

grass seeds to dry from their cellars. Every ant-hill in the vicinity had more or less seed strown around their outer doors. A few days later we visited the same locality, and the seeds had disappeared,—having doubtless been stored away again by the ants.

They cannot carry as heavy burdens as the cutting ant (*Myrmica Texana*), nor do they, like that ant, place their load upon their backs, but carry it with their mandibles and head; and, whatever they wish to take home, is, if too large, cut into segments to be thus transported.

The stinging ants are generally peaceable in their habits, rarely fighting with other species, or among themselves. In one or two instances we have noticed two different houses, situated a few rods distant, connected by a well beaten path, along which ants were passing back and forth, from one house to the other, in the greatest harmony; but one of these may have been a colony founded by the other.

Once we noticed two of these ants, which probably belonged to different houses, combating in an ant-path, along which a few ants were passing to and fro. Occasionally one of these would stop a moment, look at the contest and pass on. The struggle was obstinate and long. We became tired of the sight, and, after considerable trouble, succeeded in parting them,—both being quite lame. One we put far away, and left the other walking slowly around in search of his enemy, when, on reaching the path, he seized the first ant he met, and the fight was more animated than ever,—one of the parties being robust and untired. Suddenly they stopped, looked a moment, and then began caressing each other, soon after which they started side by side for their town, not far distant. It seemed as if the first fighter, blinded by rage, had lastly fought his own brother. We have been stung several times by them, and think the pain about equal to that caused by the sting of the honey-bee.

Descriptions of New Carboniferous Fossils from Illinois and other Western States.

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Z O O P H Y T A .

SPHENOPOTERIUM, (new gen.)

σφην, a wedge; *ποτηριον*, a cup.

Corallum free, (or attached?) cuneate or irregularly subturbinate, and provided with a few large inseparable cells, which increase in number by lateral and interstitial development. External wall rather dense, but perforated by a few pores, which seem to terminate in the cancellated substance of the coral without reaching the cells; surface marked by numerous fine, anastomosing striæ. Cells circular, or when crowded, more or less angular; without diaphragms, columella, or well developed rays, their walls being merely marked by distinct vertical striæ, and pierced by numerous pores which appear

*Illustrations with more extended descriptions, remarks, &c., to appear in the forthcoming report of the Illinois survey.

NOTE.—While investigating the fossils described in this and our paper published in the last number of the Proceedings, we have been placed under many obligations to the Secretary of the Smithsonian Institution, for the free use of the extensive collections of works on Palæontology, Geology, and various branches of Natural History, belonging to the Smithsonian library. Also, for the use of rooms in the Institution, and for access to the large and rapidly accumulating geological and palæontological collections in the Smithsonian Museum.

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to terminate in the porous substance of the corallum, between the cells, without directly connecting them.

This small group of corals appears to be more nearly related to *Cyathoceris*, of Edwards and Haime, than to any other genus, either recent or fossil, with which we are acquainted. It differs, however, in having the outer walls perforated, and in being destitute of distinct rays, as well as in the peculiar wedge-like form of the base of the corallum, which is also usually, if not always, free instead of attached. We regard the first of the following species as the type of the genus.

SPHENOPOTERIUM OBTUSUM.—Corallum short, abrupt cuneiform, wider than high; base carinate, nearly straight, or very slightly sinuous in the middle; sides expanding rapidly upwards from the keel. Cells from four to about nine, comparatively large, generally rather deep, conical, and where not more than four or five, rounded, and separated by thick interstices, but becoming angular, with thin intervening partitions, where more crowded. Surface striæ fine, and showing a tendency to converge towards the middle of the base, often anastomosing, so as to form a kind of shagreen-like style of ornament.

Length or height of a large specimens with nine cells, inch; breadth, inch; thickness, inch; diameter of one of the cells, 0.29 inch.

Locality and position.

SPHENOPOTERIUM COMPRESSUM.—Corallum compressed, wider than high, carinate on each lateral margin, and apparently retaining a scar of attachment at the middle of the base; sides sulcate between the cells, widening rapidly upwards on the edges, and very gradually on the sides. Cells three or more, comparatively large, rather deep, rounded, with thin walls; arranged in a row parallel to the longer transverse diameter of the corallum. Surface finely shagreened by the anastomosing of the striæ.

Length or height, 0.57 inch; breadth, 0.93 inch; thickness, 0.35 inch; diameter of cells, 0.26 inch.

It is possible this may be a variety of the preceding species, though its compressed form, thinner walls, and lateral carinæ, give it quite a different aspect.

Locality and position. Same as last.

SPHENOPOTERIUM ENORME.—Corallum small, subglobose, obtusely subturbinate; rounded, and apparently retaining some remains of a scar of attachment at the base. Cells four or more, rather irregularly disposed, circular, and moderately deep. Surface slightly more coarsely marked than the last, but otherwise similar.

Height, 0.45 inch; transverse diameter about 0.43 inch; breadth of cells, about 0.18 inch.

Locality and position. Rockford, Indiana, from beds probably of upper Devonian age, but containing Carboniferous *Goniatites*.

SPHENOPOTERIUM CUNEATUM.—Corallum compressed, cuneate, longer than wide, base sharp, a little rounded on the lateral edges. Cells from two or three, to five or six, rather deep, arranged alternately on each lateral edge, and directed obliquely outward and upward; rounded or somewhat oval at the aperture, and more or less compressed towards the base; sometimes having one or two slightly prominent ridges extending part of the way up the sides; punctæ of the walls numerous and distinct. Surface striæ fine, closely arranged, rather regular, and minutely crenulate, directed obliquely inward and downward from the cells, and passing more or less nearly parallel to each other to the base, on the lower flattened half.

Length, 0.75 inch; breadth, 0.43 inch; thickness, 0.21 inch; diameter of cells, about 0.15 inch.

Locality and position. Spurgen Hill, Ia. From beds generally considered on parallel with the Warsaw Limestone.

ECHINODERMATA.

ASTERIDÆ.

Genus PALASTERINA, McCoy.

Subgenus SCHOENASTER.

The specimens of the beautiful star-fish, upon which we propose to found this subgenus, are unfortunately not in a condition to enable us to work out fully the details of its structure. As far as can be determined, however, it agrees in most of its characters with *Palasterina*, though it differs from the typical species of that genus (*Uraster primævus*, Forbes) in having the adambulacral plates arranged with their longer diameter directed obliquely outward, instead of at right angles to that of the rays. This oblique arrangement, or lateral imbrication of these pieces, gives to each range, as seen from below, a peculiar twisted or rope-like appearance, which suggested the name *Schoenaster* (σχῶνός a rope, ἀστῆρ, a star.)

Although we place it for the present as a subgenus under *Palasterina*, we think it more than probable that when better specimens can be examined, it will be found to present other differences of sufficient importance to entitle it to rank as a distinct genus, in which case it can retain as a generic name that by which we have designated it as a subgenus.

PALASTERINA (SCHOENASTER) FIMBRIATA.—Body depressed, pentagonal, the angles being extended into narrow, acutely pointed rays or arms, which are convex above, and about equal in length to the diameter of the disk. Upper side of the disk and arms composed of small, solid, convex, or somewhat tumid plates. Ambulacral furrows deep, rather narrow, and bounded on each side by the single row of oblique adambulacral pieces, which also form the sides of the arms, beyond the disk, where some six or seven of these pieces occupy a space of 0.35 inch. Disk apparently not provided with a regular range of marginal pieces; concave in outline between the rays, where it is, like the sides of the arms, fringed by a single range of short, lanceolate spines.

The plates forming the upper side of the rays near the disk, are hexagonal, pentagonal, or irregular in form, and consist of about five or six ranges between the marginal rows, with a few much smaller intercalated pieces. Farther out they gradually pass into two mesial ranges of oblong, alternating pieces, arranged with their longer diameter parallel to that of the ray; and two series of much smaller, pentagonal or hexagonal alternating plates on each side, between the middle ranges and the adambulacral rows. Towards the extremities of the rays, these two ranges of small pieces on each side diminish in size, and at last become obsolete, leaving only the adambulacral and middle ranges.

None of the specimens are in a condition to show the form and arrangement of the plates forming the disk, nor the position of the vent and madreporiform plate. Near the extremities of the arms the dorsal pores, which are comparatively small, pass chiefly between the ends of the oblong plates, forming the two mesial ranges; but farther in, towards the disk, they seem to be somewhat irregularly distributed. There appear to be five bilobate, oral pieces, but we suspect each of these is divided by a close fitting suture, so as to make ten in the entire series.

Greater diameter, 2.37 inches; lesser do., 0.89 inch; breadth of ambulacral furrows, about 0.10 inch; length of marginal spines, 0.07 inch.

Locality and position. St. Clair county, Illinois. St. Louis Limestone of Lower Carboniferous series.

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MOLLUSCA.

BRACHIOPODA.

Genus CHONETES, Fischer.

CHONETES PLANUMBONA.—Shell of medium size, nearly semicircular; length from two-thirds to three-fourths the breadth; hinge line about equalling the greatest breadth; front rounded, or forming with the sides a nearly semicircular curve; lateral margins intersecting the hinge at right-angles, or sometimes very slightly sinuous near the ears. Ventral valve gibbous, most convex in the middle, and flattened at the umbo, destitute of any traces of a mesial sinus; ears a little compressed; cardinal margin sloping slightly from the beak, on each side of which it is armed with five or six spines; area of moderate breadth; foramen broad, triangular, the upper angle being rounded. Dorsal valve concave, or following nearly the curve of the other valve; cardinal process moderately prominent, nearly or quite closing the foramen of the opposite valve; interior without a prominent mesial ridge, rather distinctly granulose, the granules being arranged in radiating lines; visceral scar rather large; impressions of adductor muscles small and deep. Surface of both valves apparently smooth or only marked by obscure undulations of growth, but showing under a lens nearly obsolete traces of depressed rounded radiating striæ, crossed by minute concentric lines or wrinkles.

Length 0.42 inch; breadth 0.49 inch; convexity 0.16 inch.

Locality and position. Monroe County, Illinois. Keokuk Limestone of Lower Carboniferous series.

Genus PRODUCTUS, Sowerby.

PRODUCTUS NANUS.—Shell very small, nearly hemispherical; hinge about equalling the greatest breadth; anterior side regularly rounded; sides intersecting the hinge nearly at right-angles. Ventral valve gibbous, without any traces of a mesial sinus; ears triangular, convex, and moderately distinct from the swell of the visceral region; umbo convex, incurved, and apparently extending slightly beyond the hinge line. Surface ornamented by comparatively large, rounded, radiating costæ, which more than equal the depressions between, on the convex part of the valve, but decrease in size, and become more numerous by division, and the implantation of others between, around the anterior slope; crossed by numerous very fine concentric striæ, only visible under a lens. The visceral region is also marked by moderately distinct rather regular wrinkles, while the bases of a few scattering spines are seen on the anterior slope. (Dorsal valve unknown.)

Length 0.37 inch; breadth 0.45 inch; convexity 0.25 inch.

Locality and position. Jefferson County, Iowa. Lower Coal measures.

PRODUCTUS PARVUS.—Shell rather small, nearly hemispherical, without any traces of a mesial sinus; length and breadth nearly equal; hinge about equalling the greatest breadth; front rounded; sides sometimes slightly sinuous near the ears. Ventral valve gibbous, regularly arched, not depressed in the visceral region; beak incurved a little beyond the hinge; ears small, convex, nearly rectangular at the extremities of the hinge, moderately distinct from the swell of the umbo. Dorsal valve deeply concave, particularly in the middle and towards the beak. Surface of both valves ornamented by numerous small, rounded, rather closely arranged, occasionally bifurcating striæ, about six of which may be counted in the space of one-tenth of an inch. Spines erect, apparently confined to the ventral valve, each ear of which supports some seven or eight, while there are usually about three times that number scattered around the anterior and lateral slopes. Sometimes very

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obscure traces of small concentric wrinkles are indistinctly visible near the beak and on the ears, particularly of the ventral valve.

Length 0.59 inch; breadth 0.60 inch; convexity of ventral valve 0.34 inch.

This shell might be mistaken for an imperfect specimen of *P. fasciculatus* of McChesney, from which species it differs, however, in having finer striæ, a more deeply concave dorsal valve, and in being always destitute of a mesial sinus in the ventral valve. When good specimens of these species can be compared they may be distinguished at a glance, by the more extended anterior, and the fasciculate character of the striæ upon that part of the shell in *P. fasciculatus*.

Locality and position. Chester, Illinois. Chester, Limestone of Lower Carboniferous series.

PRODUCTUS SCITULUS.—Shell small, gibbous, wider than long, hinge line rather more than equalling the breadth of the central part of the valves; anterior side rounded, or sometimes a little flattened; sides rounding to the front, and somewhat contracted near the ears. Ventral valve gibbous, rather strongly arched, moderately produced, and presenting scarcely any indications of a sinus; ears triangular, convex, or somewhat vaulted, and separated from the swell of the umbo and the prominent visceral region, by a rather distinct rounded depression; beak convex, incurved and apparently extending a little beyond the hinge line. Surface marked by numerous fine, regular, radiating striæ, about seven of which may be counted in the space of one-tenth of an inch; crossing these there are on the visceral region small, irregular concentric wrinkles; a few scattering bases of spines are also sometimes seen on the anterior slope (in casts), where two or three of the striæ become more prominent than the others. (Dorsal valve unknown).

Length, from beak to anterior slope, 0.36; do., from beak to anterior margin, measuring over the curve of the ventral valve, 0.45 inch.

Locality and position. Alton, Illinois. St. Louis Limestone, of Lower Carboniferous series.

Genus RHYNCHONELLA, Fischer.

RHYNCHONELLA SUBTRIGONA.—Shell rather above medium size, trigonal subglobose, wider than long, truncated in front, and on each postero-lateral slope; anterior margins of the valves sharply and deeply serrated. Ventral valve nearly flat, or arching a little from the umbo along the middle towards the front, on each side of which the antero-lateral margins are at first elevated, then very abruptly deflected toward the other valve; front curving down nearly at right-angles to the plane of the valve, and extended so as to fill a broad, deep, rather rounded sinus in the front of the other valve; postero-lateral margins very abruptly deflected downwards; beak small, rather pointed, incurved, and extended somewhat beyond that of the other valve; mesial sinus broad, shallow, undefined, and not extending more than half-way back from the front. Ventral valve gibbous, elevated in the middle near the anterior side, thence sloping abruptly, with a moderately convex outline to the beak; antero-lateral and lateral margins curving strongly to meet those of the opposite valve; mesial fold not well defined. Surface of each valve ornamented by from eighteen to twenty-four rather rounded plications, about four or five of which occupy the mesial sinus and fold; fine obscure, concentric striæ are also seen on well-preserved specimens.

Length (of a medium-sized rather gibbous specimen), 0.90 inch; breadth 0.98 inch; convexity 0.91 inch.

Locality and position. Keokuk Limestone, Warsaw, Illinois.

Genus ATHYRIS, McCoy.=SPIRIGERA, D'Orbigny.

ATHYRIS PARVIROSTRA.—Shell of medium size, subquadrate, moderately gibbous, length and breadth about equal, sometimes a little wider than long; 1860.]

greatest convexity near the middle of the valves, which are equally convex. Lateral margins rather narrowly rounded in the middle, thence converging with a slightly convex outline to the middle of the front, which is faintly subtruncate; from the most prominent part of the lateral margins, they converge to the beaks at an angle of about 97° . Both valves without a distinct mesial fold or sinus, though they are each sometimes marked by a narrow, scarcely perceptible flattening along the middle. Beak of ventral valve small, slender, and closely incurved upon that of the opposite valve, which is little less prominent. Surface marked by fine lines of growth, and small, rather obscure, concentric wrinkles. Internal spiral appendages, each making about twelve turns.

Breadth of a rather wide specimen 0.82 inch; length of do. 0.75 inch; convexity 0.52 inch.

Locality and position. Near Warsaw, Illinois. Keokuk Limestone of Lower Carboniferous series.

CONCHIFERA.

Genus PECTEN, Linnæus.

PECTEN TENUILINEATUS.—Shell rather small, broad ovate or subcircular, ventral border regularly rounded; posterior edge forming a broad, gentle curve along the middle and below, and intersecting the hinge above at an angle of about 110° ; anterior margin rounding regularly into the base from near the middle; hinge short, or about half the length of the valves, from the posterior to the anterior side. Right valve compressed; posterior ear nearly obsolete, flat, and not separated from the posterior margin by a sinus; anterior ear larger than the other, rounded at the extremity, and separated from the margin below by a deep, acutely angular sinus, from the extremity of which there is a sulcus extending obliquely upward in the direction of the umbo; beak rather compressed, located slightly behind the middle of the hinge, and not extending above its margin; surface apparently smooth, but showing under a good magnifier extremely fine, closely arranged concentric striæ, which become much stronger on the anterior ear. (Left valve unknown.)

Height, from ventral margin to the hinge, 0.56 inch; breadth, from anterior to posterior side, 0.53 inch; length of hinge, 0.27 inch; convexity of right valve, 0.08 inch.

Locality and position. South line of Clinton county, Illinois. Upper Coal Measures; associated with *Modiola tenuiradiata* (= *Mytilus tenuiradiatus*, Swallow), and *Avicula? longispina*, (= *Gervillia longispina*, Cox,) or a closely allied species.

Genus AVICULOPECTEN, McCoy.

AVICULOPECTEN OWENI.—Shell small, truncato-subcircular; base regularly rounded, posterior margin rounding from above the middle to the ventral border; anterior side rounded below; hinge equalling about two-thirds the diameter of the valves, from the posterior to the anterior side. Left valve moderately convex; anterior ear compressed, separated from the swell of the umbo by a rounded shallow depression, and defined by a shallow sinuosity of the anterior margin; having the form of an equilateral triangle, the anterior side of which is shorter than either of the others, very slightly rounded at the nearly rectangular extremity; posterior ear a little smaller than the other, compressed, very short, and not separated from the margin below by a distinct sinus, terminating in an obtuse angle of more than 100° ; umbo rather convex, located apparently a little behind the middle of the hinge, and scarcely extending beyond its margin; surface ornamented by numerous fine, closely arranged, radiating striæ, which increase by implantation, and are crossed by a few irregular concentric marks of growth.

Diameter, from ventral margin to hinge, 0.48 inch; do. from the anterior

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to the posterior margin, 0.50 inch; length of hinge, 0.35 inch; number of striæ in 0.10 inch near the ventral margin, about 13.

Named in honor of Dr. D. D. Owen, the well known Western geologist.

Locality and position. Near Warsaw, Illinois. Keokuk Limestone of Lower Carboniferous series.

AVICULOPECTEN COXANUS.—Shell (left valve) rather small, very thin, compressed, broad subtrigonal ovate in outline, exclusive of the ears, slightly oblique; anterior and posterior sides rounding from below the ears to the base, which is regularly rounded; anterior ear of moderate size, triangular, and flattened, so as to be quite distinct from the umbonal slope, separated from the margin below by a broad, subangular sinus; slightly rounded at the extremity, and marked by about eight small radiating costæ, which are crossed by smaller and less regular marks of growth; posterior ear of nearly the same size as the other, flattened, but not very distinct from the umbonal slope, separated from the posterior margin by a regularly rounded, moderately deep sinus—acutely pointed at the extremity; hinge a little less than the breadth of the shell, and ranging nearly at right angles to its longer axis; beak compressed, scarcely projecting beyond the cardinal margin, and located very slightly in advance of the middle. Surface ornamented by small, simple, depressed, rigid costæ, which alternate in size, the smaller ones dying out at various distances between the margin and the umbo. (Right valve unknown.)

Length, or transverse diameter, 0.51 inch; height, from base to hinge, 0.53 inch; convexity (of left valve) 0.05 inch.

Dedicated to Edward T. Cox, Esq., of the Geological Survey of Kentucky.

Locality and position. Adams county, Illinois, dark bituminous Shale of Coal Measures.

AVICULOPECTEN BURLINGTONENSIS.—Shell of about medium size, very thin and fragile, suborbicular, slightly wider than long, broadly and regularly rounded on the ventral margin, more narrowly rounded near the middle on each side, thence sloping towards the beak at an angle of about 100° ; hinge straight, between two-thirds and three-fourths as long as the transverse diameter of the valves, and ranging at right angles to their longitudinal axis. Left valve much compressed; anterior ear of moderate size, flat, subtriangular, the anterior side being shorter than either of the others, and rounding somewhat into the hinge,—defined by a broad rectangular sinus at its base; posterior ear flat, separated from the border below by a wide, rather deep subangular sinus, and terminating in an angle of about 45° ; beak compressed, and located a little in advance of the middle of the hinge. Surface ornamented by eighty to ninety small, nearly equal, radiating costæ, which increase by implantation, and about equal the breadth of the depressions between. Costæ crossed by numerous very regular, undulating, and distinctly imbricating, concentric laminae of growth, which become closely arranged, and sharply elevated on the ears, where the radiating ribs are not developed. (Right valve unknown.)

Diameter, from the ventral border to the hinge, about 2.18 inches; do. from the anterior to the posterior side, 2.30 inches; convexity, near 0.30 inch; length of hinge, 1.63 inch; number of radiating costæ in 0.40 inch near the ventral margin, 10 to 12; number of concentric imbricating lamellæ in same space, about 18.

Locality and position. Burlington, Iowa. Burlington Division of the Lower Carboniferous series.

AVICULOPECTEN KONINCKII.—Shell large, subcircular, rather compressed, wider parallel to the hinge than the diameter at right angles to the same; broadly rounded on the pallial margin, and more narrowly rounded on each side a little below the middle. Hinge straight, apparently rather less than the greatest breadth of the valves below, and ranging very nearly at right

angles to the vertical axis of the shell. Left ? valve compressed ; anterior ear flat, having the form of an inequilateral triangle, the anterior side of which is much shorter than either of the others ;—rather acutely angular at the extremity, and separated from the margin below by a nearly rectangular notch ; posterior ear apparently nearly of the same size as the other, compressed, and separated from the margin below by a rounded, moderately deep sinus ; beak, small, compressed, and not extending above the hinge ; surface marked by rather small, obscure, depressed, radiating costæ, which are crossed by a few faint marks of growth.

Greatest breadth parallel to the hinge, a little below the middle, 3.39 inches ; diameter at right angles to the same, 3 inches ; length of hinge 3 inches.

A fragment, probably of the other valve of the same species, embedded in the same mass with that described above, has much more prominent and more angular costæ, crossed by smaller, closely arranged concentric lines, so as to give them a slightly crenulated appearance.

Named in honor of Prof. L. De Koninck, the distinguished palæontologist of Liege.

Locality and position. Alpine, Iowa. Lower Coal Measures.

AVICULOPECTEN INTERLINEATUS.—Shell rather small, compressed, broad ovate or subcircular, exclusive of the ears ; length and breadth nearly equal ; hinge straight, scarcely equalling the greatest breadth, ranging at right angles to the axis of the shell. Left valve with base regularly rounded ; posterior and anterior margins prominent near the middle, and rounding to the pallial margin, rather distinctly sinuous under the ears ; anterior ear triangular, flattened, so as to be quite distinct from the umbonal slope ; posterior ear somewhat larger than the other, compressed, triangular, the hinge side being longer than either of the others, rather acutely angular at the extremity ; beak a little nearer the anterior than the posterior side, not oblique ; surface ornamented by about fifteen regular, very prominent, slender, concentric costæ, separated by spaces some four or five times their own breadth ; spaces between the costæ occupied by numerous very fine, regular, closely arranged concentric striæ, which are crossed by very obscure traces of radiating ribs.

Diameter, from hinge to pallial border, 0.60 inch ; breadth, 0.62 inch ; convexity, 0.12 inch. (Right valve unknown.)

Locality and position. Lasalle, Illinois. Upper Coal Measures.

AVICULOPECTEN AMPLUS.—Shell large, distinctly inequivalve ; height and breadth about equal ; ventral margin regularly rounded ; posterior and anterior sides rounding to the base ; hinge line straight, less than the breadth of the valves. Left valve convex, particularly in the umbonal region ; posterior ear very short, obtusely subangular, and sometimes defined by an obscure sinus in the margin below ; anterior ear separated from the swell of the umbo by a more or less deeply rounded sulcus, (form unknown ;) beak rather gibbous, incurved, slightly oblique, and extending a little above the hinge. Surface ornamented by distinct, narrow, rather elevated, obscurely subnodose, radiating plications, separated by spaces five to seven times their breadth, and crossed by fine, indistinct lines and wrinkles of growth ; between the costæ there are also fine radiating striæ, one or two of which are often larger than the others. Right valve flat, or a little concave ; posterior ear short, nearly rectangular, the margin below it being faintly sinuous ; anterior ear also short, and separated from the margin below by a very deep, narrow, somewhat arched and angular sinus ; beak entirely obsolete ; surface smooth, or only having indistinct marks of growth, and a few faint radiating lines.

The hinge area of both valves is rather broad, and marked parallel to its margin by fine grooves. In the left valve it is slightly inclined towards the right side, over that of the other valve, in which it is also inclined backwards

in the same direction. An internal cast of one of the left valves shows a large, circular, muscular impression, located a little behind the middle of the valve.

Height, 3.67 inches; breadth, 3.69 inches; convexity of left valve, 0.70 inch; number of radiating costæ in 0.88 inch, at a distance of 2 inches from the beak, five.

In the shortness of its ears, the deep sinus in the anterior edge of its right valve, and its surface markings, this species seems to bear close relations to the typical forms of the genus *Monotis*, but it wants the cartilage-pit under the beak, said to be characteristic of that genus, while its geological position is far below the range of any of the known species of *Monotis*.

Locality and position. Monroe county, Illinois. Keokuk Limestone of Lower Carboniferous series.

AVICULOPECTEN PELLUCIDUS.—Shell small, extremely thin, broad subovate or subcircular, exclusive of the ears, slightly oblique; hinge margin straight, less than the greatest diameter of the valves, from the front to the posterior side; ventral margin nearly regularly rounded; anterior edge rounded near the middle, and passing by a slightly oblique curve into the ventral border; posterior margin most prominent below the middle. Left valve much compressed; anterior ear rather small, triangular, flattened and distinct from the umbonal slope, separated from the anterior edge by a broad, subangular sinus; posterior ear about the same size as the other, flat, and terminating in a rather acute angle, separated from the posterior margin by a broad, very shallow, rounded sinus; beak compressed, or but slightly convex, and located near the middle of the hinge. Surface ornamented by very fine, radiating, thread-like striæ, which increase by implantation, and are generally rather smaller than the depressions between; crossing these are equally fine, regular, less distinct, concentric lines. (Right valve unknown.)

Diameter from ventral margin to the hinge, 0.36 inch; breadth from the posterior to the anterior side, 0.35 inch; length of hinge, 0.23 inch; number of radiating striæ in 0.10 inch, at the ventral margin, about 12.

Locality and position. Adams county, Illinois. Coal Measures, in dark bituminous shale.

Genus AVICULA, Klein.

AVICULA OBLONGA.—Shell small, nearly semicircular, slightly oblique; hinge straight, and longer than any other part of the valves. Left valve moderately convex; anterior wing triangular, compressed, separated by a broad, undefined sulcus, from the swell of the umbo, very slight sinuous on its margin, which intersects the hinge border nearly at right angles; posterior wing larger than the other, compressed, broadly sinuous in outline, and terminating in an acute angle; beak small, pointed, slightly oblique, incurved, and scarcely passing beyond the hinge line; surface ornamented by about twenty-six simple, sharply elevated, linear, radiating costæ, separated on the middle of the valve, by spaces from three to five times their own breadth, and crossed by similar regularly disposed concentric lines, so as to produce a neat, coarsely cancellated style of ornament. (Right valve unknown.)

Diameter from ventral margin to hinge, 0.39 inch; breadth from the posterior to the anterior edge, 0.60 inch; length of hinge, 0.56 inch; convexity of left valve, 0.07 inch.

Locality and position. Warsaw, Illinois. Warsaw Limestone of Lower Carboniferous series.

Genus MYALINA, Koninck.

MYALINA ANGULATA.—Shell rather large, obliquely subovate, longer than high, nearly or quite equivalve, very convex near the front, cuneate posteriorly and above; hinge margin rather long, straight, and carinated; posterior

margin convex along the middle, and rather distinctly concave in outline near the hinge above; base very abruptly rounded, or subangular near the front; anterior side oblique, nearly straight, broadly and distinctly flattened at right angles to the plane of the valves; umbonal slopes extremely prominent, and distinctly angular, ranging at an angle of 58° with the hinge line; beaks terminal, elevated a little above the hinge, incurved, acutely angular, and strongly compressed at right angles to the hinge. Surface of casts retaining rather obscure marks of growth.

Height, measuring at right angles to the hinge, 3.32 inches; length parallel to the hinge, 3 inches; length, measuring from the beaks obliquely, to the most prominent part of the base, 3.35 inches; convexity of the valves, 1.30 inch.

Locality and position. Chester, Illinois. Chester Limestone of the Lower Carboniferous series.

MYALINA CONCENTRICA.—Shell small, thin, rather compressed, subquadrate, a little higher than long, not very oblique; hinge straight, slightly less than the length of the valves below; anterior side a little arcuate, ranging at an angle of about 85° with the hinge, and curving rather abruptly inward from the umbonal slopes; posterior side compressed, straight, or very slightly sinuous in outline above, and intersecting the hinge at about the same angle as the anterior border; base regularly rounded; beaks pointed, incurved, and scarcely rising above the hinge; umbonal slopes rather compressed; surface marked by slender, somewhat obscure, regularly arranged lines, separated by smooth spaces some eight to ten times their own breadth.

Height, 0.67 inch; length, 0.59 inch; convexity of a left valve, about 0.22 inch.

Locality and position. Spergen Hill, Indiana; from an Oolitic bed containing great numbers of small fossils, described by Prof. Hall, and placed by him on a parallel with the Warsaw Limestone of the Lower Carboniferous series.

MYALINA RECURVIROSTRA.—Shell of medium size, rather thick, obliquely trigonal, ovate, inequivalve, (the left valve being more convex, and thicker than the other,) very gibbous, and narrowly rounded along the umbonal slopes; hinge nearly or quite straight, more than equalling the height in young specimens, but proportionally a little shorter in mature shells; posterior margin a little convex, ranging nearly at right angles to the hinge above, and rounding gradually forward below; base narrowly rounded; anterior margin oblique, or ranging at an angle of about 55° with the hinge, slightly convex in outline, and separated by a shallow, oblique depression, from the umbonal ridge above, and broadly sinuous along the middle; beaks small, pointed, terminal, that of the left valve being spirally incurved, so as to make nearly one entire turn at the extreme point, which is directed obliquely forward; surface marked by distinct lines, and imbricating laminae of growth, which are quite prominent on the anterior side, and near the cardinal margin of the left valve, but more obscure on all parts of the other.

The ligament area is comparatively narrow, and marked by longitudinal furrows; immediately under the beak the anterior margin is thickened, so as to present a broader area than the hinge, from which it is separated, in the left valve, by an oblique groove, and in the other by a prominent corresponding ridge. The posterior muscular impression is large, narrow, ovate, acutely angular above, rounded below, and ranging nearly parallel to the posterior border. The pallial line is well defined; anterior muscular scar small, oval, and located near the beaks.

Length, measuring forward and upward from the postero-basal extremity to the beaks, 2.10 inches; height, 1.67 inch; convexity, about 1 inch; length of posterior muscular scar, 0.75 inch; breadth of do. at lower extremity, 0.28 inch.

Locality and position. Near Springfield, Illinois. Coal Measures.

Genus SOLEMYA, Lamarck.

SOLEMYA RADIATA.—Shell very thin, narrow, or elongate subelliptical, moderately convex; ventral margin straight, or slightly concave along the middle; anterior (longer) side narrowly rounded at the extremity, the most prominent part being a little above the middle; posterior (shorter) side rather narrowly rounded; dorsal border nearly parallel to the base in front of the beaks, and declining more rapidly, with a slightly concave outline behind them. Surface with obscure concentric marks of growth, crossed by flat, nearly obsolete, radiating plications, which are sometimes separated near the middle of the valves, by spaces greater than their own breadth; on the anterior side, where they are very oblique, and more closely arranged, they sometimes become irregular, and scarcely distinguishable from finer irregular radiating striæ; not well defined on other parts of the shell.

Length 1.10 inch; height 0.50 inch; convexity 0.36 inch.

Locality and position. Grayville, Illinois. Coal measures.

Genus LEDA, Schumaker.

LEDA (YOLDIA?) LEVISTRIATA.—Shell rather under medium size, narrow subovate, moderately convex in the central and anterior regions, more compressed posteriorly; base forming a broad semiovate curve, the most prominent part of which is a little in advance of the middle; anterior side rounded; posterior side somewhat contracted, or narrower than the other, and more abruptly rounded at the extremity, which is a little gaping; dorsal margin declining gently, and rather concave behind the beaks, nearly horizontal and slightly convex in front of them; beaks depressed and located a little behind the middle; surface apparently smooth, but when examined by the aid of a good lens it is seen to be marked by extremely fine, obscure, regularly arranged concentric striæ.

Length 0.57 inch; height 0.20 inch; convexity 0.14 inch.

Locality and position. Waterloo, Monroe County, Illinois. Upper part of St. Louis Limestone, of the Lower Carboniferous series, where it was found associated with some of the small fossils described by Prof. Hall, from Spurgeon Hill, Indiana.

Genus SCHIZODUS, King.

SCHIZODUS CHESTERENSIS.—Shell rather large, transversely ovate, convex in the anterior and umbonal regions, and cuneate posteriorly. Anterior side regularly rounded; base forming a broad, irregular, semiovate curve, being usually slightly more prominent a little behind the middle than elsewhere, thence nearly straight and ascending gradually to the posterior extremity; posterior side contracted, considerably longer than the other, and abruptly rounded or subangular at the termination, the most salient part being rather above the middle; dorsal margin nearly straight and declining gradually behind the beaks, from which it rounds regularly into the anterior margin in front. Beaks gibbous, rather elevated, incurved, and located less than one-third the length of the shell from the buccal margin. Muscular impressions shallow; those in front ovate, placed near the margin, and a little above the middle; those on the posterior side oval, and located near the dorsal edge, about half-way between the beaks and the anal extremity. Surface marked only by fine lines of growth.

Length (of internal) 1.38 inches; height 1 inch; convexity 0.78 inch.

Resembles closely the Permian species *Axinus obscurus*, Sowerby, but is less elevated in proportion to length, and has rather more oblique umbones; while the most salient part of its posterior margin is a little above, instead of below the middle. It is usually found in the condition of internal casts.

Locality and position. Chester, Illinois. Upper part of Chester Limestone, of the Lower Carboniferous series.

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Genus *CARDIOMORPHA*, Koninck.

CARDIOMORPHA RADIATA.—Shell subcircular, gibbous in the central and umbonal regions, base more narrowly rounded than the front or anal margin; cardinal border a little arched; beaks gibbous, abruptly pointed, incurved and showing a tendency to curve forward at the immediate points, depressed or rising but little above the hinge margin; surface ornamented by numerous fine, regular, radiating, rather rounded striæ, about equalling the depressions between. (Hinge and interior unknown.)

Allied to *C. ovata* of Hall, (Rept. Survey Iowa, pl. 7, fig. 10), from near the same horizon, but more rounded in outline, and has much less elevated and less curved beaks. Both these species differ from the typical forms of *Cardiomorpha*, Koninck, in having radiating striæ, and may prove to be generically distinct when specimens showing the hinge and interior are obtained.

Length 0.95 inch; height 1 inch; breadth or convexity 0.77 inch.

Locality and position. Rockford, Indiana. From beds containing Carboniferous species of *Goniatites*, but generally supposed to be of Upper Devonian age.

GASTEROPODA.Genus *BELLEROPHON*, Montfort.

BELLEROPHON CRASSUS.—Shell large, very thick, subglobose, or a little longer than wide; volutions expanding somewhat rapidly, rounded over the dorsum and sides; umbilical region excavated, but not perforate; mesial band narrow, rather prominent, and margined on each side by a raised line; aperture transverse, reniform, or sublunate; lip strongly thickened near the umbilical excavations on each side, but not covering them, thinner and but slightly prominent on either side of the narrow sinus in its outer margin, and spreading in the form of a moderately thick, smooth, callus, over the inner whorls within the aperture, and between the callosities on each side; surface marked by rather distinct irregular wrinkles, and lines of growth, the former of which are strongest on each side near the lip.

Greatest length 2.20 inches; breadth at the aperture 2 inches; breadth of the mesial band near the aperture 0.12 inch.

Locality and position. Pittsburg, St. Claire County, Illinois. Lower part of the Coal measures.

Genus *PLEUROTOMARIA*, Defrance.

PLEUROTOMARIA SUBCONSTRICTA.—Shell small, conical subovate, longer than wide; spire moderately elevated, rather pointed at the apex. Volutions five and a-half to six, obliquely flattened or concave above, excepting near the suture, where there is a subangular prominence occupied by a series of small nodes or granules; those of the spire having a second angle a little below the middle. Body whorl forming rather more than half the entire length, biangular around the middle, the lower angle being less prominent and more obtuse than the other, and not exposed on the spire; vertically flattened or a little concave on the outer side, and convex below. Suture linear, but occupying a rather distinct rounded constriction or depression. Aperture broad subovate, approaching a rhombic subquadrate outline; columella not distinctly perforate. Surface ornamented by about fifteen revolving lines, some ten or twelve of which occupy the under side of the body whorl, where they are larger than on any other part of the shell; crossing these there are very fine transverse striæ, which are closely arranged on the upper slope of the whorls, particularly in crossing the spiral band, but on reaching the lower angle of the body whorl, they become stronger, so as to give it a crenulated appearance. Spiral band narrow, flat and located just above the middle angle of the body volution.

Length 0.33 inch; breadth 0.24 inch; apical angle nearly regular, divergence 60° .

Locality and position. Hodges Creek, Macoupen County, Illinois. Coal measures.

PLEUROTOMARIA GRANULOSTRIATA.—Shell very small, conical subovate, or subtrochiform; spire moderately elevated; volutions five, increasing rather gradually in size, compressed convex, last one prominently rounded or subangular around the middle; suture well defined; aperture subcircular; spiral band not very distinctly defined, located near the middle of the body whorl and passing around just above the suture on the outer turns; columella imperforate. Surface ornamented by about twelve or thirteen comparatively distinct revolving lines, eight of which occupy that portion of the body whorl below the band, where they are a little smaller and more closely arranged than above.

On the upper slope of the whorls above the band, the three or four revolving lines occupying that part of the shell are crossed obliquely by distinct transverse lines, which are so much stronger on the revolving striæ than between them, that they present the appearance of small nodes or granules, at the points of crossing. One of the revolving lines, which is larger than the others, passes around on the middle of the revolving band, and is neatly and regularly crenulated by the crossing of the transverse lines.

Length 0.17 inch; breadth 0.15 inch; apical angle regular, divergence 60° .

Locality and position. Hodges Creek, Macoupen County, Illinois. Coal measures.

PLEUROTOMARIA TENUICINCTA.—Shell small, conical ovate, spire moderately elevated; volutions seven, obliquely flattened or a little concave above, convex and more or less distinctly angular around the middle, last one tumid below; suture distinct; spiral band very narrow, concave, located a little above the middle of the body whorl, and passing around rather below the middle of the others; aperture subcircular; umbilical region indented, but apparently not distinctly perforate. Surface ornamented by about eighteen to twenty rather distinct revolving lines, only two or three of which occupy the flattened or concave upper slope above the band, where they are less prominent than the others; while the two forming the margins of the band are more salient than any of those below; fine, regularly arranged striæ, which are much more distinct on the slope above, than below the band, mark the whorls transversely.

Length 0.24; breadth 0.20 inch; apical angle a little convex, divergence 60° .

Locality and position. Springfield, Illinois. Upper Coal measures.

PLEUROTOMARIA PRATTENI.—Shell very small, conical ovate, the length being greater than the breadth; spire rather elevated, but not acute at the apex; volutions six to six and a-half, slightly convex, increasing gradually in size, those of the spire more or less distinctly angular around the middle, last one sometimes slightly flattened near the middle just below the angle, and convex on the under side; suture well defined. Spiral band of moderate breadth, not very distinctly defined, sometimes slightly concave, occupying the more or less compressed middle portion of the last whorl, and passing around so as to bring its lower margin a little above the suture on the other turns. Aperture subcircular; columella arcuate, a little flattened below, and imperforate; outer lip thin; sinus narrow and deep. Surface marked by about eighteen to twenty very small, obscure revolving striæ, some twelve or thirteen of which occupy the body whorl below the band, where they are a little larger than those above the angle, and more regularly arranged; lines of growth very fine and obscure.

Named in honor of Mr. Henry Pratten, deceased, formerly of the Geological Survey of Illinois.

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Length 0.24 inch; breadth 0.18 inch; apical angle convex, divergence about 37°.

Locality and position. Hodges Creek, Macoupen County, Illinois. Coal Measures. Abundant.

PLEUROTOMARIA SUBSINUATA.—Shell, conical ovate; spire elevated; volutions six, convex, last one, in mature shells, sometimes obliquely flattened a little above, just below the suture, thence rounded below; suture linear, but occupying a more or less deeply rounded depression; spiral band not well defined, angular, located above the middle of the body whorl, at the lower edge of the slight flattening of its upper side, and passing around the middle of the upper turns; sinus of the lip, judging from the curve of the lines of growth in crossing the band, shallow, and not very clearly defined; aperture subcircular; columella indented in the umbilical region, but not distinctly perforate. Surface ornamented by about fourteen to eighteen distinct revolving lines, three of which, on the middle of the last turn, are larger than those above, while those below gradually diminish in size toward the umbilical pit; only two or three of the smaller lines usually occupy the slightly depressed upper part of the whorls, where they are crossed by a series of regularly arranged, transverse costæ or wrinkles; lines of growth obscure.

Length 0.40 inch; breadth 0.31 inch; apical angle convex, divergence 55°.

Locality and position. Hodges Creek, Macoupen County, Illinois. Coal Measures.

PLEUROTOMARIA CHESTERENSIS.—Shell of medium size, turbate; spire moderately elevated; volutions about six, increasing rather gradually in size, convex, distinctly carinated around the middle, and flattened, or a little concave above and below the carina, the flattened space above being oblique, and that below vertical; last whorl provided with a second carina below the other, and a little convex on the under side; suture linear; umbilicus small, or nearly closed; surface marked by numerous fine, regular, thread-like revolving lines, crossed by similar striæ, which, in traversing the spiral band,—which occupies the space on the middle of the body whorl between the two carinæ,—make a gentle backward curve, parallel to the border of the rather shallow sinus of the outer lip; aperture subcircular, approaching a subquadrate outline.

Length 0.75 inch; breadth 0.72 inch; apical angle regular, divergence about 60°; breadth of spiral band 0.14 inch.

Similar in form and general appearance to *P. tabulata*, Conrad, but differs in having a small umbilicus, while the axis of that shell is not perforate. It also differs in having a much broader spiral band, which occupies the space between the two carinæ, instead of coinciding with the upper angle. Again the upper carina of the shell under consideration is never crenulated, as in Conrad's species.

Locality and position. Chester, Illinois. Chester Limestone of the Lower Carboniferous series.

PLEUROTOMARIA SUBSCALARIS.—Shell large, rather thick, conical ovate; spire moderately elevated; volutions six, those near the summit of the spire flattened, the others convex, and provided with a distinct, sharp carina, which occupies a position a little above the middle of the body whorl, passes around near the middle of the second, becomes lower on the third, and sinks below the suture on the others. Below this angle there is on the body volution, a second less distinct subangular prominence, with a broad, vertical, nearly flattened, or slightly concave space between the two. Under side of last turn a little convex, and the umbilical region somewhat indented, but not perforate; suture well defined. Spiral band narrow, and occupying the principal angle of the whorls.

The surface of our specimen is somewhat eroded, but it retains traces of about twenty rather strong revolving lines, eight or nine of which occupy the upper side of the whorls, above the carina, some three or four the flattened

outer side of the body whorl, and the remainder the under side. On the upper sloping surface of the whorls there are also regularly arranged, oblique transverse striæ, which, in well-preserved specimens, are probably continued upon the outer and under sides of the last turn.

Agrees with *P. tabulata*, Conrad, in size and general appearance, but differs in having the upper whorls of the spire more depressed, and without any angle visible above the suture. The principal angle on its lower whorls also appears to be destitute of the crenulation, so distinct on that of *P. tabulata*.

Length 1.67 inch; breadth 1.52 inch; apical angle convex, divergence 70° .

Locality and position. Macoupen County, Illinois. Lower Coal Measures.

PLEUROTOMARIA SPECIOSA.—Shell attaining a medium size; spire moderately elevated; volutions seven to seven and a-half, subangular just below the suture, thence obliquely flattened to a much more distinct revolving angle a little below the middle of the upper turns, and about the middle of the body whorl. Below this second angle the outer side of the last turn is vertically flattened or a little concave, so as to produce a third obtuse revolving prominence below the middle, beneath which the under side of the whorl is convex. Suture well defined. Spiral band narrow, very prominent, angular and regularly crenulated by cross lines, occupying and partly forming the middle angle of the body whorl, which passes around on the upper whorls a little more than one-third of their breadth above the suture. Aperture subcircular, approaching subpentagonal; umbilicus small. Surface ornamented by eighteen to twenty-two thread-like revolving lines, about twelve of which occupy the under side of the body whorl, four to seven the upper slope, and two or three the outer flattened space. Crossing all these there are numerous extremely fine, very regular, closely arranged transverse lines, about every fourth or fifth one of which is considerably enlarged near the suture; and they all curve obliquely backwards in approaching the spiral band.

Length about 0.55 inch; breadth 0.51 inch; apical angle regular, divergence 82° ; breadth of spiral band not more than about 0.03 inch.

Locality and position. Hodges Creek, Macoupen County, Illinois. Coal Measures.

PLEUROTOMARIA TURBINIFORMIS.—Shell rather large, trochiform, height and breadth nearly equal; spire conical, moderately elevated; volutions about five and a half to six, flat, last one distinctly angular around the outer side, and flattened or slightly convex below; umbilical region somewhat excavated, but not perforate; spiral band extremely narrow, grooved, occupying the angle around the outer side of the body whorl, and passing around scarcely above the suture on the other volutions, margined above and below by a sharply elevated line; suture linear, but well defined, having a somewhat banded appearance, in consequence of the development of a rather distinct revolving line at the upper margin of each whorl; aperture apparently rhombic subquadrate. Surface ornamented by about twenty obscure, closely arranged, revolving striæ, crossed by stronger, very regular transverse lines, which are most distinct on the upper part of the whorls, and pass with a gentle curve obliquely backwards and outwards to the spiral band. Below the angle the body whorl is nearly smooth, or only marked by very obscure lines of growth, and faint traces of revolving striæ.

Length about 0.93 inch; breadth nearly 0.97 inch; apical angle regular, divergence 64° .

Locality and position. Lasalle, Illinois. Upper Coal Measures.

PLEUROTOMARIA SCITULA.—Shell small, trochiform, length and breadth nearly equal; spire depressed conical; volutions six, a little convex, last one prominent and narrowly rounded or subangular on the periphery, slightly convex below; suture somewhat channelled; aperture subcircular, approaching a subquadrate form; umbilical region impressed, but not distinctly perforate; spiral band

rather narrow, concave, and located above the narrowly rounded periphery of the body whorl, passing around rather below the middle of the other volutions. Surface ornamented by from about seventeen to twenty-two revolving lines, only three or four of which occupy that part of the body whorl above the band, where they are larger and more widely separated than below; distinct, but much smaller, regularly arranged, thread-like lines mark the volutions transversely.

Length and breadth each about 0.22 inch; apical angle convex, divergence 79°.

Locality and position. Hodges Creek, Macoupen County, Illinois. Coal Measures.

PLEUROTOMARIA SHUMARDI.—Shell trochiform, of medium size, very thin; spire moderately elevated, conical, pointed at the apex. Volutions about six, increasing rather rapidly in size, obliquely flattened above; those of the spire being somewhat angular near the lower side; last one very prominent, and angular around the middle, the immediate edge of the angle being terminated by the narrow spiral band, convex below. Band slightly concave, and margined above and below by a small line or indistinct angle, the lower one of which scarcely rises above the suture on the upper whorls. Suture well defined. Umbilicus small, or nearly closed. Aperture rhombic subquadrangular, wider than high. Surface ornamented by numerous transverse lines, which are very regular and closely arranged on the upper whorls, but become stronger, more distinct, and less regular on the last turn. In crossing the upper flattened sloping sides of the whorls, these lines arch a little forward, and pass very obliquely backwards from the suture to the band; on the under side of the body whorl they are small, nearly obsolete, and crossed by obscure traces of fine revolving striæ.

Named in honor of Dr. B. F. Shumard, State Geologist of Texas.

Length 0.70 inch; breadth 0.73 inch: apical angle rather distinctly concave, divergence 70°

Locality and position. Warsaw and Keokuk, Illinois. Base Geode bed, Warsaw Limestone, of Lower Carboniferous series.

Genus STRAPAROLLUS, Montfort?—EUOMPHALUS, Sowerby.

EUOMPHALUS PLANODORSATUS.—Shell of medium size, subdiscoidal, spire nearly flat, or but slightly elevated above the body whorl. Volutions about five, increasing gradually in size from within, flat above, and provided with a moderately distinct revolving angle about two-thirds of the distance across from the inside; from this angle the outer whorl is rounded over the periphery to about the middle of the under side, where there is another angle, from which it rounds into the umbilicus; suture well defined. Umbilicus large, deep and showing about one-half of each inner whorl; aperture subcircular. (Surface unknown.) Height about 0.30 inch; breadth 1 inch.

Allied to *E. pentangulatus*, Sowerby, but differs in having the angle on the upper side of the whorls located nearer the outer margin, and the periphery or outer side of its volutions more broadly rounded.

Locality and position. Thompson's quarry, Randolph County, Illinois. Chester Limestone, of Lower Carboniferous series.

EUOMPHALUS UMBILICATUS.—Shell of medium size, depressed subtrochiform; spire rather elevated for a species of this genus. Volutions five to five and a-half, convex, increasing gradually in size, nearly horizontally flattened on the upper side, about half-way across from the suture, where there is a rather distinct revolving angle, below this angle the upper oblique outer slope is slightly flattened to near the middle of the outer side, which, in the last whorl, is narrowly rounded; under side of body volution rounded to a moderately distinct angle near the middle, thence rounding into the umbilicus. Suture well defined. Umbilicus large, or nearly twice as wide as the diameter

of the last turn, very deep and permitting the inner side of all the volutions to be seen to the summit of the spire. Surface marked by fine, rather obscure lines of growth.

Height 0.88 inch; breadth 1.08 inch; breadth of umbilicus, measuring from its marginal angle on the middle of the under side of last whorl, 0.68 inch; apical angle convex, divergence about 100° .

Locality and position. St. Clair County, Illinois. Lower Coal Measures.

Genus NATICOPSIS, McCoy.

NATICOPSIS NODOSUS.—Shell obliquely subrhomboidal, rather thick; spire depressed; volutions four and a-half, convex, increasing rapidly in size, last one large, gibbous, oblique, and composing three-fourths of the entire length, round on the outer side, and having shallow revolving depressions near the suture above; suture moderately distinct; aperture subovate; lip sharp; columella distinctly flattened, somewhat callous, not perforated. Surface ornamented by numerous, nearly round, distinct nodes, which are arranged in oblique rows, parallel to the lines of growth near the aperture of the last turn, but become more crowded, and show a tendency to assume a quincunx arrangement on other parts of the shell; lines of growth fine, rather regular and scarcely deflected from their course by the presence of the nodes.

Length, measuring from the most extended part of the aperture below, obliquely to the apex of the spire, 1 inch; breadth 0.52 inch; apical angle convex, divergence about 96° .

Locality and position. St. Clair County, Illinois. Lower Coal Measures.

NATICOPSIS HOLLIDAYI.—Shell obliquely oblong-oval, thick and solid; spire depressed subconical, pointed at the immediate apex; volutions four to four and a-half, convex, excepting just below the suture, where there is a shallow revolving depression,—rapidly enlarging, the last one forming more than two-thirds the entire length; suture linear; aperture ovate around the margin, but contracted by the broad columella so as to be nearly semicircular within; columella distinctly flattened, broad, and marked along its sharp, nearly straight inner margin, by a well defined opercular impression. Surface ornamented by very fine regular lines of growth, and numerous small nodes, arranged in oblique rows; the larger nodes on the last half and upper part of the body whorl being more or less elongated in the direction of the lines of growth.

Length 1.15 inches; breadth 1.20 inches; apical angle nearly regular, divergence 107° . Named in honor of Mr. George H. Holliday, of Carinville, Macoupen County, Illinois, to whom we are indebted for the specimens described.

Locality and position. Hodges Creek, Macoupen County, Illinois. Coal Measures.

Genus PLATYOSTOMA, Conrad.

PLATYOSTOMA NANA.—Shell quite small, subglobose, wider than high; spire much depressed; volutions three, increasing very rapidly in size, last one large and ventricose; suture rather deeply defined; aperture large, broad obovate, straight on the inner side, equalling nearly seven-eighths of the entire length of the shell; surface marked by fine lines of growth, which become stronger, and very regular near the suture on the upper side of the whorls.

Length 0.19 inch; breadth 0.21 inch; length of aperture 0.15 inch, breadth of do. 0.11 inch; apical angle about 123° .

Differs from *P. Peoriensis*, McChesney, in being much smaller, and in having one whorl more, while its aperture is widest above instead of below.

Locality and position. Springfield, Illinois. Upper Coal measures.

PLATYOSTOMA? TUMIDA.—Shell rather large, thin, subpyriform, a little longer
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than wide; spire much depressed, or nearly flat; volutions four to four and a-half, convex, increasing rapidly in size, last one large, or forming about eight-ninths of the entire length, prominent and narrowly rounded above, contracted and extended below; suture well defined; aperture large, longer than wide, obovate, the inner side being nearly straight; columella not perforate; surface (of an exfoliated specimen) retaining traces of rather strong revolving lines.

Length 1.21 inches; breadth 1.17 inches; length of aperture 1.05 inches; breadth of do. 0.63 inch; apical angle regular, divergence 132° .

It is only provisionally we have placed this species in the genus *Platyostoma*; the only specimen yet obtained being merely a cast retaining portions of the shell, but not giving a clear idea of its generic characters. It differs from the typical species of that genus in having revolving lines, and will probably be found to present other differences. When better specimens can be examined, we suspect it will prove to belong to an undescribed genus, though we have not the means of settling the question at present. If a new genus is established for its reception, a shell figured by Murchison, De Verneuil and Keyserling (Geol. Russia, pl. 23, fig. 14), as an undetermined species of *Ianthina*, (= *Scalites Verneuilii*, of D'Orbigny), should probably be placed in the same group.

Locality and position. Grayville, Illinois. Coal Measures.

Genus EUNEMA, Salter.

EUNEMA? SALTERI.—Shell elongate conical, turreted, acute at the apex. Volutions thirteen, slightly convex, increasing very gradually in size, ornamented by two small revolving carinæ a little below the suture, the lower one of which is larger than the other; last whorl having a third angle near the middle, which passes around just above the suture on the other volutions; below this third angle there is on the under side of the last turn a fourth nearly obsolete revolving prominence. Suture linear. Aperture ovate, a little oblique. Columella arcuate, not perforate. Lines of growth fine, rather obscure, and passing straight across the whorls.

Length 0.50 inch; breadth 0.17 inch. Length of aperture 0.17 inch; breadth 0.10 inch. Apical angle convex, divergence 20° .

This beautiful little shell differs from the typical species of the genus in which we have provisionally placed it, in having the lines of growth straight instead of sinuous. This character, and the revolving carinæ, would also separate it from *Loxonema*, to which we were at first inclined to refer it. On a hasty examination it might be referred to the genus *Murchisonia*, some species of which it nearly resembles in its general appearance; a careful examination, however, has satisfied us that its lines of growth do not make the slightest curve, so as to indicate the existence of a sinus in any part of the lip. We suspect it may belong to an undescribed genus; though, if it were from a more modern formation, we should scarcely hesitate to place it in the genus *Turritella*.

Named in honor of Mr. J. W. Salter, the distinguished Palæontologist of the British Geological Survey.

Locality and position. Springfield, Illinois. Upper Coal Measures.

Genus LOXONEMA, Phillips.

We doubt the propriety of referring such forms as are here described, to the recent genus *Turbonilla*, (= *Chemnitzia*, D'Orbigny,) since they are generally not only much larger shells, but differ in not having, so far as we have been able to see, the apex of the spire reversed, as in the species upon which the genus *Turbonilla* was founded. We therefore agree with those who prefer to retain Phillips' name, *Loxonema*, for these older fossil species.

LOXONEMA SCITULA.—Shell small, elongate, conical; spire elevated and regularly tapering; volutions eight to eight and a half, very slightly convex, increasing gradually in size, last one rounded and not produced below; suture

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moderately well defined; aperture obliquely ovate, acutely angular above. Surface ornamented by distinct, regularly disposed, straight vertical folds or costæ, about fourteen or fifteen of which occupy each turn; folds equalling the depressions between, and on the last turn becoming suddenly obsolete below the middle; no lines of growth visible.

Length 0.23 inch; breadth, 0.10 inch; length of aperture, 0.07 inch; breadth of do., 0.04 inch. Apical angle regular, divergence 25°.

Locality and position. Springfield, Illinois. Upper Coal Measures.

LOXONEMA RUGOSA.—Shell small, elongate, conical; volutions seven and a half to eight, very slightly convex, increasing gradually in size, last one abruptly rounded in the middle, not extended below; suture rather slightly impressed; aperture ovate. Surface of each whorl ornamented by about eighteen to nineteen straight, distinct, vertical folds or costæ, which equal the depressions between, and are disposed so as to range in regular lines from the last whorl to the summit of the spire; those on the body whorl becoming abruptly obsolete below the middle. No lines of growth visible.

Length, 0.44 inch; breadth 0.18 inch; length of aperture 0.12 inch; breadth of do., 0.08 inch. Apical angle convex above, divergence 25°.

Near the last, but differs in having the spire less attenuate above, and in having more costæ to each turn. The costæ also differ in being ranged in right lines, all the way up the spire, while those of the adjacent whorls, in the last, alternate. This latter character gives quite a peculiar aspect to this species.

Locality and position. Same as last.

LOXONEMA CERITHIFORMIS.—Shell rather under medium size, elongate, conical; spire elevated, gradually tapering to an acute point. Volutions, eleven to twelve, convex, and increasing gradually in size; last one not much enlarged, somewhat prominently rounded below the middle. Suture well defined. Aperture oval, subrhombic, a little longer than wide, apparently provided with a small, rather oblique notch at the base of the columella; outer lip thin, broadly and deeply sinuous above and prominent below, so as to present a distinct inversely sigmoid outline; columella arcuate. Surface nearly smooth, but showing under a lens very fine, obscure lines of growth, which curve parallel to the margin of the lip; just below the suture these lines are gathered into a series of minute, short, regularly arranged wrinkles or crenulations, scarcely visible without the aid of a magnifier.

Length, 0.70 inch; breadth, 0.24 inch; length of aperture, 0.18 inch; breadth of do., 0.11 inch. Apical angle regular, divergence 24°.

Appears to agree very nearly with *Chemnitzia subconstricta* of Koninck, in form and surface markings; but differs, in the form of the aperture, and in having a small notch or sinus, with a slight projection of the lip, at the base of the columella.

Locality and position. Springfield, Illinois. Upper Coal Measures.

LOXONEMA INORNATA.—Shell small, conical subovate; spire moderately elevated, pointed at the apex; volutions seven, slightly convex, increasing rather gradually in size, last one somewhat prominently rounded in the middle, but not ventricose; suture rather shallow; aperture narrow subovate, acutely angular above, narrow, and provided with a small rounded sinus at the base of the columella below; columella arcuate; outer lip thin, and apparently but slightly sigmoid in outline; surface smooth, or only showing very obscure traces of fine lines of growth under a good lens.

Length, 0.38 inch; breadth, 0.18 inch; apical angle convex, divergence about 30°. Length of aperture, 0.16 inch; breadth of do., 0.09 inch.

Locality and position. Springfield, Illinois. Upper Coal Measures.

LOXONEMA NITIDULA.—Shell of medium size, subfusiform; spire elongated,
1860.]

conical, rather attenuate, and acutely pointed above; volutions eight to eight and a half, convex, and increasing rather gradually in size,—last one moderately large, somewhat contracted, and extended below; suture well defined, especially between the lower whorls; aperture narrow, subovate, a little oblique, acutely angular above, rather narrow, and terminating in a small rounded sinus at the base of the columella below, less than half the length of the entire shell; outer lip thin and sharp, with a scarcely sigmoidal margin; columella arcuate, and somewhat twisted below; surface smooth, but showing under a lens very fine, obscure lines of growth.

Length, 1.10 inch; breadth, 0.43 inch; apical angle regular, divergence 30°. Length of aperture, 0.47 inch; breadth, 0.20 inch.

Locality and position. Springfield, Illinois. Upper Coal Measures.

Genus EULIMA, Risso.

EULIMA? PERACUTA.—Shell comparatively large, elongate, conical; spire much elevated, attenuate, very acutely pointed at the apex, and sometimes subulate. Whorls about thirteen, nearly or quite flat, and increasing very gradually in size; last one forming a little more than one-third the entire length, slightly prominent around the middle, somewhat extended below; suture moderately distinct, particularly between the lower whorls. Aperture rather narrow, subovate, acutely angular above, and narrowly rounded below; outer lip thin and sharp; inner lip very slightly thickened, and a little reflexed below; columella arcuate or faintly sinuous. Surface polished, but showing under a good lens extremely fine, very obscure lines of growth.

Length, 1.67 inch; breadth, 0.54 inch; apical angle regular, divergence 22°. Length of aperture, 0.55 inch; breadth of do., 0.30 inch.

Locality and position. Jacksburg, St. Clair county, Illinois. Lower Coal Measures; also near Springfield, in Upper Coal Measures.

Genus MACROCHEILUS, Phillips.

Some confusion exists in regard to the limits of this genus, in consequence of the fact that Prof. Phillips did not define it clearly, and unfortunately included in it species belonging to several groups, without designating what particular species he regarded as the type of his genus. Nearly all subsequent authors, however, agree in referring to it those oval, or subglobose forms, with a thickened inner lip, and a more or less developed fold on the columella, such as *M. primigenious*, (= *Stylifer primigenious*, Conrad); while there are many other more elongated species referred sometimes to this genus, and sometimes to *Loxonema*, or to *Chemnitzia*.

It seems to us it would be better to regard as typical of this genus, only such species as have developed, in a greater or less degree, the fold and thickening of the inner lip,—nearly or quite all of which, so far as our observations go, are the shorter forms. The more slender, elongated species, with a comparatively small body whorl, somewhat extended below, and without any thickening of the inner lip, should, we think, be placed in a separate section, either of this genus, or of *Loxonema*, or constitute a distinct group from both.

MACROCHEILUS MEDIALIS.—Shell of medium size, rather thick, rhombic, oval; spire depressed conical, acutely pointed at the apex, forming near one-third of the entire length. Whorls six to six and a half, convex, increasing somewhat rapidly in size; last one large, but not ventricose, the widest part being near the middle; suture distinct. Aperture rather narrow, oval, acutely angular above, and narrowly rounded below; outer lip sharp, nearly straight, or but slightly prominent in the middle. Columella a little sinuous about half way up the aperture. Inner lip thickened to the top of the aperture, but not provided with a distinct fold or prominence below,—marked by small, regular, obscure transverse striæ or wrinkles above the middle. Surface apparently smooth, but showing under a lens traces of fine, very obscure lines of growth.

Length, 1.12 inch; breadth, 0.68 inch; length of aperture, 0.72 inch; breadth of do., 0.39 inch. Apical angle convex, divergence 83° .

Locality and position. Springfield, Illinois. Upper Coal Measures.

MACROCHEILUS INTERCALARIS.—Shell of medium size, rhombic, oval; spire conical, forming more than one-third of the entire length, pointed at the extremity. Volutions six to seven, compressed convex, increasing rather rapidly in size; last one comparatively large, but not ventricose, widest near the middle, and compressed above. Aperture narrow, subovate, a little oblique, narrowly rounded, and faintly sinuous below, acutely angular above: outer lip thin, slightly prominent along the middle; columella having a small sinuosity in the middle, below which the lip is thickened, so as to form a moderately distinct oblique fold or obtuse prominence; inner lip not much thickened above. Surface smooth, but showing obscure traces of very fine lines of growth under a magnifier.

Length, 1.14 inch; breadth, 0.70 inch. Length of aperture, 0.70 inch; breadth of do., 0.32 inch. Apical angle convex, divergence 74° .

Locality and position. Same as last.

MACROCHEILUS PULCHELLUS.—Shell of medium size, rhombic, oval, or sub-fusiform; spire rather elevated, pointed at the apex, composing more than two-fifths the entire length. Whorls seven and a half, distinctly convex, increasing moderately in size, last one not ventricose; suture well defined. Aperture narrow, subovate, acutely angular above, and rather narrowly rounded below; outer lip sharp, and slightly sigmoid in outline; columella a little arcuate, or sinuous in the middle; inner lip moderately thickened, somewhat prominent, or showing a slight disposition to form an obtuse fold below. Surface polished, and having faint traces of fine lines of growth, which can only be seen by the aid of a magnifier.

Length, 1.30 inch; breadth, 0.79 inch; length of aperture, 0.75 inch; breadth of do., 0.34 inch. Apical angle convex, divergence 64° .

Locality and position. Same as last.

New Genus SOLENISCUS.*

The shell upon which we propose to found this genus, differs from the smooth species usually referred to *Loxonema* in having the body whorl contracted and extended below into a distinct straight canal, with a well defined oblique plait or fold rather low on the columella. In the last mentioned character, as well as in its smooth surface, it agrees more nearly with the genus *Macrocheilus*, but its fusiform outline, narrow aperture and distinct canal, are peculiarities which separate it clearly from that group, as usually understood. In its general appearance it resembles some species of *Fasciolaria*; but as it has only one, instead of two or three folds on the columella, and is entirely destitute of nodes, costæ, or revolving marks, while its outer lip is quite smooth within, there is little reason for supposing it to be really nearly related to that genus, which is unknown below the upper Cretaceous.

It is probable that when the aperture and columella of such species as *Macrocheilus limnæformis*, McCoy, and *Macrocheilus fusiformis*, Hall, (non *M. fusiformis* of Morris' Catalogue,) as well as of several of the smooth fusiform species referred by others to *Loxonema*, are better known, they will be found to possess the characters of this genus.

SOLENISCUS TYPICUS.—Shell fusiform; spire elevated, and acutely conical at the apex; volutions seven to seven and a-half, flat or but slightly convex, increasing rather gradually in size, last one comparatively large, slightly ventricose in the middle, and contracted into a distinct, straight canal below; suture moderately well defined; aperture very narrow, acutely angular above, and

*σοληνισκος: a little channel, or gutter.

tapering into the canal below; outer lip thin, sharp, and scarcely sigmoid in outline; inner lip none; columella straight, and provided with a single distinct rather sharply elevated, oblique plait or fold, a little below the middle of the aperture; surface smooth, or only showing under a good lens faint traces of very fine lines of growth,

Length 0.73 inch; breadth 0.30 inch; apical angle slightly concave, divergence 0.40°. Length of aperture and canal, 0.34 inch; breadth of former 0.11 inch.

Locality and position. Springfield, Illinois. Upper Coal Measures.

CEPHALOPODA.

Genus ORTHOCERAS, Breynius.

ORTHOCERAS EXPANSUM.—Shell having the form of a moderately compressed, rapidly tapering cone; section subcircular, near the smaller end, but more oval towards the larger. Septa concave, and separated near the smaller end by spaces between one-fourth and one-fifth their own greater diameter; the intervals increasing somewhat, but not near in proportion to the expansion of the shell above; siphuncle subcentral, small where it passes through the septa, but swelling out into a globular cavity between. Surface apparently smooth.

Length of an entirely septate specimen imperfect at both extremities, 4.29 inches; greater diameter at the smaller end 0.80 inch, smaller do. of same about 0.71 inch; greater diameter at larger end apparently not less than 3.20 inches.

This species is allied in form and general appearance to *O. dilatatum*, DeKoninck, (An. Fos. p. 515, pl. 45, fig. 8, a, b, c), but differs in presenting an oval instead of a circular section; its siphuncle is also much more nearly central than is represented in DeKoninck's figure 8, a and b, pl. 45, and differs in its peculiarity of swelling out into globular cavities between the septa. Our species seems likewise to differ in its surface markings, being nearly or quite smooth; this, however, may be due, at least to some extent, to the exfoliation of the outer layers of the shell.

Locality and position. McDonough County, Illinois; the specimen being found loose, its exact geological position is unknown, though it is doubtless a carboniferous species.

Genus CYRTOCERAS, Goldfuss.

CYRTOCERAS CURTUM.—Shell rather under medium size, slightly arched and rapidly expanding; section oval, the transverse diameter being greater than from the dorsal to the ventral side; lateral margins a little flattened; ventral and dorsal sides very broadly rounded. Surface ornamented by numerous small, regularly arranged annular striæ, or impressed lines, which arch a little forward in crossing the dorsum, where they are separated by spaces several times their own breadth, excepting near the smaller extremity of the shell. On the sides and ventrum, they become much more crowded, and more deeply impressed. Septa rather deeply concave; siphuncle small, and placed about half-way between the middle and the dorsal side.

Length of a specimen imperfect at the smaller end, 1.25 inches; greater diameter at the aperture about 1.24 inch, smaller do. 0.92 inch; greater diameter at the smaller extremity 0.54 inch, smaller do. 0.45 inch.

Locality and position. Graysville, Illinois. Coal Measures.

CYRTOCERAS? DILATATUM.—Shell broadly conical, very rapidly expanding, thick, especially on one side, a little curved and apparently somewhat compressed; surface ornamented by numerous distinct, regularly arranged, subimbricating annular marks of growth: septa separated, at about about two inches from the smaller end, by spaces near one-twelfth of the greater diameter of the shell at the same place; (siphuncle and aperture unknown). Length

of a septate specimen, incomplete at both ends, 1.18 inches; breadth of smaller end 1 inch, do. of larger end 2.97 inches.

Locality and position. Near Springfield, Illinois. Upper Coal Measures.

Genus NAUTILUS, Breynius.

NAUTILUS SUBGLOBOSUS.—Shell under medium size, subglobose, broadly rounded over the dorsum and sides; umbilicus (in casts) rather small, deep, conical, or with nearly vertical sides, showing rather less than the half of each inner whorl; volutions about three, increasing rapidly in size, especially in breadth, deeply embracing, subangular on the sides around the umbilicus; septa rather deeply concave, arching very slightly forward over the dorsal region, where they are separated by spaces a little less than one-fifth their own greater (transverse) diameter; aperture transversely sublunate, or subreniform; lip deeply sinuous on the dorsal side; siphuncle central; surface apparently smooth. Length 2.11 inches; height 1.72 inch; breadth at aperture 1.95 inch.

This species is related to the following, but differs in having a wider umbilicus, with more rapidly expanding whorls. It is also more broadly rounded on the dorsum, and its septa are rather more closely arranged in proportion to the breadth of the whorls.

Locality and position. Chester, Illinois. Chester Limestone of Lower Carboniferous series.

NAUTILUS CHESTERENSIS.—Shell under medium size, subglobose, rounded over the dorsum and sides; umbilicus (in casts) small and deep, with nearly vertical walls, probably almost closed in adult specimens retaining the shell, apparently showing little of the inner whorls; volutions about three; increasing moderately in size, rather deeply embracing, abruptly rounded, or subangular around the umbilicus; septa not very concave, arching very slightly forward over the dorsal region, where they are separated by spaces a little less than one-fourth their own transverse diameter; siphuncle very nearly or quite central; aperture (as inferred from a section of the whorls) transversely subreniform; (surface unknown). Length 2.43 inches; height about 1.88 inches; breadth near the aperture about 1.80 inch; breadth of umbilicus (in cast) 0.54 inch.

Locality and position. Same as last.

NAUTILUS SPECTABILIS.—Shell large, subglobose; umbilicus moderately wide, deep, subconical, and showing rather more than half of each inner whorl; volutions increasing rather rapidly in size, or more than doubling their diameter each turn, broadly rounded over the dorsum, moderately concave within, and very narrowly rounded, or subangular along the middle of each side, where they are ornamented by a series of low nodes, some fourteen to sixteen of which may be counted on either side of each turn; section of the whorls subelliptical, the breadth being rather more than double the diameter from the dorsal to the umbilical side; siphuncle located a little outside of the centre. Septa distinctly concave, arching slightly forward over the dorsum, where they are separated by spaces less than one-fourth their own transverse diameter. (Surface, aperture, and number of whorls unknown.)

Length of a specimen, consisting entirely of septate whorls, 4.50 inches; height of do. 3.47 inches; breadth of the aperture 3.20 inches.

Locality and position. Gravel Creek, Randolph County, Illinois. Chester Limestone, of Lower Carboniferous series.

NAUTILUS (DISCUS*) PLANORBIFORMIS.—Shell of medium size, compressed

*We retain Prof. King's name *Discus*, in a subgeneric sense, for all the discoidal forms with a central siphuncle, simple septa, and slender contiguous whorls, all exposed in a wide, shallow umbilicus. It seems not to be quite synonymous with *Discites*, of McCoy, which is described as having the siphuncle "near the outer edge of the periphery." We have some doubts whether such forms should be retained in the same genus with the living species of *Nautilus*.

discoidal; umbilicus very wide, shallow, and showing nearly all of each inner whorl; volutions about four, increasing gradually in size, slightly embracing, nearly rounded in young shells, but becoming somewhat compressed on the sides and dorsum, in mature individuals—having a row of obscure nodes around each dorso-lateral margin; aperture a little oval, its longer diameter being in the direction of the plane of the shell: septa deeply concave, arching gently backwards on the sides and dorsum, and separated by spaces less than one-third the transverse diameter of the whorls; siphuncle small and central; surface apparently smooth.

Length 3.60 inches; height 3.21 inches; breadth 0.92 inch.

Locality and position. Alpine, Iowa. Coal Measures.

NAUTILUS (DISCUS) TRISULCATUS.—Shell discoidal, under medium size; umbilicus wide, moderately deep, and showing nearly all of each inner whorl; volutions slender, increasing very gradually in size, a little broader transversely than the diameter from the dorsum to the ventral margin, ventricose and rounded on each side, and provided with a deep rounded sulcus in each dorso-lateral region. Between these two sulci, the dorsum is narrow, prominent and less deeply grooved, the sulcus being bounded on either side by an angle. Surface retaining traces of rather strong longitudinal lines. Septa deeply concave, and arching distinctly backwards in each of the dorsal depressions, separated on the dorsum by spaces generally less than one-third the transverse diameter of the outer whorl at the place of measurement; siphuncle rather small, and placed a little nearer the dorsal than the ventral side. Length (of a specimen retaining a portion of the nonseptate whorl) 2.33 inches; height 1.82 inches; breadth about 0.87 inch.

Locality and position. Rockford, Indiana, in beds containing Carboniferous species of *Goniatites*, but usually regarded as Upper Devonian.

NAUTILUS (DISCUS) DIGONUS.—Shell rather small, subdiscoidal; umbilicus comparatively large, moderately deep, and showing all of each inner whorl; volutions about three or four, in contact, but not embracing, increasing gradually in size, broad and nearly flat on the dorsal side, which is marked by two very obscure longitudinal depressions near the aperture; distinctly angular on each dorso-lateral margin, thence rounding regularly into the umbilicus; surface of cast retaining traces of regular, equidistant longitudinal lines, and much finer and more closely arranged transverse striæ; aperture and section of the whorls nearly semicircular, the outer or dorsal side being almost straight, and the inner rounded. Septa distinctly concave; their margins curving obliquely backwards on the sides of the whorls, from the dorso-lateral angles, and deflected backwards in crossing the dorsum. Siphuncle small, located about one-third the diameter of each septum from the dorsal side.

Length, (of an imperfect specimen, about one-third of the outer whorl of which is non-septate,) 1.20 inch; height 1 inch; breadth across the dorsum of the outer whorl near the aperture, 0.62 inch; diameter of same from the dorsal to the ventral side, 0.40 inch.

Locality and position. Same as last.

NAUTILUS (DISCUS) SANGAMONENSIS.—Of this species we have seen but a single specimen consisting of about half of one volution. It is a little wider transversely than deep, and increases gradually in size from the smaller to the larger end, being evidently part of a discoidal shell, with an umbilicus about equalling the transverse diameter of the outer whorl. On the dorsum it is nearly flat, or but slightly convex, and the sides are a little concave. The ventro-lateral regions are obliquely flattened, so as to form an abrupt slope into the umbilicus, leaving a subangular prominence between the umbilicus and each slightly concave side. The ventrum is moderately concave along the middle, for the reception of the inner whorls, each of which was probably about one-third hidden.

On each dorso-lateral angle, there is a series of rather low nodes, about twenty to twenty-two of which probably existed on each side of the entire whorl. The transverse section of the whorls has a nearly quadrangular form, if we regard the small ventral concavity, and the two sloping ventro-lateral margins together as one side. The septa are moderately concave, and arch gracefully backward on each side, while in crossing the dorsum they arch less deeply in the same direction. The siphuncle is small, and located a little nearer the dorsal than the ventral side. (Aperture and surface markings unknown).

Length, as inferred from the curve, about 2 inches; height about 1.45 inch; breadth near the aperture 0.88 inch.

Locality and position. Sangamon County, Illinois. Coal Measures.

Genus GONIATITES, De Haan.

GONIATITES GLOBULOSUS.—Shell under medium size, length and breadth nearly equal, very broadly rounded on the dorsum; umbilicus deep, less than half as wide as the greater (transverse) diameter of the outer whorl; volutions more than twice as broad transversely, as from the ventral to the dorsal side; sides subangular around the umbilicus; aperture transverse, lunate, much wider than high; (surface unknown;) surface of internal cast slightly constricted at intervals, as if from an occasional thickening of the lip. Septa moderately distant; dorsal lobe nearly as wide as long, and deeply divided into two slightly diverging, simple, lanceolate branches; dorsal saddle linguiform, and a little narrower than the dorsal lobe, but equalling it in length, slightly contracted in the middle; superior lateral lobe as long as the dorsal saddle, but narrower, and pointed at the extremity; lateral saddle a little broader than the dorsal saddle, which it resembles in other respects.

Length 1.18 inch; height, 1 inch; breadth at the aperture, 1.11 inch.

Locality and position. Upper Coal Measures, Springfield, Illinois.

GONIATITES IOWENSIS.—Shell attaining a rather large size, discoidal or compressed on the sides, and narrowly rounded on the dorsum; umbilicus shallow, about one-half as wide as the breadth of the outer whorl from the ventral to the dorsal side, showing apparently a little less than half of each inner whorl; volutions increasing gradually in size, but slightly convex on the sides, nearly twice as broad on a line from the dorsal to the ventral margins, as the diameter at right angles to the same, profoundly grooved on the ventral side for the reception of each succeeding whorl; aperture, judging from a transverse section of the volutions, narrow sublunate. (Surface unknown.)

Septa rather crowded and deeply sinuous; dorsal lobe large, considerably wider than long, profoundly divided into two large lanceolate branches, each of which is a little narrower above than in the middle, and abruptly contracted to an acute point at the extremity; dorsal saddle linguiform, slightly oblique, a little larger than either division of the dorsal lobe, and longer than wide; superior lateral lobe infundibuliform, as long as the dorsal saddle, but not more than half as wide, acutely pointed at the apex; lateral saddle a little shorter than the dorsal saddle, but narrower at the extremity; inferior lateral lobe rather shorter than the superior, particularly on the ventral side, but resembling it in other respects; ventral saddle shorter than the others, and broadly rounded.

Length 4.21 inches; height 3.43 inches; breadth at the aperture 1.10 inch.

Locality and position. Alpine, Iowa. Coal Measures.

GONIATITES LYONI.—Shell attaining a medium size, compressed, discoidal; umbilicus large, or nearly twice the diameter of the outer whorl, from the dorsal to the ventral side, very shallow, and showing about four-fifths of each inner whorl. Volutions slender, increasing very gradually in size, compressed, or about one-third deeper from the dorsal to the ventral side than the trans-

verse diameter, rather narrowly rounded on the dorsum, compressed convex on the sides, and provided with a shallow concavity along the ventrum for the reception of the inner whorls. Septa moderately distant, and deeply divided into six lobes and six saddles; dorsal lobe longer than wide, infundibuliform, and acutely pointed; dorsal saddle as long as the dorsal lobe, but wider, and rounded at the end; superior lateral lobe halbert-shaped, a little longer than the dorsal lobe, and sharply pointed at the extremity: lateral saddle longer and narrower than the dorsal saddle, linguiform, and regularly rounded at the summit; inferior lateral lobe similar to the superior, excepting that it is somewhat smaller; ventral saddle shorter and broader than the lateral saddle, rather oblique, and rounded at the end.

Length of an imperfect entirely septate specimen, 2.55 inches; height, 2.15 inches; convexity, 0.57 inch.

Locality and position. Rockford, Indiana, from the Rockford *Goniatite* bed, the exact age of which is somewhat doubtful, though it is generally considered of upper Devonian age.

NOTE.—In the last number of the Proceedings of the Academy, we described a new Echinoderm, under the name of *Melonites Danæ*, mentioning, at the same time, that it differs from the type of the genus *Melonites*, in having only four, instead of eight double rows of pores to each ambulacrum. Since that time we have been led to regard this difference as being of more than specific importance, though until other species or better specimens are known, we cannot be quite sure it is of full generic value, especially since these forms seem to be exactly alike in other respects. We therefore now propose to found upon this species a subgenus, under the name of *Oligoporus* (ὀλίγος, few; and πόςος, opening or pore.)

We also avail ourselves of the present opportunity to correct the following errata, which were overlooked in correcting the proof of the paper mentioned above:

Page 382, 15th line from the bottom, for *second radial* read *second radials*.

Page 382, for the 4th, 5th and 6th lines from the bottom, substitute *secondary radials 1 X 10: resting partly on the second, and partly on the first primary radials; or, in the absence of the former, directly on the latter.*

Page 382, insert between the first and second lines from the bottom,—*Anal plate 1, (known); varying much in size and form.*

Page 386, 12th line from the bottom, for *Actinocrinus scilutus*, read *Actinocrinus scitulus*.

Page 389, 2d, 5th and 23d lines from the bottom, and 4th and 5th line from the top, for *Forbsiocrinus*, read *Forbesiocrinus*.

Description of a New Species of *Exocetus*, from Chili.

BY CHARLES C. ABBOTT.

Exocetus Chiliensis, Abbott.—*Spec. char.* Head of medium size, without scales, and trigonal. Body much compressed and tapering to the tail; peduncle of the tail very slender. Eye unusually large, circular, diameter entering two and two-thirds times in the length of the side of the head; the orbits are one diameter distant. The posterior extremity of the maxillary bone extends to a vertical line drawn anteriorly to the anterior margin of the orbit. The nostrils are situated anteriorly to the eyes, and are about three diameters distant. Anterior to, between, and posterior to the orbits, are numerous pores, with channelled, slender depressions over the forehead and occiput, leading to the orifices of these pores. A well-defined, carinated row of scales commence, on each side, at

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