

16. FIRE-CRACKED ROCK AND OTHER MATERIAL CLASSES *S. A. Ahler*

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16. FIRE-CRACKED ROCK AND OTHER MATERIAL CLASSES

Stanley A. Ahler

This brief chapter presents data on the quantification and distribution of fire-cracked rock and other artifact and material classes not treated in other chapters.

Fire-Cracked Rock

In the analysis of the fire-cracked rock, we have the advantage of knowledge gained from micromammal studies and studies of subsistence remains that have led us to hypothesize that the human population that occupied Scattered Village significantly impacted the environment immediately surrounding the village. Semken (Chapter 8) noted the unbalanced nature of the local micromammal fauna and suggested that the landscape surrounding the village may have resembled spoil piles from a strip mine. If such was the case, we can suggest that this process of denudation may have progressed and become more severe through time. If so, we can hypothesize that the effects of this denudation process should be documented in the record for fire-cracked rock. Specifically, the most locally available rock type is sandstone from the bluff and hill-face outcrop immediately north of the site. If this surface became more exposed through time, then we predict a steady increase in the use of rock from this source as opposed to rock types from glacial sources that would have been located on more distant hilltops.

We can also imagine that the local sandstone was not the stone of choice for use for stone boiling, heat retention, etc., as it appears very friable and would readily add grit if used in direct contact with food in hot-rock cooking. We suggest that more crystalline rocks such as granitic and basaltic stones would have been more attractive for hot rock production. We can also hypothesize that the relative abundance of glacially derived rock types would diminish through time in the site samples as the readily available and closer-by rocks of that type on the nearby hilltops would have been gradually used up. Thus, we have a second reason for proposing that rock type should shift through time, from greater use of glacial rock to greater use of local sandstone.

Size, count, and weight information for the FCR collection for TP1 – TP5 are presented in Table 16.1. We included the data for TP5 (previllage contexts) to indicate that a small amount of FCR material was in fact recovered from deep in the site. Some contexts were sample sorted for FCR in the lab (see Chapter 4), and only a fraction of the FCR was counted through all size grades. We used the grade G3 sampling multiplier to estimate total weight and count of G3 FCR debris, and we used mean specimen counts from our fully counted G1, G2, and G3 samples to estimate total counts by context for all studies units. Thus, the weight data in Table 16.1 are direct measurements for G1 and G2 and are estimates for G3, and the count data are estimates for all size grades. Altogether, the collection contains as estimated 86,900+ specimens that weigh an estimated 632.3 kg (about 1,500 lb). Density data are also provided by time period in Table 16.1. Density in TP5 is quite low, compared to other contexts, which is to be expected because these deposits were nearly culturally sterile. Density by weight is fairly constant across time periods 1 – 4, while density by count data are generally higher in the later time periods than in

the early time periods. These contrastive patterns (by weight and by count) suggest a difference in fragmentation by time period, and such is the case, with a slightly larger percentage of G1 specimens occurring in TP3 and TP4.

Table 16.1. Size grade distribution by count and weight and by time period for fire-cracked rock from Scattered Village (32MO31), 1998 excavations.

Time Period		Size Grade			Total	Excav. Vol. m ³	Density n or g/m ³
		1 G1	2 G2	3 G3			
COUNT DATA							
1 later postcontact	N	1339	2872	20482	24693	9.625	2669
	%	5.4%	11.6%	82.9%	100.0%		
2 earlier postcontact	N	2336	5689	39363	47388	18.830	2516
	%	4.9%	12.0%	83.1%	100.0%		
3 later precontact	N	410	729	5384	6523	5.658	1153
	%	6.3%	11.2%	82.5%	100.0%		
4 earlier? precontact	N	578	929	6736	8243	4.444	1855
	%	7.0%	11.3%	81.7%	100.0%		
5 previllage	N	4	14	58	76	2.246	34
	%	5.3%	18.4%	76.3%	100.0%		
Total		4667	10233	72023	86923		
		%	5.4%	11.8%	82.9%	100.0%	
WEIGHT DATA							
1 later postcontact	wt	141865	19841	12925	174631	9.625	18143
	%	81.2%	11.4%	7.4%	100.0%		
2 earlier postcontact	wt	234275	43672	24899	302846	18.830	16083
	%	77.4%	14.4%	8.2%	100.0%		
3 later precontact	wt	66510	8515	3360	78385	5.658	13853
	%	84.9%	10.9%	4.3%	100.0%		
4 earlier? precontact	wt	64750	6732	4296	75778	4.444	17051
	%	85.4%	8.9%	5.7%	100.0%		
5 previllage	wt	510	101	31	642	2.246	286
	%	79.4%	15.7%	4.8%	100.0%		
Total		507910	78861	45511	632282		
		%	80.3%	12.5%	7.2%	100.0%	

Data regarding the rock type composition for a sample of G1 and G2 specimens of fire-cracked rock are presented in Table 16.2. We analyzed only what we considered to be a representative sample of FCR for rock type information (ca. 50% of the total collection), making sure that all excavation blocks were well represented in the selected contexts. Six rock types were coded, but only two – granitic and sandstone – constitute more than 97% of the sample. These two rock types exhibit extremely patterned changes in relative abundance through time. Sandstone increases steadily from 60% in the earliest period to more than 85% of the sample in TP1. Conversely, the abundance of granitic stone decreases from 38% to 12.5% in the same time span, a reduction by two-thirds from its highest level. These data strongly support the predicted changes in rock type through time at the site. At the moment we have no clear way of determining if the pattern is predominantly due to rock source depletion in the surrounding

landscape, or simply denudation of the ground surface and greater erosion of the hill slope north of the site later in time. Either way (and it is probably a combination of these two processes), the FCR data appear to document measurable impacts of long-term occupation on the environment and resources immediately surrounding the site.

Table 16.2. Distribution of rock type in fire-cracked rock according to time period for Scattered Village (32MO31), 1998 excavations. Counts at top; percentages middle; and standardized cell residual values bottom. Residual values $>+1.0$ are shaded for emphasis.

Time Period		Rock Type						Total
		1 sandstone	2 limestone	3 granitic	4 basaltic	5 silcrete	6 other	
1 later postcontact	n	1646	8	241	10	15	9	1929
2 earlier postcontact	n	3008	18	917	14	47	28	4032
3 later precontact	n	603	1	268	4	5	5	886
4 earlier? precontact	n	466	1	293	2	5	0	767
5 previllage	n	2	0	7	0	0	0	9
1 later postcontact	%	85.3%	.4%	12.5%	.5%	.8%	.5%	100.0%
2 earlier postcontact	%	74.6%	.4%	22.7%	.3%	1.2%	.7%	100.0%
3 later precontact	%	68.1%	.1%	30.2%	.5%	.6%	.6%	100.0%
4 earlier? precontact	%	60.8%	.1%	38.2%	.3%	.7%	.0%	100.0%
5 previllage	%	22.2%	.0%	77.8%	.0%	.0%	.0%	100.0%
1 later postcontact	SR	5.2	.3	-9.4	.9	-8	-.5	
2 earlier postcontact	SR	-.4	.8	.1	-.5	1.4	1.2	
3 later precontact	SR	-2.4	-1.2	4.8	.3	-1.2	.1	
4 earlier? precontact	SR	-4.6	-1.1	9.1	-.6	-.8	-2.1	
5 previllage	SR	-1.8	-.2	3.5	-.2	-.3	-.2	
Total	n	5725	28	1726	30	72	42	7623
	%	75.1%	.4%	22.6%	.4%	.9%	.6%	100.0%

Other Artifact and Material Classes

Tables 16.3 and 16.4 present size grade distribution data by time period for several other kinds of artifacts and material recovered from the site. The tables also present density data by time period. Count data are presented in Table 16.3 for fired clay, formed fired-clay pieces (more distinctly shaped pieces), unmodified clinker, red ochre, yellow ochre, and gypsum pieces. Weight data are summarized in Table 16.4 for these classes (except yellow ochre and shaped clay pieces, which have very little cumulative weight), and also for burned earth and ash, which were not counted.

Table 16.3. Size grade distribution by count for various other artifact and material classes, Scattered Village (32MO31), 1998 excavations.

Class	Time Period		Size Grade					Total	Excav. Vol. m3	Density n/m3
			1 G1	2 G2	3 G3	4 G4	5 G5			
Fired Clay	TP1	n	4	85	3962			4051	9.625	421
		%	.1%	2.1%	97.8%			100.0%		
	TP2	n	1	135	7405			7541	18.830	400
		%	.0%	1.8%	98.2%			100.0%		
	TP3	n		56	2365			2421	5.658	428
		%		2.3%	97.7%			100.0%		
	TP4	n	1	32	1486			1519	4.444	342
		%	.1%	2.1%	97.8%			100.0%		
	Total	n	6	308	15218			15532		
		%	.0%	2.0%	98.0%			100.0%		
Formed Fired Clay	TP1	n			2			2	9.625	0.2
		%			100.0%			100.0%		
	TP2	n		3	10	12		25	18.830	1.3
		%		12.0%	40.0%	48.0%		100.0%		
	TP3	n			1	4		5	5.658	0.9
		%			20.0%	80.0%		100.0%		
	Total	n		3	13	16		32		
		%		9.4%	40.6%	50.0%		100.0%		
Unmod. Clinker	TP1	n	4	9	292			305	9.625	31.7
		%	1.3%	3.0%	95.7%			100.0%		
	TP2	n	12	49	394			455	18.830	25.2
		%	2.6%	10.8%	86.6%			100.0%		
	TP3	n	6	18	142			166	5.658	29.3
		%	3.6%	10.8%	85.5%			100.0%		
	TP4	n	1	4	34			39	4.444	8.8
		%	2.6%	10.3%	87.2%			100.0%		
	Total	n	23	80	862			965		
		%	2.4%	8.3%	89.3%			100.0%		
30 Red Ochre	TP1	n			55	343	14	412	9.625	42.8
		%			13.3%	83.3%	3.4%	100.0%		
	TP2	n			110	927	46	1083	18.830	57.5
		%			10.2%	85.6%	4.2%	100.0%		
	TP3	n			28	292	50	370	5.658	65.4
		%			7.6%	78.9%	13.5%	100.0%		
	TP4	n			7	158	1	166	4.444	37.3
		%			4.2%	95.2%	.6%	100.0%		
	Total	n			200	1720	111	2031		
		%			9.8%	84.7%	5.5%	100.0%		
31 Yellow Ochre	TP1	n				3		3	9.625	0.3
		%				100.0%		100.0%		
	TP2	n				6		6	18.830	0.3
		%				100.0%		100.0%		
	TP4	n		4				4	4.444	0.9
		%		100.0%				100.0%		
	Total	n		4		9		13		
		%		30.8%		69.2%		100.0%		

Table 16.3. Size grade distribution by count for various other artifact and material classes, Scattered Village (32MO31), 1998 excavations (concluded).

Class	Time Period	Size Grade					Total	Excav. Vol. m3	Density n/m3	
		1 G1	2 G2	3 G3	4 G4	5 G5				
33 Gypsum	TP1	n		3	101	25	129	9.625	13.4	
		%		2.3%	78.3%	19.4%	100.0%			
	TP2	n		5	152	133	5	295	18.830	15.7
		%		1.7%	51.5%	45.1%	1.7%	100.0%		
	TP3	n	1	8	86	195		290	5.658	51.3
		%	.3%	2.8%	29.7%	67.2%		100.0%		
	TP4	n		3	31	134		168	4.444	37.8
		%		1.8%	18.5%	79.8%		100.0%		
	Total	n	1	19	370	487	5	882		
		%	.1%	2.2%	42.0%	55.2%	.6%	100.0%		

Table 16.4. Size grade distribution by weight for various other artifact and material classes, Scattered Village (32MO31), 1998 excavations.

Material Class	Time Period		Size Grade					Total	Excav. Vol. m3	Density g/m3
			1 G1	2 G2	3 G3	4 G4	5 G5			
Burned Earth	TP1	wt	62.00	706.00	2782.67			3550.67	9.625	369
		%	1.7%	19.9%	78.4%			100.0%		
	TP2	wt	134.00	2170.00	6839.04			9143.04	18.830	486
		%	1.5%	23.7%	74.8%			100.0%		
	TP3	wt	45.00	306.00	1226.09			1577.09	5.658	279
		%	2.9%	19.4%	77.7%			100.0%		
	TP4	wt	15.00	109.00	637.10			761.10	4.444	171
		%	2.0%	14.3%	83.7%			100.0%		
	Total	w	256.00	3291.00	11484.90			15031.90		
		%	1.7%	21.9%	76.4%			100.0%		
Fired Clay	TP1	wt	5.00	262.00	1040.31			1307.31	9.625	136
		%	.4%	20.0%	79.6%			100.0%		
	TP2	wt	25.00	374.00	2037.53			2436.53	18.830	129
		%	1.0%	15.3%	83.6%			100.0%		
	TP3	wt		130.00	762.80			892.80	5.658	158
		%		14.6%	85.4%			100.0%		
	TP4	wt	13.00	81.00	387.06			481.06	4.444	108
		%	2.7%	16.8%	80.5%			100.0%		
	Total	w	43.00	847.00	4227.70			5117.70		
		%	.8%	16.6%	82.6%			100.0%		
Ash	TP1	wt	506.00	296.00	570.26			1372.26	9.625	143
		%	36.9%	21.6%	41.6%			100.0%		
	TP2	wt	3066.00	2659.00	1724.19	60		7449.79	18.830	395
		%	41.2%	35.7%	23.1%	.0%		100.0%		
	TP3	wt	119.00	118.00	216.68	30		453.98	5.658	80
		%	26.2%	26.0%	47.7%	.1%		100.0%		
	TP4	wt	82.00	81.00	131.22			294.22	4.444	66
		%	27.9%	27.5%	44.6%			100.0%		
	Total	w	3773.00	3154.00	2642.35	.90		9570.25		
		%	39.4%	33.0%	27.6%	.0%		100.0%		

Table 16.4. Size grade distribution by weight for various other artifact and material classes, Scattered Village (32MO31), 1998 excavations (concluded).

Material Class	Time		Size Grade					Total	Excv. Vol. m3	Density g / m3
	Period		1 G1	2 G2	3 G3	4 G4	5 G5			
Unmod. Clinker	TP1	wt	158.00	23.00	118.44			299.44	9.625	31.1
		%	52.8%	7.7%	39.6%			100.0%		
	TP2	wt	551.00	157.00	184.43			892.43	18.830	47.4
		%	61.7%	17.6%	20.7%			100.0%		
	TP3	wt	81.00	56.00	46.74			183.74	5.658	32.5
		%	44.1%	30.5%	25.4%			100.0%		
	TP4	wt	11.00	15.00	14.00			40.00	4.444	9.0
		%	27.5%	37.5%	35.0%			100.0%		
	Total	w	801.00	251.00	363.61			1415.61		
		%	56.6%	17.7%	25.7%			100.0%		
Red Ochre	TP1	wt			17.48	12.76	9	30.33	9.625	3.2
		%			57.6%	42.1%	.3%	100.0%		
	TP2	wt			30.68	33.49	24	64.41	18.830	3.4
		%			47.6%	52.0%	.4%	100.0%		
	TP3	wt			6.13	12.30	29	18.72	5.658	3.3
		%			32.7%	65.7%	1.5%	100.0%		
	TP4	wt			2.00	7.00	.03	9.03	4.444	2.0
		%			22.1%	77.5%	.3%	100.0%		
	Total	w			56.29	65.55	.65	122.49		
		%			46.0%	53.5%	.5%	100.0%		
Gypsum	TP1	wt		24.00	94.00	1.02		119.02	9.625	12.4
		%		20.2%	79.0%	.9%		100.0%		
	TP2	wt		33.30	122.54	8.47	.13	164.44	18.830	8.7
		%		20.3%	74.5%	5.2%	.1%	100.0%		
	TP3	wt	19.70	32.00	86.25	13.86		151.81	5.658	26.8
		%	13.0%	21.1%	56.8%	9.1%		100.0%		
	TP4	wt		22.50	15.40	6.86		44.76	4.444	10.1
		%		50.3%	34.4%	15.3%		100.0%		
	Total	w	19.70	111.80	318.19	30.21	.13	480.03		
		%	4.1%	23.3%	66.3%	6.3%	.0%	100.0%		