

DESCRIPTIONS OF NEW SPECIES OF FOSSILS FROM OHIO AND OTHER  
WESTERN STATES AND TERRITORIES.

BY F. B. MEEK.

The Ohio fossils described in this paper are a part of the collections of the Geological Survey of that State, now being prosecuted under the direction of Dr. J. S. Newberry. Full descriptions and illustrations of these will appear in the reports of this Survey. Those from Illinois will likewise be illustrated and described in the reports of the Survey of that State. For the latter I am under obligations to Mr. William Gurley and Dr. Winslow, of Danville, Illinois.

The *Melantho* and *Viviparus*, described at the end of the paper, belong to collections brought by Dr. Hayden from Wyoming Territory, and were accidentally omitted in my preliminary paper recently published in Dr. Hayden's report. They will be figured along with the others in his final report.

OHIO COLLECTIONS.

**FENESTELLA DELICATA**, Meek.

Growing in flat flabelliform, very finely reticulated expansions; branches very slender, rigid, bifurcating, and often nearly parallel, or gradually diverging to give room for new ones formed by division; dissepiments about half as thick as the branches, alternating or opposite, and but little expanded at their ends as seen on the non-poriferous side; fenestrules very uniform, oblong, with length usually about one-third to one-half greater than their breadth; non-poriferous side roughened by little granules; poriferous side with a row of little pointed elevations along a more or less defined mesial ridge of each branch, pores comparatively large, alternating and numbering two, or occasionally three, in each row opposite each fenestrule, and one generally exactly at each end of each dissepiment.

Size of entire polyzoum unknown, but it apparently attains a length of three inches or more; number of fenestrules in 0.20 inch, measuring longitudinally, three; ditto, measuring transversely, four.

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As seen on the non-poriferous side, this species closely resembles Prof. McCoy's figure of his *F. plebeja*, as represented natural size, excepting that it forms a slightly finer network. Under a magnifier, however, it is seen to differ in having a row of little nodes along each branch, and I have not seen any longitudinal striae on its branches, though they probably exist on those of perfect specimens. The magnified figure of the poriferous side of *F. plebeja* shows still more important differences, its fenestrules being proportionally much longer, with four or five pores opposite each side. The little nodes or projections along the middle ridge of this side of the branches in our species do not exist in *F. plebeja*, nor does the latter usually have a pore opposite the end of each dissepiment, as in the species under consideration.

*Locality and position.* Lodi, Ohio. Waverley group of Lower Carboniferous.

**PTILODICTYA (STICTOPORA) CARBONARIA, Meek.**

Ramose, branches from their origin generally nearly equalling the breadth of the stem from which they spring more or less alternately and at angles of about  $50^{\circ}$  to  $60^{\circ}$ ; poriferous surfaces of each side flattened convex; lateral margins sharp and smooth; pores arranged in quincunx so as to form about seven to nine longitudinal rows (those of each two adjacent rows alternating), and about the same number of pores may be counted in each oblique row, very nearly or quite circular, and each with a prominent margin, so as to appear as if penetrating minute pustules; intervening spaces usually about once and a half to twice the breadth of the pores, and smooth or without longitudinal ridges or furrows.

Entire size unknown; breadth of medium-sized branches, 0.14 inch; thickness in the middle, 0.05 inch; number of pores in a space of 0.10 inch of each longitudinal row, six; while in the oblique rows about seven may be counted in the same space.

Among the Silurian species of *Stictopora*, this seems to agree most nearly with *S. punctipora*, Hall, from the Niagara Group, which it nearly resembles in its round pores with raised margins, as well as in the number and arrangement of its pores. It differs, however, in having its sharp lateral margins smooth, instead of being striated. A critical comparison of specimens from these

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two widely-separated horizons would doubtless show other differences of details.

Its branches are narrower, and the number of its longitudinal rows is less than in the species from the Corniferous limestone that I have described under the name *P. Gilberti*, which also differs in having longitudinal ridges between the rows of pores.

*Locality and position.* Newark, Ohio. Coal-measures (lower part).

**AVICULOPECTEN SANDUSKYENSIS, Meek.**

Shell attaining a rather large size, strongly compressed, very nearly equivalve, rather oblique, somewhat longer in its antero-posterior diameter than high; posterior margin rounded and somewhat produced below, and sloping upward and forward above; anterior margin rounding obliquely backward and downward from the anterior ear into the base, which is semiovate, being a little more prominent behind than anteriorly; hinge line rather distinctly shorter than the entire antero-posterior diameter of the valves; ears flat, subequal, and acutely pointed, the posterior one being shorter than the margin below, and the anterior sometimes longer than the anterior margin beneath; in the left valve both are defined by somewhat angular nearly equal marginal sinuses, while in the right valve the anterior one is slightly concave and defined by a more angular sinus, from which a linear impression extends obliquely upward to the beak, which seems not to project above the cardinal margin; beak of left valve slightly more convex than that of the other, but scarcely more prominent, and placed a little in advance of the middle of the hinge. Surface of left valve ornamented by numerous unequal, slender, radiating costæ or thread-like lines, that are narrower than the spaces between, and obscure concentric striæ, only the latter of which are usually seen on the ears; surface of right valve similarly but less distinctly marked.

Antero-posterior diameter of a specimen under medium size, 1.27 inches; height, measuring at right angles to the hinge, 1.20 inches; convexity, about 0.16 inch. Some specimens were, when entire, evidently not less than twice the linear dimensions of that from which these measurements were taken.

As near as can be determined from Mr. Conrad's rather brief

description, and his figure of a single right valve of his *Avicula parilis* (Journ. Acad. Nat. Sci. Philad., vol. 8, pl. xii., fig. 9), the species under consideration would seem to be somewhat nearly allied. It has nearly the same general outline and obliquity, and somewhat similar ears, though its anterior ear is proportionally shorter, and defined by an impressed line extending from the sinus obliquely upward to the beak. Our shell also differs in being very nearly or quite equivalve, instead of having the right valve flat and the left plano-convex.

I know nothing of the hinge of this shell, and therefore merely refer it provisionally to *Aviculopecten*. It is rather more oblique than the species of that genus generally are, and possibly it may be found to have the internal characters of *Pterinea* or *Avicula*, and thus have to take the name *Pterinea Sanduskyensis* or *Avicula Sanduskyensis*.

*Locality and position.* Sandusky and Delaware, Ohio. Corniferous group of the Devonian series.

**PTERINEA (PTERONITES?) NEWARKENSIS, Meek.**

Shell small, longitudinally subovate or truncato-semiovate, about two-thirds as wide (high) as long, being wide behind and narrowing anteriorly; cardinal margin straight or slightly curved in outline behind the beaks, and about two-thirds the length of the valves, very short and declining in front of the beaks; posterior margin truncated so as to intersect the hinge at an angle of about  $100^{\circ}$ , but rounding regularly into the base; anterior side very short, somewhat lobed and narrowly rounded; basal margin semiovate, being most prominent, and ascending obliquely with a very slightly sinuous outline before. Left valve moderately convex, the greatest convexity being near the middle, or a little before it, and thence obliquely forward and upward to the beak, as well as downward to the most prominent part of the base behind the middle; beak very oblique, elevated a little above the hinge margin, and placed about one-fifth the length of the valve from the anterior extremity; swell of the oblique umbonal and central regions separated from the slightly lobed, narrowly rounded anterior extremity by a broad undefined impression extending to the antero-basal margin; posterior dorsal margin compressed and somewhat alate; surface apparently smooth, excepting some very faint ridges of growth, which are most strongly defined on the

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anterior extremity. (Right valve unknown.) Length of left valve 0.55 inch; height (behind the middle), 0.35; convexity, 0.10 inch.

This is one of those peculiar forms presenting an intermediate appearance between *Avicula*, *Pterinea*, and *Pteronites*, but not agreeing exactly in outline with well-defined species of any of these groups. So far as can be determined from casts of the left valve only, it does not appear to have had the hinge teeth of *Avicula* or *Pterinea*; while it also differs from the latter in not having the posterior extremity of the hinge extended or acutely angular, though there is an obtusely angular, slight posterior dorsal alation, which, however, is not defined by any sinuosity of the posterior margin. From the forms on which the genus *Pteronites* was founded, it differs in having the hinge a little shorter than the posterior margin, and its beaks further removed from the anterior extremity.

There are probably several undefined genera among the Carboniferous shells of this general appearance, that we have not yet the means of defining.

*Locality and position.* Newark, Ohio. Waverley group of the Lower Carboniferous series.

#### CYPRICARDINA? CARBONARIA, Meek.

Shell small, longitudinally oval, less than twice as long as high, the widest (highest) part being under the posterior extremity of the hinge; rather gibbous, with often a shallow undefined impression or slight concavity extending from the beaks obliquely backward and downward to near the middle of the basal margin; posterior side rounded below the middle, and somewhat straightened and sloping up obliquely forward to the posterior extremity of the hinge; anterior side extremely short and more or less rounded; cardinal margin nearly straight or slightly arched, and about two-thirds the length of the valves, sometimes showing a very faint compression, or tendency to become a little alate behind; base most prominent posteriorly, and gently ascending forward, with a more or less defined broad sinuosity along the middle; beaks extremely oblique, terminal, and so little prominent as scarcely to project beyond the rounded outline of the anterior end. Surface ornamented by about twenty, very regularly disposed, subimbricating laminae of growth.

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Length, 0.56 inch; height, 0.34 inch; convexity, about 0.17 inch.

This little shell agrees very nearly, in size, form, and ornamentation, with the typical forms of the group for which the name *Cypricardina* was proposed, excepting perhaps the fine sculpturing seen between the larger regularly disposed lamina of growth in those shells, though even these markings may possibly exist on well-preserved specimens of our species.

In regard to the hinge of the typical species of *Cypricardina*, nothing is known. In the shell here described, however, one of the casts shows a moderately well developed hinge plate, with one linear tooth in one valve, and two in the other, running nearly parallel with the cardinal margin along its entire length, and at the posterior end of the hinge one or two shorter linear teeth parallel to and beneath the others; while at the anterior end of the hinge, in the right valve, there is one very small, slightly oval tooth, fitting between two similar minute teeth in the left valve. These little teeth are slightly compressed from above and below, and range with their longer diameter nearly parallel to the hinge margin. No cardinal area can be seen, though there may have been a very small narrow one immediately between the beaks, as there is no cavity seen in the hinge margin for an internal cartilage. The muscular and pallial impressions are so faintly marked that no traces of them have been seen on the casts of the interior.

Until the hinge of the typical species of *Cypricardina* can be made out, it is impossible to determine whether our shell belongs to that genus or not. I have the impression, however, that it belongs to a distinct Carboniferous group nearly allied to the Silurian genus *Cypricardites* of Conrad, but differing in having its principal hinge teeth extending the entire length of the cardinal margin, with the cardinal area more or less nearly obsolete, and the anterior muscular impression very obscure. It also differs from the known species of Mr. Conrad's genus, in having remarkably regular, prominent, imbricating, concentric ridges or laminae. *Arca squamosa*, *A. obscura*, and *A. faba*, de Koninck, belong apparently to the same group, and possibly also the form referred by this same author to *A. obtusa*, Phillips, though the latter approaches still more nearly to the typical Silurian forms of *Cypricardites* in its hinge characters.

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If *Cypricardina* should be found to have a differently constructed hinge, I would propose for the group of which the species here described might be regarded as the type, the name *Synopleura*, in allusion to its very regular concentric costæ or laminae of growth. It is still possible, however, that this group may be found too nearly allied to *Cypricardites* to stand as a distinct full genus; if so, the name of the species under consideration would have to be written *Cypricardites (Synopleura) carbonaria*.

*Locality and position.* Newark, Ohio. Lower Coal-measures.

**SCHIZODUS MEDINAENSIS, Meek.**

Shell of medium size, subtrigonal, moderately convex above the middle and cuneate below, somewhat longer than high; anterior side rounded; basal margin somewhat straightened or slightly convex in outline along the middle, rounded up regularly in front and more abruptly behind; dorsal outline sloping nearly at right angles from the beaks toward the extremities, the anterior slope being more abrupt than the other; posterior side longer than the anterior, sloping with a more or less convex or subtruncate outline above, and very narrowly rounded below; beaks rather prominent, pointed, located a little in advance of the middle; posterior umbonal slopes rather prominently rounded or subangular from the beaks obliquely to the posterior basal extremity. Surface nearly smooth, or only showing fine lines of growth.

Length, 1 inch; height, 0.82 inch; convexity, 0.44 inch.

This species has been supposed to be identical with, or nearly related to, a New York Chemung form, which was, I believe, described by Mr. Conrad under the name *Nuculites Chemungensis*. It certainly differs, however, materially in form from that shell as figured and described by Mr. Conrad in vol. viii. of the Journ. Acad. Nat. Sci. Philad., and might with as much propriety be identified with western Coal-measure species, ranging even up into beds referred by some to the Permian. One of these, described by Prof. Swallow under the name *Cypricardia? Wheeleri* (Trans. St. Louis Acad. Sci., vol. ii. p. 96, 1862), and figured by Prof. Geinitz under the name *Schizodus obscurus*, in his "Carbonformation und Dyas in Nebraska," agrees more nearly in form, but differs in being decidedly more depressed, with less elevated beaks, and a more

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truncated posterior outline. It also differs from the shell under consideration, in being sometimes a little sinuous on the posterior basal margin. Another Coal-measure form figured by Prof. Geinitz, under the name *Schizodus Rossicus*, is in some respects still more nearly like our shell, but differs in other characters.

As difficult as it certainly sometimes is to separate closely allied species of this genus, I cannot think that we ought to refer to the same species forms found occupying such widely different horizons as the Chemung group of the Devonian, and the Waverley group and Coal-measure of the Carboniferous; on the contrary, it seems to me that we ought to regard them as distinct species, although it may not be easy, in all cases, to point out well-defined distinctions in the fossilized shells.

*Locality and position.* Medina, Ohio. Waverley group of the Lower Carboniferous.

#### SCHIZODUS SUBTRIGONALIS, Meek.

Shell trigonal-subovate, about once and a half as long as high, rather convex; basal margin more or less nearly semicircular in outline, rounding up regularly in front and abruptly behind; anterior side short, rounded or subtruncate; posterior side somewhat extended, rounded below, and slanting very obliquely forward and upward above to the posterior extremity of the hinge, which is short and a little straightened; posterior umbonal slopes prominently rounded; beaks somewhat depressed and usually nearer the anterior end than the middle. Surface smooth, with apparently only fine lines of growth.

Length, 0.96 inch; height, 0.66 inch; convexity, 0.36 inch.

This species is more depressed and oblique than the last, and has its beaks placed farther forward. In its depressed oblique form, it agrees even more closely with *S. Wheeleri*, Swallow (sp.), than the last, but it differs again in having its beaks placed farther forward, or sometimes almost over the anterior margin. It also appears to be always without the faint sinuosity of the posterior basal margin sometimes seen in that Coal-measure form.

*Locality and position.* Wooster, Ohio. Waverley group of the Lower Carboniferous series.

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## ALLORISMA WINCHELLI, Meek.

Shell of about medium size, elongate subelliptic, the length being equal to about three and a half times the height, moderately convex; posterior extremity a little gaping, obliquely subtruncated above and narrowly rounded below the middle; anterior extremity extremely short, closed, concave in outline obliquely forward and downward from the beaks above, to the lower end of the lunule, where it is subangular, and from this point rounding off obliquely into the base; ventral margin forming a broad, gentle curve, but generally somewhat straightened, and sometimes faintly sinuous near the middle; dorsal margin nearly straight, or a little concave in outline, and showing the usual inflection, which forms a lanceolate escutcheon with a slight ridge on each side, from the beaks to the posterior extremity of the hinge, which equals about three-fourths the entire length of the valves; beaks much depressed, very oblique, incurved, and located only about one-fourteenth the entire length of the shell from the anterior extremity; posterior umbonal slopes merely somewhat prominently rounded; anterior umbonal slopes generally subangular near the beaks, and sometimes this prominence is obscurely continued as a faint rounded ridge obliquely backward and downward to a point a little in advance of the middle of the base. Surface ornamented with concentric lines and ridges of growth, that generally assume the character of little regular wrinkles on the umbones. Lunule small, rather deep, moderately well defined, and obovate in form.

Length of a mature specimen, 1.74 inches; height to middle of dorsal side, 0.83 inch; do. to horizon of beaks, 0.87 inch; convexity, 0.70 inch; length of hinge line, 1.17 inches.

This is a very neat, symmetrical species, often found in an excellent state of preservation as casts of the exterior showing perfectly the form and surface-markings, excepting the fine granulations usually, if not always, existing in species of this genus. Like other species of the group, it varies more or less in form, some individuals being proportionally shorter and higher than others. In size and general appearance it closely resembles *A. clavata* of McChesney, from the Chester group. It does not resemble the particular *variety* of that shell, however, figured by Prof. McChesney, so nearly as it does what I have always believed 1871.]

to be the usual form of the same, his typical specimen having the beaks more prominent and farther removed from the anterior end than in the more normal form of the species, and its dorsal outline straighter and more sloping posteriorly, with the valves more compressed. Compared with specimens that I have referred to, *A. clavata* from the Chester group of West Virginia, collected by Prof. Stevenson, our Waverley species are found to agree very nearly with some individuals of the latter, though it always has its ridges of growth less strongly defined and more irregular, and its anterior basal margin usually more oblique. It also differs in the possession of an anterior umbonal ridge extending from the beaks obliquely backward and downward nearly or quite to the basal margin a little in advance of the middle.

The specific name is given in honor of Prof. A. Winchell, the able State geologist of Michigan, who has described many fossils from the same horizon in the western States.

*Locality and position.* Rushville and Newark, Ohio. Upper part of the Waverley group of the Lower Carboniferous.

**ALLORISMA VENTRIOSA, Meek.**

Shell subovate, the length being about once and a half the height, moderately convex; posterior margin obliquely subtruncated above, and narrowly rounded or subangular near the middle, thence sloping obliquely under and forward; base rather deeply and somewhat irregularly rounded, the most prominent part being near the middle; anterior side short, with an oblique truncate or concave forward slope above, to the lower extremity of the lunule, where there is a more or less angular projection, below which the margin slopes with a slightly convex outline oblique backward and downward sometimes nearly to the middle of the base; dorsal margin more or less concave in outline, and showing the usual lanceolate escutcheon margined on each side by a subangular ridge; hinge equalling about two-thirds the length of the valves; lunule rather small, deep, well defined, and narrow-subovate in form; beaks moderately prominent, oblique, and placed about one-seventh the length of the valves from the anterior end. Surface ornamented by small irregular ridges and furrows of growth.

Length, 1.46 inches; height to cardinal margin, 0.98 inch; do. to horizon of beaks, 1.03 inches; convexity, 0.66 inch; length of

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hinge, 1 inch. Another specimen, 1.54 inches in length, has a convexity of 0.75 inch.

It is barely possible that this may be a variety of the last, but as I have before me ten good specimens of that shell, and two of the form under consideration, and there are among them no intermediate gradations between the two forms, I can but regard them as distinct species. The shell here described differs from the last, with which it was found associated, in being proportionally decidedly shorter and wider (higher), as well as in having its ventral margin much more prominent or deeply rounded in the central region. Its beaks are also less oblique, rather more prominent, and proportionally farther from the anterior end. It shows some faint traces of a similar anterior oblique umbonal ridge to that seen in the preceding species, but it is less distinct, and does not show so decided a tendency to become angular at the beaks.

*Locality and position.* Rushville, Ohio. Waverley group.

**PLATYOSTOMA? TRIGONOSTOMA, Meek.**

Shell strongly depressed or subdiscoid, with the periphery angular; spire so low that the shell is less convex above than below the periphery; volutions three, very rapidly increasing in size, particularly in breadth, merely with an outward slope above; last one large and compressed convex, but not much projecting below, a little declining near the aperture on the inner side above; suture linear; aperture large, subtrigonal, with breadth greater than height; lip extended forward on the inner side above, and apparently very oblique. (Surface marking unknown.)

Breadth 1.35 inches; height about 0.60 inch.

I am not sure that this is a true *Platyostoma*. It is far more depressed in form than any of the described species of that genus, and, judging from some faint undulations on the east apparently corresponding to the direction of the lines of growth on the upper and lower sides of the body volution, these lines would seem to have curved strongly backward in passing outward toward the periphery, thus indicating the presence of a rather deep, broad sinuosity of the lip at the termination of the peripheral angle. If this is the real direction of the lines of growth, it would probably be nearer correct to call the species *Pleurotomaria trigonostoma*; but as there is no appearance of a band on the periphery, and the lines of growth are not *certainly* known to describe these curves,

I have concluded to place it provisionally in the genus *Platystoma*.

I should perhaps remark here, that this is certainly not a depressed variety of *Platystoma Niagarensis*; and the specimens clearly show that they have not been accidentally compressed. In internal casts there is a small umbilical perforation, but this was probably occupied by the columella, before the shell itself was dissolved away.

*Locality and position.* Yellow Springs, Ohio. Niagara group of Upper Silurian.

**PLATYCERAS (ORTHONYCHIA?) LODIENSE, Meek.**

Shell rather small, non-spiral, or merely having the form of rapidly expanding cone, with a backward obliquity that brings the apex nearly over the posterior margin; lateral slopes nearly straight or slightly concave, and converging to the apex at an angle of about  $80^{\circ}$ ; posterior side vertical and a little concave in outline; anterior slope somewhat more than twice as long as the height of the posterior side, moderately convex in outline, and provided with a ridge or obtuse carina along its entire length; aperture oval suborbicular, being slightly longer than wide; lip a little sinuous anteriorly, immediately on one or both sides of the termination of the central ridge of the anterior slope, which ridge is thus made to terminate in a little projection of the margin. Surface marked by fine lines of growth, most distinct on the anterior slope, where they curve backward as they approach the mesial ridge, and then abruptly forward in crossing this ridge; extremely faint traces of minute radiating striæ apparently also exist. Apex rather abruptly pointed and directed backward, without any lateral obliquity.

Length, measuring obliquely from apex, 0.97 inch; breadth, 0.82 inch; direct length from anterior to posterior margin, 0.96 inch; height of apex, 0.40 inch.

This species is remarkable for its regular obliquely-conical form and non-spiral apex, which is merely rather obtusely pointed and directed obliquely backward, without the slightest lateral curve. It therefore differs widely in form from the typical species of *Platyceras*, and agrees more nearly with existing species of *Capulus*. It also resembles a shell figured and described in the third

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volume of the Palæontology of New York, from the Oriskany Sandstone, under the name *Cyrtolites expansus*, excepting that its apex is not so alternate. Although possibly not a true *Platyceras*, it seems to be more nearly allied to the section of the same for which the name *Orthonychia* has been proposed than to *Cyrtolites*, which was founded on a very different type (*C. ornatus*, Con.), with a very peculiar style of ornamentation. In its surface markings our shell agrees with *Platyceras*, in being merely marked with fine lines of growth more or less undulated on the anterior slope, with traces of very obscure radiating striæ, which latter, with its non-spiral form, indicate relations to the section *Orthonychia*. It therefore bears the same relations to the elongated forms of *Orthonychia* that the depressed, rapidly expanded species of *Platyceras*, such as *P. obscurum*, bear to the typical forms of the genus.

*Locality and position.* Lodi, Ohio. Waverley group of the Lower Carboniferous series.

#### PLATYCERAS TORTUM, Meek.

Shell very thin, dextral, attaining a medium size; in young specimens composed of about one and a half to two volutions subglobose, these first turns being contiguous, rounded and rapidly increasing in size, after which the next turn, which composes the larger part of the shell, becomes free, very oblique, and increases little in size toward the aperture, thus making the entire form very obliquely subrhombic; body volution a little flattened on the upper slope, subangular above, and somewhat prominently rounded near and below the middle; aperture apparently oval suborbicular; lip without sinus; surface without plications, and with only moderately distinct lines of growth.

Length, 1.36 inches; breadth, 1 inch; breadth of aperture, 0.80 inch; height of aperture, 0.82 inch.

I have long been familiar with casts of this shell in the collections of the Illinois Survey, but as they were only casts of the interior, I had some doubts whether they might not be from distorted specimens of some of the other *Gasteropoda* already described. The specimens from which the above description was made out, however, retain the shell itself, and show that it is a true *Platyceras*. Specifically it is more nearly allied to some of 1871.]

the non-plicated varieties of the N. York Upper Silurian *P. spirale*, than it is to any of the other Carboniferous species known to me, though its first two volutions are more compactly coiled together than those of that species.

*Locality and position.* Greentown, Summit Co., Ohio. Coal-measures.

**HOLOPEA (CYCLORA) NANA, Meek.**

Shell very small, subglobose, wider than high; spire much depressed; volutions three, rounded, increasing rapidly in size, so that the last one forms the larger part of the shell; suture deep or almost channelled; surface smooth; umbilicus small; aperture subcircular; lip simple.

Height of the largest specimen seen, 0.05 inch; breadth, 0.07 inch.

This little shell seems to be quite abundant, and from the fact that the larger specimens present considerable uniformity of size and general appearance, I can scarcely doubt that they are adults. It will probably fall into the genus *Cyclora*, Hall (Am. Jour. Sci. and Arts, vol. xlviii. p. 294, 1845), and would seem to agree closely in size and form, as near as can be determined from a description alone, with the typical species *C. minuta*. So far as I have been able to determine, its inner lip, however, does not appear to be reflected over the minute umbilicus, as is said to be the case in that shell. The *C. minuta* came from the Cincinnati group at Cincinnati, and it is very improbable that it ranges up to the horizon at which the specimens under consideration were obtained.

*Locality and position.* Clinton, Ohio. Silurian.

**ORTHO CERAS? ISOGRAMMA, Meek.**

The only specimens of this shell that I have seen are flattened by accidental pressure. The most nearly perfect specimen in the collection is 2.80 inches in length, with a breadth (as seen flattened in the matrix), at the larger broken end, of about 0.95 inch, and with sides diverging from the smaller, rather bluntly pointed extremity, at an angle of about 18°. At and near the smaller end the surface is marked by very minute, crowded, transverse, or annular striæ. About three-fourths of an inch farther up, these

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striae gradually increase in size, and become more irregular in their arrangement, but soon pass above into very regular larger transverse lines, separated by spaces about twice as wide as the lines themselves. These spaces gradually increase in breadth, until they become five or six times as wide as the lines, above which point they continue very regular in their arrangement, about four of the lines and three of the intervening spaces occupying a space of 0.10 inch. Near the smaller end, the flattened spaces show what appear to be impressions of septa made visible through the thin shell by pressure. Two of these occupy a space of 0.10 inch.

As it is seen flattened in the matrix, the very regular transverse lines on this fossil give it somewhat the appearance of an attenuated *Conularia*; but as it shows no indications whatever of longitudinal angles or furrows, it cannot belong to that genus, from which it also differs in texture, though I am not quite sure that it is an *Orthoceras*. It will be readily distinguished by its surface-markings alone, from any species of the latter genus hitherto described from our Coal-measures. In its surface-markings, it bears some resemblance to *Dentalium cinctum*, de Koninck (Am. Foss. Belg., pl. xxii., Fig. 3), which Prof. de Koninck afterwards refers to the genus *Orthoceras*. Our shell, however, is much more rapidly tapering, and straight instead of arched.

*Locality and position.* Newark, Ohio. Lower Coal-measures.

## ILLINOIS COLLECTIONS.

### 'STREPTACIS WHITFIELDI, Meek.

Shell small, elongated, slender, and very gradually tapering; volutions nine or ten, increasing gradually and regularly in size; first or embryonic turn minute, planorbicular and standing edge upward; succeeding turns convex and obliquely coiled; suture deep and very oblique; aperture ovate. Surface smooth.

Length, 0.16 inch; breadth, 0.04 inch; slopes of spire straight, with a divergence of about thirteen degrees.

This little shell agrees so nearly with those Tertiary species on which Deshayes founded his genus *Aciculina*, that I am strongly

<sup>1</sup> I referred this shell to *Aciculina*, Desh., in MS.; but as that name was preoccupied, I propose for our type the name *Streptacis*.

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inclined to think it belongs to that group. It has exactly the form, size, surface, aperture, and lip, and even the irregularity, of the embryonic volutions seen in *Aciculina*; while the only difference I have been able to see is, that its embryonic turns, instead of forming a minute cone turned to one side at right angles to the longitudinal axis of the body of the shell, have the form of a *Planorbis* standing edge upward. Whether or not this slight peculiarity in the minute apex may have been accompanied by some important difference in the structure of the animal, it is of course impossible to say.

The specific name is given in honor of R. P. Whitfield, Esq., of Albany, New York.

*Locality and position.* Danville, Illinois, where it occurs with many other small shells of the Coal-measures, in a bed of shale immediately over the coal-mine of that place.

**LOXONEMA ATTENUATA, var. SEMICOSTATA.**

*Chemnitzia attenuata*, Stevens, 1858, Am. Journ. Sci., vol. xxv. (Sec. series), p. 259.—(Not *Loxonema attenuata*, Hall, 1859.)

Shell very small, elongate-conical, somewhat more tapering above than below the middle; volutions about twelve, slightly convex and increasing gradually in size from the apex, the last one being rounded and not larger in proportion to the regular increase of the whole than the others; suture distinct; aperture ovate, scarcely equalling one-fourth the entire length of the shell. Surface of the upper volutions (excepting one or two of the smooth apical turns) each ornamented by thirteen or fourteen very regular, straight vertical costæ, about equal in length to the furrows between; farther down these costæ gradually become obsolete, so that three or four of the lower volutions show only minute lines of growth that are invisible without the aid of a magnifier.

Length of a rather small specimen, 0.13 inch; breadth, 0.15 inch; slopes of spire slightly convex and diverging from the apex at an angle of about 18°.

This little shell is evidently closely allied to the form called *Chemnitzia attenuata* by Dr. Stevens, but its volutions increase more rapidly, and have the costæ smaller. It is probably a distinct species, but until more specimens can be examined with the view of determining how far the species varies in the characters mentioned, I have preferred to place it as a variety *L. attenuata*.

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One of the specimens of this species shows some indications of having the immediate apical turn, as it were, very slightly uncoiled, from which I am inclined to suspect that its embryonic volution may have been reversed. This and the very small size of the species seem to separate it from the typical *Loxonemas* and approximate it to *Turbonilla*. If its apex really was reversed, it should be placed in the latter genus, with the name written *Turbonilla attenuata* var. *semicostata*.

*Locality and position.* Shale over the coal-bed at Danville, Illinois.

#### MURCHISONIA OBSOLETE, Meek.

Shell small, conical; spire moderately prominent, with lateral slopes, straight, or sometimes very slightly concave a little above the middle, rather attenuated near the apex; volutions about ten, compactly coiled, and regularly and gradually increasing in size from the apex, compressed convex; last one not enlarged, or more produced below than in proportion to the general increase in the size of the others, somewhat prominently rounded, but not even subangular below the middle; aperture subrhombic, being a little longer than wide, angular above, apparently angular or effuse on the inner side below, and rather abruptly rounded on the outer side below the middle, while the arcuate character of the columella gives a rounded appearance to the middle of the inner side; suture deeply impressed; spiral band very obscure, being flat, even with the surface, and only defined by the faintest possible impressed line along its upper and lower margins. Surface almost entirely smooth, but showing, when closely examined, very obscure traces of marks of growth curving strongly backward as they approach the spiral band, which passes around rather less than its own breadth above the suture on the volutions of the spire.

Length of largest specimen, 0.95 inch; breadth, 0.37 inch.

This species will be at once distinguished from the last, by its shorter and more compactly coiled volutions, and almost entirely smooth surface, on which no traces of revolving lines, or of the distinct regular lines seen on that shell, occur. It also wants the impressed line immediately below the suture of *M. loxonemoides*. It is very peculiar in having the revolving band almost entirely obsolete.

*Locality and position,* same as last. .

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**PLEUROTOMARIA TEXTILIGERA, Meek.**

Shell attaining a medium or somewhat larger size, turbinâte or rhombic, suboval in general outline, with height a little greater than the breadth; spire depressed conical; volutions four or five, flattened exactly on a line with the slope of the spire from the apex to near the middle of the last turn, where there is more or less defined angle; last turn large, somewhat ventricose below the angle, and produced so as to make this angle near the middle of the entire bulk of the shell; umbilical region a little excavated, the excavation apparently being continued as a small perforation up into the axis; aperture, as inferred from sections of the body volution, obliquely rhombic-oval; suture merely linear, or sometimes very narrowly channelled between the middle volutions; spiral band occupying, and slightly truncating, the angle of the body volution, where it is flat or a little concave, and passing around immediately above the suture on the volutions of the sphere, excepting on some of the upper turns, where it seems to sink nearly or quite below the suture line. Surface very neatly cancellated by distinct, regular, curved, threadlike transverse and revolving lines, of about equal size and distance apart, the former becoming much finer and arched backward in crossing the band.

Height of a large specimen, 1.42 inches; breadth of revolving band on body volution, 0.10 inch; angle of spire,  $70^{\circ}$  to  $80^{\circ}$ .

I was for some time inclined to think this might be the form described by Dr. White and Mr. Whitfield, from the same horizon at Burlington, Iowa, under the name *Pleurotomaria Mississipiensis*, but on comparison with a sketch of the typical specimen in the Museum of the University of Michigan, sent to me by Prof. Winchell, I find it to be quite distinct. The type specimens of *P. Mississipiensis* are natural casts, but Prof. Winchell's sketches show that they differ from casts of the species under consideration, in having the angle of the body volution continued on those of the spire distinctly above the suture, so as to give them a turreted appearance instead of being all flattened exactly on a line with the slope of the spire. It also has the spire more elevated than that of our shell, and the upper slope of the body volution concave instead of flat. Indeed, White and Whitfield's species is more nearly allied to *P. tabulata* of Conrad, from the Coal-measures, than it is to that under consideration.

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*Locality and position.* Medina, Ohio. Waverley group of the Carboniferous, where it seems to be quite abundant.

**PLEUROTOMARIA GURLEYI, Meek.**

Shell small, with breadth somewhat greater than its height; spire depressed-conical, slightly obtuse at the immediate apex; volutions five and a half, convex, and near the apex rounded, but becoming nearly rectangular farther down, the angle being at the middle of those of the spire, and passing around above the middle of the body whorl, which is rather convex but not much produced below; upper side of all the volutions (excepting the rounded ones near the apex) sloping a little and flattened or slightly concave from a linear revolving carina just below the suture, outward to the mesial angle, below which the outer side is vertically flattened and smooth; suture canaliculate; revolving band very narrow, rather distinctly concave, with a linear ridge or minute carina along each margin passing around upon or just above the mesial angle; umbilicus very small. Surface on the inner side of the body volution ornamented by about fourteen distinct raised revolving lines, the upper of which are somewhat larger than the others, and on the upper slope above the mesial angle, by three or four very small revolving lines; while the small rounded whorls near the apex are each occupied by about six revolving lines; striae of growth very minute, and, on the upper slope and flattened outer side of the whorls, very strongly and abruptly curved backward to the band, so as to indicate an unusually profound, rapidly widening sinus in the lip. Aperture wider than high, and obliquely subrhombic in form.

Height, 0.17 inch; breadth, 0.20 inch; slopes of spire straight; divergence of same nearly rectangular.

This little shell has much the form and general appearance of *P. Grayvillensis*, N. & P., but may be distinguished at a glance by the differences in the details of its sculpturing; and particularly by the smooth vertically flattened outer side of its volutions, on which the lines of growth are seen, by the aid of a magnifier, to be much more obliquely curved backward than those on the corresponding part of *P. Grayvillensis*. It must be very rare, as I have seen only the single typical specimen among all of the Coal-measure fossils of the western States and Territories that have ever come under my observation.

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The typical specimen is beautifully mineralized by brilliant iron pyrites, and was discovered by Mr. William Gurley, of Danville, Illinois, in honor of whom I have named the species.

*Locality and position.* From the shale over the Danville coal-bed, Danville, Illinois.

## COLLECTIONS FROM MISSOURI, WYOMING, TEXAS, &c.

### AVICULOPECTEN? WILLIAMSI, Meek.

Shell small, subcircular, convex lenticular not oblique; hinge shorter than the antero-posterior diameter of the valves; anterior and posterior margins rounding regularly into the rounded base; beaks a little nearer the posterior than the anterior extremity of the hinge. Right valve rather distinctly convex, the greatest convexity being in the middle; anterior ear of moderate size, shorter than the anterior margin, rather acutely rounded at the extremity, compressed so as to be distinctly separated from the swell of the umbo, and defined from the margin below, by a moderately deep angular sinus; posterior ear a little smaller than the anterior, and, although compressed, less distinctly defined from the convexity of the umbonal region, considerably shorter than the posterior margin, and nearly rectangular at its extremity, but with its posterior margin slightly sinuous. Left valve a little more convex than the right, but otherwise similar, unless there is some difference in the ears, which are not known. Surface of both valves smooth or only with very fine concentric striæ, excepting on the anterior ear, which (at least on the right valve) is marked by a few small radiating costæ. (Hinge unknown.)

Height and length, or antero-posterior diameter, each 0.53 inch; length of hinge, 0.35 inch; convexity, about 0.32 inch.

As I have not seen the hinge of this little shell, I cannot be sure whether or not it belongs to the genus *Aviculopecten* proper. Its nearly equivalve form, and slightly larger anterior ear, together with its rather prominent anterior margin, lead me to think it will probably be found not to belong to that genus, when all of its characters can be known. I therefore suspect that it may have to be called *Streblopteria Williamsi*, as the external peculiarities mentioned seem to indicate affinities to the types upon which Prof. McCoy proposed to found his genus *Streblopteria*.

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Specifically, it seems to be more nearly allied to *Aviculopecten neglectus* (= *Pecten neglectus*, Geinitz) from the Coal-measures, than to any other form known to me. It has much the same form, and agrees in having the body part of both valves smooth, and the ears costated, or at any rate the anterior one of the right valve. It has a rather shorter hinge, however, more convex valves, and a rather more rounded general outline, with less deeply sinuous margins under the ears; while it attains a somewhat larger size. It may be regarded as the Lower Carboniferous representative of that Coal-measure species, as many of the other forms from this horizon represent species in the Coal-measures.

The specific name is given in honor of Dr. G. A. Williams, of Boonville, Missouri, to whom I am indebted for the typical specimens.

*Locality and position.* Chouteau Springs, Boon County, Missouri; from the beds called the Chouteau Limestone in the Geological Reports of that State, but now known to belong to the same horizon as the upper part of the Waverley group of Ohio.

**SPIRIFER (TRIGONOTRETA?) TEXANUS, Meek.**

Shell scarcely attaining a medium size, very gibbous in the adult, varying from subquadrate or subglobose to longitudinally subovate, the widest part being generally in advance of the middle, and the length greater than the breadth; hinge line short, or in young individuals scarcely equalling the breadth of the valves, and in the adult often proportionally very decidedly shorter, sometimes obtusely angular at the extremities, while in the more gibbous individuals its extremities do not project beyond the lateral slopes; anterior margin often somewhat emarginate in the middle. Dorsal valve truncato-subcircular or subquadrate and moderately convex; beak incurved with the narrow area, but not prominent; mesial elevation commencing as a small simple plication at the beak, but rapidly widening and becoming more prominent and angular, with, on each side, several small costæ, which divide so as to form altogether 14 to 16 at the front; lateral slopes having at the beak each two or three plications or costæ, which farther forward divide so as to form as many fascicles, beyond which the costæ become uniform, smaller, and number about 9 on each side

of the mesial fold and sinus. Ventral valve more gibbous than the other, and strongly arched from beak to front; beak very prominent in the adult, always point and distinctly curved backward over the hinge; cardinal area moderate, well defined, extending to the extremities of the hinge, directed backward and strongly curved with the beak; foramen slightly wider at the hinge than its height, open nearly or quite to the apex, and provided with a distinct marginal furrow on each side; mesial sinus angular, commencing small at the beak, but widening and deepening very rapidly to the front, where it is very profound, and terminates in a strongly curved triangular projection that fits into a corresponding sinus in the margin of the other valve; surface costated as in the other valve, the costæ in the sinus being smaller than those on the lateral slopes; fine, rather obscure undulating striæ, and near the front and lateral margins a few stronger marks of growth traverse the valves parallel to the free margins; while numerous small, rather scattering but regularly disposed granules, apparently the remaining bases of minute spines, may be seen on the whole surface of well-preserved specimens; which also sometimes show traces of extremely minute radiating striæ.

Length of a large gibbous example, 1 inch; breadth, 0.88 inch; convexity, 0.82 inch; length of hinge, 0.57 inch. Smaller specimens are proportionally shorter, wider, and less convex, with a longer hinge line.

Small specimens of this species resemble somewhat the more gibbous forms of *S. cameratus*, with a very short hinge line; but in the adult the shell becomes proportionally much more elongated anteriorly, more gibbous, and has the beak of the ventral valve so narrow and so much produced and incurved as to give the shell the appearance of a *Pentamerus*. Its distinctly granular and minutely striated surface, however, will always serve to distinguish even those specimens with the most extended hinge line from any of the analogous gibbous varieties of *S. cameratus*. Its granular surface leads me to suspect that it may possibly be a *Spiriferina*; but as I have not been able to see any punctures in the substance of the shell, it probably does not belong to that group. Should a more careful examination reveal the punctate structures, however, and the characteristic internal lamina, of course the species will have to be called *Spiriferina Texana*.

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Compared with foreign forms, this shell seems to be most nearly like the extremely narrow and elongated variety of *S. duplicosta*, Phillips, as illustrated by Mr. Davidson's figure, 8, pl. iv., Mongr. British Carb. *Brachiopoda*. It is much more gibbous, however, with a decidedly more prominent and more angular mesial sinus, while its surface granules and minute striæ serve to distinguish it. Although its mesial fold has a very angular appearance, a careful examination shows it to be very slightly flattened, or even faintly furrowed along its prominent middle; while there is sometimes a faint indication of a slightly more prominent rib in the middle of the angular sinus of the other valve.

*Locality and position.* Young County, Texas; where it was found by Mr. H. R. Roessler associated with Coal-measure fossils.

I have never seen it from any of the western localities north of Texas.

**CAMPELOMA (MELANTHO) MACROSPIRA, Meek.**

Shell attaining a large size, thick and strong, elongate-subovate; spire much elevated; volutions five, convex but not rounded, increasing gradually in size, excepting the last one, which is more abruptly enlarged, oblique, and somewhat produced below; suture strongly defined; aperture ovate, nearly or quite half the length of the shell; inner lip thick and more or less reflected in the adult, but leaving uncovered a rather distinct umbilical impression. Surface with only moderately distinct marks of growth.

Length of an adult, 1.70 inches; breadth, 1.10 inches.

Specimens of this species have been brought by various exploring parties, during the last eight or ten years, from the Bear River country, Utah; but always in too imperfect a condition to show their characters clearly, until some recently brought in. These show it to resemble, when not distorted, an abnormally elongated specimen of *C. (Melantho) integra*, Say, figured by Mr. Binney in his Smithsonian monograph, part iii., p. 49, excepting that its volutions are less convex, its spire a little narrower below, and its body volution and suture more oblique. Its inner lip is also less oppressed to the columella, so as to leave a decided larger and deeper umbilical impression. It is likewise a thicker, stronger shell than any of the varieties of *C. decisa* I have ever seen, being as thick as *C. ponderosa*, if not thicker.

I have sometimes been inclined to think Prof. Hall's *Turbo paludinæformis*, of Fremont's Report, might have been founded upon a young or imperfect specimen of this species, but the fact that that shell occurs in a yellowish-gray limestone showing sometimes an oolitic structure, and also containing Prof. Hall's *Cerithium nodulosum* (a true *Goniobasis*), shows that it must belong to a different horizon from the shell here under consideration, which comes from the oldest tertiary beds of the Bear River country, holding, according to Dr. Hayden's examinations, a position below the yellowish-gray limestone beds of that region.

*Locality and position.* Gilmore, Wyoming (Mr. Durkee); Bear River near the mouth of Sulphur Creek, Utah (Col. Simpson); and at various localities in the Bear River country (Dr. Hayden). It is always associated with *Corbula pyriformis*, *Pyrgulifera humerosa*, *Corbicula Durkei*, and *Unio priscus*; none of which have been identified among the specimens from the higher beds of that district.

**VIVIPARUS? WYOMINGENSIS, Meek.**

Shell obliquely conoid-subovate; spire conical, with slightly convex slopes; apex rather pointed; volutions six, those of the spire obliquely compressed convex, last one large, a little compressed on the upper slope, but rounding over the middle, and somewhat produced below; suture well defined, but not deep; aperture ovate; lip not thickened on the inner side below, and apparently very faintly dilated around the outer side, at the immediate margin. Surface with rather regular, distinct, oblique lines of growth, that are crossed, near the upper margins of the volutions, by fine, regular, revolving striae. Axis apparently sometimes very slightly perforated.

Length, 1.45 inches; breadth, 1.15 inches; height of aperture, about 0.90 inch; breadth of do., about 0.60 inch; divergence of slopes of the spire,  $0.72^{\circ}$ .

The specimens of this shell in the collection are mainly broken or distorted casts. One of the latter, however, is very nearly perfect, while some of the other specimens retain more or less of the shell itself. From the strong, regularly arranged striae of growth, seen on some of the latter, and apparently some indications of a slight reflection of the outer lip, I was led to think it a land shell, probably belonging to some of the elevated types

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of the *Helicidæ*, with which I am not familiarly acquainted. Another reason for suspecting that this might be the case is, that we have from the same formation, somewhat farther northward, another similar but more depressed form (*H. veterna*, M.), which has the same kind of surface-markings, with a slightly but unmistakably reflexed outer lip; while this latter shell stands, as it were, exactly intermediate in form between the still more depressed *H. Leidyi*, H. & M., from the White River territory, and that under consideration. That these latter two shells (*H. Leidyi* and *H. veterna*) really belong to some section of the genus *Helix*, there seems to be no reason to doubt.

Although believing the form under consideration to be related to the two species last above mentioned, its unusually elevated spire left me in doubt respecting its affinities. Consequently I sent the best specimen in the collection (which, however, is a cast retaining none of the shell) to Mr. Tryon, of Philadelphia, who has studied the existing land and fresh-water *Gasteropoda* with much care, and requested him to give me the benefit of his opinion in regard to its relations; and he writes that he doubts the propriety of viewing it as a land shell, or at least that he thinks that if it be, it cannot belong to any of the existing North American groups. He rather inclines to think it a *Viviparus* allied to *V. Japonica*, a species now inhabiting the streams of Japan. It certainly has much the form of that species, though more depressed.

Without being entirely sure that it belongs to that genus, I have concluded to refer the species provisionally to *Viviparus*. If a land shell, it would seem to be related to some section of the genus *Cochlostyla*, though probably not even then belonging to any of the recent groups ranged under the same.

*Locality and position.* Henry's and Black's forks, Church Buttes, &c., Wyoming; Middle Territory.

**ISOCARDIA? HODGEEI, Meek.**

Shell cordate-subtrigonal, very gibbous; length and height nearly equal; beaks elevated, gibbous strongly involute, and placed in advance of the middle; posterior dorsal side of valves convex; incurved and sloping rather abruptly backward from near the umbones; anterior side very abruptly truncated by a broad, well-defined, large concave, cordate lunule, extending with the  
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curve of the beaks to their points, and downward to the anterior basal angle; while within this area there is a smaller, deep, and sharply defined impression, or second lunule, under the beaks; basal margin forming a nearly semiovate curve from the lower extremity of the large lunule to the posterior end of the valves. Surface ornamented by small, nearly regular radiating costæ, separated by rather broader furrows; the whole being crossed by larger concentric ridges and furrows, which become smaller, more regular, and rather more distinct on the large lunule, where there are no radiating costæ.

Length and height, each 1 inch; convexity, 0.86 inch.

Of this curious form I have seen but one specimen, which is in the condition of an internal cast. The shell itself must be very thin, as the surface-markings are quite distinct on the cast. In general form, and its strongly incurved beaks, it reminds one of *Isocardia*, but its radiating costæ, and very large lunule-like cordate impression occupying the whole anterior end of the shell, are peculiar characters, I believe unknown in that genus. In addition to these features, its hinge would seem to have been without the teeth of *Isocardia*, so far as can be determined from the internal cast. From these facts I strongly suspect that it will be found to belong to an undescribed genus. If so, I would propose for it the name *Procardia*, in allusion to the distinctly heart-shaped impression occupying the whole anterior end. This species is evidently related to *Cardium? decussatum*, Mantell, and must belong at least to the same group. It is much smaller, however, and differs specifically in having mere radiating lines, instead of broad costæ.

I am under obligations to Dr. Newberry for the use of the only specimen I have seen, which was given to him by Prof. J. T. Hodge, who brought it from the Upper Missouri country.

*Locality and position.* Mr. Hodge discovered the typical specimen in a band of iron ore that extends along the Upper Missouri for some distance, near the Great Bend in the Fort Pierre group.

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