

Article XXVII.—THE FOSSIL MOLLUSCA OF FLORISSANT,
COLORADO.

By T. D. A. COCKERELL.

The Mollusca of the Florissant shales are neither numerous in species nor striking in appearance, and not unfrequently they are badly crushed. At Station 1, near the graveyard, and perhaps 150 feet above the level of the town, the individuals are very numerous, and are not crushed. The rock here has a more or less conchoidal fracture, and does not readily split into laminæ, but it is very hard, and the shells cannot be extracted from it. It was here that we found also vertebrate remains (teeth and bones), and while the material actually obtained was not especially varied or remarkable, it is likely that further digging would yield more important results. The best plant and insect beds are evidently those which have been buried under large quantities of material, and so subjected to great pressure, soon after deposition; but certainly the best Mollusca, and probably also vertebrates, may be expected in places where this has not been the case.

Leaving out certain fragmentary remains which may represent additional species, the known Mollusca of the Florissant shales number five species, one being terrestrial, the others aquatic. The operculate forms are entirely absent, but they would hardly be expected in a mountain lake.

The fossil land-shells of the Rocky Mountain region are few in number, so far as our present knowledge goes. An excellent summary was given by Dr. C. A. White in the Third Annual Report of the U. S. Geological Survey (1883), and not very much has been added since.¹

ZONITIDÆ.

Omphalina Rafinesque.

Omphalina (?) *laminarum* sp. nov.

Fig. 1 *a* and *b*.

Diameter probably about 13 mm.; whorls with a smooth shining surface,

¹The most interesting additions are some species described from the Puerco Eocene of New Mexico, including a *Holospira* (*H. leidyi*) and a probable *Lysinoe* (*L. nacimientensis*). A few of the names given by Dr. White cannot be maintained. *Hyalina* (?) *occidentalis* M. & H., from the Judith River beds, is based on *Helix occidentalis* Meek & Hayden, 1857, not of Recluz, 1845: it takes the name *nebrascensis*, substituted by Meek & Hayden in 1861. *Columna teres* Meek & Hayden (*Bulimus teres* M. & H., 1836; *Clausilia teres* Meek 1866) is a homonym because of the snail from Crete described by Olivier as *Bulimus teres* in 1801, and now known as *Clausilia teres*. The American fossil (from the Fort Union beds) may be known as *Columna haydeniana*: the substitute-name *Clausilia occidentalis* Ckll., Science Gossip, 1888, p. 114, is not available because of an earlier *C. occidentalis* Bourgnignat.

with a weak radiate sculpture consisting of oblique shallow grooves separating flattened little-elevated ribs, four or five to a millimeter on last whorl; the ribs become stronger at some distance from the aperture, and are quite strong on penultimate whorl; last whorl convex, evenly rounded, with a diameter, seen from above, of about $3\frac{1}{2}$ mm., the radial sculpture vanishing at about $2\frac{1}{2}$ mm. from the suture; color as preserved grayish white.

Florissant; Station 14 (*Wilmatte P. Cockerell*). The plant *Planera longifolia* occurs on the same slab.

The specimen, showing only part of the last two whorls, gives the impression of a large Zonitoid shell, which from its size and general appearance should belong to *Omphalina* rather than *Vitrea*. It cannot be *Ashmunella*, on account of the smoothness of the surface and the character of the sculpture. It is like nothing now living in the Rocky Mountains; and its allies, if its affinities are correctly interpreted, live to-day principally in the mountains of Tennessee, North Carolina, etc., extending however from Texas and Florida even to Ohio and Ontario. There is a certain resemblance to *Pæcilozonites* of the Bermudas, especially in the contracted whorls.

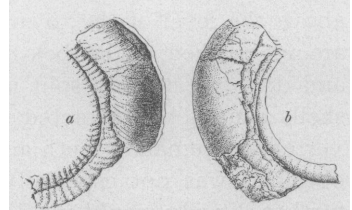


Fig. 1. *a*, *Omphalina* (?) *laminarum* sp. nov. showing portions of last two whorls of shell; *b*, impression of same. $\times 2\frac{1}{2}$

LIMNÆIDÆ.

Planorbis Geoffroy.

Planorbis florissantensis. Ckll.

Fig. 2.

Very common.

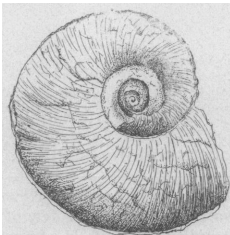


Fig. 2. *Planorbis florissantensis* sp. nov. $\times 7$.

The type (*cf. Nautilus*, Jan. 1906, p. 100) was immature; the usual diameter is about $4\frac{1}{2}$ mm., but a few have been found as large as nearly 7 mm. diameter. In these large specimens, the last whorl, near the aperture, has a diameter of about 2 mm.; the diameter of the shell without the last whorl is only $3\frac{1}{2}$ mm. The periphery was rounded (not sharply keeled), especially in the young, but the shell was evidently very flat, and probably somewhat flexible, as it could endure pressure without much breaking. The oblique striæ on the last whorl are quite strong. One specimen is dark brown, which is probably the original color.

Collected by all the members of the expedition; Stations 1, 4, 11, 12, 13, 14. The shell was evidently nearly flat, after the manner of *P. vetustus* Meek and Hayden, not broadly rounded like *P. æqualis* White. The last whorl is broader than in *vetustus*, and not sharply keeled as in that species.

Lymnæa Lamarck.

Lymnæa sieverti sp. nov.

Fig. 3.

Long. 8 mm., lat. $4\frac{1}{4}$, with about five rounded whorls; length of aperture about 5 mm.; sutures impressed; sculpture weak; aperture contracted.

Florissant; Station 1 (*Sievert* & *A. Rohwer*.)

This has the pointed spire of *L. meekii* Evans and Shumard, of the White River group, but it is much smaller, and has more rounded whorls. The elongate narrow aperture is more like that of *L. meekii* than of *L. shumardi* Meek and Hayden. The much more convex whorls distinguish it from *L. similis* Meek, and *L. vetusta* Meek, from the Bridger Eocene. There is quite a close resemblance to the living *L. humilis* Say, and *L. truncatula* Müller; in fact, if the shell were found living in Europe, it would doubtless be considered a variety of *truncatula*.

The specimen shows the interior of the shell, and the outside of a portion near the mouth. It is of course dextral, though from the manner of its preservation the aperture shows on the left side.

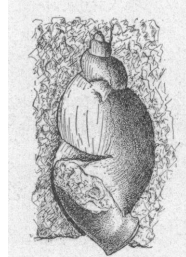


Fig. 3. *Lymnæa sieverti* sp. nov. showing interior of shell and outside of a portion near the mouth. $\times 4$.

Lymnæa scudderii sp. nov.

Fig. 4. *a* and *b*

Length about 6 mm., breadth about $\frac{1}{4}$, the spire short, about $1\frac{1}{2}$ mm.; smooth and shining, without any strong sculpture; apex obtuse.

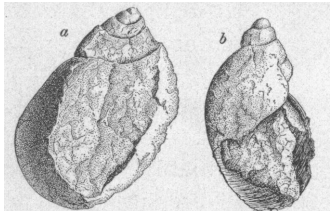


Fig. 4. *a*, *Lymnæa scudderii* sp. nov. *b*, var. *a* of the same. $\times 4\frac{1}{2}$.

Florissant; Station 1 (*Rohwer*) and Station 14 (*W. P. Cockerell*); not uncommon.

Var. *a*. (Fig. 4*b*). Smaller and more slender; long. 5, lat. 3 mm.; length of aperture about 3 mm.; whorls only slightly convex. Station 12 (*W. P. Cockerell*). Station 12 is on the west side of Fossil Stump hill.

A curious little shell, in some ways reminding one of a *Physa* rather than a *Lymnæa*, but dextral. The

species is named after Mr. Scudder, who first indicated the presence of Mollusca in these beds.

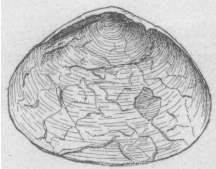
Cyrenidæ.

Sphærium Scopoli.

***Sphærium florissantense* sp. nov.**

Fig. 5.

Length $8\frac{1}{4}$, breadth 10 mm., with rounded outline like that of the European *S. corneum*; beaks not protruding or prominent; sculpture consisting of fine but distinct concentric striæ, 4 to 6 in about 150μ .



Florissant; Station 14 (*W. P. Cockerell*). Several specimens.

Fig. 5. *Sphærium florissantense* sp. nov. x $2\frac{1}{2}$.

Very much like *S. rugosum* Meek, from the supposed Miocene of Nevada, but a little larger and without the prominent beaks. Smaller and strongly convex shells from Stations 1 (*Rohwer*) and 9 (*W. P. C.*) appear to be the young of this species.