

DESCRIPTIONS OF NEW INVERTEBRATE FOSSILS FROM THE
MESOZOIC AND CENOZOIC ROCKS OF ARKANSAS, WYOMING, COL-
ORADO, AND UTAH.

By C. A. WHITE.

The fossils described in the following paragraphs are among the collections of the National Museum. All except one species have been selected for description from among the collections that were made under the auspices of the surveys formerly in charge, respectively, of Professor Powell, Dr. Hayden, and Captain Wheeler. Two of them, *Callianassa ulrichi* and *Spirorbis dickhauti*, are embraced in a small Collection of Cretaceous fossils sent to the National Museum from near Little Rock, Ark., by Mr. E. O. Ulrich, of Cincinnati, Ohio.

MOLLUSCA.

CONCHIFERA.

Genus PTERIA Scopoli.

Subgenus OXYTOMA Meek.

PTERIA (OXYTOMA) ERECTA (sp. nov.).

Arvicula linguiformis White, 1876 (not Shumard), Powell's Rep. Geol. Uinta Mts., p. 95.

Shell rather small, appearing to be nearly erect, but the axis is slightly oblique to the hinge-line; both valves convex, but the right one less convex than the left; hinge-line long, much longer than the axial length of the shell; posterior wing large, its extremity acutely angular and moderately prominent; anterior wing comparatively large, prominent, obtusely pointed, defined from the body of the shell by a sinus or furrow in both valves, the direction of which forms a slightly obtuse or nearly right angle with the hinge-line; front, exclusive of the anterior wing, nearly perpendicular the margin forming a nearly regular curve from the front all the way around to the posterior side, where it is flexed with a backward curve to meet the extremity of the hinge-line; umbones somewhat prominent, especially that of the left valve. Surface having a nearly smooth appearance, but the lens reveals the presence of somewhat regularly disposed concentric lines.

Length of hinge-line, 32 millimeters; axial length of the shell, 26 millimeters. (Museum No. 8771.)

This shell was formerly referred by me (*loc. cit.*) to the *Arvicula linguiformis* of Shumard, but it differs from that species by having larger wings, a much longer hinge-line, and a much less oblique axis. It may be compared with *P. (O.) salinensis* White, Proc. U. S. Nat. Mus., vol. ii, p. 296, pl. 5, figs. 1 and 2; but it differs in being less robust, having

proportionally larger wings, narrower body, and a more nearly erect axis.

Position and locality.—Lower Potato Valley, Southern Utah, where it was obtained by Prof. J. W. Powell from Cretaceous strata.

Genus SOLEMYA Lamarck.

SOLEMYA BILIX (sp. nov.).

Shell about two and a half times as long as high, broader anteriorly than posteriorly; both ends rounded, the posterior one more narrowly so than the other; both dorsal and basal margins gently convex or nearly straight; test thin and fragile; valves moderately convex from above downward, the greatest convexity in that direction being near the dorsum; beaks, having the usual inconspicuous character common to the genus, situated near the posterior end; ligament necessarily short, but apparently well developed, and resting upon a fulcrum of support of the usual character in each valve. Surface bright and, besides the usual lines of growth, marked by numerous faint radiating lines, which are visible to the unassisted eye, but are satisfactorily seen only under a lens, nearly uniformly distributed over the whole surface, but upon the middle portion they are arranged in pairs.

Length, 20 millimeters; height at the broadest part, which is in front of the middle, 8 millimetres. (Museum No. 8913.)

This is plainly a characteristic species of *Solemya*, but the only fossil species with which it need be compared is *S. subplicata* Meek & Hayden, from the Fox Hills Cretaceous of the Upper Missouri. It differs from that species in being proportionally broader in front, in the character and uniformity of distribution of its radiating striae, and in wanting the subpliate character of the front portion. The extension of the epidermis has not been observed, but in other respects this species may be compared with the living *S. velum* Say in general form, and in the pairing of its radiating lines.

Position and locality.—Cretaceous strata, associated with *Maetra holmesii* (= *Cyrena? holmesii* Meek), about four miles north of Golden, Colo., where it was obtained by Mr. W. H. Holmes. These strata were formerly supposed to belong to the Lignite series (Laramie), but they are marine Cretaceous, as I have shown in An. Rep. U. S. Geol. Sur. Terr. for 1877, pp. 193-196.

Genus LUCINA Bruguière.

LUCINA PROFUNDA (sp. nov.).

Shell subcircular or subpentahedral; valves not very convex; posterior side truncate, narrower than the anterior; basal border having its margin more abruptly convex at its middle than towards the front and rear; dorsal margin short, nearly straight; front margin having a nearly

regular curve; beaks small, submedially located, distinct but inconspicuous; umbonal ridge slightly developed, curved, passing near the dorsal and posterior borders. Surface marked by the usual concentric lines of growth.

Length, 20 millimeters; height, from base to beaks, 18 millimeters. (Museum No. 8362.)

This species is readily recognizable by its comparatively narrow posterior side, its deeply convex basal border, and slight convexity of the valves.

Position and locality.—Cretaceous strata, Monument Creek, Colorado, where it was obtained by Dr. A. C. Peale.

GASTEROPODA.

Genus PLANORBIS Guettard.

PLANORBIS ÆQUALIS (sp. nov.).

Shell rather small, coiled nearly in a plane, apparently sinistral; whorls apparently 4 or 5, in close contact but only slightly involute, broadly convex upon the periphery, but their sides more narrowly convex, their transverse diameter greater than that which corresponds with the plane of the coil.

Surface marked by a considerable number of revolving raised lines or slight angulations, which are crossed by the usual lines of growth.

Diameter of the full coil of the largest example discovered, 6 millimeters. (Museum No. 8909.)

This is apparently the only species of typical biumbilicate *Planorbis* that has yet been discovered among the fossil fresh-water fauna of the Western region, and it therefore needs no detailed comparison.

Position and locality.—Green River Group, Eocene, Henry's Fork of Green River, Southern Wyoming.

Subgenus GYRAULUS Agassiz.

PLANORBIS (GYRAULUS) MILITARIS (sp. nov.).

Shell very small, dextral, depressed-convex above, umbilicate below; volutions two and a half to three and a half, convex on all sides except the inner, which is very narrowly flattened against each preceding coil; suture deeply impressed both above and below; surface marked by comparatively coarse lines of growth.

Diameter of the full coil of the larger examples in the collection, 4 millimeters. (Museum No. 8594.)

This form was noticed but not named by me in vol. iv, U. S. Expl. & Sur. West of the 100th Merid., p. 210. At that time I was not satisfied as to the mature condition of these shells, but by careful examina-

tion of a larger number of examples there seems to be no reason for doubt upon that point.

The subgenus *Gyraulus* has not heretofore been published as occurring among our large fossil pulmonate molluscan faunæ of the West, but at least two other species probably exist there, one in the Bear River (Laramie) strata, and the other in those of the Green River Group.

Position and locality.—Head of Soldiers' Fork, Utah, where they were obtained by one of the parties of the survey in charge of Lieutenant Wheeler. The true age of the strata is not at present definitely known, but it is understood to be either that of the upper portion of the Laramie or the lower portion of the Wahsatch Group.

Genus LIMNÆA Lamarck.

Subgenus LEPTOLIMNEA Swainson.

LIMNÆA (LEPTOLIMNEA) MINUSCULA (sp. nov.).

Shell rather small, moderately attenuate; spire much longer than the aperture; volutions six or seven, moderately convex, the distal border very narrowly appressed against each preceding coil; aperture small, elongate, subovate; columellar fold distinct, but not large. Surface marked by distinct lines of growth, but no revolving lines have been detected.

The only two examples of this species that have been discovered are broken, but the full length of the larger one is estimated at 9 millimeters; diameter of last volution, 3 millimeters; length of aperture, $3\frac{1}{2}$ millimeters. (Museum No. 8997.)

Position and locality.—From strata belonging to either the basal portion of the Green River Group or the upper portion of the Wahsatch Group, about three miles east of Table Rock Railroad station, Southern Wyoming, where it is associated with *Planorbis cirratus* White, and also a small Linnæid that is probably referable to *Acella* Haldeman.

Genus HELIX Linnæus.

Subgenus PATULA Haldeman.

HELIX (PATULA) SEPULTA (sp. nov.).

Shell convex above; umbilicus moderately wide; volutions about six, convex upon all sides except the inner; suture impressed; surface regularly but minutely ribbed, the ribs having the same direction as the lines of growth.

All the examples discovered are distorted by pressure, but the diameter of the full coil of the largest example was about 12 millimeters and its full height about 7 millimeters. (Museum No. 8998.)

Position and locality.—The coal-bearing series of strata at Evanston, Wyo., where it is associated with *H. cranstonensis* White and other forms. These strata belong either to the upper part of the Laramie or the lower portion of the Wahsatch Group.

ARTICULATA.

VERMES.

Genus SPIRORBIS Lamarck.

SPIRORBIS? DICKHAUTI (sp. nov.).

Shell discoid, one side being nearly flat and the other broadly umbilicate; volutions about five, partially embracing but all of them visible, somewhat rugose but increasing in size with considerable regularity; peripheral side of the volutions flattened or gently convex, having a single revolving raised line along its middle and another similar one at each border, where it sharpens the angularity between the lateral and peripheral sides; outer portion of both the lateral sides of the volutions concave, and the inner portion convex, giving the last-named portion a greater transverse diameter than the outer portion, the larger part of which is embraced by the next succeeding volution; aperture small, round, and apparently, but not really, contracted. The cavity being round, the outer portion of the test only partakes of the irregularity described, and seems to have been deposited as an encrustation upon the first-formed inner portion, that of adjacent volutions seeming to blend, obscuring the suture. Besides a considerable degree of rugosity, the surface shows under the lens a peculiar granular or rather an etched appearance.

Greatest diameter of the full coil of the largest example discovered, 9 millimeters; greatest diameter of the outer volution, near the aperture, $2\frac{1}{2}$ millimeters. (Museum No. 9073.)

In size and general aspect this species resembles *S. rotulus* Morton sp., from the Cretaceous of New Jersey, but although doubtless congeneric, it differs from that species in the character of its surface ornamentation, and in having a round instead of quadrangular aperture. This shell is referred to the shell-bearing worms and not to the mollusca on account of the peculiar character of the test. It probably does not strictly belong to the genus *Spirorbis*, but it is regarded as at least a closely related form.

Position and locality.—Cretaceous strata near Little Rock, Ark., where it was obtained by Mr. E. O. Ulrich, and also by Mr. H. E. Dickhaut, in whose honor the specific name is given.

CRUSTACEA.

Genus CALLIANASSA Leach.

CALLIANASSA ULRICHI (sp. nov.).

Hand quadrate, flattened; inner face less convex than the outer; both upper and lower edges acute, the lower one more so than the upper, and finely crenulate; fixed finger slender, plain, its transverse section sub-

triangular, gently curved, shorter than the hand; movable finger larger and stronger than the fixed one, having a moderately strong prominent ridge upon the inner side, between the front end of which and the extremity of the finger there is sometimes a distinct tooth. Surface nearly smooth, but some examples are granulate about the middle of both sides of the hand, and several small foramina are observable along the upper margin of the movable finger.

Length of hand, 13 millimeters; breadth, 10 millimeters; thickness, 4 millimeters. (Museum No. 8910.)

Position and locality.—This species has been sent to the United States National Museum by Mr. E. O. Ulrich, in whose honor the specific name is given. He obtained it from Cretaceous strata near Little Rock, Ark. Associated with it, besides certain characteristic Cretaceous mollusca, there are several separate movable fingers which plainly belong to another decapod crustacean; but although complete in themselves, they constitute too small a portion of the animal to satisfactorily base a specific description upon them.