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Microwear Analysis of the Lithic Assemblage at the Rosenberger Site

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For several decades, microwear analysis has been applied to a variety of flaked stone artifacts. These studies have attempted to ascertain the function of specific flaked stone tools. This study applies microwear analysis to flaked stone artifacts recovered from a burial site in western Idaho. The purpose of this study is to determine if the artifacts recovered from the Rosenberger site (10-PE-29) were burial specific; that is, produced and used for ceremonial purposes only.

OVER the past three decades, microwear analysis of prehistoric flaked stone tools has become a standard procedure in lithic research (Yerkes and Kardulius 1993). One common approach is the determination of use-wear patterns exhibited on flaked stone margins. The current study applies this approach to the Rosenberger site (10-PE-29) assemblage from western Idaho. The Rosenberger and related sites are located in the central portion of western Idaho (Fig. 1) and constitute what is formally identified as the "Western Idaho Burial Complex" (Pavesic 1985). Pavesic's (1985, 1992) definition was based on shared burial patterns, ritual interment practices, and distinctive associated artifacts.

The Rosenberger collection provides a unique opportunity to study edgewear. The flaked stone tools are part of a single archaeological assemblage (Clarke 1985), although the site likely experienced multiple interment episodes. Furthermore, the artifacts were enclosed in glass frames soon after recovery, minimizing long-term curation damage. The overall objective of this study is to test Pavesic's (1992:290) assertion that the interred turkey-tail points, stemmed points, and cache bifaces were burial specific and appear "as fresh as if made yesterday."

SITE DESCRIPTION

The Rosenberger site is located on a sandy knoll 1.3 km. east of New Plymouth, Idaho, along the southern terrace of the Payette River. In 1962, Fred Rosenberger discovered the site during land modification. Firsthand reports relevant to the site have come from residents in the area who witnessed the excavation of the pit, which was approximately three meters in diameter. Arment (1968:2) noted that

> The human skeletal remains were not articulated. In fact, within the whole interment scarcely a bone fragment was found over six inches in length. It appeared that here were parts of three, maybe more, human skeletons.

No osteological analysis was performed at that time, and the human remains were either lost or reburied at an undisclosed location. Obsidian hydration data suggest that the site dates between about 4,100 and 4,450 B.P. (Pavesic 1985:77). Based on comparable sites and tool morphology, Pavesic (1985:78) suggested that the site may be considerably older. A subsequent limited test

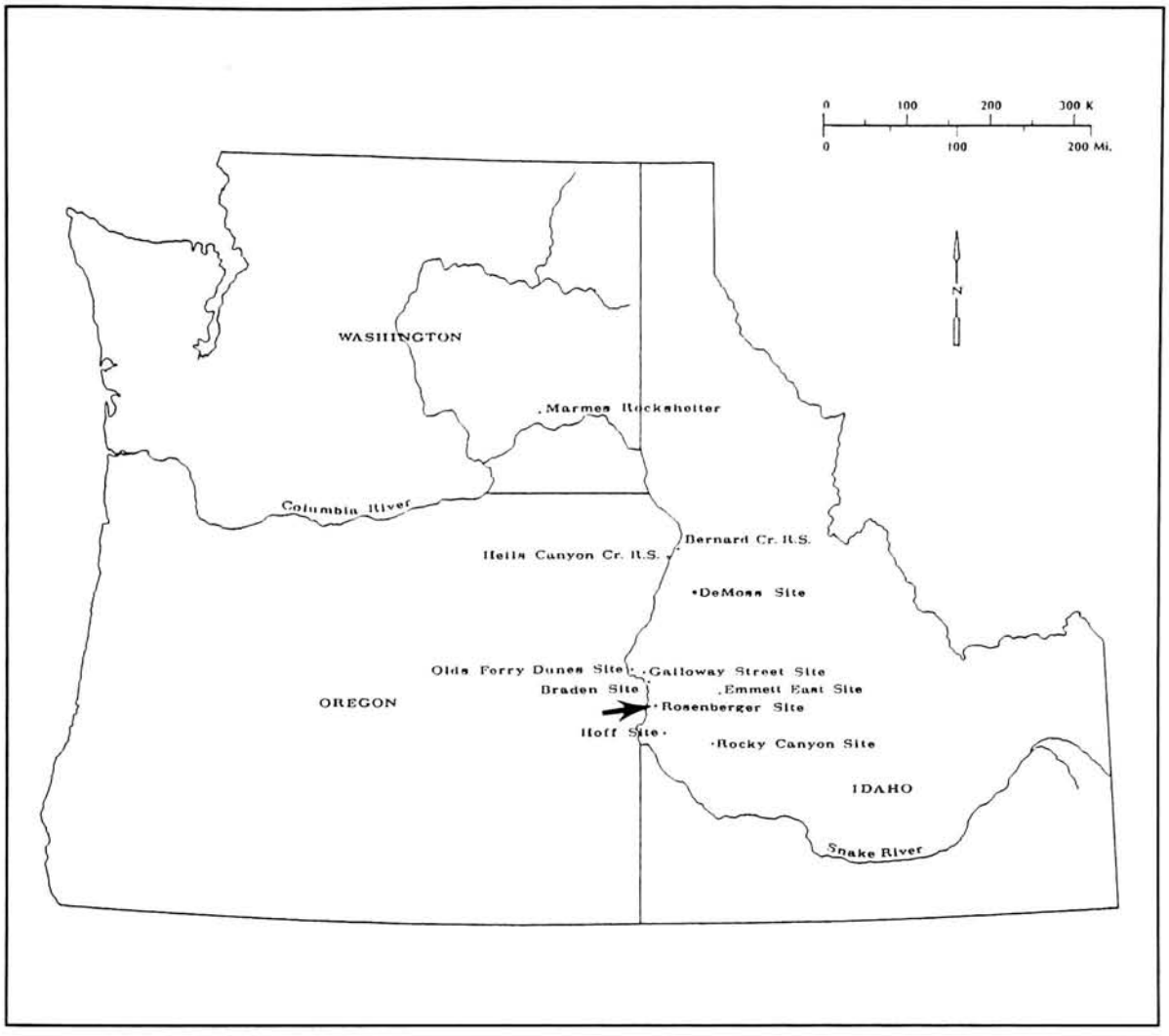

Fig. 1. Location map of the Rosenberger site (10-PE-29).

(Pavesic 1990), adjacent to the original findings, yielded no further materials.

The location and artifact assemblage are consistent with other Western Idaho Archaic Burial Complex finds (Pavesic 1985), including preferred burial locations, distinctive turkey-tail points, preform caches, cache bifaces, side-notched and Cascade points, and the use of red ochre, along with several other observed traits.

ARTIFACT INVENTORY

The lithic assemblage from the Rosenberger site (Table 1) consists of 131 flaked stone tools produced from a variety of materials, including microcrystalline silicates (MCS), obsidian, and basalt. In total, basalt makes up 1%, MCS 21%, and obsidian 78% of the flaked stone assemblage. The turkey-tail points and cache bifaces are primarily made of MCS, some exhibiting signs of thermal alteration. Obsidian was used almost exclusively for preforms and large side-notched points. Typologically, artifacts were grouped into six basic categories. Classes included turkey-tail points (n = 8) (Fig. 2), cache bifaces (n = 20) (Fig. 3), large side-notched projectile points (n = 5) (Fig. 4), trian-

Table 1
ATTRIBUTES OF THE LITHIC ASSEMBLAGE FROM THE ROSENBERGER SITE (10-PE-29)

		Material			Size Range (in cm.)			
Artifact	**Count**	**Obsidian**	**Basalt**	**MCS***	**Length**	**Width**	**Thickness**	**Weight Range (in g.)**
turkey-tail points	8	1	0	7	6.9-15.5	3.2-7.4	0.6-1.2	14.5-128.0
cache bifaces	20	3	1	16	4.6-25.6	2.4-9.4	0.6-1.2	6.7-221.0
large side-notched points	5	5	0	0	3.1-7.0	1.8-2.5	0.4-0.6	2.2-8.2
preforms for side-notched points	94	91	1	2	2.9-7.1	2.2-4.1	0.5-1.1	2.9-34.6
stemmed point	1	0	0	1	19.2	5.3	1.1	99.8
basal notched point	1	0	0	1	10.2	7.0	0.9	59.8
exhausted cores	2	2	0	0	5.2-6.6	3.8-5.2	1.5-1.8	52.8-30.5
Total	131	102 (78%)	2 (1%)	27 (21%)				

* MCS = Microcrystalline silicates.

gular preforms for side-notched projectile points (n = 94), stemmed points (n = 1) (Fig. 5), and basal notched points (n = 1). Typologies follow Muto (1971) Green et. al. (1986), and Pavesic et. al. (1993). Two exhausted cores were also recovered.

METHODOLOGY

The method of use-wear analysis employed for this study was based upon studies performed by Semenov (1964), Tringham et. al. (1974), and Keeley (1980). Low-power methods used magnification below 100X, with high power methods implementing 100X to 400X magnifications. Inferences were made primarily on the basis of polishes and/or striations present on flaked stone tools. Polishes and striations provided the basis for determining kinematics, as well as the portion of the tool used.

Initial observations were performed on a macroscopic level to determine if any obvious signs of wear were present. Following this examination, an Olympus stereoscopic microscope, Model 5051, with an external light source, was used. Magnifications of 14X, 20X, 30X, 60X, and 80X were employed for low-power observations and 240X for high-power observations. All bifaces and turkey-tail points, as well as a random sample of 20 preforms, were examined at low-power magnification.

To ensure that low-power observations were accurate, selected pieces thought to show signs of wear were compared with implements exhibiting no signs of wear or damage. The technique used was a high resolution computer enhancement system with magnifications up to 240X. At increased magnification, striations and polish became more evident on the turkey-tail point shown in Figure 6 (Cat. No. R2). There were no new signs of wear. The computer enhancement system provided excellent photomicrographs of this point (Fig. 6).

RESULTS

A collection of 55 flaked stone artifacts, which included eight turkey-tails, 20 cache bifaces, one basally notched point, one stemmed point, five large side-notched projectile points,

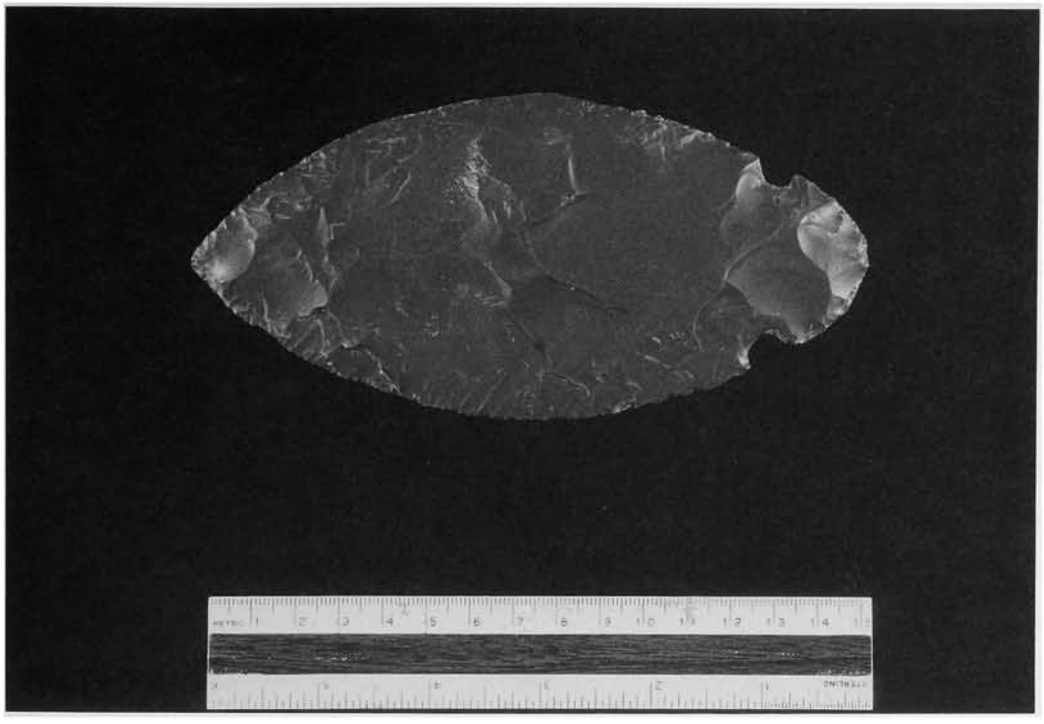

Fig. 2. Turkey-tail point in the collection from the Rosenberger site.

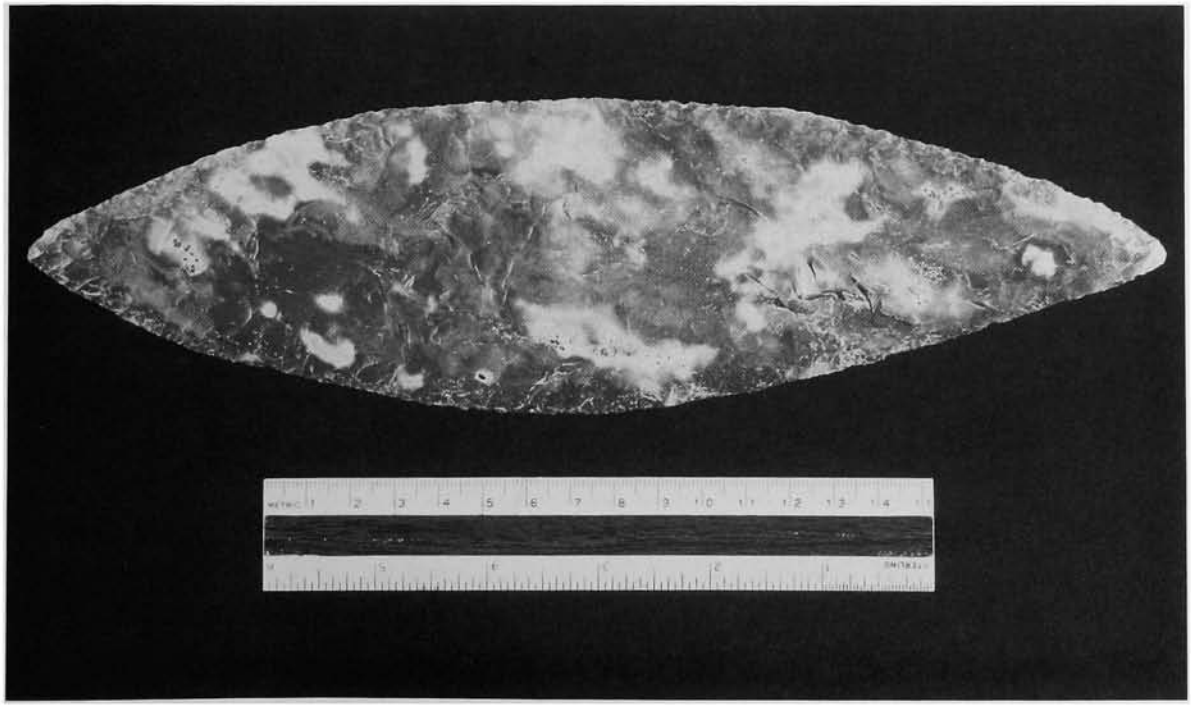

Fig. 3. Cache biface in the collection from the Rosenberger site.

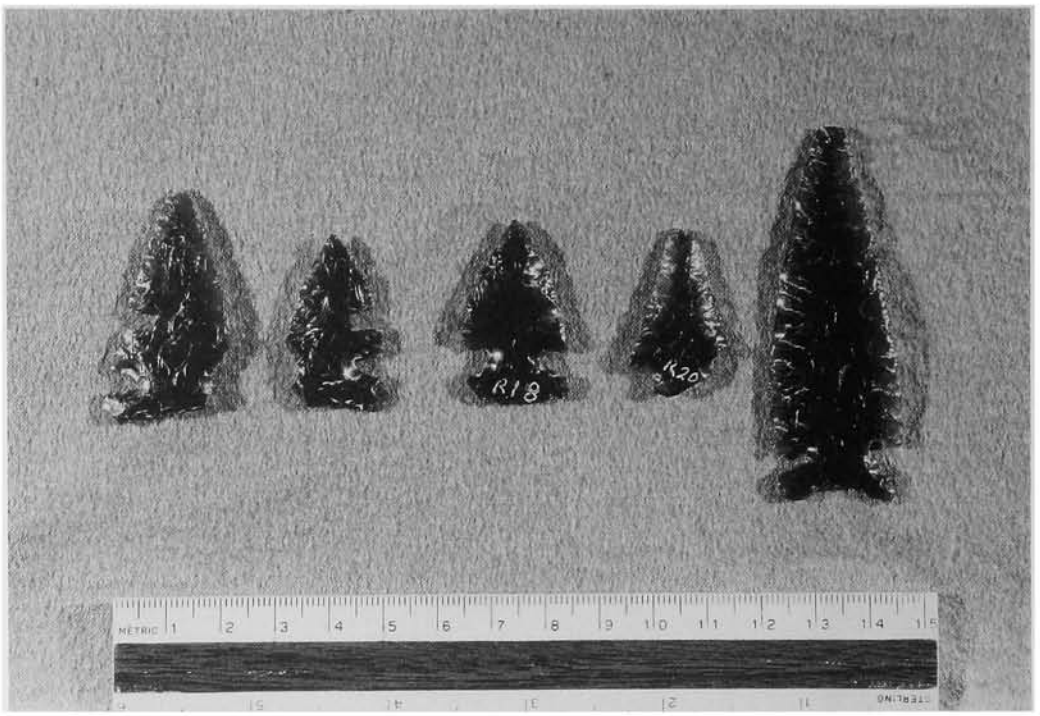

Fig. 4. Large side-notched projectile points in the collection from the Rosenberger site.

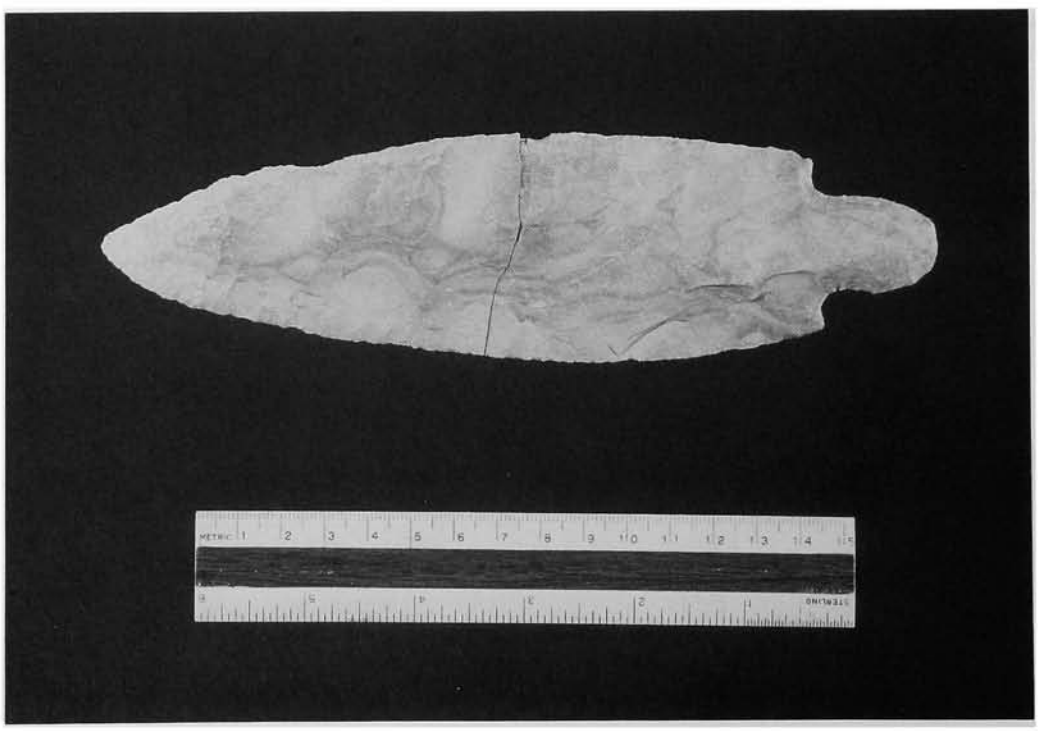

Fig. 5. Stemmed point in the collection from the Rosenberger site.

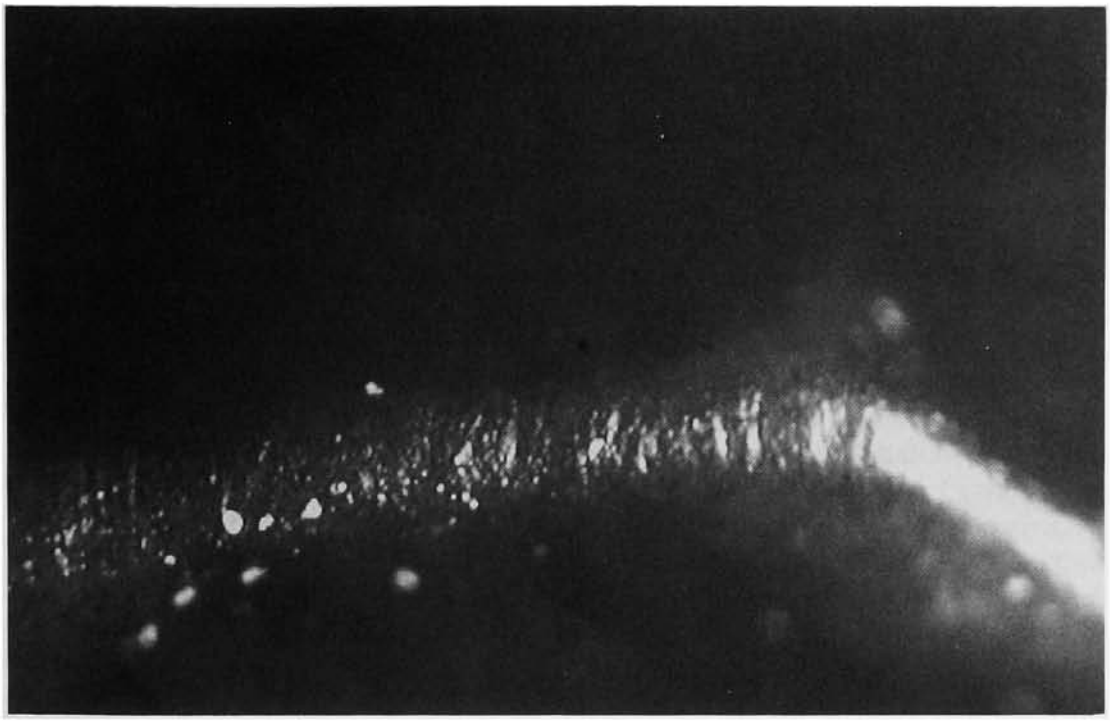

Fig. 6. Photomicrograph (240X) of striations on turkey-tail point (Cat No. R2) in the collection from the Rosenberger site.

and a random sample of 20 preforms, was examined. Two (3.6%) of the 55 flaked stone specimens exhibited signs of wear. Signs of use-wear or damage on flaked stone implements was apparent at 14X, but the increased magnifications of 20X and 30X enhanced the image. Problems encountered at 60X and 80X were reduced depth and width of field, causing a constant need to refocus the instrument and resulting in no observations of additional new wear patterns. Upon initial observation, the majority of the artifacts in this collection exhibited very few or no signs of wear or damage. Observations were recorded on individual use-wear forms.

Upon initial microscopic observation, the dark-grey turkey-tail point in Figure 2 exhibited a satin polish along the margin of the blade, with the exception of the base. Further examination, using high-resolution computer imaging, led to the discovery of a subrounded lateral margin exhibiting light striations perpendicular to the surface (Fig. 6). The wear does not radiate toward the midline as would be the case if the function of the blade was to scrape hides, as described by Keeley (1980). Titmus and Woods (1991:126) discussed the creation of this type of wear pattern, or "buffeting" (Young and Bonnichsen 1985:98), on Clovis points, as the result of rubbing with a billet or hammerstone.

A creamy white, translucent, cryptocrystalline turkey-tail (Cat No. R24) exhibited a bright polish along the lateral margins. A line of differentiation between the sharp edge and polish, approximately 7 cm. from the proximal end of the artifact, was observed at low and high magnifications. The separation between margin dulling and a relatively sharp proximal end indicates possible hafting. There were no indications of resins or other hafting materials. When observed at magnifications of 240X, extreme

light absorption obscured any indication of possible striations on the margin of the polished artifact.

All of the obsidian preforms displayed signs of margin grinding around the perimeter that are consistent with platform preparation (Muto 1971). Also present on the preforms and all other bifacial obsidian pieces in the collection, excluding the cores, was the homogeneous dulling of the arrises. The lack of similar abrasion on other artifacts, including the obsidian cores, may suggest intentional grinding of the arrises. It is also possible that edge damage may have occurred during transport. Experimental grinding of arrises with a hammerstone on obsidian pieces yielded identical results. The remainder of the flaked stone collection showed no discernible wear. Red ocher staining was present on the majority of the artifacts, which is consistent with Western Idaho Archaic Burial finds in general. In some cases, red ocher appeared to be impacted along the edges of the flake scars.

FURTHER OBSERVATIONS ON MICROWEAR ANALYSIS

Site form and context is of prime importance whenever any attempt is made to discuss the cause of damage to artifacts on the basis of use-wear observations. The Rosenberger site suffers from uncontrolled excavation, the loss of human remains and possibly other materials (e.g., wood and bone) that may have been associated with ceremonial activities, and the lack of provenience for the burial remains in general. Yerkes (1989) aptly demonstrated the importance of context and site function in his discussion of activity patterns on the basis of lithic analysis. Additionally, Holley and Del Bene (1981) and Newcomer et. al. (1986), among others, have indicated that caution must be exercised when quantifying specific wear patterns.

CONCLUSIONS

On the basis of observations made through microwear analysis, there is no evidence indicating that burial goods recovered from the Rosenberger site were produced for any purpose other than as burial goods. While two turkey-tail points (of 131 flaked stone artifacts) exhibit signs of polish or abrasion, this does not constitute a pattern and should not negate their original categorization as ceremonial goods produced for burial purposes. It is also possible that the items found in the burial site were made for and used during the burial ritual. The burial wealth of the complex is similar to earlier Clovis caches, where high quality, microcrystalline stone tools were permanently "taken out of circulation" (Wilke et al. 1991:266).

The Rosenberger collection is unique within the context of the Western Idaho Burial Complex in that it has remained intact and stored in glass-enclosed cases since its recovery. Minimal curation damage was the main factor in selecting the Rosenberger lithic assemblage for use-wear analysis. Future microwear analysis of all Western Idaho Archaic burial collections is necessary to broaden the data base from which artifact assemblages can be compared. Additional studies will allow for the determination of any consistent patterns of damage or wear that exist within the context of the Western Idaho Burial Complex.

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