

TWO HISTORICAL PLANT COLLECTION LOCALITIES IN ARIZONA: NOTES CONCERNING MISTAKEN GEOGRAPHY

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ABSTRACT

Two historic plant collection localities – Camp or Fort Lowell, and Silver Lake – near Tucson, Pima County, southern Arizona, have been confused with more recent, geographically distant locations in Arizona having the same or similar names. This confusion has found its way to the literature and persists with sheets in herbaria, even making its way into specimen databases. These instances are briefly reviewed, and collectors known to be associated with each of these locations are noted. Clarification is offered to enable accurate attribution of specimens from these localities, by these collectors, as duplicates are potentially widely distributed among herbaria.

KEY WORDS: Fort Lowell, Rillito Valley, Silver Lake, Santa Cruz Valley, Tucson, Arizona, David Griffiths.

I. THE MEANINGS OF ‘LOWELL’ ON PLANT SPECIMEN LABELS FROM ARIZONA

On nineteenth century plant specimen labels from Arizona, the locality ‘Lowell’ refers to Camp or Fort Lowell, Pima County. From 1866 to 1873, the military camp was located in what is today downtown Tucson, Pima County, southern Arizona, about one mile east of the Santa Cruz River (Weaver 1947). The Army post was relocated about nine miles northeast to the Rillito Valley in Mar 1873, was renamed a Fort in 1879 (Alexander 1998), and was abandoned in Jan 1891 (Weaver 1947). Only the ruins of the latter site are still associated with the historic name, and are shown on modern maps as a Pima County historical park. A portion of the site of the original camp downtown is preserved by the City of Tucson as Armory Park.

Several instances appear in the taxonomic literature of the twentieth century where specimens labeled 'Lowell', 'Camp Lowell', or 'Fort Lowell' have been cited with Cochise County, Arizona (Table 1). In herbaria and related databases, there remain cases where 'Cochise Co.' was penciled on a sheet and/or entered in a database for specimens labeled with 'Lowell' in any of these forms. The misattribution is not altogether unfounded – at the turn of the twentieth century, a community named Lowell was established near the mines of the Warren District, southeast of Bisbee, in Cochise County, southeastern Arizona (Barnes 1935; Varney 1994). The town appeared on period maps and, in light of the military places near Tucson having been long-abandoned by the time of these taxonomic works, may simply have been the most conspicuous bearer of the name 'Lowell' remaining in the region. The consequences of this confusion for documenting or interpreting species' geography are apparent enough: in addition to being separated by about 80 mi (130 km) and more than 2600 ft (790 m) elevation, the Tucson localities are located squarely in the Sonoran Desert, while the town of Lowell sits at the transition between semi-desert grassland and the greater Chihuahuan Desert (Figure 1). The geographic locations for these place names are summarized in the Appendix.

A combination of specimens, literature, and archives documents the whereabouts of several collectors, including those cited in Table 1, in Pima County near Tucson (and not near Bisbee) at the times of their 'Lowell' collections (Mauz 2006). These collectors (with collection years) include: J.T. Rothrock (1874), J.G. Lemmon (1880), C.G. Pringle (1881-84), W.F. Parish (1884), J.W. Toumey (1891-98), F.X. Holzner (1893), W.W. Price (1894), and M. Zuck (1896). After the turn of the century, botanists who made collections at Fort Lowell included D. Griffiths (1900), J.J. Thornber (1901-16), Mrs. [H.A.] Thornber (1903), and F. Shreve (1908).

Although these collectors were referring to the ultimate location of Camp or Fort Lowell on their labels, a note of caution is warranted against interpreting this location too literally in the Rillito Valley: it does not always mean *at* Fort Lowell. The ~1,850-hectare military

Table 1. Examples of collections from Camp Lowell, Fort Lowell, or 'Lowell' in Pima Co., mistakenly cited for Cochise Co., Arizona, in the literature.

Taxon cited	Collector number, date	Reference
<i>Lupinus brevicaulis</i> S. Watson	J.G. Lemmon, 1880	Smith 1919:399
<i>Rhamnus crocea</i> Nutt.	W.F. Parish 37	Wolf 1938:44
subsp. <i>ilicifolia</i> (Kellogg) C.B. Wolf		
<i>Psilostrophe cooperi</i> (A. Gray) Greene	W.F. Parish 111	Heiser 1944:287
<i>Lycium californicum</i> Nutt.	W.F. Parish 179	Hitchcock 1932:328
<i>Verbena gooddingii</i> Briq.	W.F. Parish 197	Moldenke 1963:145
<i>Eriophyllum lanosum</i> A. Gray	C.G. Pringle, 13 Apr 1881	Constance 1937:117-118
<i>Chilopsis linearis</i> (Cav.) Sweet var. <i>arcuata</i> Fosberg	C.G. Pringle, 13 May & 27 Jul 1881; Thornber 51	Fosberg 1936:366
<i>Verbena plicata</i> Greene	C.G. Pringle, 8 Jun 1882	Moldenke 1964:18

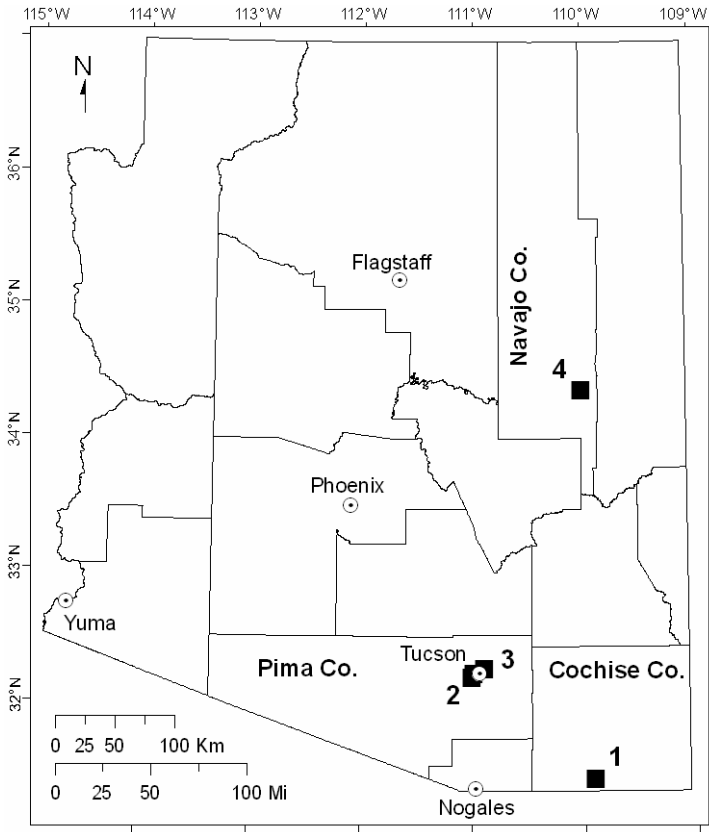


Fig. 1. Map of Arizona showing counties and locations discussed in the text. Cochise Co.: 1—Lowell; Pima Co.: 2—Silver Lake and Camp Lowell (1866-1873), 3—Camp/Fort Lowell (1873-1891); Navajo Co.: 4—Silver Lake (White Mountain Lake). Map projection: Universal Transverse Mercator (UTM, zone 12); datum: NAD83.

Reservation surrounding the Fort grounds was extensive: in addition to encompassing about 20 mi (32 km) of lower tributaries to Rillito Creek, the property spanned desert uplands at the foot of the Santa Catalina Mountains (Figure 2). Fort Lowell was a stepping-off point for

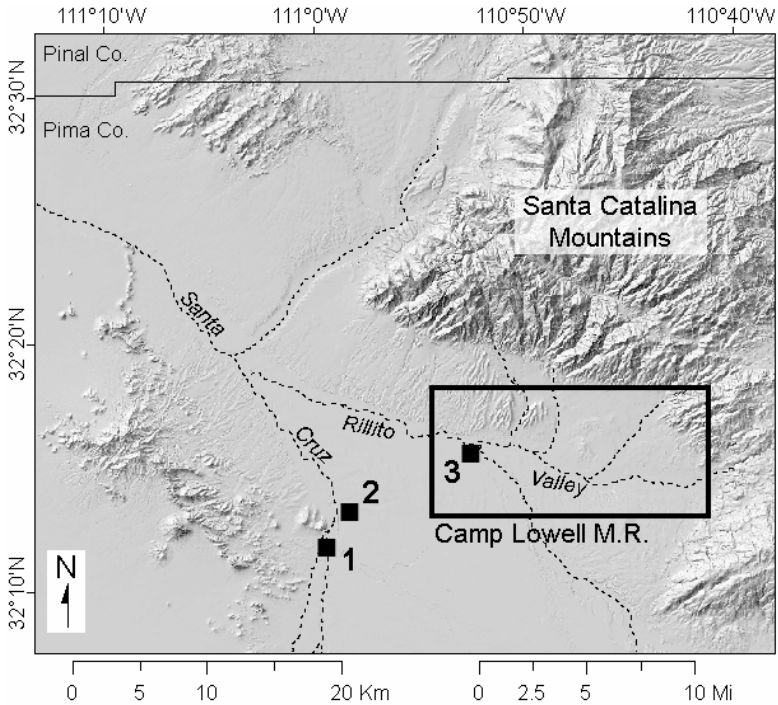


Fig. 2. Shaded relief map of the Tucson Basin, Pima Co., southern Arizona, showing historic locations discussed in the text. Santa Cruz Valley: 1—Silver Lake, 2—Camp Lowell (1866-1873); Rillito Valley: 3—Camp/Fort Lowell (1873-1891), and the extent of the historic military reservation (M.R.) at the foot of the 9157 ft (2791 m) Santa Catalina Mts. Map projection: Universal Transverse Mercator (UTM, zone 12); datum: NAD83.

exploration in the neighboring mountains, and in these cases, the Fort may have served merely as a reference point for those collection sites. On some labels, but not others, additional descriptive terms may appear that place the collection location well above the valley bottom. For example, W.F. Parish's labels of 1884 might include 'High Mts',

'Foothills', or 'High plains' with the locality, 'Lowell'. These presumably refer to the adjacent uplands and the Santa Catalina Mountains north of the Rillito Valley. Several collections by J.T. Rothrock in 1874 were labeled 'Camp Lowell, alt. 4500 ft' – an elevation more than 2000 ft (610 m) above the Fort grounds on the valley floor and beyond even the highest elevations within the military reservation. Thus, while specimens from this vicinity were sometimes labeled as specifically as 'Rillito bottoms, Fort Lowell', implying proximity to the actual Fort location, the name of the Fort, alone, on a label could potentially indicate very different collection environments (Table 2). The difference of a few or several aerial miles (likewise, kilometers) between the valley and the piedmont or mountains poses little consequence at a regional scale, for example in describing the geographic range of a species, but certainly could have implications for documenting the vertical or ecophysiological range of that same taxon.

II. 'SILVER LAKE' – A COLLECTION LOCALITY OF THE 'GILDED AGE'

Silver Lake was a man-made reservoir on the Santa Cruz River just south of Tucson, Pima County, southern Arizona (Figure 2), originally held behind an earthen dam built in 1857 to provide power for a grain mill (Kitt 1962). In addition to becoming a popular recreation area for the town, wetland and riparian vegetation grew there and along the adjacent river. Botanists known to have collected at Silver Lake in the Santa Cruz Valley near Tucson include (with collection years): J.W. Toumey (1891-92), L.H. Dewey (1891), D. Griffiths (1900-01), [W.P.?] Blake (1903), and J.J. Thornber (1904) (Mauz 2006). The dam was damaged or washed out repeatedly in the 1880s and 1890s (e.g., *Arizona Daily Citizen*, 17 Aug 1891: 4). Although the place name was still in use around the turn of the century (e.g., *Arizona Daily Star*, 10 Aug 1898: 4; 24 Jun 1905: 2) and a small water feature was indicated near the historical locality on the USGS 30' Tucson topographic map of 1905, both name and feature were absent even from maps of the valley (e.g., Dobbins 1912; Henley 1932) well before mid-century.

Griffiths cited collections at Silver Lake on five dates in 1900-1901 (Table 3) in his field notebook for those years (Griffiths 1901). The notebook, housed at the University of Arizona (UA) Herbarium (ARIZ),

Table 2. Examples of collections from Camp or Fort Lowell, Pima Co., Arizona, with descriptors indicating a range of locations and environments associated with this placename.

Taxon	(Munz)	W.L. Wagner	Location	Collector (Accession)
<i>Oenothera arizonica</i>		W.L. Wagner	Lowell	W.F. Parish 64 & 65 (GH!)
<i>Psilostrophe cooperi</i>	(A. Gray)	Greene	High plains, Lowell	W.F. Parish 111 (UC!,US!) ^a
<i>Harpagonella palmeri</i>	A. Gray		Plains, Lowell	W.F. Parish 162 (holotype:GH!)
var. <i>arizonica</i>	I.M. Johnst.			
<i>Verbena gooddingii</i>	Briq.		High mts, Lowell	W.F. Parish 197 (GH!)
<i>Gutierrezia serotina</i>	Greene		Mesas near Camp Lowell	Pringle 13 Apr 1881 (PH!,VT!)
<i>Machaeranthera asteroides</i>	(Torr.)		Valley near Camp Lowell	Pringle 12 May 1883 (PH!)
Greene var. <i>asteroides</i>				
<i>Solidago velutina</i>	DC.		Camp Lowell, 4500 ft	Rothrock 706 (holotype:GH!) ^b
subsp. <i>sparsiflora</i>	(A. Gray)	Semple		

^a A duplicate number at MO (!) does not include 'high plains' on the label.

^b Isotypes, viewed as images, at NY (sciweb.nybg.org/science2/VirtualHerbarium.asp) and US (ravenel.si.edu/botany/types) do not indicate the elevation on the label.

had been in the care of ARIZ curator-emeritus Charles T. Mason since at least 1956, when an inquiry was made about it by Lyman D. Benson, then at Pomona College, who thought that it might be useful in the curation of Griffiths' cactus specimens (letter with notebook); it has only recently resurfaced. Several of Griffiths' correspondingly numbered specimens, made when he was a member of the UA faculty and Agricultural Experiment Station (Taylor 1935), are housed at ARIZ. On the majority of them, the label contains only the plant name and Griffiths' name and collection number, but not a locality or date.

Under the heading "Trip to Silver Lake," Griffiths recorded a series of numbers (2691-2707) in his notebook. The entry was not dated, but occurred between entries for 22 Apr and 30 Apr 1901. Two specimens with corresponding numbers [2694 – *Polygomon monspeliensis* (L.) Desf.; 2704 – *Phalaris caroliniana* Walter] found at the Smithsonian Institution (US) are labeled 'Silver Lake' and dated 29 Apr 1901, so that date has been adopted for this series. At least three sheets of this series at ARIZ, numbered but without location or date, were stamped 'Navajo County' at some point during the latter part of the twentieth century. A plausible scenario underlying this attribution would be that a past collections manager knew of Griffiths' notebook, correlated the collection number on the specimen with the notebook entry, and looked up 'Silver Lake' – finding the feature of that name in Navajo County, northern Arizona (Figure 1).

Although the particular reference consulted is not known, other reference materials constrain the age of the named feature in Navajo County. The U.S. Geological Survey Geographic Names Information System (GNIS) indicates that 'Silver Lake' is one of four 'historic variants' (i.e. synonyms) – also including Baggs Reservoir, Daggs Reservoir, and Silver Creek Reservoir – for what is now White Mountain Lake on Silver Creek (a tributary of the Little Colorado River), Navajo County (see Appendix). The impoundment dates to between 1940, when it *did not* appear on the map of the adjacent Sitgreaves National Forest, and 1951, when it *was* shown, and labeled 'Daggs Reservoir' on Sheet 7 of the Arizona State Highway Department Navajo County General Highway Map. In 1964, the community of White Mountain Lake was developed and promoters advertised a 250-acre lake on Silver Creek (*Arizona Daily Star*, 30 Apr

Table 3. Griffiths' (1901) field notebook entries for collection dates bracketing and including work at 'Silver Lake' (italicized) in Arizona. Collection numbers are included for Silver Lake citations only.

Year	Mo	Day	Locality	Coll. Nos.
1900	Nov	14	Tucson	
		15	<i>Silver Lake</i>	2110
		17	Castle Rock ^a	
		18	Tucson	

1901	Feb	5	Tucson	
		6	" <i>at Silver Lake, Tucson</i> "	2256
		9	range plots	
		10	Santa Cruz [River] bottoms	
		12	range plots	
		...		
		19	<i>Silver Lake; UA</i> ^b <i>Campus</i>	2279
20	Rillito; UA Campus			

	Apr	22	Tucson	
		...		
		29 ^c	" <i>Trip to Silver Lake</i> "	2691-2707
		30	Santa Cruz [River] bottoms	
	May	1	UA Campus	
		3	range plots	
		5	range plots	
		...		
		9	" <i>Silver Lake, Arizona</i> "	2719-2723
		10	UA Campus	

^a The entry for 26 Nov places this locality in the Santa Catalina Mountains northeast of Tucson. ^b University of Arizona. ^c This date derives from two corresponding numbered specimens at US (see text), but does not accompany the locality heading in the notebook. An ellipsis (...) indicates a gap in time of more than three days between contiguous entries in the notebook. Dashes (- - -) represent spans of time omitted in this excerpt.

1964: C15) that was essentially an expansion of the preexisting reservoir. While Daggs Reservoir was the name used on the Sitgreaves National Forest maps of 1960 and 1964, the Forest maps dating from at least 1972 labeled the water feature itself as 'White Mountain Lake'.

By the time Griffiths' Silver Lake specimens were stamped 'Navajo Co.' in the herbarium, the historic reservoir of the same name near Tucson had long since disappeared. There is no cause to doubt, and good reason to believe, that Griffiths' collection locality was near Tucson. In one notebook entry (6 Feb 1901), Griffiths gave the locality, "at Silver Lake, Tucson," and on 19 Feb 1901, he cited collections from both Silver Lake and the University of Arizona campus, just a few miles away. For each of the five collection dates referencing Silver Lake (Table 3), the collection localities cited in Griffiths' notebook on the days prior and subsequent to collections there indicate proximity to Tucson, and not a location in northern Arizona. As in the case described above for the confusion of Lowell, Arizona, with Camp or Fort Lowell near Tucson, the two 'Silver Lake' locations – one in the Sonoran Desert, one at the southern edge of the Colorado Plateau – are biogeographically very different, separated by more than two degrees of latitude and about 3600 ft (1100 m) elevation. Griffiths' specimens are the only ones so far encountered that have been misattributed to the northern location. Although the collection numbers are few, his duplicates may be widespread; these 'Silver Lake' collections, as well as those of the other collectors listed above, should be affiliated with Pima County, Arizona, in herbaria, related databases, and citations of exsiccatae.

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Appendix. Locations of Arizona place names discussed in the text.

Place Name	Latitude ^a	Longitude ^a	Elevation	PLSS		Reference
				Divisions ^b	County	
Camp Lowell (1866-1873)	32.22 N	110.97 W	2380 ft (725 m)	T14S, R13E Sec.13	Pima	USGS Tucson 7.5' quadrangle
Camp/Fort Lowell (1873-1891)	32.26 N	110.87 W	2440 ft (743 m)	T13S, R14E Secs.35-36	Pima	GNIS 42713 ^c
Lowell	31.43 N	109.89 W	5075 ft (1547 m)	T23S, R24E Sec.15	Cochise	GNIS 7442 ^c
Silver Lake	32.20 N	110.99 W	2375 ft (724 m)	T13S, R13E Sec.23	Pima	USGS Tucson 7.5' quadrangle
Silver Lake (White Mtn Lake)	34.37 N	109.99 W	5961 ft (1817 m)	T11N, R22E Secs.10,15	Navajo	GNIS 36091 ^c

^a Lat & Long coordinates rounded to two decimal places; North American Datum (NAD) 1983.

^b Public Land Survey System; Gila & Salt River Base Line & Meridian.

^c United States Geological Survey (USGS) Geographic Names Information System (GNIS; geonames.usgs.gov/pls/gnispublic).

This is a List of National Historic Landmarks in Arizona. There are 46 National Historic Landmarks (NHLs) in Arizona, counting Hoover Dam which spans from Nevada and is listed in Nevada by the National Park Service (NPS), and Yuma Crossing and Associated Sites, which is listed by the NPS in Arizona, but also overlaps into California. The first designated was San Xavier del Bac Mission, in October, 1960. The most recently designated was the Painted Desert Community Complex Historic District in December. Geography rarely appears in books on religion, and religion rarely appears in books on geography. One notable exception is the American college texts which offer a sweeping panorama of world geography, in which there is often a chapter on the global distribution of the major religions and belief systems. Lily Kong, a human geographer, has commented that "concerns linking geography and cosmology in the mind of the religious person lay at the heart of early geography, and in that sense a geography that incorporated religious ideas was evident from the earliest times." (Kong 1990, p.356). Thus, for example, geographers in ancient Greece accounted for the spatial order they observed all around them as the result of cosmological principles.