Chapter 15

An Analysis of Lithic Artifacts from the Rim Deposits at HP 7

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Introduction

The goal of this report is to summarize the current data on lithic artifacts in the rims of HP 7 at the Keatley Creek Site. I then assess these data for their potential to answer a number of significant questions pertaining to the formation of the rim deposits. First, I evaluate temporal resolution in the rim deposits based on the distribution of temporally diagnostic artifacts. I follow this with an assessment of temporal variation in other lithic artifact types. Second, I evaluate spatial variation in rim lithic debitage, tool, and core assemblages. Here, I am primarily interested in differences or similarities between excavated units on the rim and how this might reflect variation in activities on the roof and rims or in practices which produced the build-up of sediments in these areas such as pre-winter occupation roof/floor excavation and dumping on the rim. Finally, I compare the overall distribution of floor and rim lithic debitage, tool, and cores to examine the idea that rim deposits are made up primarily of redeposited floor and roof materials. In the analysis of floor deposits in housepits, it was particularly important to determine if there were any biases in the representation of specific tool types or tool states due to their use outside versus inside the structure or due to selective discard of some types onto the rim middens. Therefore, this detailed analysis was undertaken.

As this report represents an initial assessment of the rim data, I also make recommendations regarding sources of error which may confound certain interpretations. I make reference to several key terms: random and systematic error, and reliability and validity. Random and systematic error are classified under the general term, measurement error (see Amick et al. 1989 for a discussion of the relationship between measuring instruments and measurement error with special reference to lithic studies). A measuring instrument is a device or procedure which provides measurements (such as a lithic tool typology). Measurement error is defined as the difference between some theoretically true score (or measurement unaffected by error) and an actual observed score (see Nance 1987 on true score theory). Random errors are truly random. They are as likely to contain negative deviations as positive deviations from the true value. Random error is produced by limits in measuring instrument precision as well as actual errors by the operator. Systematic errors are directional. In other words, they produce predictable deviations from true scores. They can be the result of idiosyncratic tendencies of the instrument operator and bias in instrument design.

Reliability studies attempt to assess the replicability or the consistency of measurements. Reliability studies are concerned with random error. An instrument might be considered to be reliable if it has very little random error. Validity studies attempt to identify sources of systematic error. An instrument might be considered valid if it has low systematic error. Thus, it would measure what it is intended to measure (Nance 1987).

Excavations of the HP 7 rim deposits were accomplished between the years of 1986 and 1989. Discussions of rim sediments and stratigraphy may be found in Volume I, Chapter 17 and Volume III, Chapter 6. I rely upon these reports and the original field notes of the excavators to identify sedimentary units belonging to the rim (as opposed to the roof, floor, or other deposit types). The lithic artifacts excavated from these sedimentary units are the focus of this report. Identification and coding of lithic tool, core, and flake types has been accomplished by a number of different analyses. Two possibly significant sources of measurement error may exist in the data set used in this study. First, variation between analysts may introduce substantial variation in artifact classifications (Nance 1987; J. Nance, personnal communication) thus lowering the reliability of the study (Carmines and Zeller 1979; Nance 1987). Fortunately, some of these reliability problems may have been mitigated through supervision and review of all analytical results by B. Hayden. However, the problem of data reliability has not been quantitatively assessed. Thus, in this report, I attempt to identify potential sources of error variability in the data. The second potential source of error may be that of data gaps or missing samples of artifacts. With much assistance from J. Spafford, I have attempted to assemble complete data sets for each of the excavation units considered. However, there remains the possibility that some data may be missing as both temporally diagnostic and exotic raw material artifacts have been removed, coded, and entered into different data sets at different times throughout the last five years. This possible source of systematic error is more difficult to recognize.

In this report, I make no attempt to explore the interesting, but complex taphonomic problems of housepit rim formation. Lithic assemblages found in rim deposits may have been affected by such processes as weathering, trampling, human and non-human size-sorting agents, and scavenging. These are problems which will require far more extensive consideration than is possible here. They are also problems which may well affect the reliability and validity of the conclusions attempted in this report.

Methods

In this report I do not consider raw material variation or taphonomic variables such as staining, weathering and breakage. Nor do I consider data from deposits designated as roof, floor, post-hole, pit or surface. Quantification does not extend beyond type frequencies, percentages, means, standard deviations and the coefficient of variation (CV) statistic. Coefficients of variation are used to identify variation within assemblages of artifacts. This information is important for attempting to identify the source of that variation, whether archaeological or error related.

The artifact and flake typology followed is described in Volume III, Chapter 1. For analytical purposes this lengthy list has been collapsed into a more concise set of types:

Type 1	Miscellaneous (types 1, 2, 4, 135, 182, 171, 143, 148)
Type 2	Middle Period Projectile Points Shuswap Phase Projectile Points Plateau Phase Projectile Points
Type 3	Kamloops Phase Projectile Points
Type 4	Acute edge angle flake tools (minimal retouch) (types 70, 170-172, 140, 180, 142)
Type 5	Obtuse edge angle flake tools (minimal retouch) (types 161, 162, 150, 141, 156, 163, 164, 165, 154)
Type 6	Bifaces (types 131, 192, 193, 130, 134, 138)
Type 7	Spall Tools (types 183, 184)
Type 8	Obtuse edge angle tools (heavy retouch) (types 155, 150, 141, 156, 163, 164, 165)
Type 9	Piercing and Boring Tools (types 151, 152, 132, 133, 153)
Type 10	Bipolar Cores (types 146, 145)
Type 11	Other Cores (type 186)
Type 12	Groundstone (types 200–15)
Type 13	Microblade Cores (types 147–149)

Categorizations of minimal versus heavy retouch are based upon visual recognition and categorization of edge wear states based upon a scale developed by Hayden and Spafford.

Data Base

To facilitate a discussion of the lithic artifacts from the HP 7 rim, I first discuss the nature of the data base. For each excavation square, I consider excavation strategies, degree of stratigraphic complexity and our ability to recognize rim deposits versus those of the roof, floor, slopewash, or other sources. These considerations will provide the context for archaeological interpretations.

Trench 1 of Square AA was excavated in natural statigraphic levels and contains 15 levels within Stratum XIII (rim). Rim deposits appear to have been easily recognized by the excavator. An earlier occupation extends below the rim in this area which is not considered in this study. All tool, core, and debitage data have been incorporated in this analysis.

Two trenches were excavated in Square D. There are tool and core data available from Trench 1 from 1986, however, no debitage data are recorded in the database. Rim deposits were recognized readily by the excavators.

Two trenches were excavated in Square K. Stratigraphic designations in this square are quite complex and rather confusing. Trench 1 appears to contain 15 natural levels identified as rim deposits. Trench 2 contains 20 natural levels identified as rim deposits. I have attempted to place them in relative stratigraphic order for purposes of this study, but further work may be necessary. One problem appears to be that of relative comparability of stratigraphy between the two trenches designated and organized differently by different excavators. Tool, core, and debitage data are available for all identified levels.

Field notes from Square L identify excavation of one trench containing six natural levels and a second trench with eight natural levels attributable to rim deposits. Profile maps indicate the presence of two additional designations within the rim deposits (XIIIC and XIIID) which are not described in the field notes. No artifacts are available for these stratigraphic units. Data regarding tools and cores and debitage however, are available for the noted 14 levels of Trenches 1 and 2. Excavators note no problems in recognizing rim deposits.

The identification of rim deposits in Squares S and T appears to be somewhat problematic as these deposits have apparently been affected by slopewash from the east. Each contains five natural levels presumed to be rim-related. Tool, core, and debitage data are available for all.

Tool and core data are available from 15 natural rim deposit levels of one test trench (Trench 2) in Square N. All level designations are clearly rim deposits with the exception of two. Levels XIIIE-1 and XIIIF-1 may represent pit fill associated with a pit located below the rim deposits.

Tool, core, and debitage data are available for two trenches from Square M. Trench 1 was excavated in arbitrary 10 cm levels. The artifact assemblages are clearly mixed with two or more natural stratigraphic units contributing artifact samples to single collection bags. This may have severe implications for statements on choronological resolution. Within Trench 1, all arbitrary levels indicate rim with the exception of the bottom four, which according to the excavator, represent a pit below the rim. Trench 2 produced 14 natural levels representing rim deposits. The bottom three designations (XIIIF1-3) are not classic rim sediments, but contain high quantities of churned till materials. These may represent the early stages of housepit excavation and thus could be identified as the initial rim from the house. They may also be the result of adjacent pit excavation. Further consideration will be necessary to resolve this problem.

Square O was excavated in subsquares, of which six contain rim deposits with tool, core, and debitage data. Natural level designations range from 4, in subsquare 4, to 10 in subsquare 11. Rim deposits appear to have been easily identified by the excavators.

Chronological Resolution

Considering the tool and core data presented in Tables 1–9, I first assess variability in temporally diagnostic artifacts. If there is high chronological resolution, early period artifacts will be found in lower stratigraphic contexts while later period materials will be found primarily in upper stratigraphic contexts. Building upon this I assess variation in overall tool, core, and debitage assemblage data.

Temporally diagnostic artifacts are found in Squares AA, K and D, located on the south and south-west sides of HP 7. In Square AA, five Shuswap projectile points are found in the lowest levels (XIIIC6 and XIIIF3) while one Kamloops point is situated in an upper level (XIIIB-1). Two Plateau points were found in what appear to be middle levels of Square D (Levels 8 and 9). Square K contains a wide variety of diagnostic artifacts including Plateau points found in the upper and lower middle levels (XIII-4 and XIIIB6-1 respectively) of Trench 1. One key-shaped formed uniface is located in the middle of the Trench 1 sequence (XIII-8). In Trench 2, one Kamloops and one Plateau point are found in an upper level sequence (levels XIIIA4 and XIIIB1-2). No temporally diagnostic artifacts are found in Square L.

Moving to the east side of HP 7, Square T contains one key-shaped formed uniface. This artifact is located in what appears to be a middle level (2A) of the rim/slopewash deposits found in this area.

Square N, located on the north side of the house, contains one Kamloops point, found in an upper level (XIIIA2). In Trench 1 of Square M a Plateau point is found stratigraphically above four Kamloops points (one is a preform). This may be the result of mechanical mixing from arbitrary level excavations. Trench 2 of Square M contains one Kamloops point in the upper middle portion of the stratigraphic profile (XIIIB4). One Shuswap point is found in the basal zone of subsquare 4 in Square O. No other temporally diagnostic artifacts are found in Square O.

Table 1. Square AA Tool Data

	1	4	5	6	7	8	9	10	11	12	13	MP	Shu	Pla	Kam
T1 XIIIA1		2	2			1									
XIIIB1	1	3	2								1				1
2	2	2	4												
3	5	5	3	3			4								
4	4	4	5			1	2			1					
5		4	1												
XIIIC1		9	4				2								
2		8	3												
3	2	8	2				1	1		1					
4	3	4	6	1			2			1					
5		4		1			1								
6	8	17	9	3			5	1					2		
XIIIF1	1	9	7			1	1								
2	9	7	6	2		1									
3	11	9	10	3		6	3		1	1			3		

1 = Misc, 4 = acute edge angle flake tools, 5 = obtuse edge angle flake tools, 6 = bifaces, 7 = spall tools, 8 = obtuse edge angle tools (heavy retouch), 9 = piercing and boring tools, 10 = bipolar cores, 11 = all other cores, 12 = groundstone, 13 = microblade cores, MP = Middle Period Points, Shu = Shuswap Points, Pla = Plateau Points, Kam = Kamloops Points.

Table 2. Square L Tool Data

	1	4	5	6	7	8	9	10	11	12	13	MP	Shu	Pla	Kam
T1 XIII-2	1		1												
3															
4															
5															
6															
7															
XIIIA1	5	7	11												
2	1	9	5	1			1		1						
3	2	6	3					1							
XIIIB1	6	6	3			1									
2		3	2	1		1									
3															
XIIIB2-1		2	5	1				1							
2															

1 = Misc, 4 = acute edge angle flake tools, 5 = obtuse edge angle flake tools, 6 = bifaces, 7 = spall tools, 8 = obtuse edge angle tools (heavy retouch), 9 = piercing and boring tools, 10 = bipolar cores, 11 = all other cores, 12 = groundstone, 13 = microblade cores, MP = Middle Period Points, Shu = Shuswap Points, Pla = Plateau Points, Kam = Kamloops Points.

Table 3. Square S Tool Data

	1	4	5	6	7	8	9	10	11	12	13	MP	Shu	Pla	Kam
1A			1												
1B		2	3	1	1										
2B	2	5	1					1							
2C								1							
3A		2	1												

1 = Misc, 4 = acute edge angle flake tools, 5 = obtuse edge angle flake tools, 6 = bifaces, 7 = spall tools, 8 = obtuse edge angle tools (heavy retouch), 9 = piercing and boring tools, 10 = bipolar cores, 11 = all other cores, 12 = groundstone, 13 = microblade cores, MP = Middle Period Points, Shu = Shuswap Points, Pla = Plateau Points, Kam = Kamloops Points.

Table 4. Square T Tool Data

	1	4	5	6	7	8	9	10	11	12	13	MP	Shu	Pla	Kam
1A		1	1												
1B	1	3	3												
1C		1													
2A	1	2	1											1*	
5A	2	4	1				2								

1 = Misc, 4 = acute edge angle flake tools, 5 = obtuse edge angle flake tools, 6 = bifaces, 7 = spall tools, 8 = obtuse edge angle tools (heavy retouch), 9 = piercing and boring tools, 10 = bipolar cores, 11 = all other cores, 12 = groundstone, 13 = microblade cores, MP = Middle Period Points, Shu = Shuswap Points, Pla = Plateau Points, Kam = Kamloops Points.

* Key shaped formed uniface

Table 5. Square K Tool Data

	1	4	5	6	7	8	9	10	11	12	13	MP	Shu	Pla	Kam
T1 XIII-2	1														
3															
4	1		1			1	1	1						1	
5	1	4	6	3		1									
6	2	9	5	1		2	1								
7	1	4	5	2		1	1								
8	5	9	13	5		4	1	1						1*	
9	1			1					1						
XIIIA-4		2				1	1								
5		1													
XIIIB6-1		3	1			1	1								
2														1	
XIIIB7	1	2													
XIIIB8		1	3	1		1	1								
XIIIB9															
T2															
XIIIA1	3	5	6	1		3								1	1
A2	1	3	1	1											
A3			3				1								
A4		2	1			2					1	1			
XIIIB1-2	4	5	8	2				1	1			1			
XIIIB2-1						1									
B3-1	1	2	2	1		2	1		1						
B4-1		1	1			3	1								
B4-2		2	1			1		1							
T2 C2-1				1		1		1							
C3-1															
C4-1	1	1				1			1						
C5-1															
C6-1		2													
C7-1		7	1			4									
C8-1															
C9-1			1			1									
C10-1	1	2				1									
C11-1						3			2						
XIIID-1		4	1			3									

1 = Misc, 4 = acute edge angle flake tools, 5 = obtuse edge angle flake tools, 6 = bifaces, 7 = spall tools, 8 = obtuse edge angle tools (heavy retouch), 9 = piercing and boring tools, 10 = bipolar cores, 11 = all other cores, 12 = groundstone, 13 = microblade cores, MP = Middle Period Points, Shu = Shuswap Points, Pla = Plateau Points, Kam = Kamloops Points.

* Key shaped formed uniface

Table 6. Square M Tool Data

	1	4	5	6	7	8	9	10	11	12	13	MP	Shu	Pla	Kam
T1 2		5	7	1		1	1	1							
3		2	1			1								1	
4	1	7	1	1		3	1	1		1					1*
5	1	3	4			5									
6	1	5	3			1	2								3
7		1						1							
8	2	1	1			1									
9			1				1								
10	1	2						1		1					
11															
12															
13															
14															
T2 A1		2					1								
A2	3	1		1			1								
B1		3				4		1							
B2	1	4	2	1		1		1							
B3		2	1	2				2							
B4	1	7	2	1			4	1							1
B5			1			1									
C1		1	2	1											
C2		1	1			1		1							
C3	1	1													
C6		1													
F1		1				2									
F2	1					1									
F3	3	6	2			1			1						

1 = Misc, 4 = acute edge angle flake tools, 5 = obtuse edge angle flake tools, 6 = bifaces, 7 = spall tools, 8 = obtuse edge angle tools (heavy retouch), 9 = piercing and boring tools, 10 = bipolar cores, 11 = all other cores, 12 = groundstone, 13 = microblade cores, MP = Middle Period Points, Shu = Shuswap Points, Pla = Plateau Points, Kam = Kamloops Points.

*Kamloops point preform

Table 7. Square N Tool Data

	1	4	5	6	7	8	9	10	11	12	13	MP	Shu	Pla	Kam
T2 XIIIA1		3	1	1		1									
A2		4	2			1									1
A3		1	1												
B1-1		2	1			1		1		1					
B1-2			1												
B2		3	1			2	1								
B2-1						1									
B2-2	1	1	2			2		1							
C1-1															
C2-1			2					1							
C3-1															
C4-1		3	3												
D-1	2	3													
E-1															
F-1							1	3							

1 = Misc, 4 = acute edge angle flake tools, 5 = obtuse edge angle flake tools, 6 = bifaces, 7 = spall tools, 8 = obtuse edge angle tools (heavy retouch), 9 = piercing and boring tools, 10 = bipolar cores, 11 = all other cores, 12 = groundstone, 13 = microblade cores, MP = Middle Period Points, Shu = Shuswap Points, Pla = Plateau Points, Kam = Kamloops Points.

Table 8. Square D Tool Data

	1	4	5	6	7	8	9	10	11	12	13	MP	Shu	Pla	Kam
T2 XIIIB1		1				1									
B2		2	1						1						
B3	1	3				1			1						
B4	1	9	4			2		2			1				
B5	1	4	4	1		2	2	1	1						
C1-1						2									
2-1	1	2	1	1		1									
3-1															
4-1															
5-1															
6-1															
7-1		1													
8-1															
9-1															
D-1		1	2			1			2						
D-2	1	4				2		2	1						
D-3		1				1									
D-4		3	1			4									
D-5		4				1									
1986															
Trench															
XIII-6	2	10	1					2							
7		4													
8	1	4	2					1						1	
9		5	1	1				3						1	
10	2	3	2					1							

1 = Misc, 4 = acute edge angle flake tools, 5 = obtuse edge angle flake tools, 6 = bifaces, 7 = spall tools, 8 = obtuse edge angle tools (heavy retouch), 9 = piercing and boring tools, 10 = bipolar cores, 11 = all other cores, 12 = groundstone, 13 = microblade cores, MP = Middle Period Points, Shu = Shuswap Points, Pla = Plateau Points, Kam = Kamloops Points.

In general, these data indicate a fair degree of chronological resolution. In squares excavated in natural levels, late period artifacts such as Kamloops points occur relatively high in stratigraphic sequences. Moving backwards in time, Plateau Horizon artifacts occur typically in the middle portions of the rim stratigraphy, while even earlier Shuswap Horizon and Middle Period artifacts occur at the bottoms of the profiles. Identification of chronological resolution does not mean that there is an understanding of integrity, or the number of agents which played a role in producing the observed archaeological patterns (Binford 1981). A complete analysis aimed at understanding the integrity of the rim deposits is beyond the scope of this study. However, I provide some preliminary statements in this direction through a consideration of overall artifact assemblage variability throughout the rims, both stratigraphically and horizontally.

Stratigraphic Variability

To study stratigraphic variability by excavation unit, I converted tool and core assemblages with more than 15 artifacts from raw data to percentages (Table 10). This process unfortunately removed the majority of artifacts from consideration leaving artifact assemblages from 21 stratigraphic levels in five excavation squares (AA, L, K, M, and D). This process, however, provides at least a standardized set of artifact distributions for comparison where sample sizes are large enough to more likely reflect actual variability rather than idiosyncratic sampling. Artifact category 1 contains miscellaneous artifacts ranging from severely broken tools to resharpening flakes. I consider variation in category 1 between levels and units to be the result of the nature of this category rather than any true reflection of variation in processes producing the archaeological record. Thus, I do not consider it further. Future researchers might consider the artifact types from this category independently. I assess debitage assemblage variability peripherally through an examination of raw data frequencies. Only those assemblages where acceptable numbers of tools and cores have been identified are considered (i.e., Squares AA, L, K, M, and D).

Square AA produced eight assemblages large enough for consideration in this analysis (Table 10), thus providing the best sequence of lithic artifacts from the

Table 9. Square O Tool Data

	1	4	5	6	7	8	9	10	11	12	13	MP	Shu	Pla	Kam
8 XIII F2-111	3				1										
3-1	1	1													
3-2		7				1									
3-3															
3-4	1	3													
4-1															
4-2		1													
4 F3-1															
4-1		1													
4-2		1	1												
4-3	1	2	2						1				1		
11 D-1		1													
D-2		1	1												
D-3		1				1									
E-1			1												
F-1		2				1									
F-2			1								1				
F-3	1	1	1				1								
F-4		1	1												
F-5		2													
F-6															
F-7/8		4				2									
F-9		1													
12 D-1		1													
D-2		1	1												
E-1															
F-1															
F13F1	1	3				1									
F-2		3				1									
F-3									1						
F-4			1												
F-5															
F-6		2					1								
F3-7		3	2	1			1								
F-10		1	1												
15															
XIIIA-1	1														
D1-2		1				1									
D1-3			1												
D-2		1													
F-1						1									
F-2		1													
F-3	1	2	1			1									
16															
XIIIA-1		1	1												
D1-1		1													
D2-1		3	1												
D2-2	1	1	2												
E-1		3				1		1							
F-1															
F-3															
F-4		2				1									

1 = Misc, 4 = acute edge angle flake tools, 5 = obtuse edge angle flake tools, 6 = bifaces, 7 = spall tools, 8 = obtuse edge angle tools (heavy retouch), 9 = piercing and boring tools, 10 = bipolar cores, 11 = all other cores, 12 = groundstone, 13 = microblade cores, MP = Middle Period Points, Shu = Shuswap Points, Pla = Plateau Points, Kam = Kamloops Points.

HP 7 rim. Artifacts in categories 4 and 5 are most common throughout the sequence indicating that discard of minimally modified flake tools may have been relatively consistent through time. Although level XIIIB3 contains several bifaces, bifaces are most common in the lower levels. Likewise, heavily modified, obtuse edge-angle flake tools occur more commonly in the lower levels. Boring and piercing tools occur consistently throughout. Other artifact types occur too infrequently for further consideration. Overall density in debitage increases in the lower levels. Especially notable are increases in billet flakes in these levels.

The primary difference in artifact frequencies from Square L is in terms of density. Tools and cores are far more common in the upper levels than in the lower ones, where modified artifacts are almost nonexistant. Debitage patterning is similar with few flakes in the lower levels and dramatic increases in the upper levels.

Patterning in Square K is difficult to evaluate due to its complex stratigraphy. Tool and core density is far greater in the middle to upper levels than in the lower levels. If projectile points are any indication of the period of occupation which produced the middle and upper-middle deposits, then they are primarily attributable to the Plateau Horizon. This is consistent with radiocarbon dates discussed in Volume I, Chapter 2. Minimally modified flake tools, bifaces and heavily modified flake tools are common in these levels. Flakes are also most dense in the middle to upper middle levels, with especially high numbers of billet flakes.

Only three levels from Square M are represented by percentage data (Table 10). I, therefore, make statements regarding assemblage variability in this square from a consideration of both the raw (Table 6) and percentage data. I rely on Trench 2 data only as there are clearly validity problems associated with Trench 1 due to excavation in arbitrary 10 cm levels. This type of validity problem is known as criterion-related validity (Nance 1987). In this case it would be impossible to make accurate statements about stratigraphic variability as mixing of stratigraphically distinct assemblages has occurred during excavation. Minimally modified acute edge-angle flake tools are consistent throughout the stratigraphic sequence of Trench 2. The middle to upper levels contain minimally modified obtuse edge-angled flake tools and bifaces, which are not commonly found in the lower levels. Heavily modified obtuse edge-angled flake tools occur throughout the sequence while piercing and boring tools and bipolar cores cluster in the middle to upper levels. The middle to upper levels of Trench 2 contain far higher densities of flakes than the lower levels. Billet flakes are not particularly numerous in any levels.

Raw (Table 8) and percentage data (Table 10) from Square D indicate two general clusterings of tools and cores: one in the upper levels and one in the extreme lower levels. There appear to be no real differences between the two, however. Both contain numerous flake tools of all types, a limited number of cores and very few of any other tool types. Flakes are also clustered in the upper and lower levels. There do not appear to be any real differences between the two. Billet flakes are relatively uncommon throughout.

Two major trends are apparent from this rather cursory examination of stratigraphic variability in rim lithic assemblages. First, on the south and southwest sides of the house, bifaces and heavily worked obtuse edge-angle flake tools are far more common in the lower to middle levels than in the upper levels. Other flake tools and piercing/boring tools are common throughout the stratigraphic sequences. Second, on the north side of the house bifaces are most common in the middle levels while piercing/boring tools are the most common in the upper levels. There is little stratigraphic variation in any of the flake tool categories.

If the lower levels of the rim are primarily attributable to Middle period and Shuswap Horizon occupations, the middle levels to Plateau Horizon occupations, and the upper levels to Kamloops Horizon occupations, then it is possible to note a general decrease through time in biface and intense flake tool resharpening and reuse. There may also be a parallel increase in specialized flake tool use as indicated by increased numbers of piercing/boring tools on the north side of the house. If not attributable to sampling bias, this may be indicative of possible shifts in mobility and general economy of the housepit occupants through time.

Spatial Variability

In order to begin evaluating spatial differences in the formation of the rim lithic assemblages I compare mean tool and core percentage data for rim Squares AA, L, K, M and D (Table 11, Figs. 1–3). I also calculate the coefficient of variation for each mean score to provide some assessment of variability in each tool and core category for the rim strata represented (Table 11). Raw data for the calculation of the mean and CV scores is provided in Table 10.

Before discussing the mean percentage data, I note that the CV scores are distributed in almost direct correspondence to sample size. Low sample sizes generally have CV scores higher than 10 and are the result of bimodal distributions or at least some form of unrecognized sub-variation. It is clear that there is substantial variation in the representation of all tool classes between levels in the rim of HP 7. Archaeological variability as well as sources of error may have contributed to this total variability.

As I do not think artifact category 1 represents anything meaningful archaeologically, I initiate my discussion with categories 4 and 5 (Fig. 1), or respectively, minimally modified acute and obtuse edge-angle flake tools. Mean scores for each category are fairly consistent across the five excavation squares. Category 6 (bifaces) means are consistently low across all five excavation squares (Fig. 1). Category 8 parallels that of 5 in the number of potential tool types contained. Means are consistently low with the exception of Square D, which contains a somewhat higher score. Distributions of categories 9 and 10 (piercing/boring tools and bipolar cores—Fig. 2) are quite similar. Both have high mean scores in Squares M and D. Category 9 tools also score somewhat highly in Square AA. All other artifact types occur very infrequently across all squares (Figs. 2 and 3).

It is not possible at this point to remove the confounding effects of random error from this analysis. However, assuming that random error is present to some degree and assuming knowledge of some of its sources (excavation strategies and intra- and inter-observer error) it is possible to cautiously draw some limited conclusions on archaeological spatial variability. It seems clear that there is no substantial typological variability between the five squares. The same basic processes seem to have produced these lithic

Table 10. Percentage Tool Data

		1	4	5	6	8	9	10	11	12	13	MP	Shu	Pla	Kam
AA															
T1															
	XIIIB1	25	25	15	15		20								
	XIIIB4	23.5	23.5	29.4		5.9	11.8			5.9					
	XIIIC3	13.3	53.3	13.3			6.7	6.7		6.7					
	XIIIC4	17.6	23.5	35.3	5.9		11.8			5.9					
	XIIIC6	18.2	38.6	20.5	6.8		11.4	2.3					4.5		
	XIIIF1	5.3	47.4	36.8		5.3	5.3								
	XIIIF2	36	28	24	8	4									
	XIIIF3	23.4	19.1	21.3	6.4	12.8	6.4		2.1	2.1			6.4		
L															
	XIIIA1	45.4	30.4	47.8											
	XIIIA2	5.6	50	27.8	5.6		5.6		5.6						
	XIIIB1	37.5	37.5	18.8		6.3									
K															
T1															
	XIII-5	6.7	26.7	20	6.7										
	XIII-6	10	45	25	5	10	5								
	XIII-8	12.8	23.1	33.3	12.8	10.3	2.6	2.6						2.6	
T2														5.0	5.0
	XIIIA-1	15	25	30	5	15									
	XIIIB1-2	18.2	22.7	36.4	9.1			4.5	4.5			4.5			
M															
T1															
	2		31.2	43.8	6.3	6.3	6.3	6.3							
	4	5.9	41.2	5.9		17.6	5.9	5.9		5.9					5.9
T2															
	B4	5.9	41.2	11.8	5.9		23.5	5.9							5.9
D															
T2															
	B4	5.3	47.4	21.1		10.5		10.5							
	B5	6.3	25	25	6.3	12.5	12.5	6.3	6.3						

(levels with >15 artifacts) 1 = misc., 4 = acute edge angle flake tools, 5 = obtuse edge angle flake tools, 6 = bifaces, 7 = spall tools, 8 = obtuse edge angle tools (heavy retouch), 9 = piercing and boring tools, 10 = bipolar cores, 11 = all other cores, 12 = groundstone, 13 = microblade cores.

assemblages. Although typological variation is minimal, artifact density is not. Lithic artifacts in Square AA are far more common than in any other square. It is still unclear, however, whether this derives from differences in actual stone tool production, use and discard on the roof and rim, or floor and roof cleanout procedures resulting in extra-large accumulations on the southwest side of the house. Any attempt at addressing this problem requires a comparison of rim and floor data.

Floor and Rim Comparison

Tool, core, and debitage data are used to facilitate a comparison between the rim and floor data sets. Mean scores from Table 11 are used to produce means for the entire rim across each artifact category. These means were then compared to the percentage scores for each artifact category from the floor (Table 12, Fig. 4). Lithic samples from the rim and floor are compared by first summing the total number of flakes in each type and size class and converting these data to percentages (Table 13). These are compared graphically in Figures 5–8.

With the exception of category 1, which has been disregarded throughout this report for reasons of excess random error, there is an extremely high level of consistency across all artifact categories between the floor and the rim. Artifact category 8 (obtuse edge angle tools) is not considered in this analysis as these data are not available for the floor. Thus, in Figure 4, rim categories 5 and 8 have been collapsed together.

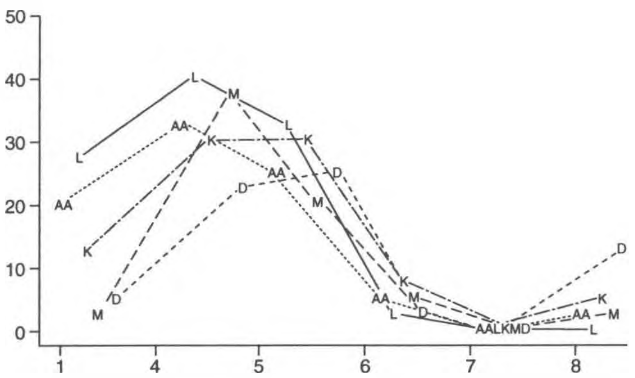

Figure 1. Comparison of rim squares (classes 1–8). (1 = Misc., 4 = acute edge angle flake tools, 5 = obtuse edge angle flake tools, 6 = bifaces, 7 = spall tools, 8 = obtuse edge angle tools [heavy retouch], 9 = piercing and boring tools, 10 = bipolar cores, 11 = all other cores, 12 = groundstone, 13 = microblade cores, MP = Middle Period points, Shu = Shuswap points, Pla = Plateau points, Kam = Kamloops points).

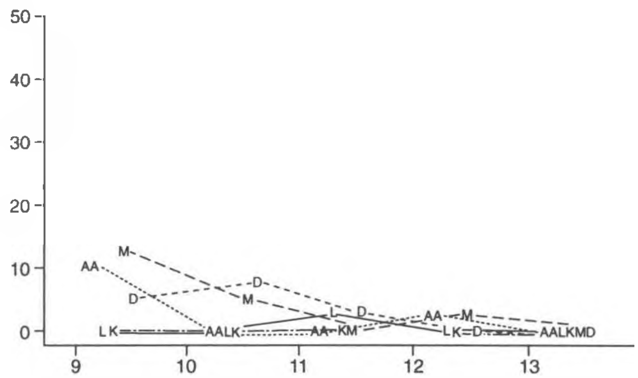

Figure 2. Comparison of rim squares (classes 9–13). (1 = Misc., 4 = acute edge angle flake tools, 5 = obtuse edge angle flake tools, 6 = bifaces, 7 = spall tools, 8 = obtuse edge angle tools [heavy retouch], 9 = piercing and boring tools, 10 = bipolar cores, 11 = all other cores, 12 = groundstone, 13 = microblade cores, MP = Middle Period points, Shu = Shuswap points, Pla = Plateau points, Kam = Kamloops points).

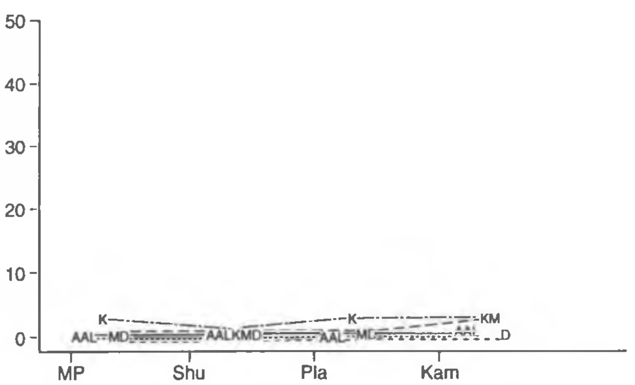

Figure 3. Comparison of rim squares (temporally diagnostic types). (1 = Misc., 4 = acute edge angle flake tools, 5 = obtuse edge angle flake tools, 6 = bifaces, 7 = spall tools, 8 = obtuse edge angle tools [heavy retouch], 9 = piercing and boring tools, 10 = bipolar cores, 11 = all other cores, 12 = groundstone, 13 = microblade cores, MP = Middle Period points, Shu = Shuswap points, Pla = Plateau points, Kam = Kamloops points).

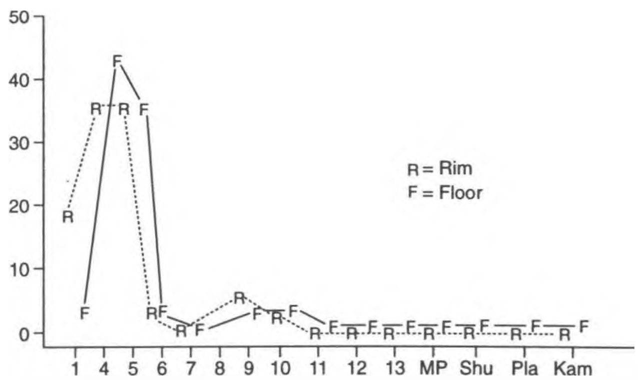

Figure 4. Mean rim and floor data relationship. (1 = Misc., 4 = acute edge angle flake tools, 5 = obtuse edge angle flake tools, 6 = bifaces, 7 = spall tools, 8 = obtuse edge angle tools [heavy retouch], 9 = piercing and boring tools, 10 = bipolar cores, 11 = all other cores, 12 = groundstone, 13 = microblade cores, MP = Middle Period points, Shu = Shuswap points, Pla = Plateau points, Kam = Kamloops points).

Table 11. Rim Summary Statistics

	1	4	5	6	7	8	9	10	11	12	13	MP	Shu	Pla	Kam
AA															
Mean															
Rim	20.3	32.3	24.5	5.3	0.0	3.5	9.2	1.1	0.3	2.6	0.0	0.0	1.4	0.0	0.0
SD	9.0	12.6	8.7	5.2	0.0	4.5	6.0	2.4	0.7	3.1	0.0	0.0	2.6	0.0	0.0
CV	44.3	39.0	35.5	98.1	0.0	128.6	65.2	218.1	63.6	119.1	0.0	0.0	185.7	0.0	0.0
L															
Mean															
Rim	29.5	39.3	31.5	1.9	0.0	2.1	1.9	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0
SD	21.1	9.9	14.8	3.2	0.0	3.6	3.2	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
CV	71.5	25.2	47.0	168.4	0.0	171.4	168.4	0.0	105.3	0.0	0.0	0.0	0.0	0.0	0.0
K															
Mean															
Rim	12.5	28.5	28.9	7.7	0.0	7.1	1.5	1.4	1.9	0.0	0.0	.9	0.0	1.5	1.0
SD	4.4	9.4	6.5	3.3	0.0	6.7	2.2	2.1	2.0	0.0	0.0	2.1	0.0	2.2	2.2
CV	35.2	33	22.5	42.9	0.0	94.4	146.7	150.0	222.2	0.0	0.0	233.3	0.0	146.7	220.0
M															
Mean															
Rim	3.9	37.8	20.5	4.1	0.0	4.6	11.9	6.0	0.0	2.0	0.0	0.0	0.0	0.0	3.9
SD	3.4	5.8	20.4	3.5	0.0	4.1	10.0	0.2	0.0	3.4	0.0	0.0	0.0	0.0	3.4
CV	87.2	15.3	99.5	85.4	0.0	89.1	84.0	3.3	0.0	170.0	0.0	0.0	0.0	0.0	87.2
D															
Mean															
Rim	5.8	21	23.1	3.2	0.0	11.5	6.3	8.4	3.2	0.0	0.0	0.0	0.0	0.0	0.0
SD	0.7	19.8	2.8	4.4	0.0	1.4	8.8	3.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0
CV	12.1	94.3	12.1	137.5	0.0	12.2	139.7	35.7	140.6	0.0	0.0	0.0	0.0	0.0	0.0

1 = Misc., 4 = acute edge angle flake tools, 5 = obtuse edge angle flake tools, 6 = bifaces, 7 = spall tools, 8 = obtuse edge angle tools (heavy retouch), 9 = piercing and boring tools, 10 = bipolar cores, 11 = all other cores, 12 = groundstone, 13 = microblade cores.

Debitage percentages are almost identical between the floor and the rim in all size categories except for the largest (Figs. 5–8). In size category 4 (>5cm), there appear to be some important differences between the two. The rim contains far more primary flakes and far fewer secondary and bipolar flakes and spalls. Since the frequencies of all other classes of flakes are almost identical between the rim and the floor and since this is the largest size class of flakes, thereby best suited for use as tools, I argue that this distribution disparity is monitoring some specific behaviors on the part of the prehistoric inhabitants of HP 7.

In general, tool, core, and flake data from the rim and floor indicates such substantial similarity that it is hard not to imagine that they are the result of the same processes. I conclude that indeed much of the floor materials are being removed and placed on to the rim. Given relative spatial and stratigraphic consistency in assemblage composition the process of removing the old floor materials and placing them on to the rim appears to have been repeated through time. There does not appear to be any indication of different activities on the rim compared to the floor, at least given this level of resolution. The greater density of artifacts on the south-west side of the house may still represent work by house inhabitants on the roof and rim. If this is the case then, activities themselves may not have been significantly different from those conducted regularly on the inside.

Large bipolar flakes and spalls on the floor may well represent potential tools to be collected and used before floor cleanup and disposal on to the rim. Thus, these flake types may have been regularly collected for later use, rather than discarded on the rim. At housepit abandonment, they were no longer needed and were subsequently left *in situ*. We can view secondary flakes as more common on the floor than rim due to the intense trampling which may have occurred in this location. High numbers of large primary flakes on the rim may reflect less intensive flake culling/scavenging activities in these areas than in those occurring on the floor. Another possibility is that some large primary flakes may have been placed on the rim in anticipation of future use and thus could be seen as site furniture in Binford's terms (1979).

Table 12. Floor Percentage Tool Data and Mean Rim Percentage Data

	1	4	5	6	7	8	9	10	11	12	13	MP	Shu	Pla	Kam
Mean Rim	16	33.6	25.8	5.0	0.0	5.5	6.4	2.4	.9	1.3	0.0	.2	.5	.4	.8
Floor Total	6.9	40.0	33.7	3.0	1.1		2.3	3.8	1.6	2.0	0.0	.1	1.0	1.0	3.3

1 = Misc., 4 = acute edge angle flake tools, 5 = obtuse edge angle flake tools, 6 = bifaces, 7 = spall tools, 8 = obtuse edge angle tools (heavy retouch), 9 = piercing and boring tools, 10 = bipolar cores, 11 = all other cores, 12 = groundstone, 13 = microblade cores.

Table 13. Total Floor and Rim Lithic Sample Data

	Pri.	Sec.	Bi	RBi	BP	Shat	MB	Spa
Floor								
Size 1		391	52			6		
%		87.1	11.6			1.3		
Size 2		2,580	296	1	25	60		
%		87.1	10	0.1	0.8	2		
Size 3	487	631	109	4	24	37	1	
%	37.7	48.8	8.4	0.3	1.9	2.9	0.1	
Size 4	10	3			1	2		
%	62.5	18.8			6.2	12.5		
Rim								
Size 1		328	87	4	1	23	1	1
%		73.7	19.6	0.9	0.2	5.2	0.2	0.2
Size 2		5,051	1,314	108	34	101	31	3
%		77.2	20.1	1.7	0.5	1.5	0.5	0.1
Size 3	1,221	681	431	53	42	63	14	2
%	48.7	27.2	17.2	2.1	1.7	2.5	0.6	0.1
Size 4	12	1						
%	92.3	7.7						

1 = Misc., 4 = acute edge angle flake tools, 5 = obtuse edge angle flake tools, 6 = bifaces, 7 = spall tools, 8 = obtuse edge angle tools [heavy retouch], 9 = piercing and boring tools, 10 = bipolar cores, 11 = all other cores, 12 = groundstone, 13 = microblade cores.

Conclusions

In this report I have explored spatial and stratigraphic lithic artifact data from the rim of HP 7 in order to first assess chronological resolution in the rim deposits and, second, to assess occupational variability. I have also made a comparison between the rim and floor data in an attempt to determine the origin of the rim assemblages. As this report does not deal in depth with all data and attempts little statistical analysis, I view all findings as preliminary in an ongoing series of investigations into the formation of the HP 7 rim lithic assemblages.

A number of conclusions were drawn during the course of this study. First, I concluded that chronological resolution was relatively good. Kamloops Horizon artifacts were found in the upper levels, Plateau Horizon in the middle levels and Shuswap and Middle Period materials in the bottom. I also noted that having identified some resolution did not mean that we had any understanding of integrity.

A second group of conclusions centered around issues of integrity. I argued that, stratigraphically, bifaces and heavily modified obtuse edge-angled flake tools were found more commonly in the lower to middle levels, while more specialized flake tools such as piercers and borers became somewhat more common in upper levels. This illustrated to me that some different processes resulted in stratigraphic inter-assemblage variability. We may be monitoring organizationally different strategies of residential and logistical mobility and lithic technological organization. Chatters (1989) has noted that during the Pithouse I period on the Columbia Plateau (4,440–3,770 BP), mobility and technological organization was quite different compared to the later period (3,300 BP to historic). This poses a research problem which future researchers may wish to consider.

Little variability is present in rim spatial organization with the exception of artifact density. Square

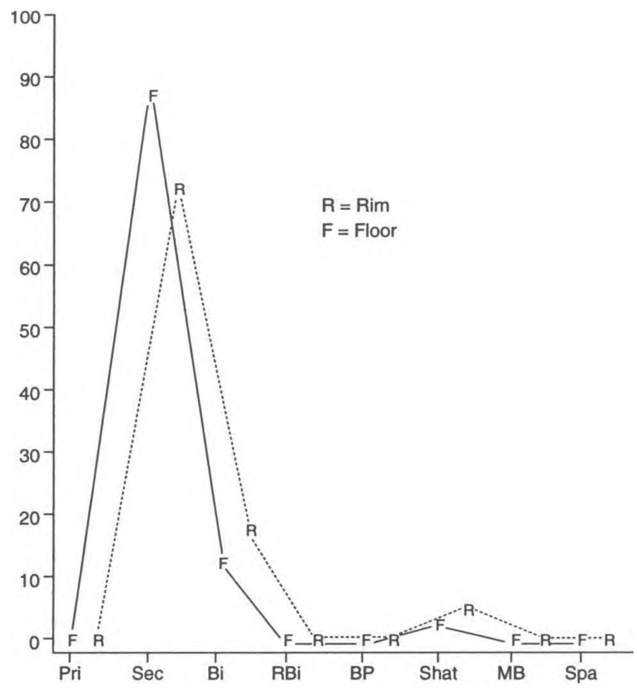

Figure 5. Comparison of rim and floor lithic sample data—size category 1. (Pri = primary flakes, Sec = secondary flakes, Bi = billet flakes, RBi = r billet flakes, BP = bipolar flakes, Shat = shatter, MB = microblades, Spa = Spalls).

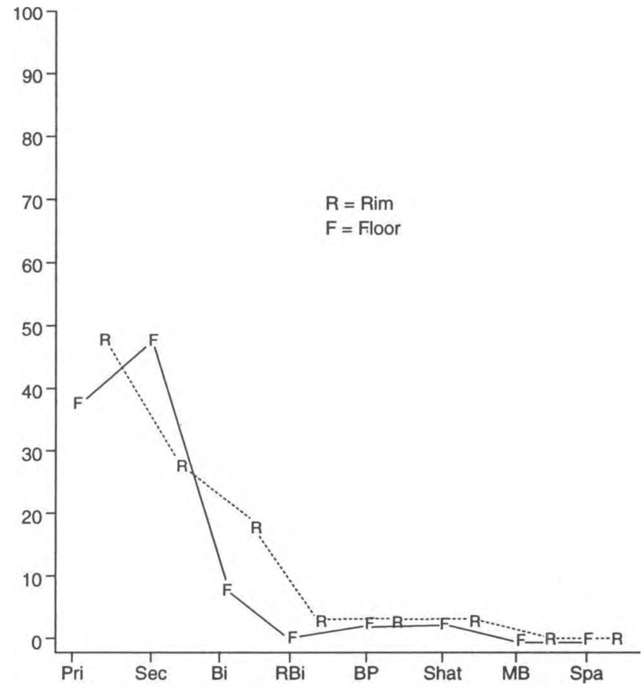

Figure 7. Comparison of rim and floor lithic sample data—size category 3. (Pri = primary flakes, Sec = secondary flakes, Bi = billet flakes, RBi = r billet flakes, BP = bipolar flakes, Shat = shatter, MB = microblades, Spa = Spalls).

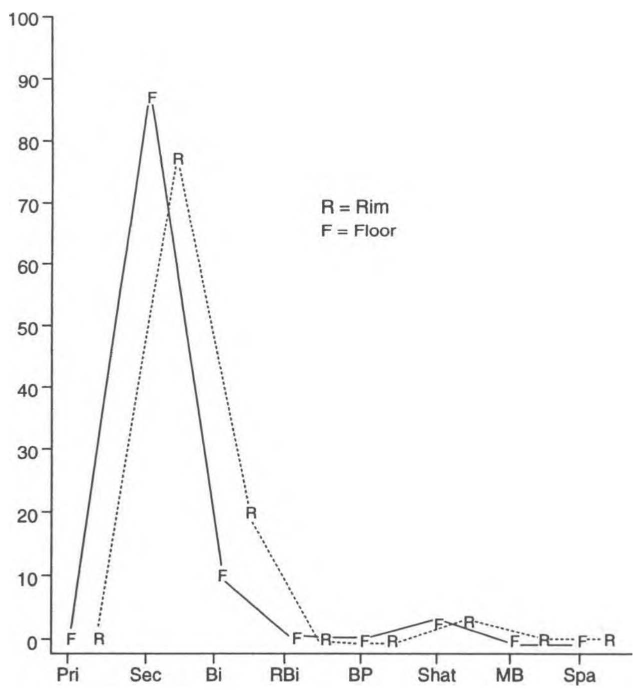

Figure 6. Comparison of rim and floor lithic sample data—size category 2. (Pri = primary flakes, Sec = secondary flakes, Bi = billet flakes, RBi = r billet flakes, BP = bipolar flakes, Shat = shatter, MB = microblades, Spa = Spalls).

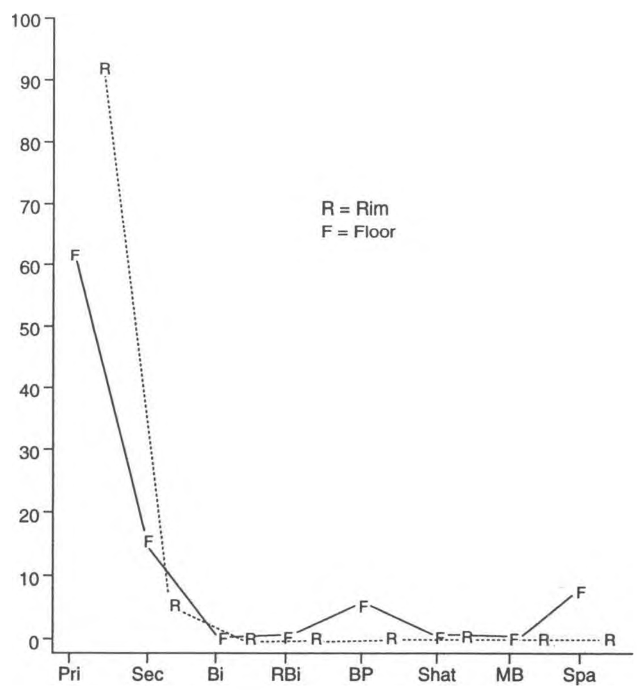

Figure 8. Comparison of rim and floor lithic sample data—size category 4. (Pri = primary flakes, Sec = secondary flakes, Bi = billet flakes, RBi = r billet flakes, BP = bipolar flakes, Shat = shatter, MB = microblades, Spa = Spalls).

AA is far more dense in lithic artifacts than any other excavation square. It has not been determined as to whether this is due to outside activity focus in this area or some other process of rim formation.

Finally, it is clear that the overwhelming majority of rim lithic materials derive from the interior floors of the housepit. Relative frequency profiles of tool, core, and debitage data are almost identical between the rim and the floor. Some limited variability exists in a few flake types which may be attributable to specific behaviors of the inhabitants over time.

In general, this study provides indications of, first, some shifts in artifact use and discard over time, and second, the derivation of rim lithics from excavated and redeposited floor sediments. Many details associated with these conclusions have not been explored. First, research is required into the presence and effects of random error on these conclusions. Reliability research should focus on both the reliability of inter-observer classification, as well as on possible sampling error in the excavation strategies. Should it be possible to obtain reliability coefficients, then researchers could correct data distributions for attenuation problems associated with excess random error (if present—see Nance 1987).

Second, research into the integrity of the rim deposits should continue with a detailed consideration of taphonomic conditions. Clearly, purposeful human behavior alone is not the cause of assemblage variability. There may have been a variety of processes in action including trampling, size-sorting, scavenging and intensive weathering.

Third, cultural organizational variability could be further examined stratigraphically and horizontally. There are differences between the lower and upper lithic assemblages found in the rim deposits. These could well be informing us of organizational differences in housepit occupation. Likewise, spatial variability around the rim could be informing us of differences in the spatial organization of work and artifact discard. Research should move beyond the coarse grained approach taken here to examine these problems in greater depth.

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