

Descriptions of new Organic Remains from the Tertiary, Cretaceous and Jurassic Rocks of Nebraska.

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The following new species of fossil mollusca, belong mainly to the collections brought from Nebraska by the expeditions under the command of Lieut. G. K. Warren, of the U. S. Top. Engrs. in 1856-7 and 8. More extended descriptions of these and the other species already described by us from that region, together with remarks, comparisons, and full illustrations, will appear in Lieut. Warren's final report.

TERTIARY SPECIES.

GASTEROPODA.

HELIX EVANSI, A. & H.—Shell small, suborbicular, spire depressed; volutions four and a half to five, obliquely compressed, or a little convex above, rounded on the outer side, and very convex below, the most prominent part being near the umbilicus, concave within, and each embracing on the upper side about half, and below nearly the whole breadth of every succeeding inner turn; surface unknown; umbilicus rather small, or about equalling the breadth of the widest part of the outer volution; aperture nearly obovate, its longer diameter being directed outward and upward. Height, 0.10 inch; breadth, 0.17 inch.

Named in honor of Dr. John Evans, Geologist, of Oregon.

Locality and position. Estuary beds at the mouth of Judith River.

PLANORBIS VETULUS, M. & H.—Shell discoidal, much compressed, spire slightly concave, umbilicus shallow, very little broader than the concavity on the upper side, and rather more than one-third wider than the outer whorl, showing about half of each inner turn; volutions three and a half to four, compressed convex above and below, the upper side being a little more convex than the other, and sloping slightly outward from near the inner margin, rather distinctly angular around the outer side, a little below the middle, and deeply concave within for the reception of each succeeding inner whorl; sutures well defined, though not very deep; aperture sub-cordate, approaching an irregular hastate outline, very slightly oblique, having its longer axis in the direction of the greatest breadth of the shell; surface apparently nearly smooth, or only showing obscure marks of growth. Greatest breadth 0.23 inch; height 0.05 inch.

Locality and position. Upper part of the Tertiary forming the Bad Lands of White River.

PLANORBIS LEIDYI, M. & H.—Shell small, subdiscoidal; spire flat, or a little concave; volutions scarcely three, increasing rather rapidly in size, not embracing on the upper side, inner ones almost entirely hidden by the last turn below, all convex above, rather narrowly rounded on the upper outer side, ventricose and rounded below; suture well defined; umbilicus small, or less than half the breadth of the outer whorl, deep and scarcely permitting the inner volutions to be counted; surface marked by fine delicate lines of growth; aperture sub-circular, or obliquely a little oval, flattened or somewhat concave on the inner side. Greatest breadth, 0.22 inch; height, 0.09 inch.

Named in honor of Prof. Jos. Leidy of Philadelphia.

Locality and position, same as last.

CONCHIFERA.

SPHÆRIUM PLANUM, M. & H.—Shell rather small, broad oval or subcircular, much compressed; extremities more or less regularly rounded, the posterior margin being sometimes faintly subtruncate; base semi-oval in outline; cardinal margin rounding gradually from near the middle; beaks very small, compressed, and scarcely extending beyond the hinge margin, nearly central; surface marked
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by fine irregular, obscure, concentric striæ. Length, 0.38 inch; height, 0.32 inch; convexity 0.08 inch.

Locality and position. Near the mouth of Grand River on the Upper Missouri.

SPHERIUM RECTICARDINALE, M. & H.—Shell of medium size, transversely subelliptical, rather compressed, very thin; anterior side rounded; base forming a regular semielliptic curve; posterior extremity obliquely subtruncate above, and rather narrowly rounded below; cardinal margin long and straight; beaks very small, compressed, and projecting but slightly above the hinge, located nearly half way between the middle and the anterior end; surface marked by moderately distinct, irregular lines of growth. Length, 0.55 inch; height, 0.36 inch; breadth, 0.24 inch.

Locality and position, same as last.

CYRENA (CORBICULA?) CYTHERIFORMIS, M. & H.—Shell broad trigonal ovate, varying to subcircular, rather thick and strong; extremities more or less rounded; base semiovate, usually more prominent before than behind the middle; dorsal outline sloping from the beaks, the anterior slope being more abrupt than the other, and slightly concave, while the posterior is convex; beaks rather elevated, moderately gibbous, located in advance of the middle; surface marked by fine lines of growth, which sometimes show a very slight tendency to gather into small irregular concentric wrinkles. Length, inches; height, inch; thickness, inch.

Locality and position. Estuary heds, near mouth of Judith River.

CRETACEOUS SPECIES.

CEPHALOPODA.

Genus *PHYLLOTEUTHIS*, M. & H.

PHYLLOTEUTHIS SUBOVATUS, M. & H.—The specimens on which we propose to found this genus and species consist of the expanded portion of the pen or gladius. This organ seems to have been corneous, and is thin, very wide or subovate in form, a little concave on the under side, and convex above. From behind the middle it narrows towards the front, the outline of the lateral margins being convex, while the posterior end is more or less obtusely angular. The shaft is broken away in our specimens, but that portion of it extending backward and forming the midrib of the expanded part, is narrow, prominent, and rather sharply carinate above, while on the under side it is merely represented by a narrow groove. The lateral expansions are crossed a little obliquely backward and outward, at an angle of about 65° from the midrib, by numerous slender, ridged parallel striæ, which are very nearly straight, or very slightly curved backward near the outer margins. Length of expanded part, exclusive of the shaft, 1.55 inch; breadth of do., 0.82 inch.

Apparently near the Liassic genera *Beloteuthis* and *Teudopsis*, or at any rate to species that have been, with doubtful propriety, ranged in these groups.

Locality and position. Moreau River, in formation No. 5.

HELICOCERAS ANGULATUM—Of this shell we have seen but a single nonseptate fragment, 2.78 inches in length, with a diameter of 1.50 inches at the larger end, and 1.37 inches at the smaller. It is rounded, or subcylindrical, and makes a broad (sinistral?) spiral curve, in such a manner that if continued around, the volutions would be disconnected, and encircle an umbilical cavity apparently more than three times their own breadth. The surface is ornamented by distinct angular costæ, which pass around the whorls obliquely and support two rows of nodes on the lower outer side, where they sometimes bifurcate. Septa unknown.

Locality and position. Head of south branch of Shyenne River, in the upper part of formation No. 4, of the Nebraska series.

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AMMONITES PLACENTA, var. INTERCALARIS.—It is possible this shell may be specifically distinct from *A. placenta* of Dekay, but it agrees with that species so nearly that we are in doubt about the propriety of considering it entitled to rank as a species. It differs externally from the typical forms of Dekay's species, in being rather less compressed, and in having a slightly larger umbilicus, while instead of a single series of scarcely perceptible transversely elongated prominences on each side, it has a row of small, but distinct nodes a little less than one-third of the way across from the dorsum, and another more prominent series near the umbilicus. It also differs in having a row of small, pinched, alternating nodes on each of the two dorsal angles.

With these external differences, however, the septa of the shell under consideration, are so very similar in all their details to those of *A. placenta*, that we are at present inclined to regard it as a variety of that species.

It is also worthy of note, that the form before us is closely related to *A. sylvaticus* of Morton, being in fact almost exactly intermediate between that shell and *A. placenta*, as well in form and external ornaments, as in the characters of its septa. Its exact relations to these species can perhaps only be settled by a careful comparison of a more extensive series of specimens than has yet been obtained; in the mean time it may be made known as a subspecies, under the name *A. placenta, var. intercalaris*, and should it prove distinct, it may take the latter as a specific name. It seems to attain a large size. Our specimen, which consists of inner septate whorls, is 5.70 inches in its greatest diameter, with a thickness or convexity of 1.62 inches.

Locality and position. Sheyenne River, in the upper part of Formation No. 4 of the Nebraska Cretaceous series.

AMMONITES VERMILIONENSIS, M. & H.—Shell compressed discoidal; umbilicus large, very shallow, and showing about four-fifths of each inner whorl; volutions five or more, rather sharply carinated around the middle of the dorsum, and ornamented on each side by nearly straight, simple, moderately strong, obtuse costæ, which show a tendency to develop nodes at each extremity. Greatest diameter 1.05 inches; convexity about 0.29 inch.

Locality and position. Mouth Vermilion River, in Formation No. 2, of the Nebraska section.

SCAPHITES WARRENI, M. & H.—Shell small, transversely subovate, moderately compressed, rounded on the dorsum; umbilicus rather small; volutions subcylindrical, height and breadth nearly equal, increasing gradually in size; non-septate portion of last turn slightly compressed laterally, and deflected from the regular curve of the others, so as to become nearly or quite disconnected at the aperture. Surface of the inner whorls ornamented by numerous small costæ, which increase chiefly by implantation, and all cross the dorsum very regularly without arching; on the sides of the non-septate outer chamber, about every fourth or fifth one of the costæ is much more prominent and sharper than the others, and extends quite across to the umbilical side, while those between die out, or coalesce with the others at various distances.

Length 1.45 inches; height about 1.22 inches; breadth 0.57 inch.

Locality and position. Near the Black Hills, in formation No. 2 of the Nebraska Section.

SCAPHITES NODOSUS, var. PLENUS.—We suspect the noble specimen we here propose to notice provisionally, as a variety of Dr. Owen's *Scaphites nodosus*, may prove to belong to a distinct species, but as we are not yet fully satisfied on this point, it is perhaps better to regard it, for the present, as a marked variety of Dr. Owen's species; and should further comparison demonstrate that it is entitled to rank as a species, it can take as a specific name that by which we have designated it as a variety. It differs externally from Dr. Owen's figure of *S. nodosus*, in being greatly more ventricose, and shorter in proportion to its height, while its inner rows of nodes are much smaller and nearer the umbili-

cus. There are also some differences in the details of the septa, which cannot, however, be readily explained without figures. It is likewise much larger than the specimen represented by Dr. Owen, or any individuals of that form we have seen, its length being 4.57 inches; height 3.87 inches, and its breadth 2.53 inches.

Locality and position. On Yellow Stone River, 150 miles above the mouth, in the upper part of formation No. 4 of the Nebraska Cretaceous Series.

GASTEROPODA.

APORRHAIIS PARVA, M. & H.—Shell small, conical, subfusiform; spire moderately elevated, and acute at the apex; volutions six or seven, separated by a small but rather distinct suture, and having around the middle a single series of very oblique, flexuous folds, or node-like costæ, which do not extend to the surface either above or below; last whorl having just below the row of nodes, a small but well defined revolving angle; surface marked by very obscure lines of growth, and fine, closely set, revolving striæ. Length about 0.28 inch; breadth of body whorl, 0.15 inch; apical angle a little convex, divergence 33°.

Locality and position, same as last.

APORRHAIIS SUBLEVIS, M. & H.—Shell conical, or subfusiform; spire elevated; volutions seven or more, convex, and separated by a rather distinct, though not deep suture; last one convex above, and abruptly contracted below, having a (single?) small, revolving angle, which passes around to the suture, but is not seen on the succeeding turn above. Surface polished, and marked by moderately distinct, arcuate lines of growth, which are crossed by rather obscure revolving lines, nearly equalling the spaces between, on the spire, but more distant, with sometimes a few indistinct, irregular, very fine, parallel striæ between on the body whorl; aperture and lip unknown. Length about 0.54 inch; breadth of body whorl, 0.26 inch; apical angle slightly convex, divergence 37°.

Locality and position. Yellow Stone River, Upper part of No. 4, Nebraska section.

DENTALIUM PAUPERCULUM, M. & H.—Shell small, arcuate, slender and tapering gradually; section circular; substance comparatively thick; surface smooth, but showing under a magnifier extremely fine, obscure lines of growth, which pass around somewhat obliquely. Length (of an incomplete specimen, measuring from the apex,) 0.36 inch; diameter of same at apex 0.03 inch, do. at larger extremity 0.06 inch.

Locality and position. Moreau River, formation No. 5 of the Nebraska section.

CYLICHA SCITULA, M. & H.—Shell small, rather thick, narrow, subelliptical, or subcylindrical; spire entirely hidden; summit truncate, and occupied by a comparatively large umbilicoid depression; aperture very narrow, moderately arched, and equalling the greatest length of the shell; umbilical region slightly impressed; inner lip reflexed upon the columella, which seems to be slightly twisted, so as to form a small indistinct fold at its base; surface marked by fine, obscure lines of growth, which are crossed by impressed, revolving striæ, separated by spaces about twice or three times their own breadth, near the middle of the outer whorl, but becoming much more closely crowded towards the extremities. Length 0.24 inch; breadth 0.14 inch; widest part of aperture 0.07 inch, breadth of same near upper extremity, only 0.02 inch.

Locality and position. Moreau River, No. 5 of the Nebraska section.

CONCHIFERA.

TEREDO SELLIFORMIS, M. & H.—Shell small, subglobose; posterior side narrowly rounded above, gaping, and having a broad, more or less angular notch

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below; antero-ventral side provided with a large hiatus, formed by a similar, but deeper rectangular notch, which extends from the base nearly half way up to the beaks, and back almost to the middle of the valves; base, between the anterior and posterior notches, extended downward in the form of a narrow prolongation, which curves under, and is the only part of the ventral borders of the two valves that come in contact; beaks elevated, gibbous, incurved, and located between the middle and the anterior margin; surface ornamented by small concentric lines, which are curved, and deflected parallel to the great irregularities of the free borders, and crossed by two distinct radiating grooves, one of which passes from the back part of the beaks obliquely downward and backward to the corner of the posterior notch, and the other nearly directly downward to the extremity of the ventral prolongation. Length, of a medium sized specimen, 0.16 inch; height 0.14 inch; gibbosity 0.13 inch.

Locality and position. Fort Clark, on the Missouri, in formation No. 5.

MACTRA SIOUXENSIS, M. & H.—Internal cast oval-subtrigonal, moderately gibbous; anterior border narrowly rounded; posterior margin subangular at the extremity; base forming a nearly semiovate curve, the most prominent part of which is in front of the middle; dorsal outline declining with a slightly convex outline behind the beaks, and distinctly concave in front of them; beaks prominent, rather gibbous, very nearly central; pallial impression provided with an oval sinus, which appears to be a little narrower behind than in the middle, rounded at the anterior extremity, and extending nearly in a horizontal direction, about three-fourths of the way towards the middle of the valves. Length 1.55 inches; height, 1.22 inches; convexity 0.76 inch.

Locality and position. Near mouth of Big Sioux River, in formation No. 1, of the Nebraska Cretaceous series.

MACTRA GRACILIS, M. & H.—Shell small, rather thin, ovate-subtrigonal, moderately gibbous, anterior end rounded, a little broader than the other; base forming a broad semiovate curve, being usually more prominent towards the front than behind; posterior margin rather narrowly rounded, or subtruncate; beaks moderately prominent, and located slightly in advance of the middle; escutcheon comparatively large, lance-ovate in form; surface marked by distinct, regular lines of growth; hinge unknown. Length 0.49 inch; height 0.38 inch; convexity about 0.24 inch.

Locality and position. On Yellowstone River, 150 miles above the mouth, in beds containing a mingling of the fossils of No. 4 and 5.

TELLINA? FORMOSA, M. & H.—Shell subelliptical, very thin, moderately convex; anterior extremity a little wider than the other, but very narrowly rounded; posterior side subangular at the extremity; base forming a semi-elliptical curve; dorsum sloping gradually, with a slightly convex outline in front and rear; beaks small, and located almost exactly in the middle; surface marked by rather obscure, irregular lines of growth, and extremely fine radiating striæ, only visible by the aid of a magnifier; hinge unknown. Length 0.67 inch; height 0.40 inch; convexity (of a right valve) about 0.13 inch.

Locality and position. Twenty miles below mouth of Cannon Ball River, formation No. 5.

CYPRINA HUMILIS, M. & H.—Shell ovate, gibbous, thick, very oblique; anterior margin scarcely extending beyond the beaks, abruptly rounded below; base semiovate in outline, most prominent towards the front, sometimes a little contracted behind; posterior extremity rounding obliquely, with a broad curve from the dorsum to the postero-basal extremity, which is narrowly rounded; beaks very oblique, almost overhanging the anterior border, declining and turned a little inwards at the extremities; umbonal slopes prominent from near the beaks obliquely backward to the lower part of the anal margin; surface marked by distinct, subimbricating lines of growth. Length 1.70 inches; height 1.34 inches; breadth 1.30 inches.

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Locality and position. North branch of Cheyenne River, near Black Hills, formation No. 5.

AVICULA SUBGIBBOSA, M. & H.—Shell (left valve) obliquely rhombic-oval, or ovate, moderately gibbous; anterior margin contracted, or a little concave in outline just below the wing, from which point it descends obliquely backward, with a broad, gently convex sweep, into the base; posterior border rather broadly rounded below, distinctly sinuous under the wing above; hinge line straight, a little less than the height of the shell. Anterior wing forming an equilateral triangle, compressed, and rather distinct from the umbo; posterior wing having the form of a very inequilateral triangle, the posterior side of which is much the shortest, compressed, moderately distinct from the more gibbous part of the valve, forming an angle of about 50° at the extremity; beak small, slightly elevated above the hinge, gibbous, located a little less than one-third the length of the hinge, behind the anterior extremity; posterior muscular scar large, oval or ovate, and located a little above the middle. Height 1.40 inches; length, measuring from the postero-basal extremity obliquely forward and upward to the point of the beak, 1.72 inches; length of hinge 1.32 inches.

This species resembles *A. linguiformis*, Evans & Shumard, but is much broader and less oblique, while its postero-basal margin is more broadly rounded. Our specimen is a cast, and does not show the surface-markings, excepting on the anterior wing, where the marks of growth are rather distinct and subimbricating.

Locality and position. Long Lake, above Fort Pierre, formation No. 5.

INOCERAMUS CUNEATUS, M. & H.—Shell oblong-ovate, moderately gibbous in the umbonal and anterior regions, very nearly or quite equivalve, rather thin; buccal side descending from the beaks at first, almost at right angles to the hinge, after which it gradually curves obliquely backward and downward, so as to pass by a graceful sweep into the base; posterior side long, compressed, broader than the other extremity, and regularly rounded; ventral border forming a semiovate curve, the most prominent part of which is behind the middle; hinge very long, and nearly straight. Beaks very nearly terminal, or located almost directly over the anterior border, oblique, rising little above the hinge, equal, and but slightly incurved. Surface marked by rather distinct, more or less regular undulations. Length 3.90 inches; height 2.75 inches; convexity 2 inches.

Locality and position. Yellow Stone River, 150 miles above the mouth, in beds containing a blending of the fossils of formations Nos. 4 and 5.

INOCERAMUS VANUXEMI, M. & H.—Shell large, subcircular or broad oval, equivalve, and much compressed; anterior margin rounded; base forming a nearly semicircular curve, being a little more prominent behind than in front; posterior side longer and wider than the other, broadly rounded or subtruncate; hinge (of moderate length?) straight, and forming an angle of about 70° with the axis of the umbones. Beaks small, compressed, scarcely rising above the hinge, not distinctly incurved, located a little in advance of the middle. Surface ornamented by regular, distinct, angular, but not very prominent concentric undulations, which are separated by rather shallow depressions. Length of the largest specimen we have seen, 10 inches; height of do. 9 inches.

Locality and position. White River above the Bad Lands, in upper part of formation No. 4.

INOCERAMUS BALCHII, M. & H.—Shell large, subquadrate, or broad oblong-oval, much compressed; anterior side truncate obliquely forward above, at an angle of about 115° with the hinge, rounding into the base below; ventral margin forming a broad curve, the most prominent part of which is a little behind the middle; posterior side longer and wider than the other, broadly rounded, (sometimes subtruncate above?); hinge line rather long, forming an

angle of about 60° with the umbonal axis. Beaks narrow, rising somewhat above the hinge, scarcely incurved, located about half way between the middle and the most prominent part of the anterior border. Surface ornamented by very slightly elevated, broadly rounded, rather irregular undulations, which become entirely obsolete on large specimens below the middle, and on the posterior as well as the lower anterior regions. Attains a diameter of $3\frac{1}{2}$ to 4 inches.

Named after Lieut. G. T. Balch, of U. S. Ordinance—who discovered the only specimens of the species we have seen.

Locality and position. White River above the *Mauvaises Terres*.

INOCERAMUS SUBCOMPRESSUS, M. & H.—Shell rhombic-oval, compressed, very thin; anterior side rounded below the beaks; base forming a long semioval curve, the most prominent part of which is behind the middle; posterior side long, very narrowly rounded and prominent below the middle, subtruncate obliquely forward above; hinge of moderate length, forming an angle of about 40° with the umbonal axis. Beaks small, scarcely rising above the hinge, located nearly over the anterior extremity. Surface ornamented by somewhat regular concentric undulations. Length 2.55 inches; height 1.70 inches.

Locality and position. Mouth of Judith River, formation No. 1? of Nebraska section.

INOCERAMUS AVICULOIDES, M. & H.—Shell compressed, often broad ovate or subcircular when young, but becoming obliquely oval or subrhomboidal in outline as it advanced in age; substance thin and fragile. Anterior and basal margins forming a broad gentle curve; posterior extremity narrowly rounded below, ascending obliquely forward, with a slightly convex outline above, and meeting the hinge at an angle of about 120° . Hinge margin long, straight and compressed, so as to form an alate expansion behind. Beaks nearly terminal, scarcely rising above the hinge, not gibbous or distinctly incurved. Surface ornamented by more or less regular concentric undulations and obscure lines of growth. Length from the beaks obliquely backward and downward to the postero-basal edge, about 3 inches; height from base to hinge, 2.30 inches.

Locality and position. Little Blue River, formation No. 3.

ANOMIA OBLIQUA, M. & H.—Shell thin, broad oval, subcircular, or somewhat irregular, and more or less oblique; upper valve rather convex, beak nearly or quite marginal, and placed nearer the anterior side, moderately gibbous; surface marked concentrically by fine obscure lines, and small wrinkles of growth. Length about 1.32 inches; breadth 1.16 inches.

Locality and position. Near mouth of Niobrara River, in formation No. 3 of the Nebraska section.

ANOMIA SUBTRIGONALIS, M. & H.—Shell subtrigonal, approaching subcircular, extremely thin and fragile; upper valve moderately convex; anterior side subtruncate, with a slightly convex outline, rounding abruptly at its junction with the ventral margin; posterior side obliquely truncate from the beak, and very narrowly rounded at its connection with the ventral border, provided with a broad, oblique, rounded fold; pallial margin nearly straight, or but slightly convex; umbo marginal and rather prominent. Lower valve nearly flat, or compressed, and more irregular than the other. Surface marked by small, irregular, concentric wrinkles, and very obscure lines of growth. Length 1.57 inch; breadth 1.14 inch.

Locality and position. Bijou Hill, on the Missouri, formation No. 4.

OSTREA INORNATA, M. & H.—Shell small, narrow subovate, rather thin, attached by the whole under surface of the lower valve; beaks pointed and curved usually to the left side; under valve conforming to the contour of the surface to which it adhered, moderately concave, area small and narrow; upper valve rather convex, having its beak less pointed than that of the other valve; 1860.]

surface smooth, or only marked by very obscure lines of growth, with sometimes a few very small, irregular, nearly obsolete radiating wrinkles near the lower border. Length about 1.40 inches; breadth 0.87 inch.

Locality and position. Great Bend of the Missouri, below Fort Pierre—lower part of No. 4, Nebraska section.

JURASSIC SPECIES.

CONCHIFERA.

PHOLADOMYA HUMILIS, M. & H.—Shell transversely oblong-oval, ventricose; posterior end rounded, and more or less gaping; base nearly straight along the middle; anterior end very short, narrowly rounded below the beaks; dorsum nearly parallel with the base, slightly concave in outline; escutcheon lanceolate, and bounded by an obscure angle on each side; beaks depressed, gibbous, incurved, and located in advance of the middle; surface ornamented by small, regular, concentric wrinkles, crossed by a few raised lines, or obscure, distant, radiating costæ, extending from the back part of the beaks, to the posterior, and postero-basal margins. Length about 1.06 inch; height 0.52 inch; breadth 0.52 inch.

Locality and position. Lower Jurassic series, at the south-west base of the Black Hills.

MYACITES NEBRASCENSIS, M. & H.—Shell elongate, subelliptical, rather convex; extremities narrowly rounded, the posterior end being sometimes apparently obliquely subtruncate, and more or less gaping above; base nearly straight, or very slightly sinuous along the middle, rounding up gradually towards the ends; dorsum behind the beaks concave in outline; posterior umbonal slopes gibbous, or prominently rounded; antero-ventral region a little compressed, or contracted from near the middle of the base obliquely forward and upward; beaks moderately elevated, gibbous, incurved, and located near the anterior end; surface ornamented by concentric striæ, and small, very obscure, irregular parallel wrinkles. Length about 1.43 inch; height 0.69 inch; breadth 0.59 inch.

Locality and position. South-west base Black Hills. Jurassic.

THRACIA? SUBLEVIS, M. & H.—Shell narrow oblong-oval, rather compressed; anterior end narrowly rounded; base nearly straight along the middle, rounding up toward the ends; posterior side longer than the other, rounded or slightly truncate, and apparently gaping a little at the extremity; dorsal border concave in outline, and nearly horizontal behind the beaks, declining more abruptly in front; beaks moderately elevated, the right one being usually a little higher than the other, located in advance of the middle; posterior umbonal slopes prominently rounded; surface concentrically striate; hinge and interior unknown. Length 1.17 inch; height 0.60 inch; breadth about 0.32 inch.

Locality and position. Near the middle of the Jurassic deposits at the south-west base of the Black Hills.

THRACIA? ARCUATA, M. & H.—Shell small, transversely subovate, more or less arcuate, moderately convex; extremities rather narrowly rounded, and a little gaping; cardinal margin sloping from the beaks, anterior slope more abrupt than the other; beaks rather elevated and unequal, that of the right valve being higher than the other, located in advance of the middle; posterior and anterior umbonal slopes prominent; sides of the valves flattened or slightly concave in the central region near the base; surface of cast retaining small concentric marks of growth; hinge and interior unknown. Length, 0.62 inch; height, 0.37 inch; thickness or convexity, 0.23 inch.

Locality and position. Same as last.

CARDIUM SHUMARDI, M. & H.—Shell small, subcircular, rather gibbous; an-

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terior side rounded; base more broadly rounded; posterior side obliquely subtruncate above and passing with an abrupt curve into the base below; hinge margin rather short, and sloping slightly from the beaks, which are moderately elevated, gibbous and nearly central; posterior umbonal slopes angular; surface of cast retaining only traces of small radiating costæ or lines on the prominent posterior umbonal slopes, and flattened postero-dorsal region; hinge and interior unknown. Length 0.44 inch; height 0.37 inch; thickness 0.32 inch.

Named in honor of Dr. George G. Shumard, of the Texas Geological Survey.

Locality and position. Jurassic, beds south-west base of Black Hills.

TANCREEDIA ? EQUILATERALIS, M. & H.—Shell very nearly equilateral, moderately convex; anterior end rather narrowly rounded; base forming a broad, regular, semielliptical curve; posterior end slightly truncate on the upper oblique slope, narrowly rounded below, apparently not gaping; beaks depressed, located a little in advance of the middle; surface of cast retaining traces of concentric striæ; hinge and interior unknown. Length 1 inch; height 0.64 inch; breadth about 0.16 inch.

Locality and position. South-west base Black Hills—Jurassic.

TANCREEDIA WARRENANA, M. & H.—Shell small, trigonal ovate, moderately convex, anterior half a little narrower and more compressed than the other, narrowly rounded at the extremity; base forming a broad gentle curve; posterior side subtruncate, angular, or abruptly rounded below; dorsum sloping from the beaks, the anterior slope being slightly concave in outline, and the other nearly straight, or a little convex; beaks elevated, but not extending much above the cardinal edge; posterior umbonal slopes prominent, or subangular; surface and hinge unknown.

Named in honor of Lieut. G. K. Warren, U. S. Top. Engineers.

Length 0.50 inch; height 0.33 inch; breadth about 0.14 inch.

Locality and position. Same as last.

ASTARTE FRAGILIS, M. & H.—Shell small, rather broad oval, thin, moderately compressed; anterior end rounded; base nearly straight along the middle, rounding up regularly in front, and more abruptly behind; posterior extremity obscurely subtruncate; dorsum straight and slightly declining behind the beaks, which are small, obtuse, rather depressed, and located a little in advance of the middle; posterior umbonal slopes prominent; surface ornamented by distinct, irregular concentric wrinkles and fine parallel striæ; hinge and interior unknown; pallial margin crenulate within. Length 0.45 inch; height 0.32 inch; breadth or convexity 0.18 inch.

Locality and position. South-west base of the Black Hills—Jurassic.

ASTARTE INORNATA, M. & H.—Shell subelliptical, compressed; extremities rounded, the posterior margin forming a broader curve than the other; base semielliptical in outline; dorsum declining from the beaks, the anterior slope being a little concave, and the other nearly straight or slightly convex; beaks moderately elevated, compressed, angular in front, located just in advance of the middle; lunule rather deep, lance-oval, bounded on each side by a more or less distinct angle; surface marked by concentric striæ, with a tendency to develop small, very obscure concentric wrinkles. Length 1.15 inches; height 0.79 inch; breadth or convexity 0.44 inch.

Locality and position. Same as last.

TRIGONIA CONRADI, M. & H.—Shell rather small, subtrigonal, moderately convex; anterior side truncate; base rounded; posterior side sloping obliquely from the beaks above, and apparently vertically truncate at the extremity; beaks elevated, narrow, incurved, and located in advance of the middle; posterior umbonal slopes distinctly angular; surface ornamented by rather small, obscure concentric costæ, which on the posterior side of the valves, descend

at first perpendicularly, after which they are deflected forward parallel to the basal and anterior borders. Length and height, each about 0.97 inch; convexity 0.58 inch.

Locality and position. South-west base Black Hills, Jurassic.

Named in honor of Mr. T. A. Conrad, the well known palæontologist, of Philadelphia.

PECTEN EXTENUATUS, M. & H.—Shell broad ovate, or sub-circular, thin, compressed; basal margin rounded; beaks small; hinge line rather short; ears unknown; surface apparently having only concentric striæ of growth. Height 0.98 inch, length 0.90 inch; convexity 0.28 inch.

Locality and position. South-west base of Black Hills, in a sandstone of lower Jurassic age.

PALÆOZOIC.

MYALINA AVICULOIDES, M. & H.—Shell subtrigonal, higher than long, very convex, or sometimes subangular down the umbonal slopes; anterior margin distinctly sinuous above the middle, thence descending with a slightly convex curve, nearly at right angles with the hinge, to the basal extremity, which is narrowly rounded; posterior side compressed, its margin curving a little forward above, or intersecting the hinge at right angles, slightly convex, and nearly perpendicular along the middle, below which it curves obliquely forward to the abruptly rounded basal extremity; hinge straight, nearly equalling the length of the shell; beaks very convex, subangular, and curving rather abruptly forward, so as to become nearly, or quite terminal; surface having moderately distinct marks of growth. Length, 1.48 inch; height, 1.66 inch; convexity, (of left valve), 0.32 inch.

This will be readily distinguished from all the other species of the genus known to us, by its more accurate front, and the extension of its anterior margin under the beaks, above its most sinuous part.

Locality and position. From the upper beds, containing Permian types of fossils, on Cottonwood creek, Kansas Territory.

NOTE. In going carefully over these extensive collections, we have in addition to finding the new species here described, succeeded in working from the matrix, better specimens of many of those already published by us, than had been previously obtained. The additional information derived from these, and a more careful review of the subject has enabled us to make several corrections in the synonyma, as well as in the generic references, a list of which is given below.

It will also be observed, that we have made quite a number of other changes, in order to range the species under the oldest generic names proposed after the introduction by Linnæus, of the binomial system. We must confess, however, that we have some doubts whether science is to be much benefitted by a strict observance of the law of priority, in such cases as those where it becomes necessary to change long established names. We nevertheless make some such changes in conformity with usages rapidly gaining ground, and probably destined soon to become universal amongst conchologists and laborers in other departments of Natural History.

The transfer of several species formerly published under the names *Hanites*, *Ancylloceras*? and *Turrilites*, to the genus *Helicoceras*, has been made in accordance with the views of Mr. Daniel Sharpe, (Fossil Mol. Chalk, England, part 3d, Cephalopoda, p. 59, Paleont. Soc.) who refers all the so called *Turrilites* having rounded whorls, with the siphuncle placed on the dorsal or outer side, to the genus *Helicoceras*, whether the whorls are in contact or not. The genus *Turrilites*, he restricts to those forms having more or less angular contiguous whorls, with the siphuncle located near the suture. The fact of the whorls of those forms with rounded volutions being in contact or not, can scarcely be

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regarded in all cases, of even specific importance, since it is now well known that in some instances the same species presents both these peculiarities, and sometimes the whorls of one part of the spire are in contact, and in others disconnected, even in the same individual.

Our specimens confirm Mr. Sharp's views, for although they are but mere fragments, it is evident they are parts of spiral shells, presenting intermediate gradations between forms with whorls barely in contact, and others in which they are clearly disconnected.

Mr. D'Orbigny describes the septa of the genus *Helicoceras* as being unsymmetrical, like those of *Turrilites*, this, however, is not always the case in species, the whorls of which make a very broad curve around a large umbilical cavity, for in some of our specimens of this kind, the corresponding lobes on opposite sides of the siphuncle, present scarcely the slightest inequality, and in other instances seem to be as nearly symmetrical as in *Hamites*, or any of the allied genera.

Names formerly used.

HAMITES MORTONI, Hall & Meek. }
Helicoceras tenuicostatum, Meek & Hayden. }
 TURRILITES (HELICOCERAS) COCHLEATUS, M. & H. }
 ANCYLOCERAS? NEBRASCENSIS, Meek & Hayden. }
Turrilites Nebrascensis, Meek & Hayden. }
 ANCYLOCERAS? CHEYENNENSIS, Meek & Hayden. }
Turrilites Cheyennensis, Meek & Hayden. }
 TURRILITES UMBILICATUS, Meek & Hayden. }
 AMMONITES PERCARINATUS, Hall & Meek, }
 presents extremely different characters, at }
 various stages of its growth; probably not }
 distinct from *A. WOOLGARI*, of Mantell. }
 AMMONITES CORDIFORMIS, Meek & Hayden, }
 probably identical with *A. CORDATUS*, Sowerby. }
 PLANORBIS FRAGILIS,* M. & H. (non Dunker.) }
 PLANORBIS SUBUMBILICATUS, Meek & Hayden. }
 PLANORBIS AMPLEXUS, Meek & Hayden. }
 PALUDINA CONRADI, Meek & Hayden. }
 PALUDINA MULTILINEATA, Meek & Hayden. }
 PALUDINA LEAL, Meek & Hayden. }
 PALUDINA RETUSA, Meek & Hayden. }
 PALUDINA TROCHIFORMIS, Meek & Hayden. }
 TURRITELLA MOREAUENSIS, Meek & Hayden. }
 SCALARIA CERITHIFORMIS, Meek & Hayden. }
 TURBO NEBRASCENSIS, Meek & Hayden. }
 ROSTELLARIA BIANGULATA, Meek & Hayden. }
 FUSUS CONTORTUS, Meek & Hayden. }
 BUCCINUM? VINCLUM, Hall & Meek. }
 ACTEON ATTENUATUS, Meek & Hayden. }
 ACTEON CONCINNUS, Hall & Meek, }
Avellana subglobosa, Meek & Hayden. }
 ACTEON SUBELLIPTICUS, Meek & Hayden. }
 NATICA PALUDINÆFORMIS,* Hall & Meek. }
 (non *N paludiniformis*, D'Orbigny.) }
 BULLA SUBCYLINDRICA,* Meek & Hayden. }
 CORBULA VENTRICOSA, Meek & Hayden. }
 CORBULA MOREAUENSIS, Meek & Hayden. }
 CYTHEREA TENUIS, Hall & Meek. }
 CYTHEREA PELLUCIDA, Meek & Hayden. }
 CYTHEREA DEWETI, Meek & Hayden. }
 CYTHEREA OWENANA, Meek & Hayden. }
 CYTHEREA ORBICULATA, Meek & Hayden. }
 CYCLAS FORMOSA, Meek & Hayden. }
 CYCLAS FRAGILIS, Meek & Hayden. }
 CYCLAS SUBELLIPTICA, Meek & Hayden. }
 HETTANGIA AMERICANA, Meek & Hayden. }
 NUCULA EVANSI, Meek & Hayden. }
 NUCULA SCITULA, Meek & Hayden. }
 CUCULLEA SHUMARDI, Meek & Hayden. }
 PECTUNCULUS SIOUXENSIS, Hall & Meek. }
 PECTUNCULUS SUBIMBRICATUS, Meek & Hayden. }

Names here adopted.

HELICOCERAS MORTONI.
 HELICOCERAS COCHLEATUM.
 HELICOCERAS NEBRASCENSE.
 HELICOCERAS CHEYENNENSE.
 HELICOCERAS UMBILICATUM.
 PLANORRIS PLANOCONVEXUS.
 VALVATA SUBUMBILICATA.
 HELIX (POLYGYRA) AMPLEXUS.
 VIVIPARA CONRADI.
 VIVIPARA MULTILINEATA.
 VIVIPARA LEAL.
 VIVIPARA RETUSA.
 VIVIPARA TROCHIFORMIS.
 CERITHIOPSIS MOREAUENSIS.
 TURBONILLA (CHEMNITZIA) CERITHIFORMIS.
 MARGARITA NEBRASCENSIS.
 APORRHAIUS BIANGULATUS.
 PLEUROTOMA CONTORTA.
 FUSUS VINCLUM.
 SOLIDULUS ATTENUATUS.
 AVELLANA CONCINNA.
 SOLIDULUS (ACTEONINA?) SUBELLIPTICUS.
 AMAUROPSIS PALUDINÆFORMIS.
 BULLA SPECIOSA.
 NEERA VENTRICOSA.
 NEERA MOREAUENSIS.
 MERETRIX TENUIS.
 MERETRIX PELLUCIDA.
 MERETRIX DEWETI.
 MERETRIX OWENANA.
 MERETRIX ORBICULATA.
 SPHERIUM FORMOSUM.
 SPHERIUM FRAGILE.
 SPHERIUM SUBELLIPTICUM.
 TANCREEDIA AMERICANA.
 LEDA EVANSI.
 LEDA SCITULA.
 CUCULLEA FIBROSA, Sowerby.
 AXINÆA SIOUXENSIS.
 AXINÆA SUBIMBRICATA.

*The names followed by an asterisk, were pre-occupied.