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Mollusca of Fish Springs, Juab County, Utah: rediscovery of *Stagnicola pilsbryi* (Hemphill, 1890)

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MOLLUSCA OF FISH SPRINGS, JUAB COUNTY, UTAH: REDISCOVERY OF *STAGNICOLA PILSBRYI* (HEMPHILL, 1890)

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Abstract.—Twelve species of Mollusca are reported from the Fish Springs area in west central Utah, including *Stagnicola pilsbryi* (Hemphill, 1890). Most of the species are well known from Utah or the southwestern United States except *S. pilsbryi*, which is apparently endemic to Fish Springs.

The Fish Springs area, at an elevation of approximately 4,300 feet, is located on the southern edge of the Great Salt Lake Desert in western Juab County, Utah (Fig. 1). There is a series of 16 springs which arise from a fault zone along the eastern edge of the Fish Springs Mountains. The water from these springs is channeled into nine artificial impoundments having a surface area of over 4,000 acres (Fig. 2). The impoundments were constructed by the U.S. Fish and Wildlife Service, beginning in 1961, when the area was developed into a wildlife refuge.

In June of 1970, the Fish Springs area was visited to survey the molluscan fauna, specifically to ascertain the presence or absence of *Stagnicola pilsbryi*. This snail was collected in 1868 by Henry Hemphill and described 22 years later. The type locality was listed as "Fish Springs, Nevada"; but, as pointed out by Pilsbry and others, Hemphill tended to be cryptic (and at times erroneous) in his locality descriptions.

In the account of his journey, Hemphill wrote, "I collected a few specimens of this interesting shell in the month of June, 1868, at this locality after a long and hard day's ride of 40 miles horseback. Another long ride the next day of 50 miles to water compelled an early start and thus the opportunity to secure more specimens was lost." It might be assumed from his description that he was following the old Pony Express trail (a service discontinued in October of 1861). There was no water on the route from Simson Springs Station to Fish Springs Station, a distance of 39 miles. From Fish Springs Station west to Deep Creek Station (now the town of Ibapah) it was approximately 50 miles. During the time of the Pony Express, however, there was water at Willow Springs Station (now the town of Callao). Deep Creek is approximately 6 miles from the Nevada border.

Mollusca of Utah and the Great Basin have been monographed several times since Henderson's works of 1924 and 1936. Chamberlain and Jones (1929) catalogued the Mollusca of Utah, and others (such as Berry, 1922, Chamberlain and Roscoe, 1948, and Bailey and Bailey, 1951) have published on the Mollusca of this region.

Eight localities in the Fish Springs area were examined. These

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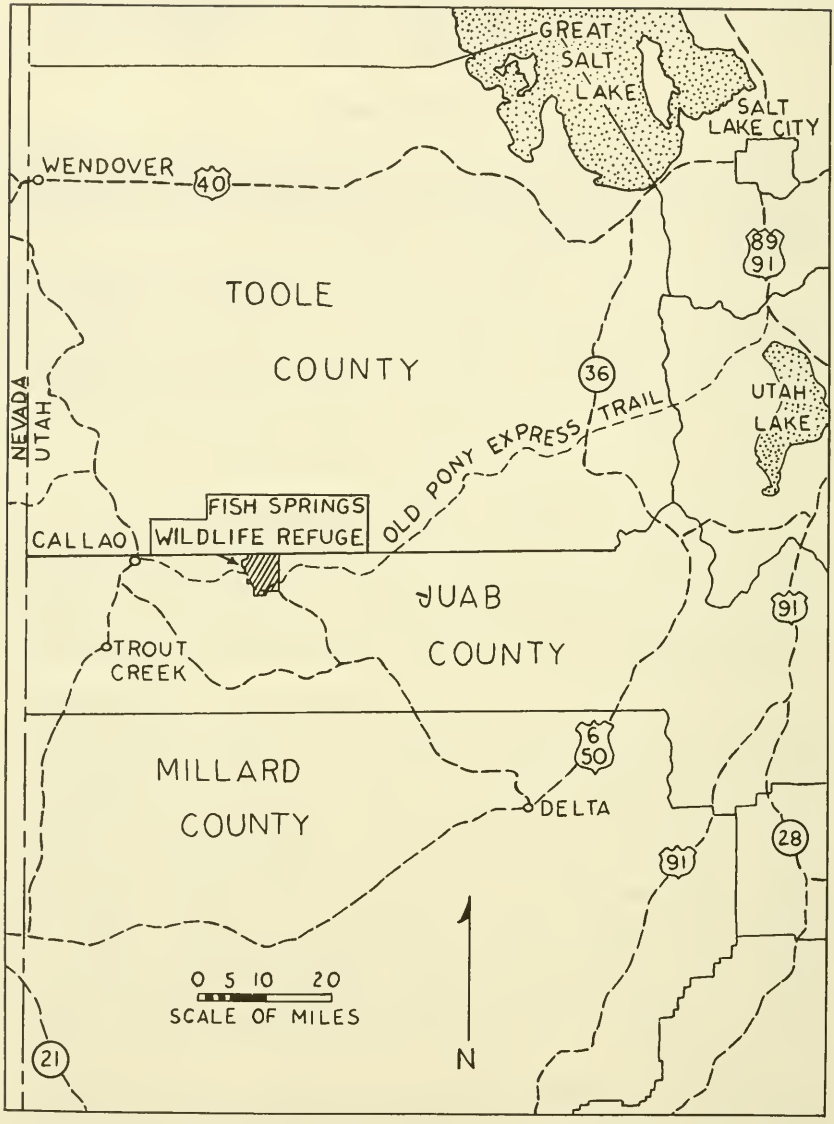

Fig. 1. Map of west central Utah showing location of Fish Springs.

are listed by numbers 2-8 in the appendix and are indicated by corresponding numbers on the map (Fig. 2). Cold Springs (locality 1) is outside the area covered by the map. Specimens sent to me in 1971 by Mr. J. Brent Giezentanner of the refuge staff are also included (locality 9 of map).

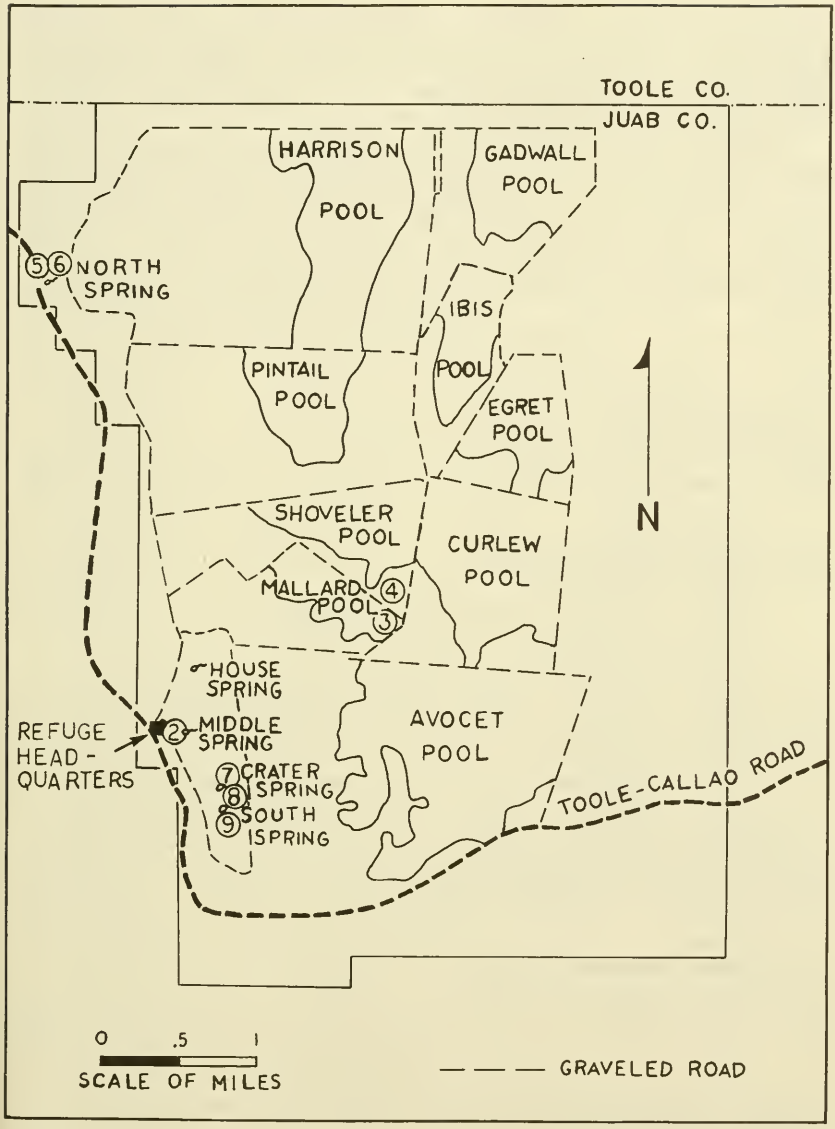

Fig. 2. Map of Fish Springs area. Encircled numbers refer to localities listed in appendix.

Systematic Discussion of Species

The molluscan fauna of the Fish Springs area (with the exception of *Stagnicola pilsbryi* and *Viviparus*) is typical of the Great Basin. In the following discussion, no attempt has been made to

include complete synonymies, as these are available in the literature. In general, a reference is given to the original description and to a figure (if the species was unfigured in the original description). Distributions are based upon records in the literature and collections at the University of Arizona.

The taxonomy of several of these families is in an unsatisfactory state. Consequently, the naming of *Oxyloma retusa*, *Physa virgata*, *P. utahensis*, and others is only tentative; the specific names which are used represent the best choices. All specimens have been deposited in the Invertebrate Museum, Department of Biological Sciences, University of Arizona, and in the collection of the author.

TABLE 1. Systematic list of Mollusca from Fish Springs

LAND MOLLUSCA (Gastropoda)
family Succineidae
1. *Oxyloma* cf. *retusa* (Lea, 1834)

AQUATIC MOLLUSCA (Gastropoda)
family Physidae
2. *Physa virgata* Gould, 1855
3. *Physa utahensis* Clench, 1925
family Planorbidae
4. *Helisoma* (*Pierosoma*) *subcrenatum* (Carpenter, 1857)
5. *Gyraulus* (*Torquis*) *parvus* (Say, 1817)
family Lymnaeidae
6. *Stagnicola* (*Hinkleyia*) *pilsbryi* (Hemphill, 1890)
family Ancylidae
7. *Laevapex* (*Ferrissia*) *californica* (Rowell, 1863)
family Viviparidae
8. *Viviparus* (*Cipangopaludina*) *chinensis malleatus* (Reeve, 1863)
family Valvatidae
9. *Valvata utahensis* Call, 1884
family Hydrobiidae
10. *Tryonia protea* (Gould, 1855)
11. *Fontelicella longinqua* (Gould, 1855)

Pelecypoda
family Sphaeriidae
12. *Pisidium insigne* Gabb, 1868

Oxyloma cf. *retusa* (Lea)

Succinea retusa I. Lea, 1834, Trans. Amer. Phil. Soc. 5:117, pl. 19, fig. 86. (T. L. Ohio, near Cincinnati).

Oxyloma retusa: Pilsbry, 1948, Acad. Nat. Sci. Phila., Monogr. 3, 2(2):785-788, fig. 421.

Distribution: Ohio west to Montana and south to Kansas (Pilsbry, 1948). Other described species may very well represent this species, and the range of *Oxyloma retusa* would then cover a greater area. The numerous Utah records of *Oxyloma haydeni* (cf. Chamberlain and Jones, 1929:116) might be based upon this species.

Occurrence at Fish Springs: Only shells were found (locality 7), as time prohibited a critical examination of terrestrial localities. During a wetter season of the year, *Oxyloma* could likely be found in much of the marshy area surrounding the pools at Fish Springs. Of this species Leonard (1943:240) has stated that it "thrives on the moist marshes and borders of the pools in the artesian basins, where it is frequently found on watercress."

Physa virgata Gould

Physa virgata A. Gould, 1855, Proc. Boston Soc. Nat. Hist. 1855-1856:128, 129. (T. L. Gila River and near San Diego).

Physella virgata: Chamberlain and Jones, 1929, Bull. Univ. Utah, 19(4):164, 165, fig. 76.

Physa virgata: Henderson, 1936, Univ. Colo. Studies 23(2):130.

Distribution: At present considered to be a southwestern species ranging from west Texas through Arizona and southern Utah to the west coast. Whether or not *Physa virgata* is a valid species or represents an eastern species remains to be seen.

Occurrence at Fish Springs: *Physa virgata* is generally found in pools and canals. This is the most widespread species at Fish Springs.

Physa utahensis Clench

Physa lordi utahensis Clench, 1925, Occ. Papers Mus. Zool., Univ. Michigan 161:8-10, pl. 1, fig. 5. (T. L. Utah Lake, Utah).

Physa utahensis: Chamberlain and Jones, 1929, Bull. Univ. Utah 19(4):162-164, fig. 75.

Physa utahensis: Henderson, 1936, Univ. Colorado Studies 23(2):130.

Distribution: Utah Lake, Utah (Clench, 1925), and from a spring seven miles south of Junction [Piute County], Utah (Henderson, 1936). Chamberlain and Jones (1929) discuss this species in some detail. Their inclusion of a lot from New Mexico is likely based upon *Physa humerosa* (Gould).

Occurrence at Fish Springs: This species was not seen alive in any of the marshes or canals but is known only from springs. Specimens were collected from Middle Spring, North Spring, and South Spring and were observed (but not collected) in House Spring.

Helisoma (*Pierosoma*) *subcrenatum* (Carpenter)

Planorbis subcrenatus Carpenter, 1857, Proc. Zool. Soc. London 1856:220. (T. L. Oregon).

Helisoma (*Pierosoma*) *subcrenatum*: Baker, 1945, The Molluscan Family Planorbidae, p. 149, pl. 89, figs. 18-20, pl. 91, figs. 9-15, pl. 92, figs. 1-12, pl. 101, fig.14.

Distribution: California and Utah to Oregon and Washington. Henderson (1936:133) considered this to be the common form of *Helisoma* in Utah.

Occurrence at Fish Springs: Like *Physa virgata*, this is a snail of ponds and marshes. It was not collected in any of the springs or spring outflows but was found only in the semipermanent, shallow pools.

Gyraulus (*Torquis*) *parvus* (Say)

Planorbis parvus Say, 1817, *in* W. Nicholson's British Encyclopedia, 1st American Edition, 2, Article "Conchology," 9th numbered page, pl. 1, fig. 5. (T. L. Delaware River).

Gyraulus (*Torquis*) *parvus*: Baker, 1945, The Molluscan Family Planorbidae, p. 75, pl. 77, figs. 4-6.

Distribution: All of North America from Alaska and northern Canada to Cuba and from the Atlantic to the Pacific (Taylor, 1960: 58).

Occurrence at Fish Springs: Found in all types of habitats. It is well known (Taylor, 1960:58) that *Gyraulus parvus* will tolerate a wide range of environments.

Stagnicola (*Hinkleyia*) *pilsbryi* (Hemphill)

Limnaea (*Leptolimnea*) *pilsbryi* Hemphill, 1890, Natilus 4:25,26. (T. L. "Fish Springs, Nevada").

Galba pilsbryi: Baker, 1911, Chicago Acad. Sci. Special Publ. 3:254,255, pl. 4, figs. A, B.

Stagnicola (*Hinkleyia*) *pilsbryi*: Taylor, Walter, and Burch, 1963, Malacologia 1:237-281, pl. 2, fig. 1.

Stagnicola pilsbryi is known from only three specimens of the original type lot collected by Hemphill in 1868. Taylor et al. (1963) suggest that more specimens were collected but that these additional specimens (if any) were lost.

In all, 134 complete shells and 30 fragmented specimens of this species were collected on the surface of the ground just east of Crater Springs, approximately one-half mile southeast of the refuge headquarters (locality 7, Fig. 2). This area had recently been drained and burned over, and only shells could be found. *Stagnicola pilsbryi* was not found elsewhere in the Fish Springs area.

The sculpture of the shell of *S. pilsbryi* is of spiral incised lines, and fresh shells have raised ridges of periostracum in these incised lines. This characteristic immediately allies this species with *Stagnicola caperata* (Say). Some shells resemble high-spired shells of *Stagnicola montanensis* (Baker), but when comparing adult shells of approximately the same size, *S. pilsbryi* has an additional whorl (Fig. 3).

Measurements: The largest of the three specimens in the type lot of *S. pilsbryi* measured 7.9 mm with 6½ whorls, whereas the largest specimen collected in 1970 measured 16.3 mm with 9 whorls (Table 2). In order to compare adequately *S. pilsbryi* with published measurements of the other two species of *Hinkleyia* (Taylor et al., 1963), 17 specimens were chosen at random from those having over 6 whorls. While the size comparisons are obvious, it is surprising

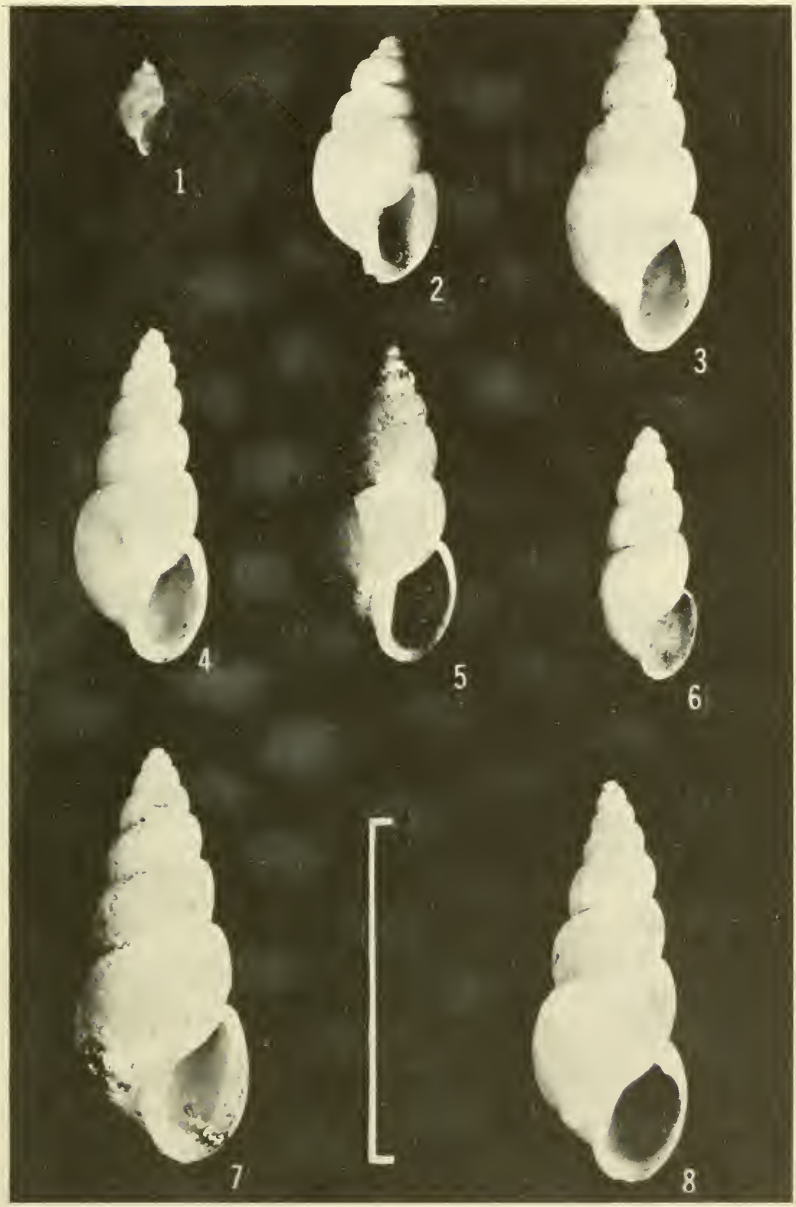

Fig. 3. Shells of *Stagnicola pilsbryi* (Hemphill). Scale line = 10 mm, measurements of length are given. (1) immature specimen of 2.8 mm with 4½ whorls; periostracum intact. (2) 7.5 mm with 6½ whorls; outer surface eroded. (3) 10.6 mm with 7¾ whorls. (4) 9.7 mm with 7½ whorls. (5) 9.7 mm with 7¼ whorls. (6) 7.4 mm with 6½ whorls. (7) 12.3 mm with 8 whorls. (8) 11.8 mm with 8 whorls.

TABLE 2. Shell measurements for *Stagnicola pilsbryi*.

	Shell length	Shell width	Ratio of length to width	Aperture length	Aperture width	Ratio of aperture length to width	No. of whorls
	16.3 mm.	5.9 mm.	2.76	4.9 mm.	3.0 mm.	1.63	9
	15.1	5.2	2.91	4.0	2.9	1.38	9
	14.7	5.6	2.63	4.8	3.1	1.55	8¾
	12.0	4.9	2.45	4.5	3.0	1.50	7½
	11.8	4.5	2.63	4.0	2.8	1.43	7¾
	11.8	4.5	2.63	3.9	2.7	1.44	7½
	11.2	4.9	2.29	4.7	2.9	1.62	7½
	11.2	4.2	2.67	4.0	2.5	1.60	6½
	11.1	4.4	2.52	4.0	2.3	1.74	7
	10.5	4.1	2.56	3.9	2.4	1.62	7
	10.5	4.1	2.56	3.9	2.4	1.62	7
	10.3	4.2	2.45	4.1	2.7	1.52	7
	10.2	4.3	2.37	3.6	2.3	1.57	7½
	9.7	3.8	2.55	3.5	2.2	1.59	7¼
	7.5	3.7	2.03	3.3	2.1	1.57	6¼
	7.4	2.2	3.36	2.8	1.6	1.75	6¼
	7.1	3.3	2.15	2.9	1.8	1.61	6½
Mean	11.1	4.3	2.57	3.9	2.4	1.57	

that the mean ratios of aperture length to width are nearly identical for *S. pilsbryi* and some populations of *S. montanensis* (Table 3).

Habitat: This snail probably occupies a habitat similar to other *Hinkleyia* species. From the location in which the shells were found, it appears that *S. pilsbryi* lives in a shallow, semipermanent marsh. Although burned over, this area was covered with the remains of emergent marsh grasses. In the western United States, *S. caperata* has been found in ponds, marshes, and spring seepages—generally areas with some seasonal fluctuation in water level (Taylor et al., 1963). In a similar manner, *S. montanensis* is typical of ponds, bogs, and marshy creeks. Near the type locality in Montana, I have found it most often in well-drained habitats in mountainous areas.

Laevapex (*Ferrissia*) *californica* (Rowell)

Gundlachia californica Rowell, 1863, Proc. Calif. Acad. Sci.. (1)3:21, 3 figs. (T. L. Feather River, California).

TABLE 3. Comparison of mean shell measurements of *Stagnicola pilsbryi* with other species of *Hinkleyia*.

	Shell			Aperture				
Species	length	width	ratio of length to width	length	width	ratio of length to width	No. of whorls (range)	No. of specimens
S. pilsbryi[1]	11.1	4.3	2.6	3.9	2.4	1.6	6¼ - 9	17
S. caperata[2]	9.8	5.5	1.8	5.2	3.5	1.5	4½ - 5	14
S. montanensis[3]	11.9	5.9	2.0	5.2	3.2	1.6	5¼ - 6¼	22

[1]From Table 2, this paper.
[2]From measurements of specimens collected in western Montana.
[3]Summarized from Table 2, p. 25 in Taylor et al., 1963.

Distribution: Apparently a southwestern species, ranging from Arizona to the west coast. *Laevapex fragilis* (Tryon, 1863) in the west is likely synonymous with *L. californica*. The specific status of eastern and northern (U.S.) limpets referred to *L. fragilis* also remains unsettled.

Occurrence at Fish Springs: Only two shells of *Laevapex* were collected at Fish Springs, and these were in the same general area as shells of *Stagnicola pilsbryi*. This limpet is being referred to *L.* (*Ferrissia*) *californica*, with hesitation, as neither shell is well preserved. Basch (1963) convincingly showed that many species of freshwater limpets are difficult to determine with precision. Chamberlain and Jones (1929:170-171, fig. 79) reported *L.* (*F.*) *rivularis* from Utah Lake, and subsequent authors have repeated this record. No other records of ancylids could be found for Utah.

Ferrissia is typically found in clean water (streams, lakes), and, perhaps, certain of the springs or canals are the habitat at Fish Springs. The occurrence at Fish Springs of a limpet along with other Utah Lake snails (*Physa utahensis*, *Valvata utahensis*) could suggest that the *Ferrissia* at Fish Springs is conspecific with the Utah Lake *Ferrissia*.

Viviparus (*Cipangopaludina*) *chinensis malleatus* (Reeve)

Paludina malleata Reeve, 1863, Conch. Icon., 14, *Paludina*, pl. 5, figs. 25a, b. (T. L. Japan).

Viviparus malleatus: Pilsbry, 1902, Proc. Acad. Nat. Sci. Phila. 54:116, 117, pl. 9, figs. 6, 7.

Distribution: Japan; introduced into U.S. via aquarium trade.

Occurrence at Fish Springs: This species appears to thrive in Middle Spring, near the refuge headquarters. How or when this snail was introduced into the Fish Springs area is not known, but according to refuge personnel, it has been there for some time.

Valvata utahensis Call

Valvata sincera var. *utahensis* Call, 1884, Bull. U.S. Geol. Surv. 11:22, 24, 25, 44, pl. 6, figs. 1-3. (T. L. Utah Lake, Utah).

Valvata utahensis: Bailey and Bailey, 1951, Nautilus 65(2):49, 50, pl. 4, figs. 5, 5a, b.

Distribution: North central Utah. This species is also known as a Pleistocene fossil from California, northern Utah, southern Idaho, and western Wyoming (Taylor, 1966).

Occurrence at Fish Springs: *Valvata utahensis* has been found living primarily in springs. A few individuals of this species have been found elsewhere, but the most favorable habitat seems to be the clean water of the springs, where it lives with *Physa utahensis*. Specimens from Fish Springs show some obvious differences from typical *V. utahensis* in that carinae are absent from both the base and shoulder, and radial striae are coarser than in the typical form.

Tryonia protea (Gould)

Amnicola protea Gould, 1855, Proc. Boston Soc. Nat. Hist. 5:129 (T. L. Colorado Desert).

Tryonia protea: W. G. Binney, 1867, Smithsonian Misc. Coll., 7, Art. 3(144):71, figs. 140, 141.

Distribution: Colorado Desert (southern California), eastern Arizona and southern Utah. Taylor (1966:53-54) has suggested that *Tryonia protea* may actually represent several species.

Occurrence at Fish Springs: This species is generally found living in springs and spring outflows. It should be noted that *T. protea* from Fish Springs was found to be ovoviviparous.

Fontelicella longinqua (Gould)

Amnicola longinqua Gould, 1855, Proc. Boston Soc. Nat. Hist. 5:130. (T. L. Colorado Desert).

Amnicola longinqua: Bailey and Bailey, 1951, Nautilus, 65(2):51, pl. 4, fig. 7.

Distribution: Colorado Desert, Nevada, Utah, southeastern Oregon (Pilsbry, 1899). Chamberlain and Jones (1929:178) indicate that this species is ". . . almost invariably found on watercress near the outflow of springs."

Occurrence at Fish Springs: This species inhabits springs and spring seepages. It lives in every spring examined and was the only snail found living in Cold Spring. This species was placed provisionally in *Fontelicella* by Gregg and Taylor (1965), and the characteristics of the verge (Fig. 4) are as described for the genus. The accessory process is nearly twice the length of the penis, and has

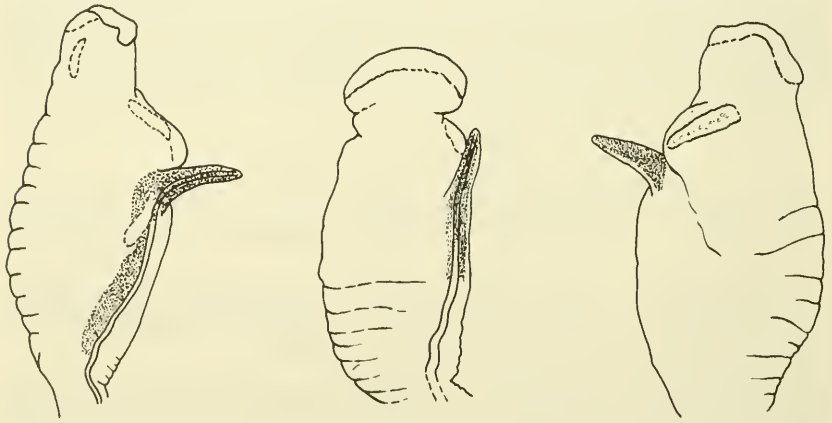

Fig. 4. Verges from three individuals of *Fontelicella longinqua* (Gould) from Cold Spring (locality 1). Scale line = 1 mm.

a conspicuous, raised, circular lobe on the inner surface. This lobe bears an elongate-oval, transverse glandular area. In addition, there is a small glandular area on the verge proximal to the penis and a large glandular area at the distal end of the accessory process (specimens examined were from Cold Spring).

Pisidium insigne Gabb

Pisidium insigne Gabb, 1868, Amer. Jour. Conch., 4(2):69 (T. L., Fort Tejon, Kern Co., California).

Pisidium insigne: Herrington, 1962, Misc. Publ. Museum Zool., Univ. Mich., 118: 42, 43, pl. 6, fig. 5, pl. 7, fig. 21.

Distribution: Nearctic: southeastern and southwestern Canada, northeastern and western U.S.: Utah not included in range (Herrington, 1962).

Occurrence at Fish Springs: Shells of this species were found on the surface of the ground near Mallard Pool. According to Herrington, this is a species of "slow-moving creeks or spring creeks." Neither Henderson (1924, 1936) nor Chamberlain and Jones (1929) lists this species (or any of its synonyms) from Utah.

Discussion

Fish Springs, on the southern edge of the Great Salt Lake Desert, is characterized by a single endemic species. Other species in the area (excepting *Viviparus*) are typical of the Great Basin and the Colorado Desert. Five species (*Oxyloma retusa*, *Physa virgata*, *Helisoma subcrenatum*, *Gyraulus parvus*, and *Pisidium insigne*) are too widespread to be of any special zoogeographic significance.

The distribution of the remaining five species is primarily in the western United States, and two of these species (*Tryonia protea* and *Fontelicalla longinqua*) are well known from the Colorado Desert. *Valvata utahensis* is known primarily as a Pleistocene fossil from California, northern Utah, southern Idaho, and western Wyoming. *Valvata utahensis* and *Physa utahensis* have been collected alive at only a few localities in north and central Utah.

It is conceivable, from an examination of the molluscan fauna, that the Fish Springs area might have been isolated from other Utah waters since the recession of Lake Bonneville in the late Pleistocene. Fish Springs is within the area covered by Pleistocene Lake Bonneville, and it is likely that the distribution of some species of Mollusca in lakes of the Great Basin can be traced to Lake Bonneville. Examples of such species are *Physa utahensis* and *Valvata utahensis*, both well known from Utah Lake (which lies within the basin of Lake Bonneville). It is probable that *Stagnicola pilsbryi* differentiated (as a species) since the last recession of Lake Bonneville. Most of the species found at Fish Springs are known from at least the Pliocene, and, although nothing is known of the history of *S. pilsbryi*, other species of *Hinkleyia* are known from Blancan deposits in the western United States (Taylor et al., 1963).

It is indeed unfortunate that no living animals of *S. pilsbryi* could be found, as the anatomy (and hence the precise taxonomic relationship) is still unknown.

Because of the limited distribution of *S. pilsbryi*, it has been suggested (Taylor et al., 1963) that this snail may have some ecological specialization. My impression is, however, that this is a recently derived species and has a limited distribution only because of extreme isolation. Many of the other molluscan species in the Fish Springs area are of wide distribution, and none appears to have a specialized habitat.

It should be mentioned here that improvements in the Fish Springs area may have unearthed sediments which are Pleistocene or older in age. Some of the shells which were collected may be fossils, but the only species which was not found alive (or as fresh shells) was *Laevapex californica.*

Acknowledgments

I should especially like to thank the staff of the Fish Springs National Wildlife Refuge for their assistance during my visit to the Fish Springs area. In particular, I should like to acknowledge the help of Mr. Ronald Perry, refuge manager at the time of my visit, and Mr. J. Brent Giezentanner, present refuge manager. I should also like to thank Dr. Joseph C. Bequaert and Mr. Peter D'Eliscu for their assistance with the taxonomy and Mr. Richard L. Reeder and Dr. Albert R. Mead for critically reviewing the manuscript. Thanks are also extended to Mr. David Richman and to Miss Laura Emmett for their aid in preparing the figures.

Appendix

Molluscan assemblages in the Fish Springs area. Numbers refer to localities on map (Fig. 2).

1. Cold Spring, 6 miles north of refuge headquarters. (not on map, Fig. 2)
   Fontelicella longinqua (Gould)
2. Middle Spring, at refuge headquarters.
   Physa utahensis Clench
   Gyraulus parvus (Say)
   Viviparus chinensis malleatus (Reeve)
   Valvata utahensis Call
   Tryonia protea (Gould)
   Fontelicella longinque (Gould)
3. Surface of ground near Mallard Pool, 1 mile northeast of refuge headquarters. (shells only)
   Physa utahensis Clench
   Tryonia protea (Gould)

4. Pond near Mallard Pool, 1 mile northeast of refuge headquarters.
   Physa virgata Gould
   Helisoma subcrenatum (Carpenter)

5. Bottom sample from North Spring, 4.5 miles north of refuge headquarters.
   Physa utahensis Clench
   Gyraulus parvus (Say)
   Valvata utahensis Call
   Tryonia protea (Gould)
   Fontelicella longinqua (Gould)

6. Outflow seepage of North Spring, 4.5 miles north of refuge headquarters.
   Physa virgata Gould
   Fontelicella longinqua (Gould)

7. Wet meadow east of Crater Spring, 0.5 mile southeast of refuge headquarters. (Mostly shells on surface of ground)
   Oxyloma cf. *retusa* (Lea)
   Physa virgata Gould
   Helisoma subcrenatum (Carpenter)
   Gyraulus parvus (Say)
   Stagnicola pilsbryi (Hemphill)
   Laevapex californica (Rowell)
   Valvata utahensis Call
   Tryonia protea (Gould)
   Fontelicella longinqua (Gould)
   Pisidium insigne Gabb

8. Canal near Crater Spring (due east of Crater Spring), 0.5 mile southeast of refuge headquarters.
   Physa virgata Gould
   Gyraulus parvus (Say)
   Valvata utahensis Call
   Tryonia protea (Gould)
   Fontelicella longinqua (Gould)

9. Sediment from outlet of South Spring, 0.75 mile southeast of refuge headquarters. Collected 1971 by refuge personnel.
   Physa utahensis Clench
   Gyraulus parvus (Say)
   Valvata utahensis Call
   Tryonia protea (Gould)
   Fontelicella longinqua (Gould)

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