

*Indian Writing Waterhole
and Tom's Spring:
Two Central Idaho Petroglyph Sites
in the Great Basin Tradition*



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Indian Writing Waterhole and Tom's Spring are two petroglyph sites at the northern edge of the Great Basin. They are representative of many similar petroglyph sites located at water sources in an area of exposed basalt lava flows in the Bennett Hills of Idaho. Although dominated by ancient curvilinear and geometric abstract designs, there are also petroglyphs of more recent origin. Documentation of these two sites included obtaining cation-ratio ages and varnish microlamination (VML) ages of several elements. An additional discovery included the identification of quartz crystals embedded in a scratched pattern superimposed over a pecked motif.

Indian Writing Waterhole (IWWH) and Tom's Spring are two petroglyph sites at the northern edge of the Great Basin. They are located in an area of ancient lava basalt flows in the Bennett Hills area of south central Idaho, west of Craters of the Moon National Park (Figure 1). The primary motifs at these sites appear to be part of the Great Basin Rock Art Tradition.

Pictographs and petroglyphs from this area of basalt cliffs, flow surfaces and lava tube caves show a unique distribution. Pictographs are found almost exclusively in caves formed when lava continued to flow in its interior thus creating a tube, while petroglyphs are found only in above ground settings. Pictographs are generally thought to be Late Archaic to Late Prehistoric in age

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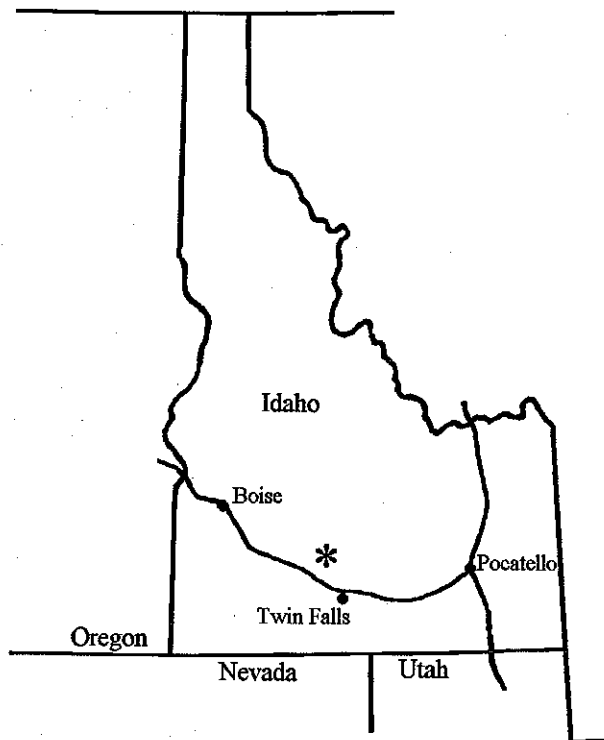


Figure 1. Map of south central Idaho. Star indicates general location for IWWH and Tom's Spring.

(Pavesic and Studebaker 1993), but we have found that petroglyphs at these sites can be significantly older, ranging from Early Archaic (approximately 8500 calendar years BP) to Late Prehistoric.

Indian Writing Waterhole and Tom's Spring are representative of many similar petroglyph sites located at water sources and springs in the Bennett Hills. Although dominated by ancient Great Basin curvilinear and geometric abstract designs, there are also pecked, incised, and scratched petroglyphs.

INDIAN WRITING WATERHOLE

Indian Writing Waterhole, 10-GC-30, was first reported in *Indian Rock Writing in Idaho* (Erwin 1930). The site is located in an ancient streambed and falls that cuts across ancient basalt lava flows (Figure 2). Camas (*Camassia quamash*) and other edible plants grow in the drainages of the rocky terrain.

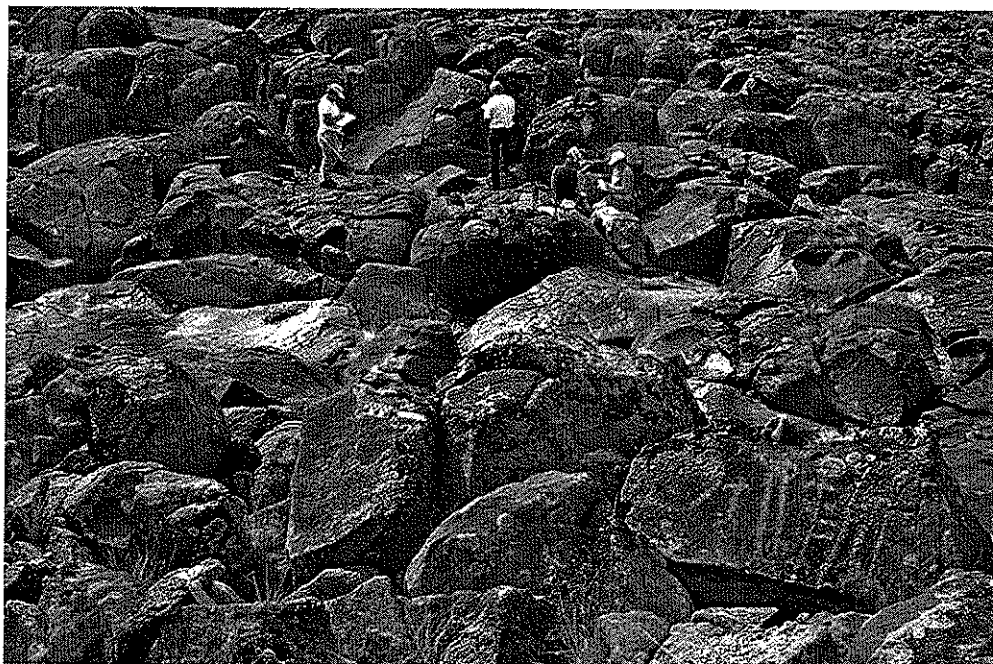


Figure 2. Recording petroglyph boulders above the falls at IWWH.

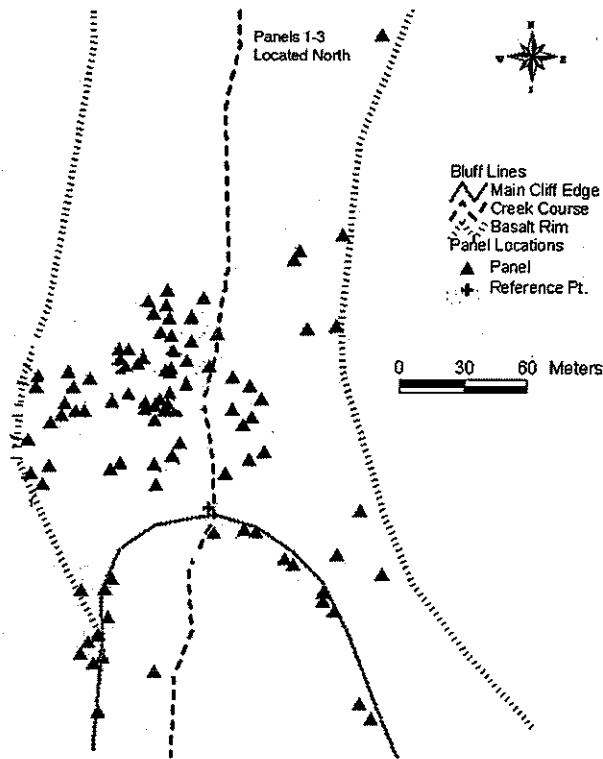


Figure 3. View below cliffs at IWWH. Dark staining indicates area of seasonal falls.

Remains of several hunting blinds have been recorded. The cliffs form an alcove with acoustic properties (Figure 3). Water collects in a small pool below the falls during spring run-off and heavy rains. Local historians noted that the location was a favorite camping place and rock art site of the local Indians into the 1920s. These histories mention the sheep and cattle grazing in the Bennett Hills and throughout this country (Bard 2000, 2005). One example of graffiti at the site has the Basque phrase “Gora Euskadi” (Long live independent Basque Country) written with a swastika probably by a Basque sheepherder (Merrell 2007).

The rock art at Indian Writing Waterhole consists exclusively of petroglyphs

concentrated in a depressed area near the cusp of the falls and scattered on the east-facing cliff faces along the lower cliffs to the west and just east in the alcove area (Figure 4). There is one outlier location with eight petroglyph panels east of the falls alcove and another outlier site about a half mile west of the alcove at the place of a small seep. On the top of the falls the greatest concentration of petroglyphs are found on the west side facing east. There were 20 panels of petroglyphs recorded on the east side of the stream channel compared to 60 panels on the west side. The density of petroglyphs decreases dramatically moving away from the edge of the falls to the north.



The petroglyphs are found on flat “floor” rocks, boulders and basalt bedrock steps that rise from the stream bed (Figure 5). Most of the rocks are covered with rock varnish and there is some indication of superimposition on several panels with the earlier revarnished art covered by later fresher pecking (Figure 6). The petroglyphs were executed in a variety of ways. Most were pecked with a stone tool leaving deeper grooves and peck marks than the abraded glyphs that barely penetrate the black varnish. Some panels have been scratched over while a few consist exclusively of scratched or incised patterns.

Figure 4. Map showing petroglyph panel locations at IWWH.



Figure 5. Example of petroglyphs on variety of rock surfaces at IWWH.



Figure 6. IWWH. Example of superimposition and scratches on one panel.

TOM'S SPRING

Tom's Spring topography is very different from Indian Writing Water Hole, although this site also had camas and other edible plants in the immediate vicinity. This recently discovered site has yet to be thoroughly documented.

It is a much smaller site with no steep cliffs; rather, the petroglyphs are congregated on varnished basalt surfaces around a seep or small pond where the water would drain from the sloping terrain (Figure 7). Lack of graffiti and unvarnished petroglyphs suggest this site has not been used for petroglyph manufacturing recently. Isolation of the locale away from any known trails may have helped preserve this site. Several petroglyphs were selected for possible dating because the

pecking here is heavily revarnished and elements resemble the typical curvilinear abstract pecking traditionally found in the Great Basin petroglyphs of Nevada and eastern Oregon (Francis 2001).

PETROGLYPH TYPOLOGY

The rock art elements present at Indian Writing Waterhole and Tom's Spring are consistent with the Great Basin Rock Art Tradition, although the sites are just north of the of the Snake River Plain physiographic province. Great Basin rock art styles have traditionally been named on the basis of the techniques employed in making them, combined with element inventories. Although some postulated that the earliest form of Great Basin rock art is the Pit and Groove style

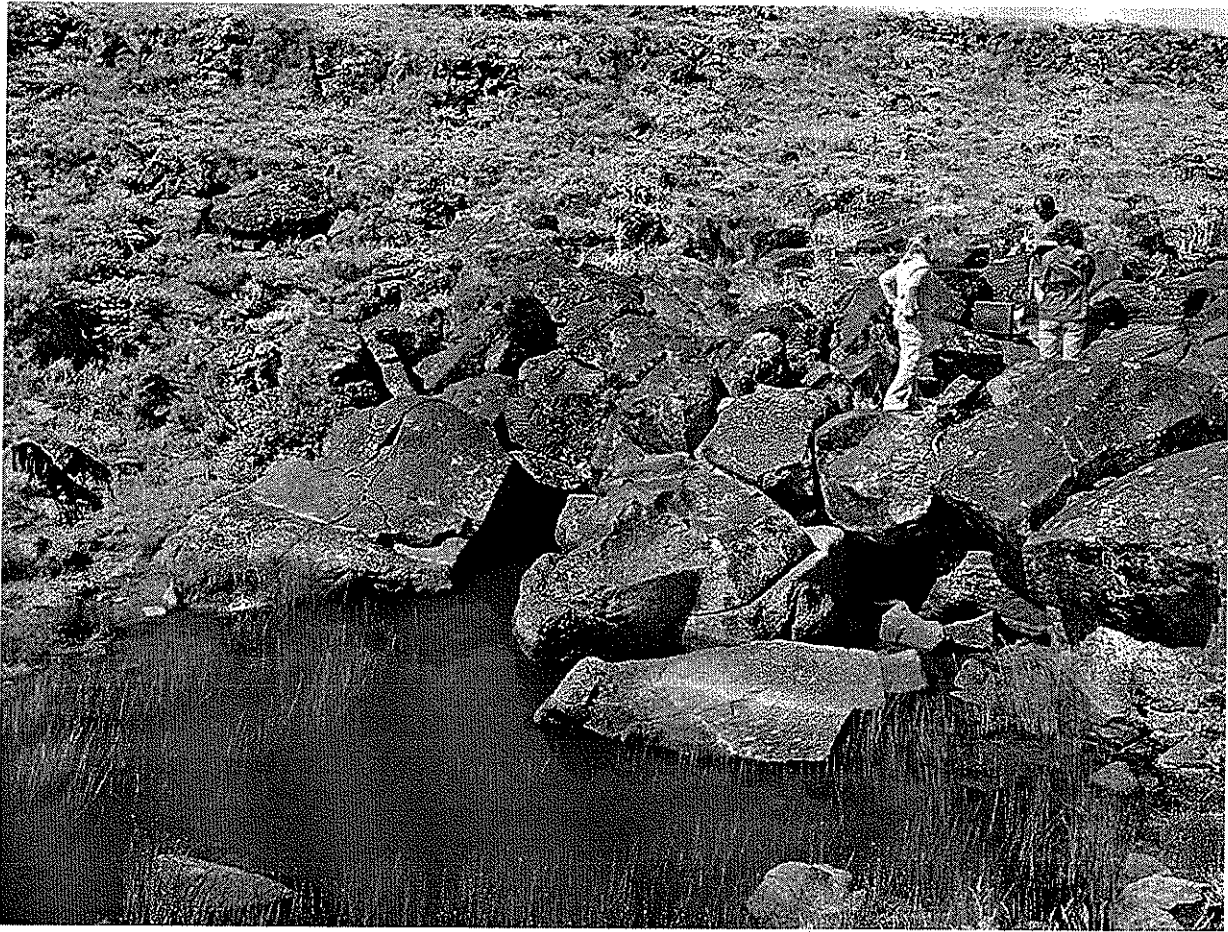


Figure 7. Overview of Tom's Spring.

(Schaafsma 1986:215), objective dating analyses have found that most of the different Great Basin styles have considerable chronologic overlap (e.g. Whitley et al. 1999).

The Pit and Groove style is found throughout the Great Basin. In Idaho it is especially prevalent along the banks of major rivers such as the Salmon and Snake (Merrell 2002). The Pit-and-Groove style can cover rock surfaces in random depressions or pits an inch or two in diameter, although in some places they are much larger. At some sites groves connect the rounded depressions. Although Schaafsma (1986: 216) asserted early

archaic dates for this style, no objective data were presented to support this perspective.

The Pecked Abstract rock art tradition dominates and characterizes the Great Basin area. This tradition can be broken down into Curvilinear Style and Rectilinear styles. The Curvilinear style is typified by the presence of circles, concentric circles, circle chains, sun disks (or rayed circles), the curvilinear meander, wavy lines or snakes, and star figures. The Rectilinear style is characterized by dots, rectangular grids, bird tracks, rakes, and crosshatchings (Schaafsma 1986:216).

Another style is the Great Basin Scratched that was made by a sharp rock used to inscribe lines in a single stroke. Subject matter consists of straight lines, and crosshatching. Usually found over earlier glyphs, such motifs can also be found as freestanding designs (Heizer and Baumhoff 1962).

Recently, an additional Great Basin style has been defined by Cannon and Ricks as Great Basin Carved Abstract (Cannon and Ricks 1999). They describe it as a deeply carved glyph with designs up to an inch deep. They state that the art has a "bas relief" effect. Their evidence suggests it is one of the earliest Great Basin petroglyph styles (Cannon and Ricks 2007).

Finally, there is the Great Basin Representational style, which is often commingled with the other geometric abstract styles. Examples include recognizable elements such as atlatls, bows, hands, feet, birds, tracks, lizards, mountain sheep, stick figures and stylized anthropomorphic or zoomorphic forms. Plew (1996) provides a good summary of rock art elements and styles for three localities in southern Idaho. Many of the elements he describes are found at both IWWH and Tom's Spring located north of the Snake River Plain.

DATING THE PETROGLYPHS

When Archaeographics recorded Indian Writing Waterhole for the Shoshone District, Bureau of Land Management (Merrell 2007), funds were earmarked to attempt dating a few glyphs using cation-ratio dating and varnish microlamination (VML) dating. In the spring of 2007 the second author sampled millimeter-size varnished chips from several petroglyphs as well as taking control samples from beside

the petroglyphs at both Indian Writing Waterhole and Tom's Spring (Dorn and Merrell 2006, 2007). One scratched pattern from IWWH was also sampled. In all, we collected samples from eight petroglyph elements at IWWH and seven from Tom's Spring. The cation-ratio (Dorn 2007) results are more experimental, because the calibration used is a bit distant from the petroglyph sites (Kuntz et al. 1988). However, the method is valuable because it provides a second chronometric perspective that is very useful for isolating any systematic bias in the VML patterns.

The most reliable results come from the VML method (Liu, 2008), where Tanzhuo prepared and analyzed over ten thousand microsedimentary basins. The premise of the method is that the pattern of black, orange and yellow varnish laminations relate to regional climatic change. These patterns have been calibrated where Liu collected varnishes from an extensive sequence of sites with known age. This is a revolutionary method for petroglyph dating in the western United States.

The key advance permitting our research was presented by Liu and Broecker (2007), who published a calibration for the pattern of rock varnish microlaminations for the Holocene in the western United States. This calibration has profound significance for placing petroglyphs in age classes.

We also used lead-profile dating (Dorn 2006). This robust method has been replicated by four different research groups, all of whom have found that 20th century varnishes have a spike in lead and other anthropogenic heavy metals. This technique only determines if a petroglyph pre-dates the 20th century by measuring if the lead concentration goes down to natural background levels underneath the

Table 1. Dating results completed in this study, organized from youngest to oldest.

Site	Petroglyph	Age in calendar years before present	Method
Indian Writing Waterhole	Scratch Glyph	350	VML
Indian Writing Waterhole	Foot	Older than 20 th century	Lead-profile dating
Tom's Spring	Circles	1400	VML
Indian Writing Waterhole	Shield Figure	1300±400	Cation-ratio dating
Tom's Spring	Wave Rock	Between 5900 and 6500	VML
Indian Writing Waterhole	Shield Figure	5700±800	Cation-ratio dating
Tom's Spring	Wave Rock	6500	VML
		6900±1200	Cation-ratio dating
		Between 8100 and 9400	VML
		8500±1400	Cation-ratio dating

20th century spike in the surface layers of varnish.

DATING RESULTS

After optical and scanning electron microscopic (SEM) examination of the samples to determine feasibility for dating, Dorn and Merrell prioritized and selected samples from each site to pursue dating techniques using cation-ratio and VML analysis. Separate tests that including lead profile-dating and electronic dispersive spectroscopy (EDS) were performed on a sample taken from a scratched petroglyph panel at Indian Writing Waterhole. Table 1 summarizes our age results. The rest of this section provides additional insight.

INDIAN WRITING WATERHOLE AGES

The probable shield motif (Figure 8) was selected for dating because it appeared to be heavily revarnished and dating a shield would provide a chronological context for the presence or use of shield technology in this area. The result of the

VML dating showed a complex series of varnish Holocene layers and yielded a VML age of approximately 6500 calendar years B.P. This interpretation is based on finding the WH7 (Wet Holocene 7) black layer at the bottom of two different VML sequences, where the WH7 lamination has a calendar age of 6500 years B.P. This age is in statistical overlap with the cation-ratio age of 6900±1200 (1 sigma error).

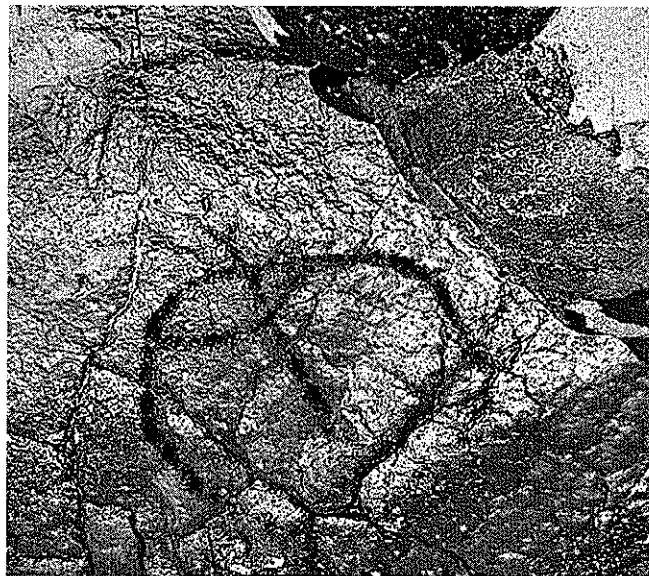


Figure 8. IWWH. Shield motif dated to minimum age of 6500 calendar years B.P. Shield design enhanced by stippling on the photograph for better recognition.

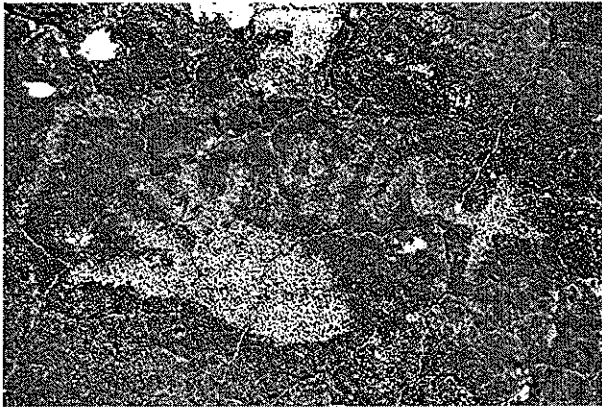


Figure 9. IWWH. Foot motif dated at a minimum of 1300 calendar years B.P.

The foot motif was selected, because it was not heavily varnished but is a representational motif frequently found throughout Great Basin and southwestern rock art. The cation-ratio age for this petroglyph (Figure 9), using the calibration from Craters of the Moon, yielded a minimum age of 1300 ± 400 calendar yrs B.P. corresponding with the VML age of 1400 calendar years with the WH3 lamination at the base of two different VML sequences.

Our results for the scratched motif (Figure 10) may be the first objective dating of this style. Lead-profile dating revealed that the varnish was definitely pre-20th century in age, because lead concentrations dropped to background levels. The VML sequence indicated that there was no WH1 (Little Ice Age) microlamination. Thus, we constrain the age of this motif to be between 100 and 350 calendar years before present.

Our thin section observations, however, were startling. First, we could observe the erosional unconformity created by incomplete scratching of the pre-existing varnish. The scratching clearly abraded away only part of the varnish, and we observed accretion of the new varnish on top of this abraded surface. Even more startling, we observed a quartz



Figure 10. IWWH. Scratch from this panel was dated to between 100 and 350 calendar years B.P.

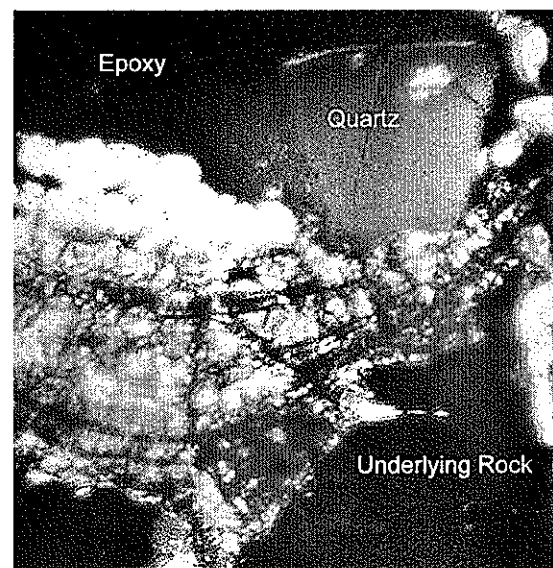


Figure 11. One rock chip from the scratched petroglyph, captured a fragment of the quartz tool used to manufacture the petroglyph.

particle imbedded in rock varnish (Figure 11). The quartz composition was indicated by an energy-dispersive analysis showing only Si. Thus, the scratching was probably done by a quartz tool. The sequence of events recorded in this ultra-thin section started with exposure of the underlying rock through natural erosion of the basalt. Then, rock varnish formed on the eroded surface. The scratched groove did not completely remove the pre-existing rock varnish, and a quartz fragment broke off from the engraving tool.

The implications for the use of quartz tools to create the scratched patterns could be significant because quartz is not commonly found in the immediate vicinity. While quartz can be found as a minor mineral in some basalts, we did not see any quartz in the local area in the lava flow. This would indicate that

the tool was carried to the site with the possible intention of using it for marking on a rock surface. It appears that the defacement of the earlier petroglyph was intentional for reasons known only to the artist, but the use and religious significance of quartz by indigenous people, particularly for religious purposes, in the western United States has been well documented in prior research (Whitley 1994, Whitley et al. 1999).

TOM'S SPRING

Wave rock containing the sampled petroglyphs was so named because the pecked lines seemed to follow a wave pattern over the top of the rock (Figure 12). The wave petroglyph was selected for dating, because it was heavily revarnished and bears a striking

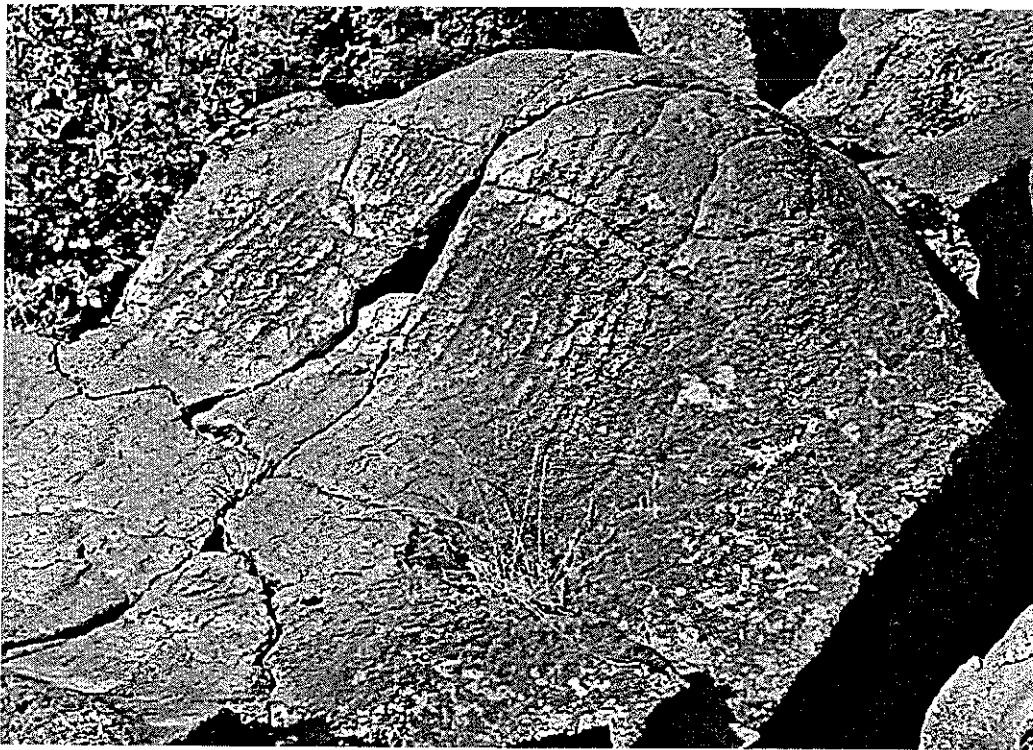


Figure 12. Tom's Spring, Wave rock selected for dating.

style petroglyphs (Figure 13) from Long Lake, Oregon (Cannon and Ricks 2007), which has a previously established minimum age of approximately 6800 years B.P. The cation-ratio age for the Wave rock petroglyph, using the calibration from Craters of the Moon, is a minimum age of 8500 ± 1400 yrs B.P. Two VML sequences from the wave rock petroglyph indicate that the varnish formed on top of the engraved surface is younger than the 9400 WH10 VML and older than the 8100 WH9 VML. The reader should be aware that since the Long Lake petroglyph is a minimum age, it could also be as old as the date for the Wave Rock petroglyph.

The concentric circles pecked around a natural “cupule” in the rock’s surface was the second motif sampled at Tom’s Spring (Figure 14). The sampled circles, while looking very old, were on a surface that was smoother, reddish, and more polished than the typical



Figure 13. Line drawing of buried petroglyph panel from Long Lake, Oregon. Drawing by Mary Ricks (Ricks 1995).

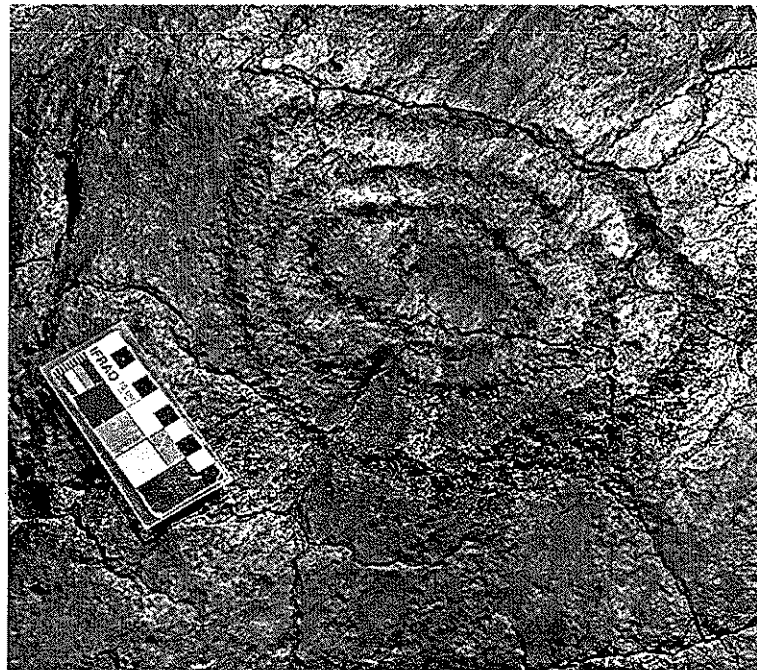


Figure 14. Tom’s Spring. Concentric circles dated at a minimum of 5700 calendar years B.P. Pecking stippled on photo for better visibility.

grey/black basalt common to the other petroglyph surfaces. The cation-ratio age for the circles, using the calibration from Craters of the Moon, provided a minimum age of 5700±800 calendar yrs B.P. (Dorn 2007). The VML age is older than the 5900 WH6 lamination and younger than the 6500 calendar year WH7 lamination.

DISCUSSION AND CONCLUSION

This paper presents the first objective dating of scratched-style petroglyphs, revealing that at least one was manufactured between 100 and 350 calendar years before present through using quartz — a mineral known to have significant religious implications (Whitley et al. 1999). Using two different dating methods of varnish microlaminations (VML) and cation-ratio dating, we determined that the Indian Writing Waterhole site was used, perhaps intermittently, between 350 and 6500 calendar years before present. In contrast, our data only reveal ages older than 5000 calendar years for two motifs collected from Tom's Spring.

The most heavily revarnished elements at Indian Writing Waterhole and Tom's Spring are stylistically similar to many Great Basin styles found further to the south and west in Nevada and Oregon. Our age for the shield element from Indian Writing Waterhole is approximately 6500 years BP. This is considerably earlier than a radiocarbon date of AD 1104 associated with a rock art panel of shield-bearing warriors in south central Montana (Loendorf 1990:45). Classic full body shield figures are commonly found in the Rocky Mountain and Great Plains regions of the west (Grant 1967:61; Keyser and Klassen 2001), but shield figures are also found

throughout Idaho, Nevada and southeastern Oregon (Boreson 2007). Shield figures, especially the prehistoric, large body shields are found in Hells Canyon on the Snake River in west central Idaho (Leen 1988:94,72), the Middle Fork of the Salmon River (Merrell 2004), the main Salmon River in east central Idaho (Boreson 1998:615), the Camas Creek drainage in southwestern Idaho (Plew 1976:112), and at numerous sites in eastern and central Idaho (Merrell 1999, 2003, 2004, 2004a, 2005, 2005a, 2006, 2007, 2007a).

There are several other shield figures besides the dated presumed shield at Indian Writing Waterhole. However, none have the heavy varnish coating of the dated shield. Most of these are very simple in execution in that they consist of a shield with the stick body of a person on the shield in x-ray fashion. The head extends above the shield on the body which may or may not have arms and legs. Some of these shield bearers may hold a weapon or have a headdress of some sort. This is simple x-ray shield bearer design is typical of others found at rock art sites throughout this general area (Merrell 2003, 2004a, 2005a, 2007, 2007a).

Although shield figures on the Plains span AD 1000 – Historic times, on the Colorado Plateau and Great Basin, they may be considerably earlier and are attributed to the Fremont (Keyser 1975). They are found in pictographs as well as petroglyphs. Our early date for this simple Idaho shield from IWWH should contribute to future discussions and research regarding the earliest origins and pathways of diffusion of the shield bearing warrior.

The earlier VML and cation-ratio ages for Tom's Spring engravings of ca 5,700 and ca 8,500 calendar years B.P. compares favorably

with a minimum date of approximately 6,800 years B.P. for similar motifs reported by Cannon and Ricks for a site in the Warner Valley, Oregon (Cannon and Ricks 1999). Their age was determined by the fact that the image was overlain by an air-laid volcanic ash lens that came from the eruption of Mt. Mazama in approximately 6800 years B.P.

An examination of the buried Great Basin Carved Abstract style petroglyph elements from Long Lake showed that they are very similar in style to those found at Tom's Spring. This favorable comparison of Great Basin Carved Abstract styles at the Long Lake and Tom's Spring sites, and the middle to lower Holocene ages, tends to confirm the presence of a quite early rock art style in this region and extends the Great Basin cultural area into north central Idaho, north of the Snake River Plain. This extension is further north than many archaeologists previously thought.

There is a growing corpus of petroglyphs that are known to be at least early Holocene in age, including Warner Valley, Oregon (Cannon and Ricks 1999), Paleo-Indian ages in the Black Hills (Tratebas 1993), a minimum age of 11,000 years B.P. for a petroglyph panel at Buffalo Eddy, Washington (Dorn and Merrell 2006), but the earliest known ages come from the Mojave Desert (Whitley et al. 1999). The minimum age for Tom's Spring, supported by independent comparative evidence, continue to illustrate substantive early Holocene engravings in North America. Further recording and research of the numerous petroglyph sites found on the basalt lava formations of central Idaho will contribute to a clearer understanding of the northern Great Basin cultural and stylistic boundary.

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