

# ***Rose Spring Point Chronology and Numic Population Movements in Eastern California***

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## **Abstract**

In this brief paper I would like to consider the data now available with which to date Rose Spring points in eastern California. I will focus on the most well dated materials from the Rose Spring site (CA-INY-372, Locus A) and will cross check my conclusions using data from other well researched sites in the vicinity of Rose Spring and the Coso Region (Yohe 1992, 1997, 2000). Both radiocarbon assays and obsidian hydration measures will serve as an independent evaluation for my work. Finally, I will consider the temporal placement of Rose Spring points in light of suggestions that their relative frequency and duration, compared to that of the Desert Side-notched (DSN) type, may reflect population movements of the Numic out of their hypothesized homeland in the Owens Valley and into the outlying areas of the Great Basin (Bettinger 1994; Delacorte 1995).

## **Background: What are Rose Spring Points?**

Rose Spring points were originally recognized from the type-site of that same name, located in southern Owens Valley, at the edge of the Coso Range, in eastern California (Lanning 1963, Yohe 1992). The Rose Spring type is a small, narrow, triangular arrow point with a variety of stem forms. Rose Spring points are typically considered to be time markers for the interval from ca. 1350-650 cal. BP (calibrated radiocarbon date) in the far southern Sierra Nevada and southwestern Great Basin (Basgall and McGuire 1988; Bettinger and Taylor 1974; Gilreath

and Hildebrandt 1997; Justice 2002; Thomas 1981; Yohe 1992, 1997, 2000).

At about 1500 rcybp (radiocarbon years before present) local prehistoric populations in the southwestern Great Basin and western Mojave Desert began using the bow and arrow, shifting away from their former use of the dart and atlatl. Marking this change is the introduction of smaller, lighter arrow points of the Rose Spring, Eastgate, and Saratoga Springs Series. In the northern Mojave Desert at Fort Irwin, researchers indicate that during this time territorial ranges are reduced, curated tools decrease, local rather than exotic toolstone materials are preferred, milling gear increases in frequency, faunal remains evidence greater use of small game, and biface reduction decreases substantially (Basgall 1993, Hall 1992).

In the Owens Valley and western Mojave Desert specialized sites first occur that are single component loci targeting small, easily harvested game animals procured through communal hunts and focused on jack rabbits and grebes (Delacorte 1994; Gold 2005; Garfinkel 2006; McGuire, Garfinkel, and Basgall 1982; Williams 2004). These sites and similarly dated localities often contain abundant

portable milling equipment, rock ring structures, and bedrock milling/threshing features (Basgall and Giambastiani 1995, Delacorte 1994). These data reflect a shift to more intensive use of small game and local plants (dryland hard seeds) perhaps as a means of mitigating increasing human population pressure—consistent with the model presented by Bettinger and Baumhoff (1982) for Numic adaptations.

### The Importance of Dating

The dating of Rose Spring points is significant since this is an important technological change in weaponry and hunting accoutrements for aboriginal occupants of the region. Some have hypothesized that this change may have fostered excess anthropic predation and resource depression of targeted large game animals. “Aboriginal overkill” is a hotly debated topic and has yet to be widely accepted by prehistorians or adequately tested with the archaeofaunal record. However, evidence strongly suggests that increasing exploitation of large game in the region depressed the numbers of key prey animals, most importantly bighorn sheep (*Ovis canadensis*). This pattern has been argued as occurring in the White Mountains above Owens Valley in eastern California (Grayson 1991) and a similar but perhaps more recent intensification of hunting patterns also may have led to the local extirpation of bighorn in the Coso Range (Grant, Baird, and Pringle 1968).

The introduction of Rose Spring points also may have fostered a change in socioceremonial organization. Rose Spring points may be recognized in the iconography of the Coso Range petroglyphs and these style points also were incorporated into the burial offerings of this time period (Garfinkel 2007, Garfinkel and Pringle 2004, Gold 2005).

### Rose Spring Points and the Rose Spring Site

The Rose Spring site is situated about 15 kilometers northwest of the Coso Volcanic Field at the northern end of Rose Valley on the very western edge of the Coso Range just east of the front of the far southern Sierra Nevada. The site is widely known as one of the best dated and most well-studied sites in eastern California and has been pivotal in terms of the development of the cultural sequence and projectile point chronology for the western Great Basin (Lanning 1963, Yohe 1992). The locus served and is widely recognized as a substantial Rose Spring/Haiwee Period village site. However more recent reevaluation of the chronological materials from the site have led researchers to now believe that the peak period of cultural activity was during late Newberry times from 1500 to 2000 years ago (Garfinkel 2007, Gilreath and Hildebrandt 1997, Gold 2005).

The site is physically and culturally stratified, however, obsidian studies at the site revealed significant mixing of much of the smaller, easily transported artifacts. Nevertheless, Gilreath and Hildebrandt (1997) reinterpreting the chronostratigraphic sequence, suggested that there is a unimodal distribution of obsidian hydration measurements with over half the rims falling between 7.0 and 8.4 microns and two-thirds of all hydration readings grouped within a range of rim widths from 5.8 to 8.4 microns. They interpret the latter suite of rim values to represent the period from 3300 to 1350 BP.

Elko and Gypsum Series dart points (n = 8), from the most refined and recent studies at the site (Yohe 1992), were all discovered at Rose Spring below 60 centimeters and most (28 of 30) Rose Spring points were recovered above 70 centimeters. Gilreath and Hildebrandt believe that this supports a theory of two major periods of cultural activity at the site with some of the earlier material incorporated into

the later deposits. When Gilreath and Hildebrandt speculated on the character of the cultural chronology at the Rose Spring site there were no hydration measurements available on Rose Spring points from the deposit. Yet they predicted when these data became available most Rose Spring points would display rims of less than 5.8 microns.

For this research I present 28 hydration measurements and source determinations on Rose Spring points from the Rose Spring site (Table 1). It was determined that all these Rose Spring points were manufactured from Coso obsidian. These data allow us to evaluate the Gilreath and Hildebrandt prediction. Inspection of the resulting measurements confirms that they were largely correct. All Rose Spring points reviewed here (n = 28), recovered from as deep as the 100-110 centimeters level to the uppermost 0-10 centimeters level, can be incorporated into a suite of hydration rim values ranging from 2.7 to 5.8 microns with no outliers.

Given the continuous nature of this distribution it is likely that the rim range represents the full spectrum of use life for Rose Spring points in eastern California and provides rim readings indicative of the complete span of time when the points began to be used through their replacement by Desert Side-notched and Cottonwood Series points. Therefore 5.8 microns most likely represents a base date and hinge point near 1350 rcybp and 2.7 microns would equate with an age ca. 600 rcybp or an even more recent date.

A remarkably similar hydration rim suite comes from the Coso Volcanic Field within the Naval Weapons Station, China Lake (Gilreath and Hildebrandt 1997) and provides closely comparable rim readings, range, and mean (Table 2). Within this area Rose Spring points exhibit a range of hydration measurements from 2.5 to 6.9 microns. If we exclude the largest value (a possibly aberrant outlier a full .5 micron larger than the next largest rim read-

Table 1. Rose Spring points and Coso obsidian hydration measurements from CA-INY-372 (Locus A).

Level	Hydration Measurements								n	mean
0-10	4.7	4.6	5.1/7.2	5.2/7.0					4	4.8
10-20	4.4	4.5	4						3	4.4
20-30	3.0	3.4	4.9						3	3.8
30-40	3.1	4.1/5.0	3.4						3	3.5
40-50	4.7	4.5/9.7	2.7	4.5	4.3/6.0	4.8	5	3.7	8	4.3
50-60	3.7	4.3	5.8						3	4.6
60-70	5.0	5.7							2	5.3
70-80										
80-90	4.4								1	4.4
90-100										
100-110	5.0								1	5.0
Full Range: 2.7 - 5.8, mean: 4.4, standard deviation: 0.76, number: 28 Adjusted Range (mean plus one standard deviation.) 3.6 - 5.2 Data Points: 2.7, 3.0, 3.1, 3.4, 3.4, 3.7, 3.7, 4.0, 4.1, 4.3, 4.4, 4.4, 4.5, 4.5, 4.5, 4.6, 4.7, 4.7, 4.8, 4.9, 5.0, 5.0, 5.0, 5.0, 5.1, 5.2, 5.7, 5.8										

Note: Multiple hydration readings on the same artifact are represented with a slash (/). Smaller of the hydration measurement are used for statistical calculations. Level measurements in centimeters. Hydration measurements in microns. Micron measurements rounded to nearest 0.1 microns.

Table 2. Rose Spring points and Coso obsidian hydration measurements from the Coso volcanic field.

Projectile Point Type	Number	Range	Spread (microns)	Mean	Standard deviation	Coefficient of variation
Rose Spring	20	3.6 - 6.9	3.3	5.2	0.8	0.15

ing within the sample) then that distribution ranges from 2.5 to 6.3 microns - nearly identical with the Rose Spring values at 2.7 to 5.8. Given the range of contexts where these points were discovered, representing surface finds to more deeply buried discoveries, I believe that effective hydration temperature (EHT) conversions and adjustments to these values for variations in microclimates, elevation, and depth appear to be of little significance.

Another independent test of the appropriate hydration measurement range of Coso rims and their close association with the proper age and rim widths comes from Portuguese Bench site. This site is also located in Rose Valley at the base of the eastern scarp of the southern Sierra Nevada just seven kilometers south of Rose Spring. At this locality most Rose Spring points were recovered from depths no greater than 50 to 60 centimeters (Allen 1986:14). Excavation levels interpreted as dating exclusively to the inception of the Rose Spring points, from 30 to 50 centimeters, are bracketed by an obsidian hydration rim range from 5.2 to 5.7 microns (Allen 1986).

### Radiocarbon Dates and the Temporal Placement of Rose Spring Points

Radiocarbon dates from the Rose Spring site support the introduction of Rose Spring arrow points to a time ca. AD 300 to 500 (corrected) rcybp. Two radiocarbon dates are available from the Rose Spring site (Locus A) to evaluate the date of the introduction of arrow points. One date came from the top of a hearth feature in Unit X-1 at 90 centimeters and returned an assay of 1360±70 rcybp (UCR-2535). A nearly identical date was recovered from the bot-

tom of that same hearth feature from Feature 12 in Unit X-2 at 140 centimeters and returned a date of 1400±70 rcybp (UCR 2324). Yohe argues that the 12C/13C ratio of the older date requires a correction (an addition) of some 200 years to 1600 BP. The delta for the uppermost sample was unavailable but assuming both radiocarbon assays date the same event these attributions place this material to 1600 rcybp (ca. AD 350).

Most researchers have followed Bettinger and Taylor (1974) in suggesting that Rose Spring points terminated ca. AD 1300. However, the vertical distribution and chronometric information at the Rose Spring site led Yohe (1992:208-212) to argue that this point type continued in use somewhat later than that date, even persisting into the late prehistoric and possibly historic period. That suggestion is bolstered by materials from a hearth feature that dates to the last 300 or 400 years based on two radiocarbon assays and the fact that this house feature contained both Rose Spring and Desert Series points. Hence the terminal date for Rose Spring points could be as late as AD 1650 or even later.

### Desert Side-notched/Rose Spring Point Index and Numic Population Movements

Delacorte (1995) proposed in an oft-cited paper that the uneven distribution of Desert Side-notched (DSN) points across the Great Basin might suggest that they are a Numic marker artifact. If this artifact could serve as an ethnic signature then it might be used to document the prehistoric and historic migrations of Numic peoples across the Desert West. Rose Spring points and DSNs, along with its companion point form, the Cottonwood type, have

a similar duration. Both DSNs and Rose Spring points are believed to have a longevity on the order of 600 to 700 years. Since on the periphery of the northern and eastern Great Basin Numic time depth is hypothesized to be only a few hundred years it was predicted that DSNs would have only a brief temporal span and would be less frequently represented than the Rose Spring point forms. Corollary with that prediction would be that Rose Spring points in those peripheral areas would have greater duration and be over-represented.

Through an examination of the relative frequency of these two point forms and a review of their obsidian hydration measurements, Delacorte provided persuasive evidence supporting his argument that DSN representation mirrors the movements of the Numic. He documented changing distributions and different hydration metrics that matched his predictions for points from the Owens Valley, northeastern California, northwestern Nevada, and southeastern Oregon. He consistently found far fewer DSNs than Rose Spring points as one moves away from the Owens Valley to the north and east out into the Great Basin.

If the Numic migration into the Coso region occurred as a late expansion from the Owens Valley southward, then one would predict a distinctively different distribution for both Rose Spring and Desert Side-notched points in the Coso region compared to that of the Owens Valley area. Rose Spring points would be over-represented and endure later

than in the adjacent area to the north. Corollary with that manifestation, DSNs would be rarer and under-represented in comparison with Rose Spring points in the Coso region. This overabundance of Rose Spring points, compared with DSNs, may illustrate that the point form endured for a longer interval than the period of DSN use.

Reflecting on Delacorte's studies, he did not evaluate the point distributions in the adjacent regions to the south of the Owens Valley in the Coso region south nor in the Kern Plateau to the west. Hence, I thought it important to first review the data from the Coso region and compare it with the evidence from the Owens Valley. I was surprised to find a very steep drop-off in Desert Side-notched points from that of the Owens Valley to the Coso region (Table 3). In the Owens Valley from 40% (region-wide per Delacorte 1994) to 100% of the total number of Rose Spring points are represented by DSN projectile point frequencies (Table 3). The latter estimate is based on the projectile point inventory exhibited at Lubkin Creek (CA-INY-30) in the Owens Valley, seven kilometers south of Lone Pine (Basgall and McGuire 1988).

In the adjacent upland Kern Plateau (Garfinkel 2007) where no population replacement is suggested, the DSN/Rose Spring point index is similar to the Owens Valley (Table 3). However at the Rose Spring site (Yohe 1992) and in the Coso Volcanic Field region (Gilreath and Hildebrandt 1997) this percentage drops to less than 10%! If Yohe is cor-

Table 3. Proportion of Desert Side-Notched as a percentage of total Rose Spring point assemblage.

Location	Site/Area	Point Form Frequency				Index
		CT	RS	DSN	ELKO	DSN/RS
Owens Valley	Lubkin Creek (INY-30)	51	33	38	27	100%
Coso Range	Rose Spring (INY-372)	16	143	12	41	9.50%
Coso Range	Coso Volcanic Field	10	21	2	41	8.40%
Kern Plateau	Pacific Crest Trail	78	43	41	19	

rect about the late dates for Rose Spring points at the Rose Spring site and the relative percentage of DSNs is an accurate reflection indicative of their late introduction and brief fluorescence, then this might imply that Numic in-migration in the Coso region was a rather late occurrence. Delacorte argues that the regional index of Desert Side-notched points is a highly sensitive and robust indicator of the arrival of Numic people. He suggests that data from central Nevada consistently indicated a one to two century lag in the introduction of the DSN point form. Further, he predicts that the regional index or proportional abundance of DSNs should drop precipitously as soon as one crosses out of the Numic areas into areas outside the historic range of the Great Basin Shoshonean groups.

My studies of the Coso region (Gold 2005, Garfinkel 2007) indicate that there was an enduring presence of pre-Numic (or non-Numic) occupation that antedated the late introduction of Numic people into the area and this occupation was marked by an abrupt population replacement. Bettinger (1994) has argued that the Owens Valley is the Numic homeland and was occupied by Numic speakers for a longer duration than elsewhere in the Great Basin. He further avers that the Owens Valley was the source or heartland from where the Numic migrations initiated. Limited mitochondrial DNA studies appear to support this contention (Kemp, Smith, and Nelson 2004; Garfinkel 2007; see also Kaestle and Smith 2004). Although data is lacking, I would predict that the coefficient of variation (CV) for Rose Spring point obsidian hydration rim values would be less than that of the DSNs at the Rose Spring site and in the Coso region. If this were the case, such metrics would further bolster our suggestion of a population replacement and a late in-migration of Numic intruders into the Coso area. Further studies should clarify the situation and refine the rough estimates presented here.

## Conclusions

Stratigraphic distribution of Rose Spring points from the Rose Spring site support the position that the uppermost meter of deposit is in part a Haiwee Period expression beginning ca. AD 300/500. Consistent Coso obsidian hydration readings within this region at the Rose Spring site, Portuguese Bench site, and Coso Volcanic Field sites indicate that a suite of hydration measurements beginning at 5.7/5.8 microns and ending at 2.6/2.7 microns represents the full range of Coso hydration measurement for Rose Spring points in lowland settings in the Rose Valley terminating ca. AD 1500 to 1600. This information is useful to efforts at properly calibrating obsidian dating equations aimed at providing temporal controls for the ubiquitous Coso obsidian artifacts and debitage found at prehistoric sites throughout the region. If accurate, this temporal span may be indicative of a late in-migration of Numic peoples bringing with them the distinctive Desert Side-notched point form—an hypothesized ethnic marker of Numic migrations.

## References

- Allen, Mark W.  
1986 The Effects of Bow and Arrow Technology on Lithic Production and Exchange Systems: A Test Case Using Debitage Analysis. M.A. Thesis, Department of Anthropology, University of California, Los Angeles.
- Basgall, Mark  
1993 Early Holocene Prehistory of the North Central Mojave Desert. Ph.D. dissertation. Department of Anthropology, University of California, Davis.

- Basgall, Mark E., and Mark Giambastiani  
1995 Prehistoric Use of a Marginal Environment: Continuity and Change in Occupation of the Volcanic Tablelands, Mono and Inyo Counties, California. *Center for Archaeological Research at Davis Publication 12*.
- Basgall, Mark E., and Kelly R. McGuire  
1988 The Archaeology of CA-Inyo-30: Prehistoric Culture Change in the Southern Owens Valley, California. Report on file, California Department of Transportation, District 09, Bishop.
- Bettinger, Robert L.  
1994 How, When, and Why Numic Spread. In *Across the West: Human Population Movement and the Expansion of the Numa*, D. B. Madsen and D. Rhode, editors, pp. 44–55. University of Utah Press, Salt Lake City.
- Bettinger, Robert L., and Martin A. Baumhoff  
1982 The Numic Spread: Great Basin Cultures in Competition. *American Antiquity* 47(3):485–503.
- Bettinger, Robert L., and R. E. Taylor  
1974 Suggested Revisions in Archaeological Sequences of the Great Basin in Interior Southern California. *Nevada Archaeological Survey Research Paper* No. 5:1–26.
- Delacorte, Michael G.  
1994 Late Prehistoric Resource Intensification in the Numic Heartland. Paper presented at the 24th Annual Great Basin Anthropological Conference, Elko, Nevada.
- 1995 Desert Side-notched Points as a Numic Population Marker in the West-Central Great Basin. Paper presented at the 29th Annual Meeting of the Society for California Archaeology, Eureka, California.
- Garfinkel, Alan P.  
2006 Paradigm Shifts, Rock art Studies and the “Coso Sheep Cult” of Eastern California. *North American Archaeologist* 27:203–244.  
2007 Archaeology and Rock Art of the Eastern Sierra and Great Basin Frontier. *Maturango Museum Publication* 22. Maturango Press, Ridgecrest, California.
- Garfinkel, Alan P., and J. Kenneth Pringle  
2004 Dating the Rock Drawings of the Coso Range: Projectile Point Petroglyphs in *American Indian Rock Art* Volume 30, J. T. O’Connor, editor, pp. 1–14. American Rock Art Research Association, Tucson.
- Gilreath, Amy J., and William R. Hildebrandt  
1997 Prehistoric Use of the Coso Volcanic Field. *Contributions of the University of California Archaeological Research Facility* No. 56. University of California, Berkeley.
- Gold, Alan P.  
2005 Linguistic Archaeology: Prehistoric Population Movements and Cultural Identity in the Southwestern Great Basin and far southern Sierra Nevada. Ph.D. dissertation, Department of Prehistoric Forager Ecology, University of California, Davis.
- Grant, Campbell  
1968 Rock Drawings of the Coso Range, Inyo County, California. *Maturango Museum Publication* 4, China Lake.

- Grayson, Donald K.  
1991 Alpine Fauna from the White Mountains, California: Adaptive Change in the Late Prehistoric Great Basin? *Journal of Archaeological Science* 18:483–506.
- Hall, Matthew C.  
1992 Final Report on the Archaeology of the Tiefert Basin, Fort Irwin, San Bernardino County, California. Report on file with the Eastern California Information Center, Department of Anthropology, University of California, Riverside.
- Justice, Noel D.  
2002 *Stone Age Spear and Arrow Points of California and the Great Basin*. Indiana University Press, Bloomington.
- Kaestle, Fredrika A., and David G. Smith  
2001 Ancient Mitochondrial DNA Evidence for Prehistoric Population Movement: The Numic Expansion. *American Journal of Physical Anthropology* 115:1–12.
- Kemp, Brian M., David G. Smith, and Wendy J. Nelson.  
2004 DNA Analysis of Ancient Coprolites from Fish Slough Cave. Poster presented at the Great Basin Anthropological Conference.
- Lanning, Edward P.  
1963 Archaeology of the Rose Spring Site (INY-372). *University of California Publications in American Archaeology and Ethnology* 49(3):237-336. Berkeley.
- McGuire, Kelly R., Alan P. Garfinkel, and Mark E. Basgall  
1982 Archaeological Investigations in the El Paso Mountains of the Western Mojave Desert: The Bickel and Last Chance Sites, CA-Ker-250, -261. Report on file, Ridgecrest Resource Area, Bureau of Land Management, Ridgecrest.
- Thomas, David H.  
1981 How to Classify the Projectile Points from Monitor Valley, Nevada. *Journal of California and Great Basin Anthropology* 3(1):7–43.
- Williams, Audry  
2004 Subsistence Patterns in the Northwestern Mojave Desert: At Freeman Springs (CA-KER-6106). Paper presented at the Great Basin Anthropological Conference, Sparks, Nevada.
- Yohe, Robert M., II  
1992 A Reevaluation of Western Great Basin Cultural Chronology and Evidence for the Timing of the Introduction of the Bow and Arrow to Eastern California Based on New Excavations at the Rose Spring Site (CA-INY-372). Ph.D. Dissertation, Anthropology Department, University of California, Riverside.  
1997 The Introduction of the Bow and Arrow and Lithic Resource Use at Rose Spring (CA-INY-372). *Journal of California and Great Basin Anthropology* 20(1):26–52.  
2000 “Rosegate” Revisited: Rose Spring Point Temporal Range in the Southwestern Great Basin. In, *Archaeological Passages: A Volume in Honor of Claude Nelson Warren*, edited by Joan S. Schneider, Robert M. Yohe, II, and Jill K. Gardner, pp. 213–224. Western Center for Archaeology and Paleontology, Hemet.