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DESCRIPTIONS OF SOME NEW SPECIES OF FOSSILS, FROM THE CINCINNATI GROUP.

By E. O. Ulrich.

Incerta Sedes.

Anomaloides, n. gen.

The above generic name is proposed for the reception of certain hollow, compressed, conical bodies, having much of the form of the rays of the Asteroidea. Upon examination, however, they are found to have no surface which can be called either ventral or dorsal, since they are composed uniformly of elongated, cylindrical, spine like bodies, which are placed parallel with each other, and perpendicular to the surface.

The fragments from which this description is taken are in all so peculiar, and so different from anything heretofore known, that it would be exceedingly difficult, and probably premature for me to attempt to point out the affinities of the genus from the specimens at hand. At present, however, I believe they are to be looked for in the Echinodermata.

Anomaloides reticulatus, n. sp. (Plate IV., figs. 6, 6*a* and 6*b*.)

The thirty-five fragments before me were found on a spot about two feet square, and it may be possible that they all belonged to one individual, but that seems scarcely probable. They are all hollow, and the envelope is composed of an aggregation of sub-cylindrical or rather club-shaped stems, which are placed parallel with each other, and perpendicular to the surface; their inner ends are acutely pointed, while that end which shows on the exterior surface is rounded, and with a minute pit on the top, for the articulation of two very fine and small spines. The distribution of these club-shaped plates is very regular, being arranged in curved or flexuous transverse, and diagonally intersecting lines; and on account of their cylindrical form, there are a great number of interstices, which may be referable to pores, analogous to those in the Asteroidea.

Two of the specimens are compressed, conical in form ; one is two inches in length, and the greatest breadth is three-fourths of an inch ; its two edges run nearly parallel for about one and one-fourth of an inch, from where it tapers rapidly to a point. These specimens may represent rays. Another specimen appears to be part of a disk, and judging from its form it seems possible that it was supplied with three such rays, as those described. Two other fragments were observed, in which

some small specimens of Bellerophon bilobatus were found within the envelope of plates.

Locality and Position.—From the Cincinnati Group at Covington, Ky., at an elevation of about 275 feet above low water mark in the Ohio river. Found by Mr. H. Dickhaut and the author.

TUBULIPORIDÆ.

Genus Callopora, Hall.

Callopora cincinnatiensis, n. sp. (Plate IV., figs. 8, 8*a* and 8*b*.)

Polyzoary growing, usually in solid, though sometimes hollow branches, that do not bifurcate equally, but at variable distances send off short spurs, and are digitate at their extremities.

Cells very small, not contiguous, with the intertubular space thick, and occupied by from one to three rows of subangular interstial tubuli; cell apertures circular, about eight occupying the space of one line, and are generally separated once and a half times their diameter. Surface presenting no maculæ nor regular tuberosities, but is sometimes raised into low monticules, with no particular arrangement.

In longitudinal sections, the tubules are seen to have somewhat flexuous walls, and to be nearly vertical in the middle of the polyzoary; they then gradually bend outwards, so as to make an angle of forty-five degrees with the surface. In the intercellular tubuli, the diaphragms are quite numerous and close, while in the true tubes they are few and remote.

This species is the only recorded representative of the Genus *Callopora* in the Lower Silurian. The genus is, however, well represented in all the strata from the Niagara to the Coal Measures. There is no form in the Cincinnati group with which *C. cincinnatiensis* could be confounded, unless it be with a certain variety of *Chætetes fletcheri*, in which there are a great number of intertubular cells; they are readily distinguished by the smaller and circular cell apertures in this species; the cell mouths in *C. fletcheri* are angular, and the intertubular cells are not so numerous; the growth in the two forms is also very different.

Locality and Position.—This is a very rare species, and but few specimens of it have been found. The specimens examined were found by Mr. Fred. Braun and the author, in the Cincinnati Group, at Cincinnati O.

Chætetes venustus, n. sp. (Plate IV., figs. 7 and 7*a*.)

Polyzoary composed of large, hollow branches, bifurcating at variable distances, and sometimes irregularly thickened; branches growing from a broad expansion, which is covered on the lower side by a heavy

and strongly wrinkled dermatic crust. Branches from 3 to 10 lines in diameter, the inner or inferior side lined with a very thick epitheca; the substance of polyzoary surrounding the hollow part from 1 to 3 lines in thickness.

Surface smooth, or carrying low, broad monticules, distant from each other about $1\frac{1}{2}$ lines; their summits occupied by large maculæ, consisting of from 30 to 80 minute tubuli. Tubules arranged in regular, alternating series, about six in the space of one line, with apertures rhomboidal in outline, and in the perfect state, slightly raised and arched. Intertubular spaces thin, and almost completely destitute of minute cells, excepting the cellulose maculæ before mentioned.

Sections show tubules prostrate at first, and then bending rectangular to the surface. Diaphragms in these, straight, and generally twice the diameter of a tube apart. Diaphragms in the minute tubes close together.

This species is very distinct from any species of the genus heretofore described. From *C. jamesi*, to which it bears some resemblance, it is distinguished by the regular arrangement of its cells, and the cellulose maculæ; the latter are not represented in that species.

Locality and Position.—In the lower part of the Cincinnati Group, at Covington, Ky., from low water mark to 100 feet above that elevation. It is also found at Frankfort, Ky.

PTILODICTYA PERELEGANS, n. sp. (Plate IV., figs. 16 and 16*a*.)

Polyzoary frequently and alternately branched, sharp edged, the branches being acutely elliptical in cross section, about one quarter of a line in thickness centrally, and one and a quarter line wide. Cells covering the surface on both sides, with the exception of a rather broad non celluliferous border lining the branches. The bases of the cells on the two aspects of the frond are separated by a thin laminar axis. Cell-mouths circular, with a conspicuously elevated rim, arranged in transverse rows, as well as in very regular intersecting diagonal lines, which form an angle of about thirty degrees with the sides of the branches; about seven cells in the space of one line measuring both longitudinally and transversely.

Intertubular spaces quite as wide as the cell-openings, and ornamented, when perfectly preserved, by slightly raised and flexuous lines. The non-poriferous border occupies, on each side, about one seventh of the entire width of a branch, and is marked with very fine, and but slightly waved striae, the direction of which forms an angle of about fifteen degrees with the margin of the branches.

This beautiful species is allied to *P. (Stictopora) elegantula*, of Hall, but that species does not branch so frequently, has the cell-mouths

val, and larger, while the intertubular species are thinner than they are in this species; the direction of the striae on the non-poriferous margin of Hall's species, forms a much larger angle with the edge of the branch than it does in P. *perelegans*.

Locality and Position.—In the upper part of the Cincinnati Group, near Clarksville, O. Type specimen found by Mr. F. Fornshell.

OPHIUROIDEA.

Protasterina, n. gen.

Rays five, slender, flexible, and extending much beyond a circular and minutely granular disk, which is provided with short, slender, and outwardly directed spines; inner ray pieces regularly alternating, of an hour-glass shape, and interlocking along the median line, which is therefore not straight but zigzag; outer ray pieces elongated, directed obliquely outwards, so as to partly overlap each other; two rows of large pores between the inner and outer ray pieces; in the type species these pores appear to have been occupied by loosely-fitting, sub-pyramidal plates, some of which have a deep depression in the top, as though they were perforated; their true nature, however, is very uncertain. Oral pieces ten, each pair being formed by two of the outer ray pieces.

Type, *P. fimbriata*.

This genus is allied to Protaster, of Forbes, but differs from it in the following particulars:

1. The disk of Protaster is composed of distinct imbricating plates, which carry no spines.

2. The inner ray pieces do not interlock, but are set opposite to each other, with the impressed mesial line straight.

3. The oral plates are formed by the extension of the inner ray ossicles, and not of the outer ray pieces.

4. That genus has four rows of pores, while in Protasterina there are but two rows.

The rays of Tæniaster, of Billings, bear some resemblance to those of Protasterina, but in that genus there is no disk, and the ambulacral ossicles are set opposite to each other, while the two rows of pores are situated within those pieces. Mr. Billings placed his genus with the Asteroidea, while Protasterina clearly has the characters of the Ophiuroidea.

Protaster fimbriata, n. sp. (Plate IV., fig. 9, 9*a*, 9*b* and 9*c*.)

Disk of medium size, circular. Dorsal side of disk, and rays to margin of disk, covered with a granular integument. Ventral surface of

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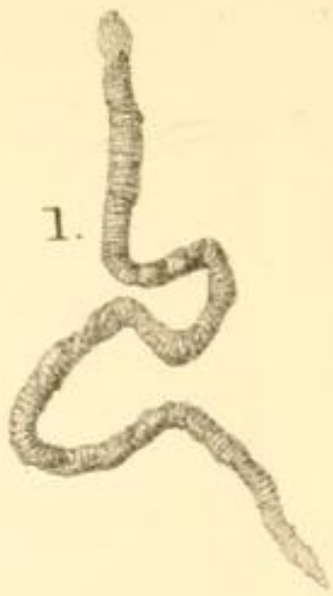

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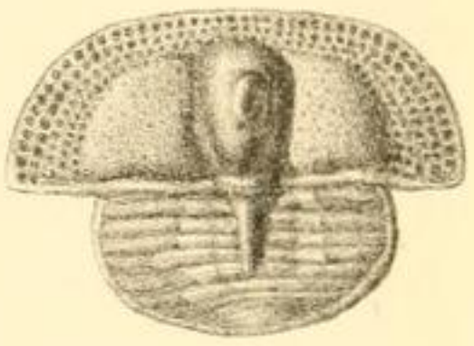

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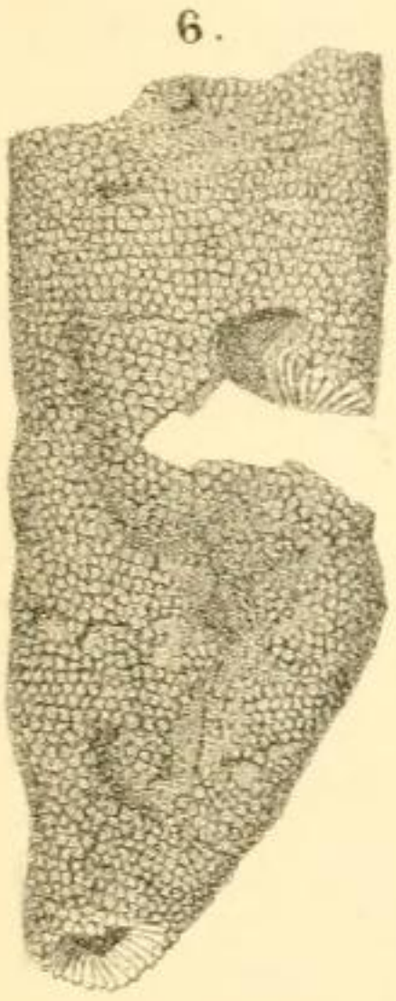

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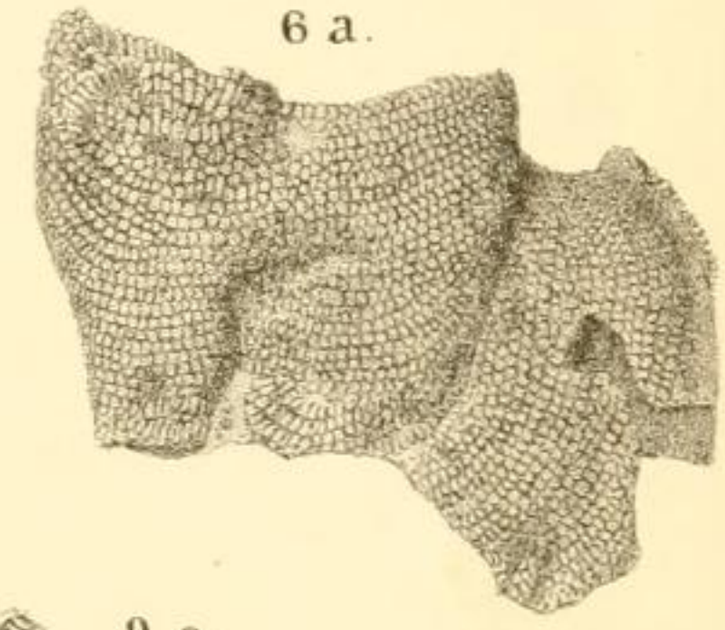

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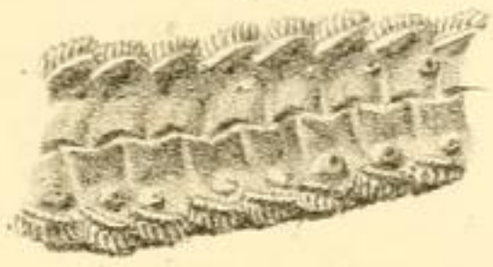

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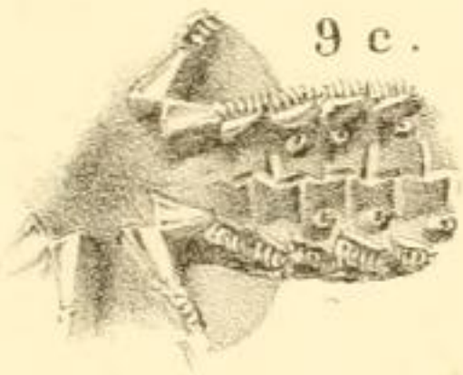

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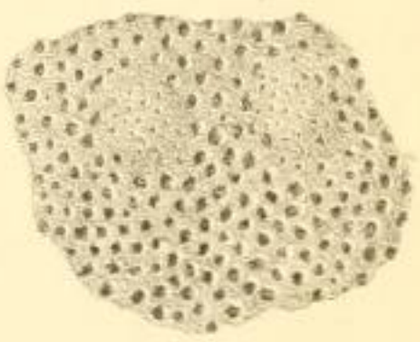

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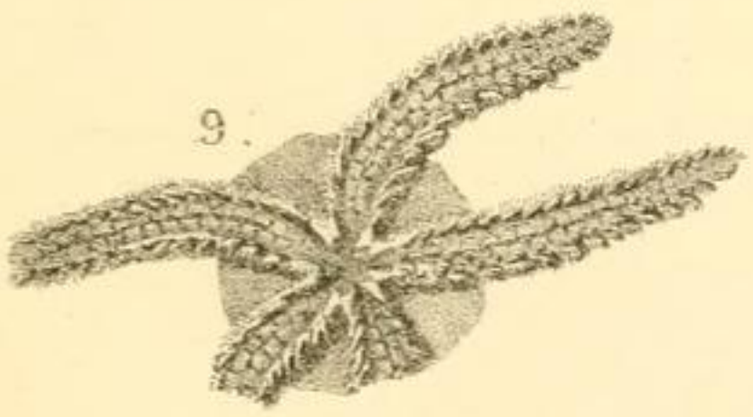

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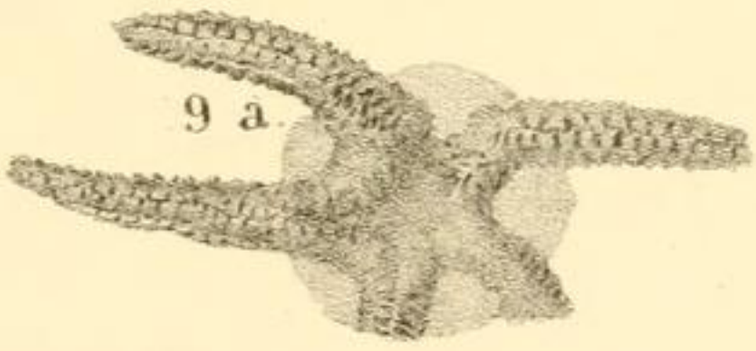

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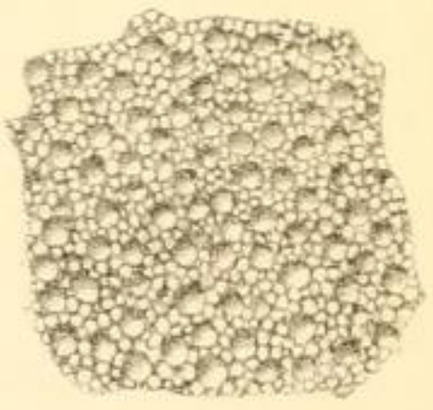

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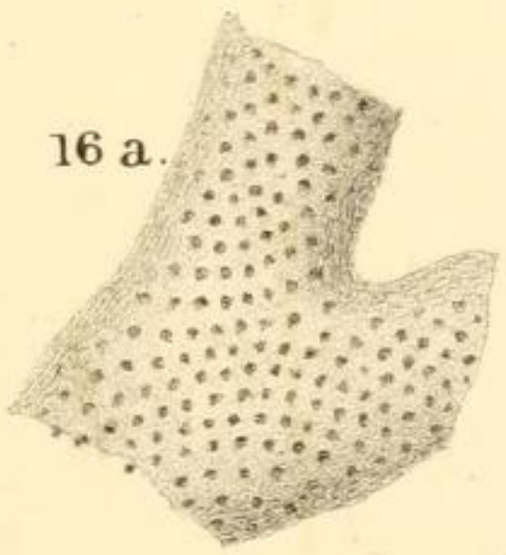

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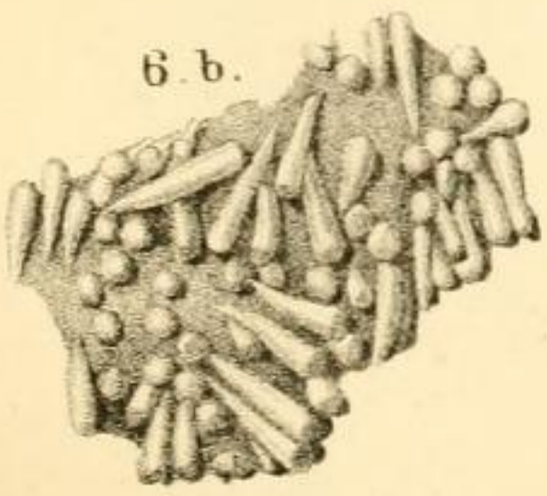

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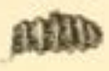

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DESCRIPTIONS OF SOME NEW SPECIES OF FOSSILS,

FliOM THE CINCINNATI GEO UP.

By E. O. Ulrich.

Incerta Sedes.

Anomaloides, n. gen.

The above geueric name is proposed for the reception of certain hollow, compressed, conical bodies, having much of the form of the rays of the Asteroidea. Upon examination, however, they are found to have no surface which can be called either ventral or dorsal, since they are composed uniforaily of elongated, cylindrical, spine like bodies, which are placed parallel with each other, and perpendicular to the surface.

The fragments from which this descripMon is taken are in all so peculiar, and so different from anything heretofore known, that it Avould be exceedingly difficult, and probably premature for me to attempt to point out the affinities of the genus from the specimens at hand. At present, however, I believe thej^ are to be looked for in the Echinodermata.

Anomaloides reticulatus, n. sp. (Plate IV., figs. 6, Qa and 6b.)

The thirty-five fragments before me were found on a spot about two feet square, and it may be possible that they all belonged to one individual, but that seems scarcely probable. They ai'e all hollow, and the envelope is composed of an aggregation of sub-cylindrical or rather club-shaped stems, which are placed parallel with each other, and perpendicular to the surface; their inner ends are acutely pointed, while that end which shows on 'the exterior surface is rounded, and with a minute pit on the top, for the articulation of two very fine and small spines. The distribution of these club-shaped plates is very regular, being arranged in curved or flexuous transverse, and diagonally intersecting lines; and on account of their cylindrical form, there are a great number of interstices, which may be referable to pores, analogous to those in the Asteroidea.

Two of the specimens are compressed, conical in form ; one is two inches in length, and the greatest breadth is three-fourths of an inch ; its two edges run nearly parallel for about one and one-fourth of an inch, from where it tapers rapidly to a point. These specimens may represent rays. Another specimen appears to be part of a disk, and judging from its form it seems possible that it was supplied with three such

rays, as those described. Two other fragments were observed, in which

[Begin Page: Page 93]

some small specimens of Bellerophon bilobatus were found within the envelope of plates.

Locality and Position. — From the Cincinnati Group at Covington, K3^, at an elevation of about 275 feet above low water mark in the Ohio river. Found bv Mr. H. Dickhaut and the author.

TUBULIPORID^.

Genus Callopora, Hall.

Callopora cincinnatiensis, n. sp. (Plate IV,, figs. 8, 8a and %h.)

Polyzoary growing, usually in solid, though sometimes hollow branches, that do not bifurcate equallj^ but at variable distances send off short spurs, and are digitate at their extremities.

Cells very small, not contiguous, with the intertubular space thick, and occupied b}' from one to three rows of subangular interstial tubuli ; cell apertures circular, about eight occupj'ing the space of one line, and are generally separated once and a half times their diameter. Surface

presenting no maculae nor regular tuberosities, but is sometimes raised into low monticules, with no particular arrangement.

In longitudinal sections, the tubules are seen to have somewhat flexuous walls, and to be nearlv vertical in the middle of the polyzoary; they then gradually bend outwards, so as to make an angle of forty-five degrees with the surface. In the intercellular tubuli, the diaphragms aie quite numerous and close, while in the true tubes they are few and remote.

This species is the only recorded representative of the Genus Callopora in the Lower Silurian. The genus is, however, well represented in all the strata from the Niagara to the Coal Measures. There is no form in the Cincinnati group with which C. cincinnatiensis could be confounded, unless it be with a certain vai'iety of ChcBtetes fletcheri, in which there are a great number of intertubular cells; they are readily distinguished by the smaller and circular cell apertures in this species; the cell mouths in C. fletcheri are angular, and the intertubular cells are not so numerous; the growth in the two forms is also very difl^'erent.

Locality and Position.— This is a very rai'e species,and but few specimens of it have been found. The specimens examined were found by Mr. Fred. Braun and the author, in the Cincinnati Group, at Cincinnati O.

Ch^tetes vexustus, n. sp. (Plate IV., figs. 7 and la.)

Pol^'zoar}^ composed of large, hollow branches, bifurcating at variable

distances, and sometimes irregularly thickened; branches growing from a broad expansion, which is covered on the lower side by a heavy

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and strongly wrinkled dermatic crust. Branches from 3 to 10 lines iu diameter, the inner or inferior side lined with a very thick epitheca; the substance of pol^^zoary surrounding the hollow part from 1 to 3 lines in thickness.

Surface smooth, or carrj'ing low, broad monticules, distant from each other about 1|- lilies; their summits occupied b}' large maculiv, consisting of from 30 to 80 minute tubuli. Tubules arranged in regular, alternating series, about six in the space of one line, with apertures I'homboidal in outline, and in the perfect state, slightly raised and arched. Intertubular spaces thin, and almost completely destitute of minute cells, excepting the cellulose maculse before mentioned.

Sections show tubules prostrate at first, and then bending rectangular to the surface. Diaphragms in these, straight, and generally twice the diameter of a tube apart. Diaphragms in the minute tubes close together.

This species is very distinct from any species of the genus heretofoi'e described. From C. jamesi, to which it bears some resemblance, it is

distinguished by the regular arrangement of its cells, and the cellulose maculiB; the latter are not represented in that species.

Locality and Position. — In the lower part of the Cincinnati Group, at Covington, K}'., from low water mark to 100 feet above that elevation. It is also found at Frankfort, K}'.

Ptilodictya perelegans, n. sp. (Plate IV., figs. 16 and 16a.)

Folyzoary frequentl}^ and alternately branched, sharp edged, the branches being acutely elliptical in cross section, about one quarter of a line in thickness centrally, and one and a quarter line wide. Cells covering the surface on both sides, with the exception of a rather broad non celluliferous border lining the branches. The bases of the cells on the two aspects of the frond are separated by a thin laminar axis. Cell-mouths circular, with a conspicuously elevated rim, arranged in transverse rows, as well as in very regular intersecting diagonal lines, which form an angle of about thirty degrees with the sides of the branches; about seven cells in the space of one line measuring both longitudinally and transversely.

Intertubular spaces quite as wide as the cell-openings, and orna-mented, when perfectly preserved, by slightly raised and flexuous lines. The non-poriferous border occupies, on each side, about one seventli of the entire width of a bi-ancli, and is marked with very fine, and but slightly waved striae, the direction oi' which forms an angle of about fifteen degrees with the mnrgin of the branches.

This beautiful species is allied to 1'. (Stictopora) elegantula, of Hall,

))ut that species does not branch so fro(\u('ntly, has the cell-mouths

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vtil, and larger, while the iutertubular species are thinner than they are in this species; the direction of the striae On the non-poriferous margin of Hall's species, forms a much larger angle with the edge of the branch than it does in P. ^jereZer/ro?.?.

Locality and Position. — In the upper part of the Cincinnati Group, near ("larksville, O. Type specimen found b}' Mr. F. Fornshell.

OPHIUROIDEA.

Protastekina, n. gen.

Rays five, slender, flexible, and extending much beyond a circular and minutely granular disk, which is provided with short, slender, and outwardly directed spines ; iuner ra}^ pieces regularly alternating, of an hour-glass shape, and interlocking along the median line, which is therefore not straight but zigzag; outer ray pieces elongated, directed obliquely outwards, so as to partly overlap each other; two rows of large pores between the inner and outer ray pieces; in the type species these pores appear to have been occupied b}^ loosely-fitting, sub-pvra-midal plates, some of which have a deep depression in the top, as

though they were perforated; their true nature, however, is very uncertain. Oral pieces ten, each pair being formed bj- two of the outer raj" pieces.

Type, P. fmbriata.

This genus is allied to Protaster, of Forbes, but differs from it in the following particulars :

1. The disk of Protaster is composed of distinct imbricating plates, which carry no spines.

2. The inner ray pieces do not interlock, but are set opposite to each other, with the impressed mesial line straight.

3. The oral plates are formed by the extension of the inner ray ossicles, and not of. the outer ray pieces.

4. That genus has four rows of pores, while in Protasterina there are but two rows.

The rays of Tjieni aster, of Billings, bear some resemblance to those of Protasterina, but in that genus there is no disk, and the ambulacral ossicles are set opposite to each other, while the two rows of pores are situated within those pieces. Mr. Billings placed his genus with the Asteroidea, while Protasterina clearly has the characters of theOphiuroidea.

Protaster fijibriata, n; sp. (Plate IV., fig. 9, da, 9b and 9c.)

Disk of medium size, circular. Dorsal side of disk, and rays to margin of disk, covered with a granular integument. Ventral surface of

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