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THE MOLLUSCA COLLECTED IN NORTHEASTERN NEVADA BY THE WALKER-NEWCOMB EXPEDITION OF THE UNIVERSITY OF MICHIGAN.

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The Walker-Newcomb Expedition of the University of Michigan spent a portion of the summer of 1912 in northeastern Nevada. The area studied was about the town of Carlin, Nevada, in the western part of Elko County and the northern part of Eureka County. It lies in the Lahontan Area of the Great Basin. The topography and physical characteristics have been given in detail by Ruthven and Gaige in their report upon the reptiles and amphibians collected by the expedition (Occ. Papers, Mus. Zool., U. of M., No. 8) and may be briefly summarized as follows:

The region includes a broad in-filled valley called the Maggie Basin and the sides of the Cortez, Seetoya, River and

Pinyon Ranges which surround it. The valley is drained by the Humboldt River, which flows across the south end, and its tributaries, the principal ones being known as Maggie, Annie, Susan and James creeks. The Humboldt River and Maggie Creek are the only permanent and continuous streams in the valley, the others becoming either entirely dry or discontinuous in the summer. These creeks are fed from numerous canyons in the surrounding mountains, which for the most part become entirely dry in the summer. Occasionally, springs, more or less continuous, are found.

The region is an arid one. The sage brush covers the whole area to the summit of the ranges. There is no forest and, except for the willows and shrubs along the permanent water courses and small groves of poplar, buffalo berry and other small trees and shrubs in the mountain canyons, the region is treeless.

As might be expected, the molluscan fauna is very meagre, as indeed it is throughout the Great Basin.

In 1884 R. E. Call published an elaborate report "On the Quarternary and Recent Mollusca of the Great Basin", (Bull. U. S. Geol. Survey, No. 11, pp. 359-410), which embodied all of the information in regard to the fauna available at that date. Call's material came mostly from the western part of the state, in the Pyramid Lake region, but he also lists a few (four marked with an asterisk in the Call column given below) species from the Humboldt River at Elko, which is a little east of the area covered by the University Expedition. His list of the recent species known to him from the Lahontan Area is, therefore, of interest as a basis of comparison of the faunas of the eastern and western portions of the state. This is shown by the following table.

TABLE.

(Species marked with an asterisk were not found by Call but are quoted from papers by W. G. Binney.)

Name.	Call.	W.-N.
**Oreohelix strigosa* Gld	x	..
**Oreohelix strigosa idahoensis* Newc	x	..
**Oreohelix strigosa hemphilli* Newc	x	..
**Zonitoides arborea* (Say)	x	..
**Zonitoides nitida* (Müll.)	x	..
**Vitrea hammonis* (Ström)	x	..
Euconulus fulvus (Dr.)	x	..
**Vitrina alaskana* Dall	x	..
Vallonia costata (Müll.)	x	..
Vallonia gracilicosta Reinh	..	x
Vallonia cyclophorella Ancey	..	x
Succinea sillimani Bld	x	..
Succinea stretchiana Bld	x	..
**Succinea grosvernori* Lea. *"S. lineata* W. G. Binn."	x	..
**Succinea rusticana* Gld	x	x
Succinea nuttalliana Lea	..	x
Pupilla muscorum (L.)	x	..
**Vertigo modesta corpulenta* (Mse.)	x	..
**Pupoides hordaceus* (Gabb). *"Arizonensis* Gabb"	x	..
Lymnæa stagnalis (L.) "Semifossil"	x	..
Lymnæa palustris Mull	x	x
Lymnæa sumassi Bd	x	..
Lymnæa bulimoides Lea	x	..
Lymnæa humilis Say	x	..
Lymnæa humilis rustica Lea	..	x
Lymnæa humilis modicella Say	..	x
Lymnæa dalli Baker	..	x
Lymnæa caperata Say	..	x
Physa gyrina Say	x	..
Physa humerosa Gld	x	..
Physa ampullacea Gld	x	x
Physa heterostropha Say	x	..
Planorbis binneyi Try. *"P. corpulentus* Say"	x	..
Planorbis ammon Gld. "Semifossil"	x	..
Planorbis trivolvis Say	x	x
Planorbis subcrenatus Cpr	x	..
Planorbis vermicularis Gld	x	..
Planorbis opercularis Gld	x*	..
Pompholyx effusa Lea	x	..

Name.	Call.	W.-N.
Amnicola dalli Call	x	..
Pyrgulopsis nevadensis Stearns	x	..
Fluminicola nevadensis Walker	..	x
Margaritana margaritifera (L.)	x*	x
Anodonta nuttalliana Lea	x	..
Anodonta oregonensis Lam	..	x
Sphærium striatinum Lam	x*	x
Pisidium compressum Pme	x*	x
Pisidium huachucanum, P. & F	..	x

As might naturally be expected the Call list shows a considerable infusion of western species, which, so far as the University of Michigan collection shows, do not seem to have extended into the eastern portion of the state. It is also quite possible that a review of both series by the same student might eliminate some of the apparent discrepancies between the two list of species. But, taken as a whole, and especially if the species quoted from Binney are eliminated, the two lists are very similar. I am indebted to Dr. V. Sterki for the identification of the Sphæriidæ.

LIST OF SPECIES.

1. *Vallonia gracilicosta* Reinh.—A single specimen from a spring in the Cortez foot-hills.

2. *Vallonia cyclophorella* Ancey.—A single example from an ant nest in Maggie Canyon.

3. *Succinea nuttalliana* Lea.—Spring in Cortez foot-hills; bed of diverted spring stream, Cortez Range, and irrigation ditch and marsh ponds near the river, Humboldt Valley.

4. *Succinea rusticana* Gld.—Near hot springs and in drift in river dam, Humboldt Valley.

5. *Lymnæa palustris* Müll.—Pools in the bed of and along the Humboldt River and along the rail-road track near the river; Annie Creek; irrigation ditches near the Humboldt River and near Annie Creek and north of the ranch house, Carlin; dry pond west of tunnel, Moleen Canyon.

Very abundant and exceedingly variable, but, as in the case of the Physas, it is practically impossible to draw any fixed lines between the various forms represented, and it would seem best to refer them all to one species.

6. *Lymnæa caperata* Say.—Very abundant in pools in the bed of Humboldt River. Apparently a well marked local form characterized by the almost entire obsolescence of the spiral sculpture. Many of the specimens are conspicuously striped longitudinally.

8. *Lymnæa humilis modicella* Say.—Maggie Creek; bed of diverted spring stream, Cortez Range; marshy ponds near the Humboldt River, and Woodruff Creek.

9. *Lymnæa dalli* Baker var.—Spring in Cortez foot-hills; bed of diverted stream, Cortez Range, and Woodruff Creek. A considerable portion of the specimens of both this and the preceding species from Woodruff Creek are conspicuously striped longitudinally.

10. *Physa ampullacea* Gld.—Ponds by the rail-road track and in the bed of and along the river and along Susan Creek, Annie Creek, and Maggie Creek; oxbow pond in Maggie Canyon; mud-flat along the river, Humboldt Valley; irrigation ditch, Annie Creek; spring in Cortez foot-hills, and diverted spring stream in Cortez Range.

This species is by far the most common one in the collection. There is, as might be expected, a very considerable variation in size and several of the lots have only immature speci-

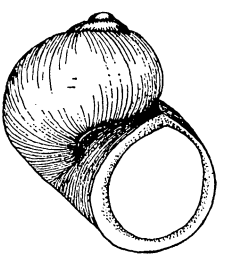
mens. But, taken as a whole, I think that they are all referable to one species.

11. *Planorbis trivolvis* Say.—Abundant in ponds in the bed of and along the Humboldt River, and in dry pond, west of tunnel, Moleen Canyon.

12. *Planorbis parvus* Say.—Ponds along Susan Creek; Maggie Creek; oxbow in Maggie Canyon; oxbow and marsh ponds by the Humboldt River; pond by railroad track and spring in Cortez foot-hills.

13. **Fluminicola nevadensis** n. sp.

Shell minute, narrowly umbilicated, globose, rather thick for so small a species, pale greenish horn-color, smooth, with very fine, regular lines of growth; whorls 3½; spire short, apical whorl small and somewhat elevated, giving a mamilliform appearance to the spire, the succeeding whorls are low and flatly rounded, not constricted by the suture, which is well impressed and becomes deeper and wider towards the aperture; body-whorl large, globosely rounded and in its last half descends rapidly; aperture large, decidedly angled above and regularly rounded below, entirely solute or barely touching the body whorl, thickened throughout by a callous deposit, which is heavier and somewhat flattened on the columellar margin; inner lip separated from the umbilical region by a distinct groove.



Alt. 2, diam. 2 mm.

A spring in the Cortez foot-hills, Humboldt Valley, Elko County, Nevada. Cotypes in the collections of the University of the Michigan, the Philadelphia Academy of Natural Sciences and Bryant Walker.

This pygmy species is an interesting addition to the number of dwarf forms characteristic of the arid region of the western states. In size it may be compared with *F. minutissima* Pils., but differs entirely in shape and proportions. It was quite abundant in the one locality where it was found.

14. *Margaritana margaritifera* (L.)—Humboldt River. Only a few collected.

15. *Anodonta oregonensis* Lea. — Humboldt River. Abundant.

16. *Sphærium striatinum* (Lam.)—Marsh pond near the Humboldt River; drift in river dam and mud flat along the river.

"It appears that all of the shells are of the same species, although of markedly different forms. I see no way of separating them cleanly and so it is better not done. Most of the specimens are much like *S. striatinum* (Lam.), and if they were from somewhere east, there would be barely a doubt about it: that is, the more elongate and subequipartite ones. As stated, some are markedly different, oblique, with the posterior part much larger, higher and grown downward, much like *S. acuminatum* (Pne.); but there appear to be intermediate forms and some eastern (Mississippi Valley and eastward) forms, apparently also of *striatinum,* are much like those. Of course, it sounds strange to take specimens from that region for *striatinum,* but I have seen specimens occasionally from far west, which appeared not separable from that species. Unfortunately, very little material is at hand from the intermediate country and the Central and Pacific regions are insufficiently known. So, for the present, it appears preferable to take them for the species, which they resemble most, at least tentatively.

"They can hardly be any other of the known western *Sphœria*: *S. dentatum* is barely known. T. Prime states that he has seen one adult and one young specimen and his description is insufficient for distinction in this difficult genus." (Sterki).

17. *Pisidium huachucanum* P. & F.—Spring in Cortez foot-hills, Humboldt Valley, Elko County, Nevada.