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EXCAVATIONS AT 29SJ 627 CHACO CANYON, NEW MEXICO

Volume II

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EXCAVATIONS AT 29SJ 627, CHACO CANYON, NEW MEXICO

Volume II. The Artifact Analyses

Edited by
Frances Joan Mathien

BRANCH OF CULTURAL RESEARCH
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INTRODUCTION

Frances Joan Mathien

The excavation and analyses of material culture remains from site 29SJ 627 provide a wealth of data upon which to base interpretations of life in a small site in Chaco Canyon, especially during the A.D. 800s through mid A.D. 1100s. The 7,401 field specimen numbers assigned to the artifacts and samples only hint at this unusual volume of material. These data were recovered from all areas of the site (Figure 1.1) and represent several construction and use periods.

Because of the size of the site and the amount of material recovered during Chaco Project site excavations, numerous archeologists and associates from other disciplines were involved in the analyses of specific artifacts/ecofacts. Those who analyzed the artifacts and biological remains from this site used terminology for the major roomblock that had been assigned to various rooms and features during excavations. Their chronological framework had been developed midway during the Chaco Project; it divided the Bonito Phase into three segments, each approximately 100 years long.

Since the mid 1980s, Truell has revised some of her terms, especially for features in some rooms that were later determined to be part of larger, earlier ramada areas; also she clearly labelled room suites in her revision that appears in Volume I of this report. In addition, Windes has updated the chronological framework in which Chaco is placed and he uses the updated time frames in his writing. For these reasons, it is necessary to provide the reader with ways to correlate these differences. Table 1.1 lists the phases and approximate dates used in Volume I to separate various periods of site use at 29SJ 627. Table 1.2 lists the pottery types that Truell (1986) uses to suggest calendric dates, and Table 1.3, prepared by Windes (1987a), presents the ceramic assemblages assigned to the Bonito Phase and the dates currently assigned to each of the divisions within it. The chronological framework used in the analysis of artifacts from 29SJ 627 is slightly different from that presented in Tables 1.2 and 1.3 because Windes has been able to tighten the control over ceramic time. Table 1.4 allows the reader to convert the time spans used in this analysis into Windes' latest suggested framework for ceramic typology. Even though all of these revisions make it more difficult to compare data from one report with another, it is hoped that the refinements in chronological

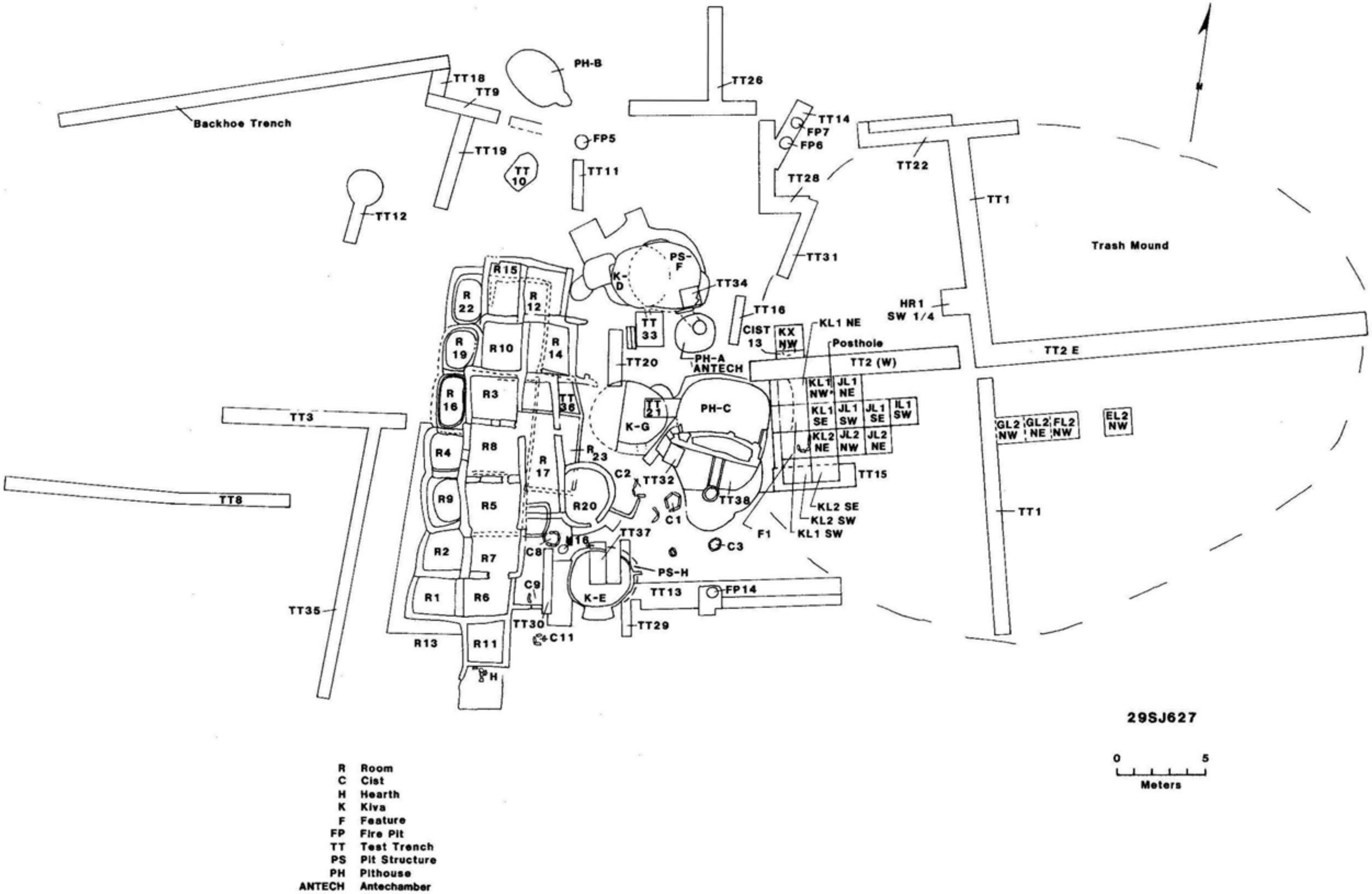

Figure 1.1. Plan view of 29SJ 627 showing excavation extent subsequent to 1975 Chaco Center exploration.

Table 1.1. Periods represented at 29SJ 627.

Truell's Assignment	Approximate Dates	Phase Designation
Initial Site Use	A.D. 600s-Early 700s	Phase A
First Roomblock Construction and Use Period	Late A.D. 700s-Middle 900s	Phase B
Second Roomblock Construction and Use Period	Late A.D. 900s-Early 1000s	Phase C
Third Roomblock Construction and Use Period	Middle A.D. 1000s	Phase D
Last Site Use	Early A.D. 1100s	Phase E

control will allow a better understanding of development in Chaco Canyon through time. These guides are a necessary part of the constant updating of that improved understanding.

Tables 1.5-1.9 are included in this chapter so that the reader can correlate differences between terms used by Truell in Volume I for room suites and their features with the earlier ones assigned in the field.

Phase A (A.D. 600s-early 700s) was represented by two pit structures, Pithouses A and B, based on architectural styles.

Major construction at 29SJ 627 began during Phase B (somewhere between the late A.D. 700s to middle 900s), when Pithouse C was constructed and the first living or work areas and storage rooms in the above-ground roomblock were built (Figure 1.2, Table 1.5). Room Suite A consisted of Room 22, Floor 3, and Room 19, Floor 2; these were the northernmost storage rooms associated with a ramada area to the east (Room 10, Floor 2; parts of the second floors of Rooms 12, 14, and 15). Two storage rooms (Room 16, Floors 3 and 4, and Room 4, Floor 2), plus the ramada area to the east of them (Room 3, Floor 2 and Room 8, Floor 3) make up Room Suite B. This suite is located directly west of Pithouse C and is in the approximate center of the roomblock as initially constructed. To the south, Room Suite C included Room 9, Floor 4, as a storage area, and Room 5, Floor 2 as a ramada area. An addition to the south of this roomblock near the end of this first construction period or possibly at the beginning of the second one--Phase C (see below)--was designated as Room Suite D (Table 1.6). It consisted of Room 2, Floors 3 and 2, plus a ramada area that was formed by Room 11, Floor 4 and possibly Floor 3; Room 6, Floor 4; and Room 7, Floor 3. An overlying ramada area (consisting of Room 7, Floor 2 and Room 6 Floor 3, plus Room 11, Floor 3) was also identified for Room Suite D. Pit Structure H, may have been added at the same time as Room Suite D. In addition, Phase B included a plaza-facing ramada (Room 14, Floor 1) and a grinding room adjacent to the ramada of Suite B (Room

Table 1.2. Dominant ceramic types by period.[a]

Period (A.D.)	Black-on-whites	Black-on-reds	Culinary
500s-early 700s (late 400s-500s = higher frequencies above, ca. 10% Woodruff brownwares)	La Plata B/w White Mound B/w Lino B/g Piedra B/w	Abajo B/o Bluff B/r Sanostee B/o	Lino Gray Lino Fugitive
Middle/late 700s-early/middle 900s (700s-early 800s = White Mound B/w, Piedra B/w, and Lino Gray dominate)	Kiatuthlanna B/w Early Red Mesa B/w White Mound B/w Piedra B/w Tunicha B/w Pena B/w	Deadman's B/r Bluff B/r	Kana'a wide neckbanded Lino Gray Grey Hills Gray Tohatchi neckbanded
Middle/late 900s-early/middle 1000s	Red Mesa B/w Newcomb B/w Burnham B/w Naschitti B/w Cortez (Cortecanos B/w) Early Gallup B/w (mid 1000s) Puerco-Escavada B/w	Deadman's B/r	Narrow neckbandeds (see above) Neck corrugateds Capt. Tom's Corrugated Newcomb Corrugated Coolidge Corrugated (etc.) Tohatchi Neckbanded
Late 1000s-middle 1100s (see Truell 1986)	Gallup B/w Puerco-Escavada B/w Mancos B/w Chaco-McElmo B/w Chaco B/w Sosi B/w Black Mesa B/w McElmo B/w Brimhall B/w Nava B/w Toadlena B/w Chuska B/w	Tusayan B/r Puerco B/r Wingate B/r	Chaco Corrugated Mancos Corrugated Blue Shale Corrugated

[a] Taken from Truell (1986:142, Table 2.3).

Table 1.3. Bonito phase ceramic assemblages in Chaco Canyon: A.D. 900-1140.[a]

Phase	Black-on-whites	Black-on-reds	Culinary
Early Bonito phase A.D. 900-975± (early Red Mesa)	Red Mesa B/w Whitemound B/w Tunicha B/w Kana'a B/w LaPlata B/w	San Juan Redwares (types unidentified) Deadman's B/r LaPlata B/r Bluff B/o Sanostee B/r	Cibola/Tusayan plain gray Cibola narrow neckbanded Tohatchi Banded Kana'a Neckbanded Cibola neck indented corrugated Chuskan neck indented corrugated Lino Gray
Early Bonito phase A.D. 975±1040/1050 (Red Mesa)	Red Mesa B/w Escavada B/w Newcomb B/w Burnham B/w	San Juan Redwares (types unidentified) LaPlata B/r Deadman's B/r	Cibola/Tusayan plain gray Cibola narrow neckbanded Cibola neck indented corrugated Chuskan neck indented corrugated Chuskan narrow neckbanded Tohatchi Banded
Classic Bonito phase A.D. 1040/1050-1100 (Gallup)	Gallup B/w Puerco B/w Red Mesa B/w Chuska B/w Toadlena B/w Black Mesa B/w Mancos B/w	Tsegi Orangewares (types unidentified) San Juan Redwares Tusayan B/r	Cibola Corrugated (unidentified) Chuskan Corrugated (unidentified) Indented corrugateds (types unidentified) Exuberant Corrugated Coolidge Corrugated Blue Shale Corrugated Tohatchi Banded
Late Bonito phase A.D. 1100-1140 (Late Mix)	Chaco-McElmo B/w Gallup B/w Puerco B/w McElmo B/w Chuska B/w Toadlena B/w Black Mesa B/w Mancos B/w Sosi B/w Socorro B/w	White Mountain Redwares (types unidentified) Tsegi Orangewares (B/r and polychromes) Puerco B/r Wingate B/r Wingate Polychrome	Chuskan corrugated (unidentified) Cibola corrugated (unidentified) Indented corrugateds (types unidentified) Coolidge Corrugated Blue Shale Corrugated Chaco Corrugated Hunter Corrugated Mancos? Corrugated

[a] Types arranged in approximate descending order of frequency. Not all minority types listed. Table taken from Windes (1987a:246, Table 8.15).

Table 1.4. Ceramic typological time in Chaco Canyon.[a]

Ceramic Spans for Artifact Analyses	Ceramic Spans Revised	Phase/Ceramic Period	Dominant Painted Ceramic Type(s)
A.D. 900-1020	A.D. 900-1040/1050	Early Bonito phase A.D. 900-975± (early Red Mesa)	Red Mesa Black-on-white
		Early Bonito phase A.D. 975±-1040/1050 (Red Mesa)	Red Mesa Black-on-white
A.D. 1020-1040	A.D. 1040/1050	None	Red Mesa Black-on-white and Gallup Black-on-white
A.D. 1020-1120	A.D. 1040/1050-1100	Classic Bonito phase (Gallup)	Gallup Black-on-white
A.D. 1120-1220	A.D. 1100-1140	Late Bonito phase (Late Mix)	Gallup Black-on-white Puerco Black-on-white Chaco-McElmo Black-on-white McElmo Black-on-white (local varieties)

[a] Taken from Windes (1987b[III]:8, Table I.2).

Table 1.5. Original field designations and those used in Volume I of this report for floor surfaces and features associated with above-ground rooms built during the first roomblock construction and use period (Phase B--late A.D. 700s-middle 900s).

Designations in Text	Original Field Designations	Associated Field Specimen Numbers
<u>Suite A</u>	Northernmost suite	
Room 22, Floor 3, no floor features	Same	7375, 7378-7390, 7392, 7394-7396
Room 19, Floor 2, no floor features	Same	6979-6982, 6992-6995, 7023-7025
Suite A ramada	Includes Room 10, Floor 2, and portions of 2nd floor surfaces of Rooms 12, 14, and 15 (northernmost ramada)	1762-1765, 2138, 2160, 4910-4914, 4958-4964, 5129-5137, 5156, 6262-6264, 7302, 7305
Firepit 1	Pit 1, Room 14, Floor 2	818-819, 1950, 2138-2139, 2246
Firepit 2	Pit 3, Room 10, Floor 2	5365-5369, 5618-5619
Posthole 1	Pit 1, Room 10, Floor 2	5254-5255, 5364, 5626-5628
Posthole 2	Pit 2, Room 14, Floor 2	None
Posthole 3	Pit 3, Room 14, Floor 2	None
Posthole 4	Pit 9, Room 10, Floor 2	5520-5521
Bell-shaped Cist 1	Pit 4, Room 10, Floor 2	5473-5480, 5488, 5517, 6072-6073, 7300
Other Pit 1, only partially excavated	Pit 1, Room 15, Floor 2	None
Other Pit 2	Pit 2, Room 10, Floor 2	5250-5253, 5629
Other Pit 3	Pit 5, Room 10, Floor 2	5471-5472
Other Pit 4	Pit 6, Room 10, Floor 2	None
Other Pit 5	Pit 7, Room 10, Floor 2	5518-5519, 5620-5623
Tool Storage Area	Feature 10, Room 10, Floor 2	5129-5134, 5137, 5473 (flotation)
Cist 1, not excavated	Cist 1, Room 12, Floor 2	None

Table 1.5. (continued)

Designations in Text	Original Field Designations	Associated Field Specimen Numbers
Suite B		
Room 16, Floor 4	Same	6784-6792, 6801
Pit 1 (firepit)	Same	6793-6796, 6800, 7005, 7198
Room 16, Floor 3 (upper--used sequentially with Floor 4 in this report)	Same	5241-5247, 5351-5358, 5554-5556, 5559, 5561, 5565, 5770-5774, 6048
Pit 2 (heating pit/firepit)	Same	5748-5754, 5775-5777, 5794, 6012, 6013, 6156-6160, 6171
Pit 2 (posthole)	Same	5755, 5768-5770, 5778-5779, 6161-6164
Pit 3 (posthole)	Same	5756, 5760-5762, 6165-6167
Pit 4 (posthole)	Same	5757-5759, 6168-6170, 6172
Pit 5 (posthole ?)	Same	5763-5766, 6045-6047
Feature 6 (function unknown)	Same	5558, 5560, 5562-5564, 5566-5569
Pit 7 (posthole, rodent disturbance)	Same	None
Room 4, Floor 2	Same	4921-4922, 5095-5103, 5157-5160, 5499-5514, 5648, 5664, 5676-5677
Pit 1 (heating pit)	Same	5649-5652, 5678-5679, 5747, 6115, 6616
Pit 2 (storage)	Same	5653-5663, 5680-5681, 6124-6127
Suite B ramada	Includes Room 3, Floor 2, and Room 8, Floor 3	2687-2689, 2775, 5854-5861, 5873-5874, 5937-5940, 6014-6015, 6238-6239, 6326-6329, 6331, 6443-6446, 6504-6505, 6571, 7262-7263
Heating Pit 1	Firepit 1, Room 3, Floor 2	2595-2596, 2632, 4489-4498
Heating Pit 2	Firepit 2, Room 3, Floor 2	2690, 2696
Heating Pit 3	Firepit 3, Room 3, Floor 2	2674?-2682, 2691, 2697, 2699, 2730-2732, 4506-4510

Table 1.5. (continued)

Designations in Text	Original Field Designations	Associated Field Specimen Numbers
Heating Pit 4	Pit 1, Room 8, Floor 3	6240-6243, 6265, 6390-6391
Heating Pit 5	Pit 16, Room 8, Floor 3 (beneath Firepit 1, Room 8, Floor 2)	6833-6835
Posthole 1	Posthole 1, Room 3, Floor 2	2631, 2631A, 4181, 6330
Posthole 2	Pit 5, Room 3, Floor 2	2700, 2820, 2823, 2825, 2956, 2973, 4163, 4680
Posthole 3	Pit 6, Room 3, Floor 2	2701, 2867-2868, 2957
Posthole 4	Pit 9, Room 3, Floor 2	2821-2822
Posthole 5	Pit 7, Room 8, Floor 3	6323-6325
Posthole 6	Pit 9, Room 8, Floor 3	6358-6362
Posthole 7	Pit 10, Room 8, Floor 3	6363-6366
Posthole 8	Pit 11, Room 8, Floor 3	6447-6450
Posthole 9	Pit 14, Room 8, Floor 3	6506-6509, 6655, 6920
Posthole 10	Pit 15, Room 8, Floor 3	6649-6654, 6910-6911
Posthole 11	Pit 17, Room 8, Floor 3	7244
Posthole 12 ?	Pit 7, Room 3, Floor 2	2947-2950
Storage Pit 1	Pit 5, Room 8, Floor 3	6276-6280, 6318-6319, 6374
Other Pit 1	Pit 4, Room 3, Floor 2	2819, 2821-2822, 6336
Other Pit 2	Pit 8, Room 3, Floor 2	2951-2955
Other Pit 3	Pit 2, Room 8, Floor 3	?
Other Pit 4	Pit 3, Room 8, Floor 3	6266-6269, 6385
Other Pit 5	Pit 4, Room 8, Floor 3	6270-6275, 6383-6384
Other Pit 6	Pit 6, Room 8, Floor 3	6320-6322

Table 1.5. (continued)

Designations in Text	Original Field Designations	Associated Field Specimen Numbers
Other Pit 7	Pit 8, Room 8, Floor 3	6354-6357
Other Pit 8	Pit 12, Room 8, Floor 3	6451-6453
Suite C		
Room 9, Floor 4	Same	5256-5270, 5338-5345, 5481-5483A
Pit 1	Same	5491-5496, 6134-6137
Pit 2	Same	5484-5487, 6069-6071
Suite C ramada	Includes Room 5, Floor 2	4230-4238, 4261-4264, 4269, 4271-4273, 4298-4299
Pit 3 (firepit)	Same	4205-4206, 4294-4296, 4302-4305, 4307-4310, 4532
Pit 7 (heating pit)	Same	4382, 4419, 4422, 4429, 4432, 4435, 4742
Pit 8 (heating pit)	Same	4455-4461, 4529-4531
Pit 1 (posthole)	Same	4370, 4378-4379, 4385, 4387, 4393, 4528
Pit 4 (posthole ?)	Same	4394, 4428, 4526-4527
Pit 5 (posthole)	Same	4371, 4383, 4636-4638, 4856, 4859-4860
Pit 10 (posthole)	Feature 10	4645-4646, 4669
Pit 11 (posthole)	Feature 11	4647, 4663-4667, 4858, 4863
Pit 12 (posthole ?)	Same	4744, 4748-4750, 4854-4855
Pit 13 (posthole ?)	Same	4746-4747
Pit 14 (posthole ?)	Same	None
Pit 15 (posthole ?)	Same	None
Pit 16 (posthole ?)	Same	None
Pit 17 (posthole)	Same	4833-4834

Table 1.5. (continued)

Designations in Text	Original Field Designations	Associated Field Specimen Numbers
Pit 18 (posthole)	Same	4826-4829, 4847-4848
Pit 19 (posthole--plugged)	Same	4830-4832, 4840, 4844
Pit 20 (posthole)	Originally mistakenly thought to be part of Suite B (Pit 13, Room 8, Floor 3)	?
Pit 2 (ashpit)	Same	4388, 4395
Pit 6	Same	4423, 4425, 4427, 4533-4534, 4741
Pit 9	Same	4584-4587, 4639-4641, 4652

Table 1.6. Original field designations and those used in Volume I of this report for floor surfaces and features associated with above-ground rooms built as additions to the first roomblock construction period.

Designations in Text	Original Field Designations	Associated Field Specimen Numbers
Suite D	Southernmost room suite (added on to the south end of the site either at the end of the first construction episode or during the second--see text)	
Room 2, Floor 3	Same	None
Pit 1 (heating pit)	Same	None
Room 2, Floor 2	Same	668, 669-671, 742, 1987, 5439-5448, 5515-5516, 5544-5551, 5887, 6149-6150
Pit 1	Same	5527-5530, 5664, 6077
Pit 2	Same	5531-5534, 5624, 6109-6111
Pit 3 (posthole)	Same	5535-5539, 5888, 6112-6114
Room 1, Floor 2 (burial from later occupation placed on this surface, no primary deposits)	Same	None
Suite D1A Ramada (stratigraphically deepest, no floor contact materials)	Formed by Room 11, Floor 4, only (dimensions incomplete) very fragmentary	None
Pit 1 (burned pit)	Same	6313-6314
Pit 2 (other pit--not dug ? postoccupational fill, unidentified function)	Same	7309
Pit 3 (other pit--not excavated)	Same	None
Suite D1B Ramada	Includes Room 6, Floor 4; Room 7, Floor 3; Room 11, Floor 3? (Room 6, Floor 4 and Room 7, Floor 3 only uncovered in tests)	6187, 6192, 6295
Pit 1 (heating pit)	Pit 1, Room 11, Floor 3[a]	5777, 6294

Table 1.6. (continued)

Designations in Text	Original Field Designations	Associated Field Specimen Numbers
Pit 3 (posthole ?)	Pit 3, Room 11, Floor 3[a]	5780-5781
Pit 6 (posthole ?, associated with Pit 3)	Pit 6, Room 11, Floor 3[a]	5922
Pit 5 (posthole)	Pit 5, Room 11, Floor 3[a]	5926-5927
Pit 8 (posthole)	Pit 4, Room 11, Floor 3[a]	6091-6093
Pit 4 (storage pit)	Pit 4, Room 11, Floor 3[a]	5782-5787, 5923-5925, 6188-6191, 6336
Pit 9 (not a feature--rodent burrow)	Pit 9, Room 11, Floor 3	6094-6100
Pit 2 (charcoal concentration)	Pit 2, Room 11, Floor 3	5778-5779
Firepit 1 (only partially excavated, no material collected)	Pit 1, Room 6, Floor 4	None
<u>Suite D2 Ramada</u> (overlying D1)	Includes Room 7, Floor 2, and Room 6, Floor 3; Room 11, Floor 3 continued in use	4097-4107, 4214-4221, 4246, 4267, 6089A, 6090
Firepit 1	Pit 1, Room 7, Floor 2	4108, 4120-4135, 4207-4208
Firepit 2	Pit 1, Room 6, Floor 3	5840-5843, 5930, 6154-6155
Heating Pit 1	Pit 6, Room 6, Floor 2 (mistakenly called Room 7, Floor 2, on FS sheets)	6894-6895
Posthole 1	Pit 2, Room 7, Floor 2	4118-4119, 4268, 4536-4538
Posthole 2	Pit 4, Room 7, Floor 2	6896-6897
Posthole 3	Pit 2, Room 6, Floor 3	5844, 5876
Posthole 4	Pit 4, Room 6, Floor 3	5932
Posthole 5 ?	Pit 5, Room 6, Floor 3	5933-5934
Other Pit 1	Pit 5, Room 7, Floor 2	None

Table 1.6. (continued)

Designations in Text	Original Field Designations	Associated Field Specimen Numbers
Other Pit 1	Pit 3, Room 6, Floor 3	5931
Plaza-facing Ramada		
Room 24, Floor 1 (only partially excavated; no features were encountered in test)	Same	6822-6825, 7010-7011
Room 23, Floor 1 (grinding room adjacent to Suite B ramada)	Same	6281-6293, 6301, 6303-6306, 6345-6348, 6397, 6489-6492, 6494-6495, 6503, 6510-6511, 6971
Mealing Bin 1	Same	6349, 6349A
Pit 1 (posthole)	Same	6970, 6977
Pit 2 (posthole)	Same	6972, 6976
Pit 3 (firepit)	Same	6512-6515, 6973-6975
Pit 5 (heating pit)	Same	6500
Pit 6 (pot rest ?)	Same	6501-6502
Room 25, Floor 1 adjacent to Suite C; no features; possibly large storage bin	Same	6930-6939, 7074, 7081

[a] Materials contained in these Room 11, Floor 3, features probably were deposited during the use of Suite D2.

Table 1.7. Original field designations and those used in Volume I of this report for floor surfaces and features associated with above-ground rooms built during the second roomblock construction and use period (Phase C--late A.D. 900s-early A.D. 1000s).

Designations in Text	Original Field Designations	Associated Field Specimen Numbers
<u>Suite A</u>		
Room 22, Floor 1 (storage--probably not the upper surface)	Same[a]	None
Pit 1 (cist)	Same[a]	None
Room 19, Floor 1 (mealing room)	Same[a]	None
Cist 1	Same[a]	None
Mealing Catchment 1	Pit 1, Room 19, Floor 1[a]	None
Mealing Catchment 2	Pit 2, Room 19, Floor 1[a]	None
Mealing Catchment 3	Pit 3, Room 19, Floor 1[a]	None
Mealing Catchment 4	Pit 4, Room 19, Floor 1[a]	None
Mealing Catchments 5 and 6 (Pit 5 overlies Pit 6)	Pits 5 and 6, Room 19, Floor 1[a]	None
Cist 1 (storage)	Same[a]	None
<u>Suite B</u>		
Room 16, Floor 2 (storage, surface only partially preserved)	Same	None
Room 4, Floor 1	Same[a]	None
Bell-shaped Storage Cist 1	Same[a]	None
Suite B ramada	Includes Room 3, Floor 1A; Room 8, Floor 2	2463-2464, 2605-2606, 2771, 2771A, 4150-4151, 5648, 5659, 5862-5871, 6120-6123
Firepit 1	Firepit 1, Room 8, Floor 2	2578, 2607-2608, 2630, 2883-2884, 4148, 4513-4515, 4728-4736, 6630

Table 1.7. (continued)

Designations in Text	Original Field Designations	Associated Field Specimen Numbers
Firepit 2	Firepit 2, Room 8, Floor 2	2609-2611, 2626-2627, 4143-4147, 4188-4189, 4200-4203, 4516, 4643-4644
Firepit 3 (just a burned spot on the floor surface)	Firepit 3, Room 8, Floor 2	None
Firepit 4	Firepit 4, Room 8, Floor 2	2733-2737, 4421, 4433, 4436-4437, 4443, 4517-4520, 4561-4564, 6016
Pit 1 (posthole)	Posthole 1, Room 8, Floor 2	2518, 2612, 2613, 2766, 4204
Pit 2 (posthole)	Pit 2, Room 3, Floor 1A (originally designated Floor 1)	2689, 2698, 4499, 4501-4504
Pit 4 (possible posthole)	Pit 4, Room 8, Floor 2 (not the same as Firepit 4)	2693-2694
Pit 5 (posthole)	Pit 5, Room 8, Floor 2	2695, 4525
Pit 7 (possible posthole)	Pit 7, Room 8, Floor 2	4382, 4395, 4551-4555
Pit 8 (possible posthole)	Pit 7, Room 3, Floor 1A (originally Floor 1)	2947-2950
Pit 6 (basin in tool storage area)	Pit 6, Room 8, Floor 2	2767-2769, 2865-2866, 2885
Feature 8 (series of three grooves)	Feature 8, Room 8, Floor 2	4374, 4381, 4392
Feature 9 (two grooves, crossed)	Feature 9, Room 8, Floor 2	None
Tool Storage Area	Tool Storage Area, Room 8, Floor 2	2770, 2772, 2776-2778
Pit 3 (metate rest ?)	Pit 3, Room 8, Floor 2	2628, 2629, 2709-2711
Suite C		
Room 9, Floor 3 (no floor features)	Same	1988, 2161
Suite C ramada	Includes Room 5, Floor 1A (originally Floor 1)	None
Firepit 1	Same (originally designated Floor 1)	2826-2827, 2834, 2961-2964, 4169-4171

Table 1.7. (continued)

Designations in Text	Original Field Designations	Associated Field Specimen Numbers
Pit 4	Same (originally designated Floor 1)	2970-2972, 4156-4158, 4163?
Suite D (added at the end of the first construction episode or beginning of second, see Table 2)		
Plaza-facing Room/Ramadas		
Room 23, upper surface	Same	None
Pit 6	Pit 6, Room 17/18, subfloor	6244-6248, 6381-6382
Pit 7 (firepit)	Pit 7, Room 17/18, subfloor	6235-6237, 6249-6252, 6257, 6375-6380
Pit 8 (firepit)	Pit 8, Room 17/18, subfloor	6253-6254
Room 20, lower surface (may be associated with this episode--only uncovered in a small test)	Same	None

[a] Materials recovered from these surfaces probably were deposited during the third construction episode; it is believed that the surfaces continued in use during the latter period.

Table 1.8. Original field designations and those used in Volume I of this report for floor surfaces and features associated with above-ground rooms built during the third roomblock construction and use period (Phase D--middle A.D. 1000s).

Designations in Text	Original Field Designations	Associated Field Specimen Numbers
Suite A		
Room 22, Floor 1? (continued in use from second construction episode)	Same	6898-6901, 6951-6964, 7012-7013, 7284
Pit 1	Same	6967-6968
Room 19, Floor 1? (continued in use from second construction episode)	Same	2000, 2142-2145, 2172, 6614-6615, 6868, 6978
Cist 1	Same	1953, 1994-2003, 2164, 2168, 2187, 2191B, 2238
Mealing Catchment 1	Same	2165-2166
Mealing Catchment 2	Same	None
Mealing Catchment 3	Same	2163, 2185, 6869
Mealing Catchment 4	Same	2162, 2170-2171, 2189B, 2190B, 6870
Mealing Catchments 5 and 6	Same	2169, 2175, 2177
Room 15, Floor 1	Same	1395, 7090-7091
Pit 1	Same	None
Room 10, Floor 1 (no associated floor features)	Same	474-479, 2140, 4739-4740
Room 14, Floor 1	Same	840, 853, 856-859, 861, 864, 866-868
Firepit 1	Same	818-819, 851
Room 12, Floor 1	Same	583, 615, 719-724, 730
Firepit 1	Same	678-684

Table 1.8. (continued)

Designations in Text	Original Field Designations	Associated Field Specimen Numbers
Suite B		
Room 16, Floor 1 (no floor features)	Same	1651-1656, 1989-1993, 5025-5038
Room 4, Floor 1 (probably constructed during second construction episode; continued in use?)	Same	241, 673-676, 4923
Storage Cist 1	Same	104-105, 202?, 248-249, 646, 664-665, 776
Room 3, Floor 1	Same	197, 204, 208, 2141, 2466, 6331
Pit 1 (heating pit)	Same	123, 205-207, 242-243, 7259-7261
Pit 2 (heating pit)	Same	198-199, 201, 203, 244-245
Pit 3 (animal burrow)	Same	None
Pit 4 (heating pit)	Same	None
Room 8, Floor 1	Same	725, 729, 737, 1675-1676, 1689-1690, 1692-1693, 1696, 1698, 1700-1701, 1703
Tool Storage Area	Same	1677-1688, 1702
Firepit 1	Same	725-728
Tool Cache (northwest corner of room floor)	Same	138
Suite C		
Room 9, Floor 2A (surface identified by isolated baking pit)	Firepit 1	None
Firepit 1	Same	624, 626-628
Room 9, Floor 2	Same	107-110
Burial 2 on Floor 2	Same	106, 429, 446-448, 484, 539, 543, 741

Table 1.8. (continued)

Designations in Text	Original Field Designations	Associated Field Specimen Numbers
Room 5, Floor 1	Same	221, 431-432, 449-450, 459-473, 1553-1559, 1657-1674
Burned concentration of vegetal material and slabs on floor (possibly post-occupational)	Firepit 1	485-488, 4169-4171
Burial 5 and Burial Pit	Same	4653-4662, 4743, 4745, 4770-4771, 4852-4853
Suite D		
Room 2, Floor 1[a]	Same	None
Room 1, Floor 1[a]	Same	None
Room 1, Floor 2 (the upper floor of Room 1 was removed during the third construction episode and Burial 1 was placed on the lower surface)	Same	None
Burial 1	Same	74-85, 246-247, 250, 608, 897
Room 7, Floor 1	Same	637, 2159, 2984-2985
Firepit 1	Same	623, 630-631, 783
Two possible mealing bins or remains of catchments; no artifacts associated other than one upright slab buried in floor plaster and one flat slab		
Room 6, Floor 2 (no floor features)	Same	2158
Room 11, Floor 2	Same	None
Pit 1	Same	None
Burned slab concentration (northwest corner)	Same	None

Table 1.8. (continued)

Designations in Text	Original Field Designations	Associated Field Specimen Numbers
Plaza-facing Ramada		
Room 17/18 (mealing room)	Same	1737-1741, 1959-1986, 2146-2147, 4897-4898, 6255-6256, 6312, 6988-6989
Mealing Catchment 1	Bin 1	1478-1482
Mealing Catchment 2	Bin 2	1744-1745, 1954
Mealing Catchment 3	Bin 3	None
Mealing Catchment 4	Bin 4	1951
Mealing Catchment 5	Bin 5	None
Firepit 1	Same	1742-1743, 1752
Pit 1	Same	None
Room 20, Floor 1 (upper surface)	Feature 1 or Room 20	1957, 2142-2145
Ashpit 1	Same	1947-1948, 1955-1957
Mealing Catchment 1	Bin 1	None
Mealing Catchment 2	Bin 2	None
Mealing Catchment 3	Bin 3	None
Pit 1 (function unknown)	Same	None
Pit 2 (function unknown)	Same	None
Pit 3 (function unknown)	Same	None

[a] Both upper surfaces removed prehistorically, see text.

Table 1.9. Original field designations and those used in Volume I of this report for floor surfaces and features associated with pit structures.

Designations in Text	Original Field Designations	Associated Field Specimen Numbers
<u>Pithouse B</u>		
Floor 1 (not a real surface; level where prehistoric construction ceased)		None
Central Pit 1 (mixing pit ?)	Same	2019, 2028
<u>Pithouse C</u>	Kiva C	None
Bench	Same	2648
Floor 1	Same	4867-4879, 4988-5008, 5015-5019, 5051-5054, 5317-5321, 5323-5325, 5451-5463, 5644-5645, 6181-6185, 6193-6205, 6387-6389
Wing wall structure	Same	4981-4987, 5990
Hearth 1	Same	5448-5449, 5590-5594, 5616-5617, 5745, 5972-5976
Pit 2 (heating pit)	Same	5596-5598
Pit 8 (heating pit)	Same	5815-5818, 6032, 6033
Pit 11 (heating pit)	Same	6038-6039
Pit 12 (heating pit)	Same	5810-5814, 6030-6031
Pit 17 (heating pit)	Same	6407-6411, 6918-6919
Pit 1 (main roof support)	Same	5595, 5803, 5808-5809, 5977
Pit 5 (main roof support)	Same	None
Pit 7 (main roof support)	Same	5599-5601
Pit 20 (main roof support)	Same	None
Pit 4 (sipapu)	Same	None
Pit 10 (sipapu)	Same	5589, 5970-5971

Table 1.9. (continued)

Designations in Text	Original Field Designations	Associated Field Specimen Numbers
Pit 3 (other pit)	Same	None
Pit 9 (other pit)	Same	6403-6404
Pit 13 (other pit)	Same	None
Pit 14 (other pit)	Same	None
Pit 15 (other pit)	Same	5986
Pit 16 (other pit)	Same	6405-6406
Pit 18 (other pit)	Same	6412-6413
Pit 19 (other pit)	Same	6414-6415
Pit 21 (other pit)	Same	None
Pit 22 (other pit)	Same	None
Pit structure F	Kiva F	
Floor 1	Same	6561-6563, 6592-6596, 6606, 6610, 6640-6646, 6648, 6670, 6737-6738, 6889-6893, 6921-6922, 7073
Hearth 1	Same	6887-6888, 6940-6944
Pit 7 (heating pit)	Same	6760, 6764, 6769-6770, 6772
Pit 8 (heating pit)	Same	6756, 6773-6775, 6782, 7003
Pit 11 (heating pit)	Same	6876-6877, 6879-6882
Pit 15 (heating pit)	Same	None
Pit 18 (heating pit)	Same	None
Pit 12 (ash pit)	Same	6947-6950
Posthole 1	Same	6597-6598, 6753-6755
Posthole 2	Same	6757, 6761-6762, 6765, 7004

Table 1.9. (continued)

Designations in Text	Original Field Designations	Associated Field Specimen Numbers
Posthole 3	Same	7121-7126
Posthole 4	Same	7127-7128
Posthole 5	Same	6874-6875, 7085-7089
Pit 16 (posthole)	Same	7136
Pit 1 (other pit)	Same	None
Pit 2 (sipapu)	Same	6759, 6763
Pit 3 (other pit)	Same	6758
Pit 4 (other pit)	Same	6766
Pit 5 (pot rest ?)	Same	None
Pit 6 (other pit)	Same	6768, 6780
Pit 9 (other pit)	Same	6776
Pit 13 (other pit)	Same	7129-7131
Pit 14 (other pit)	Same	7132-7135
Pit 17 (other pit)	Same	7243
Pit 19 (also Pit 10 ?)	Same	7174-7175
Pit 20 (other pit)	Same	7176
Wall Niche 1	Same	6878, 6883-6886
Kiva D		
Floor 1	Same	4924-4932, 4967-4980, 5009-5012, 5139-5146, 5168-5169, 5175-5184, 5186-5210, 5212-5214, 5216-5229, 5370-5377, 5396-5397, 5579, 6052-6053, 7094
Hearth 1	Same	5378-5386, 5432-5436, 5605-5607, 5625

Table 1.9. (continued)

Designations in Text	Original Field Designations	Associated Field Specimen Numbers
Ashpit 1	Same	None
Mealing Bin 1	Same	5408, 5611-5613, 5792
Pit 9 (sipapu ?)	Same	5393-5395, 5608-5610
Pit 1 (other pit)	Same	5387-5392, 5437-5438
Pit 2 (rodent burrow)	Same	None
Pit 3 (other pit)	Same	5419-5421
Pit 4 (other pit)	Same	5422
Pit 5 (other pit)	Same	5423-5424
Pit 6 (other pit)	Same	5425-5426
Pit 7 (other pit)	Same	5410-5415
Pit 8 (other pit)	Same	5428-5429
Pit 10 (other pit)	Same	5694
Kiva G (only partially excavated)		
Floor 1	Same	7030-7037, 7114, 7295-7299, 7308
Firepit 1	Same	7138, 7180-7194, 7199-7233, 7246
Kiva E		
Floor 1	Same	6663-6669, 6675-6678, 6712, 6802-6811, 6817-6819, 7069, 7095, 7112
Hearth 1 (upper) Hearth 2 (discovered beneath Hearth 1)	Same	6679-6681, 6812-6816, 7001-7002
Pit 2 (deflector groove)	Same	6682

Table 1.9. (continued)

Designations in Text	Original Field Designations	Associated Field Specimen Numbers
Pit 3 (other pit)	Same	6681
Pit 4 (other pit)	Same	None

23, Floor 1). These original four room suites, once initially defined, continued to be remodeled and used for approximately 250 years.

Phase C, the second major roomblock construction and use period (late A.D. 900s-early A.D. 1000s), represents the most intense use of the site (Figure 1.3, Table 1.7). During this phase, Pitstructure F was definitely in use; it may have been built somewhat earlier. Pithouse H is possibly a part of this phase, and Pithouse C continued to be used. Considerable remodeling in the rooms took place; their shape and size differs somewhat from the earlier ones, but the room numbers assigned to these approximate locations were the same. Their functions may have changed somewhat. Room Suite A, Room 22, Floor 1 continued to be used for storage. Room 19, Floor 1, however, has evidence of use as a mealing room in that there were several mealing catchments in the floor. In general, the differences in the numbers of rooms and work areas consisted of rebuilding of storage rooms and resurfacing of the ramada areas.

The final remodeling of the roomblock, which dates to the mid A.D. 1000s, was assigned Phase D (Figure 1.4, Table 1.8). Although the room suites occupied the same areas, their composition differs in that the former ramada areas adjacent to the earlier storage rooms were walled in, the third or easternmost row of rooms may have functioned as work areas, and pitstructures evolved into "kivas." Kivas D and G were definitely part of this use period; Kiva E may have been constructed in the later part of this phase. In Room Suite A, Floor 1 in both Rooms 22 and 19 continued in use from the earlier period as storage and meal-

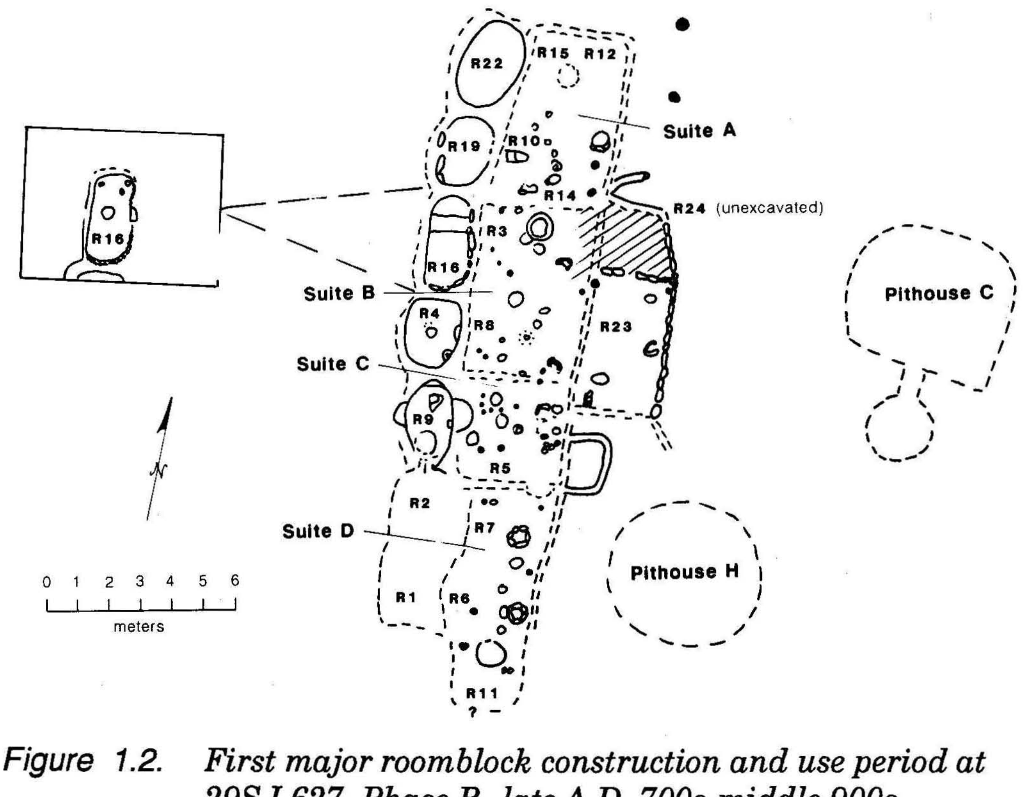

Figure 1.2. First major roomblock construction and use period at 29SJ 627, Phase B--late A.D. 700s-middle 900s.

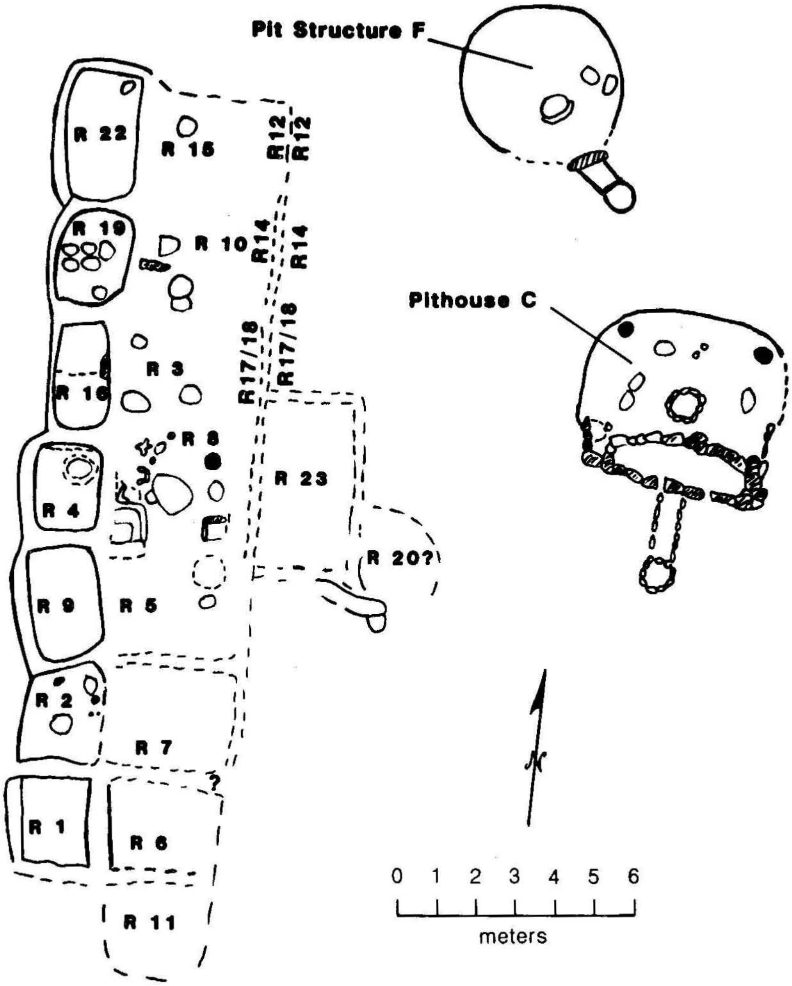

Figure 1.3. *Second major roomblock construction and use period at 29SJ 627, Phase C--late A.D. 900s-early 1000s.*

ing rooms. They were associated with the uppermost floor (Floor 1) in Rooms 15, 10, 14 and 12. In Room Suite B, Truell thinks that Floor 1 of Room 4 probably had been constructed during the earlier period and continued in use. Room 3, Floor 1, had three heating pits, and Room 8, Floor 1 had evidence for a tool cache in the northwestern corner of the room, of a tool storage area, and a firepit. Room Suite C included two rooms, Room 9, Floors 2 and 2A, and Room 5, Floor 1. The burial of an infant (Burial 5) was recovered in Room 5. Room Suite D included Room 1, Floor 2, and Burial 2; Room 7, Floor 1, which had evidence for two possible mealing bins or catchments; Room 6, Floor 2; and Room 11, Floor 2. A plaza facing ramada and two mealing areas (Room 17/18 and Room 20, Floor 2) were also assigned to Phase D.

The last use of 29SJ 627, Phase E, early A.D. 1100s, is seen in the trash deposit in Kiva E; in addition, this structure was the only kiva built with masonry. In their analysis of ceramics, Toll and McKenna (1985; Chapter 2 of this volume) indicate that the latest floors of Rooms 6 and 11 (which are adjacent to Kiva E) have evidence of the latest types of ceramics. They do not exclude the possibility that other high late floors may have been used, but the extensive damage at the site precluded a detailed analysis of the artifacts with the necessary tight provenience control.

The association of pit structures to the roomblock was complicated because no surface was found that linked these two types of architecture. The pit structures were not always built or remodeled

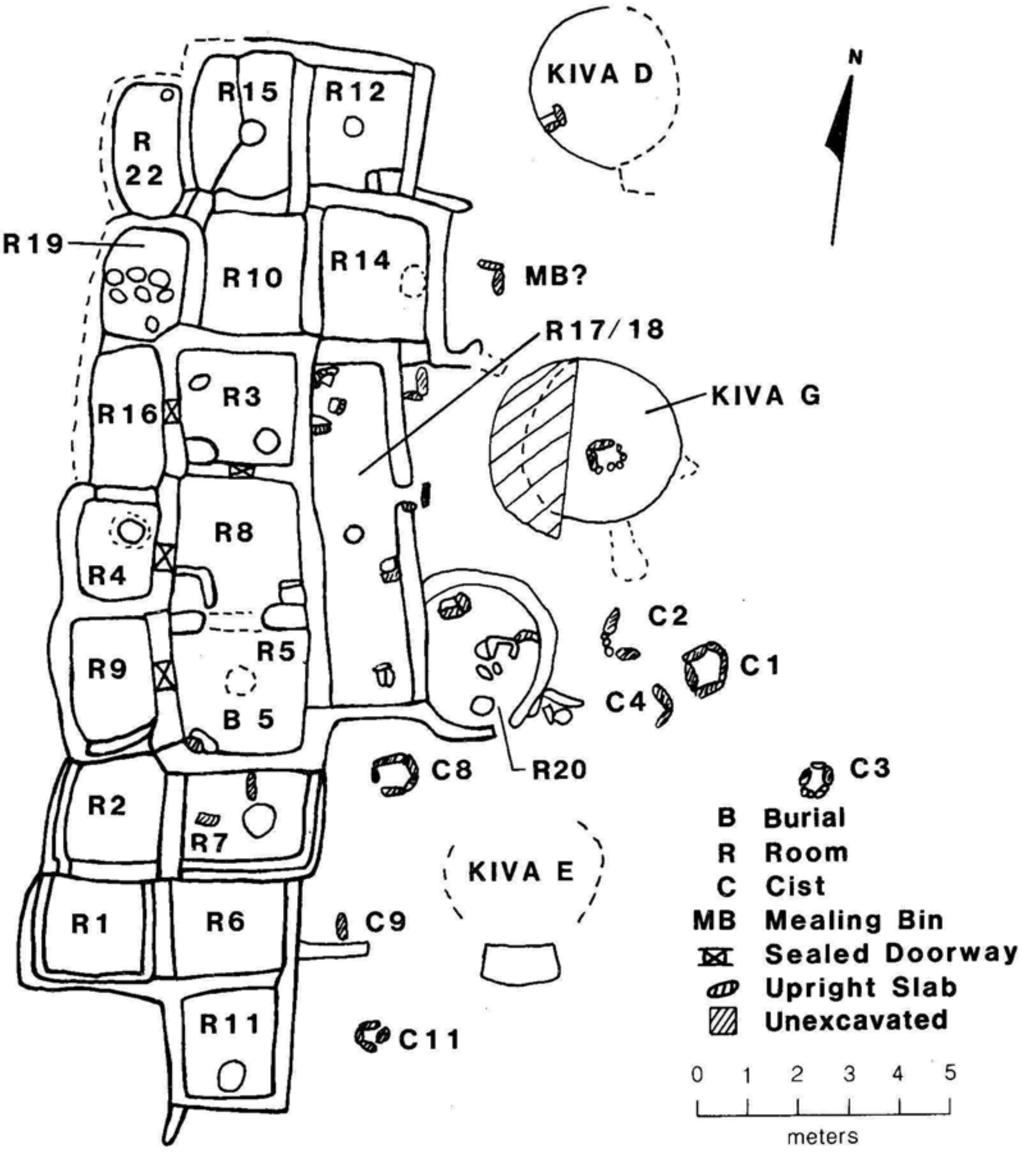

Figure 1.4. Third major roomblock construction and use period at 29SJ 627, Phase D--middle A.D. 1000s.

at the same time as the above-ground rooms (see Volume I). A list of specimen numbers for artifacts recovered from floor surfaces and features within them is given (Table 1.9).

In addition, as Truell (Volume I) and Toll and McKenna (Chapter 2 of this volume) point out, most artifacts at this site were not recovered from primary use contexts but were found in several types of fill. This fill consisted mainly of trash, alluvium, or structural remains either singly or in some combinations; the trash deposits, dated ceramically from early to late, are found in Pithouse C, lower Pit Structure F, the eastern part of the Trash Mound, the western third of the Trash Mound, Kiva D, and Kiva E (Toll and McKenna, Chapter 2). Alluvial fill was recovered in Kiva G, the upper part of Pit Structure F, and the majority of the western row of storage rooms. Most of the other rooms and lower ramada surfaces contained structural melt and alluvium. Thus, any analysis of artifacts is limited to some extent to broad time frames; such analyses, however, add much to an understanding of questions that are not tied to proveniences or specific functions within rooms or work areas.

Several of the archeologists who performed these analyses were an integral part of the Chaco Project staff who excavated the site; others joined the staff later, did not have an opportunity to see the material in situ, and yet contributed to this volume. Table 1.10 summarizes the results of these efforts, as well as lists all published and unpublished reports pertaining to these data.

Because data on several topics are reported in summary overviews only, they have not been included in this volume. In addition, the reports on pollen and flotation have been excluded because they are available as Masters Theses (Cully 1977; Struever 1977); additional summary data on botanical remains from 29SJ 627 have been included in a volume that addresses several aspects of environment and subsistence in Chaco Canyon (Cully 1985; Toll 1985) or elsewhere (Cully 1984; Toll 1984). Information on human burials has been presented by Akins (1986), who compared the physical and cultural remains at small and large sites through time to determine broadly patterned changes, as well as differences among various groups within the Anasazi world.

The five analytical chapters that appear in this volume were written and revised during a several year time span; however, they were completed before the latest revision of the architecture and stratigraphy that appears in Volume I. Because most contributors to this volume are no longer part of the National Park Service staff or are working on other projects, the authors were unable to incorporate all these changes in dates and feature terminology. In addition, the move of the Branch of Cultural Research from offices in Albuquerque to Santa Fe precluded reexamination of the computerized data base to improve reports written several years ago. As a result, a decision was made to use the original terms in this volume. Thus, there is some unevenness in the flow and

Table 1.10. Published and unpublished reports on material culture remains from site 29SJ 627.

Topic	Original Report	Revised	Data Published	Data Scheduled to be Published
Architecture and Stratigraphy	Truell 1980	1986-88	Volume I, this report	
Ceramics	Toll and McKenna 1982	1985	Volume II, this report; Toll 1984, 1985	
Chipped Stone	Cameron 1981	1987-88	Volume II, this report; Cameron 1984; Cameron and Sappington 1984	
Chipped Stone Tools	Lekson 1980	1985		Artifact volume, in preparation
Ground Stone: Abraders	Akins 1980			Artifact volume, in preparation
Ground Stone: Axes and Mauls	Breternitz 1976			Artifact volume, in preparation
Ground Stone: Hammerstones	Wills 1977			Artifact volume, in preparation
Ground Stone: Manos	Cameron 1985			Artifact volume, in preparation
Ground Stone: Metates	Schelberg n.d.			Artifact volume, in preparation
Ornaments	Mathien 1985		Volume II, this report; Mathien 1981, 1984	
Botanical Remains: Flotation	Struever 1977		Toll 1984, 1985	
Botanical Remains: Pollen	Cully 1977		Cully 1984, 1985	
Fauna	Akins 1981		Volume II, this report; Akins 1984	
Bone Tools	Miles 1982	1985	Volume II, this report	
Human Burials	Akins 1985		Akins 1986; Akins and Schelberg 1984	

depth of the presentations in Volume I and Volume II. The data presented in Chapters 2 through 6, however, are an important addition to the Chaco Canyon database.

In Chapter 2, Toll and McKenna present the detailed type descriptions used for their analyses, discuss the function of vessels, their distribution within the site, and the sources of imported wares. Because Red Mesa Black-on-white was the dominant pottery type during the span of major occupation of the site and there were sizable samples from three pit structures, Truell suggested a detailed comparison of material from them. Toll and McKenna's results confirmed the relationship of Pithouse C, Kiva D, and Kiva E that was suggested by absolute dates, which were few in number and some of which had been questioned (see Chapter 3, Volume I). Along with architecture and stratigraphy, their ceramic chronology was an important aspect of the reconstruction of site use through time. Toll and McKenna were constantly aware that material found in structures did not necessarily go with those structures, yet they were able to make statements about the regional definition of design and importation of ceramics. Several of their tentative conclusions, which they admit need further study, indicate higher numbers of whitewares than other wares in grinding complexes; differences between percentages of whitewares and culinary wares in storage rooms with floor features versus those without. In summary, their work offers some interesting observations, as well as provides the reader with considerable information about ceramics at 29SJ 627, in Chaco Canyon, and in the San Juan Basin.

Cameron's analysis of chipped stone (Chapter 3) presents basic data on the materials, their sources, the types of tools recovered, and some statements regarding comparisons with data from other earlier and later sites. Because most of the other small sites excavated by the Chaco Project had no large samples of chipped stone that dated to post A.D. 1000 and because material from Pueblo Alto, a large pueblo, generally dated to the period from A.D. 1050-1100, the sample from 29SJ 627 bridges a time gap. Cameron's analysis points to similarities and differences between this site and other small sites and the large pueblo--one that might be expected given its intermittent placement in the time sequence.

Data from the analysis of ornaments and minerals (Chapter 4) indicate that around A.D. 900 there were many new shell species being imported into Chaco Canyon and that these were available to the inhabitants of the small sites. In addition, Mathien notes the presence of turquoise beads and other material in a kiva ventilator shaft, which Truell considers a possible offering. Mathien also observed that differences in the sizes of beads may be the result of their function (e.g., as parts of a long necklace versus a short set of earloops) rather than related to temporal change.

Analyses of faunal remains by Akins (Chapter 5) were complicated by the large number of small, unidentifiable bones that could indicate a reaction to stress in which all resources, including bones, were fully utilized. There was a trend at 29SJ 627 to have more Lepus californicus (black-tailed jack rabbit) than Sylvilagus sp. (cottontail rabbit). This is similar to information she obtained at two other small sites that were roughly contemporaneous. Yet, the use of Odocoileus hemionus (mule deer) as the predominant artiodactyl at 29SJ 627 contrasts with data obtained from other sites, particularly 29SJ 1360, where Antilocapra americana (pronghorn) was the more frequently recovered artiodactyl. Both sites 29SJ 627 and 29SJ 1360 had approximately equal access to the flats south of the canyon for hunting. In addition, Akins was concerned with why the faunal remains recovered do not represent enough meat to have fed the estimated population for the years this site was inhabited. She offers several possible explanations.

In Chapter 6, Miles notes an increased production of bone beads over time; this coincides with the construction of kivas.

In summary, these reports document some of the changes through time as well as differences among contemporaneous sites within Chaco Canyon.

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THE RHETORIC AND THE CERAMICS DISCUSSION OF TYPES, FUNCTIONS, DISTRIBUTIONS AND SOURCES OF THE CERAMICS OF 29SJ 627

H. Wolcott Toll and Peter J. McKenna

Introduction

The objectives of this report are to present the basic data on the ceramics of 29SJ 627 and to interpret those data. Any analysis involves a large number of choices as to attributes monitored and interpretation pursued. The choices of attributes and the recording methods are discussed more fully elsewhere (McKenna and Toll 1984, Toll and McKenna 1987), but an attempt has been made in the following sections to indicate the attributes in question, suggest their interpretation, and be cognizant of the extent to which such interpretations are reliable and the extent to which they are beclouded by other circumstances.

The initial handling of ceramics was oriented toward obtaining chronological information about sites and components. The next phase of the ceramic analysis incorporated the project emphasis on regional supply of Chaco Canyon, both its temporal development and the source of non-local goods. Of related interest are the questions of the existence of localized specialization and of social differentiation. Finally, functional interpretation, as indicated by ceramic attributes and distributions in time and space within the site, are of interest.

Background--The Site

29SJ 627 is located on a colluvial fan west of the confluence of the Fajada Wash with the Chaco Wash in the center of a Chaco Canyon locality presently known as "Marcia's Rincon." This site is the most extensive and complex small site village archaeology undertaken by the Chaco Project. The complexity and temporal depth of 29SJ 627 is rivaled only by that of the more renowned "Bc" sites, such as Bc 50, Bc 51, and Bc 59, near South Gap and Casa Rinconada, which were excavated in the 1930's and 1940's by the UNM field school (Brand, Hawley, Hibben et al. 1937; Dutton 1938; Kluckhohn and Reiter 1939; Voll 1965). At 29SJ 627, a two-year excavation exposed a single-storied pueblo of 25 rooms and seven pit structures with evidence of a 375-year-occupation falling between A.D. 775 and A.D. 1150 (Truell, Volume I). Scattered Basketmaker structures in the immediate area and the proximity of Basketmaker site 29SJ 628 (Truell 1975) suggest an even longer development and occupation of 29SJ 627 than was clearly discerned in the core excavation.

Truell's interpretation of the development of 29SJ 627 sees rapid initial growth to three contiguous, multiroom architectural units during the first major roomblock construction period (Phase B). Thereafter, the site remained essentially the same size but underwent extensive modification. Associating population and subsistence requirements with the site size leads to an expectation of relatively uniform ceramic demands throughout the occupation of 29SJ 627 inasmuch as no marked architectural increases can be documented after the developments culminating circa A.D. 910.

The architectural growth of the site suggests consistently patterned use and reuse of space through time. The basic functional pattern of paired small storage rooms fronted to the east by larger domiciliary rooms was maintained throughout the site's development. Through time, diversification and specialization of features and work space becomes apparent. Features common in earlier pit structures (such as mealing areas, miscellaneous burned and unburned pits) decline in frequency in later pitstructures, concurrently appearing more regularly in surface rooms and exhibiting a wider variety of contents, shapes, and locations. With the architectural evolution of pit structures to "kivas," the latter were built closer to the rooms and were more consistent in architectural planning and execution. This coincides with the standardization of room plan and construction during the third major roomblock construction period (Phase D). The last construction appears uniform and tract-like; the site's subdivision into specific units can be inferred by the locations of specific features such as hearths of several types, mealing bins, and storage areas.

Site 29SJ 627 contains few primary context deposits; most fill is either trash, alluvium, structural melt, or mixtures of the three. Earliest to latest, major trash deposits are located in Pithouse C, lower Pit Structure F, the eastern part of the trash mound, the western third of the trash mound, Kiva D, and Kiva E. Alluvium fills Kiva G, upper Pit Structure F, and the majority of the western row of storage rooms. Most rooms are filled with structural melt and alluvium. This is particularly true of the two lower ramada surfaces, which appear to be leveled with razed architecture and reused fill-trash prior to the laying of the next floor. These continuous surfaces generally underlie the eastern two tiers of later rooms. The latest floors were located in Rooms 6 and 11 adjacent to Kiva E and were noticed partly because of late, floor contact ceramics. Other high, late floors may have been present, but extensive damage following abandonment destroyed or reduced their visibility. The extant upper floors were located only centimeters below the surface without appreciable associated rubble. The occupation, which continued in the rincon at sites such as 29SJ 633 (Truell 1979), may well have used 29SJ 627 as a "mine" for readily available, shaped building stone. Such gleaning activity has also probably modified the final ceramic record in terms of reuse of abandoned whole pots, reuse of large sherds for tools, and possibly collection of others for temper. Evidence of the latest ceramic period featuring late Gallup Black-on-white, Chaco Black-on-white, and late carbon-painted ceramic types at 29SJ 627 has been largely obliterated in occupational contexts and is best represented in the deeper trash deposits of Kiva E.

Analytical Background

This report concerns primarily the pottery found at 29SJ 627, but these ceramics are more meaningful and more easily discussed in terms of ceramics from elsewhere. The most relevant ceramics with which the authors are most familiar are those from other Chaco Project excavations. It will save a great deal of paper and ink if bibliographic references to the reports for these sites are omitted after initial introduction. References and site designations are given in Table 2.1.

To this list should be added the ceramics chapter of the artifact volume (Toll 1986), which gives an overview of all ceramics analyzed by the project. This overview also includes descriptions of terms and time periods used for all Chaco Project ceramic analyses and comparisons by time among the sites excavated. It is, perhaps, useful information for the reader to know that the sequence of final analysis and write-up was 29SJ 628, 29SJ 629, 29SJ 627 with

Table 2.1. Sites excavated by the Chaco Project.

Smithsonian Number	Name in Text	Site Reference	Ceramic References
29SJ 627	29SJ 627	Truell 1980	Primary: this report Secondary: Toll 1981, 1984 Toll et al. 1980 Warren 1977
29SJ 628	29SJ 628	Truell 1975	Primary: Toll and McKenna 1981b Secondary: Warren 1976
29SJ 629	29SJ 629	Windes 1978	Primary: Toll and McKenna 1981a Secondary: Toll 1981
29SJ 633	29SJ 633	Truell 1979	Primary: McKenna and Toll 1991 Secondary: Toll et al. 1980
29SJ 1360	29SJ 1360	McKenna 1984	Primary: McKenna and Toll 1984
29SJ 389	Pueblo Alto	Windes 1987	Primary: Toll and McKenna 1987 Secondary: Toll et al. 1980 Toll 1981, 1984, 1985

29SJ 1360 and Shabik'eshchee concurrent, Pueblo Alto, and the overview.

Time is the subject of this report almost as much as is pottery. It should be recognized that there are several variations on the theme of time. While they are all approximating the same thing, they cannot be considered equivalent. Three varieties may be defined.

1) Chronological time is "real" and it is the dimension the other kinds of time attempt to approximate. At 29SJ 627, there are lamentably few direct contacts with chronological time--archeomagnetic dates and C^{14} dates are problematic at this site and tree-ring dates are scarce. Because even these approximations are tenuous, reliance on the other views of time are of increased importance.

2) Depositional time relies on the conventional archeological wisdom of the law of superposition. Archeologists from Burgh (1959) to Schiffer (1972) have instructed us that the processes subsequent to the first deposition are continually violating the law and this, too, is a problem at 29SJ 627. As is developed further in the time-space section, depositional time in ceramics must be kept distinct from time of production. That is, even assuming an undisturbed deposit, different classes of vessels were surely subject to different breakage risks. A case in point is the set of grave goods accompanying Burial 1 from 29SJ 627. The pots with this burial are all Red Mesa Black-on-white but one, and probably relatively late Red Mesa Black-on-white. The exception is a very large bowl sherd that is typologically earlier (Kiatuthlanna or Early Red Mesa Black-on-whites). It has a post-firing burn mark in it and the edges are somewhat worn, suggesting that it may have been used as an ash scoop. Thus, through extended use of a vessel or some portion thereof, ceramics produced at quite different times end up in the same deposit, in this case a deposit representing a very discrete point in time.

3) Typological time is the most artificial of these views of time, but it is also the most accessible and the most heavily used in this report. "Typological time" is based on the fact that many types do have chronological limits, and that types appeared more or less in a serial fashion. Characteristics of typological time that bear on the understanding of our use of the concept as an ordering principle are:

a) While points along the typological time line have the appearance of intervals, they are ordinal at best; certainly typological time cannot be thought of as consisting of equal-sized units, though it can be given a rough correspondence to years.

b) The ordinal nature of typological time is also not perfect; that is, rather than types ending and beginning at precise points, there is temporal overlap between them (see Figures 2.1-2.2 or Breternitz et al. 1974:Table 1). The concept, therefore, relies on the probability of a type coming from a certain point in time as suggested by the classic "battleship curve" (Deetz 1967). Thus, typological time deals strictly with trends and tendencies; it relies on one type to be overall later than another and should be regarded in that light rather than as an absolute chronology or perfect series. As such, its use allows the definition of trends in changes in attributes such as decoration, temper, vessel size, and use.

This is nothing more than the well-established use of ceramics for chronological placement of deposits with an attempt, on the one hand, to use that chronological information and, on the other hand, to recognize its limitations.

Figures 2.1 and 2.2 illustrate the complementarity and noncongruence of depositional time. The assumed production dates of the six most abundant specific types at 29SJ 627 are found across the top of each figure with the actual frequencies found within assigned time periods below. The periods were assigned mainly on the basis of ceramic types and secondarily on architectural types and chronometric dates. The figures show that in all cases the types were found in time group proveniences falling outside the dates assigned to the type. Mixing may be blamed in part, but imprecision of dates and type assignment and differential deposition are all further complications lurking in the background. On the positive side, it may be noted that actual frequencies do conform to the trends the assigned dates predict.

A rough sort of the ceramics was designed to provide temporal information; the other major concern was that it be amenable to processing large quantities of ceramics quickly. The ceramic types employed in the rough sort are broad, so as to minimize sorting time, but specific enough to place common types into temporally meaningful groups. Ceramics in especially broad groups--and thereby temporally not meaningful--are all redwares, "exotic mineral-on-white," polished smudged wares, and Pueblo II-III carbon-on-white. Other broad categories include undecorated whitewares and redwares and graywares too small to be classified; categories similar to the latter would be necessary in the most detailed of analyses. The initial plan was for the detailed analyses to record refined types in addition to rough sort types, but due to mid-

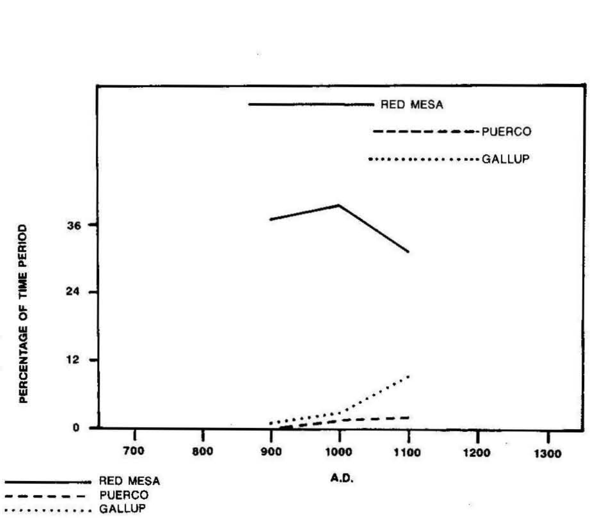


Figure 2.1. Whiteware chronology. The three most abundant whiteware types at 29SJ 627 are shown; these types are those chosen for detailed description. The horizontal lines at the top of the figure show the time spans of each type as applied by the Chaco Project. The frequency plots lower on the chart show the occurrence of each type in proveniences assigned time spans, expressed as the percent of each segment's total collection.

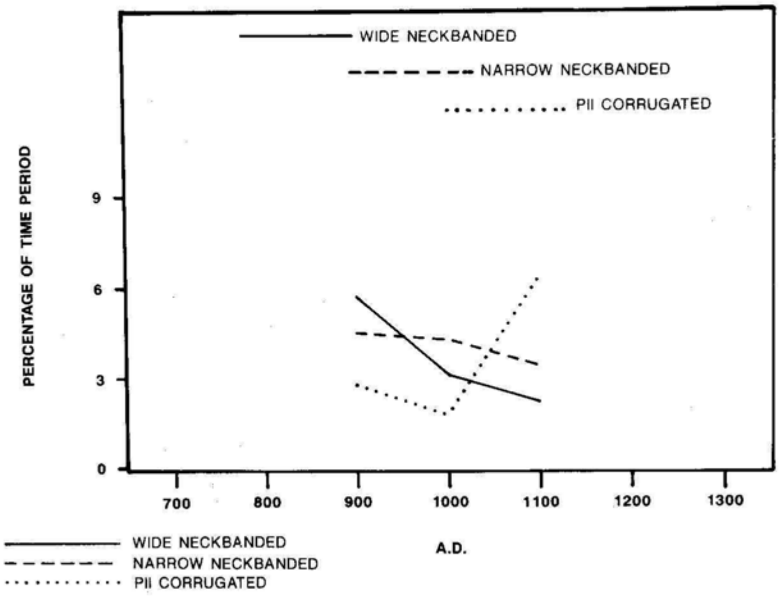


Figure 2.2. Grayware chronology. The three most abundant grayware types at 29SJ 627 are shown (arranged as in Figure 2.1).

stream personnel changes and sheer momentum, only rough sort types were recorded.

The effects of the absence of finer types is two-fold. On the one hand, considerable information is lost--redwares are readily placed in series and "exotics" can be placed in horizons if not in geographically oriented types. On the other hand, many of the undesirable aspects of typological analysis are avoided by using only rough sort types. Our circumvention of the lack of split types is that considerable other information was recorded, some of which is the basis for some types used by splitters. The most prominent among these supplementary attributes is temper, which allows division of a type such as Red Mesa Black-on-white into others, such as Naschitti Black-on-white (if you're so inclined), and redwares into series.

There is, therefore, a compromise between extreme splitting and complete anti-typology. In the last analysis, which is not one with which we are especially pleased, some information such as time horizon in redwares or smudged ware or more precise time and space information for exotic mineral-on-white and later carbon-on-whites has been unnecessarily lost. However, in terms of primary types, the rough sort type approach is the one we would take by choice. Rough sort types with Cibola series names (Red Mesa, Puerco, Escavada, and Gallup Black-on-whites, etc.) are sufficiently tightly construed that sherds in these types are likely to be from a broad area and a limited time span. The variability in tempering, finishing, and other technological attributes within such groups is relevant to ceramic production and distribution in the Chaco region. Presentation of the quantified results thus provides information on economics as well as an objective assessment and definition of the types as identified.

It must be recognized that all the attribute monitoring in the world cannot solve the fundamental problem that there is a substantial number of items that do not fit well into types in use. Within the high frequency types at 29SJ 627, for example, questions may arise as to whether an item should be called Red Mesa or Puerco Black-on-white, or Red Mesa or Gallup Black-on-white. We claim only that use of broader types reduces such problems and that use of back-up attributes ameliorates the problems created by possible misidentifications.

Report Outline

Having given some preamble as to the philosophy underlying this report and a very brief sketch of the site itself, the contents of this report may be outlined as follows:

1) Sample and analysis--a discussion of the sampling levels used and basic characteristics of the ceramic assemblage from 29SJ 627. Processing factors that could influence the complexion of the results are also enumerated.

2) Type descriptions--the six most abundant types at 29SJ 627 are discussed; included are definitional history of whitewares, detailed presentation of each type's attributes, and comparisons with one another within wares.

3) Type-temper-surface-attribute combinations--this section is, in essence, a continuation of the type description section; it presents data on groups that are technologically and typologically similar. Such groups are the best available place to examine the ceramics for evidence of production groups or areas.

4) Co-occurrence of technological attributes--ignoring types, the covariation of form, paint, temper, grain size, and visual clay types is examined, again looking for practices that may have been favored in some areas. Also addressed are functional inferences that can be made from technological attributes and grayware sooting.

5) Time-space distributions--this section examines ceramic variability in several dimensions, concentrating on type, form, and temper. Time and space assignments are discussed separately and in combination, including the use of principal components analysis. Three specific deposits and whole vessel distributions are presented and discussed; bulk count distributions are also covered.

6) Summary--inferences are included in each of the above sections and it is our opinion that these carry interpretation about as far as is valid. Rather than a grand synthesis, this section reduces and reviews the evidence for ceramic import through time and recaps some of the findings from the various sections.

Throughout the report, the tables are heavily referenced and we consider them to be fundamental to the understanding of the 29SJ 627 ceramics. The interpretations offered are those we consider supportable, but we realize that others are possible. The extensive presentation of data combinations is intended to permit assessment of our interpretations and to make possible the generation of others.

Sample and Analysis

The Collection and How It Was Sampled

The collection has been subjected to two levels of analysis: a traditional typological or "rough sort" classification and a more detailed analysis based on types and attributes.

The rough sort analysis was conducted after the pottery had been brought to the lab and washed. This analysis was essentially an inventory which recorded numbers of sherds by provenience. In addition to provenience information, counts of basic vessel forms (open or bowl, closed or jar, and ladle) were recorded by type. The types used were from a restricted list that was intended to make it possible for lab workers not familiar with all Southwestern types to do the analysis. These types cover a range of specificity. At their most specific they are comparable to formally defined types; the types included in this group are those that are most abundant in Chaco Canyon, those in the Chaco Cibola series (Windes 1984). Less specific "types" include identification as to series, such as Tusayan or Chuska. Still less specific are types such as indented corrugated or PII-III whiteware, or "exotic mineral-on-white." These least specific "catchall" types include a variety of items. Many members of these classes are so small as to be impossible to type, or lack attributes such as design or rim form necessary to finer type placement. Others may be sherds that the classifier thought he could not place in another type for some other reason.

Although the rough sort record is a useful inventory and can be used to judge the ceramic assemblage for chronological purposes, it is not suited to answering questions about variability within the ceramic assemblage, function, production, or decoration. To address such questions, we wanted a sample that was based on vessels rather than sherds and we wanted to know more about those vessels than we did from the rough sort.

A series of steps was taken to arrive at the detailed analysis sample. An effort was made to match sherds into vessel groups both within and, more informatively, across proveniences (Appendix C). This process not only gave us some control over the number of times a single vessel would show up in the analysis, but also provided important depositional information that indicated which proveniences were somehow related. During the detailed analysis, we continued to look for matches to minimize duplication of vessels in the sample. The basis of the detailed analysis sample was rim sherds. An effort was made to include all rim sherds, again placing them in vessel matches wherever possible.

The columns in Table 2.2 show the four groups that were used in stages of the 29SJ 627 pottery analysis. The rough sort count is an inventory of all the sherds recovered from the site. The "Detailed Count" column shows the sample originally drawn for detailed analysis. This sample contains rim sherds from the whole site and all of the sherds from Pithouse C, Balk 3. We eventually rejected the notion that full treatment of this one provenience would be useful, so this count is little used in this report. The "Temper Count" column shows all sherds that were examined with the microscope for temper. This sample is primarily a rim sample, but it does contain some non-rim sherds. The final column, "Rim Count," is a count of all vessels represented by rims. Insofar as possible, no vessel is present more than once in the rim and temper samples. That is, no matter how many sherds from a vessel are present, the vessel counts as one item in the rim and temper columns.

The detailed analysis recorded the information that forms the basis for most of this report. It retained the rough sort type assignment and the provenience information from the rough sort, but went into far greater detail in a number of categories. An attempt was made to be much more specific as to vessel form. A range of technological variables was recorded including paint type and color, polish, slip distribution, various paste attributes, and temper type. Design elements and surface manipulation were noted, as were handle type and post manufacture modification. On the whole, the detailed analysis sample was consistent, and it can be considered to be a reasonable census of the vessels represented in the excavated materials. As in any census, the entire population is not represented and some inconsistencies in data collection must be assumed. The quirks we know of and some of the problems in taking the census are discussed below.

Overview of Sample Variant Contents

As was true of the 29SJ 629 sample (Toll and McKenna 1981a:9-10), the rough sort distribution is markedly different from that of the temper sample, with relative frequencies of graywares much greater in the rough sort and whitewares greater in the temper analysis. Some of the causes for this are:

1) Grayware vessels are, on the whole, larger than whiteware vessels, are more commonly jars or ollas, and thereby produce more body sherds per vessel when broken.

2) The bulk of whiteware vessels are bowls, which produce a higher ratio of rim sherds to body sherds than do grayware vessels. Assuming that not all rim sherds survive and that not all portions of a vessel are recovered, a grayware vessel has a smaller chance of being included in the sample. This disproportion is, in all likelihood, a minor factor because, for example, the mean estimated orifice diameter for PII corrugated jars is 213.2 mm, although for Red Mesa Black-on-white bowls it is 186.0 mm. All other Red Mesa Black-on-white vessel forms have smaller mean diameters than do bowls.

3) There is a possible bias that favors the inclusion of whiteware in the sample. The policy is to include some large whiteware jar form sherds because of the nondescript nature of neck decoration on such vessels. However, when the strictly rim sample and the temper sample in Table 2.2 are compared, the percentages in most types are quite similar.

Table 2.2. 29SJ 627 ceramic sample comparison.[a]

Rough Sort Type	Rough Sort Count	Rough Sort %	Detailed Count	Detailed %	Temper Count	Temper %	Rim Count	Rim %
GRAYWARE								
Plain gray	17,968	21.3	2,188	17.8	162	2.2	63	1.1
Lino gray	255	0.3	136	1.1	135	1.9	135	2.4
Lino fugitive	115	0.1	8	0.1	6	0.1	6	0.1
Polished tan	26	0.03	7	0.1	6	0.1	6	0.1
Wide neckbanded	237	0.3	411	3.3	150	2.1	136	2.5
Narrow neckbanded	5,590	6.6	508	4.1	244	3.4	234	4.2
Neck corrugated	698	0.8	104	0.8	72	1.0	68	0.8
PI corrugated	811	1.0	398	3.2	398	5.6	394	7.5
PII-III corrugated	180	0.2	82	0.7	81	1.1	82	1.5
PIII corrugated	40	0.04	43	0.4	43	0.6	42	0.8
Unident. corrugated	22,687	26.9	683	5.6	152	2.1	82	1.5
Total gray[a]	48,607	57.5	4,568[a]	37.2	1,449[a]	20.1	1,247	22.3
MINERAL-ON-WHITE								
BMIII-PI polished M/w	151	0.2	102	0.8	94	1.3	86	1.6
BMIII-PI unpolished M/w	242	0.3	70	0.6	66	0.9	58	1.0
E. Red Mesa B/w	758	0.9	220	1.8	155	2.1	144	2.6
L. Red Mesa B/w	7,527	8.9	2,841	23.1	2,307	31.9	1,964	35.1
Escavada B/w	368	0.4	60	0.5	53	0.7	51	0.9
Puerco B/w	1,154	1.4	241	2.0	221	3.1	176	3.1
Gallup B/w	3,932	4.7	610	5.0	551	7.6	463	8.3
Chaco B/w	178	0.2	30	0.2	26	0.4	15	0.3
Exotic M/w	157	0.2	172	1.4	166	2.3	70	1.3
PII-III M/w	6,999	8.3	1,617	13.1	1,044	14.5	659	11.8
Total M/w	21,466	25.4	5,963	48.5	4,683	64.8	3,686	65.9
CARBON-ON-WHITE								
BMIII-PI polished C/w	135	0.2	41	0.3	33	0.5	26	0.5
BMIII-PI unpolished C/w	58	0.1	18	0.1	16	0.2	14	0.3
PII-III C/w	1,112	1.3	93	0.8	71	1.0	52	0.9
Mesa Verde B/w	0	0.0	2	0.02	2	0.03	2	0.04
Chaco McElmo B/w	0	0.0	1	0.01	1	0.01	0	0.0
Chuska B/w	0	0.0	25	0.2	24	0.3	15	0.3
Chuska whiteware	1	0.0	95	0.8	82	1.1	55	1.0
Red Mesa design Chuska	0	0.0	75	0.6	58	0.8	44	0.8
Tusayan whiteware	0	0.0	47	0.4	45	0.6	42	0.8
Total C/w	1,306	1.5	397	3.2	332	4.6	250	4.5
Unidentified whiteware	12,083	14.3	1,102	9.0	545	7.5	246	4.6
TOTAL WHITEWARE	34,855	41.3	7,463	60.7	5,560	77.0	4,182	74.8
REDWARE								
Plain red	1	0.00	2	0.01	2	0.03	2	0.04
Decorated red	574	0.7	166	1.4	135	1.9	99	1.8
TOTAL REDWARE	575	0.7	168	1.4	137	1.9	101	1.8
Polished smudged	432	0.5	94	0.8	76	1.1	62	1.1
Brownware	4	0.00	3	0.02	3	0.04	2	0.04
GRAND TOTALS	84,473		12,295+		7,225		5,594	
% of Rough Sort				14.6		8.6		6.6
% of Detailed Analysis						58.8		45.5

[a] An unfortunate oversight omitted 293 culinary sherds from the original analysis. Information on these vessels and the effects of their inclusion in the sample may be found in Appendix E.
B/w = Black-on-white C/w = Carbon-on-white M/w = Mineral-on-white
+ Includes all sherds from Pithouse C, Balk 3.

Thus, we argue that the sample is a reasonable representation of the entire vessel assemblage. Most excavated Anasazi sites reported in the literature show more grayware than whiteware in their collections, and 29SJ 627 conforms to that pattern. However, when an attempt is made to correct for a vessel count, we find that whiteware is more abundant than grayware. Accordingly, it is likely that Factor 1 above is the most important.

Much of the information in Tables 2.3 and 2.4 is present in various sections of this report, but because the information serves as a good introduction to the ceramics of 29SJ 627, these tables are presented early. Table 2.3 shows that, as at 29SJ 629, the overall temper assemblage is dominated by undifferentiated sandstone temper; including Tusayan sherds, it comprises 76.6% of the temper as opposed to 73.6% at 29SJ 629. Trachyte is the second most abundant temper (14.2%), an increase of 5% from 29SJ 629. In part, this is the result of lumping the sand-trachyte temper mix together, but as sand-trachyte temper mixes with sand dominant are nearly nonexistent in culinary vessels and less frequent than mixes showing the reverse in whitewares, the difference between the assemblages from these two sites is not just an analytical artifact. Both chalcedonic sandstone and San Juan igneous tempers are relatively less abundant when compared with those at 29SJ 629. These trends are indicative of the later occupation at 29SJ 627, which was not present at 29SJ 629.

Table 2.4 shows the heavy favoring of certain ceramic forms by certain wares. Only in the earliest types do forms such as bowl or ladle appear as graywares. Throughout this analysis, grayware jars have been kept separate from whiteware jars. "Whiteware jar" is a catchall category that includes smaller closed forms that have no specific name in this analysis, as well as sherds that can only be identified to be closed forms, but not a more specific form such as pitcher or olla. The group "whiteware jars" contains fewer rim sherds than any other form category; the mean percentage of forms represented by rims is 79.4%, but only 27.3% of the whiteware jars are rims. This low rim frequency stems from two facts: first, the practice of including closed form body sherds, and second, the fact that if the rim of a closed vessel is present, it is more likely that a more specialized vessel form can be assigned to the entry (note the correspondences between numbers of seed jars and tecomates [Figure 2.3] and numbers of rim sherds). The rim section of Table 2.4 also makes it clear that rim sampling was more rigid for bowls and less so for ladles and effigies. There is a large number of ollas--here large whiteware vessels with small orifices, most like a "tinaja" (Reina and Hill 1978:25) in PII-III mineral-on-white. This results from the normally non-distinctive decoration found on olla necks that does not allow a more specific typological assignment. The vessel distributions in major forms between mineral-on-white and carbon-on-white may be remarkably similar; the relatively large number of carbon-on-white pitchers is the main difference. Unidentified whiteware is represented by a small number of bowls and a large number of jars, which has more to do with the placement of designs on the two forms than with an inordinately large number of plain jars. Redwares are

Table 2.3. 29SJ 627 temper types tabulated by rough sort types; tempers have been lumped and only items with observable temper have been included.[a]

Rough Sort Type	Temper Type: Sand-stone	Chalc. SS	Iron Ox. SS	Magn. SS	San Juan	Trachyte	Unident. Igneous	Total
GRAYWARES:								
Plain gray	111	12	2	4	1	29	0	159
Lino gray	114	2	5	11	3	0	0	135
Lino fugitive red	6	0	0	0	0	0	0	6
Polished tan-gray	3	0	1	0	0	2	0	6
Wide neckbanded	100	31	0	1	2	16	0	150
Narrow neckbanded	156	36	0	1	0	50	0	243
Neck corrugated	52	1	0	1	1	17	0	72
PII corrugated	221	21	1	6	4	145	0	398
PII-III corrugated	41	3	0	1	1	35	0	82
PIII corrugated	29	3	0	0	0	11	0	43
Unident. corrugated	106	11	9	8	0	27	0	152
Grayware total	939	120	9	33	12	333	0	1,446
Grayware percent	65.0	8.3	0.6	2.3	0.8	23.0		
MINERAL-ON-WHITE								
Polished BMIII-PI	73	4	0	1	5	11	0	94
Unpolished BMIII-PI	56	3	1	0	3	3	0	66
Early Red Mesa B/w	139	9	0	0	0	7	0	155
Red Mesa B/w	1,973	156	5	7	15	127	16	2,299
Escavada B/w	49	1	0	2	0	1	0	53
Puerco B/w	193	5	0	1	3	17	1	220
Gallup B/w	411	5	2	3	7	119	2	549
Chaco B/w	20	0	0	0	0	6	0	26
Exotic M/w	117	2	0	0	25	17	4	165
PI-III M/w	873	37	4	8	12	95	4	1,032
M/w total	3,904	222	12	22	70	403	27	4,659
M/w percent	83.8	4.8	0.3	0.5	1.5	8.6	0.6	
CARBON-ON-WHITE								
BMIII-PI pol. C/w	18	0	0	0	0	15	0	33
BMIII-PI unpol. C/w	14	0	0	0	0	2	0	16
Chuska, Red Mesa design	3	0	0	0	0	55	0	58
Chuska B/w	0	0	0	0	0	24	0	24
Chuska C/w	3	0	0	0	0	79	0	82
Tusayan C/w	41	0	0	2	0	2	0	45
Chaco-McElmo B/w	0	0	0	0	0	1	0	1
PI-III C/w	39	0	0	0	3	29	0	71
Mesa Verde B/w	0	0	0	0	1	1	0	2
C/w total	118	0	0	2	4	208	0	332
C/w percent	35.5			0.6	1.2	62.7		
Unidentified whiteware	434	18	1	1	15	66	1	537
WHITEWARE TOTALS	4,456	240	13	26	89	677	28	5,529
WHITEWARE PERCENT	80.6	4.3	0.2	0.5	1.6	12.2	0.5	
REDWARE								
Decorated redware	36	0	0	0	86	8	1	131
Plain red	0	0	0	0	1	1	0	2
REDWARE TOTALS	36	0	0	0	87	9	1	133
REDWARE PERCENTS	27.1				65.4	6.8		
Polished smudged	72	0	0	0	0	0	2	74
Brownware	1	0	0	0	0	0	2	3
GRAND TOTALS	5,504	360	22	59	188	1,019	33	7,184
PERCENTS	76.6	5.0	0.3	0.8	2.6	14.2	0.5	

[a] Due to an oversight, 293 culinary ware sherds were not included in the original analysis--see Appendix E.
Temper not observable: 41 (0.57% of the whole temper sample).
Total n = 7,225, with 7,184 observations.

Table 2.4. 29SJ 627 vessel forms of all rough sort types.

Rough Sort Type	Bowl	Ladle	Canteen	Pitcher	Seed Jar	Tecomate	Jar	Olla	Effigy/ Duck/Mini	Total
	Vessel Form									
GRAYWARE										
Plain gray	4	3	-	9	-	-	114	-	1	131
Lino gray	3	-	3	-	-	85	38	-	-	130
Lino Fugitive Red	-	-	-	-	-	-	6	-	-	6
Polished tan-gray	-	-	-	-	-	2	3	-	-	5
Wide neckbanded	-	-	-	1	-	-	149	-	-	150
Narrow neckbanded	-	-	-	3	-	-	241	-	-	244
Neck corrugated	-	-	-	-	-	-	72	-	-	72
PII corrugated	-	-	-	2	-	-	394	-	2	398
PII-III corrugated	-	-	-	-	-	-	81	-	-	81
PIII corrugated	-	-	-	-	-	-	43	-	-	43
Unident. corrugated	-	-	-	-	-	-	152	-	-	152
Grayware total	7	3	3	16		87	1,293		3	1,412
Grayware percent	0.5	0.2	0.2	1.1		6.2	91.6		0.2	
BLACK-ON-WHITE										
Polished BMIII-PI	82	5	-	2	2	1	2	-	-	94
Unpolished BMIII-PI	54	1	-	4	-	3	3	1	-	66
Early Red Mesa B/w	140	7	1	-	1	0	6	-	-	155
Red Mesa B/w	1,738	239	5	49	23	7	175	35	14	2,285
Escavada B/w	42	6	-	3	-	-	-	2	-	53
Puerco B/w	140	43	2	8	3	-	18	3	2	219
Gallup B/w	346	48	4	66	5	5	50	19	6	549
Chaco B/w	7	1	-	7	-	-	9	1	1	26
Exotic M/w	88	14	3	7	-	-	57	1	-	165
PII-III M/w	433	142	16	38	5	7	237	87	13	984
M/w total	3,070	506	31	179	39	23	558	149	41	4,596
M/w percent	66.8	11.0	0.7	3.9	0.8	0.5	12.1	3.2	0.9	
CARBON-ON-WHITE										
BMIII-PI pol. C/w	24	2	-	3	-	-	4	-	-	33
BMIII-PI unpol. C/w	12	-	-	-	-	-	4	-	-	16
Chuska, Red Mesa des.	29	9	1	8	-	-	8	1	-	56
Chuska B/w	13	6	-	2	-	-	2	1	-	24
Chuska C/w	40	14	1	8	-	-	7	6	2	78
Tusayan C/w	43	-	1	-	1	-	-	-	-	45
Chaco-McElmo B/w	-	-	-	-	-	-	1	-	-	1
PII-III C/w	41	9	3	2	-	-	11	1	1	68
Mesa Verde B/w	1	-	-	-	-	-	-	1	-	2
C/w total	203	40	6	23	1		37	10	3	323
C/w percent	62.8	12.4	1.9	7.1	0.3		11.5	3.1	0.9	

Table 2.4. (continued)

	Vessel Type									
Rough Sort Type	Bowl	Ladle	Canteen	Pitcher	Seed Jar	Tecomate	Jar	Olla	Effigy Duck/Mini	Total
Unidentified whiteware	194	53	9	19	4	5	151	25	9	469
WHITEWARE TOTALS	3,467	599	46	221	44	28	746	184	53	5,388
WHITEWARE PERCENT	64.3	11.1	0.9	4.1	0.8	0.5	13.8	3.4	1.0	
REDWARE	113	4	-	1	5	3	7	-	2	135
REDWARE PERCENT	83.7	3.0		0.7	3.7	2.2	5.2		1.5	
Polished smudged	76	-	-	-	-	-	-	-	-	76
Brownware	-	-	-	-	-	-	-	-	2	2
Rims only	3,247	260	46	187	48	118	204	148	26	4,284
Redware	85	-	-	-	-	-	1	-	-	86
Smudged	62	-	-	-	-	-	-	-	-	62
Grayware	-	-	-	14	-	-	1,121	-	-	1,135
Total rims	3,394	260	46	191	48	118	1,326	148	26	5,567
GRAND TOTALS	3,663	606	49	238	49	118	2,046	184	60	7,013
PERCENTS	52.2	8.6	0.7	3.4	0.7	1.7	29.2	2.6	0.9	

Not shown are 3 pipes (2 PII-III M/w and 1 Red Mesa B/w),
2 gourd jars (1 Red Mesa B/w and 1 brownware) both with rims,
1 cup (Chuska whiteware), also a rim,
206 with unknown form, 22 rims.

Effigy/Duck Pot/Miniature includes 27 effigies (6 rims), 14 duck pots (4 rims), and 19 miniatures (16 with rims).

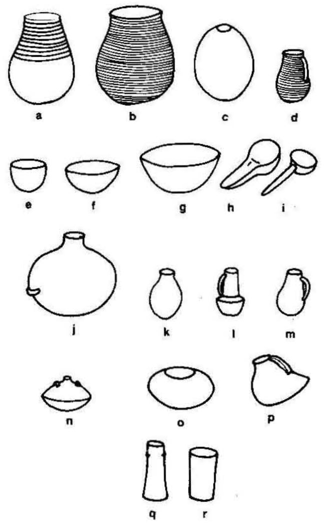


Figure 2.3. Schematic outline of vessel forms found in Chaco Canyon sites, drawn roughly to scale: a) gray neckbanded jar, b) gray corrugated jar, c) gray tecomate, d) gray pitcher, e, f, and g) white, red or polished smudged bowls, h and i) ladles, j) olla, k) white jar, l and m) pitchers, n) canteen, o) seed jar, p) duck pot, q and r) cylinder jars. (Taken from Toll 1985:Figure 3-1).

mostly bowls and all polished smudged vessels are bowls.

Of all the sites excavated by the Chaco Project, we had the most organizational and curatorial problems with 29SJ 627. These problems resulted from the very large size of the collection, the long time span occupied by the analysis, changes in recording procedures, and the number of people who worked with the collection. The ceramic collection, totalling in the neighborhood of 85,000 sherds, was handled by McKenna, Windes, Warren, Lekson, Toll, and Washburn. The provenience coding for the entire site was revamped by Truell. The goals of the analysis were changed with the changing personnel, most notably from Warren's participation to Toll's. The problems created by all these permutations resulted mostly in an increase in handling time for the present analysis, but they also had some long-range effects in that some items were not relocated for temper analysis and others could no longer confidently be given provenience assignments.

Coding Changes

The sheer size of this collection also occasioned some problems. Computer manipulations of the large file were quite expensive and a number of data storage procedures were implemented to reduce storage space and machine processing time. Large files mean a greater probability of errors and that the errors are more difficult to find. The file, as permanently stored, has been used a substantial number of times and the detectable coding and punching errors have been corrected in that file. Undoubtedly, more errors are present, but it is our conviction that they are minimal.

The size of the collection was also a stimulus for streamlining the temper recording system to one that was used for the great majority of the sherds processed during the Chaco Project's detailed analysis (Pueblo Alto, 29SJ 629, 29SJ 633, 29SJ 423, 29SJ 1360, 29SJ 626, 29SJ 299 Basketmaker component, and Shabik'eshchee test). As the ceramics from 29SJ 627 were the the first processed under the original system, some slight modifications were found to be desirable. These were:

1) Instituting a code indicating that sand was relatively more abundant than igneous material in sherds where the two tempering agents were mixed.

2) Instituting separate codes for white and pink chalcedonic sandstone cement.

3) Adding a code to indicate that the paste had the appearance of being well-fired, with a sheen which suggests that vitrification had begun, but that its state is not to the exaggerated point observed in some sherds (Toll 1986).

The above three changes were added after the 29SJ 627 ceramic analysis and, thus, are consistent within the assemblage from this site, but this assemblage is not fully comparable to those from other sites subsequently analyzed under this system. All the igneous-sand temper mixes are coded, as are the dominantly igneous temper mixes at the other sites. This unequal treatment leads to inflation in the counts of trachyte and other igneous tempers from 29SJ 627, when compared to those from other sites, because cases in which sand temper predominates are generally excluded from trachyte temper counts. As was long ago argued by Shepard (1939:280), there is a good chance that some trachyte temper is introduced from the addition of sherd temper, and those cases in which trachyte is the minor constituent seem especially likely to be instances of such introduction. Pink and white chalcedonic sandstone tempers have, by-and-large, been treated as a single group at 29SJ 629, where they were separated, so the de facto lumping at 29SJ 627 should not be distorting. The aim in creating a new vitrification code was to divide the vitrification class rather than add more sherds to it. The intermediate vitrification group is mostly recorded as "vitrified" at 29SJ 627, though the broadening of the classification system allowed for inclusion of some examples that might not have been included without the intermediate class.

During the analysis there were two other expansions to the information recorded. The first of these was the addition of several descriptive paste codes, and the second, an estimate of the density of tempering material. The frequency of recording of these attributes by ware listed in Table 2.5.

Table 2.5. Frequency of attributes by ware.

Ware	Total n	% with Density	% with Paste	n of paste Categories
Grayware	1,450	90.6	91.0	10
Mineral-on-white	5,229	74.3	77.9	7
Unidentified white	545	71.9	73.9	7
Carbon-on-white	332	82.5	85.5	7
Redware	137	86.8	86.8	6

The order of analysis of mineral-on-white was basically by Field Specimen (FS) number and, therefore, within broad limits, the sherds analyzed with these attributes recorded are presumably randomly selected with regard to these variables. As the graywares had been largely separated, most grayware was recorded with both systems in effect. The classes tan, black, and white clay were added to the paste groups; and these were recorded only for the graywares (except for a few whiteware stragglers). Some of the sherds that contribute to missing percentages listed above lack these data because of being worked, complete, or too small for sections to be observed (41 sherds fall into this class).

There is a large discrepancy between the sizes of the "detailed analysis sample" and the "temper sample" (Table 2.2). The difference results, once again, from the number of analysts and changes in goals the collection endured. At one point, Warren and Truell had planned to analyze the entire contents of Balk 3 of Pithouse C. Lekson went through this very large group of sherds and recorded them in the detailed analysis format, excluding temper information, but the rest of the program was never attempted. Subsequently, Toll went back through the sherds and recorded temper for all rim sherds present. The mass of material from Pithouse C, Balk 3, thus is not comparable to the rest of the sample in that there is little control for vessel duplication; it is, in essence, a rough sort in detailed analysis format. Although the counts from Pithouse C, Balk 3, are from the whole provenience shown in Table 2.2, only the rim sherds were included in the full detailed analysis, as was true of the remainder of the assemblage.

Curatorial Problems and Their Effects on the Analysis

Tables of ceramic type frequency by provenience (Appendix A) were used to form the core of ceramic reports and, in some cases, the cornerstones of entire site reports and/or "cultural" synthesis involving migrations, diffusions, and prehistoric change. Here they constitute just the raw data, made a little rawer by some unwise management. We offer this recital of handling problems to alert others with large ceramic collections to be especially careful how they classify their material and how the collection is subdivided and further curated.

The ceramics from 29SJ 627 were subdivided a great many times during the active study of the collection. The separate collections include:

1) Stratification of the original collection into a bulk and detailed analysis sample. The detailed analysis sample, as mentioned, contains mostly rims but originally included:

a) Floor sherds,

b) Vessel bottoms,

c) All handles, lugs, effigy heads, etc.,

d) All reds, carbon and smudged wares (in some sites), and

e) Large body sherds from vessels probably not represented by a rim sherd. These sherds were usually from jars.

Most of these were later dropped from the final analysis in deference to rims but often they were integrated into other collections. Bulk body sherds were placed in "dead storage."

2) Red, Carbon, and Smudged Collection. Those not in the detailed analysis were separated for type-specific identification.

3) Warren's Collection. H. Warren removed many sherds for special studies on tempering sources. Reintegration headaches with the final analysis are myriad and the process is incomplete.

4) The Washburn Collection. D. K. Washburn removed many sherds large enough to permit symmetry analysis. These largely remain as isolated collections for each site and, accordingly, are another headache.

5) Floor Sherd Collections. These are usually just separated from the bulk collection but are another body of sherds from a site "floating" around the storage areas.

6) Worked Sherd Collection. Specimens with drill holes, edge grinding, chipping, or other abrasion were separated from bulk sherds and detailed analysis samples for additional scrutiny. This usually occurred following detailed analysis and does not affect the composition of that sample.

7) Restorable Culinary Vessels. A number of fragmentary vessels were in the possession of a patient individual attempting to restore the vessels. While the aim is a worthy one, the process took a very long time that spanned both ends of the analysis. Inclusion of such vessels in the analysis should take precedence over restoration.

8) Matching Collection. Sherds from a single vessel that were found in different proveniences are often stored separately. This exercise cross-cuts all other samples including detailed, red-smudged-carbon, and floor sherd collections. As matched vessels usually have rims and are "large," they often form part of the final analysis collection, although physical separation of these two groups still occurs.

9) Refiring Collection. This is a subgroup of the final analysis but, again, physical separation usually occurs.

10) Photo Collection. Occasionally, photographed sherds are regarded as something special and are separated from others (often later cataloged). This is not yet an acute problem with Chaco Project's collections, but it is a strong candidate.

11) "The Lady" Collection. A group of sherds showing a distinctively precise execution of scalloped triangles and parallel lines that may be the work of a single potter was pulled from a number of sites.

We found that these subdivisions greatly increased handling time for the main analysis and that back checking is so onerous that it is often deemed not worth the effort. Because we know these collections quite well, this does not bode well for future users.

We suggest, then, that analysts faced with large collections keep subdivisions to an absolute minimum. Separation of a large, consistent, controlled detailed sample improves handling time and allows more efficient storage. Beyond that, however, any "special interest" withdrawals should be well documented as to the location from which they came and such removal should be clearly understood to be short term and temporary. A useful motto might be "let the specialist come to the collection, not the collection to the specialist." That is to say, when specialists (either in-house or out) seek to study the collection, maintenance of that collection should be on the principal analyst's terms and not the specialist's. The specialist's "squirrel" collection should not be permitted, although such studies should not be discouraged (the prudent principal investigator will require a statement of research purpose, basic assumptions, and immediate xerox of notes and analyses).

A final warning is to maintain original field designation, even though a "new" cataloging system may be imposed over items entered into a "permanent collection." The latter problem is not serious at 29SJ 627, although some problem with renumbering specimens has occurred and relocation of some whole pots has been complicated by the need to retranslate catalog numbers to field numbers.

Type Descriptions

First and last, a great deal of the project's analysis relies on ceramic types and that reliance is, of course, particularly heavy in this ceramic analysis. The importance of ceramic types to the ceramic analysis, to the project, and to Southwestern archeology, as it now stands, creates several incumbencies in this report. These include definition of the classification criteria and assumptions used here, and presentation of the contents of the types. Because a detailed presentation of data for types occurring in low frequencies is pointless, we needed a cutoff for types to be discussed and described in detail. The sample at 29SJ 627 is sufficiently large that we might have used a numerical cutoff, but we had already used 2.5% of the detailed sample at other sites and we used that criterion again for 29SJ 627. The types selected for detailed discussion are based on the occurrence of specific types in the temper sample. Catchall types (see above) were not included.

The following description of our definition of the six types so selected--Red Mesa, Puerco, and Gallup Black-on-whites, and wide neckbanded, narrow neckbanded, and Pueblo II corrugated graywares--is a discussion of the data tables presented for each of the types. The tables serve both as a quantified definition of individual types from 29SJ 627 and, by extension, as illustrations of the variation within categories and through time. The information in the tables is further summarized with diversity and evenness indices (H'=diversity, J=evenness, s=number of categories present).

Because chronology is of major concern and the structure of the Cibola series is such that Red Mesa Black-on-white fills one time slot, while Puerco, Escavada, and Gallup Black-on-whites together fill the succeeding slot, we have included tables for a macro-type composed of the three contemporary types. While comparisons of Puerco and Gallup Black-on-whites are of interest for type definition and such questions as whether or not these types have geographical significance, they are of less interest for an overview of trends in the ceramic assemblage. Using the later types in isolation leads directly to results that are purely typological artifacts. For example, if the contemporary types are considered separately, it appears that variability in several attributes, most notably design, decreased through time, even though temper compositions would suggest that more areas are represented. Combining the contemporary types, however, shows that design is also more diverse.

Before defining the specific types as they are used herein, a brief statement of how we conceive of and use types in general is necessary. Many years of excavation and sherd handling have demonstrated that types do have a chronological reality, and it is for that chronological information that current typologies were largely devised (Windes 1981). Where typologies seem to run into problems is at the level of fine subdivision. One method of circumventing such problems is to avoid traditional types, at least in name, and then to divide the ceramics up on the basis of a few technological attributes (e.g., Plog 1980a). Plog's approach tends to recreate traditional classifications at the supra-type level. We feel that the finer structure of fairly broadly defined types provides a useful organization of the ceramics, especially with regard to temporal change. Of the subdivision problems mentioned, geographical variation seems to present more difficulties than does temporal variation. This is especially the case on the sub-regional level in which we are most interested in the Chaco Phenomenon. By placing the ceramic assemblage into broad types and then examining the variability within those types, it is possible to address subregional variability of ceramics that are produced in a somewhat limited division of time and space, and assess whether or not a type is coextensive with a particular area.

Typological History and Definition

Site 29SJ 627 was occupied long enough to contain several ceramic types in considerable abundance. However, Red Mesa Black-on-white is undeniably the prevalent decorated ceramic type, for which there may be several reasons:

1) The complete production duration for Red Mesa Black-on-white is represented, which provides for greater potential variation in the type's decorative style, pastes, imports, and overall frequency.

2) The production of Red Mesa Black-on-white spans a longer time than does the production of the other types found at 29SJ 627. Moreover, occupation of the site was apparently more intensive during Red Mesa times than it was during the later portion of the time during which Puerco, Escavada, and Gallup Black-on-white were produced. These facts combined result in a far greater abundance of Red Mesa Black-on-white than the later types; there is more than twice as much Red Mesa as Puerco, Escavada, and Gallup combined.

Earlier pottery such as La Plata, White Mound, Lino, and Kana'a Black-on-white or grayware are, of course, relatively more abundant in the earlier sections of the site, but they are outnumbered by Pueblo II-III types.

Because the bulk of this report will be concerned with the description and implications of three decorated types--Red Mesa, Puerco, and Gallup Black-on-whites--and because of their tangled histories, confused and imprecise or neglected definition, some attention must be given their backgrounds. With much of the available information and discussion on these types, particularly Puerco and Gallup Black-on-whites, found in obscure, generally unavailable tracts, it is necessary to outline the main points of their definitional history in order to present our work and interpretations as part of a continuum of study in using ceramics towards the goal of cultural interpretation.

Simplistically, classification may be divided into those before and those after Colton and Hargrave's (1937) establishment of a taxonomic method for Southwestern ceramics. Their system was built on the ruins of the Gladwins' (1930) binomial taxonomy, supplemented, to the Gladwins' horror, by the biological implications imbedded with Hargrave's (1932) use of borrowed biological taxonomy. In producing a system that, ironically, would "pigeonhole" ceramics, Hargrave and Colton produced a system they thought would hierarchically identify ceramics to the local level. That contention, the dogmatic use of their system, and the value of such "pigeonhole" types to behavioral interpretations has been increasingly called into question in recent years. Be that as it may, no systematic method of identification existed or was generally accepted before publication of their Handbook, yet previously published descriptions of ceramics (particularly from Chaco Canyon) continued to be uncritically used. This is particularly true of the type names Escavada and Gallup Black-on-white. Red Mesa Black-on-white, generally accepted as the predecessor of these two later types, is better described, although a thorough, systematic description of the Chaco series has not been presented.

Roberts' (1927) dissertation remains the single most comprehensive work on Chacoan ceramics; however, it has only recently become available because of an early suppression of its distribution. Researchers have relied on subsequent publications by the Gladwins (1931; Gladwin 1945) and Hawley (1934, 1936). Neither the Gladwins nor Hawley had access to Roberts' work and were unable to benefit from his later ceramic descriptions at Shabik'eshchee (1929) or Kiatuthlanna (1931) as these works did not rival the scope and detail of his dissertation. Both Hawley's and Gladwin's initial classifications were generalized and not equatable with types as conceived today using Colton and Hargrave's method. Gladwin's Puerco Black-on-white referred to a large, diverse group of pottery in the Little Colorado area, which he felt preceded the later black-on-reds and polychromes in that area. In short, he used his binomial system. This system saw a general place name appended by a descriptive color or decorative term, such as "black-on-white" or "polychrome" (Gladwin and Gladwin 1930). Thus, Puerco Black-on-white was originally a generic term similar to such "types" as "Southwest Black-on-white" or "Anasazi Black-on-white." Hawley's tripartite classification based on surface finish was presented in a similar vein; motifs were not a factor in determining the "types." The subsequent elevation of these general groups to "types" (Hawley 1936) set the stage for later confusion.

The situation, at least in respect to the Chaco Series, was further muddled when Vivian (1959, 1965) appended Hawley's type names to Roberts' more discrete descriptive types, but failed to provide updated descriptions, referring instead to both Roberts (1927) and Hawley (1936) as if they were compatible works. Almost concurrently, the Cibola Whiteware Conference (1958) circulated an "updated" but unresolved Puerco Black-on-white type description which contained elements of Gladwin's, Hawley's and Roberts' ceramic descriptions. Early types had been pruned from the 1958 version of Puerco Black-on-white, but Gallup, Escavada and other "in-part" Black-on-whites were retained as "varieties." Puerco Black-on-white's description, less the indicators of local technology and some motifs, looks remarkably similar to the current description of Mancos Black-on-white (Breternitz et al. 1974). Hargrave (1964) and Windes (1984) have touched on these problems. More complete descriptions based on ceramics recovered by the Chaco Project may be found in the ceramic overview (Toll 1986). One might view the problem as entirely semantic nit-picking among ceramists were it not for the subsequent strains placed on cultural interpretation by dubious classifications.

Although there is considerable distaste for using traditional Southwestern typology on the grounds that it "doesn't work" (see Reid 1984; Plog 1980a), much of this disfavor seems to stem from the inability of the system to answer "behavioral," "social," or "processual" questions. Such an objective is not inherent to the goals of ceramic typology. The original goal of typology is to provide a structure for identifying ceramics of a similar nature and time. We find this structure to be as adequate a framework for creating ceramic groups as any other "alternative taxonomy" that is based on an examination of the internal variations of those groups and the subsequent explanation thereof.

Red Mesa Black-on-white may generally be recognized by several principal attributes (Table 2.6). A white slip, often thin and streaky in appearance, was applied to vessel surfaces in a variety of manners: interior only, both surfaces of bowls, and with some "slip-slop" over the rim onto a generally unslipped surface from a slipped surface on bowls and jars. Bowl rims are often straight, tapered extensions of the vessel wall, with enclosed forms often displaying a rounded lip. Rims are almost invariably painted with a solid line frequently exhibiting a line break (Roberts 1927:79). Paint is mineral and designs are most often expressed in bands, the number and location usually depending on the vessel form. Common motif elements are interlocking scrolls, opposed solid elements, checkerboards, ticked or scalloped triangles, and squiggled and straight line hachured motifs with framing and hatching lines of equal width. Frequently, parallel lines, either straight or squiggled, are used as framers adjacent to banded patterns or as panel dividers within the bands. In Chaco Series ceramics, temper is principally of sand or sherd, or combinations thereof. Traditionally, this period of ceramic production marks the beginning of heavy use of sherd temper, suggesting this aspect of Red Mesa Black-on-white's technology should be quite variable (Baldwin 1978).

Puerco Black-on-white, as mentioned, is the least clearly defined ceramic type of the Chaco Series (Table 2.7). We use this type name to designate a polished, mineral-painted pottery

Table 2.6. Red Mesa Black-on-white description at 29SJ 627.

A. Surface Treatment

1. Decoration:

Designs	Motif No. 1	2	3	N	%
Hooks, flags	6	2	12	20	0.6
Nested isolates	6	3	-	9	0.3
Nonoverlapping steps	1	-	-	1	-
Parallel lines	215	76	7	298	9.3
Cribbed parallel lines	13	3	1	17	0.5
Pendant parallel lines	86	34	4	124	3.9
Framers w/unticked solids	63	3	-	66	2.1
Framers w/ticked solids	81	3	-	84	2.6
Irregular wide lines	2	-	-	2	-
Ticking	-	3	1	4	0.1
Corner triangles	-	3	1	4	0.1
Scrolls	122	157	2	281	8.7
Dots	9	3	-	12	0.4
Other framed isolates	1	-	-	1	-
Framing dots	-	4	14	18	0.6
Dotted lines	70	71	6	147	4.6
Thick wavy lines	17	14	-	31	1.0
Parallelograms	-	1	-	1	-
Checkerboard	151	3	-	154	4.8
Eye solids	7	4	-	11	0.3
Sawteeth	93	21	5	119	3.7
Barbs	42	20	2	64	2.0
Elongated scalloped triangles	2	-	-	2	-
Wide Sosi style	8	1	-	9	0.3
Heavy dotted lines	9	3	-	12	0.4
Heavy curvilinear lines	-	1	-	1	-
Solid band design	591	55	11	657	20.4
Banded hatched motif	1	1	-	2	-
Isolated triangles	2	-	-	2	-
General solids	118	97	13	228	7.1
Hachure A-1	161	13	3	177	5.5
Hachure A-2	12	-	2	14	0.4
Hachure A-3	10	-	-	10	0.3
Hachure B/C	6	-	-	6	0.2
Hachure B-1	8	2	1	11	0.3
Hachure B-3	4	-	-	4	0.1
Hachure B-4	1	1	-	2	-
Hachure B-5	1	-	-	1	-
Hachure B-6	2	-	1	3	-
Heavy gallup squiggle	3	1	-	4	0.1
Squiggle lines	124	41	22	187	5.8
Interlocked frets	2	-	-	2	-
Solid ticked triangles	178	71	13	262	8.2
Ext. bowl motif	-	15	8	23	0.7
Jar neck motif	14	3	1	18	0.6
Narrow Sosi style	5	5	-	10	0.3
Narrow curvilinear lines	2	-	-	2	-
Interlocked ticking	28	37	9	74	2.3
Others, solid	5	4	-	9	0.3
Others, hatched	1	5	-	6	0.2
Narrow banded	-	2	-	2	-
Wide banded	-	-	1	1	-
Narrow clapboard	1	-	-	1	-
Wide clapboard	1	-	-	1	-
Narrow corrugated	1	-	-	1	-
Wide corrugated	1	-	-	1	
N	2,286	787	140	3,213	99.1
n w/1, 2, 3 designs	1,499	647	140	2,286	
% w/1, 2, 3 designs	65.6	28.3	6.1		100.0

Type Design Diversity:
H' = 2.862 s = 56 J = 0.711
Design Distribution Diversity:
H' = 0.805 s = 3 J = 0.733

Table 2.6. (continued)

2. Paint:

Type	n	%
Mineral:		
Red	36	1.6
Brown	497	21.5
Green	20	0.9
Black	1,712	74.2
Carbon	5	0.2
Glaze	28	1.2
Unknown	9	0.4
Totals	2,307	100.0

Rim Decoration

Type	n	%
Unpainted	279	12.1
Solid line	1,458	63.2
Dotted	6	0.3
Eroded, solid	132	5.7
Use-ground	113	4.9
Use-ground, no paint	4	0.2
Use-ground, w/paint	58	2.5
Unknown	258	11.2
	2,308	100.1

3. Polish:

	Open		Closed		Total	
	n	%	n	%	N	%
Unknown	104	5.3	17	5.2	121	5.2
None	47	2.4	15	4.6	62	2.7
One side						
Streaky	66	3.3	15	4.6	81	3.5
Moderate	151	7.6	64	19.4	215	9.3
Total	491	24.8	218	66.3	709	30.7
Both sides						
Streaky	37	1.9	-	-	37	1.6
Moderate	118	6.0	-	-	118	5.1
Total	405	20.5	-	-	405	17.6
Differential	560	28.3			560	24.3
Totals	1,979	85.8	329	14.2	2,308	100.0

4. Slip:

	Open		Closed		Total	
	n	%	n	%	N	%
Absent	45	2.3	9	2.7	54	2.3
Interior	406	20.5	1	0.3	407	17.6
Exterior	12	0.6	257	78.1	269	11.7
Slip-slop	78	3.9	50	15.2	128	5.5
Both sides	1,359	68.7	-	-	1,359	58.9
Unknown	79	4.0	12	3.7	91	3.9
Totals	1,979	85.8	329	14.2	2,308	99.9

5. Forms and Metrics:

Forms	n	%	Orifice Diameter n	Range	$\bar{x}$	s.d.	cv
Bowl	1,738	73.3	1,264	35-350	186.0	57.954	31.2
Canteen	5	0.2	4	20-40	30.0	8.165	27.2
Duckpot	7	0.3	3	25-40	45.0	5.000	11.1
Ladle	239	10.4	77	50-175	102.9	26.783	26.0
Pitcher	49	2.1	46	50-130	82.6	18.310	22.2
Seed jar	23	1.0	17	30-150	82.4	36.100	43.8
Tecomate	7	0.3	5	40-110	76.0	26.786	35.2
Olla	35	1.5	23	25-110	74.1	17.033	23.0
Miniature	2	0.1	2	30-35	32.5	3.536	10.9
Jar	175	7.6	55	30-265	83.4	38.754	46.5
Effigy	5	0.2	4	15-110	53.8	41.908	78.0
Pipe	1	-	-				
Gourd jar	1	-	1	25			
Unknown	20	0.9					
Total	2,307	99.9					

Diversity of Forms:
H' = 0.910   s = 13   J = 0.355

Table 2.6. *(continued)*

6. Handles:

Type	n	%
Solid coil	7	3.1
Multiple coil	1	0.4
Strap	52	23.0
Tubular	7	3.1
Perf. tube	1	0.4
Trough	136	60.2
Nubbin lug	2	0.9
Strap lug	12	5.3
Tabular lug	1	0.4
Cupule lug	2	0.9
Perf. nubbin lug	1	0.4
Multi-coil strap	1	0.4
Effigy	3	1.3
Total	226	100.0

2068:82
handles:items = 1:25
(excluding labels from forms and handles)

B. Paste

1. Temper Composition

Temper	n	% of total	% of observed
Undifferentiated sandstone	1,973	85.5	85.8
All chalcedonic sandstone	156	6.7	6.8
Sandstone with rounded iron oxide	5	0.2	0.2
Magnetitic sandstone	7	0.3	0.3
Trachyte only	25	1.1	1.1
with sandstone	102	4.4	4.4
San Juan igneous with hornblende	3	0.1	0.1
with sandstone	9	0.4	0.4
San Juan igneous without hornblende and sandstone	2	0.1	0.1
Gray andesite	1	0.04	0.04
Unidentified igneous and sandstone	16	0.7	0.7
Not observable	8	0.3	-
Total	2,307		(2,299)

2. Texture Attributes

Grain Size	n	%
Fine	533	2.1
Medium	1,399	60.6
Coarse	353	15.3
Very coarse	14	0.6
Totals	2,299	

Sherd Density	n	%
1-2%	4	0.2
5%	107	6.0
10%	588	33.0
20%	856	48.1
30%	203	11.5
40%+	22	1.2
	1,780	

Temper	n	%
None	138	6.0
0-50%	564	24.4
50-95%	1,558	67.5
100%	39	1.7
	2,299	

Undifferentiated sandstone

Grain Size	n	%
Fine	460	23.4
Medium	1,193	60.4
Coarse	308	15.6
Very coarse	12	0.6
Totals	1,973	

Texture Index	n	%
Very fine (0-2)	403	22.7
Fine (2.1-4)	788	44.2
F-Medium (4.1-7)	452	25.4
Medium (7.1-10)	87	4.9
M-Coarse (10.1-13)	24	1.3
Coarse (13.1-16)	18	1.0
Very Coarse (16.1+)	8	0.4
	1,780	

Table 2.6. (continued)

3. Clay Attributes

Clay-temper types	n	%
No type assigned	750	40.2
Black clay, white sherd	417	22.4
Gray clay, black sherd	415	22.3
Black and white sherd	2	0.1
Gray clay, white sherd	261	14.0
Little Colorado paste	4	0.2
Chuska gray, homogeneous	14	0.8
Totals	1,863	

Vitrification	n	%
Absent	485	21.1
Present	1,814	78.9
	2,299	

decorated principally with bold, solid-painted motifs in the Sosi Design Style (Colton and Hargrave 1937:17-22). Other principal motifs include large, often coarsely executed checkerboards, interlocked scrolls, and some wide, bold parallel lines. In contrast, Red Mesa Black-on-white has a higher frequency of band design, use of fine parallel lines, and ticking of solid elements with the elements generally smaller. Puerco Black-on-white's slip is often the white exhibited in Red Mesa Black-on-white, but it is frequently less evenly or consistently applied. Gladwin's photos of vessels on Plates XVIc, XVII and XXV we would call Puerco Black-on-white (Gladwin and Gladwin 1931). The type has been discussed by Roberts (1927:81-83, 94-95) as "Degenerate-Transitional" and "Solid-Design" pottery, a description partly more akin to Hawley's (1936:32-33) Escavada Black-on-white, which we have relegated to Puerco Black-on-white's unpolished "local" counterpart. To no small measure the presumption of Escavada Black-on-white's local derivation stems from the coincidence and historical place of the descriptions by Hawley and Roberts. Clearly, we do not share the 1958 Cibola Conference's consensus that Puerco Black-on-white is a (or should be) a Mancos-like decorative polyglot.

Gallup Black-on-white is here recognized by the use of hachured motifs (Table 2.8). Execution of these motifs procedes through time from widely spaced hachured lines of equal width to framing lines to increasingly bold framers and closer spacing of hachure (Figure 2.4). A similar progression is apparent in motifs with squiggle hachure lines. Slip and polish vary considerably but are most often present. Gallup Black-on-white hachure ranges from paneled motifs to complete oblique coverage. Use of panels or involvement of the entire surface depends on temporal placement and angularity of the vessel; pitchers or canteens with sharply angled shoulders will more often display paneled designs. Early Gallup Black-on-white, as does its late Red Mesa Black-on-white predecessor, tends to ex-

Table 2.7. Puerco Black-on-white description at 29SJ 627.

A. Surface Treatment

1. Decoration:

Designs	Motif No. 1	2	3	N	%
Hooks, flags	-	-	1	1	0.3
Nested isolates	1	-	1	2	0.7
Unnested isolates	-	1	-	1	0.3
Stars, suns	1	-	-	1	0.3
Parallel lines	3	1	-	4	1.4
Cribbed parallel lines	1	-	-	1	0.3
Pendant parallel lines	11	4	-	15	5.1
Framers w/unticked solids	-	1	-	1	0.3
Irregular wide lines	1	1	-	2	0.7
Scrolls	1	3	-	4	1.4
Dotted lines	-	2	-	2	0.7
Thick wavy lines	1	1	-	2	0.7
Checkerboard	6	-	-	6	2.0
Eyed solids	1	2	1	4	1.4
Sawteeth	13	5	-	18	6.1
Barbs	37	11	-	48	16.4
Elongated scalloped triangles	4	-	-	4	1.4
Wide Sosi style	81	11	1	93	31.7
Heavy dotted lines	3	-	-	3	1.0
Heavy curvilinear lines	5	-	-	5	1.7
Solid band design	16	1	-	17	5.8
Isolated triangles	1	2	-	3	1.0
General solids	15	12	-	27	9.2
Solid ticked triangles	3	4	-	7	2.4
Ext. bowl motif	1	3	-	4	1.4
Jar neck motif	-	2	2	4	1.4
Narrow Sosi style	12	-	-	12	4.1
Narrow curvilinear	2	-	-	2	0.7
N	220	67	6	293	99.9
n w/1, 2, 3 designs	153	61	6	220	
% w/1, 2, 3 designs	69.5	27.7	2.7		99.9

Type Design Diversity:
H' = 2.451   s = 28   J = 0.736
Design Distribution Diversity:
H' = 0.697   s = 3   J = 0.635

2. Paint:

Type	n	%
Mineral:		
Red	4	1.8
Brown	50	26.2
Green	4	1.8
Black	146	66.1
Glaze	8	3.6
Unknown	1	0.5
Total	221	100.0

Rim Decoration

Type	n	%
Unpainted	30	13.6
Solid line	116	52.5
Dotted	7	3.2
Eroded, solid	10	4.5
Use-ground	17	7.7
Use-ground, no paint	1	0.5
Use-ground, w/dots	1	0.5
Unknown	39	17.6
Total	221	100.1

Table 2.7. (continued)

3. Polish:

	Open n	Open %	Closed n	Closed %	Total N	Total %
Unknown	7	3.8	-	-	7	3.2
None	15	8.2	1	2.6	16	7.2
One side						
Streaky	28	15.3	2	5.3	30	13.6
Moderate	48	26.2	14	36.8	62	28.1
Totals	52	28.4	21	55.3	73	33.0
Both sides						
Streaky	4	2.2	-	-	4	1.8
Moderate	10	5.5	-	-	10	4.5
Totals	8	4.4	-	-	8	3.6
Differential	11	6.6	-	-	11	5.0
Totals	183	82.8	38	17.2	221	100.0

4. Slip:

	Open n	Open %	Closed n	Closed %	Total N	Total %
Absent	15	8.2	-	-	15	6.8
Interior	85	46.4	-	-	85	38.5
Exterior	-	-	31	81.6	31	14.0
Slip-slop	17	9.3	7	18.4	24	10.8
Both sides	61	33.3	-	-	61	27.6
Unknown	5	2.7	-	-	5	2.3
Totals	183	82.8	38	17.2	221	100.0

5. Forms and Metrics:

Forms	n	%	Orifice Diameter n	range	$\bar{x}$	s.d.	cv
Bowl	140	63.3	124	65-350	219.5	66.215	30.2
Canteen	2	0.9	2	25-30	27.5	3.536	12.9
Ladle	43	19.5	17	70-175	101.2	30.646	30.3
Pitcher	8	3.6	6	40-115	84.2	26.910	22.0
Seed jar	3	1.4	2	70-110	90.0	28.284	31.4
Olla	3	1.4	2	70-90	80.0	14.142	17.7
Jar	18	8.1	5	50-120	74.0	27.249	36.8
Effigy	2	0.9					
Unknown	2	0.9					
Total	221	100.0					

Diversity of Forms:
H' = 1.135 s = 8 J = 0.546

6. Handles:

Type	n	%
Solid coil	2	4.9
Strap	5	12.2
Tubular	13	31.7
Perf. tube	2	4.9
Trough	13	31.7
Nubbin lug	1	2.4
Strap lug	2	4.9
Tabular lug	2	4.9
Perf. nubbin lug	1	2.4
Total	41	100.0

13:178
handles:items = 1:14
(ladles excluded from handles and forms)

Table 2.7. (continued)

B. Paste

1. Temper Composition:

Temper	n	% of Total	% of Observed
Undifferentiated sandstone	193	87.3	87.7
All chalcedonic sandstone	5	2.3	2.3
Magnetitic sandstone	1	0.5	0.5
Trachyte only	7	3.2	3.2
with sandstone	10	4.5	4.5
San Juan igneous with hornblende with sandstone	2	0.9	0.9
San Juan igneous w/o hornblende and sandstone	1	0.5	0.5
Unidentified igneous and sandstone	1	0.5	0.5
Not observable	1	0.5	-
Total	221		(220)

2. Texture Attributes:

Grain Size	n	%
Fine	35	15.9
Medium	116	52.7
Coarse	67	30.5
V. coarse	2	0.9
Totals	220	

Sherd Density	n	%
1-2%	3	1.8
5	38	22.2
10	74	43.3
20	48	28.1
30	7	4.1
40+	1	0.6
	171	

Temper	n	%
none	12	5.4
0-50%	44	19.9
50-95%	150	67.9
100%	14	6.3
	220	

Undifferentiated Sandstone Grain Size	n	%
Fine	31	16.1
Medium	96	49.7
Coarse	64	33.2
V. Coarse	2	1.0
Totals	193	

Texture Index	n	%
Very fine (0-2)	36	21.1
Fine (2.1-4)	74	43.3
F-Medium (4.1-7)	44	25.7
Medium (7.1-100)	15	8.8
M-Coarse (10.1-13)	1	0.6
Coarse (13.11-16)	1	0.6
Very coarse (16.1+)	-	
	171	

3. Clay Attributes:

Clay-temper types	n	%
No type assigned	70	39.6
Black clay, white sherd	38	21.5
Gray clay, black sherd	43	24.3
Gray clay, white sherd	25	14.1
Chuska gray, homogeneous	1	0.5
Total	171	

Vitrification	n	%
Absent	57	26.0
Present	162	74.0
Total	219	

Table 2.8. Gallup Black-on-white description at 29SJ 627.

A. Surface Treatment

1. Decoration:

Designs	Motif No. 1	2	3	N	%
Parallel lines	4	1	-	5	0.8
Cribbed parallel lines	1	-	-	1	0.2
Pendant parallel lines	4	-	-	4	0.6
Irregular wide lines	1	-	-	1	0.2
Corner triangles	-	-	1	1	0.2
Scrolls	-	1	-	1	0.2
Checkerboards	2	1	-	3	0.5
Eyed solids	-	1	-	1	0.2
Sawteeth	-	3	-	3	0.5
Barbs	-	10	1	11	1.7
Elongated scalloped triangles	-	1	-	1	0.2
Wide Sosi style	4	5	-	9	1.4
Heavy curvilinear lines	-	5	-	5	0.8
Banded hatched motif	1	1	-	2	0.3
Isolated triangles	1	2	-	3	0.5
General solids	2	14	-	16	2.5
Hachure A-1	6	-	-	6	0.9
Hachure B/C	51	1	-	52	8.1
Hachure A-2	12	1	-	13	2.0
Hachure A-3	10	-	-	10	0.3
Hachure B-1	130	1	-	131	20.3
Hachure B-2	2	-	-	2	0.3
Hachure B-3	104	2	-	106	16.5
Hachure B-4	117	3	-	120	18.6
Hachure B-5	4	-	1	5	0.8
Hachure B-6	28	3	-	31	4.8
Hachure B-7	8	1	-	9	1.4
Hachure C	5	-	-	5	0.8
Counterchange	5	1	-	6	0.9
Hatched checkerboard	16	-	-	16	2.5
Heavy Gallup squiggle	1	-	-	1	0.2
Solid ticked triangles	-	1	-	1	0.2
Ext. bowl motif	-	13	1	14	2.2
Jar neck motif	3	6	1	10	1.6
Narrow Sosi style	-	1	-	1	0.2
Narrow curvilinear lines	-	1	-	1	0.2
Others, solid	-	5	-	5	0.8
Others, hatched	25	3	-	28	4.3
Narrow corrugated	1	-	-	1	0.2
N	550	89	5	664	100.6
n w/1,2,3 designs	461	84	5	550	
% w/1,2,3 designs	83.8	15.3	0.9		100.0

Type Design Diversity:
H' = 2.626 s = 39 J = 0.71
Design Distribution Diversity:
H' = 0.478 s = 3 J = 0.435

2. Paint

Type	n	%
Mineral:		
Red	21	3.8
Brown	166	30.1
Green	12	2.2
Black	342	62.1
Glaze	9	1.6
Unknown	1	0.2
Totals	551	100.0

Rim Decoration

Type	n	%
Unpainted	90	16.3
Solid line	290	52.6
Dotted	12	2.2
Eroded, solid	45	8.2
Use-ground	32	5.8
Use-ground, w/paint	1	0.2
Unknown	81	14.7
	551	100.0

Table 2.8. (continued)

3. Polish:

	Open n	Open %	Closed n	Closed %	Total N	Total %
Unknown	35	8.9	8	5.1	43	7.8
None	32	13.2	8	5.1	60	10.9
One side						
Streaky	37	9.4	10	6.4	47	8.5
Moderate	45	11.4	27	17.2	72	13.1
Total	154	39.1	104	66.2	258	46.8
Both sides						
Streaky	5	1.3	-	-	5	0.9
Moderate	10	2.5	-	-	10	1.8
Total	27	6.9	-	-	27	4.9
Differential	29	7.4	-	-	29	5.3
Totals	394	71.5	157	28.5	551	100.0

4. Slip:

	Open n	Open %	Closed n	Closed %	Total N	Total %
Absent	41	10.4	6	3.8	47	8.5
Interior	147	37.3	-	-	147	26.7
Exterior	-	-	100	63.7	100	18.1
Slip-slop	87	22.1	48	30.6	135	24.5
Both sides	97	24.6	-	-	97	17.6
Unknown	22	5.6	3	1.9	25	4.5
Totals	394	71.5	157	28.5	551	99.9

5. Forms and Metrics:

Forms	n	%	Orifice Diameter n	Range	x̄	s.d.	cv
Bowl	344	62.4	261	50-350	216.5	66.619	30.8
Canteen	4	0.7	4	20-40	30.0	8.165	27.2
Duckpot	1	0.2	-	-	-	-	-
Ladle	50	9.1	25	60-170	117.4	27.768	23.7
Pitcher	66	12.0	60	30-140	88.0	22.117	25.1
Seed jar	5	0.9	5	55-155	110.0	38.406	34.9
Tecomate	5	0.9	4	90-175	132.5	39.264	29.6
Olla	19	3.4	12	50-100	74.6	14.687	19.7
Miniature	4	0.7	4	25-40	31.3	6.292	20.1
Jar	50	9.1	8	45-140	83.1	29.147	35.1
Effigy	1	0.2					
Unknown	2	0.4					
Total	551	100.0					

Diversity of Forms:
H' = 1.280 s = 11 J = 0.534

Table 2.8. (continued)

6. Handles:

Type	n	%
Solid coil	1	1.5
Strap	15	22.7
Tubular	7	10.6
Perforated tube	1	1.5
Trough	15	22.7
Nubbin lug	1	1.5
Indented cup	3	4.5
Strap lug	12	18.2
Tabular lug	5	7.6
Perforated nubbin lug	4	6.1
Multi-coil strap	2	3.0
Total	66	99.9

43:501
handles:items = 1.12
(excluding ladles from handles and forms)

B. Paste

1. Temper Composition:

Temper	n	% of Total	% of Observed
Undifferentiated sandstone	411	74.6	74.9
All chalcedonic sandstone	5	0.9	0.9
Sandstone with rounded iron	2	0.4	0.4
Magnetitic sandstone	3	0.5	0.5
Trachyte only	36	6.5	6.6
with sandstone	83	15.1	15.1
San Juan igneous with hornblende	2	0.4	0.4
with sandstone	1	0.2	0.2
San Juan igneous w/o hornblende	1	0.2	0.2
with sandstone	3	0.5	0.5
Unidentified igneous	2	0.4	0.4
Not observable	2	0.4	-
Total	551		(549)

2. Texture Attributes:

Grain Size	n	%
Fine	143	26.0
Medium	294	53.6
Coarse	105	19.1
Very coarse	7	1.3
Total	549	

Sherd Density	n	%
1-2%	1	0.3
5%	35	9.4
10%	128	34.3
20%	165	44.2
30%	42	11.3
40%+	1	0.5
Total	373	

Temper	n	%
None	48	8.7
0-50%	126	23.0
50-95%	358	65.2
100%	17	3.1
Total	549	

Undifferentiated sandstone Grain Size	n	%
Fine	98	23.8
Medium	211	51.3
Coarse	95	23.1
Very coarse	7	1.7
Total	411	

Texture Index	n	%
Very fine (0-2)	113	30.3
Fine (2.1-4)	129	34.6
Fine-Medium (4.1-7)	87	23.3
Medium (7.1-10)	29	7.8
Medium-Coarse (10.1-13)	7	1.9
Coarse (13.1-16)	6	1.6
Very coarse (16.1+)	2	0.5
Total	373	

Table 2.8. (continued)

3. Clay Attributes:

Clay Temper Types	n	%
No type assigned	166	42.3
Black clay, white sherd	77	19.6
Gray clay, black sherd	74	18.9
Gray clay, white sherd	69	17.6
Chuska gray, homogeneous	6	1.5
Total	392	

Vitrification	n	%
Absent	140	25.5
Present	409	74.5
Total	549	

hibit more band design and painted or filled-in corners. Hachured elements in Red Mesa Black-on-white form a minority of motifs and consist of widely-spaced, often squiggled hatching with hatch and framer lines of equal width. The subdivision of hachure motifs follows Roberts' (1927:84-94) A-B-C (Red Mesa-Gallup-Chaco) system, but presents some refinements that may be meaningful temporally and behaviorally.

Whiteware Surface Treatment

Motif distributions must be viewed on the level of both typological and temporal variation. As noted, Red Mesa Black-on-white is, by far, the most abundant type at 29SJ 627 and, thus, probability dictates that uncommon design elements are more likely to be found in the Red Mesa Black-on-white portion of the sample than in either Puerco or Gallup Black-on-whites, or even in the

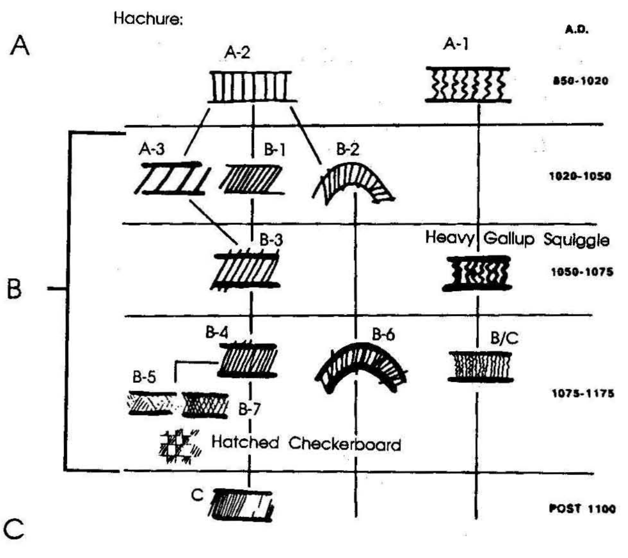


Figure 2.4. Evolution of hachure motifs. Approximation of the temporal occurrence of hachure in Chaco Canyon sites. The first two rows (up to ca. A.D. 1040) are typed Red Mesa; the next two, showing heavier framing lines, are typed Gallup, and the bottom line, Chaco Black-on-white. Note the considerable temporal overlap and that Gallup Black-on-white extends well into the A.D. 1100s.

Puerco-Escavada-Gallup Black-on-white lump (Table 2.9). That this is the case can be seen by the large number of elements with very low relative frequencies (Table 2.6A). Because Puerco Black-on-white is separated from Gallup Black-on-white on the basis of design, it is hardly surprising that Puerco Black-on-white has only half to three quarters as many painted design motifs as Red Mesa Black-on-white. A temporal comparison of Red Mesa Black-on-white with the lumped types, however, shows that the two periods are remarkably close in the number of different painted motifs recorded; Red Mesa Black-on-white has 50, while the Puerco-Escavada-Gallup Black-on-white lump has 49. Exterior corrugation and banding is rare in all types but slightly more common in Red Mesa Black-on-white (0.3% as opposed to 0.1%). The types of exterior corrugation in Red Mesa Black-on-white, ranging from banding to indented corrugated, reflect the fact that Red Mesa Black-on-white spans the major transition from banded to corrugated in culinary types.

The designs occurring on Red Mesa, Puerco, Gallup, and Escavada Black-on-whites are summarized (Table 2.10), providing a number of ways of looking at the commonality of motifs between types. The table contains three sections with the following contents:

1) Types in common--shows the number of motifs in each type that are shared with how many of the other four types. Percentages are given both in terms of the motif inventory for each type and of the number of items in each motif category. Thus, the 12 motifs that are common to all four types are 24% of the 50 painted motifs in Red Mesa Black-on-white, but those same 12 motifs account for 32% of the coded sherds.

2) Number of shared motifs--shows the number of common motifs exhibited in all six pairs of types. The percentages in this section are of the motif inventory in each type.

3) Coefficients of similarity--this section also treats the types in a pairwise fashion in terms of number of motifs. The coefficients are the coefficient of Jaccard (Sneath and Sokal 1973:131-132). This statistic is calculated as shown (Table 2.10); its value ranges from zero to one. Motifs that are not present in either of a pair of types (d) are not considered.

Far more of the motifs coded by this analysis are found in several types than are unique to one (Table 2.10). Puerco and Escavada Black-on-whites show much heavier reliance on common motifs than do Gallup and Red Mesa Black-on-whites. In terms of numbers of items with shared motifs, Gallup Black-on-white is the least like the other types. Gallup and Red Mesa Black-on-whites, however, share more motifs than any other types paired and thus show the highest similarity coefficient. Hachure is common only in Red Mesa and Gallup Black-on-whites, and hachure motifs account for many of the motifs common only to one type in Red Mesa and Gallup Black-on-whites. Although all motifs found in Escavada Black-on-white are also present in Red Mesa Black-on-white, the coefficient of similarity is relatively low because of the large number of motifs that occur in Red Mesa Black-on-white, but not in the small Escavada Black-on-white sample. The small motif inventory causes all Escavada Black-on-white coefficients to be

Table 2.9. Puerco, Escavada, and Gallup Black-on-white description at 29SJ 627.

A. Surface Treatment

1. Decoration:

Designs	Motif No. 1	2	3	N	%
Hooks, flags	-	-	1	1	-
Nested isolates	1	-	-	1	-
Unnested isolates	-	1	-	1	-
Stars	1	2	-	3	0.3
Parallel lines	7	-	-	7	0.7
Cribbed parallel lines	2	-	-	2	0.2
Pendant parallel lines	17	5	-	22	2.2
Framers w/unticked solids	-	1	-	1	-
Irregular wide lines	2	1	-	3	0.3
Ticking	-	1	-	1	-
Corner triangles	-	-	1	1	-
Scrolls	2	5	-	7	0.7
Dotted lines	-	3	-	3	0.3
Thick wavy lines	1	1	-	2	0.2
Dots in parallelograms	-	-	1	1	-
Checkerboard	13	1	-	14	1.4
Eyed solids	1	3	1	5	0.5
Sawteeth	16	9	-	25	2.5
Barbs	48	24	1	73	7.2
Elongated scalloped triangles	5	3	-	8	0.8
Wide Sosi style	98	19	2	119	11.8
Heavy dotted lines	4	-	-	4	0.4
Heavy curvilinear lines	8	6	-	14	1.4
Solid band design	22	1	-	23	2.3
Banded hatched motif	1	1	-	2	0.2
Isolated triangles	2	4	-	6	0.6
General solids	19	27	-	46	4.6
Hachure A-1	6	-	-	6	0.6
Hachure B/C	51	1	-	52	5.2
Hachure A-2	12	1	-	13	1.3
Hachure B-1	131	1	-	132	13.1
Hachure B-2	2	-	-	2	0.2
Hachure B-3	104	3	-	107	10.6
Hachure B-4	117	3	-	120	11.9
Hachure C	5	-	-	5	0.5
Hachure B-5	4	-	1	5	0.5
Hachure B-6	28	3	-	31	3.1
Hachure A-3	12	1	-	13	1.3
Hachure B-7	8	1	-	9	0.9
Counterchange	5	1	-	6	0.6
Hatched checkerboard	16	-	-	16	1.6
Heavy Gallup squiggle	1	-	-	1	-
Solid ticked triangles	3	5	-	8	0.8
Ext. bowl motif	1	17	3	21	2.1
Jar neck motif	3	8	2	13	1.3
Narrow Sosi style	16	1	-	17	1.7
Narrow curvilinear lines	2	1	-	3	0.3
Others, solid	-	5	-	5	0.5
Others, hatched	25	3	-	28	2.8
Narrow hatched	1	-	-	1	-
N	823	173	13	1,009	100.0
n w/1, 2, 3 designs	650	160	13	823	
% w/1, 2, 3 designs	79.0	19.4	1.6		100.0

Type Design Diversity:
H' = 3.049 s = 3 J = 0.779
Design Distribution Diversity:
H' = 0.570 s = 3 J = 0.519

Table 2.9. (continued)

2. Paint:

Type	n	%
Mineral:		
Red	25	3.0
Brown	239	29.0
Green	18	2.2
Black	524	63.5
Glaze	17	2.1
Unknown	2	0.2
Totals	825	100.0

Rim Decoration	n	%
Unpainted	127	15.4
Solid line	441	53.5
Dotted	20	2.4
Eroded, solid	57	6.9
Use-ground	54	6.5
Use-ground, w/paint	4	0.8
Unknown	122	14.8
	551	100.1

3. Polish:

	Open		Ladles		Closed		Total	
	n	%	n	%	n	%	N	%
Unknown	36	6.8	7	7.2	8	4.0	51	6.2
None	79	15.0	13	13.4	12	6.0	104	12.6
One side								
Streaky	63	11.9	11	11.3	12	6.0	86	10.4
Moderate	92	17.4	8	8.2	40	20.0	140	17.0
Total	174	33.0	32	33.0	126	63.0	332	40.2
Both sides								
Streaky	10	1.9	2	2.1	-	-	12	1.4
Moderate	16	3.0	6	6.2	2	1.0	24	2.9
Total	23	4.4	12	12.4	-	-	35	-
Differential	35	6.6	6	6.2	-	-	41	-
Totals	528		97		200		825	

4. Slip:

	Open		Ladles		Closed		Total	
	n	%	n	%	n	%	N	%
Absent	65	12.3	9	9.8	8	4.0	82	9.9
Interior	222	42.0	24	24.7	3	1.5	249	30.2
Exterior	4	0.8	12	12.4	132	66.0	148	17.9
Slip-slop	100	18.9	10	10.3	52	26.0	162	19.6
Both sides	113	21.4	39	40.2	2	1.0	154	18.7
Unknown	24	4.6	3	3.1	3	1.5	30	3.6
Totals	528		97		200		825	

5. Forms and Metrics:

Form	n	%	Orifice Diameter n	Range	x̄	s.d.	cv
Bowl	528	64.0	421	50-350	217.5	66.715	30.7
Canteen	6	0.7	-	20-40	29.2	6.646	22.8
Duckpot	1	0.1	-	-	-		
Ladle	97	11.8	69	30-140	88.8		
Pitcher	77	9.3	47	60-175	107.9	29.722	27.6
Seed jar	8	1.0	7	55-155	104.3	34.812	33.4
Tecomate	5	0.6	4	90-175	132.5	39.264	29.6
Olla	24	2.9	15	50-100	76.3	14.201	18.6
Miniature	4	0.5	4	25-40	31.3	6.292	20.1
Jar	68	8.2	13	45-140	79.6	27.648	34.7
Effigy	3	0.4					
Unknown	4	0.5					
Total	825						

Diversity of Forms:
H' = 1.235 s = 11 J = .515

Table 2.9. (continued)

6. Handles:

Type	n	%
Solid coil	4	3.6
Strap	21	18.8
Tubular	21	18.8
Perforated tube	3	2.7
Trough	29	25.9
Nubbin lug	2	1.8
Indented cup	4	3.6
Strap lug	14	12.5
Tabular lug	7	6.3
Perforated nubbin lug	5	4.5
Multi-coil strap	2	1.8
Total	112	

59:825
handles:items = 1:12
(excluding ladles from handles and forms)

B. Paste

1. Temper Composition:

Temper	n	% of total	% of observed
Undifferentiated sandstone	653	79.2	79.4
All chalcedonic sandstone	11	1.3	1.3
Sandstone with rounded iron	2	0.2	0.2
Magnetitic sandstone	6	0.7	0.7
Trachyte only	44	5.3	5.4
with sandstone	93	11.3	11.3
San Juan igenous with hornblende	2	0.2	0.2
with sandstone	3	0.4	0.4
San Juan igneous w/o hornblende	1	0.1	0.1
with sandstone	4	0.5	0.5
Unidentified igneous	3	0.4	0.4
Not observable	3	0.4	-
Total	825		(822)

2. Texture Attributes:

Grain size	n	%
Fine	183	22.3
Medium	429	52.2
Coarse	195	23.7
V. coarse	15	1.8
Totals	822	

Sherd Density	n	%
1-2%	4	0.7
5%	86	14.7
10%	218	37.3
20%	223	38.2
30%	50	8.6
40%+	3	0.5
	584	

Temper	n	%
None	68	8.3
0-50%	181	22.0
50-95%	540	65.7
100%	33	4.0
	822	

Undifferentiated sandstone

Grain Size	n	%
Fine	133	20.4
Medium	324	49.6
Coarse	182	27.9
V. Coarse	14	2.1
Totals	653	

Texture Index	n	%
Very fine (0-2)	158	27.1
Fine (2.1-4)	210	36.0
F-Medium (4.1-7)	144	24.7
Medium (7.1-10)	49	8.4
M-Coarse (10.1-13)	9	1.5
Coarse (13.1-16)	9	1.5
Very coarse (16.1+)	5	0.9
	584	

Table 2.9. (continued)

3. Clay Attributes:

Clay Temper Types	n	%
No type assigned	260	42.6
Black clay, white sherd	121	19.8
Gray clay, black sherd	125	20.5
Gray clay, white sherd	96	15.7
Coarse angular sandstone	1	0.2
Chuska gray, homogeneous	7	1.1
Total	610	

Vitrification	n	%
Absent	211	25.7
Present	610	74.3
Total	821	

low. Escavada Black-on-white is found to be more similar to Puerco Black-on-white than any other type, which follows from the fact that the two are separated strictly on the basis of polishing or its absence.

Distributions of motifs within types is fairly similar, with the lumped later types having more diverse motifs, and Puerco and Escavada Black-on-whites having the fewest. Especially in the case of Escavada Black-on-white, the sample size is a factor in this index, but the smaller, less diverse motif inventory is "real" for Puerco Black-on-white. The single type most diverse in motifs is Red Mesa Black-on-white, which is to be expected because it is undivided, has a long time span, and is so well represented at 29SJ 627.

Motifs in this system are far from equivalent. Red Mesa Black-on-white's five most frequent designs (52.4% of the designs) consist of such widely differing motifs as solid band designs, multiple squiggled lines, checkerboards, ticked triangles, and interlocked scrolls, while the five most common motifs in Gallup Black-on-white (60.2% of the design) are all variations on one theme--hachure (Figure 2.5). There are 10 different hachure motifs in the Red Mesa Black-on-white ceramics, which form a minor part of the variation in decoration for this type. Hachure motifs are most abundant and exhibit the greatest diversity in Gallup Black-on-white. The most common hachure motif on Red Mesa Black-on-white (Hachure A-1, n=177, 5.5%) is one of the least common in Gallup Black-on-white (n-6, 0.9%) and may be counted as another qualitative, as well as quantitative, difference between the two ceramic types. Recording similar hachure motifs in Red Mesa and Gallup Black-on-whites in some respects cross-cuts traditional typology, but also gives an idea of the background, relative continuation, and differential expression of a motif within a decorative regime.

Although a smaller portion of the design inventory is not being expressed in later ceramics, that portion being expressed is increasingly more stylized and limited. The Puerco-Escavada-Gal-

Table 2.10. Painted motif co-occurence in Red Mesa, Puerco, Escavada, and Gallup Black-on-white at 29SJ 627.

A. Number of types in common:

Types (motifs)	3	2	1	None
Red Mesa B/w (50)	12	12	17	9
% of Red Mesa motifs	24%	24%	34%	18%
% accounted for	32%	46%	11%	12%
Puerco B/w (28)	12	11	3	2
% of Puerco motifs	43%	39%	11%	7%
% accounted for	82%	16%	2%	1%
Gallup B/w (38)	12	8	13	5
% of Gallup motifs	32%	21%	34%	13%
% accounted for	12%	38%	43%	7%
Escavada B/w (18)	12	5	1	0
% of Escavada motifs	67%	28%	6%	-
% accounted for	85%	14%	1%	-

B. Number of shared motifs:

	Red Mesa	Puerco	Gallup
Puerco B/w	26	-	-
Column type motifs	52%	-	-
Puerco motifs	93%	-	-
Gallup B/w	33	20	-
% column type motifs	66%	71%	-
% Gallup motifs	87%	53%	-
Escavada B/w	18	15	14
% column type motifs	36%	54%	37%
% Escavada motifs	100%	83%	78%

C. Coefficients of similarity:

	Red Mesa	Puerco	Gallup
Puerco B/w	0.500	-	-
Gallup B/w	0.600	0.435	-
Escavada B/w	0.360	0.484	0.333

$$
\begin{array}{cc|cc|c}
 & & \multicolumn{2}{c}{\text{Type 2}} & \\
 & & + & - & \\
\text{Type} & + & a & b & \\
1 & - & c & d & x \\
\hline
 & & y & & n
\end{array}
$$

Coefficient of Jaccard:
$S_J = a/a+b+c$ or $a/(x+y)-a$

lup Black-on-white lumped type ceramics are compared, in part, with the earlier Red Mesa Black-on-whites (Table 2.11A). The diversity of decoration is higher in the later period, but as the lower diversity index for design distribution suggests, these designs are not as uniformly expressed from pot to pot; fewer designs tend to dominate the decorative character of later vessels (Table 2.9A).

Puerco Black-on-white is not Red Mesa Black-on-white writ in solid designs, although solid-painted elements do constitute most of the motifs (Table 2.7A). Puerco Black-on-white was primarily recognized on the basis of solid-painted Sosi design style. As is true of its contemporary, Gallup Black-on-white, the biggest decorative contrast with Red Mesa Black-on-white is in the decline of banded motif layouts. That decorations tend to cover the entire vessel in unbounded patterns is indicated by the increase in continuous linear motifs at the expense of band design. Although solid band design layouts continue as important parts of Puerco Black-on-white's decorative style, inspection of the motif inventory reveals a decline in relative frequency when compared with Red Mesa Black-on-white and a total absence on Gallup Black-on-white. Recording of complete motifs and components suggests band design composition has subtly changed in Puerco Black-on-white. An unbanded, free-form, Sosi style predominates, although the most common banded decoration is opposed ticked triangles divided into panels by vertical parallel lines. In comparison with Red Mesa Black-on-white, a noticeable decline in the use of checkerboards, attendant straight and squiggled parallel lines, scrolls, and ticked elements can be seen in the design inventory of Puerco Black-on-white. Small elements such as hooks and nested isolates, common in earlier types, become incidental as their occurrence in the third motif place suggests.

Using the most abundant primary design motifs for each type (Figure 2.5, Table 2.12), comparisons were made on "closed" forms versus bowls and ladles. The chi-square comparisons reveal some

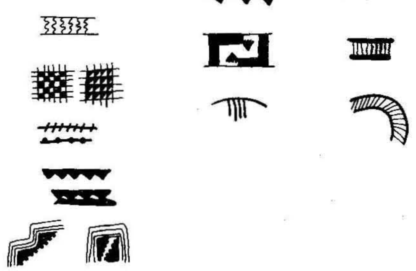


Figure 2.5. Common motifs in Red Mesa (left column), Puerco/Escavada (center), and Gallup Black-on-white (right).

Table 2.11A. Diversity indices for summary of surface treatments at 29SJ 627.

Rough Sort Type	n	Motif Assemblage s	Motif Assemblage Diversity Evenness	Design Distribution[a] s	Design Distribution[a] Diversity Evenness	Vessel Forms s n	Vessel Forms Diversity Evenness	Polish s n	Polish Diversity Evenness
Wide neckbanded	150	9	1.012 0.460	2	-	1	-	-	-
Narrow neckbanded	242	12	1.718 0.691	2	-	1	-	-	-
PII corrugated	397	18	1.831 0.634	2	-	3	0.063 0.058	-	-
Red Mesa B/w	2,287	56	2.862 0.711	3	0.805 0.733	13	0.910 0.355	8	1.707 0.821
Puerco B/w	220	28	2.451 0.736	3	0.697 0.635	8	1.135 0.546	8	1.780 0.856
Gallup B/w	550	39	2.626 0.717	3	0.478 0.435	11	1.280 0.534	8	1.695 0.815
Puerco-Escavada-Gallup lump	823	50	3.049 0.779	3	0.570 0.619	11 822	1.235 0.515	8 582	1.785 0.858

[a] Distribution of items with 1, 2, or 3 designs present.
[b] Ladles and bowls only.

Table 2.11B. Summary of paste attributes for types selected for detailed description at 29SJ 627.

		Temper		Sand Grain		Texture		Clay	
Type	n	s	Diversity Evenness	s n	Diversity Evenness	s n	Diversity Evenness	n	Diversity Evenness
Red Mesa B/w	2,283	10	0.569	4	0.965	7	1.322	6	1.162
			0.247	1,974	0.696	1,781	0.679	1,114	0.649
Puerco B/w	219	7	0.541	4	1.054	6	1.313	4	1.117
			0.278	193	0.761	171	0.733	101	0.806
Gallup B/w	547	10	0.844	4	1.092	7	1.436	4	1.191
			0.367	411	0.788	373	0.738	226	0.859
Puerco-Gallup-Escavada lump	825	10	0.763	4	1.110	7	1.444	6	1.362
			0.331	653	0.801	584	0.742	610	0.760
Wide neckbanded	150	6	0.935	4	0.994	7	1.497	6	1.437
			0.522	100	0.717	147	0.769	76	0.802
Narrow neckbanded	245	5	0.999	4	1.047	7	1.478	7	1.558
			0.621	157	0.755	239	0.758	132	0.801
PII corrugated	398	8	1.071	4	1.062	7	1.531	7	1.591
			0.515	221	0.766	397	0.787	216	0.818

significant motif-form differences between Red Mesa and Gallup Black-on-whites. Results in the Puerco Black-on-white test, although not significant, did reveal that "wide Sosi style" (a non-banded motif) did not conform to expected values, but occurred relatively more frequently on jars and less on ladles. The influence of variation among ladles is seen in the Red Mesa Black-on-white comparison, in which high numbers of solid band designs and squiggled lines, and low numbers of checkerboards and parallel lines on ladles somewhat obscure the comparison of closed with bowl forms. Excluding the ladles, tests indicate that, as found in the 29SJ 629 sample (Toll and McKenna 1981a:14), parallel framers around ticked solids and component parts are more frequent as jar designs; the main contributors to the chi-square value are solid band designs and checkerboards, which occur more commonly on bowls. Another deviation from the expected is Hachure A-1, which occurs more frequently on jars, a suggestive "shift" in design use preceding the development of hachured Gallup Black-on-white.

Following the flow chart of expected hachure through time (Figure 2.4), one can see that the largest stylistic difference among the five Gallup Black-on-white motifs under consideration should be between Hachures B-1 and B-4; even-valued, widely-spaced lines of hachure and framer versus heavier banding lines bordering closer, finer hachure lines. These two hachure types are the largest contributors to the chi-square test of designs by forms for Gallup Black-on-white. Hachure B-4 occurs more on jars and Hachure B-1 more on bowls; ladles are sufficiently few and are sufficiently close to expected design distributions as to have little effect on the chi-square value. This pattern may support the argument of change in hachure suggested by the chart; especially when fine-squiggle Hachure B/C (a later version of Red Mesa Black-on-white's Hachure A-1) can be seen to occur more frequently than expected on bowls, even though Hachure B-3 (an intermediate style to Hachures B-1 and 4) occurs just slightly more on jars.

Paint colors show a trend to greater dispersion in Gallup Black-on-white. Red Mesa Black-on-white exhibits the most consistency in paint color, with about 74% recorded as black. This is contrasted by the increased relative occurrence of greenish, brown, and red mineral paints from Puerco and Gallup Black-on-whites. Glaze-like mineral paints (not true glazes) occur with relative consistency among the three types, which suggests that the technology governing firing practices and paint mixture had stabilized by the Red Mesa Black-on-white ceramic period. Rim decoration in the Puerco-Gallup Black-on-white ceramic period sees a slight increase in rim dotting at the expense of the still dominant traditional solid line design.

Significant differences exist between Red Mesa Black-on-white and the Puerco-Gallup Black-on-white group in the use of slip and the polishing of vessels. Polish undoubtedly correlates with slip and, therefore, the patterns closely

Table 2.12. Primary designs by vessel form among Red Mesa, Puerco, and Gallup Black-on-white.

A. Red Mesa Black-on-white

Design	Closed	Bowl	Ladle	n
Solid band	56	447	86	589
Parallel lines	34	169	12	215
Scrolls	19	87	13	119
Ticked triangles	26	134	16	176
Squiggles lines	14	76	32	122
Hachure A-1	24	109	19	152
Checkerboard	5	138	8	151
Ticked lines	6	59	5	70
Sawteeth	13	68	10	91
Framers w/ticked solids	17	57	6	80
Total	214	1,344	207	1,765

Chi-square:

$\chi^2 = 77.434$
df = 18 p = 0.000
C = 0.205 0 cells <5

Contributors:

Ladles high in solid band and squiggled lines. Bowls high in checkerboard. Jars low in solid band and checkerboard.

Closed by bowl only n = 1,558

$\chi^2 = 28.651$
df = 9 p = 0.001
C = 0.134 0 cells <5

Jars low in solid band and checkerboard. Bowls lower in ticked solids.

B. Puerco Black-on-white

Design	Closed	Bowl	Ladle	n
Wide Sosi style	17	50	7	74
Barbs	4	24	8	36
Sawteeth	2	7	4	13
Solid band design	3	10	3	16
Pendant parallel lines	0	8	3	11
Total	26	99	25	150

Chi-square comparisons:

$\chi^2 = 9.850$
df = 8 p = 0.276
C = 0.248 6 cells <5

Table 2.12. (continued)

C. Gallup Black-on-white

Design	Closed	Bowl	Ladle	n
Hachure B-1	24	90	6	120
Hachure B-4	49	58	8	115
Hachure B-3	34	60	10	104
Hachure B/C	9	37	5	51
Hachure B-6	5	22	1	28
Total	121	267	30	418

Chi-square:	Contributors:
$\chi^2 = 25.083$ df = 8 p = 0.022 C = 0.238 2 cells <5	Jars high in B-4. Bowls high in B-1, low in B-4.
Closed by bowl only n = 388	Same as above.
$\chi^2 = 22.097$ df = 4 p = 0.000 C = 0.232 0 cells <5	

follow one another, with the frequent (68.7%) application of slip to both surfaces of bowls in Red Mesa Black-on-white (Figure 2.6). Slipping of both surfaces in Red Mesa Black-on-white occurs twice as often as on bowls of Puerco Black-on-white, the next more frequently slipped group. Accordingly, Red Mesa Black-on-white bowls tend to be polished, at least to some degree, more often on both sides (56.7%) than either Puerco Black-on-white (18.7%) or Gallup Black-on-white (18.1%) bowls. Along these lines, Gallup Black-on-white can be seen to exhibit relatively less slip and a higher incidence of no polishing than either Puerco or Red Mesa Black-on-whites.

Finer inspection of the descriptive tables reveals other differences between Puerco and Gallup Black-on-white ceramics. Gallup Black-on-white tends to exhibit a slightly more diverse applica-

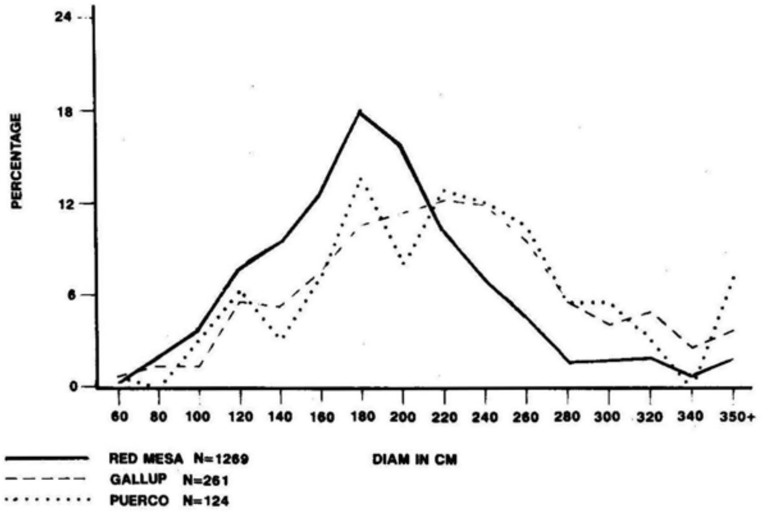
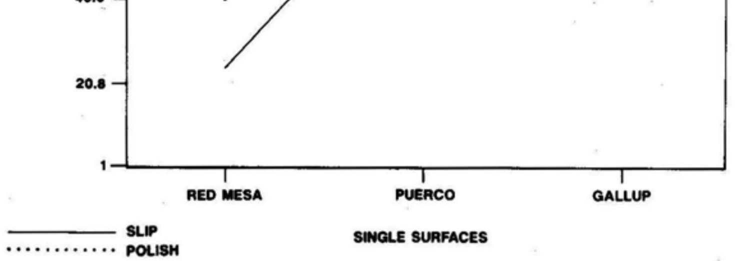


Figure 2.6. Whiteware bowl estimated orifice diameter. Shown are the three whiteware types described in detail. The attribute was measured to the nearest 5 mm; entries are made at intervals of 20 mm, grouped in the following way: 110-115 entered at 120; 130-145 entered at 140, etc. The points graph the percentage of each type occurring in each orifice group.

tion of slip represented by the increased incidence of "slip-slop," a swipe-line of slip in evidence immediately below rims on bowl exteriors and jar interiors. Slip-slop was observed about twice as often on both open and closed vessel forms in Gallup Black-on-white as it was on sherds classified as Puerco Black-on-white. Judgements on the degree of polish in Puerco Black-on-white are that it is more evenly distributed in this type than it is for Gallup Black-on-white or even Red Mesa Black-on-white. This is even more apparent when it is remembered that Escavada Black-on-white may be an unpolished variant of Puerco

Figure 2.7. Surface treatment comparison. Frequency of slip and polish on one surface only in Red Mesa, Puerco, and Gallup Black-on-white.



Black-on-white. Gallup and Red Mesa Black-on-white classifications do not have similar riders on polishing as part of the identification process, yet they can be seen to trend more toward complete polish, depending, of course, on the location of slip. Similarity of treatment in these two types may be readily seen in the polishing of jars, especially when compared with polish on jars of Puerco Black-on-white (Figure 2.7).

Bowls and ladles make up 85% of the Red Mesa Black-on-white vessel forms recorded. Red Mesa Black-on-white, thus, has the lowest indices of diversity and evenness (Table 2.11A). Although ladle percents remain at around 10% in the later type lump, the relative frequency of ladles in Puerco Black-on-white is very high. Gallup Black-on-white is slightly lower in ladles but markedly higher in ollas, jars, and especially pitchers, given that it has the highest diversity index. Although the apparent affinity of Puerco Black-on-white and ladles is balanced in a comparison of Puerco-Escavada-Gallup Black-on-white to Red Mesa Black-on-white, the high frequency of pitchers in the late lump remains a glaring temporal difference.

Vessel size, insofar as volumes correlate with orifice diameters, increases through time, especially when Red Mesa Black-on-white is compared with the later two types. That Gallup Black-on-white tends to exhibit larger orifice diameters than Red Mesa or Puerco Black-on-whites is suggested by the trends summarized in Table 2.13. T-tests on rim diameter estimates for whole types indicate that the mean sizes of Gallup and Puerco Black-on-white bowls are not significantly different, although each of these types is significantly different from Red Mesa Black-on-white. The mean diameter for Puerco Black-on-white bowls is 219.5 mm, and for Gallup Black-on-white bowls 216.5 mm, even though for Red Mesa Black-on-white bowls, the mean is 186.8 mm. This difference of around 3 cm is not one of great magnitude, but the size of the sample seems to assure us that there is a trend to larger bowls in Puerco and Gallup Black-on-whites (Figure 2.6). The coefficients of variation for orifice diameters suggest that Puerco Black-on-white is the most consistently made bowl form among the three types under study at 29SJ 627.

In the handle types, two temporal changes are apparent (Tables 2.6A6, 2.7A6, 2.8A6, 2.9A6). There is an increased number of lugs per item and an increase in the relative frequency of tubular type handles on ladles over the still predominant open-trough handle. After eliminating the three handle types, there is a progression of handle frequency and diversity from 1:25 in Red Mesa Black-on-white to 1:14 in Puerco Black-on-white, and finally 1:12 in Gallup Black-on-white. Pitchers are relatively more abundant in Gallup and Puerco Black-on-whites. Elimination of strap handles (which mostly come from pitchers) and pitchers, as well as ladles and ladle handles, reduces the relative number of lugs per item, but it does not alter the distributional pattern already noted (1:67, 1:21, 1:16).

Table 2.13. Comparative trends in decorated ware metric variables.

	Type		
	Red Mesa	Puerco	Gallup
Means			
Bowl	1	2	2
Ladles	2	1	2
Canteen	1	1	1
Pitcher	1	2	3
Seed jar	1	2	3
Tecomates	1	-	3
Ollas	1	2	1
Jars	2	1	2
Coefficients of Variation			
Bowl	2	1	3
Ladle	3	1	2
Canteen	2	1	2
Pitcher	1	1	2
Seed jar	3	1	2
Tecomate	1	-	3
Ollas	3	1	2
Jars	3	2	1

1 = low
2 = medium
3 = high

T-Tests of diameters by type

	n	Mean	s.d.	t	Variance	df	p>t
Bowls							
Red Mesa	1,269	186.7	57.51	-	-	-	-
vs. Gallup	261	216.5	66.62	6.721	unequal	344.1	0.000
vs. Puerco	124	219.5	66.22	5.308	unequal	151.7	0.000
Gallup/Puerco	-	-	-	-0.406	equal	383.0	0.685
Pitchers							
Red Mesa	46	82.6	18.31	1.334	equal	104.0	0.183
Gallup	60	88.0	22.12	-	-	-	-
Ladles							
Red Mesa	77	102.9	26.78	-	-	-	-
vs. Gallup	25	117.4	27.77	2.328	equal	100.0	0.022
vs. Puerco	17	101.2	30.65	-0.237	equal	92.0	0.813
Gallup/Puerco	-	-	-	1.782	equal	40.0	0.082

Whiteware pastes

The three whiteware types broken down in detail show an overall marked similarity with some minor subvariation (Tables 2.6B, 2.7B, 2.8B, and 2.9B). Undifferentiated sandstone tempers run from 75% (Gallup Black-on-white) to 86% (Red Mesa Black-on-white). Within that group, grain sizes show a significant difference when all three types are tested at once. The size of the Red Mesa Black-on-white group (1,974 sherds as opposed to 193 Puerco Black-on-white sherds and 411 Gallup Black-on-white sherds) causes it to dictate the expected values; major contributors to the chi-square value are the coarse Gallup and Puerco Black-on-white cells, which show that the sandstones in those types are significantly coarser than those in Red Mesa Black-on-white (χ^2=53.77, df=6, p=0.000, C=0.143). A significant difference is also produced by a contingency table comparing all three types by major temper groups. In the elements other than sandstone, these differences may be noted:

1) Red Mesa Black-on-white shows the highest relative frequency of chalcedonic sandstone temper. Chalcedonic sandstone temper constitutes less than 1.0% in Gallup Black-on-white, but 6.8% in Red Mesa Black-on-white.

2) Gallup Black-on-white has, by far, the greatest relative frequency of trachyte temper, both mixed with sandstone and as the only non-sherd temper visible. All sherds showing trachyte in Gallup Black-on-white come to 21.7% in contrast to 7.7% in Puerco Black-on-white and 5.5% in Red Mesa Black-on-white. In all three groups, trachyte is more frequently mixed with sandstone than used as the sole tempering material. Some of these examples probably do result from introduction through sherd temper rather than by inclusion as raw trachyte (Shepard 1939:280). To attribute all such occurrences to an introduction through use of sherds as temper is, however, overly conservative.

3) San Juan River cobbles used as temper occur in less than 2% of each type. Recall that mineral-painted items with designs similar to any of these three types that were recognizably exotic would have been recorded as a separate rough sort type. Hence, igneous tempers have a smaller representation than if all sherds in a particular design style were included in each equivalent Cibola rough sort type. This skewing can be seen where "exotic mineral-on-white" contains 15.2% San Juan igneous temper, which is higher than any mineral paint type, and also contains 10.3% trachyte, which is higher than all mineral types except Polished BMIII-PI, Gallup and Chaco Black-on-whites (Table 2.3).

A chi-square test of the three type groups by temper yields a significant value and a relatively high contingency coefficient (χ^2=184.84, df=10, p=0.000, 5 cells <5 [27.8%], C=0.239). Relative to expected values, Gallup Black-on-white is very high in trachyte-sandstone mixed temper, high in trachyte temper, and low in chalcedonic sandstone and undifferentiated sandstone temper. Red Mesa Black-on-white is the reverse of Gallup and Puerco Black-on-whites; it is in between, with slightly higher than expected numbers for trachyte.

The incidence of trachyte in temper is quite clearly time-related; it shows an overall increase through time in both white and grayware (Toll 1981, 1984). A test comparing Red Mesa Black-on-white, and lumping the putatively contemporary Puerco and Gallup Black-on-whites, still gives a significant chi-square, based largely on the trachyte difference (n=3,048, χ^2=146.16, df=5, p=0.000, C=0.214). Within the contemporaneous group, however, the Gallup Black-on-white portion contains nearly three times the relative frequency of trachyte temper and is significantly different from the Puerco Black-on-white portion (χ^2=23.24, df=4, p=0.000, C=0.172, 2 cells <5). A similar comparison, based on sand grain size, shows that the two groups are once again statistically different, though the strength of the difference is less (χ^2=9.22, df=3, p=0.027, C=0.123, 1 cell <5). The major contributor to this finding is the coarse-grained Puerco Black-on-white cell, which is substantially higher than the expected value. Thus, while the temper results suggest that substantial portions of these two contemporaneous types could be from similar production areas (as seen in the sandstone percentages and the grain size within sandstone), Gallup Black-on-white was more likely to come from the Chuska Mountain area (Peckham and Wilson would call this "Brimhall Black-on-white," Windes 1977:311-313). Trachyte-tempered ceramics with solid mineral paint designs ("Taylor Black-on-white") are less common than the hachured ones, and coarse sandstones are more likely to be found with solid designs. Gross frequencies are heavily weighted toward Gallup Black-on-white. Granting that some vessels with trachyte-sand mixes and fine and medium undifferentiated sandstone tempers are likely to have been produced in Chaco Canyon, Gallup Black-on-white stands at least as good a chance to have been locally produced as Puerco Black-on-white.

Minor differences can be found among the three types on other paste attributes as well. While some of these give significant chi-square values, the contingency coefficients are mostly low. The Puerco Black-on-white group differs from the Red Mesa and Gallup Black-on-white groups in having lower densities of temper inclusions (67.3% with 10% or less temper, as opposed to around 40% with 10% or less in the other two). The difference in temper densities shows the highest contingency coefficient (C=0.195) of the tests conducted (n=2,324, χ^2=91.75, df=8, p=0.000, 2 cells <5). As shown above, Puerco Black-on-white is coarser than Gallup Black-on-white, and both of these later types tend more to coarseness than does Red Mesa Black-on-white; coarseness of sand grains shows a stronger difference than does the general grain size (n=2,578, χ^2=53.48, df=6, p=0.000, C=0.143, 2 cells < 5). It will be noted that because of the presence of more sherd temper and coarser grain size in Puerco Black-on-white, it evens out the texture index, with Puerco Black-on-white being slightly coarser than the other two. The texture index is calculated as:

density estimate rank x grain size rank)/sherd temper rank + 1

(density ranges from 1 [2%] to 6 [>40%], grain size 1 [fine], 3 [medium], 5-6 [coarse-very coarse], and sherd temper from 0 [none] to 3 [all sherd]).

The presence-absence of signs of vitrification and the distribution of sherd temper both also give significant chi-square values in tests using all three types. The vitrification coefficient of contingency is very low ($C=0.048$, $n=3,068$, $\chi^2=6.96$, $df=2$, $p=0.031$). It is higher for the sherd temper test, but there are more cells in that test (12 vs. 6) with an absence of sherd temper and all sherd temper being the areas of major difference ($C=0.097$, $\chi^2=29.10$, $df=6$, $p=0.000$). That these differences in sherd temper content occur at the extremes lends another dimension to the temper and grain size evidence that a number of producers were responsible for the ceramics of each type found at 29SJ 627. The clay colors, as recorded, do not show significant differences among these types ($p=0.191$, $C=0.072$).

Red Mesa Black-on-white comprises the bulk of both the 29SJ 627 and 29SJ 629 samples. The sizes of the sandstone components of this type at the two sites are similar (85.5% at 29SJ 627 and 88.4% at 29SJ 629). San Juan tempers are not present in the sherds typed as Red Mesa Black-on-white at 29SJ 629 and they account for less than 1% of the larger 29SJ 627 sample. Chalcedonic sandstone temper is somewhat more abundant at 29SJ 629 (8.7% as opposed to 6.9%), but the largest discrepancy is in trachyte temper, which is relatively more frequent at 29SJ 627 (5.5% versus 1.9%). The difference is large enough to give a significant chi-square when comparing the two sites for occurrence of sandstone, chalcedonic sandstone, and trachyte tempers ($n=2,657$, $\chi^2=10.52$, $df=2$, $p=0.005$, $C=0.063$). This difference presents something of a dilemma: 29SJ 627 clearly has a substantial population later than does 29SJ 629 and the patterns in both chalcedonic sandstone and trachyte tempers fit the respective sequent decrease and increase of these materials predicted for two temporally overlapping sites. However, 29SJ 629 is thought to have been occupied until the final stages of the production of Red Mesa Black-on-white, and 29SJ 627 has evidence of occupation later than that at 29SJ 629. It is difficult, therefore, to explain this difference in tempering material between these two close neighbors in their primary ceramic type. The most satisfying explanation is that the latest Red Mesa Black-on-white would be fully represented at 29SJ 627, since use of that site continued full scale into the period during which Gallup and Puerco Black-on-whites were in production. At 29SJ 629, the latest Red Mesa Black-on-white is much less well represented because the site was falling into disuse by that time.

The Red Mesa Black-on-white from 29SJ 627 and 29SJ 629 is otherwise quite similar in paste composition: there is no significant difference in the sherd temper and texture of the ceramics from these two sites.

Grayware Surfaces

Because a substantial quantity of grayware sherds was omitted from the original ceramic analysis for 29SJ 627, the effects of the addition of those sherds are considered (Appendix E). The remainder of this section was written prior to that additional analysis.

Whereas two later whiteware types and one earlier whiteware type made the 2.5% cutoff for inclusion in detailed descriptions (see above), two earlier grayware types and one later grayware type were sufficiently abundant to warrant detailed description. The accepted dates for wide neckbanded are earlier than those for Red Mesa Black-on-white, narrow neckbanded contemporary; and Pueblo II corrugated is more or less coterminous with Puerco and Gallup Black-on-whites (Figures 2.1 and 2.2). Treating the graywares as sequential is reasonable, whereas doing so with the whitewares is not. The omission of neck-corrugated from this description somewhat fragments the continuum, but the general pattern of continuous temporal change is suggested by the overlap in the surface treatment inventories of narrow neckbanded and Pueblo II corrugated.

A steady increase in the variety of texturing patterns can be observed through time (Tables 2.14A, 2.15A, and 2.16A). Wide neckbanded, more so than subsequent types, exhibits a uniform decorative treatment that consists of overlapping neckbands greater than 5 mm wide above a plain, untooled, lower body. Narrow neckbanded exhibits not only an increase in decorative patterns, but also the most even expression of that inventory. In the Pueblo II corrugated, the trend of increasing motif diversity continues, but differs substantially from its predecessors not only in the change of primary motif, but in the use of a greater range and number of secondary decorative techniques, such as the flattening or ridging of the body corrugations.

In terms of grayware development, these types might then be viewed as falling into two categories: a first order decorative change from plainware beginnings and a subsequent proliferation of surface texturing techniques and patterns. As such, narrow neckbanded represents the type with the most generalized decorative treatment, as it contains more equally represented decorative elements of both earlier and later types.

Simple nubbin lugs remained the most popular form of protuberance on grayware jars in all the types. Of more importance is the mirror image relationship grayware exhibits to whiteware when considering the proportionate number of handles to the number of pots through time. Although the relative frequency of handles can be seen to drop in Pueblo II corrugated, it is nowhere near the increase in handles per item noted between Red Mesa and Gallup Black-on-whites, which suggests that consistent factors of function and transport may account for the relatively more frequent and invariable use of lugs on grayware (Tables 2.14, 2.15, and 2.16A3).

Vessel forms in all grayware types are all jars of various sizes (short, small globular pitchers are an infrequent form in all types). Miniature Pueblo II corrugated jars were found only in association with burials and probably represent special ritual items that were not part of the grayware that was used on a daily basis. Metric differences are most notable between Pueblo II corrugated and the neckbanded types. The earlier types exhibit smaller means, which are substantially the same: mouth diameters about 180 mm, rim fillets at 15-16 mm and rims flaring about 19°. Pueblo II corrugated is larger on all counts (Figures 2.8-2.10); further discussion is undertaken in the more refined attribute group breakdowns and discussion of function.

Table 2.14. Wide neckbanded description at 29SJ 627.

A. Surface Attributes

1. Decoration:

Designs	Motif No. 1	Motif No. 2	Total	%
Undifferentiated neckbanding	4	-	4	2.5
Wide neckbanding >5 mm	44	-	44	27.7
Wide clapboard >5 mm	101	-	101	63.5
Narrow corrugated	-	1	1	0.6
Patterned, narrow	1	-	1	0.6
Vertical incisions	-	2	2	1.3
Horizontal incisions	-	1	1	0.6
Fingernail punctate	-	4	4	2.5
Applique scrolls	-	1	1	0.6
N	150	9	159	99.0
n w/1, 2, 3 designs	141	9	150	
% w/1, 2, 3 designs	94.3	5.7		100.0

Type Design Diversity:
H = 1.012 s = 9 J = 0.460
Design Distribution Diversity:
H' = 0.218 s = 2 J = 0.314

2. Sooting:

	n	%
Sooted	48	32.0
Unsooted	102	68.0
Total	150	100.0

3. Handles:

	n	%
Multiple coil	2	13.3
Nubbin lug	6	40.0
Dual nubbin	1	6.7
Cupule lug	3	20.0
Multi-coil strap	2	13.3
Unknown	1	6.7
Total	15	100.0

handles:items = 1:10

4. Form and Metrics:

Forms	n	%
Jars	149	99.3
Pitcher	1	0.7
Total	150	

	n	Range	$\bar{x}$	s.d.	cv
Orifice diameter	103	100-350	181.1	45.308	25.0
Rim fillet	133	9-28	16.2	3.025	18.7
Rim flare	86	6-45°	19.2	8.618	44.9

Table 2.14. (continued)

B. Paste

1. Temper Composition:

Temper	n	% of Total
Undifferentiated sandstone*	100	66.7
All chalcedonic sandstone	31	20.7
Magnetitic sandstone	1	0.7
Trachyte only	16	10.7
San Juan igneous w/o hornblende	1	0.7
San Juan igneous with hornblende	1	0.7
Total	150	100.2

2. Texture Attributes:

Grain Size	n	%
Fine	1	0.7
Medium	24	16.0
Coarse	77	51.3
Very Coarse	48	32.0
Total	150	

Sherd Density	n	%
1-2%	1	0.7
5%	9	6.1
10%	96	65.3
20%	36	24.5
30%	4	2.7
>40%	1	0.7
Total	147	

Temper	n	%
None	126	84.0
<half	17	11.3
>half	7	4.7

*Undifferentiated Sandstone

Grain Size	n	%
Fine	1	1.0
Medium	12	12.0
Coarse	55	55.0
Very Coarse	32	32.0
Total	100	

Texture Index	n	%
Very fine (0-2)	1	0.7
Fine (2.1-4)	3	2.0
Fine-medium (4.1-7)	8	5.4
Medium (7.1-10)	25	25.0
Medium-Coarse (10.1-13)	11	7.5
Coarse (13.1-16)	45	30.6
Very coarse (16.1+)	54	36.7
Total	147	

3. Clay Attributes:

Clay-temper types	n	%
No type assigned	70	46.7
Black with white sherd	4	2.7
Gray with black sherd	3	2.0
Chuska gray homogeneous	6	4.0
Tan to brown clay	30	20.0
Black clay	26	17.3
White clay	7	4.7
Total	147	

Vitrification	n	%
Absent	20	13.3
Present	130	86.7
Total	150	

Table 2.15. Narrow neckbanded description at 29SJ 627.[a]

A. Surface Attributes

1. Decoration:

Designs	Motif No. 1	Motif No. 2	Total	%
Undifferentiated neckbanding	23	-	23	9.1
Narrow neckbanding 2-5 mm	24	-	24	9.5
Wide neckbanding >5 mm	13	-	13	5.1
Narrow clapboard 2-5 mm	88	-	88	34.8
Wide clapboard >5 mm	81	-	81	32.0
Patterned, narrow	6	-	6	2.4
Patterned, wide	6	-	6	2.4
Corrugated, unknown	1	-	1	0.4
Vertical incisions	-	3	3	1.2
Horizontal incisions	-	3	3	1.2
Punctate	-	1	1	0.4
Fingernail punctate	-	4	4	1.6
N	242	11	253	100.0
n w/1, 2, 3 designs	231	11	242	
% w/1, 2, 3 designs	95.7	4.3		100.0

Type Diversity:
H' = 1.718 s = 12 J = 0.691
Design Distribution Diversity:
H' = 0.179 s = 2 J = 0.258

2. Sooting:

	n	%
Sooted	77	31.7
Unsooted	166	68.3
Total	243	100.0

3. Handles:

	n	%
Multiple coil	2	7.1
Strap	2	7.1
Extended lip	1	3.6
Nubbin lug	12	42.9
Dual nubbin	4	14.3
Strap lug	1	3.6
Tabular lug	2	7.1
Cupule lug	2	7.1
Unknown	2	7.1
Total	28	99.9

Handles:items = 1:9

4. Form and Metrics:

Form	n	%
Jars	241	99.8
Pitchers	3	1.2
Total	244	

	n	Range	$\bar{x}$	s.d.	cv
Orifice diameter	192	50-350	179.3	57.825	32.2
Rim fillet	227	6-25	15.1	7.599	50.3
Rim flare	162	1-42°	18.4	7.760	42.2

Table 2.15. (continued)

B. Paste

1. Temper Composition:

Temper	n	%
Undifferentiated sandstone*	156	63.9
All chalcedonic sandstone	36	14.8
Magnetetic sandstone	1	0.4
Trachyte only	44	18.0
Trachyte with sandstone	7	2.9
Total	244	

2. Texture Attributes:

Grain Size	n	%
Fine	3	1.2
Medium	38	15.6
Coarse	115	47.1
Very coarse	88	36.1
Total	244	

Sherd Density	n	%
5%	16	6.8
10%	158	66.7
20%	55	23.2
30%	7	3.0
>40%	1	0.4
Total	237	

Temper	n	%
None	210	86.1
<half	28	11.5
>half	6	2.5
Total	244	

*Undifferentiated sandstone

Grain Size	n	%
Fine	2	1.3
Medium	20	12.8
Coarse	74	47.4
Very coarse	60	38.5
Total	156	

Texture Index	n	%
Fine (2.1-4)	1	0.4
Fine-medium (4.1-7)	17	7.1
Medium (7.1-10)	33	13.9
Medium-coarse (10.1-13)	25	10.5
Coarse (13.1-16)	71	30.0
Very coarse (16.1+)	90	38.0
Total	237	

3. Clay Attributes:

Clay-temper Types	n	%
No type assigned	106	44.7
Black with white sherd	10	4.2
Gray with black sherd	3	1.3
Chuska gray homogeneous	18	7.6
Gray with white sherd	2	0.8
Tan to brown clay	57	24.1
Black clay	25	10.5
White clay	16	6.8
Total	237	

Vitrification	n	%
Absent	23	9.8
Present	221	90.2
Total	244	

[a] This table is updated in Appendix E to include omitted sherds.

Table 2.16. Pueblo II corrugated description at 29SJ 627.[a]

A. Surface Attributes

1. Decoration:

Designs	Motif No. 1	2	Total	%
Undifferentiated neckbanding	8	-	8	1.7
Narrow neckbanding 2-5mm	1	1	2	0.4
Wide neckbanding >5mm	1	-	1	0.2
Narrow clapboard 2-5mm	16	4	20	4.4
Wide clapboard >5mm	4	-	4	0.9
Narrow corrugated 2-5mm	214	4	218	47.6
Wide corrugated >5mm	54	2	56	12.2
Flattened corrugations	-	25	25	5.5
Undifferentiated corrugated	45	-	45	9.8
Corrugated, festoon	2	-	2	0.4
Corrugated, oblique	7	20	27	5.9
Patterned, narrow	36	-	36	7.9
Patterned, wide	4	-	4	0.9
Corrugated, unknown	2	-	2	0.4
Vertical incisions	2	3	5	1.1
Horizontal incisions	-	1	1	0.2
Punctate	-	1	1	0.2
Fingernail punctate	1	1	2	0.4
N	397	62	459	100.0
n w/1, 2, 3 designs	335	62	397	
% w/1, 2, 3 designs	84.4	16.6		100.0

Type Design Diversity:
H' = 1.831 s = 18 J = 0.634

2. Sooting:

	n	%
Sooted	193	48.5
Unsooted	205	51.5
Total	398	100.0

3. Handles:

	n	%
Strap	2	11.8
Nubbin lug	6	35.3
Dual nubbin	1	5.9
Strap lug	2	11.8
Tabular lug	4	23.5
Curved nubbin lug	2	11.8
Total	17	100.0

handles:items = 1:23

Table 2.16. *(continued)*

4. Forms:

	n	%
Jars	394	99.0
Pitcher	2	0.5
Miniature	2	0.5
Total	398	100.0

5. Metrics:

	n	range	$\bar{x}$	s.d.	cv
Jars					
Orifice diameter	294	70-350	214.4	54.589	25.5
Rim fillet	389	10-53	22.7	6.775	29.8
Rim flare	232	8-45°	28.5	6.606	23.2
Pitcher					
Orifice diameter	1	80			
Rim fillet	-	13			
Miniatures					
Orifice diameter	2	35-60	47.5	17.678	37.2
Rim flare	1	3°			

B. PASTE

1. Temper Composition:

Temper	n	% of Total
Undifferentiated sandstone*	221	55.5
All chalcedonic sandstone	21	5.3
Sandstone with rounded iron	1	0.3
Magnetetic sandstone	6	1.5
Trachyte only	135	33.9
Trachyte with sandstone	10	2.5
San Juan igneous w/o hornblende	1	0.3
San Juan igneous w/o hornblende + sandstone	3	0.8
Total	398	

Texture Attributes:

Grain Size	n	%
Fine	8	1.9
Medium	56	14.1
Coarse	184	46.2
V. coarse	150	37.7
Total	398	

Sherd Density	n	%
1-2%	3	0.7
5%	53	13.4
10%	217	54.7
20%	100	25.2
30%	21	5.3
40%+	3	0.8
Total	397	

Temper	n	%
None	341	85.7
<half	24	6.0
>half	27	6.8
All	6	1.5
Total	398	

Table 2.16. (continued)

*Undifferentiated Sandstone

Grain Size	n	%
Fine	8	3.6
Medium	21	9.5
Coarse	85	38.5
V. coarse	107	48.4
Total	221	

Texture Index	n	%
Very fine (0-2)	9	2.3
Fine (2.1-4)	18	4.5
Fine-medium (4.1-7)	17	4.3
Medium (7.1-10)	40	10.1
M-Coarse (10.1-13)	46	11.6
Coarse (13.1-16)	86	21.7
Very Coarse (16.1+)	181	45.6
Total	397	

3. Clay Attributes:

Clay-temper Types	n	%
No type assigned	181	45.6
Black with white sherd	13	3.3
Gray with black sherd	10	2.5
Chuska gray homogeneous	54	13.6
Gray with white sherd	3	1.3
Tan to brown clay	69	17.4
Black clay	55	13.9
White clay	12	3.0
Total	397	

Vitrification	n	%
Absent	38	9.6
Present	359	90.4
Total	397	

[a] 158 sherds were omitted from the original analysis--see Appendix E.

Grayware Paste

The trends in tempering materials of graywares at 29SJ 627 are gratifyingly stark (Figure 2.11). Treating the types as sequential ("typological time"), trachyte temper increases steadily in relative frequency over that of sandstone and chalcedonic sandstone. Chalcedonic sandstone temper is absent in Lino Gray from 29SJ 627, it is present in a substantial portion of wide neckbanded and narrow neckbanded, and then tails off. In terms of findings at other sites, the neck corrugated (not treated in detail here--Table 2.3) is anomalous in the absence of chalcedonic sandstone temper (which is over 30% of neck corrugated temper at 29SJ 629). This anomaly is of some concern because no ready explanation is available. Fifty-two of the 72 sherds coded as neck corrugated were re-examined to check for temper misidentifications, but the identifications were found to agree with the re-examination. Therefore, we must assume that the neck corrugated ceramics from 29SJ 627 and 29SJ 629 were from different sources. Although neckbanded antedates neck corrugated, neck-corrugated and narrow neckbanded are considered basically contemporaneous. Chalcedonic sandstone temper is considerably more abundant in the 29SJ 627

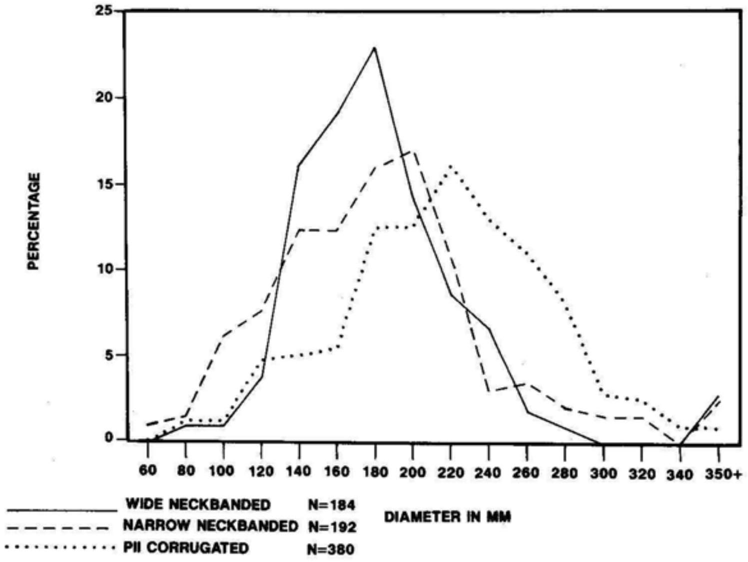


Figure 2.8. *Grayware jar diameters. Neck indented corrugated and narrow neckbanded are shown, using the same lumping method as shown in Figure 2.7.*

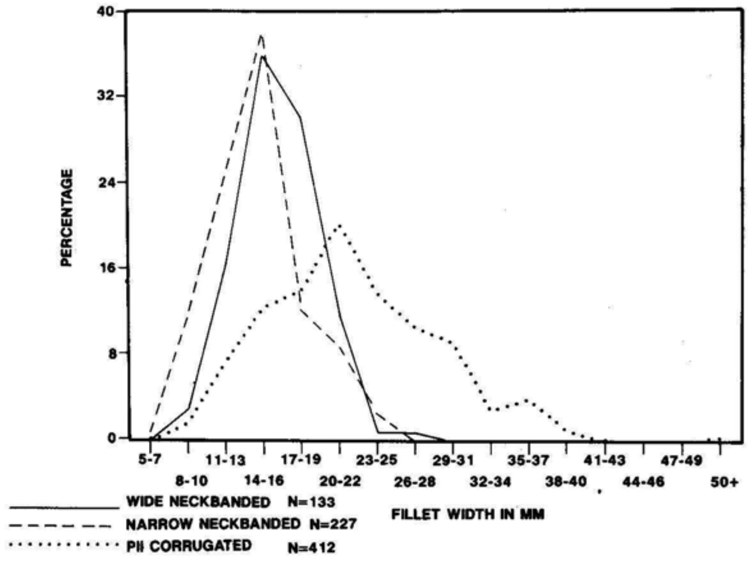


Figure 2.9. *Grayware rim fillet widths. Rim fillets are measured to the nearest mm and are graphed here in lumps of 3 mm by percentage occurrence within fillet width lumps.*

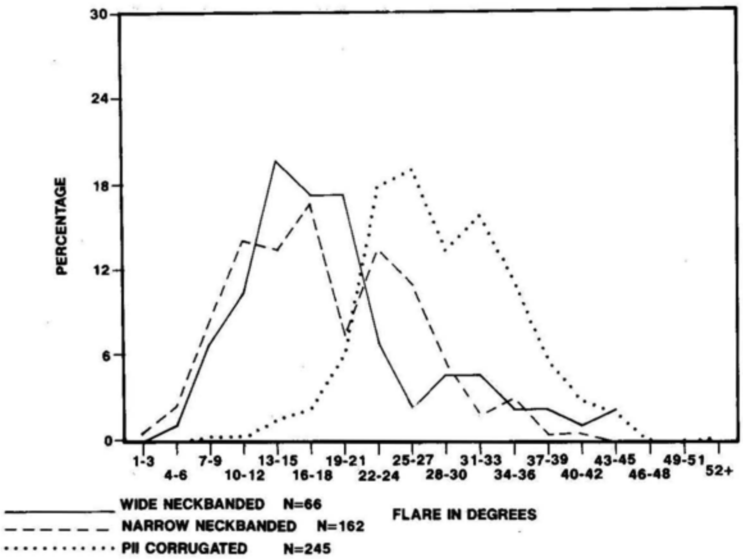


Figure 2.10. *Grayware rim flare by type. Rim flare is calculated to the nearest degree and graphed here in 3 degree lumps.*

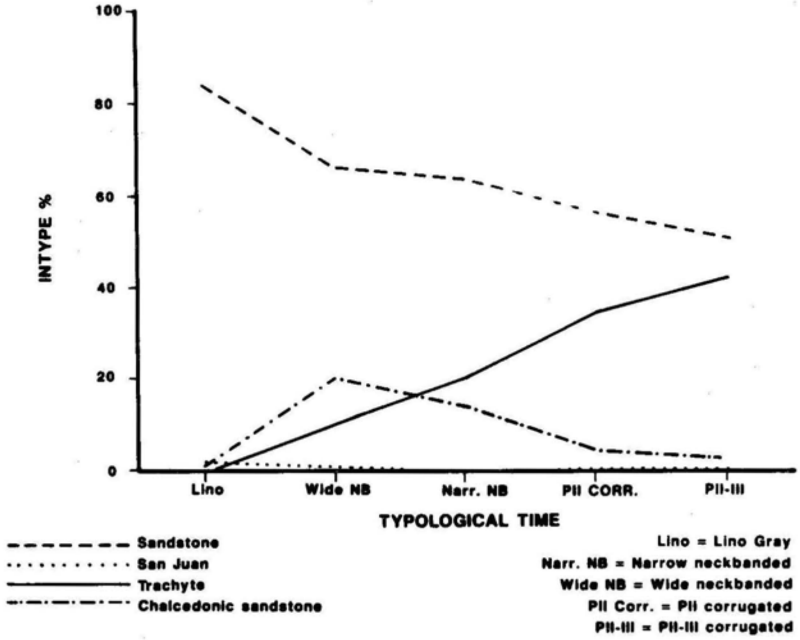


Figure 2.11. *Grayware tempers in selected types. Types represented by more than 50 items have been included. The types are temporally sequential, but neck corrugated (contemporaneous with narrow neckbanded) has not been included. Frequencies can be found in Tables 2.2, 2.14-2.16.*

narrow neckbanded than in neck corrugated (14.7%--Table 2.15B). The additional sherds discussed (Appendix E) correct this discrepancy somewhat. Chalcedonic sandstone temper is also less abundant at 29SJ 627 in narrow neckbanded than it is at 29SJ 629 (narrow neckbanded at 29SJ 629 is 19.4% chalcedonic sandstone tempered), even with the additional sherds. If the roughly contemporaneous narrow neckbanded and neck corrugated were combined in the figure, percentages for the group would decrease to 12.4% chalcedonic sandstone and increase to 21.3% trachyte.

In spite of the increase in trachyte temper, undifferentiated sandstone is the temper of over half of any of the types. The grain size distribution within the undifferentiated sandstone group is remarkably similar from type to type--85.3% to 87.0% are coarse or very coarse-grained. Within that similarity, wide and narrow neckbanded are predominantly coarse-grained and PII corrugated is predominantly very coarse. This difference is sufficient to produce a significant chi-square value, with narrow neckbanded closest to the expected (n=497, χ^2=13.68, df=6, p=0.033, C=0.164, 2 cells <5).

Among the three types treated in detail here (distributions of the three main tempers: sandstone, chalcedonic sandstone, and trachyte), differences are sufficient to give a significant chi-square value and a substantial coefficient of contingency (n=801, χ^2=60.37, df=4, p=0.000, C=0.26 with maximum value for C=0.816). Only in PII corrugated does San Juan temper occur as more than 1% of the temper and two of the five items so tempered are a miniature and a pitcher, rather than jars, which make up 99.3% of the forms of this type.

Significant differences within the types are also present for sherd tempering, temper density, and texture variables. All three types largely lack sherd temper, but PII corrugated exhibits a higher than expected number of heavily sherd-tempered items when compared to the other two types (n=817, χ^2=15.33, df=4, p=0.004, C=0.136). This finding fits with the general observation that sherd tempering in culinary wares tends to be a relatively late phenomenon in Chaco Canyon. PII corrugated also makes a substantial contribution to the chi-square value for temper density by virtue of having more than the expected number of items with sparse temper (1-5%) (n=806, χ^2=15.34, df=6, p=0.018, C=0.137). In view of higher quantities of sherd temper and lower tempering density, the occurrence of higher than expected numbers of PII corrugated items in the fine texture categories is not surprising because of the method of calculating that index (n=806, χ^2=29.30, df=10, p=0.001, C=0.187).

The presence or absence of vitrification and a comparison of the occurrence of tan, black, and white clay among the three types show no significant differences. Chuska gray pastes are more abundant in PII corrugated, as would be expected from the higher frequency of trachyte temper. This occurrence may also relate to the finding that earlier Chuskan graywares have less red oxidation color than do later ones (Toll and McKenna 1983), which may show in the color of the unoxidized paste as well (see the section on refiring tests below and Appendix D).

Summary

The surface and paste statistics in the type description tables (Tables 2.5-2.9, 2.14-2.15) are summarized by means of diversity and evenness indices (Table 2.11). The paste indices have been calculated using all the temper categories except unidentified igneous, which potentially overlaps with several categories. Should these paste diversity indices be compared to those from other sites (e.g., 29SJ 629, Pueblo Alto), it should be remembered that there are fewer categories at 29SJ 627 because of the coding additions discussed under "sample and analysis" above. Within the two ware groups, there is strikingly similar paste diversity among the types (Table 2.11). In all attributes, Gallup Black-on-white shows the most diversity, and, because the number of categories for each type within each attribute is usually the same or close, the greatest evenness among the whitewares. With one exception, the difference between Gallup Black-on-white and the other types is slight. The exception is in temper, where the substantial size of the two trachyte categories in Gallup Black-on-white results in a markedly higher diversity index. PII corrugated also shows consistently slightly higher diversity, though the evenness indices are not consistent. The low evenness in PII corrugated temper is largely the result of three different types of San Juan temper recorded for five items. Because the differences between types are small, pushing an interpretation very far is unwise, but the indices do suggest an increase in the number of producers, who are represented in some substantial manner, as most dramatically seen in Gallup Black-on-white.

The Puerco-Escavada-Gallup Black-on-white type lump indicates an overall increase in diversity of paste characteristics as compared to Red Mesa Black-on-white. The type lump shows the highest diversity and evenness of all whitewares for both sand grain and texture distributions, but Gallup Black-on-white remains the most diverse group in temper and clay. This points up the fact that Puerco Black-on-white is even less diverse than is Red Mesa Black-on-white. This suggests, then, that Gallup Black-on-white was produced in more areas than was Puerco Black-on-white. Gallup Black-on-white appears to represent an expansion of the production area of Red Mesa Black-on-white, primarily through the addition of potters using trachyte for temper. As noted in the design section, Puerco and Gallup Black-on-whites are essentially stylistic subdivisions of Red Mesa Black-on-white, which we regard as developments from Red Mesa Black-on-white rather than total replacements thereof. The paste evidence indicates that the Puerco Black-on-white subdivision was a smaller segment of the production area, although Gallup Black-on-white was an expansion that conceivably included the entire area formerly involved with the production of Red Mesa Black-on-white. The overall effect is a marked increase not in the areas indicated but in the participation of some areas.

Perhaps the lack of subdivision of Red Mesa Black-on-white parallel to the Puerco-Gallup Black-on-white division signifies a perceived unity on the part of Southwestern ceramicists, but to defer to that fact as evidence is an exercise in psychology at best, and not even paleopsychology at that. The results here tend to support the separation of Puerco and Gallup Black-on-whites, but they also point to technological and design overlap between the two as well as with Red Mesa Black-on-white. Impressionistically, that overlap seems to be present in geographical distribution as well--that is, ceramics from some areas, such as the Puerco of the West, seem to exhibit a solid design emphasis, while those from other places, such as Chaco Canyon, seem to have more hachured elements. Pushing the contention to the logical--and perhaps absurd -- extreme, some areas counterpose hatched and solid elements in the Reserve, Socorro, and Mancos Black-on-white styles. As a part of the overlap, there is another trend for Red Mesa Black-on-white to be more completely polished than either Puerco or Gallup Black-on-whites; again suggesting some production/stylistic affinity between the two later types.

A number of possibilities are suggested by the changes apparent, but none is subject to final confirmation.

1) The change in design layout or symmetry apparent between the bulk of Red Mesa Black-on-white and the bulk of Puerco and Gallup Black-on-whites indicates some change in social organization. Washburn (1980:70) has suggested that a complete change in tradition is indicated, but we find too many continuities to accept this suggestion.

2) There may be some shift toward more rapid production of vessels, suggested by reduction in finishing time. McKenna (1980) has suggested that hachure is a more rapid method of filling spaces than is solid design. This could be experimentally quantified but has not been. Mary L. Garcia and her sister, Ann, both Acoma potters, find hachure slower than solid design. If production time was, in fact, reduced, it could be interpreted to show more production by fewer potters; that is, some form of specialization. If this were the case, our evidence would require the interpretation that such a process took place in more than one production area.

3) Perhaps related to (2), there is a movement toward slip conservation. Red Mesa Black-on-white shows 69% of open forms slipped on both sides, while the Puerco-Escavada-Gallup Black-on-white macrogroup shows only 29%, with a dramatic increase of slip-slop. Use of slip-slop and slipping of only one side of open forms is more marked in Gallup Black-on-white than in Puerco Black-on-white.

Type-Temper-Surface Combinations

Based on the foregoing type descriptions, there is reason to believe that considerable variability exists within types. Because the definition of production areas and the question of the existence of ceramic specialists are of interest, an examination of the data in terms of groups of attributes is relevant to those questions. The approach is to isolate groups based on three hierarchical variables. The first variable, the rough sort type assignment, places an item in a rough temporal category and in an admittedly somewhat subjective "normative" category based on design, paint type, and surface treatment. The second variable, temper, adds a more secure limitation to potential production areas, though some temper categories are broad. In sufficiently large groups of decorated wares, this variable was further subdivided for the temper category "undifferentiated sandstone" into coarse and fine grain sizes, because that division also has potential for limiting potential sources.

Attributes used for the third variable are less reliably related to area of production, but a case can be made for their relevance. In whitewares, the variable used is paint color. All the rough sort types treated in this analysis--the primary types Red Mesa, Puerco, and Gallup Black-on-white--have mineral paint by definition. Within mineral paint, a variety of colors may be observed. Paint color results from a number of factors:

1) Chemical composition. In this sense, paint color is comparable to temper insofar as it may have areal geological determinants. At present, we have no information on either the geological or the geographical meaning of paint color other than to note than San Juan/Mesa Verde mineral paints tend to be brown, while Cibola whiteware mineral paint is more often black.

2) Firing atmosphere. Differences here can be attributed to accidental variation and/or to possible differences in firing procedures, which may be locally variable.

3) Firing temperature. Again, accidental variation must be expected, but some areal variation may again be cited in that available fuels and local practices would be expected to vary with locality.

This method of group formation is somewhat similar to that used by Plog (1977, 1980a), except that it gives a more refined set of groups. Plog's groups are based on surface treatment (though they necessitate an unrealistic choice between slipping and polishing), temper type (using largely sherd temper, primarily types of sherd temper), and paint type (strictly organic versus mineral). The groups formed by our method are at a much finer level, as Plog's attributes are designed to separate groups that are above the rough sort type level; the concept, however, is similar.

For grayware, the third variable used for defining groups is the primary surface treatment visible. This variable is also determined, within limits, by an item's rough sort type assignment. It has less potential source information than does paint type and, clearly, a single potter is capable of producing several types of surface treatment. However, the ethnographic record suggests that potters from the same locale tend to produce similarly decorated pots (see Reina and Hill 1978:68-69, 231, 219, 271-272; Stanislawski 1975; Stanislawski and Stanislawski 1974) and, subjectively, in this "lower visibility" artifact, consistency of surface manipulation would be predicted (Plog 1980a:138-139). Minimally, use of this attribute creates a consistent subgroup for analysis, which will, if nothing else, allow some assessment of whether or not this attribute does discriminate.

Having created groups of sherds that are similar on the above levels, it is then possible to examine the groups of other attributes to test them for consistency and, perhaps, better understand local production economics and functional aspects of the ceramics. In order that such examinations may have meaning, only large groups are analyzed (Table 2.17). It will be noted that few of the groups generated account for large percentages of each type. The groups selected for inclusion were based on size

Table 2.17. Within-type breakdown by temper and paint or surface manipulation at 29SJ 627.

Types	n	n of Attribute Groups	Mean n of Sherds Per Group	Range of Items s.d.	Group Makeup					
						Members per Group				
					Per Group	1	2-10	11-20	21-39	>40
Red Mesa Black-on-white	2,299	37	62.16	247.79	1-1466	11	16	2	4	4
Puerco Black-on-white	220	18	12.22	31.10	1-129	8	8	0	0	2
Gallup Black-on-white	549	28	19.61	53.26	1-260	14	8	1	2	3
Wide neckbanded	150	14	10.71	18.30	1-66	7	3	1	2	1
Narrow neckbanded	244	26	9.38	14.25	1-57	7	11	5	0	2
Pueblo II corrugated	396	39	10.15	21.95	1-113	15	16	4	2	2

	Diversity	Evenness	Number of Groups Accounting			
			25%	50%	75%	90%
Red Mesa B/w	1.350	0.374	1	1	2	4
Puerco B/w	1.452	0.502	1	1	2	6
Gallup B/w	1.771	0.532	1	2	3	7
Wide neckbanded	1.695	0.642	1	2	3	5
Narrow neckbanded	2.531	0.777	2	3	8	12
Pueblo II corrugated	2.548	0.695	1	3	7	15

Excludes unobservable temper, includes unidentified igneous, includes all grayware surface treatments except fillet only. Note that this table does not take into account subdivison of large groups by sandstone grain size.

(20 or more members and 1% of the type) and to avoid a few very general categories such as rim fillet only or undifferentiated corrugation. For computing and other purposes, each of the 26 groups was assigned a letter.

The graywares are more diverse in this system than are the whitewares (Table 2.17). This results, in part, from the fact that the number of potential surface treatments is greater than the number of potential paints. Thus, while there are six to eight mineral paint categories (including "unknown") recorded for the decorated types, there are six to thirteen surface treatment types recorded for the grayware types. In addition, a decided preference for black paint is in evidence, which greatly reduces whiteware diversity index values.

The large size of the 29SJ 627 sample allows a further breakdown of the combinations by temper. The category "undifferentiated sandstone" is an unsatisfying one because of its likelihood of masking variability. Warren (1976, 1977) has noted that coarse-grained sandstones do not occur in central Chaco Canyon; testing of grain size subgroups of this large temper category is therefore warranted. Two of the Red Mesa Black-on-white groups, one Puerco Black-on-white group, and two Gallup Black-on-white groups were further split into fine-medium (referred to as fine) and coarse-very coarse (referred to as coarse) groups to ascertain whether differences existed along grain size lines. The division is not meaningful within the culinary groups, because even within the largest of these, only 14 sherds would be included in the "fine" group, since these groups have around 80% coarse to very coarse temper.

Whiteware Group Composition

Vessel Form

The vessel forms in the whiteware subgroups show a striking split between Red Mesa Black-on-white on the one hand (Table 2.18), and the more even distribution of forms in the later types (Table 2.19). Bowls constitute over 50% of all of the Gallup and Puerco Black-on-white temper-paint-grain size groups, but the mean for these two groups is 64.9%, as opposed to the mean of 76.0% for the Red Mesa Black-on-white groups. Jars are similarly distributed in Red Mesa and Gallup-Puerco Black-on-whites, and ladles are somewhat more abundant in Gallup-Puerco Black-on-whites, but pitchers are relatively much more abundant in the latter lump. This better representation of forms other than bowls is reflected in the diversity and evenness indices, which are all higher in the Gallup and Puerco Black-on-white groups with three exceptions. The Gallup-trachyte-brown paint group is completely anomalous for all of the Gallup and Puerco Black-on-white groups; the percentage of bowls is in the high Red Mesa Black-on-white range (82%). The sample for this group is very small (n=22), but it is at least curious that the Red Mesa-trachyte-brown paint group has the highest percentage of bowls in the Red Mesa Black-on-white groups. The other exception is the higher evenness index in the Red Mesa-sandstone-red paint group (J=.613), which is largely the result of a high relative frequency of jars.

Perusal of vessel form (Table 2.18) shows that in the Red Mesa Black-on-white groups, the larger the number of

Table 2.18. Red Mesa Black-on-white temper-paint-grain size-color groups (comparisons of vessel form, metrics and paste attributes).

A. Forms

	Combination															
TEMPER/GRAIN SIZE	CH SS		SS/all		SS/fine		SS/cse.		SS/fine		SS/cse.		Tr.+SS.		Tr+SS	
PAINT COLOR	Black		Red		Brown		Brown		Black		Black		Brown		Black	
GROUP	A		B		C		D		E		F		G		H	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
FORM																
Bowl	97	76.4	22	68.8	244	73.7	67	77.0	945	76.6	170	77.3	24	80.0	50	78.1
Ladle	17	13.4	3	9.4	32	9.7	7	8.0	130	10.5	28	12.7	2	6.7	4	6.3
Pitcher	1	0.8	1	3.1	7	2.1	2	2.3	27	2.2	3	1.4	2	6.7	1	1.6
Canteen	1	0.8	-	-	-	-	-	-	3	0.2	-	-	-	-	-	-
Seed jar	1	0.8	-	-	3	0.9	1	1.1	11	0.9	1	0.5	1	3.3	1	1.6
Tecomate	1	0.8	-	-	1	0.3	-	-	3	0.2	1	0.5	-	-	-	-
Gourd jar	-	-	-	-	-	-	-	-	1	0.1	-	-	-	-	-	-
Olla	2	1.6	1	3.1	11	3.3	3	3.4	11	0.9	3	1.4	-	-	-	-
General jar	5	3.9	5	15.6	30	9.1	7	8.0	98	7.9	12	5.5	-	-	8	12.5
Duck pot	1	0.8	-	-	2	0.6	-	-	2	0.2	-	-	1	3.3	-	-
Effigy	1	0.8	-	-	1	0.3	-	-	2	0.2	2	0.9	-	-	-	-
Miniature	-	-	-	-	-	-	-	-	1	0.1	-	-	-	-	-	-
Total	127		32		331		87		1,234		220		30		64	
Diversity	0.897		0.986		0.972		0.861		0.872		0.829		0.766		0.756	
Evenness	0.389		0.613		0.442		0.480		0.351		0.399		0.476		0.470	
Form(s)	10		5		9		6		12		8		5		5	
MEAN DIAMETERS																
Bowl mean	185.3		162.6		180.6		181.4		190.2		190.8		181.1		185.3	
Bowl s.d.	51.3		43.8		52.4		61.1		58.7		57.3		70.2		64.1	
Bowl n	62		19		200		46		664		136		18		35	
Ladle mean	99.2		-		104.0		78.3		103.6		105.8		-		105.0	
Ladle s.d.	18.6		-		36.2		-		27.6		16.3		-		-	
Ladle n	6		0		15		3		39		6		-		2	
Pitcher mean	90.0		50.0		83.6		67.5		83.8		76.7		92.5		80.0	
Pitcher s.d.	-		-		25.6		-		17.0		-		-		-	
Pitcher n	1		1		7		2		26		3		2		1	

Table 2.18. (continued)

B. Motifs

Motif	Red	General SS Brown Fine	General SS Brown Coarse	General SS Black Fine	General SS Black Coarse	ChSS Black	Trachyte mix Brown & Black	N
Solid band	8	81	27	383	58	45	21	623
Parallel lines	3	39	17	176	22	15	12	284
Scrolls	5	47	8	163	20	12	9	264
Ticked triangles	4	50	11	134	19	14	10	242
Squiggles	1	31	5	97	23	19	8	184
Hachure A-1	6	28	4	89	10	8	11	156
Checkerboards	2	13	7	79	21	4	12	138
Ticked lines	1	26	8	82	14	5	6	142
Sawteeth	0	23	3	52	21	7	2	108
Framers w/t solids	1	19	1	41	7	8	2	79
Total	31	357	91	1,296	215	137	93	2,220

Chi-square:

w/o red n=2,189
χ^2=80.731
df=45
p=0.001
C=0.189
cells <5=5

Contributors:

Gen. SS black: high parallels, scrolls.
brown: high in triangles, sawteeth, framed solids.
ChSS black: high in bands.

Trachyte mix: high in A-1 and checkerboards.
Black-fine vs. coarse: fine low in squiggles, checkers, sawteeth.

Other pairwise comparisons:

	N	Table	χ^2	df	p	C	cells <5
Trachyte brown vs. black	93	10x2	10.179	-	-	-	13
ChSS vs trachyte	124	10x2	17.814	9	0.037	0.268	3
F SS brown vs trachyte	450	10x2	18.415	9	0.031	0.199	1
F SS black vs trachyte	1,389	10x2	12.394	9	0.192	0.094	2
C SS black vs trachyte	308	10x2	12.270	9	0.199	0.196	0
Ch SS vs F SS black	1,433	10x2	15.584	9	0.076	0.104	1
Ch SS vs C SS brown	494	10x2	12.456	9	0.189	0.157	1
Ch SS vs C SS black	352	10x2	12.548	9	0.184	0.186	0
Gen. SS:							
Brown vs black	1,959	10x2	23.652	9	0.005	0.109	0
Fine: brown vs black	1,653	10x2	21.224	9	0.012	0.113	0
f black vs c black	1,511	10x2	24.233	9	0.004	0.126	0
Coarse: brown vs black	306	10x2	11.670	9	0.233	0.191	2
f brown vs c brown	448	10x2	15.424	9	0.080	0.182	2
c brown vs f black	1,387	10x2	6.512	9	0.688	0.068	2

Table 2.18. (continued)

C. Rim Decoration

	Solid line	Other	N	
SS red paint	15	6	21	
Fine SS brown paint	154	55	209	
Coarse SS brown paint	53	12	65	
Fine SS black paint	792	93	885	
Coarse SS black paint	144	20	164	
Chalcedonic SS black	88	3	91	
Trachyte + SS brown	43	5	48	- brown-fine high in other
Trachyte + SS black	18	5	23	- black-fine & ChSS low in other
Total	1,307	199	1,506	

Chi-square:

χ^2=52.551 df=7 p=0.000 C=0.184 cells <5=2

D. Slipping on Bowls

	None	Interior	Slip-slop	Both	N
Sandstone red	0	9	0	13	22
Fine SS brown paint	8	64	8	150	230
Coarse SS brown	5	17	3	37	62
Fine SS black paint	14	189	36	673	912
Coarse SS black	3	41	10	110	164
Chalcedonic SS black	3	10	3	78	94
Trachyte + SS brown	0	13	4	31	48
Trachyte + SS black	2	6	2	12	22
Total	35	349	66	1,104	1,554

Chi-square comparisons:

	n	χ^2	df	p	C	cells <5
F SS brown vs C SS brown	292	2.784	3	0.426	-	2
F SS black vs C SS black	1,076	3.631	3	0.304	-	-
F SS black vs F SS brown brown lower than E both, higher interior, high none	1,142	9.762	3	0.021	0.092	1
C SS black vs C SS brown	226	5.546	3	0.136	-	2
All trach vs F SS black	982	6.575	3	0.087	-	2
ChSS black vs F SS black	1,006	6.854	3	0.077	-	2
SS brown vs black brown >E none, >E interior only, <E both surfaces	1,368	15.341	3	0.002	0.105	-

Table 2.18. (continued)

E. Polish on Bowls

	One side			Two sides			N
	None	Incomp	Comp	Incomp	Comp	Differ	
SS red paint	0	4	5	1	6	5	21
Fine SS brown paint	5	30	72	17	50	55	229
Coarse SS brown	5	14	10	9	7	16	61
Fine SS black paint	20	77	247	82	192	297	915
Coarse SS black	3	31	40	10	23	50	157
Chalcedonic SS black	1	12	20	3	24	34	94
Trachyte + SS black	0	5	18	2	6	17	48
Trachyte + SS brown	1	2	8	2	8	1	22
Total	35	175	420	126	316	475	1,547

Chi-square comparisons:

	n	χ^2	df	p	C	cells <5
All 1 side vs 2 sides	1,547	14.054	7	0.050	0.095	-
F brown <E 1 side, F black >E 1 side, C black <E one side, + converses						
F SS brown vs C SS brown	290	17.602	5	0.003	0.240	1
C>E 1 side incomplete, <E 1 side complete, >E 2 sides incomplete. <E 2 sides complete						
F SS black vs C SS black	1,072	20.982	5	0.001	0.139	1
C>E 1 side incomplete, <E 2 sides complete						
C SS black vs C SS brown	218	10.853	5	0.054	-	1
F SS black vs F SS brown	1,144	10.402	5	0.065	-	-
Ch SS black vs trachyte black	141	5.893	4	0.207	-	-
SS brown vs SS black	1,362	11.787	5	0.083	0.093	-
Brown >E incomplete 1 side, <E 2 sides differential						

E denotes chi-square expected

Table 2.18. (continued)

	Combination															
TEMPER/GRAIN SIZE	Ch SS		SS/all		SS/fine		SS/cse.		SS/fine		SS/cse.		Tr.+SS		Tr.+SS	
PAINT COLOR	Black		Red		Brown		Brown		Black		Black		Brown		Black	
GROUP	A		B		C		D		E		F		G		H	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
F. Texture:																
Very fine	12	11.8	9	37.5	64	24.3	-	-	273	28.3	1	0.6	5	18.5	13	26.5
Fine	44	43.1	6	25.0	151	57.4	3	5.1	510	52.8	15	8.8	7	25.9	11	22.4
Fine to medium	29	28.4	7	29.2	41	15.6	38	65.5	162	16.8	110	64.7	14	51.9	17	34.7
Medium	12	11.8	1	4.2	5	1.9	12	20.7	7	0.7	39	22.9	-	-	3	6.1
Medium to coarse	2	2.0	-	-	2	0.8	-	-	9	0.9	1	0.6	1	3.7	3	6.1
Coarse	2	2.0	-	-	-	-	4	6.9	4	0.4	2	1.2	-	-	2	4.1
Very coarse	1	1.0	1	4.2	-	-	1	1.7	-	-	2	1.2	-	-	-	-
Total	102		24		263		58		965		170		27		49	
G. Sherd Temper																
None	11	8.7	3	9.4	13	3.9	9	10.3	52	4.2	10	4.5	3	10.0	10	15.2
Less than half	47	37.0	4	12.5	61	18.1	19	21.8	285	22.9	57	25.9	11	36.7	27	40.9
More than half	68	53.5	23	71.9	252	74.8	57	65.5	893	71.7	149	67.7	16	53.3	29	44.0
Nearly all	1	0.8	2	6.2	11	3.3	2	2.3	16	1.3	4	1.8	-	-	-	-
Total	127		32		337		87		1,246		220		30		66	
H. Clay Combinations																
No type	48	(45.7)	9	(37.5)	107	(38.6)	26	(42.6)	393	(38.5)	60	(34.3)	15	(53.6)	31	(63.3)
Black w/white sherd	16	28.1	8	53.3	94	55.3	15	42.9	107	33.0	45	39.1	5	38.5	3	16.7
Gray w/white sherd	23	40.4	5	33.3	44	25.9	15	42.9	258	41.1	48	41.7	3	23.1	3	16.7
Gray w/white sherd	18	31.6	2	13.3	31	18.2	-	-	158	25.2	21	18.3	4	30.8	8	44.4
Coarse angular SS	-	-	-	-	1	0.6	5	14.3	-	-	1	0.9	-	-	-	-
Chuska gray	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	22.2
Little Colorado	-	-	-	-	-	-	-	-	3	0.5	-	-	-	-	-	-
Total	105		24		277		61		1,021		175		28		49	

Table 2.19. *Puerco and Gallup Black-on-white temper-paint-grain size-color groups comparisons based on vessel form and paste attributes.*

TYPE	Puerco		Puerco		Puerco		Gallup		Gallup		Gallup		Gallup		Gallup		Gallup		Gallup	
TEMPER/GRAIN SIZE	SS/all		SS/fine		SS/cse.		SS/fine		SS/cse.		SS/fine		SS/cse.		Tr.+SS.		Tr.+SS		Trachyte	
PAINT COLOR	Brown		Black		Black		Brown		Brown		Black		Black		Brown		Black		Black	
GROUP	I		J		K		L		M		N		O		P		Q		R	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
A. FORMS																				
Bowl	31	64.6	63	70.8	27	69.2	49	54.4	23	65.7	126	63.0	41	69.5	18	81.8	29	60.4	14	53.8
Ladle	11	22.9	13	14.6	5	12.8	8	8.9	2	5.7	15	7.5	4	6.8	-	-	7	14.6	3	11.5
Pitcher	2	4.2	3	3.4	1	2.6	16	17.8	3	8.6	26	13.0	4	6.8	3	13.6	6	12.5	4	15.4
Canteen	-	-	1	1.1	1	2.6	-	-	1	2.9	2	1.0	-	-	-	-	-	-	1	3.8
Seed jar	-	-	2	2.2	-	-	2	2.2	-	-	1	0.5	-	-	-	-	1	2.1	-	-
Tecomate	-	-	-	-	-	-	4	4.4	-	-	-	-	-	-	-	-	1	2.1	-	-
Olla	1	2.1	1	1.1	-	-	2	2.2	-	-	9	4.5	3	5.1	-	-	2	4.2	1	3.8
General jar	3	6.3	6	6.7	4	10.3	8	8.9	6	17.1	18	9.0	7	11.9	1	4.5	2	4.2	3	11.5
Effigy	-	-	-	-	1	2.6	-	-	-	-	1	0.5	-	-	-	-	-	-	-	-
Miniature	-	-	-	-	-	-	1	1.1	-	-	2	1.0	-	-	-	-	-	-	-	-
Total	48		89		39		90		35		200		59		22		48		26	
Diversity	1.006		1.008		1.033		1.426		1.054		1.252		1.022		0.576		1.271		1.370	
Evenness	0.625		0.518		0.577		0.686		0.655		0.570		0.635		0.525		0.653		0.765	
Form (s)	5		7		6		8		5		9		5		3		7		6	
MEAN DIAMETERS																				
Bowl mean	209.7		224.5		239.4		221.0		180.9		219.7		222.8		212.9		211.7		220.0	
Bowl s.d.	62.3		63.3		69.5		64.6		57.6		68.2		51.9		93.7		69.8		52.5	
Bowl n	29		54		24		41		17		98		27		12		24		9	
Ladle mean	110.1		115.0		90.0		120.0		120.0		139.3		-		-		103.3		110.0	
Ladle s.d.	40.8		35.0		-		23.7		-		21.7		-		-		32.5		-	
Ladle n	4		5		2		5		1		7		0		0		6		1	
Pitcher mean	60.0		107.5		100.0		98.9		73.3		83.8		105.0		81.7		82.0		82.5	
Pitcher s.d.	-		-		-		20.2		-		24.0		-		-		23.1		12.6	
Pitcher n	2		2		1		14		3		24		3		3		5		4	

Table 2.19. (continued)

TYPE	Puerco		Puerco		Puerco		Gallup		Gallup		Gallup		Gallup		Gallup		Gallup		Gallup	
TEMPER/GRAIN SIZE	SS/all		SS/fine		SS/cse.		SS/fine		SS/cse.		SS/fine		SS/cse.		Tr.+SS.		Tr.+SS		Trachyte	
PAINT COLOR	Brown		Black		Black		Brown		Brown		Black		Black		Brown		Black		Black	
GROUP	I		J		K		L		M		N		O		P		Q		R	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
B. TEXTURE																				
Very fine	13	32.5	17	27.0	9	29.0	20	33.3	1	4.2	57	43.5	-	-	5	27.8	7	18.9	11	55.0
Fine	13	32.5	40	63.5	14	45.2	32	52.7	5	20.8	55	42.0	3	7.5	5	27.8	15	40.5	4	20.0
Fine to Medium	9	22.5	4	6.3	-	-	5	8.3	10	41.7	16	12.2	24	60.0	5	27.8	10	27.0	3	15.0
Medium	4	10.0	2	3.2	7	22.6	2	3.3	4	16.7	2	1.5	11	27.5	4	16.7	4	10.8	1	5.0
Medium to Coarse	-	-	-	-	1	3.2	1	1.7	-	-	1	0.8	-	-	-	-	1	2.7	-	-
Coarse	1	2.5	-	-	-	-	1	1.7	2	8.3	-	-	2	5.0	-	-	-	-	1	5.0
Very coarse	-	-	-	-	-	-	-	-	2	8.3	-	-	-	-	-	-	-	-	-	-
Total	40		63		31		60		24		131		40		18		37		20	
C. SHERD TEMPER																				
None	2	4.2	3	3.3	3	7.7	9	9.9	6	17.1	5	2.5	6	10.2	2	9.1	8	16.7	4	15.4
Less than half	14	29.2	10	11.1	6	15.4	16	17.6	9	25.7	39	19.4	14	23.7	10	45.5	14	29.2	6	23.1
More than half	30	62.5	70	77.8	27	69.2	62	68.1	18	51.4	150	74.6	38	64.4	10	45.5	26	54.2	16	61.5
Nearly all	2	4.2	7	7.8	3	7.7	4	4.4	2	5.7	7	3.5	1	1.7	-	-	-	-	-	-
Total	48		90		39		91		35		201		59		22		48		26	
D. CLAY COMBINATIONS																				
No type	17	(41.5)	22	(33.3)	14	(42.4)	29	(46.0)	16	(66.7)	45	(31.7)	18	(42.9)	8	(44.4)	23	(62.2)	4	(20.0)
Black w/white sherd	8	33.3	15	34.1	6	31.6	12	35.3	4	50.0	24	24.7	12	50.0	5	50.0	6	37.5	3	18.8
Gray w/black sherd	10	41.7	20	45.5	7	36.8	11	32.4	3	37.5	40	41.2	11	45.8	1	10.0	2	12.5	2	12.5
Gray w/white sherd	6	25.0	9	20.5	6	31.6	11	32.4	1	12.5	33	34.0	1	4.2	2	20.0	5	31.3	8	50.0
Chuska gray	-	-	-		-	-	-	-	-	-	-	-	-	-	2	20.0	1	6.3	3	18.8
Total	41		66		33		63		24		142		42		18		37		20	

items, the less the evenness index. This results mainly from the fact that the large samples are more likely to exhibit rare forms represented by only one or two specimens. Also influencing this result is the apparent tendency for the more common forms other than bowls (jars, ladles, pitchers) to be slightly less relatively frequent in the large samples.

Between-group, within-type comparisons of vessel forms are remarkable for the lack of significant differences present. Of the pairs that were tested, all but one yielded insignificant results (Table 2.20).

Of all the tests conducted in this way, only that comparing Red Mesa-sandstone-black paint with brown paint yielded a significant chi-square value. The main contributors to this value are the two olla cells; the brown paint group is higher than the expected, the black paint lower. This is of some interest in that at 29SJ 629 (Toll and McKenna 1981a:23-24), Red Mesa Black-on-white bowls with brown paint were found to be significantly larger than the black-painted bowls. The prevalence of brown-painted ollas is, however, not present at 29SJ 629. Also, although the difference between brown-painted and black-painted vessel forms is significant at 29SJ 627, the strength of the association is very low (C=0.086) because of the large sample size and the small chi-square value. The within-type, between-group similarities thus cross grain size groups within sandstone tem-

Table 2.20. Chi-square test results from within-type vessel form comparisons.

Pair	n	Dimensions	χ^2	df	p	C
Coarse-Fine						
Red Mesa black paint[a]	1,447	2x5	3.83	4	.429	.051
Red Mesa brown paint[a]	415	2x5	.37	4	.985	.030
Puerco black paint[b]	125	2x3	.26	2	.879	.045
Gallup black paint[b]	256	2x3	.62	2	.732	.049
Gallup brown paint[b]	120	2x3	.83	2	.662	.083
Paint						
Red Mesa brown-red[b]	447	2x3	.87	2	.649	.044
Red Mesa brown-black	1,862	2x5	14.02	4	.007	.086
Puerco brown-black[b]	175	2x3	1.95	2	.377	.105
Gallup brown-black[c]	380	2x4	2.00	3	.572	.072
Tempers						
All Gallup trachyte vs all Gallup SS[c]	461	2x4	1.67	3	.645	.060
All Red Mesa trachyte vs all Red Mesa SS[b]	1,991	2x3	1.79	2	.410	.030
Red Mesa chalcedonic SS-black vs Red Mesa SS[b]	2,023	2x3	2.43	2	.297	.035

All exclude miniatures, duckpots, effigies.
[a] Lumps canteen, seed jar, tecomate, pitcher.
[b] Adds olla and jar to ([a]) to give lump of all closed forms.
[c] Lumps jar, olla, canteen, tecomate, seed jar, and pitchers separately.

per, temper groups, and paint groups. This finding is similar to the within-type vessel form continuity found at 29SJ 629.

Bowl Diameters

The only metric attribute recorded for decorated pottery was the estimated orifice diameter. Bowls are the only vessel form represented by enough pieces to make testing worthwhile. The mean bowl diameters of the eight Red Mesa Black-on-white groups range from 162.6 to 190.8 mm, with seven of the eight means ranging from 180 to 191 mm. This similarity in group means is also reflected in the frequency plot (Figure 2.12); only the four largest groups are shown, but the general shape of the distribution is similar when all but the two smallest groups are included. The red-painted group has the smallest mean and peaks at 26% at 160 mm, which is the most marked non-conformance to a fairly normal distribution around a peak at 180 mm seen in the other groups (Figure 2.6). An analysis of variance on all of the Red Mesa Black-on-white groups yields an insignificant F value, confirming the similarity apparent, even with the very small increment (5 mm) used (F=1.33, df=7, probability of a greater F=0.232).

The means for the Gallup and Puerco Black-on-white group bowls are more wide-ranging (180.9-239.4) and irregularly distributed than are those for the Red Mesa Black-on-white bowls (Tables 2.19 and 2.21, Figure 2.13-2.14). Removing the two extremes (Gallup-coarse sandstone-brown paint and Puerco-coarse sandstone-black paint) leaves eight groups with means from 209.7 to 224.5, a range of similar magnitude to that of the Red Mesa Black-on-white groups. The analysis of variance on these groups, as well, produces an insignificant F value, suggesting an overall sameness. The considerably more erratic frequencies shown in these groups may result, in part, from small sample size, but even those Red Mesa Black-on-white groups with similar numbers of items are more similar in frequency than the Puerco and Gallup

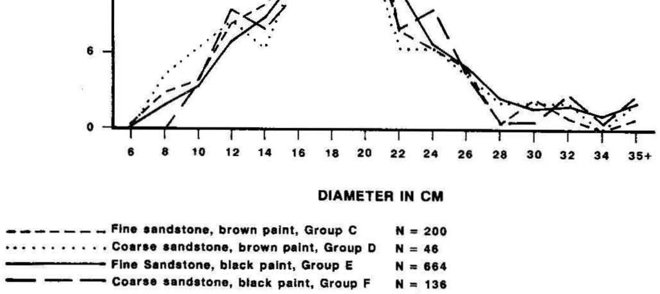


Figure 2.12. Frequencies of bowl diameters within Red Mesa temper-paint-grain size groups.

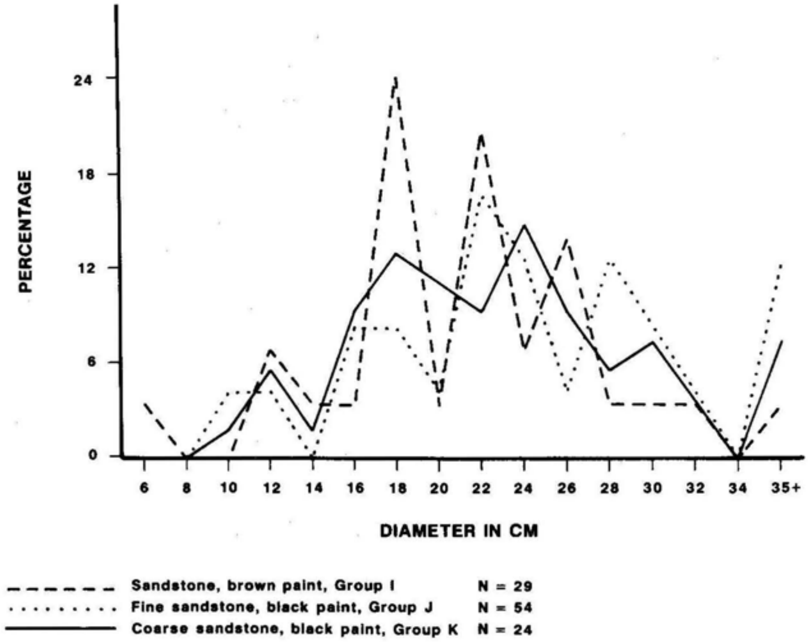


Figure 2.13. *Frequencies of bowl diameters within Puerco temper-paint-grain size groups.*

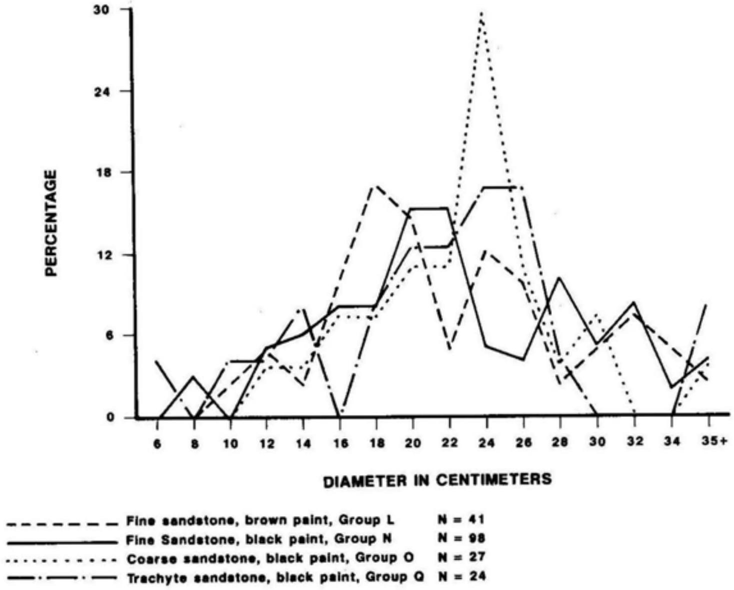


Figure 2.14. *Frequencies of bowl diameters within Gallup temper-paint-grain size groups.*

Table 2.21. Puerco Black-on-white temper-paint-grain size group surface attributes.

A. Motifs:

	Sandstone			
		Black		
	Brown	Fine	Coarse	N
Wide Sosi Style	14	49	15	78
Barbs	20	10	14	44
Sawteeth	6	10	1	17
Solid band design	3	3	4	10
Pendant parallels	3	6	2	11
Total	46	78	36	160

Chi-square:

$\chi^2=23.740$
df=8
p=0.003
C=0.359
Cells <5=7

Contributors:

Gen. SS black-fine high in Sosi style.
Brown and black coarse: barbs higher.

B. Slip:

	None	Interior	Slip-slop	Both	N
Brown	1	17	2	10	30
Black-fine	5	35	6	15	61
Black-coarse	5	12	4	6	27
Total	11	64	12	31	118

C. Polish:

	One Side			Two sides			
	None	Incomp	Comp	Incomp	Comp	Differ	N
Brown	1	15	6	1	2	3	28
Black-fine	6	31	17	3	1	4	62
Black-coarse	3	15	5	3	0	1	27
Total	10	61	28	7	3	8	117

D. Rims:

	Solid line	Other	N
Brown	17	12	29
Black-fine	51	10	61
Black-coarse	20	6	26
Total	88	28	116

Chi-squares:

	χ^2	d.f.	p	cells < 5
B. Lumping interior & slip-slop	4.68	4	0.322	2
C. Lumping incomps & comps	3.43	6	0.753	5
one side vs. 2 sides	0.821	2	0.663	2

Black-on-white groups. Five groups have two major definable peaks, and in four of these instances the peaks are separated by 6 cm, which suggests that bowls may have been produced for different functions within production areas. Clear indications of complementary bowl size between groups seems to be lacking. There are three peaks, each at 18, 22, and 24 cm, and two at 28 cm among the 10 groups. Note that 18 cm is the main mode for nearly all of the Red Mesa Black-on-white groups, which suggests that the erratic distributions in the Puerco and Gallup Black-on-white groups result from the addition of some function (e.g., an increase in the number of people served). The significant between-type t-test (see type descriptions) is echoed on an analysis of variance of all Red Mesa, Puerco, and Gallup Black-on-white groups, which is also significant (F=5.48, df=17, probability of a greater F=0.000).

Paste Attributes

The paste attributes give an impression of greater variability between groups than do the metric and form attributes. Because several of the groups are defined by means of grain size, comparisons of texture (which is partly based on grain size), and grain size are not meaningful. Both clay attributes and sherd temper quantities give significant chi-square values when all Red Mesa Black-on-white groups are compared (Table 2.18G, H). The use of sherd temper in the trachyte-tempered groups (especially the black-painted one) is much less than that for the more abundant sandstone-tempered groups, and thus the trachyte groups contribute heavily to the chi-square value. The chalcedonic sandstone-tempered group contains fewer than expected items with no sherd temper and more than expected items with less than half sherd temper. Testing only the three clay-sherd combinations and omitting the trachyte brown-painted group, the Red Mesa Black-on-white groups again produce a significant chi-square. The largest contributors include more than expected black clay with white sherd temper in the fine sandstone-brown paint group with a converse lower frequency of gray clay with white sherd in the coarse sandstone-brown paint group and more than expected of this same clay-sherd combination in the trachyte plus sandstone black-painted group.

The Puerco and Gallup Black-on-white groups also show significant differences in the distribution of sherd temper, and again the sherds containing trachyte are less than expected in sherd temper content (Table 2.19C). Even though the overall distribution shows that 72% contain more than half sherd temper, the Puerco Black-on-white fine sandstone-black paint contributes substantially to the chi-square value by having fewer items than expected with less than half sherd temper. Using the groups with sufficient quantities of clay combination identifications, the chi-square value is not significant at the .05 level. As compared to the Red Mesa Black-on-white groups, there is a higher frequency of gray clay with white sherd temper, less with black clay and white sherd temper, and an equivalent amount of gray clay with black sherd.

Surface Treatment

Design. Traditional type descriptions assume that within a type, decoration is more or less constant across the type area. The type subgroupings from 29SJ 627 allow us to examine this assumption by looking for areal variability in the use of motifs, using the same format as the type descriptions (Tables 2.6-2.8, 2.17-2.19, and 2.21-2.22).

Comparison of diversity indices must be undertaken warily in both the Red Mesa and Gallup Black-on-white groups because the large differences in group size do have an effect on the values. Significant rank order correlations are present between sample size and diversity index value in both the Red Mesa and Gallup Black-on-white groups, as well as higher coefficients between n and the number of motifs in a group or groups. Among the six largest groups in each of the two types, the rank order coefficients are smaller and not significant, so only those groups are used in the following comparisons. Even within the six largest Red Mesa and Gallup Black-on-white groups, evenness and sample size have very high negative rank order correlations (-1.00 and -.971), which shows that as the population is more nearly approximated, common designs become even more common because of the increase in rare motifs, the absolute limit on the number of motifs possible, and the occurrence of common motifs as secondary and tertiary designs. There is also a statistical artifact of undetermined proportions here--the H' values are not greatly dissimilar between groups, but the numbers of motifs (from which the maximum H' is calculated in order to determine J) are larger, thereby depressing J. H' values remain similar, at least in part, because of the addition of low frequency motifs to larger groups.

A synopsis of intra-group Red Mesa Black-on-white decorative diversity patterns between the general sandstones includes the following:

1) Black paint groups are generally more diverse than brown paint groups.

2) Fine sandstone groups are generally more diverse than coarse sandstone, although coarse sandstone-black paint exhibits the greatest diversity.

3) Fine sandstone-brown paint exhibits the highest number of multi-motif sherds.

4) Fine and coarse sandstones with brown paint have different motif distributions.

Tentatively, then, there is a tendency for the four undifferentiated sandstone groups to show more diversity than the chalcedonic sandstone and the trachyte plus sandstone groups, though coarse sandstone-brown paint has the lowest index of the six. Taking into account the sample size problem, the indices of greater interest are the coarse sandstone-black paint (rank 1 H', rank 3 n), fine sandstone-black paint (rank 3 H', rank 1 n), and trachyte plus sandstone-black paint (rank 4 H', rank 6 n).

The Red Mesa Black-on-white ceramic groups have markedly higher diversity indices than do most of either the Puerco or Gallup Black-on-white groups. Several reasons for the greater diversity found in Red Mesa Black-on-white ceramics, both as a whole and in its subgroups, have been discussed in the type description. Its period of production means minimally that many potters pro-

Table 2.22. Gallup Black-on-white temper-paint-grain size group decorative and surface attributes.

A. Motifs:

TEMPER	General SS							
PAINT	Brown		Black		Trachyte + SS		Trachyte	
GRAIN SIZE	Fine	Coarse	Fine	Coarse	Brown	Black	Black	N
Hachure B-1	18	15	44	25	2	11	4	119
Hachure B-4	18	1	63	8	2	11	6	109
Hachure B-3	28	5	30	13	0	8	5	89
Hachure B/C	2	0	12	1	10	11	7	43
Hachure B-6	5	2	15	3	0	2	1	28
Total	71	23	164	50	14	43	23	388

Chi-square:	Contributors:
$\chi^2=123.232$	Trachyte pure & mix all high in hachure B/C and lower in all other.
df=24	Gen. SS: Fines low in B-2 & B/C. B/C low all across.
p=0.000	Brown-coarse: high in B-1.
C=0.494	Brown-fine: high in B-3.
cells <5=12	Black-coarse: high in B-1, B-3.
	Fine: high in B-4, B-6.

B. Rim Decoration:

	Solid line	Other	N
Fine SS brown paint	32	15	47
Coarse SS brown paint	18	5	23
Fine SS black paint	99	21	120
Coarse SS black paint	25	12	37
Trachyte + SS brown paint	15	2	17
Trachyte + SS black paint	22	6	28
Trachyte black paint	9	3	12
Total	220	64	284

Chi-square:

$\chi^2=7.387$ df=6 p=0.287 C=0.159 cells <5=2

C. Slip bowls:

	None	Interior	Slip-slop	Both	N
Fine SS brown paint	6	21	10	10	47
Coarse SS brown paint	6	8	3	4	21
Fine SS black paint	13	52	26	28	119
Coarse SS black paint	7	16	6	7	36
Trachyte + SS black	0	4	9	4	17
Trachyte + SS brown	0	11	14	4	29
Trachyte black paint	0	3	7	4	14
Total	32	115	75	61	283

Table 2.22. (continued)

Chi-square comparisons:

	n	χ^2	df	p	C	cells <5
F SS brown vs C SS brown	68	2.608	3	0.456		3
F SS black vs C SS black	155	2.122	3	0.574		1
All trachyte 3x3	60	2.414	4	0.660		3
SS brown, SS black, trachyte	283	27.766	6	0.000	0.299	
SS brown >E none, <E slip-slop; SS black <E slip-slop; trachyte <E none, <E interior, much >E slip-slop SS brown vs						
SS black	223	0.898	3	0.826		
F SS, C SS, trachyte by interior+slip-slop, none,						
both:	283	16.051	4	0.003	0 .232	
Trachyte >E interior, >E slip-slop; Coarse >E none; Fine >E both						

D. Slip pitchers:

	None	Exterior	Slip-slop	N
Fine SS brown paint	-	6	9	15
Coarse SS brown paint	1	1	1	3
Fine SS black paint	-	8	18	26
Coarse SS black paint	-	3	1	4
Trachyte + SS black	-	1	2	3
Trachyte + SS brown	-	4	2	6
Trachyte black paint	-	2	2	4
Total	1	25	35	61

Lumps as above all produce insignificant chi-square values.

E denotes chi-square expected.

E. Polish bowls

		One Side		Two sides			
	None	<Total	Total	<Total	Total	Differ	N
Fine SS brown paint	7	12	17	0	3	6	45
Coarse SS brown	4	6	7	3	0	1	21
Fine SS black paint	15	28	52	7	7	9	118
Coarser SS black	13	12	7	2	0	0	34
Trachyte + SS brown	0	5	7	0	2	2	16
Trachyte + SS black	2	3	17	0	3	1	26
Trachyte black	0	2	6	1	2	1	12
Total	41	68	113	13	17	20	272

Table 2.22. (continued)

Chi-square comparison:

	n	χ^2	df	p	C	cells <5
SS brown vs C SS brown	66	0.208	3	0.976		2
F SS black vs C SS black fine <E none, >E 2 sides; coarse >E none, <E complete 1 side, >E 1 side incomplete, <E 2 sides	152	17.397	3	0.001	0.320	
SS brown vs SS black	218	0.445	3	0.930		
SS brown vs SS black vs trachyte/none, <total, total, 2 sides--	272	10.747	4	0.097		
3 Trachyte/<total, total, 2 sides--	52	4.189	4	0.381		5

F. Polish pitchers:

	None	Incomplete	Complete	N
Fine SS brown paint	-	5	8	13
Coarse SS brown paint	1	1	1	3
Fine SS black paint	-	5	19	24
Coarse SS black paint	-	-	3	3
Trachyte + SS brown	-	-	3	3
Trachyte + SS black	-	2	4	6
Trachyte black	-	1	3	4
Total	1	14	41	56

Chi-square comparisons:

	n	χ^2	df	p	C	cells <5
SS brown vs SS black vs trachyte/incomplete incomplete	55	2.396	2	0.302		2

duced it and, potentially, that many areas did; further, it is abundant at 29SJ 627. That so much Red Mesa Black-on-white pottery is tempered with the somewhat nondescript undifferentiated sandstone increases the likelihood that multiple producers are represented within those groups; there is also the fact that more motifs are available to Red Mesa Black-on-white potters by definition because of the lack of a solid-hatched division. Statistically and practically speaking, therefore, it is predictable that Red Mesa Black-on-white ceramic groups would show a relatively high diversity.

The Gallup Black-on-white ceramic groups' design diversity indices follow much the same pattern as those of the Red Mesa Black-on-white groups (Tables 2.22 and 2.23A):

Table 2.23A. Diversity of designs and multiple motifs in whiteware type groups at 29SJ 627.

	Diversity Indices						
	Motif	Design			Distribution		
	n	s	H'	J	s	H'	J
Red Mesa Black-on-white	3,003						
SS red paint	43	14	2.415	.915	3	.646	.589
Fine SS brown paint	486	37	2.860	.792	3	.771	.701
Coarse SS brown	123	21	2.610	.857	3	.707	.643
Fine SS black paint	1,739	46	2.800	.731	3	.727	.662
Coarse SS black	308	34	2.870	.814	3	.698	.636
Chalcedonic SS black	176	25	2.644	.821	3	.734	.668
Trachyte + SS brown	35	14	2.372	.900	2	.458	.661
Trachyte + SS black	93	22	2.737	.885	3	.769	.700
Puerco Black-on-white	233						
SS brown paint	63	15	2.141	.790	2	.549	.792
Fine SS black	120	20	2.185	.729	3	.642	.585
Coarse SS black	50	13	2.000	.780	3	.594	.541
Gallup Black-on-white	566						
Fine SS brown paint	99	19	2.230	.757	3	.311	.283
Coarse SS brown paint	38	12	2.015	.811	2	.276	.398
Fine SS black paint	251	33	2.662	.761	3	.564	.513
Coarse SS black paint	68	14	2.041	.773	2	.181	.261
Trachyte + SS brown	25	11	2.021	.843	2	.367	.529
Trachyte + SS black	55	13	2.157	.841	2	.410	.592
Trachyte black	30	10	2.043	.887	2	.393	.567

Table 23B. Occurrence of most common motifs in Red Mesa Black-on-white temper/grain size/paint groups at 29SJ 627.

	Solids in band	Scrolls	Ticked Triangle	Checker-board	Parallel Lines	Squiggle Lines	Squiggle Hachure A	Total Designs
Undif. SS-red paint	8	5	4	2	3	1	6	43
% of group	18.6	11.6	9.3	4.7	7.0	2.3	14.0	
F SS-brown paint	81	47	50	13	39	31	28	486
% of group	16.7	9.7	10.3	2.7	8.0	6.4	5.8	
C SS-brown paint	27	8	11	7	17	5	4	123
% of group	22.0	6.5	8.9	5.7	13.8	4.1	3.3	
F SS-black paint	383	163	134	79	176	97	89	1,739
% of group	22.0	9.4	7.7	4.5	10.1	5.6	5.1	
C SS-black paint	58	20	19	21	22	23	10	308
% of group	18.8	6.5	6.2	6.8	7.1	7.5	3.2	
Chal. SS-black paint	45	19	15	5	12	8	14	176
% of group	25.6	10.8	8.5	2.8	6.8	4.5	8.0	
Tr + SS-brown paint	8	3	2	2	3	3	6	35
% of group	22.9	8.6	5.7	5.7	8.6	8.6	17.1	
Tr + SS-black paint	13	6	8	10	9	5	5	93
% of group	14.0	6.5	8.6	10.8	9.7	5.4	5.4	

Squiggle Hachure A is squiggle hachure with framing lines of equal width to hachure lines.

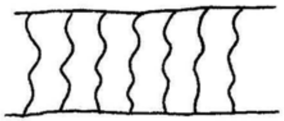
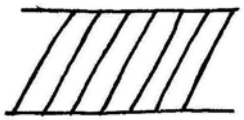


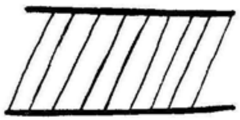
Table 2.23C. Occurrence of most common motifs in Gallup Black-on-white temper/grain size/paint groups at 29SJ 627.

	Hachure B-1	Hachure B-3	Hachure B-4	Other Hachure	Gallup Squiggle	Total Designs
F SS-brown paint	18	28	18	8	2	99
% of group	18.2	28.3	8.1	18.2	2.0	
C SS-brown paint	15	5	1	4	0	38
% of group	39.5	13.2	2.6	10.5	-	
F SS-black paint	44	30	63	5	12	251
% of group	17.5	12.0	25.1	2.0	4.8	
C SS-black paint	25	13	8	4	1	68
% of group	36.8	19.1	11.8	5.9	1.5	
Trachyte-black paint	4	5	6	0	7	30
% of group	13.3	16.7	20.0	-	23.3	
Tr + SS-brown paint	2	0	2	2	10	25
% of group	8.0	-	8.0	8.0	40.0	
Tr + SS-black paint	11	11	8	1	11	55
% of group	20.0	20.0	14.5	1.8	20.0	

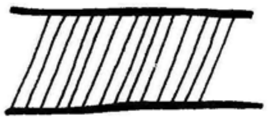
Hachure B-1



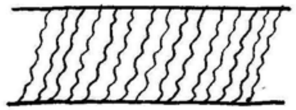
Hachure B-3



Hachure B-4



Gallup Squiggle



1) Black-paint groups are generally of higher diversity than brown, with black-fine having the highest Gallup index.

2) Coarse-tempered groups crosscut the paint categories as distinctively lower in diversity of motifs.

3) Fine sandstone groups have the highest motif diversity and contain the only multi-motif specimens.

As noted, the diversity indices in the Gallup Black-on-white ceramic groups are lower than those in Red Mesa Black-on-white. In addition to definitional considerations, Gallup Black-on-white is less abundant at 29SJ 627 and Gallup Black-on-white items, in general, have fewer multiple motifs on single items, further reducing the motif count. The fine sandstone-black paint group stands apart from the other Gallup Black-on-white groups as remarkably larger and more diverse, falling in the lower range of the Red Mesa Black-on-white ceramic groups.

In short, a comparison of groups within types suggests that design inventory size and use was fairly constant. However, when the motifs actually in use are examined, some small differences can be discerned; these are more pronounced in Gallup Black-on-white ceramic groups than in Red Mesa Black-on-white ones. While differences suggestive of areal design emphasis can be identified, these common designs occur in almost all of the groups. It is a question of variable frequencies, not absolute exclusions.

Tables 2.23B and 2.23C were constructed so that the three most abundant motifs in each Red Mesa and Gallup Black-on-white ceramic group would show, excluding the category "undifferentiated solid." Seven motifs cover all the most abundant designs for the eight Red Mesa Black-on-white groups. The "motif" solid elements in band (less a motif than a design layout) is the most common motif in all Red Mesa Black-on-white groups, in accordance with the importance of that layout to the definition of Red Mesa Black-on-white and the prevalence of that type at this time. It is also apparent that scrolls and parallel lines are common in groups from various tempering areas. Past these motifs common to several groups, a chi-square test of the six largest groups in the table of the most abundant motifs (Table 2.23B) shows that there are significant differences in use of motifs by group ($\chi^2 2=49.668$, df=30, p=0.013, C=0.162). Compared with expected values, trachyte plus sandstone-black paint and coarse sandstone-black paint are found to be high in checkerboard designs, coarse sandstone-brown paint high in parallel lines, and fine sandstone-brown paint high in ticked triangles. Chalcedonic sandstone temper is fairly close to the expected except that it shows a low relative frequency of squiggle lines. Differences in sandstone grain size within the black and brown painted groups show no significant differences in design. Between fine sandstone-brown paint and fine sandstone-black paint, a statistical difference does exist, again largely because of the high relative frequency of ticked triangles in the brown paint group. Further comparisons of more design elements may be found (Table 2.18B). On the whole, comparisons show no significant difference between pairs except for the combined trachyte groups. Simple inspection of the sandstone-red paint and the trachyte-brown paint groups shows them to be quite similar, with both having an especially high relative frequency of squiggle Hachure A, with the red paint group higher on ticked triangles and lower on squiggle lines. Thus, perhaps some source significance might be attributed to red paint, but the sample is really too small to know.

Even fewer designs (five) account for all the common designs in the Gallup Black-on-white groups and all the common designs are hachure variants (Tables 2.22A and 2.23C). There is a very clear and strong association of squiggle hachure with the three trachyte groups (even though the trachyte plus sandstone-brown paint group was not included in the test--χ^2=75.162, df=15, p=0.000, C=0.422). The trachyte groups are conversely low in straight Hachures B-1 and B-4. Within the sandstone groups, the straight hachures also vary. The major emphases are Hachure B-1 in the coarse sandstone groups with both brown and black paint, Hachure B-3 in brown-fine, and Hachure B-4 in the black-fine. The general sandstone-fine groups are lower than expected in Hachure B-1.

Bearing in mind the hachure evolution suggested (Figure 2.4), ordering among general sandstone groups might be Hachure B-1, B-3 and B4/6. Here the coincidence of Hachure B-1 with coarse temper might be purely chronological--a simple association of even-valued hachure developed from Red Mesa Hachure A-2 with coarser temper--but it might also represent a hachure style attributable to producers using coarser temper. Time seems an unlikely cause, because fine tempers are clearly dominant by early Red Mesa Black-on-white, ca. A.D. 850 (Toll and McKenna 1981a). Red Mesa B-1 and two forms of hachure similar to B-1 are all low in relative frequency in all groups, making such a developmental sequence a tenuous explanation for this occurrence of coarse temper. The highest relative frequency of B-1 hachure in Red Mesa Black-on-white (2.4%) does, however, occur in the coarse sandstone-brown paint group, which seems to bolster the areal, as opposed to the temporal, argument. Regardless of temporal considerations, coarser temper may produce a surface unsuitable to finer execution of motifs such as Hachures B-3 and B-4, which are most abundant on fine tempered pottery. Whatever the case, the decorative-paint-temper associations are the most clear-cut in the Gallup Black-on-white groups, which is the strongest suggestion of specialized finishing for vessels of this type.

While the relative frequency of trachyte in Puerco Black-on-white ceramics is similar to that in Red Mesa Black-on-white, the Puerco Black-on-white trachyte-tempered group is so small that only the sandstone-tempered groups are considered. Differences in Puerco Black-on-white motifs were registered in the higher frequencies of barbs in brown-painted and black-coarse groups, while wide Sosi style designs were found mostly in the black-fine category (Table 2.21B). Usually, the two designs are thought to go hand-in-hand; barbs often are finishing elements on a Sosi style "fret." There is slightly higher contribution by "sawteeth" in black-fine--a possible alternative "finisher" to the barb--but not enough to offset the dearth of barbs as the end of Sosi style "fret," which shows black-fine motifs frequently lack barbed terminations. In short, the fine tempered group may again be suggested as the more variable.

Slip and Polish. Only bowl forms were tested for slip and polish differences in Red Mesa and Puerco Black-on-white groups, but pitchers were plentiful enough to be included in the Gallup Black-on-white group tests. These tests revealed similar patterns to those found in the Red Mesa Black-on-white sample from 29SJ 629; brown and black painted ceramic groups vary in respect to each other as do grain size groupings. Comparisons of slipping and polishing on bowls are not entirely consistent between grain size groups and paint groups (Tables 2.18, 2.21, and 2.22). Slip distributions within the sandstone-tempered groups in Red Mesa, Puerco, and Gallup Black-on-white are nearly all the same. With the exception of the Red Mesa Black-on-white paint groups, no significant differences are found in within-type comparisons between brown and black paint or between coarse and fine tempers within the brown and black paint groups. The differences between Red Mesa Black-on-white brown and black paint groups are found in the fine sandstone subgroups, since the coarse groups show no significant difference (Table 2.18D). The difference stems from the presence of less slip in the brown-painted group, which is higher than expected in both the slip and interior slip only categories, while the black-painted group is more often slipped on both sides. Chalcedonic and trachyte-tempered specimens were both distinctive from the general sandstone tempered group, and they pattern in different ways. As at 29SJ 629, chalcedonic tempered ceramics show a slightly greater tendency to be slipped on both sides, trachyte tempered ones on only one side (Toll and McKenna 1981a:Table 18).

Although no differences are present within sandstone-tempered Gallup Black-on-white groups, the three trachyte-tempered groups are all characterized by a prevalence of "slip-slop" slip, and, conversely, a lower frequency of slip in other locations (Table 2.22C). In the relationship of Gallup and Red Mesa Black-on-white temper groups to one another (Figure 2.15), the Red Mesa Black-on-white groups can be seen to be very similar (because paint is not re-

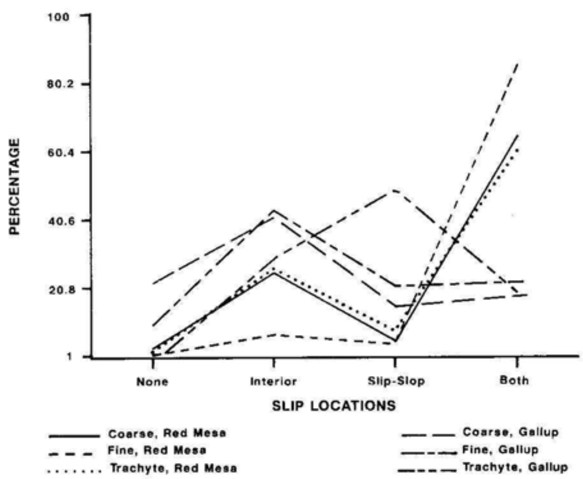


Figure 2.15. Slip locations in Red Mesa and Gallup Black-on-white subdivisions, bowls only. The within-type groups are formed on the basis of temper only--coarse versus fine sandstone and trachyte.

corded in the figure); and the marked difference between types in presence/absence of complete slipping is clear. The distinctive preference for "slip-slop" slip in trachyte-tempered Gallup Black-on-white pottery is also evident. Gallup Black-on-white pitchers are tallied (Table 2.22D), but they are scarce on a per-group basis and no significant associations were found. The pitchers do not exhibit the preference for "slip-slop" slip found in bowls.

In polish distributions within sandstone-tempered type groups, one primary thing (the coarseness of temper) has an effect on the amount of polish recorded. Comparisons of fine and coarse within the Red Mesa Black-on-white black and brown paint groups and the Gallup Black-on-white black paint group all show significantly less polish in the coarse-grained groups (Tables 2.18E and 2.22E). Chalcedonic tempered specimens also tend to have complete polish on both surfaces or differential polish with the exterior receiving less finishing than the interior. The brown-coarse group tends to be the least polished, black-coarse the next least, brown-fine shows complete interior polishing, and black-fine exhibits the most polishing investment, being most frequently polished on both sides. These patterns are graphically displayed in comparison with those of Gallup Black-on-white (Figures 2.16 and 2.17), all of which only concern bowl treatments.

The coarse groups are the most different in polish distribution in Red Mesa and Gallup Black-on-whites (Figure 2.16). These figures also show that the trachyte tempered groups in both Red Mesa and Gallup Black-on-white are different from the sandstone tempered groups; neither set of type groups shows a significant difference, and the Gallup Black-on-white groups show a greater difference. In both Red Mesa and Gallup Black-on-white, the trachyte tempered groups tend toward higher frequencies of complete interior polish. For Red Mesa Black-on-white, the chalcedonic sandstone-black paint group tests similar to the trachyte tempered group; in these groups and the Gallup Black-on-

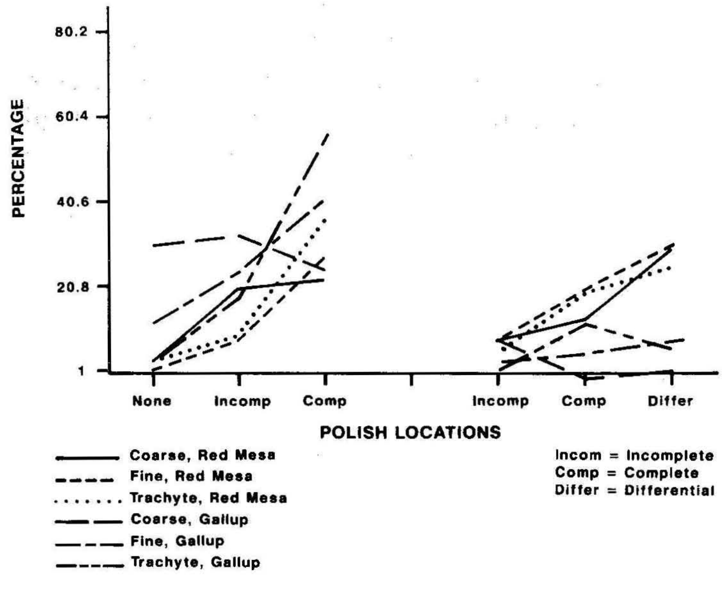


Figure 2.16. Polishing in temper subgroups of Red Mesa and Gallup Black-on-white. On the left is the pattern for treatment of those bowls only polished on the interior; to the right are bowls polished on both sides.

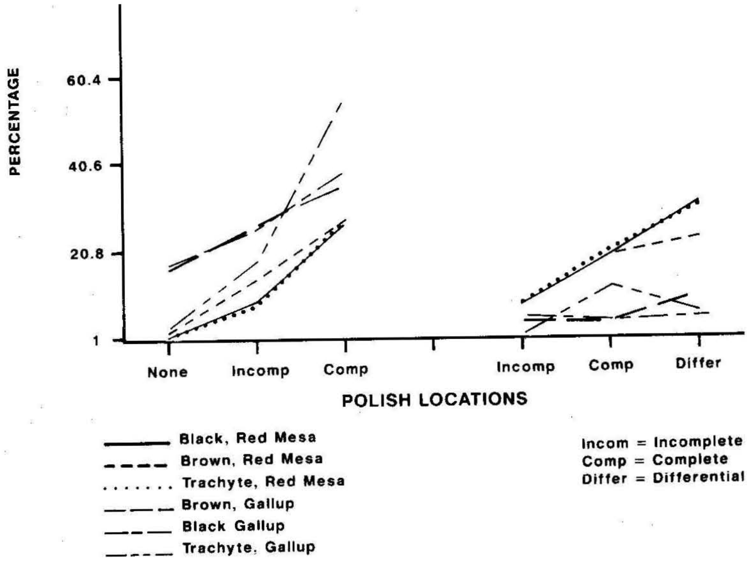


Figure 2.17. Polishing in paint subgroups of Red Mesa and Gallup Black-on-white. Items with interior polish only are on the left, and those with polish on both sides are on the right.

white trachyte tempered group, as well, there is a virtual absence of items completely lacking polish. As with slip, no differences in polish were found in Gallup Black-on-white pitchers (Table 2.22F). The Puerco Black-on-white groups are similar in both slipping and polish distributions. Thus, along attribute group lines, variation in surface finish generally may be viewed as similar across types; brown-coarse materials are less well or completely finished than black-fine, while trachyte tempered items pattern as a distinct unit.

Testing of rim treatments shows a similar decline in variability through typological time. The variability in Red Mesa Black-on-white consists mostly of a lack of solid painted rim in the brown-fine group and more than expected solid line in the chalcedonic and black-fine (Table 2.18C). In the Gallup and Puerco Black-on-white groups, no significant differences can be noted (Tables 2.21D and 2.22B).

Summary and Interpretation

It is rather clear that even with the examination of these few attributes for these relatively simple possible production groups, that a bewildering welter of information results. Distillation of a clear overall picture, thus, is not easy (not possible?) and must be undertaken from a few different angles.

Examination by type has been discussed in the type description section. The study of the subgroups does reveal, however, some additional things. Perhaps the most salient feature is that the majority of each type falls into the fine sandstone temper with black paint class. The second most common combination in each type is fine sandstone temper with brown paint. As can be seen in the similarity in surface treatments, it is not unlikely that at least some of these sherds were firing variations by potters who also produced black-painted sherds. These two groups (Gallup and Red Mesa

Black-on-white, respectively) together account for 53-69% of the types. Thus, these large groups are in several senses the standard against which the other groups are compared; they are the apparent cultural norms, and they control expected values in statistical tests.

Although there are substantial sampling problem caveats, along with the increased diversity of production subgroups within whole types in Puerco Black-on-white, and especially Gallup Black-on-white as compared to Red Mesa Black-on-white (Table 2.17), there is a greater affinity of motifs with subgroups. Stated another way, subgroups of Puerco and Gallup Black-on-white are consistently less diverse in decoration than the Red Mesa Black-on-white subgroups (Table 2.23A). Therefore, diversity indices suggest that some areal definition took place. Bowl diameters and vessel forms also are more variable within Puerco and Gallup Black-on-white than they are within Red Mesa Black-on-white. We suggest that this shows that more producers from more areas are more evenly represented in this later ceramic period. A contravening trend is also present in that the variety of surface treatment on bowls declines at the supra-type level in spite of the other increases in variability. This is perhaps attributable to a wider trend in the "acceptable" or perhaps to some increase in speed of production. Such similarity is far from unprecedented; between-group vessel form comparisons show that each area produced a very similar ceramic assemblage. The assemblage similarity suggests that while areas seem to be better defined in the later ceramic period, there is no evidence at 29SJ 627 that some complementariness had developed, at least within whiteware types (the increase in trachyte-tempered grayware suggests that some complementariness may have existed between areas on that level of ceramic differentiation). Perhaps the most disturbing similarities are those among groups across paste variables; these variables are not very precise and are largely of unknown sourcing value. Perhaps this similarity does nothing more than demonstrate this imprecision, or perhaps it shows, yet again, the fundamental conformance to a widespread ceramic tradition.

From the above, Red Mesa Black-on-white pottery seems to be a large, undifferentiated mass. In some sense it is; in this analysis it is not differentiated by motif, as are Puerco and Gallup Black-on-white, and it is more heavily tempered with the material known to us only as undifferentiated sandstone. These facts have at least two effects. First of all, there is a reduction in the variety of designs potentially found in either Puerco or Gallup Black-on-white. Second, within the sandstone group, production subunits undoubtedly exist, but they could not be defined on the basis of temper. Presumably, within-group diversity indices would fall if Red Mesa Black-on-white ceramics were more finely subdivided. Note that in equivalent groups, such as Red Mesa and Gallup Black-on-white trachyte-sandstone black paint, that the Red Mesa Black-on-white remains more diverse in motif; probably, at least in part, because of the Puerco-Gallup Black-on-white type division (Table 2.23A). There are several factors over which we have no control, such as within-area shifts in tempering practice or the precise effects of sample size based on what we are able to discern in these ceramics. A simple explanation of the differences in pottery is that more of the Red Mesa Black-on-white is probably made locally than either of the other two types and that later more of it was imported.

Grayware Group Composition

The groups isolated illustrate quite well the regional nature of the grayware tradition. Both nominal and metric attributes show a great deal of similarity through time and, assuming that the variables used do have spatial meaning, across space. Within the overall similarity, some variability may be discerned in type, temper, and surface manipulation (Table 2.24).

In the sandstone-tempered groups, 80-88% of each group contains coarse to very coarse-grained temper, with the exception of the small wide neckbanded-chalcedonic sandstone temper group, which contains only 73% coarse or very coarse sand grains. A somewhat smaller percentage of trachyte-tempered PII corrugated pottery has coarse grains as well, suggesting that these more angular tempers may not need to be as coarse as the tempers in which the primary constituent is quartz sand. These figures make it quite evident that division of the utility groups into fine versus coarse (as done for the whitewares) is not practical.

Sherd temper occurs in minor amounts in each group; it is very rare in the PII corrugated trachyte group (present in 2.5%) and reaches nearly 20% predominately sherd temper in the PII corrugated sandstone-tempered group with the same coil width as the trachyte group (the overall occurrence of sherd temper in this sandstone-tempered group is 29%). This may again be interpreted as evidence that abundant, high quality temper was present in the Chuska area, while it was less so elsewhere. In the same vein, note that the chalcedonic sandstone-tempered wide neckbanded group also contains relatively little sherd temper. There is more sherd temper in the other two wide neckbanded groups than there is in the two narrow neckbanded groups, which belies assertions that an increase in sherd temper in grayware is strictly a function of time. Certainly, though, an increase in use of sherd temper is the overall trend. There is a substantial difference in the occurrence of sherd temper between the wider coiled, sandstone-tempered PII corrugated and the narrower coiled--perhaps the wider coils tend to be earlier or perhaps some difference in source is indicated.

The texture index, which combines grain size, temper density, and the quantity of sherd temper, again shows that graywares tend to be coarse. The trachyte-tempered PII corrugated group stands out as having the coarsest rating (95% medium-coarse or coarser). This results from the scarcity of sherd temper and the tendency for trachyte-tempered items to be densely tempered. The converse is the sandstone-tempered PII corrugated narrow coil group of which only 63% is rated above medium because of the higher quantity of sherd temper and lower temper densities. The other groups range from 71 to 81% above medium.

Observations on clay color exclusive of sherd temper combinations show a basic pattern of fairly equal quantities of

Table 2.24. Utility type-temper-surface group attributes at 29SJ 627.

	COMBINATION															
	Wide NB SS 5 mm+ band		Wide NB SS 5 mm clap		Wide NB ChSS 5 mm clap		Narrow NB SS 2-5 mm clap		Narrow NB SS 5 mm clap		PII C. SS 2-5 mm coil		PII C. SS 5 mm coil		PII C. Trachyte 2-5 mm clap	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
A. Temper:																
Fine	-	-	1	1.5	-	-	1	1.8	1	1.9	4	3.5	-	-	-	-
Medium	4	13.3	8	12.1	6	27.3	8	14.0	6	11.5	10	8.8	7	19.4	17	21.5
Coarse	17	56.7	35	53.0	9	40.9	24	42.1	26	50.0	48	42.5	10	27.8	41	51.9
Very coarse	9	30.0	22	33.3	7	31.8	24	42.1	19	36.5	51	45.1	19	52.8	21	26.6
Total	30		66		22		57		52		113		36		79	
B. Sherd Temper:																
None	24	80.0	53	80.3	20	90.0	51	89.5	45	86.5	81	71.7	31	86.1	77	97.5
Less than half	4	13.3	9	13.6	2	9.1	6	10.5	3	5.8	10	8.8	3	8.3	2	2.5
More than half	2	6.7	4	6.1	-	-	-	-	4	7.7	17	15.0	2	5.6	-	-
Nearly all	-	-	-	-	-	-	-	-	-	-	5	4.4	-	-	-	-
Total	30		66		22		57		52		113		36		79	
C. Texture:																
Very fine	-	-	1	1.5	-	-	-	-	-	-	7	6.2	-	-	-	-
Fine	-	-	3	4.5	-	-	-	-	-	-	7	6.2	3	8.3	-	-
Fine to medium	2	3.4	2	3.0	1	4.8	2	3.7	6	11.5	12	10.7	-	-	1	1.3
Medium	5	17.2	13	19.7	3	14.3	8	11.1	8	15.4	16	14.3	6	16.7	3	3.8
Medium to coarse	2	6.9	4	6.1	2	9.5	7	13.0	1	1.9	12	10.7	5	13.9	9	11.4
Coarse	10	34.5	22	33.3	6	28.6	18	33.3	16	30.8	24	21.4	4	11.1	19	24.1
Very coarse	10	34.5	21	31.8	9	42.9	19	35.2	21	40.4	34	30.6	18	50.0	47	59.5
Total	29		66		21		54		52		112		36		79	
D. Clay Combinations																
No type	13	(44.8)	35	(53.0)	11	(52.4)	25	(46.3)	22	(42.3)	54	(48.2)	19	(52.8)	29	(36.7)
Tan	6	37.5	10	32.3	4	40.0	10	34.5	13	43.3	20	34.5	5	29.4	12	24.0
Black	7	43.8	12	38.7	4	40.0	8	27.6	9	30.0	15	25.9	8	47.1	4	8.0
White	-	-	5	16.1	1	10.0	7	24.1	3	10.0	5	8.6	2	11.8	1	2.0
Chuska gray	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	66.0
Black w/white sherd	2	12.5	2	6.5	-	-	4	13.8	4	13.3	11	19.0	-	-	-	-
Gray w/black sherd	1	6.3	2	6.5	-	-	-	-	1	3.3	7	12.1	1	5.9	-	-
Gray w/white sherd	-	-	-	-	1	10.0	-	-	-	-	-	-	3	17.6	-	-
Total	29		66		21		54		52		112		36		79	

Table 2.24. (continued)

	COMBINATION															
	Wide NB SS 5 mm+ bnd		Wide NB SS 5 mm clap		Wide NB ChSS 5 mm clap		Narrow NB SS 2-5 mm clap		Narrow NB SS 5 mm clap		PII C. SS 2-5 mm coil		PII C. SS 5 mm coil		PII C. Trachyte 2-5 mm clap	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
E. Handles:																
None	23	(76.7)	62	(93.9)	18	(90.0)	48	(84.2)	48	(92.3)	107	(94.7)	34	(94.4)	79	(100.0)
Strap	-	-	-	-	-	-	2	25.0	-	-	1	16.7	-	-	-	-
Multiple coil strap	1	16.7	-	-	2	100.0	-	-	-	-	-	-	-	-	-	-
Nubbin	2	33.3	3	75.0	-	-	3	37.5	2	50.0	3	50.0	-	-	-	-
Two nubbins	1	16.7	-	-	-	-	1	12.5	-	-	-	-	-	-	-	-
Sagging nubbins	-	-	-	-	-	-	-	-	-	-	1	16.7	-	-	-	-
Tabular lug	-	-	-	-	-	-	1	12.5	1	25.0	1	16.7	2	100.0	-	-
Extended lip	-	-	-	-	-	-	-	-	1	25.0	-	-	-	-	-	-
Cupule	2	33.3	1	25.0	-	-	1	12.5	-	-	-	-	-	-	-	-
Unknown	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Total	30		66		20		57		52		113		36		79	
F. Metrics:																
Jar diameter	184.2		181.9		179.6		175.1		177.0		214.0		214.3		207.2	
Standard deviation	52.17		49.67		39.76		63.19		55.75		57.41		44.46		50.16	
Jar n	20		49		13		39		42		90		29		60	
Jar rim fillet	16.0		16.0		15.6		13.5		14.6		25.2		23.0		20.7	
Standard deviation	2.88		2.38		3.59		3.33		2.79		7.03		7.40		4.88	
Jar n	26		60		17		50		50		111		36		77	
Jar rim flare	17.9		19.0		24.2		17.9		17.8		27.1		29.0		28.2	
Standard deviation	6.94		8.21		11.81		8.68		8.03		5.38		9.21		6.07	
Jar n	14		47		11		38		35		69		27		49	
Pitcher diameter	140.1						117.5									
Pitcher n	1						2				1					
Miniature diameter											35.0					
Miniature n											1					

tan and black pastes, more often favoring tan. White pastes are usually present, but at something like a fourth to a half the others. Exceptions to this pattern are:

1) The absence of white clay in the wide neckbanded-sandstone-wide coil group (S).

2) More than usual white in the narrow neckbanded-sandstone-wide clapboard group (U).

3) More than usual tan in the PII corrugated-sandstone-wide coil group (X).

4) Considerably more tan than black in the PII corrugated trachyte narrow coil group (Y). This group is exceptional in the prevalence of the clay type "Chuska gray." This clay is a distinctive dark gray; items recorded here as having this paste do not have carbon streaks. Obviously, it has been recorded only for sherds containing trachyte. While there may well be some recording bias introduced by temper, the association between this clay type and trachyte temper is a real one. Subjectively, there is a tan variant of this gray clay that shows no carbon streak and has a gray cast reminiscent of the gray variant. It is this apparent variant that inflates the tan count in this group.

The distribution of handle types among the groups is quite variable. The PII corrugated trachyte-tempered group contains no handles at all. The group is sufficiently large so that this seems unlikely to be a sampling error, especially since all handles (whether or not they were attached to rims) were included in the detailed analysis sample. The preference for nubbin lugs seen in each of the three more general type groups is paralleled in five of the eight subgroups. The chalcedonic sandstone-tempered wide neckbanded group has only two multiple coil strap handles and the sandstone-tempered PII corrugated wide coil group only two tabular lugs. The highest relative frequency of handles is in the wide neckbanded-sandstone-wide coil group, followed by the narrow neckbanded-sandstone-narrow coil group, which contains the largest number of different handle types (5).

Comparison of these groups on a metric basis shows a remarkable similarity within rough sort type. Estimated orifice diameter means are within 5 mm in wide neckbanded, 2 mm in narrow neckbanded, and 8 mm in PII corrugated. The narrow neckbanded orifices are very slightly smaller than the wide neckbanded ones, and all the PII corrugated orifices are larger than any of the neckbanded ones. Though they have the smallest means and the least difference between means, the narrow neckbanded groups have the highest coefficients of variation in the diameter variable. The three lowest diameter coefficients of variation are in groups X (PII-sandstone), Z (wide neckbanded-chalcedonic sandstone) and Y (PII-trachyte). The two PII corrugated-sandstone groups have virtually identical means, slightly larger than that for the PII corrugated trachyte group. Less refined comparisons found trachyte-tempered items to be larger overall than sandstone-tempered items (Toll 1981a, 1984). This size differential can be attributed to several causes: errors in the file that had not yet been discovered and corrected; inclusion of pitchers and miniatures in the calculations, which do not occur in the 29SJ 627 trachyte-tempered PII corrugated;

and, perhaps, the more inclusive nature of both the temper groups used in the early comparisons.

Modality in size distribution is of interest when defining functional classes and production of specific forms by different areas. The group with the largest number of items, PII corrugated-sandstone-narrow coil, exhibits a fairly smooth, unimodal frequency curve when graphed in 2 cm diameter lumps (Figure 2.18). The trachyte-tempered PII group curve is very similar, with the highest peak at 22 cm (as in the sandstone group) and a second peak at 26 cm. This is of some interest in view of the finding that diameters of 26 cm and over correlate with vessels that fall two standard deviations above the mean volume in a sample of whole vessels dominated by neckbanded jars (McKenna and Toll 1984:196). Thus, there is a suggestion of size definition in imported pots. The PII corrugated-sandstone-wide coil group shows a wider separation of peaks, but the group may be too small (29 diameters) to be useful.

The neckbanded group (Figure 2.19) curves also suggest some modality. The modes in wide neckbanded are at 18 cm and, secondarily, 24 cm in the large group. This is closely reflected by the very small chalcedonic sandstone-tempered group (not shown) except that the second peak is at 22 cm, with the narrow coil group having a substantial peak at 10 cm. It is notable that the main wide neckbanded peaks are at a low point in the narrow neckbanded distribution. Tentatively, this suggests a refinement in vessel size/function definition.

Mean rim fillet widths among the rough sort type macrogroups are as follows: narrow neckbanded 13.5-14.6 mm; wide neckbanded 15.6-16.0 mm; PII corrugated 20.7-25.2 mm. While the central tendencies for each rough sort type form non-overlapping ranges, the standard deviations show that all distributions overlap considerably. Rim flare measurements behave similarly, except that overlap is present between the wide and narrow neckbanded groups. The PII corrugated group, again, is distinct in having greater mean flare.

In view of the multiplicity of attributes and groups involved in this analysis, a method for dealing with several at

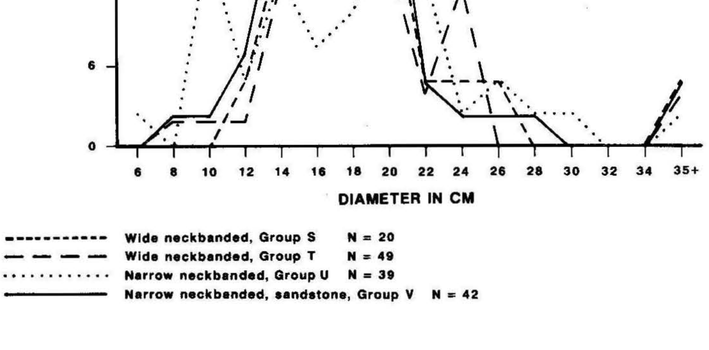


Figure 2.18. Jar orifice diameters in the four largest wide and narrow neckbanded type-temper-surface treatment groups.

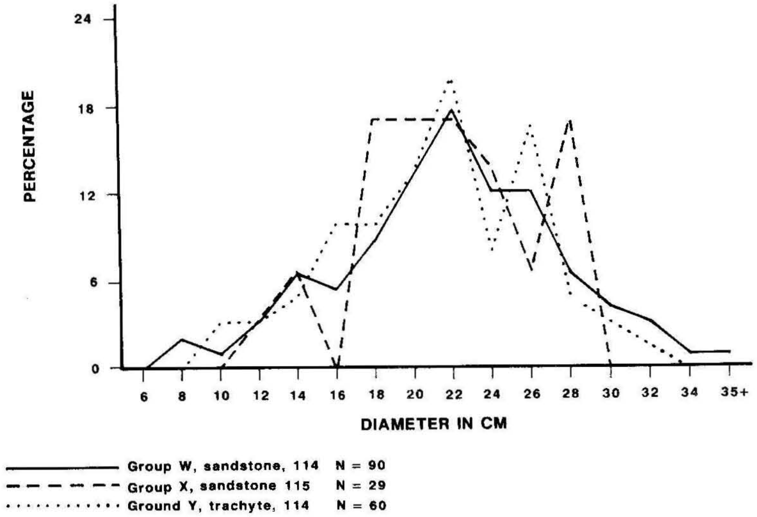


Figure 2.19. Jar orifice diameters in the three largest Pueblo II corrugated type-temper-surface groups.

once was sought in order to examine the groups for metric consistency. A principal components analysis was performed on all the utility groups, based on the three metric variables discussed above. Two of the three principal components created explain 82.3% of the variance in a run that included all the utility groups. Component 1, which explains 53.5%, is a size component, which loads high on all three variables, with rim fillet width having the highest loading and diameter, and rim flare being similar. Principal Component 1 does a fairly consistent job of separating the neckbanded items from the corrugated items. As has been indicated (Table 2.24F), the PII corrugated groups have uniformly larger means for all three of these variables. Component 2, which has a high positive loading on diameter and a negative loading on rim flare, explains only 28.7% of the variance, and Component 3 explains even less. Plots of Component 1 by Components 2 and 3 show a considerable area of overlap between the neckbanded groups and the corrugated groups along the Factor 1 axis, but in the extremes, the separation is complete. Little separation is apparent along the Component 2 and Component 3 axes.

Separate principal components analyses were also run with the three corrugated groups and the five neckbanded groups. The principal components generated by these analyses are somewhat different from those for the whole utility group. The first two components for the corrugated groups explain 76.3% of the variance. Principal Component 1 (41.3%) has high loadings on diameter and rim fillet, and Component 2 (35.0%) loads highest on flare and moderately on fillet width. These components give no discernible separation of groups; the Factor 1-Factor 2 plot does show a linear arrangement of items in the negative-negative quadrant, created by a lack of intermediate Factor 2 values (i.e., flare) in the lower range of Component 1 (size). This, perhaps, results from the constructional dictates of flare on smaller pots or perhaps from difficulties in measuring flare on smaller items.

The first two principal components of the neckbanded analysis also explain three fourths of the variance (76.2%). Component 1 again loads high on fillet width and diameter and Component 2 on rim flare. Marked group separation is again lacking, though the size factor is suggested by a tendency for the two narrow neckbanded groups to have smaller Component 1 values (recall that mean diameter and fillet width are smallest for narrow neckbanded).

A set of multivariate analyses of variance was also run, giving results supportive of the principal components. Significant F values were produced for all three variables by conventional sum-of-squares (Type I) when all eight utility groups were analyzed at once. When neckbanded and corrugated groups were analyzed separately, only rim fillet width showed a significant value in each group. This is consistent with the analysis of all the utility groups together in which rim fillet produced the highest F values of the three variables and with principal Component 1, in which rim fillet was given the highest loading. Based on this finding, the rim fillet frequencies were graphed by group (Figures 2.20-2.22). The narrow and wide neckbanded distributions are similar in appearance due to their tight distribution at the small end of the fillet width range. The distributions are similar enough to make the significant F value somewhat surprising. The corrugated peaks are all to the right of (i.e., larger than) those for the majority of the neckbanded items, and the peaks are lower than those for all but one of the neckbanded groups. Of the corrugated groups, the trachyte-tempered one is most similar to the neckbanded groups in that it has a tighter distribution, peaking at 20-22 mm.

What emerges from the analysis of both white and graywares, then, is that there are some minor differences within types. To some extent, perhaps this is merely a verification of the consistency of the types as recognized and a reflection of the selection of attributes that relate to type identifications. In the less precise attributes, such as clay color and sherd temper content, variability is ap-

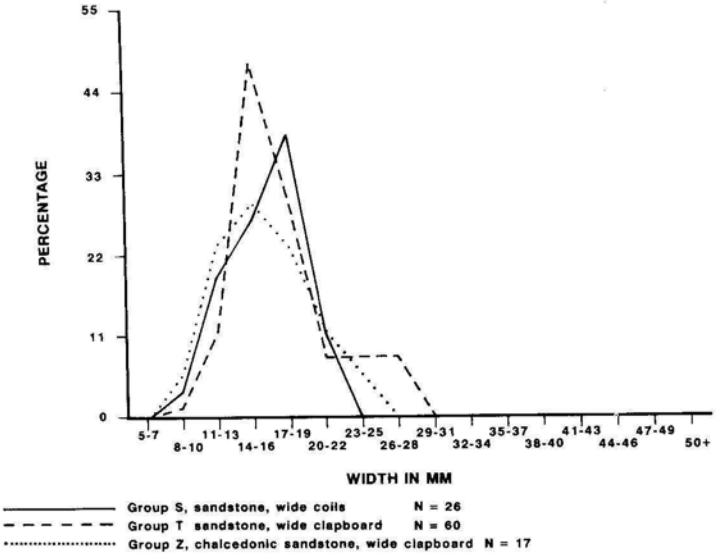


Figure 2.20. *Rim fillet width in wide neckbanded type-temper-surface groups.*

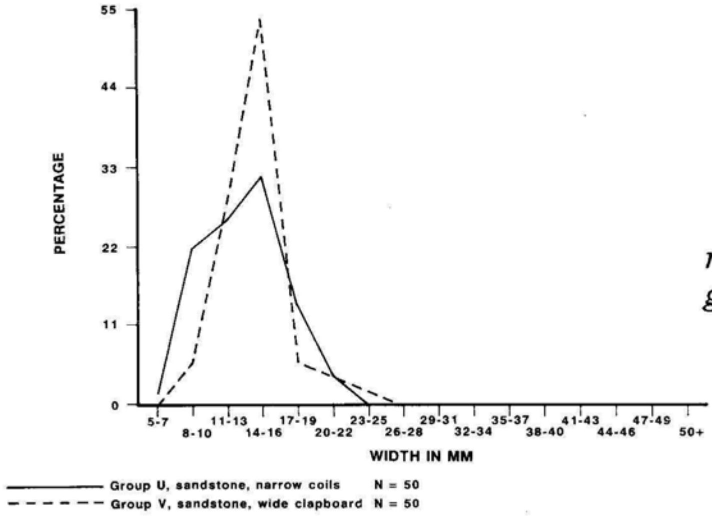


Figure 2.21. *Rim fillet width in narrow neckbanded type-temper-surface groups.*

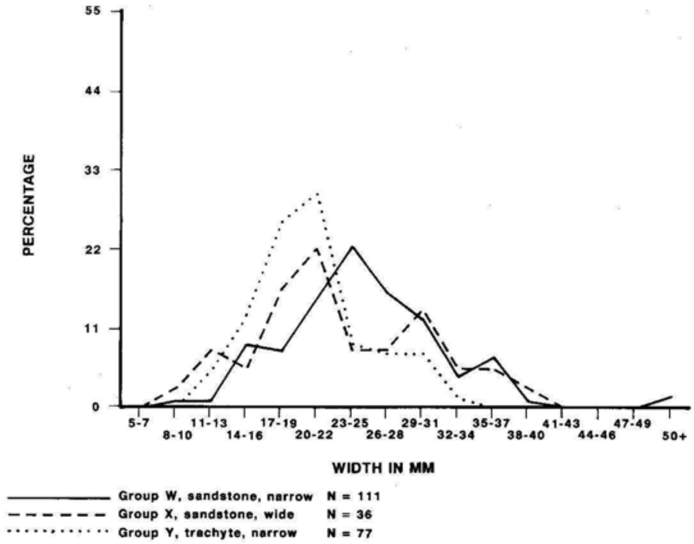


Figure 2.22. *Rim fillet width in PII corrugated type-temper-surface groups.*

parent, but is basically minor. It is difficult to say whether or not these attributes do, in fact, isolate production subsets on the basis of temper (trachyte vs. sandstone). It is likely that they do. Because the similarity holds across all groups and across tempers, the differences within groups suggest several potters per sherd group. The interpretation adopted here is that the functional and stylistic definition of an acceptable grayware jar or whiteware bowl was quite narrow over a broad area--probably at least from the Red Mesa Valley to the San Juan or Mesa Verde areas (north-south) and from the Chuska Mountains to somewhat east of Chaco (east-west), based on temper distributions. It may be that a typological orientation has resulted in monitoring variables insensitive to areal production, but we are unsure of what variables would be better. Temper is the most sensitive variable recorded, but the low level of corroboration from other variables suggests that the normative explanation has some merit (Toll 1985:Chapter V, 1986).

Co-occurrence of Technological Attributes

Vessel Form Associations

Function and Source

Temper. Due to the functional properties of temper vis-a-vis vessel use and the emphasis on production of certain forms in certain areas, vessel form is predicted to be associated with temper type. Within the whitewares, numerous tests have been performed showing similar patterns of association (Tables 2.25-2.26). If the maximum number of tempers (combining iron oxide bearing and magnetitic sandstone into one group and all trachyte into another) is tested against four vessel forms (bowl, ladle, "special closed," and jar/olla), a significant association is present. It consists largely of more than expected special closed forms with iron-bearing sandstone and trachyte differences from the expected as follows: fewer than expected bowls and more than expected ladles, closed and jar/ollas. Also contributing to the value are more than expected chalcedonic sandstone-tempered bowls and fewer closed forms of both varieties. Because the sandstone temper group is so large, it dominates the expected values and seldom makes large contributions to the chi-square value. The trend in the sandstone group is, however, for more bowls and special closed forms, fewer ladles, and jars/ollas about as proportionally predicted. The high contribution of the iron-bearing temper group stems from its small size and the relatively large number of tecomates in it. On the whole, a tecomate is an early vessel form and this temper is also more often found in earlier ceramics.

The more refined comparisons (Table 2.26) follow the patterns seen in the more inclusive test. Within the whitewares, it is noteworthy that the distributions of San Juan igneous and trachyte tempers are statistically similar. The vessel form distribution within San Juan temper is, of course, altered when redwares are added to the comparison, because the vast majority of redwares in Chaco Canyon are bowls. Similarity in vessel form distribution between trachyte and San Juan igneous is even less if graywares are also added, since grayware with San Juan temper is very rare in these collections, and trachyte-tempered grayware is very common. Nearly all of the pottery in the Tusayan group is bowls.

Grayware-temper group associations are very strong; both trachyte and chalcedonic sandstone tempers are common in graywares relative to whitewares. Both show relatively high contingency coefficients when compared to the sandstone group, with that for trachyte being the highest. When these two tempers are compared, including grayware jars and the four whiteware form groups used in the above tests, a significant difference is found; but the relative contributions of the grayware jars is small, the differences being in the whiteware forms. The differences between these two temper groups are sufficient to give a relatively high contingency coefficient.

While temper type does not associate strongly with sooting within the graywares (Table 2.27), casting some doubt on the importance of temper type to thermal qualities of a vessel, grain

Table 2.25. Temper types at 29SJ 627 tabulated by identifiable vessel forms.[a]

Vessel Form	Sand-stone	Chalc. SS	Tusayan SS	Iron Ox. SS	Magn. SS	San Juan	Trachyte	Unident. Igneous	Total
White bowl	2,814	166	39	9	17	52	348	12	3,457
Ladle	459	28	0	0	1	11	96	8	603
Pitcher	159	5	0	0	1	5	54	2	226
Canteen	37	1	1	1	1	4	3	1	49
Seed jar	30	2	1	0	0	1	9	1	44
Tecomate	100	2	0	3	7	1	2	0	115
Gourd jar	1	0	0	0	0	0	0	1	2
Olla	148	3	0	1	2	2	28	1	185
Whiteware jar	594	25	0	0	4	9	98	2	732
Mug	0	0	0	0	0	0	1	0	1
Duck pot	11	1	0	0	0	0	2	0	14
Miniature	15	0	0	2	0	1	1	0	19
Effigy	19	1	0	1	1	0	1	1	24
Pipe	2	0	0	0	0	0	1	0	3
Redware bowl	30	0	-	0	0	71	8	1	110
Smudged bowl	72	0	-	0	0	0	0	2	74
Redware jar	4	0	-	0	0	11	1	0	16
Redware ladle	1	0	-	0	0	3	0	0	4
Grayware jar	811	113	-	4	24	9	328	0	1,289
Grayware pitcher	9	0	—	1	0	1	0	0	11
	5,316	347	41	22	58	181	981	32	6,978

[a] Tempers have been lumped and only items with observable temper are included.

Table 2.26. Chi-square test results from tables containing vessel form and temper compared to other technological attributes.

Table	Test Entries	n	Controlling Group	Table Dimensions	χ^2	df	p	C	Small Expected
VESSEL FORM									
By temper:									
2.25	Bowl, ladle, closed*, jar by SS, Ch SS, Fe SS, SJ, Tr	5,344	81% sandstone	5x4	68.931	12	.000	.113	1 cell<5
	Same whiteware forms by SS, Ch SS, SJ, Tr	5,297	82% sandstone	4x4	42.246	9	.000	.089	
	Same forms by Ch SS, SJ, Tr	955	67% trachyte	4x3	25.015	6	.000	.160	
	Same whiteware forms by SS, Tr	4,980	87% sandstone	2x4	28.345	3	.000	.075	
	Same whiteware forms by SJ, Tr	723	88% trachyte	2x4	3.013	3	.390	.064	
	Whiteware forms plus gray jars by Ch SS, SS	5,498	93% sandstone	2x5	73.832	4	.000	.115	
	Whiteware plus gray jars by Tr, SS	6,119	84% sandstone	2x5	202.000	4	.000	.179	
	Whiteware plus gray jars by Tr, Ch SS	1,311	74% trachyte	2x5	23.061	4	.000	.131	
By paint:									
2.29	Bowl, ladle, closed*, jar by mineral paint types	4,593	70% black paint	4x5	21.972	12	.039	.069	2 cells<5
	Same whiteware forms by red, brown, black paint	4,469	72% black paint	3x4	11.257	6	.081	.050	
	Same whiteware forms by mineral, carbon paint	4,915	94% mineral	2x4	5.382	3	.146	.033	
	Same whiteware forms by carbon, mineral+carbon	425		2x4	18.470	3	.000	.204	
Vessel form by grain size:									
2.28	Bowl, closed[a], jar/olla	4,604	75% bowl	3x4	42.067	6	.000	.095	
	Bowl, ladle	4,068	85% bowl	2x4	6.110	3	.106	.039	

Table 2.26. *(continued)*

Table	Test Entries	n	Controlling Group	Table Dimensions	χ^2	df	p	C	Small Expected
	White jar, olla	917	80% jars	2x4	9.503	3	.023	.101	1 cell<5
	Bowl, closed[a]	3,767	92% bowl	2x4	4.711	3	.194	.035	
	Tecomate, gray jar	1,407	92% gray jar	2x4	17.410	3	.001	.111	1 cell<5
TEMPER By paint:									
2.30A	Red, brown, black mineral by SS, Ch SS, Fe SS, SJ, Tr	4,555	84% sandstone	3x5	58.424	8	.000	.113	2 cells<5 1 cell <1
	All paints by SS, Tr	4,680	87% sandstone	2x7	884.368	6	.000	.399	
	All mineral paints by SS, Tr	4,353	91% sandstone	2x5	23.784	4	.000	.074	1 cell<5
By sherd temper:									
2.30B	None, <50%, >50% sherd temper by lumped tempers	7,106	77% sandstone	5x3	936.540	8	.000	.341	
	Same by Ch SS, SJ, Tr	1,566	-	3x3	64.723	4	.000	.199	
	Same by Tr, SJ	1,206	-	2x3	11.775	2	.003	.098	
By vitrification:									
2.30C	All tempers except unident. igneous	7,147	76% sandstone	2x7	68.360	6	.000	.098	
By paste type:									
2.31A	Blk/wt shd, gr/blk shd,gr/wt shd by SS, Ch SS, Tr: whiteware	2,214	89% sandstone	3x3	23.525	4	.000	.102	
2.31B	Tan, black, white by SS, Ch SS, Tr: grayware	442	67% sandstone	3x3	61.308	4	.000	.349	

size clearly is important between gray and whitewares (Table 2.28). Whereas whiteware forms run from 12 to 29% coarse and very coarse-grained (mostly around 20%), 85% of the grayware jars have coarse or very coarse-grained temper. Presumably, this relates to vessel size and finish from the manufacturing aspect and the potential necessity for grayware vessels to have to withstand repeated heating and cooling from the functional aspect. Thus, it may be that grain size is more important than temper type for thermal shock properties, but this is difficult to test via sooting here because the overwhelming majority of graywares are coarse-grained. Tecomates, which tend to be early and which are 80% grayware (primarily Lino Gray), are omitted from the form-grain size comparisons that follow. They are intermediate to grayware and whiteware grain-size distributions and significantly different from grayware jars when tecomates are treated strictly as a form class (Table 2.26). Grain sizes for bowls, ladles, and special closed forms (less tecomates) are all similar. The lumped jar and olla group is significantly different from the other whiteware forms, due to the presence of more than expected coarse-grained and fine-grained tempered items. In comparing whiteware jars to ollas, it is found that ollas have more than expected coarse-grained temper and jars more than expected fine temper. Again, perhaps building a large vessel is facilitated by using coarser temper (Mary Garcia of Acoma uses coarser temper when making larger pots, personal communication, 1981).

Paint type. Much as for temper and vessel form, paint types on various vessel forms carry two potential kinds of information (Table 2.29). Assuming that the non-mineral paints found at 29SJ 627 are not local products, because the site largely antedates the production of late carbon-painted Cibola ceramics, paint type should offer information as to vessel types imported to the site. Less clearly, some indication may be present as to possible emphasis on production of certain forms within the region. As mineral paint color is probably influenced by firing conditions, vessel size and shape may play a part in the final color of the paint, so that paint color cannot be directly equated with producing area or group.

Comparison of the four major vessel forms (see above and Table 2.26) across mineral paint types shows a significant chi-square and a low contingency coefficient. The only paint type showing greater than expected values for the most common form, bowls, is brown. All other mineral paint types are close to the expected. Other contributors to the significant chi-square are fewer than expected green-painted ollas and jars, and more than expected green-painted ladles. The pseudo-glaze group runs close to expected for all the forms, suggesting either that this paint type is accidental or that its few users made all forms. Among the three most common mineral paint colors (red, brown and black), the vessel form differences are not significant at the .05 level.

Coding for mineral plus carbon paint was reversed almost entirely for redwares with the rare exceptions (Table 2.29) being either ambiguous paints on whitewares or miscodes that could not be easily relocated and checked. The relatively high contin-

Table 2.27. Occurrence of sooting on grayware sherds at 29SJ 627.[a]

A. By rough sort type:

	Lino Gray	Wide Neckbanded	Narrow Neckbanded	Neck Corrugated	PII Corrugated	PII-III Corrugated	PIII Corrugated	Total
Sooted	8	45	73	26	174	43	20	389
Unsooted	120	93	135	36	170	31	21	606
Total	128	138	208	62	344	74	41	995

B. By type by exposure group:

	Group 1	Group 2	Group 3	Group 4	Group 5	Total	χ^2	df/p/C
WIDE NECKBANDED								
Sooted	21	9	9	4	2	45	13.457	4
Unsooted	25	11	16	25	16	93		0.009
Total	46	20	25	29	18	138		0.269
NARROW NECKBANDED								
Sooted	26	14	11	10	12	73	16.215	4
Unsooted	29	9	26	29	42	135		0.003
Total	55	23	37	39	54	208		0.269
PII CORRUGATED								
Sooted	13	28	68	2	63	174	21.449	4
Unsooted	11	12	63	20	64	170		0.000
Total	24	40	131	22	127	344		0.244
ALL BUT LINO								
Sooted	68	58	125	18	112	381	48.35	4
Unsooted	71	37	129	89	160	486		0.000
Total	139	95	254	107	272	867		0.270

Table 2.27. (continued)

C. By type by temper:

	Sandstone	Chalcedonic Sandstone	Trachyte	Total	χ^2	df/p/C
WIDE NECKBANDED						
Sooted	25	10	4	39	2.914	2
Unsooted	39	6	6	51		0.232
Total	64	16	10	90	1 cell<5	0.177
NARROW NECKBANDED						
Sooted	30	8	13	51	0.278	2
Unsooted	41	10	14	65		0.870
Total	71	18	27	116		0.049
PII CORRUGATED						
Sooted	64	1	40	105	1.471	1
Unsooted	41	6	37	84	n=182	0.225
Total	105	7	77	189	2x2	

[a] Surface sherds have been excluded.

Table 2.28. Vessel forms by temper grain size at 29SJ 627.

Vessel Form	Temper Grain Size: Fine	Medium	Coarse	Very Coarse	Total
White bowl	759	1,977	673	56	3,465
Ladle	133	329	123	18	603
Pitcher	66	117	35	4	222
Canteen	20	19	8	2	49
Seed jar	13	30	6	0	49
Tecomate	8	16	55	39	118
Gourd jar	0	1	0	1	2
Olla	39	92	50	4	185
Whiteware jar	201	390	130	11	732
Mug	0	1	0	0	1
Duck pot	6	8	0	0	14
Miniature	4	14	0	1	19
Effigy	6	12	6	0	24
Pipe	2	1	0	0	3
Redware bowl	26	47	30	5	108
Smudged bowl	31	36	7	0	74
Redware jar	2	2	2	1	7
Grayware jar	18	173	627	471	1,289
Grayware pitcher	2	1	4	9	16
Total	1,336	3,266	1,756	622	6,980

gency coefficient and the significant chi-square for forms between mineral-carbon and carbon paints is of interest because it indicates that these two exotic classes follow different import patterns. The mineral-carbon (redware) group is high on bowls when compared to the carbon group, within which there is a much better distribution of non-bowl forms. Considering that the carbon paint group includes all the Tusayan sherds, which are nearly all bowls, the disparity in forms between the Chuskan-dominated carbons and the redwares is enhanced. Thus, the Tusayan group approximates the redware vessel forms, which suggests that these two groups from relatively distant areas tend to be bowls, as opposed to the carbon-painted Chuska whiteware group from somewhat closer to the canyon. The pattern of a predominance of bowls in non-locally produced redwares was also found in the Chuska Valley (Windes 1977:346-348).

Comparing the vessel form distribution of lumped mineral paints to that of the carbon-painted ceramics shows no significant difference. The difference between carbons and redwares and the similarity between carbons and mineral suggests that carbon wares were produced close enough to Chaco Canyon and/or were sufficiently important in daily use to place them in a different category from the redwares and the more distant Tusayan wares. This finding concurs with the importance of trachyte-tempered graywares evidenced by the sheer numbers of the latter. How-

Table 2.29. Vessel forms by paint types at 29SJ 627.

		Paint							
	Unpainted	Mineral Red	Mineral Brown	Mineral Black	Mineral Green	Mineral Glaze	Mineral +Carbon	Carbon	Total
<u>Vessel form</u>									
White bowl	165	83	735	2,173	41	43	0	202	3,442
Ladle	43	16	140	340	12	7	4	37	600
Pitcher	11	3	55	121	2	2	1	25	220
Canteen	8	1	5	29	1	0	0	4	48
Seed jar	3	2	10	26	0	1	3	1	46
Tecomate	93	0	14	8	1	0	2	0	118
Gourd jar	1	0	0	1	0	0	0	0	2
Olla	19	2	34	118	0	3	0	10	186
Whiteware jar	136	13	128	412	2	8	0	40	739
Mug	0	0	0	0	0	0	0	1	1
Duck pot	1	0	3	8	0	1	0	1	14
Miniature	5	2	3	8	0	0	0	0	18
Effigy	5	0	7	12	0	0	1	2	27
Pipe	0	1	0	2	0	0	0	0	3
Redware bowl	12	0	0	2	0	1	94	0	109
Smudged bowl	76	0	0	0	0	0	0	0	76
Redware jar	2	0	0	0	0	0	5	0	7
Grayware jar	1,228	0	0	1	0	0	0	0	1,289
Grayware pitcher	16	0	0	0	0	0	0	0	6
Total	1,884	123	1,134	3,261	59	66	109	323	6,960

ever, though they dominate the carbon-painted ceramics at Chaco Canyon, the trachyte-tempered whitewares have never been found in relative frequencies as high as those of their grayware counterparts.

Association of Temper and Technological Attributes

Paint. There are a number of associations between paint and temper that require no testing. Because San Juan temper is most often found in redwares and painted redwares are more or less automatically coded for mineral plus carbon paint, that paint type is hyperabundant in the San Juan temper group. By definition, Tusayan whitewares are carbon-painted and the designation "Tusayan Sandstone" is computer generated by putting items with the rough sort type Tusayan whiteware and undifferentiated sandstone temper into a new category. The Chuska carbon series (Table 2.30A) is noteworthy in that there are more black mineral-painted, trachyte-tempered sherds than there are carbon-painted. Many of the mineral-painted, trachyte-tempered items shown in the table are sandstone-trachyte mixes, whereas such mixes are less frequent in the carbon-painted items. Because of the Chuska carbon series, a high contingency coefficient is produced when sandstone and trachyte are compared; a trachyte-sandstone comparison including only mineral paints is also significant, but the strength of the association is less. The primary differences are more red and green painted and fewer black-painted trachyte-tempered items than expected.

A chi-square test on the major mineral paint types and lumped temper groups in Table 2.30A gives a significant value (Table 2.26). The large size of the sandstone temper group controls the expected values; in the remaining temper groups, chalcedonic sandstone temper contributes to the value by having less than expected brown paint and more than expected black, while trachyte has more than expected brown and red paint. The largest deviation from expected is in the occurrence of more red-painted items in the iron-bearing sandstone temper lump, the large contribution to the chi-square value being in part the result of the expected value of 0.9. The occurrence of red paint with this temper is consistent with the findings at 29SJ 629, which indicate a mutual association of these tempers with earlier pottery and, in turn, with red mineral paint. Though the frequency of green mineral paint is low, there is a relatively large number of green-painted items in the San Juan temper group.

Sherd Temper. The quantity of sherd temper in sherds can be seen to associate with the type of non-sherd tempering material. This is mainly because of the heavy association of undifferentiated sandstone with at least half sherd temper (Table 2.30B). Two explanations may be adduced for the association:

1) The nature of the tempering materials. Because sand grains tend to be rounded, the angular nature of crushed sherd temper make it a better binder (Shepard 1956:132).

2) The nature of temper identifications. When the density of sherd temper is high relative to other temper, the

Table 2.30. Temper types by paint types, sherd temper and vitrification at 29SJ 627.[a]

	Temper								
	Sandstone	Chalc. SS	Tusayan SS	Iron Oxide SS	Mag. SS	San Juan	Trachyte	Unident. Igneous	Total
A. Paint Type									
Unpainted	1,359	135	0	10	35	38	393	5	1,975
Mineral red	93	2	0	5	1	3	20	0	124
Mineral brown	958	38	0	3	7	12	115	9	1,142
Mineral black	2,800	178	1	4	13	46	257	16	3,315
Mineral green	40	0	0	0	1	8	11	0	60
Black "glaze"	53	4	0	0	0	1	6	2	66
Mineral-carbon mix	30	0	1	0	0	71	8	0	110
Carbon	86	0	39	0	2	5	203	0	335
Total	5,419	357	41	22	59	184	1,013	32	7,127
B. Sherd Temper									
None	1,160	138	32	15	38	125	594	6	2,100
Less than half	1,069	101	6	4	16	43	212	12	1,463
More than half	3,063	120	3	3	5	19	210	1	3,437
Nearly all	170	1	0	0	0	0	3	1	175
Total	5,462	360	41	22	59	187	1,019	20	7,183
C. Vitrification									
Absent	1,406	58	12	14	26	75	233	6	1,830
Present	4,054	302	29	8	33	112	785	27	5,351
Total	5,460	360	41	22	59	187	1,018	33	7,181

[a] All wares are included.

probability of seeing and identifying distinctive elements (such as fragments of the cement from chalcedonic sandstone) is less. Further, some sand grains usually can be found in a sherd, some of which are probably naturally present (rather than introduced as temper). This makes the undifferentiated sandstone temper code something of a default code for sherds that are mostly tempered with sherd.

Tests among angular tempers for quantity of associated sherd temper, however, show that significant differences are present here as well. The chalcedonic sandstone group shows more sherd temper than expected when compared with trachyte and San Juan igneous temper groups. The two latter tempers also differ (though less markedly) in that San Juan igneous temper has less sherd temper associated with it. As San Juan redwares in the Chaco collections rarely contain sherd temper, part of the difference may be between the redware tradition, in particular, and the Chuska whitewares, rather than between the San Juan tradition, in general, and the Chuska tradition. Introduction of non-sherd temper via sherd temper is much more likely to have occurred in the trachyte temper group than in the San Juan igneous group because of the absolute frequencies of each temper available in sherds that might be used for ceramic manufacture in Chaco Canyon. An additional bias in favor of less sherd temper in trachyte-tempered items is the high relative frequency of graywares so tempered.

Vitrification. The undifferentiated sandstone, chalcedonic sandstone, Tusayan, and trachyte-tempered groups all are associated with high fired ceramics in 71-83% of cases (Table 2.30C). The magnetitic sandstone and San Juan igneous tempered groups show this characteristic somewhat less (56-60%); the very small rounded iron oxide bearing-sandstone bearing group runs counter to the trend shown in the other groups by having fewer "vitrified" items than "non-vitrified" ones. The use of the term vitrification is a loose one here; it is based largely on visual inspection (presence or absence of a shiny paste) and somewhat on hardness. The recording of this attribute at 29SJ 627 is cruder than that for sites analyzed later in the Chaco Project (e.g., Pueblo Alto and 29SJ 629) because it is recorded in terms of presence-absence only instead of dividing presence into present and marked.

Paste types. The paste types recorded (Table 2.31) do not vary completely independently of temper types, which makes selection necessary before testing and the results after selection somewhat questionable. In the whitewares, the three paste types that are both numerous enough and sufficiently association-free to test all have to do with core color and color of sherd temper. The majority of identified paste types in the trachyte group are "Chuska gray," which undoubtedly has an effect on the distribution of the remaining paste types within that temper group. That effect is not specifiable other than as a reduction in sample size. The trachyte group does show as markedly different from undifferentiated sandstone and chalcedonic sandstone in the low frequency of gray clay with black sherd temper and the high occurrence of gray clay with white sherd temper. It may be

Table 2.31. Temper types tabulated by paste types, separating gray and whitewares at 29SJ 627.[a]

	Temper								
Paste type	Sand- stone	Chalc. SS	Tusayan SS	Iron Ox. SS	Magn. SS	San Juan	Trachyte	Unident. Igneous	Total
A. Whitewares:									
No type	1,460	93	36	9	18	45	259	10	1,930
Black clay/white sherd	768	93	2	0	0	1	58	4	871
Gray clay/black sherd	735	33	0	1	0	1	25	4	799
Gray clay/white sherd	478	27	0	1	1	4	52	6	569
"Little Colorado"	10	0	1	0	0	0	0	0	11
Chuska gray	5	0	0	0	0	0	148	0	153
Coarse angular SS	23	0	1	0	0	0	0	0	24
Total	3,479	191	40	11	19	51	542	24	4,357
B. Graywares:									
No type	455	71	-	1	17	4	92	-	640
Black clay/white sherd	44	0	-	0	0	0	1	-	45
Gray clay/black sherd	19	0	-	0	0	0	2	-	21
Gray clay/white sherd	9	1	-	0	0	0	2	-	12
Coarse angular SS	14	0	-	0	0	0	0	-	14
Chuska gray clay	1	0	-	0	0	0	118	-	119
Tan clay	121	15	-	3	4	3	89	-	235
Black clay	124	18	-	0	4	2	12	-	160
White clay	52	6	-	1	0	1	5	-	63
Total	839	111	-	5	25	10	321	-	1,311

[a] Red and smudged wares are not included.

that some of the latter is yet another version of Chuska gray clay, in this case with sherd temper. These two deviations from the expected account for nearly all of the significant chi-square value (Table 2.26).

The trachyte-tempered graywares are also over half "Chuska gray" in the identified pastes and, once again, the trachyte group accounts for the majority of the significant chi-square value. As noted earlier, there seems to be a tan variant of Chuska gray, and the trachyte group contains far more tan items than is statistically expected. It is conversely lower than expected in the black and white pastes in a test of sandstone, chalcedonic sandstone, and trachyte on tan, black and white pastes (Tables 2.26 and 2.31B). The sandstone group shows more than expected black clay and white clay and the chalcedonic sandstone slightly more than expected black clay. Black clay may have source significance--Warren (personal communication, 1977) suggests that black clay associates with Chinle sandstone in the Red Mesa Valley, but it can also be the result of firing conditions (Shepard 1956:17, 106). Clearly, it has some such value as seen in its low frequency in trachyte-tempered sherd. If chalcedonic sandstone temper is also indicative of a source south of the canyon, some co-occurrence with black clay might also be expected; an association is present but it is not strong. Finally, there may be some indication that a sizable sector of the undifferentiated sandstone group is Chinle sandstone.

Refiring Results

The main concern of refiring is to examine paste groups in ceramics identified as Red Mesa and Gallup Black-on-white and neck decorated culinary, primarily narrow neckbanded, to see if paste attribute groups maintain any cohesiveness in refired clay color to further support the concept of differentiated production units and the validity of discussing such groups as production units at the attribute group level. Methods, procedures and assumptions of the refiring test are more fully detailed in Shepard (1939) and Windes (1977:290-293). All items were refired once to 950° in order to expose the varying amounts of iron naturally occurring in the clay which permit the comparison and discussion of clay source variability between any groups or within a single temper/paste group.

Refiring tests on mineral-on-white ceramics and culinary wares (n=191) bring to 409 the number of sherds refired from 29SJ 627. Complete documentation of type, temper, paste group, and Munsell color are presented (Appendix D) and summarized (Table 2.32). Two other groups of refired ceramics are incorporated (Table 2.32), but they will not be the subject of lengthy discussion. One group of late carbon-on-white ceramics (n=105) were refired in conjunction with a general study of late ceramic patterns in Chaco Canyon and are discussed elsewhere (Toll et al. 1980). One can see from the color group distributions by type (Table 2.33) that these late carbons contribute substantially to the redder firing groups, particularly the trachyte tempered items in the Chuska Series (Tunicha through Nava Black-on-white), while the others are more scattered, although colors mainly fall in the buff range. The other group is the red smudged wares (n=113), which are the

Table 2.32. Summary of refiring data: specific temper, paste and finish groups in Mineral-on-whites and culinary.

Type	Windes' Color Group White	1-3	4-6	N	H'	J(s=3)	+*
Exotics	12	12	5	29	1.033	0.940	+
Red Mesa Black-on-white							
Trachyte	-	2	8	10	0.500	0.289	
Trachyte+SS mix	2	7	2	11	0.908	0.826	
ChSS gray w/white	-	5	1	6	0.451	0.260	
ChSS black w/white	2	3	1	6	1.011	0.921	+
Undiff SS; black paste	1	6	1	8	0.735	0.670	
Gray w/white <50%	1	6	2	9	0.849	0.772	
Gray w/white >50%	2	2	3	7	1.079	0.982	+
Gray w/black & white	1	6	1	8	0.735	0.670	
Gallup Black-on-white							
Trachyte	1	7	2	10	0.801	0.730	
Trachyte+SS mix	-	10	1	11	0.304	0.175	
Undiff SS;							
Gray w/white >50%	-	12	-	12	0.000		
Gray w/black & white	2	5	2	9	0.995	0.906	+
Black w/white >50%	-	8	1	9	0.349	0.201	
Subtotal	24	91	30	145	0.916	0.834	
Culinary wares							
Trachyte	2	2	7	11	0.908	0.926	+
Chalcedonic SS	2	6	1	9	0.849	0.773	
Undiff SS:							
Tan paste	-	6	1	7	0.410	0.237	
White paste	2	3	2	7	1.079	0.982	+
Black paste	1	5	-	-	0.451	0.260	
Subtotal	7	22	11	40	0.989	0.900	
Total[a]	31	113	41	185	0.934	0.851	

Mineral-on-white & culinary only:

Temper	Windes' Color Group White	1	2	4	5	6	7	Total
Fine-medium SS	15	26	26	9	9	5	-	90
Coarse-vc SS	3	13	2	-	4	-	-	22
Chalcedonic SS	5	6	8	1	1	2	-	12
Trachyte	3	7	1	1	7	5	3	27
Trachyte+SS mix	2	6	4	1	2	-	-	15
San Juan igneous	1	1	-	-	1	1	-	4
SJ igneous+SS mix	1	1	-	-	1	-	-	3
Total	30	60	41	12	25	13	3	184

7 vitrified gray samples, total N=191.
N incorporates cross-referenced "2nd Group" in Appendix D.
* + groups of higher diversity than subtotal indices.

Table 2.33. Chi-square results of 2x2 tests comparing buff to red within temper and type groups.

(Buff vs. Red, df=1)	N	χ^2_c	p	High Red	High Buff
Culinary:					
Chal. SS. vs trachyte	20	3.712	.054	Trachyte	Chal. SS
Trachyte vs undiff. SS.	31	5.618	.018	Trachyte	Undiff. SS
Red Mesa B/w:					
Exotics vs trachyte	39	10.506	.001	Trachyte	Exotics
Exotics vs chal. SS.	41	0.169	.681		
Exotics vs undiff. SS.	62	0.132	.717		
Trachyte vs trachyte & SS mix	21	5.738	.017	Trachyte	Mix
Trachyte vs chal. SS.	22	6.455	.011	Trachyte	Chal. SS.
Chal. SS. vs undiff. SS.	44	0.001	.970		
Gallup B/w:					
Trachyte vs trachyte & SS. mix	21	0.008	.929		
Trachyte + mix vs undiff. SS.	49	0.004	.950		
Red Mesa vs Gallup B/w:					
All	116	4.175	.041	Red Mesa	Gallup
Trachyte Red Mesa vs Gallup	20	5.000	.025	Red Mesa	Gallup
Undiff. SS. Red Mesa vs Gallup	60	0.656	.418		
Red Mesa B/w vs culinary:					
All	105	0.001	.975		

subject of another study (McKenna and Toll 1984; Toll and McKenna 1987). This group of ceramics includes over 70% of the red color group items in the undifferentiated sandstone tempered service wares and is the sole representative in color group 7, the reddest firing of all clay-color groups. Records (Appendix D) indicate that smudged wares get progressively redder through typological time until about A.D. 1075, when clay sources diversify and a trend to the application of red slips over buff firing clays is established. The types/groups of concern here are primarily a buff-firing series of ceramics on which simple observations along a buff/red-firing dichotomy will not be sufficiently sensitive to examine paste group variation.

Chi-square tests suggested some differences exist between types and basic temper differentiated pastes (Table 2.33).

Inspection of color distributions within sandstone temper groups (Table 2.34) shows that testing at the level of buff versus red is unnecessary because of the consistency among these groups. Buff-red testing does not, of course, allow for differences within the buff range. Tests among temper groups, within and between types, however, do show some significant differences (Table 2.33). Two trends are evident in these tests:

Table 2.34. Summary of refiring data: color by type and temper group.

Type	Windes' Color Group								Total
	White	1	2	3	4	5	6	7	
Narrow neckbanded	7	17	4	-	5	2	2	-	37
Neck corrugated	-	1	-	-	1	-	1	-	3
E. Red Mesa B/w	-	-	-	-	-	-	-	-	-
Red Mesa B/w	9	14	16	5	5	6	-	-	55
Gallup B/w	2	15	15	5	3	1	-	-	41
Cortez B/w	2	2	2	-	1	-	-	-	7
Mancos B/w	7	2	2	-	3	1	-	-	15
Aztec B/w	-	1	-	-	-	-	-	-	1
Ceboletta B/w	-	1	-	-	-	-	-	-	1
Reserve-Tularosa B/w	3	-	-	-	-	-	-	-	3
Socorro B/w	-	1	-	-	-	-	-	-	1
Naschitti B/w	-	-	1	1	5	3	-	-	10
Brimhall B/w	-	6	1	1	2	-	-	-	10
Chaco-McElmo B/w	2	-	1	-	-	-	-	-	3
McElmo B/w	2	4	3	-	3	2	-	-	14
Kana'a B/w	-	3	-	-	1	-	-	-	4
Sosi B/w	-	13	10	5	5	1	-	-	34
Tunicha B/w	-	-	-	-	1	-	-	-	1
Burnham/Newcomb B/w	-	-	1	-	-	1	1	-	3
Toadlena B/w	-	-	-	2	3	8	9	-	22
Chuska B/w	-	-	-	-	2	10	11	-	23
Nava B/w	-	-	-	-	-	1	-	-	1
Lino Smudged	2	2	-	-	-	-	-	-	4
Forestdale Smudged	-	-	-	-	1	6	63	4	74
Gila Corrugated	-	-	-	-	-	-	4	-	4
Showlow Smudged	1	5	3	1	2	7	11	1	31
Total	37	87	59	20	43	49	102	5	402

Seven sherds no assignment (vitrified gray), five alone in Socorro B/w.

1) A tendency toward use of buff-firing clays in all areas through time as witnessed by the shift in trachyte-tempered decorated pottery into the buff firing groups during Gallup Black-on-white production. This is similar to Windes' (1977) finding of more standardized clay color in wares through time.

2) Exotic mineral-on-white in Chaco Canyon tends to fire more frequently in the white group. White-refiring pastes differ from local canyon clays, which have a tendency to exhibit some color (McKenna and Toll 1974; Toll and McKenna 1987; Warren 1978). Identification of these mineral-on-white items as exotic supports findings that suggest truly white-firing clays are foreign to ceramic production associated with Chaco Canyon proper (Shepard 1954; Toll 1980).

In Red Mesa Black-on-white and neck decorated culinary wares, trachyte tempered items are distinct because they are associated with redder firing clays. Refiring colors in the chalcedonic sandstone temper group are very similar to those of undifferentiated sandstone in the prevalence of buff-firing clays (Table 2.33). This result differs from results obtained from 29SJ 1360 and 29SJ 629 in that there is a stronger association of chalcedonic sandstone temper and redder oxidation colors in the ceramics at those sites. Particularly at 29SJ 1360, the association of redder clays was strongest with the pink variant of chalcedonic sandstone. At 29SJ 627, white and pink chalcedonic sandstone tempers were not recorded separately; white chalcedonic sandstone temper has been found to be more common than pink at other sites, making it likely that white is predominant in these 29SJ 627 tests, perhaps obscuring an association with red refiring clays.

Excluding the exotic mineral-on-white wares for obvious reasons, the most diversity is, as at 29SJ 1360, found in those groups using abundant sherd temper, which is a potential means of distinguishing areal subgroups for this ubiquitous temper. Increased uniformity in clay may again be seen in the proportion of Gallup Black-on-white falling in oxidation groups 1-3 (80%) compared with those in Red Mesa Black-on-white (57%). This suggests a lower diversity of clay selection, which may represent fewer producers of Gallup Black-on-white than of Red Mesa Black-on-white. This possible standardization of mineral-on-white technology runs counter to the diversity measures monitoring design which might, in turn, suggest fewer vessel makers associated with socially diverse pot-painting work groups (Stanislawski 1975).

As at 29SJ 1360, some refiring groups seem to monitor production units better than others, if lower diversity in clay colors coincident with the other features of an attribute group indicate true units of ceramic production. The following gives a brief summary of variability within groups and some indication of ranges of variation within the combined "buff" category:

Trachyte

Red Mesa Black-on-white vs culinary; culinary seems to form stronger bimodal groups, very red or very buff. Decorated material values are more evenly distributed and are not represented by the extremely red clays of the culinary. It would seem that a clearer definition of production groups is apparent in the culinary, however, if clay source is related to production area, this distribution may suggest a broader production base for culinary in the Chuskan area. Decorated types may have more clay specific selection in a more limited production area.

Trachyte and sandstone mix

Red Mesa Black-on-white; apparently a different production group than those purely of trachyte. This may only be a counterpart of the buff-firing trachyte culinary, which both may have been produced further into the Basin (e.g., lower Sanostee drainage) where Cretaceous clays would be more common and may have been preferred.

Exotics

Broad range of refired colors which drop-out mainly in the light buff colors and which seem to be consistent with each type. Those items identified as Reserve-Tularosa Black-on-white are a particularly tight group, all being recorded as white clay, while those identified as "Socorro" all evidence a rather marked degree of vitrification and clay alteration.

Chalcedonic sandstone with gray paste

Red Mesa Black-on-white; tight group of firing colors with faint gray core, usually one value darker than the surrounding paste (the latter is the recorded color). The consistency of this group makes it seem likely to represent a production group. One dissimilar item has paste and texture bordering on "Little Colorado" paste; i.e., gray with large coarse chunks of white sherd.

Chalcedonic sandstone with black paste >50% white sherd

Red Mesa Black-on-white; displays much more dispersion of paste colors, suggesting that firing practices from several production areas produced this group. A single yellow-red (Group 5) occurs in each chalcedonic group, which points up the presence of alternative clays in the areas of chalcedonic sandstone use that were not being consistently selected.

Chalcedonic sandstone, no type

Chalcedonic tempered culinary ware without any specific paste type (mostly gray paste without sherd). This group reinforces the light colored pastes as a characteristic of chalcedonic area ceramics--at least as revealed at 29SJ 627. The split between Groups 1 and 2 strongly suggests at least two clay sources were used in chalcedonic tempered pots; one with almost no color and one with some (Group 2).

Undifferentiated Sandstone

Tan paste

Culinary; mostly very light buff pastes; one yellow-red item.

White paste

Culinary; greatest dispersion of color groups; two yellow-reds, two whites, two very light buffs.

Black paste

Culinary; tightest and lightest buff of culinary groups which runs counter to the dispersion seen in chalcedonic sandstone black paste groups. Decorated; greater dispersion of clay color than corrugated but the majority are buff; one yellow-red item.

Gray paste with white sherd

Those items with <50% sherd temper are generally (light) buff. Two yellow-reds suggest some variation. Those with 50% sherd have two distinct groups--light buff and yellow-reds (i.e., Groups 1 and 5). This group of sherds contains two specimens like the Socorro Black-on-white samples, which suggest some clays in this group tend to lower maturation.

Gray pastes w/black sherd

This group tends to fire, unlike the others, in the upper buff range (Groups 2 and 3). A good suggestion of a paste/temper combination marking a production group.

Trachyte

Gallup Black-on-white (Brimhall Black-on-white); very light buff group with two yellow-red items.

Trachyte and sandstone mix

Gallup Black-on-white; mixed group of clay colors, more diverse than pure trachyte items and tends to cluster in the upper (more color) buff Groups of 2 and 3. The Gallup Black-on-white groups differ from the Red Mesa groups in the apparent selection of lighter firing clays in the pure trachyte groups of Gallup Black-on-white. The mix groups in both cases are more diverse and tend to cluster in the upper buff values.

Gray paste with white sherd

Gallup Black-on-white; majority in buff Group 2, complete absence of red firing clays compared with Red Mesa Black-on-white equivalent.

Black paste with white sherd

Gallup Black-on-white; majority in buff Group 1 and remarkably similar to Red Mesa Black-on-white black paste characteristics; possibly represents continuation from same production source.

Gray paste with black and white sherd

Gallup Black-on-white; majority in buff Group 1, but this is the least homogenous of the Gallup Black-on-white paste-group clay color samples. This may be a polyglot group in terms of production source(s) and represents a continuation of the association of multi-colored sherd temper with diverse clay colors from Red Mesa Black-on-white.

While refiring tests point up some of the foibles of creating attribute groups and then attempting to use such groups as units of regional interaction, such tests also indicate that this approach is superior to simple typological constructs in that some refinement is apparent. This refinement permits a discussion of intra-regional exchanges or interaction, albeit not as source-specific as some may desire. Refiring has suggested that both intra-type and temporal change are apparent, although differences in the temporal dimensions are stronger in the present sample. Further, comparison with the refired Red Mesa Black-on-white and neckbanded culinary sample from 29SJ 1360 suggests that exchange was not a uniform activity from site to site within any one unit of typological time. This suggests, at least during the production of Red Mesa Black-on-white, multiple methods of ceramic acquisition.

Grayware Sooting

Sooting on graywares is of interest because of its implications for vessel use. However, the presence of sooting can be seen to be influenced by several things. One such conditioning factor is exposure to the elements (see below); another is that cooking practices appear to have changed through time. When ordered typologically, a steady increase in the proportion of sooted sherds is apparent, with over half of the PII and PII-III corrugated vessels exhibiting soot. A moderate drop-off is present in the PIII corrugated (Table 2.27A). It might be argued that this occurrence of sooting is a function of time and weathering, except that increases in sooting through time are present in a variety of exposure conditions. Fugitive red paint survives in abundance on Lino Gray sherds, and there is a lower frequency of soot on PIII corrugated than on the two typologically preceding types; both of these facts suggest that differential survival of soot cannot account for this different distribution across types. Sooting is generally low in frequency in Lino Gray (29SJ 629, 29SJ 628; Penny Whitten personal communicaton 1980) and the low frequency is enhanced by the presence of more forms in Lino Gray than in other types. Windes (personal communication, 1985) suggests that perhaps this change in the occurrence of sooting through time may have to do with changes in the roles of basketry and pottery. With or without Lino Gray, there is a significant association of sooting with type (Table 2.27A).

Findings at 29SJ 629 supported the common sense proposition that survival of soot on cooking vessels is likely to be affected by exposure to the elements (Toll and McKenna 1981a:32-33). Graywares from 29SJ 627, therefore, were divided into five provenience categories based on likelihood of prolonged exposure. All sherds recovered from the surface are excluded from the sooting table and from the calculations.

Group 1) Minimal exposure--quickly filled pit structures, Kiva E and Pithouse C.

Group 2) Pit structures more slowly filled, Kiva D and Pithouse B.

Group 3) Rooms; more likely to have been exposed and shallowly buried.

Group 4) Trash mound; variable exposure.

Group 5) Other proveniences, including plaza and other extramural areas most likely to have had extensive exposure.

A markedly different occurrence of sooting can be observed among the exposure groups. Removing Lino Gray, the trash mound contains fewer sooted items relative to overall frequency and the Kiva E, Pithouse C group contains consistently more sooting. The association is significant both when the "other" category is included and when it is excluded. This significant association also holds within the three most abundant grayware types (Table 2.27B).

Contrary to prediction, there is no significant difference among the three primary types or all gray types except Lino Gray in the socting distribution in Groups 1-3. A probability value of 0.051 was obtained in the chi-square test for narrow neckbanded, resulting largely from the incidence of sooting in the Pithouse B, Kiva D group (2). Several explanations may be proffered for this apparent lack of difference:

1) The exposure among the three exposure groups was not sufficiently different to affect observed sooting.

2) The exposure was as identified, but the rooms, Pithouse B, and Kiva D were functionally different, leading to a higher frequency of sooting in spite of greater exposure. Because the results are similar in all three primary types, it is suspected that within these protected proveniences the weathering was not sufficiently different to be a factor in sooting survival.

As was also true at 29SJ 629, no significant differences as to sooting were present among primary temper types (Table 2.27C).

Ceramic Distributions in Time and Space

Approaches to Time-Space Analyses

This section examines the ceramics for patterning through time and within various contexts at 29SJ 627. The reasons for making such an examination arise from two fundamental archeological goals--the study of change through time and attempts to interpret behavioral patterns from material evidence. Control over chronological change is most often sought in types in ceramic analyses and this study is no exception; however, typological assignments are subject to numerous risks and viewing ceramics in depositional units serves as a back-check on the typological units. This control is, of course, best within single features, because stratigraphy generally only tells white lies when watched carefully. As will be discussed, the sequences found in stratigraphy are those that result from disposal rather than production and, thus, there is an overlay of function to the consideration of time in this context. Between-structure seriations are less straightforward--that is, how does Layer 20 of Pithouse X relate to Layer 2 of Kiva Y?--but some relative ordering is possible. Disposal patterning, if it can be found, may have some inferential meaning as to social practice or as to feature function. At a site such as 29SJ 627, where there is no deposit that spans the occupation of the site, time and location are tightly intertwined. The groups generated by the project-wide "time-space matrix" (Chapter 1) are intended more for canyon-wide comparisons than for intra-site analyses, but their use on the single site level has at least two purposes. First, it does segment the collection into categories suitable for temporal analysis; second, it provides a foundation for the broader analysis by defining the actual contents of the groups and testing their validity before dropping them into the mill.

A number of complicating factors enters the discussion of within-site spatial and temporal ceramic variability at 29SJ 627:

1) The site is stratigraphically complex.

2) Few ceramics, relatively speaking, are in "primary context"--understood here as the location in which an item was likely to have been used.

3) The presence of a sherd on a floor is ambiguous in terms of cultural meaning--was it broken in use and left? Was it in use as something other than the vessel from which it came? Whole vessels are less ambiguous, especially in situations where they were implanted, but such vessels were often apparently so placed after they could no longer serve their primary intended function.

4) Primarily, most proveniences are placed temporally by means of their ceramic contents; thus, at least on the type level, some automatic correlation of time groups and ceramics is written into the time assignments.

5) A multiplicity of variables is present that could be meaningful and that might be taken into account. This condition is further multiplied by provenience and temporal considerations (and the two combined). This is a chronic rather than new problem, but it is fairly acute here.

Five avenues of approaching these problems have been selected here in an attempt to cover the time-space problem rather than being covered by it:

1) Using the rim sample that is the basis for the majority of the analyses in this report, distributions are presented in terms of time and space groups assigned to proveniences for all artifact analyses carried out by Chaco Project personnel. This system has the advantage of having placed nearly all items into a space and a time category; it has the concomitant disadvantage that several categories are so broad as to be of minimal meaning (i.e., A.D. 820-1120). In dealing with the space categories alone, floors or trash from widely divergent time periods are lumped. Such lumps are useful mainly for functional overviews. After examining distributions of most of the sample across single dimensions, more refined groups were created. Sherd lots were created by concatenating the time and space variables that are sufficiently well-defined as to be meaningful and viewing type, temper, and vessel form distributions within those lots.

2) Having viewed the distributions in the simple stepwise fashion in (1) above, the same information and groups tabulated for the last step are used in a principal components analysis. The program, written by A. R. Rogers, compensates for the effects of sample size and the nominal nature of these variables by determining the percentage composition of each variable's states within each lot. The frequency is then standardized in an operation similar in concept to the z score as follows:

$$\frac{\sqrt{n_{ij}}(p_{ij}-\bar{p})}{\sqrt{\bar{p}(1-\bar{p})}}$$

where n_{ij}= the number in a certain cell

p_{ij} = the percent that number constitutes in a group (groups in this case being time-space categories)

$\bar{p}$ = the mean percent in the group

Correcting the sample size circumvents the common problem of a tight cluster of values with a few size-related "outliers" determining the eigenvector. Dividing by $\sqrt{\bar{p}(1-\bar{p})}$ corrects for the tendency of types with intermediate frequencies to vary more than other types. This analysis thus condenses the variables of time, space, and the relative occurrence of types or variables into two-dimensional plots of multi-dimensional distance relationships. Its risks lie in the assignment of meaning to those plots (or the inability to do so). It should be remembered that principal components analysis is not an inferential procedure, but a tool that produces condensed, graphic displays of complex data.

3) Again, using the rim sample, the ceramic contents of three proveniences selected by Truell for their integrity are viewed separately. These proveniences, Pithouse C, Kiva D, and Kiva E were singled out by Truell as ones with sizable samples and less disturbed fill deposits at the site. The only sense in which these deposits are "primary" is as primary trash deposition. Their potential usefulness is in their unitary nature. The main thrust of the ceramic analysis of these structures is their examination for discernible variation within small time segments.

4) The whole vessels recovered are presented by specific provenience as the ceramic items most clearly related to feature function.

5) Customarily, considerations of ceramics are discussions of bulk counts. The by-provenience inventory of bulk ceramics (Appendix A) provides the raw material for such a consideration. The distribution of bulk ceramics is discussed here and proveniences are characterized by the diversity of their ceramic contents and by their relationship to other proveniences in terms of low or high frequency wares.

Distributions Strictly in the Time Dimension

Two sorts of chronology are operating here, the foundation of both being typology. Types are used to date ceramics on the assumption that the production of a type spanned a definable period. It is in that sense that all developmental trends thus far specified in this report have been made. The time groups are based on the same assumption, but because the groups are depositional rather than typological, there is a difference from the purely typological studies. That is, a deposit is assigned to a time group because of its dominant typological make-up, but deposits are rarely purely a single type. Some intermixture of other types no doubt results from post-depositional disturbances, but other cultural considerations are also likely to have been operative.

1) It is unlikely that the production of types is neatly chronologically segmented and far more likely that considerable overlaps were the case.

2) Another source of typological overlap is that presumably vessels of varying age would have been in use at a given time rather than strictly those in production. A depositional group within a time segment, therefore, should better reflect the household vessel assemblage at a given time. A facet of this assumption is that all vessels are at equal risk of being translated into the archeological record, which, of course, is not valid. What any vessel form assemblage represents is the sampling through time of those vessels present as seen through the filter of those more likely to be broken, which is a function of the frequency of the form, the frequency of its handling, its size, its durability and the use to which it was put. Although a vessel form assemblage, therefore, may not directly reflect the forms in use at a given moment, it does seem likely that changes in form use through time can be monitored, and that time groups are at least as good a reflection of relative form occurrence as are type groups.

Ware Groups

The ware groups used in these calculations (Tables 2.35-2.36) are as follows:

1) Early mineral-on-white--BMIII-PI polished and unpolished mineral-on-white, Early Red Mesa black-on-white.

2) Red Mesa Black-on-white--this type was treated singly due to its dominance of the collection and because it serves as a good break of the other mineral-painted types.

3) Later mineral-on-white--Puerco, Gallup, Escavada, and Chaco Black-on-whites.

4) Early carbon-on-white--BMIII-PI polished and unpolished carbon-on-white and Chuskan whiteware with Red Mesa Black-on-white design.

5) Later carbon-on-white--PII-III carbon-on-white, Chaco-McElmo Black-on-white, Chuska Black-on-white, Tusayan whitewares, and Mesa Verde Black-on-white.

6) Early graywares--Lino Gray, wide neckbanded, narrow neckbanded, and neck corrugated.

7) Later graywares--PII, PII-III, and PIII corrugated.

8) All redware.

9) All polished-smudged ware.

Examination of these ware groups has two primary utilities--in looking at spatial variability within the site and in verification of the time groups as established. Because most of these groups have assigned temporal values and they are being compared across temporal groups, a significant variation from the random is practically (as opposed to statistically) expected (Table 2.35). All six of the earlier-later pairs deviate correctly from the statistically expected in terms of the ceramic expectation. The difference in the carbon-on-white wares is a small one, which is of interest as "later carbons" are a hallmark of late ceramics in Chaco Canyon. The message is that though later carbon-painted types are present at 29SJ 627 (Toll et al. 1980), they constitute a minor part of the sample. The time group A.D. 1020-1120 embraces only the end of the presently understood period of Red Mesa Black-on-white production (thought to last to ca. A.D. 1040) and, therefore, a frequency less than statistically expected would be ceramically predicted for the third time period. The observed distribution is as ceramically expected, and it contributes substantially to the chi-square value. The smudged wares follow the statistical expectation; i.e., they are proportionally constant, which is also the ceramic expectation because they seem to occur in small numbers through time in Chaco Canyon. Redwares, on the other hand, fluctuate through time with the highest relative frequency in the earliest time group. The temper distribution suggests that much of the redware in the A.D. 1020-1120 time group is San Juan redware; the current suggested ending date for redwares from that area is ca. A.D. 1000 (Lucius and Breternitz 1981:104), which would make this occurrence late. However, the time groups are depositional units, as discussed, and occurrences of White Mountain Redwares should increase during this chronological period. In short, the time groups contain the proportions of ceramics that they "should," but they also show that mixing of several potential sorts is present.

Table 2.35. Temper and ware groups by time group at 29SJ 627.

Temper	Time Group 820-920	920-1020	1020-1120	920-1120	820-1220	Total
Undiff. sandstone	123	1,587	1,707	279	1,744	5,440
Chalcedonic SS	11	139	110	18	81	359
Tusayan sandstone	0	3	7	2	29	41
Iron Oxide SS	1	3	5	1	11	21
Magnetitic SS	2	23	19	0	15	59
San Juan igneous	9	37	82	12	48	188
Trachyte	15	130	231	33	220	629
Trachyte + SS	7	88	130	20	142	387
Unident. igneous	0	10	9	0	14	33
Total	168	2,020	2,300	365	2,304	7,157

Unobservable temper - 41 No time assignment - 27

Ware Group	Time Group 820-920	920-1020	1020-1120	920-1120	820-1220	Total
Early Mineral/w	14	136	84	16	62	312
Red Mesa B/w	64	808	726	121	575	2,294
Later Mineral/w	2	95	295	30	424	846
Early Carbon/w	5	37	39	4	22	107
Later Carbon/w	4	46	60	17	98	225
Earlier grayware	33	320	243	50	128	774
Later grayware	7	95	227	24	321	674
Redware	6	29	45	9	47	136
Smudged	0	14	17	0	45	76
Total	135	1,580	1,736	271	1,722	5,444

Excluded wares - 1,758 No time assignment - 23

Table 2.36. Chi-square test results from tables containing vessel form, ware and temper by time, space, and time-space groups.

Table	Test Entries	n	Controlling Group	Table Dimensions	χ^2	df	p	C	Small Expected
TIME GROUP									
2.35	920-1020, 1020-1120 by all 9 wares	3,116	46% Red Mesa	2x9	102.598	8	.000	.228	
2.37	820-920, 920-1020, 1020-1120 by bowl, ladle, special[a], tecomate, WW jar, gray jar	4,298	52% white bowls	3x9	30.605	14	.006	.084	3 cells<5
	920-1020, 1020-1120 by above forms w/o GW, tecomate, RW	3,212	67% white bowls	2x5	26.393	4	.000	.090	
2.35	820-920, 920-1020, 1020-1120 by SS, Ch SS, Fe SS, Tr, Tr+SS	4,459	77% sandstone	3x6	48.059	10	.000	.103	2 cells<5
	3 time by Ch SS, SJ, Tr, Tr+SS	989		3x4	33.995	6	.000	.182	
SPACE GROUP Floors									
2.40	Living, storage, pit str. by 2 mins. RM, 2 graywares	266	43% pit structure 40% Red Mesa	3x5	26.244	8	.001	.300	
2.38	Living, storage, pit str. by bowl, ladle, closed[a], jar/olla	280	53% pit structure	3x4	4.253	6	.643	.122	1 cell <5
	3 space by above forms + b, l, c, j/o, gray jar	359	48% pit structure	3x5	22.554	8	.004	.243	
2.39	Living, storage, pit str. by SS, Ch SS, Tr-Tr+SS, SJ	363	80% sandstone 48% pit structure	3x5	5.009	6	.543	.117	5 cells<5
	Without San Juan	353	82% sandstone	3x3	3.870	4	.424	.104	2 cells<5
Nontrash fill									
2.40	4 space by 7 wares (carbons lumped, reds+smudged lumped)	739	50% plaza	4x7	94.346	18	.000	.336	5 cells<5
2.38	4 space by bowl, ladle, jar/olla, closed[a], gray jar	896	50% plaza	4x5	49.127	12	.000	.223	1 cell <5
2.39	4 spac by SS, Ch SS, SJ, Tr, Tr	922	79% sandstone	4x5	7.368	12	.832	.089	4 cells<5
SPACE GROUP Trash Fill									
2.40	Rooms, pit structure, midden by all wares	4,178	65% pit structure	3x9	157.534	16	.000	.191	

Table 2.36. (continued)

Table	Test Entries	n	Controlling Group	Table Dimensions	χ^2	df	p	C	Small Expected
2.38	3 space by bowl, ladle, jar/ olla, closed[a], gray jar	5,163	65% pit structure	3x5	74.391	8	.000	.119	
	3 space by ladle, pitcher, canteen/seed jar, tecomate, jar, olla	1,561	66% pit structure	3x6	82.859	10	.000	.225	
	3 space by redware, smudged	153		2x3	4.490	2	.106	.169	
2.39	3 space by SS, Ch SS, Fe SS, SJ, Tr, Tr+SS	5,447	77% sandstone	3x6	31.720	10	.000	.076	
TIME SPACE COMBINATIONS									
<u>Within time across space</u>									
2.43	920-1020 trash fill, midden by 9 subdivisions	1,232	69% trash fill	2x9	28.651	8	.000	.151	1 cell <5
	1020-1120 4 provenience types by 9 subdiv. wares	1,642	50% trash fill 44% Red Mesa	4x9	89.832	24	.000	.228	6 cells<5
	1020-1040 trash fill, midden by 9 subdivided wares	1,311	64% trash fill 44% Red Mesa	2x9	64.638	8	.000	.217	1 cell <5
	920-1020 floors, trash fill by grayware, M/w, C/w, Red Mesa B/w	870	95% trash fill 60% Red Mesa	2x4	6.021	3	.111	.083	
	920-1020 floors, midden by grayware, M/w, C/w, Red Mesa B/w	418	89% midden 52% Red Mesa	2x4	3.655	3	.301	.093	1 cell <5
	1020-1120 floors, trash fill by grayware, M/w, C/w, Red Mesa B/w	896	89% trash fill 42% Red Mesa	2x4	2.765	3	.429	.055	
	1020-1120 floors, midden by grayware, M/w, C/w, Red Mesa B/w	560	83% midden 49% Red Mesa	2x4	11.015	3	.012	.139	
2.42	820-920 trash fill, floors by bowl, ladle, WW closed, gray	165	81% trash fill	2x4	2.628	3	.453	.125	1 cell <5
	920-1020 floor, trash fill, other fill midden by 4 forms	1,777	62% trash fill 56% bowls	4x4	21.419	9	.011	.109	1 cell <5

Table 2.36. (continued)

Table	Test Entries	n	Controlling Group	Table Dimensions	χ^2	df	p	C	Small Expected
	920-1020 trash fill, midden by b, 1, special[b], j/o, red, gray	1,624	70% trash fill 56% bowls	2x7	30.443	6	.000	.136	
	920-1020 floor, trash fill by b, 1, closed WW, gray jar	1,173	95% trash fill 54% bowls	2x4	3.623	3	.305	.056	1 cell <5
	920-1020 floors, midden by b, 1, closed WW, gray jar	547	89% midden 60% bowls	2x4	11.539	3	.009	.144	1 cell <5
	1020-1120 4 prov by b, l, w, closed[a], j/o, gray jar, red bowl	2,199	50% trash fill 49% bowls	4x6	60.171	15	.000	.163	1 cell <5
	1020-1120 trash fill, midden by all forms except effigy	1,786	62% trash fill 48% bowls	2x11	55.737	10	.000	.174	2 cells<5
	1020-1120 trash fill, midden ww forms less bowl, tecomate	519	63% trash fill	2x6	19.176	5	.002	.189	1 cell <5
	1020-1120 floors, trash fill b, 1, all WW closed, gray jar	1,217	89% trash fill 47% bowls	2x4	3.769	3	.288	.056	
	1020-1120 floors, midden by b, 1, all WW closed, gray jar	788	83% midden	2x4	19.655	3	.000	.156	
2.44	820-920 floors, fill by SS, Ch SS, lumped trachyte	156	79% trash fill	2x3	8.700	2	.013	.230	2 cells<5
	920-1020 floors, other fill, tr fill, midden by SS, Ch SS, Fe SS, SJ, lumped Tr.	1,086	62% trash fill 81% sandstone	3x4	10.381	6	.110	.076	1 cell <5
	920-1020 trash fill, midden by SS, Ch SS, Fe SS, SJ, Tr, Tr+SS	1,681	69% trash fill 78% sandstone	2x6	6.048	5	.301	.060	
	1020-1120 4 provs by 6 tempers	2,280	50% trash fill 75% sandstone	4x6	20.084	15	.169	.093	2 cells<5
TIME-SPACE COMBINATIONS									
Within space across time									
2.43	Floors-3 time groups by whiteware, grayware	167	59% 1020-1120 73% whiteware	2x3	3.821	2	.148	.150	

Table 2.36. *(continued)*

Table	Test Entries	n	Controlling Group	Table Dimensions	χ^2	df	p	C	Small Expected
	Trash fill-3 time groups by M/w, C/w, grayware, redware[b]	1,766	68% M/w	3x4	15.376	6	.018	.093	1 cell <5
	Midden-2 time groups by M/w, C/w, Red Mesa, grayware, redware[b]	844	52% Red Mesa	2x5	2.243	4	.691	.051	
2.42	Floors-3 time groups by b, 1, all closed WW, grayware jar	229	59% 1020-1120 49% bowls	3x4	1.996	6	.920	.093	3 cells<5
	Trash fill-3 time groups by b, 1, closed[a], j/o, grayware jar, red bowl	2,370	50% bowls	3x6	21.249	10	.019	.094	1 cell 5
	Midden-920-1020, 1020-1040 by b, 1, special[a], olla, WW jar, redware, grayware	1,160	55% bowls	2x8	15.432	7	.031	.115	
2.44	Trash fill-3 time groups by SS, Ch SS, Fe SS, SJ, Tr, Tr+SS	2,426	76% sandstone	3x6	38.581	10	.000	.120	2 cells<5 1 is <2
	Midden-920-1020, 1020-1040 by SS, Ch SS, Fe SS, SJ, Tr, Tr + SS	1,227	77% sandstone	2x6	11.530	5	.042	.096	

[a] Closed indicates a lump of canteen, seed jar, pitcher, and tecomate.
Special indicates a lump of canteen, seed jar, and pitcher.
Closed WW or all closed WW indicates all closed whiteware forms including jar and olla.
[b] Excludes exotic Mineral-on-white.

Vessel Form

Several comparisons of vessel form distributions by time group show significant differences (Tables 2.36-2.38). Considering the three 100-year-periods and eight form types, the small A.D. 820-920 group conforms quite closely to the expected for all forms. Differences between the two later groups are, however, large enough to produce a significant chi-square for the table. The major differences from the expected are more bowls and fewer ladles, ollas, and pitchers/canteens/seed jars in the A.D. 920-1020 group, and more ollas and special

Table 2.37. Vessel forms by time group at 29SJ 627.

	Time Group					
Vessel Form	820-920	920-1020	1020-1120	920-1120	820-1220	Total
White bowl	85	1,077	1,085	176	1,037	3,460
Ladle	13	135	200	25	229	602
Pitcher	2	50	67	8	93	220
Canteen	2	7	21	2	16	48
Seed jar	0	12	18	5	14	49
Tecomate	4	42	39	3	30	118
Gourd jar	0	1	0	0	1	2
Olla	5	31	67	14	67	184
Whiteware jar	20	203	239	50	233	745
Mug	0	1	0	0	0	1
Duck pot	0	5	1	1	7	14
Miniature	0	4	5	0	10	19
Effigy	1	8	11	0	7	27
Pipe	0	0	0	0	3	3
Redware bowl	3	26	36	6	39	110
Smudged bowl	0	14	17	0	45	76
Redware jar	0	0	5	2	0	7
Grayware jar	34	355	420	66	417	1,292
Grayware pitcher	1	4	6	1	4	16
Total	170	1,975	2,237	359	2,252	6,993

Unknown forms = 205.
No time assigned = 27.

Table 2.38. Vessel forms by provenience type at 29SJ 627.

DEPOSIT TYPE/ Vessel Form	Provenience Group: Living Room/ Ramada	Storage Room	Pit Structure	Plaza	Total
FLOORS					
White bowl	38	49	103	4	194
Ladle	9	8	17	0	34
Pitcher	4	1	5	0	10
Canteen	1	0	3	0	4
Seed jar	2	1	2	0	5
Tecomate	1	1	1	0	3
Olla	4	2	2	0	8
Whiteware jar	4	5	17	1	27
Miniature	1	1	0	0	2
Effigy	0	1	2	0	3
Redware bowl	2	0	3	0	5
Smudged bowl	1	1	6	0	8
Grayware jar	34	23	22	0	79
Grayware pitcher	1	0	0	0	1
Total	102	93	183	5	383
NON-TRASH FILL					
White bowl	91	97	46	253	487
Ladle	15	13	5	34	67
Pitcher	4	3	2	9	18
Canteen	1	1	1	6	9
Seed jar	2	4	0	5	11
Tecomate	2	4	1	8	15
Olla	8	7	0	13	28
Whiteware jar	13	15	5	42	75
Cup	1	0	0	0	1
Duck pot	2	0	0	1	3
Miniature	0	0	0	2	2
Effigy	0	0	0	3	3
Redware bowl	3	0	0	9	12
Smudged bowl	1	2	0	1	4
Redware jar	0	0	0	1	1
Grayware jar	78	19	8	81	186
Total	221	165	68	468	922

Absent forms FLOORS: Gourd jar, duck pot, cup, effigy, pipe, redware jar.
Absent forms NON-TRASH FILL: Gourd jar, pipe, grayware pitcher.

DEPOSIT TYPE/ Vessel Form	Living Room/ Ramada	Storage Room	Pit Structure	Plaza	Total
TRASH FILL					
White bowl	277	1,690	665	2,632	3,313
Ladle	49	344	83	476	577
Pitcher	13	132	41	186	214
Canteen	3	15	16	34	47
Seed jar	1	22	6	29	45
Tecomate	13	31	46	90	108
Gourd jar	0	2	0	2	2
Olla	29	91	22	142	178
Whiteware jar	52	402	150	604	706
Cup	0	0	0	1	1
Duck pot	1	8	1	10	13
Miniature	0	12	2	14	18
Effigy	4	12	4	20	26
Pipe	0	3	0	3	3
Redware bowl	11	57	21	89	106
Smudged bowl	12	45	7	64	76
Redware jar	0	4	1	5	6
Grayware jar	168	628	172	968	1,233
Grayware pitcher	4	5	4	13	14
Total	637	3,503	1,241	5,381	6,686

Missing from TRASH: cup.
Miscellaneous contexts = 307.
Unknown form = 205.
Unassigned context = 27.

closed forms in the later group. Gray and white jars, redwares and, interestingly, tecomates all seem to conform to the implied null hypothesis of no form change through time. As has been noted, pitchers associate with later types; the other two "special closed forms" also increase somewhat in relative frequency. A more specific test of whiteware forms only, in these two time periods only, conforms to this trend of increase.

Temper

The six most frequent temper types in the A.D. 820-920 time group are similar in proportion to the proportions in the overall sample, except that there is more San Juan igneous temper than the expected (Tables 2.35, 2.36, and 2.39). The overall temper trends defined elsewhere (Toll 1984, 1985, 1986) are by and large present here: early greater relative frequencies of San Juan igneous temper, an increase in chalcedonic cement sandstone temper in the tenth century followed by a decline, increase through time of the incidence of trachyte temper, and a steady preponderance of undifferentiated sandstone tempering material. Also, as per general trends, the frequencies of rounded iron oxide and magnetitic sandstone tempering materials decrease through time, but the lumped pair contributes little to the chi-square value. The Tusayan whitewares increase through time, but remain a small percentage. The quantity of trachyte temper decreases slightly in the A.D. 920-1020 period (when chalcedonic sandstone temper is most abundant) and then increases somewhat; its overall percentage is low relative to general trends for trachyte occurrence even though the graywares are included. The great quantity of whiteware in the whole sample mutes the within-grayware increases present.

Distributions Strictly in the Space Dimension

The ceramic attributes ware group, vessel form, and temper do vary in their occurrence across the space categories defined. Significant differences in distribution occur in all deposit types for both ware and vessel form, but only comparisons of temper of ceramics from the trash deposits produce a significant chi-square value. The most consistent association of type-ware-vessel form with provenience is a high relative frequency of later grayware jars associated with the living rooms. In the ceramics from the trash fill of the living rooms, there is a concomitant higher frequency of trachyte temper as well. The trash midden contains a preponderance of earlier materials. Earlier graywares and earlier mineral-on-white vessels are relatively more frequent there, and Red Mesa Black-on-white, Smudged wares, and later mineral-painted types are relatively infrequent. As would be predicted from the occurrence of earlier graywares, chalcedonic sandstone temper is also proportionately more common in ceramics from the midden. Red Mesa Black-on-white, the most abundant "ware group" in all tabulated proveniences in all deposit types, is more common in plaza fill and less common in the trash fill of both the midden and the rooms. Presumably, this is again a chronologically influenced event, with the midden containing, on the whole, the earliest materials (predating the aban-

Table 2.39. Temper types by provenience type at 29SJ 627.

DEPOSIT TYPE/ Temper	Provenience Group: Living Room/ Ramada	Storage Room	Pit Structure	Plaza	Total
FLOORS/					
Undiff. sandstone	77	68	146	5	296
Chalcedonic SS	6	5	4	0	15
Tusayan sandstone	0	1	1	0	2
Iron Oxide SS	0	1	1	0	2
Magnetetic SS	2	1	1	0	4
San Juan igneous	3	1	6	0	10
Trachyte	14	13	20	0	47
Trachyte + SS	3	3	7	0	13
Unidentif. igneous	0	0	1	0	1
Total	105	93	187	5	390
NON-TRASH FILL/					
Undiff. sandstone	170	131	54	376	731
Chalcedonic SS	8	6	2	18	34
Tusayan sandstone	0	1	1	4	6
Iron Oxide SS	0	0	1	1	2
Magnetetic SS	0	1	1	5	7
San Juan igneous	4	5	1	17	27
Trachyte	30	17	7	38	92
Trachyte + SS	10	7	2	19	38
Unidentif. igneous	0	0	0	2	2
Total	222	168	69	480	939

DEPOSIT TYPE/ Temper	Provenience Group: Storage+ Living Room	Pit Structure	Midden	Total	Three Deposit Total
TRASH FILL/					
Undiff. sandstone	474	2,704	993	4,171	5,198
Chalcedonic SS	23	179	89	291	340
Tusayan sandstone	3	26	4	33	41
Iron Oxide SS	4	11	1	16	20
Magnetetic SS	9	22	13	44	55
San Juan igneous	21	80	41	142	179
Trachyte	71	298	93	462	601
Trachyte + SS	38	221	62	321	372
Unidentif. igneous	4	22	3	29	32
Total	647	3,563	1,299	5,509	6,838

Unobservable temper = 41.
Miscellaneous provenience = 319.
No provenience assignment = 27.

donment of pit structures), the pit structures containing middle and later deposits, and the rooms the latest deposits.

Wares, too, can be seen to be non-randomly distributed on floor types, the category presumably most meaningful in terms of areal function within the site (Tables 2.36 and 2.40). The occurrence of ceramics on identified plaza surfaces is too small to carry much meaning, but all of the ceramics from that provenience type are mineral-painted whitewares, and four of the five vessels represented are bowls. The distribution of many of the ware groups, including all white-ware forms, is similar to that expected for the three floor types. The evidence from pitstructure floors is somewhat contradictory in that there are substantially fewer later graywares than the expected, while there are substantially more later mineral-painted whitewares than expected. The frequency of later graywares on the living room floors is greater than expected.

Particularly in the two remaining categories, non-trash and trash fill, the space dimension is useful for reconstructing "site formation processes." The contradictory evidence from the floors of pit structures suggests that it may be more useful for studing the formation process than for studying function. A combination of formation and function, however, may be seen in the consistent association of later graywares with the living rooms in all three provenience types. The use of later graywares in living rooms instead of pit structures is consistent with the idea that the function of pit structures became more formal, if not ceremonial,with more worldly activities associated with surface rooms. The presence of numerous grayware vessels on the floor of the presumably earlier Pithouse 2 at 29SJ 629 perhaps is further illustrative of this trend. This, however, is somewhat tenuous--it assumes graywares are non-ceremonial. It also risks an auto-correlation in that if surface rooms are more or less late by definition, then late graywares are the most likely grayware association.

Particularly because the wares are subdivided into earlier and later, one naturally wonders from which provenience the sherds in the category pit structure floors came. Kiva E contained 60% of all pit structure floor sherds (with less than 5% grayware, which is consistent with the thought that later pit structures were less domestic). Pithouse C contained 18% of all pit structure floor sherds, but, here too, there were few graywares. The remaining 22% come from small samples from Kiva D, Pit Structure F, and Kiva G, where early mineral-on-white sherds are rare and graywares of all types are outnumbered by whitewares. Thus, while the ceramics from structures of wide age range (from Pithouse C to Kiva E) are pooled in the category pit structure floors, the early structure does not bias the ware proportions as might be expected. Graywares are relatively infrequent among all pit structure floor sherds. The assemblage from the latest structure (Kiva E) is heavily dominated by whiteware. The proportion of whiteware is probably realistic because only the sample from this structure was sizable (115 sherds before exclusion of broad types). Thus, the basic difference comes down to one of grayware in surface rooms and whitewares in pit structures including the earliest, presumably domiciliary pithouse.

Table 2.40. Ware groups by provenience type at 29SJ 627.[a]

DEPOSIT TYPE Ware Group	Provenience group Living Room/ Ramada	Storage Room	Pit Structure	Plaza	Total
FLOORS					
Early Mineral/w	3	8	10	0	21
Red Mesa B/w	26	30	52	3	111
Late Mineral/w	13	10	29	2	54
Early Carbon/w	0	1	4	0	5
Late Carbon/w	3	1	5	0	9
Early grayware	12	14	17	0	43
Late grayware	24	11	7	0	42
Redware	2	0	4	0	6
Smudged ware	1	1	6	0	8
Total	84	76	134	5	299
NON-TRASH FILL					
Early Mineral/w	5	8	4	26	43
Red Mesa B/w	55	51	31	179	316
Late Mineral/w	34	31	8	40	113
Early Carbon/w	1	3	3	6	13
Late Carbon/w	4	8	4	15	31
Early grayware	21	17	6	49	93
Late grayware	60	7	2	42	111
Redware	4	0	0	11	15
Smudged ware	1	2	0	1	4
Total	185	127	58	369	739

DEPOSIT TYPE Ware group	Provenience Group Storage+ Living Room	Pit Structure	Midden	Total	Three Deposit Total
TRASH FILL					
Early Mineral/w	23	137	72	232	296
Red Mesa B/w	162	1,164	459	1,785	2,212
Late Mineral/w	84	453	108	645	812
Early Carbon/w	10	58	17	85	103
Late Carbon/w	19	115	39	173	213
Early grayware	69	340	180	589	725
Late grayware	117	326	52	495	648
Redware	13	75	22	110	131
Smudged ware	12	45	7	64	76
Total	509	2,713	956	4,178	5,216

Miscellaneous provenience = 228.
No provenience assignment = 23.
Excluded wares = 1,758.
[a] 293 graywares were omitted from the original analysis; see Appendix E for a discussion of the effects.

Time and Space Distributions Combined

It is difficult to talk about time or space independent of one another. Combining time and space (Table 2.41) does not alter associations found in the preceding single-dimension discussion. There are, in fact, some reassuring reoccurring patterns, especially across time within provenience type. The two striking form-space associations are that grayware jars tend to be more frequent on floors and in trash fill and less common in the trash mound in deposits from A.D. 920-1020 and A.D. 1020-1120 (Tables 2.36 and 2.42). Conversely, tecomates were found in disproportionate numbers in the trash mound from both time slots. Other forms--bowls, ladles, whiteware closed forms, redwares--were more or less proportionately distributed in each time group across provenience types. Viewing distributions in terms of type groups (or subdivided wares) is not completely independent of forms, because most graywares are from gray jars and most redwares are from red bowls. Along these lines, it is relevant that whiteware bowls dominate each set of form distributions (thereby controlling expected values to varying degrees) and that redwares follow the expected very closely in most cases. Thus, it may be that the bowl form is similarly distributed regardless of its color (temper, type, or creed).

In the earliest time segment there is no difference in form distribution between the floor sherds and the trash fill sherds. In the two succeeding time segments, the trash fill does not significantly differ either, but the midden deposits do differ significantly from the floor sherds in both the A.D. 920-1020 and A.D. 1020-1120 groups. In each case, the main difference in forms lies in inordinate amounts of graywares on floors as compared to the amount in the midden (Tables 2.42-2.43). In the A.D. 1020-1120 period, there are few closed whiteware forms (including tecomates) on floors compared to the number in the midden or the trash fill. The occurrence of tecomates alone is the reverse. While there may be some indication of differential disposal practice, it is likely that, time assignments not withstanding, the deposits in the midden are somewhat earlier than the other deposits in the same group. The distribution of ware types not subdivided by age (i.e., strictly grayware, redware, carbon-on-white, mineral-on-white and Red Mesa Black-on-white) is similar to the distribution of form in the ceramics from floors and trash fill from both A.D. 920-1020 and A.D. 1020-1120. There is no difference in type and form in assemblages from the midden and floor in A.D. 920-1020, but in A.D. 1020-1120, there is a difference. There is less Red Mesa Black-on-white than expected on floors while there is more other mineral-on-white and graywares than expected. Perhaps an increasing divergence between midden content and floor sherds took place through time--such divergence is suggested by contingency coefficients for both wares and forms (Table 2.36).

Having noted some similarity in distribution patterns through time, the distributions of types found in single proveniences between time segments were examined. Although floor samples are small, the relative grayware-whiteware frequencies and basic forms are similar in all three time segments. The dominance of sandstone temper pre-

Table 2.41. Time and space groupings at 29SJ 627.

Temporal		Spatial	
Code	Range	Code	Provenience Type
02	A.D. 500's	01	Ramada or living room fill
03	A.D. 600's	02	Living room floors
04	A.D. 700-820	03	Storage room fill
05	A.D. 820-920	04	Storage room floors
06	A.D. 920-1020	05	Living or storage room trash fill
07	A.D. 1020-1120		
08	A.D. 1120-1220	06	Pit structure trash fill
09	A.D. 920-1120	07	Pit structure fill
10	A.D. 920-1220	08	Pit structure floors
11	A.D. 820-1220	09	Plaza/ramada fill
12	A.D. 1220-1320	10	Plaza/ramada surfaces
13	A.D. 820-1020	11	Trash midden
14	A.D. 1120-1300	12	Site feature fill & floor
15	A.D. 500-1200	13	Site surface
16	A.D. 920-1320	14	Miscellaneous
17	A.D. 1120-1320		
18	A.D. 1020-1040		
19	A.D. 700-1020		
20	Unknown		
21	A.D. 1020-1220		
22	A.D. 900-1130		
23	A.D. 820-1120		
24	A.D. 600-820		

Lumps used for 29SJ 627.

Code	Lump	Code	Lump	Category
07	07 with 18	03	01, 03, 07, 09	Fill
		04	02, 04, 08, 10	Floors
		05	05, 06	Trash fill

Time-space groups used in the 627 analysis.

Time-Space Code	Group Symbol	Group Description
5 - 4	A	A.D. 820-920 floors and surfaces
5 - 5	B	A.D. 820-920 structure trash fill
6 - 3	C	A.D. 920-1020 non-trash fill
6 - 4	D	A.D. 920-1020 floors
6 - 5	E	A.D. 920-1020 trash fill
6 - 11	F	A.D. 920-1020 trash midden
6 - 12	G	A.D. 920-1020 site features
7 - 3	I	A.D. 1020-1120 non-trash fill to structures
7 - 4	J	A.D. 1020-1120 floors
18 - 5	K	A.D. 1020-1040 trash fill
18 - 11	L	A.D. 1020-1040 trash midden

Table 2.42. Vessel forms by time-space group at 29SJ 627.

Vessel Form	Time-Space Group: 820-920 Floors Group A	820-920 Trash Fill Group B	920-1120 Floors Group D	920-1020 Trash Fill Group E	920-1020 Other Fill Group C	920-1020 Midden Group F	920-1020 Features Group G
White bowl	17	68	30	608	68	296	24
Ladle	1	12	3	77	8	31	5
Pitcher[a]	0	2	2	30	3	12	1
Canteen	1	1	0	2	0	5	0
Seed jar	0	0	0	6	3	1	0
Tecomate	0	4	1	11	3	21	0
Olla	1	4	2	20	3	5	0
Whiteware jar	3	17	4	124	14	46	7
Effigy[b]	1	0	1	10	0	4	1
Redware bowl	1	2	1	16	0	7	0
Smudged bowl	0	0	2	7	0	5	0
Redware jar	0	0	0	0	0	0	0
Grayware jar	9	25	19	234	13	69	6
Grayware pitcher	0	1	0	1	0	2	0
Total	34	136	65	1,146	115	504	44

Vessel Form	Time-Space Group: 1020-1040 Trash Fill Group J	1020-1040 Midden Group K	1020-1120 Floors Group I	1020-1120 Other Fill Group H	Total
White bowl	507	344	66	166	2,194
Ladle	121	45	12	22	337
Pitcher[a]	35	25	3	4	117
Canteen	5	11	0	5	30
Seed jar	8	5	3	2	28
Tecomate	10	25	2	2	79
Olla	36	15	3	13	102
Whiteware jar	121	92	9	17	454
Effigy[b]	8	3	2	4	34
Redware bowl	16	13	1	6	63
Smudged bowl	11	2	2	2	31
Redware jar	4	1	0	0	5
Grayware jar	239	91	37	51	793
Grayware pitcher	3	2	1	0	10
Total	1,124	674	141	294	4,277

[a] Pitcher includes gourd jars.
[b] Effigy includes effigies, duckpots, miniatures, and pipes.
Group symbols are different from those for type/temper/paint/grain groups; see Table 2.41.

cludes testing the temper distribution, which looks similar in all three time segments, with an increase in trachyte-tempered sherds from the latest floors.

There are significant differences through time in vessel forms, wares, and tempers of ceramics from the trash fill (Tables 2.36, 2.42-2.44). The ceramics from the early group remain remarkably close to expected for all three attributes. The only slight differences are more redware and, concomitantly, more San Juan temper. There are more differences in form and temper over time. The two most common whiteware forms are bowls and ladles. Bowls are relatively more frequent in the A.D. 920-1020 assemblage and ladles are more common in the one from A.D. 1020-1120. Tempers also differ, with the primary deviations from expected falling in the igneous groups.

The frequency of trachyte-tempered material is relatively low in the two earlier time segments, especially A.D. 920-1020, and higher in the last one. The frequency of San Juan igneous temper is low in ceramics from the middle segment and high in those from the later one. In spite of the differences in San Juan temper and in bowls, the frequency of redware bowls is close to the expected in both time segments. Two factors may be operating here. The redware proportion may be augmented in the latest group by Tusayan and White Mountain Redwares, and the bowls from the middle group may contain an inordinate quantity of San Juan-tempered whiteware (65% of redwares are San Juan-tempered and 47% of San Juan temper occurs in whitewares as opposed to 46% in redwares--Table 2.3).

The assemblages from the midden deposits do not differ significantly in ware proportions through time, but they do differ in form and temper make-up (only the two later groups were tested). The sample from the midden in the A.D. 920-1020 segment also contains more bowls than expected. While the midden sample from A.D. 1020-1040 contains more specialized closed forms, the A.D. 920-1020 group contributes to the chi-square value by virtue of low frequencies in all closed whiteware forms.

Principal Components Analysis of Time-Space Groups

The foregoing sections demonstrate that variations in the ceramic assemblage can be found in time and space, and that there are similarities in the samples from some proveniences and time periods. The demonstration is somewhat laborious and, clearly, it is far from exhaustive. Performing a multivariate analysis of the same data provides added perspective to the definition of time-space patterning by considering several variables at once: type, time, and space distribution. Further, it generates relationships which may not be apparent in the simpler analyses, but which may be interpretable as having archeological significance.

The groups used for the principal components analysis (Table 2.41) are the same as those used in the simpler tabulations for time and space combined (Tables 2.42-2.44). Only time groups of 100 years were used and proveniences were lumped (e.g., all floors from A.D. 1020-1120). Each attribute was also condensed by removing very broad categories (such as unidentified whiteware and PII-III mineral-on-white) or

Table 2.43. *Types by time-space group as used in the principal components analyses at 29SJ 627.*

	Time-Space Group						
Rough Sort Type	820-920 Floors Group A	820-920 Trash Fill Group B	920-1020 Floors Group D	920-1020 Trash Fill Group E	920-1020 Other Fill Group C	920-1020 Midden Group F	920-1020 Features Group G
GRAYWARE							
Lino Gray[a]	0	6	2	13	4	30	0
Wide neckbanded	2	8	3	43	3	11	1
Narrow neckbanded	0	8	4	64	1	16	1
Neck corrugated	0	0	6	20	2	4	3
PII corrugated	0	5	0	22	2	11	1
PII-III corrugated	0	1	0	1	0	4	0
PIII corrugated	0	0	0	1	0	2	0
MINERAL-ON-WHITE							
Polished BMIII-PI	0	3	2	17	3	16	0
Unpolished BMIII-PI	2	3	0	6	3	8	0
Early Red Mesa B/w	2	4	2	53	2	14	2
Red Mesa B/w	13	51	23	501	43	196	22
Escavada B/w	0	0	0	1	0	2	0
Puerco B/w	0	0	1	16	3	9	1
Gallup B/w	1	1	3	13	6	26	0
Chaco B/w	0	0	0	0	0	0	0
Exotic M/w	0	0	1	11	1	6	1
CARBON-ON-WHITE							
BMIII-PI polished	0	1	0	10	1	1	0
BMIII-PI unpolished	0	0	0	5	1	2	1
PII-III	0	1	1	14	1	7	0
Chuska B/w	0	0	0	0	0	1	0
Chuska carbons	0	3	0	10	4	5	0
Chuska, Red Mesa des.	1	3	0	13	0	3	0
Tusayan	0	0	0	0	0	3	0
Redware	1	5	1	19	0	7	0
Smudged	0	0	2	7	0	5	0
Total	22	102	51	860	80	389	33

[a]Lino includes Lino Fugitive and Obelisk gray.
Group letters are different from those indicating type/temper/paint/grain size groups; see Table 2.41.

Table 2.43. *(continued)*

Rough Sort Type	Time-Space Group 1020-1040 Trash Fill Group J	1020-1040 Midden Group K	1020-1120 Floors Group I	1020-1120 Other Fill Group H	Total (both pages)
GRAYWARE					
Lino Gray[a]	11	27	2	4	99
Wide neckbanded	26	20	3	4	124
Narrow neckbanded	41	29	4	6	174
Neck corrugated	13	3	0	3	54
PII corrugated	106	11	17	19	194
PII-III corrugated	12	2	2	4	25
PIII corrugated	5	2	0	3	13
MINERAL-ON-WHITE					
Polished BMIII-PI	11	12	5	2	71
Unpolished BMIII-PI	10	7	0	2	41
Early Red Mesa B/w	17	14	1	3	114
Red Mesa B/w	341	241	35	108	1,574
Escavada B/w	6	1	4	5	19
Puerco B/w	27	12	4	11	84
Gallup B/w	121	49	15	36	271
Chaco B/w	1	0	1	2	4
Exotic M/w	30	9	8	7	74
CARBON-ON-WHITE					
BMIII-PI polished	3	3	0	3	22
BMIII-PI unpolished	2	3	0	0	14
PII-III	7	10	0	1	42
Chuska B/w	5	2	0	3	11
Chuska carbons	9	7	3	3	44
Chuska, Red Mesa des.	16	5	2	2	45
Tusayan	4	2	0	2	11
Redware	24	14	1	6	78
Smudged	11	2	2	2	31
Total	859	487	109	241	3,233

[a]Lino includes Lino Fugitive and Obelisk gray.
Group letters are different from those indicating type/temper/paint/grain size groups; see Table 2.41.

Table 2.44. Temper by time-space groups as used in the principal components analysis at 29SJ 627.

	Temper								
	Sand-stone	Chalc. SS	Tusayan SS	Iron Ox. SS	Magn. SS	San Juan	Trachyte	Trachyte + SS	Total
Time-space group									
A 820-920 floors	23	0	0	0	0	2	8	1	34
B 820-920 trash fill	100	11	0	1	2	7	7	6	134
D 920-1020 floors	55	3	0	0	1	1	4	0	64
C 920-1020 nontrash	95	4	0	0	1	2	9	4	115
E 920-1020 trash fill	914	73	0	3	11	19	79	58	1,157
F 920-1020 midden	404	49	3	0	6	10	35	20	527
G 920-1020 features	42	1	0	0	1	1	0	1	46
J 1020-1040 trash fill	837	52	4	2	7	40	123	74	1,139
K 1020-1040 midden	537	40	1	1	7	29	54	35	704
I 1020-1120 floors	105	8	0	1	1	4	23	4	146
H 1020-1120 fill	226	10	2	1	4	9	30	16	298
Total	3,338	251	10	9	41	124	372	219	4,364

lumping very small categories (e.g., pipes, duckpots, and miniatures were lumped with effigies and all San Juan tempers were combined). This procedure considerably reduces the size of the sample, which is indicative of the proportion of material that comes from unmixed proveniences. Unfortunately, this means that some proveniences are not well represented. Kiva E, for example, contains a great quantity of ceramics, but with this control in effect, it contributes little to the analysis. The contribution of each provenience to each time-space group (Table 2.45) gives an idea of provenience time assignment as well as contribution to the analysis. Individual analyses were then performed on the contents of each time-space group for rough sort types, vessel forms, and tempers. The resulting plots display distance relationships between time-space groups on the principal components generated by the frequency percents of the class variables (see the section on approaches to time-space analysis above).

The first component of the analysis of rough sort types gives the strongest separation of the three analyses performed. Its eigenvalue indicates that it explains 58% of the variance, as opposed to 43% for the vessel form and 41% for the temper first components. This analysis summarizes information about the distribution of ceramic types among deposits. Because both ceramic types and deposits vary in age, there is reason to hope that chronological variation will be displayed by the principal components analysis. The first principal component does seem to have a chronological aspect to it. With one exception, all the deposits assigned to post A.D. 1020 are to the left of zero and all those before A.D. 1020 are to the right. The single exception is the A.D. 1020-1040 midden, which is grouped with the pre-A.D. 1020 proveniences. This placement is in accordance with the chi-square analysis finding that the midden is apparently earlier than the other deposits (trash fill, floors) placed in the same time segment. It would be incorrect to assume that this principal component created a strictly temporal ordering of deposits, however, because both A.D. 820-920 deposits are placed with the A.D. 920-1020 groups and the A.D. 1020-1040 midden. Rather than indicating a failure of the technique, this placement serves to point up that these putatively earlier deposits are not very different from the A.D. 920-1020 groups. In terms of lumped types, the "early" groups were very close to the expected in tables dominated by the later proveniences (Tables 2.36 and 2.43). The principal components analysis deals with specific rather than grouped types, but simple inspection shows that percentages of early types such as BMIII-PI Mineral-on-white and Lino Gray are, in some cases, higher in the A.D. 920-1020 groups than they are in the A.D. 820-920 groups (Table 2.43).

The ordering on a finer level than pre- and post-A.D. 1020 also does not conform to assigned dates. The distribution has a periodic appearance that creates four evenly spaced groups: A.D. 1020-1040 trash fill at one extreme, followed by A.D. 1020-1120 floors and other fill. Then, a large group including the A.D. 820-920 proveniences, most of the A.D. 920-1020 groups and the A.D. 1020-1040 midden and, at the right extreme, the A.D. 920-1020 trash fill. If this axis had a time ordering value, this right-

Table 2.45. Contributions of proveniences to the time-space groups used for the principal components analyses--rooms.

	Time-Space Group						
Provenience	820-920 Floors Group A	820-920 Trash Fill Group B	920-1020 Floors Group D	920-1020 Trash Fill Group E	920-1020 Other Fill Group C	920-1020 Midden Group F	920-1020 Features Group G
Room 1	-	-	9	-	39	-	-
Room 2	-	-	-	-	-	-	-
Room 3	-	-	3	5	-	-	-
Room 4	-	-	5	16	-	-	-
Room 5	-	-	3	9	-	-	-
Room 6	-	-	-	-	5	-	-
Room 7	-	-	2	12	3	-	-
Room 8	-	-	3	3	-	-	-
Room 9	2	15	-	-	-	-	-
Room 10	-	-	-	77	-	-	-
Room 11	-	-	-	-	-	-	-
Room 12	-	-	-	-	5	-	-
Room 14	-	-	7	-	-	-	-
Room 15	-	-	-	-	2	-	-
Room 16	-	-	-	-	-	-	-
Room 17	-	-	1	-	-	-	-
Room 19	-	-	-	-	-	-	-
Room 20	-	-	-	-	6	-	-
Room 22	-	-	5	-	32	-	-
Room 23	-	-	3	-	9	-	-
Room 24	-	-	1	-	1	-	-
Room 25	-	-	11	5	-	-	-
Pithouse B	-	-	-	46	-	-	-
Pithouse C	33	122	-	846	-	-	-
Kiva D	-	-	-	36	-	-	-
Kiva E	-	-	-	-	8	-	-
Pit Structure F	-	-	10	111	1	-	-
Kiva G	-	-	-	-	-	-	-
Antechamber PH A	-	-	-	-	-	-	45
Antechamber PH B	-	-	-	-	-	-	1
Plaza Grid 4	-	-	-	-	-	-	-
Ramada 1	-	-	-	-	-	-	-
Trash grid 1	-	-	-	-	-	-	-
Trash grid 2	-	-	-	-	-	183	-
Trash grid 3	-	-	-	-	-	-	-
Trash grid 5	-	-	-	-	-	351	-
TOTAL	35	137	65	1,169	117	535	46

Table 2.45. (continued)

Provenience	1020-1040 Trash Fill Group J	1020-1040 Midden Group K	1020-1120 Floors Group I	1020-1120 Other Fill Group H	Total (both pages)
	Time-Space Group				
Room 1	-	-	-	-	6
Room 2	52	-	8	-	80
Room 3	-	-	6	-	32
Room 4	-	-	15	-	53
Room 5	36	1	16	-	65
Room 6	-	-	1	-	28
Room 7	40	-	-	-	57
Room 8	3	-	20	-	48
Room 9	-	-	12	-	39
Room 10	-	-	-	-	77
Room 11	-	-	7	-	17
Room 12	-	-	-	-	5
Room 14	-	-	-	-	7
Room 15	78	-	-	-	80
Room 16	-	-	30	-	30
Room 17	-	-	-	-	1
Room 19	-	-	-	-	51
Room 20	-	-	-	-	6
Room 22	-	-	-	-	35
Room 23	-	-	-	-	12
Room 24	-	-	-	-	2
Room 25	-	-	-	-	16
Pithouse B	-	-	-	-	46
Pithouse C	8	-	-	-	1,009
Kiva D	926	-	18	-	980
Kiva E	-	-	-	17	25
Pit Structure F	13	-	-	7	129
Kiva G	13	-	-	41	54
Antechamber PH A	-	-	-	-	45
Antechamber PH B	-	-	-	-	1
Plaza Grid 4	1	-	-	69	70
Ramada 1	-	-	-	19	23
Test trench 6	1	-	-	-	1
Test trench 16	1	-	-	-	1
Trash grid 1	-	461	-	-	461
Trash grid 2	-	-	-	-	183
Trash grid 3	-	16	-	-	16
Trash grid 5	1	227	-	-	579
TOTAL	1,151	706	147	300	3,998

most group should probably be later than (i.e., left of) the A.D. 920-1020 midden and decidedly left of the A.D. 820-920 groups. The periodicity of points suggests some further structure to the data, but no interpretation on that level is attempted here. The plot of the first and second components reveals little structure other than the segments visible for the first component. The second and third component plots, however, place deposit types in the same parts of the map. That is, the points for trash fill from three different time groups are all toward the lower left (-x, -y), the two midden groups to the right (+x, -y), floors and other features from three time groups in a small area in the upper center (-x, +y), and two other fill proveniences at the center (-x, -y and +x, -y). The ordering along the third component conforms fairly well to an ordering based on within group sample size. While the technique does normalize to reduce the effects of large samples, it cannot, of course, correct the small sample size effect that rarer types (forms, tempers) are not likely to be present in smaller samples. This, in part, explains the clustering of samples on the Component 2-3 plot; middens and trash have large samples, floors have smaller ones. The fact that placement is also somewhat similar on the second component suggests that the deposit types have some cross-temporal similarity. Placement on the second component alone puts floors, other fill, and midden closer to others of the same category than to other points. The trash fill deposits are much more widely spread and bracket the floors (a finding similar to that for the A.D. 920-1020 and A.D. 1020-1120 groups). In summary, based on the simpler analyses performed and on prior knowledge, the principal components analysis does make some meaningful placements of groups, and serves to remind us that some of the differences between assigned groups are slight and that there are some within-group disparities.

The vessel form analysis again places the two midden groups close to one another on the first axis and fairly close on the third. Some of the placement on the first axis results from a gradient in the two most common forms, whiteware bowls and grayware jars. The midden deposits are at the mean or above for the percentage of bowls and below for those of grayware jars, and they lie at one extreme; the A.D. 1020-1040 trash fill and the A.D. 920-1020 and A.D. 1020-1120 floors are high in gray jars and low in bowls at the other extreme. While the A.D. 920-1020 trash fill is in a central group with all the remaining time-space groups, it is the closest of the groups to the floors and trash fill, once again demonstrating the similarity of those deposit types. The two early provenience groups (A.D. 820-920 trash fill and floors), as in the type plots, are placed with the intermediate group of points in the first by second and first by third component plots; the two points are close in the one-by-three map. Also, as with types, the forms in these groups were close to expected in the simple analysis. The lack of difference of the two putative time segments and thus their "reality" are again brought into question. It is difficult to assign archeological meaning to the third axis; its eigenvalue is low relative to the first and second axes.

The temper analysis also divides the proveniences into early and late with the exception of placement of the A.D. 820-

920 floors with the late groups on the left side of the plot. At face value, this is a misclassification, but the "misplaced" group, surprisingly enough, has the highest relative frequency of trachyte temper of any group. As noted, this is generally a late trait and it is basically on the frequency of the two most common tempers, undifferentiated sandstone and trachyte, that the first component is ordered. Thus, the "late" end contains high frequencies of trachyte temper and lower frequencies of sandstone temper. The second component in this analysis orders the groups quite well as to sample size, probably for the same reasons discussed above, with the exaggerating effect that the Tusayan and iron oxide sandstone tempers each comprise only 0.2% of the sample analyzed and that undifferentiated sandstone temper is 76%. The groups with higher principal Component 2 values also tend to contain more chalcedonic sandstone temper than the others; in part, this may be due to sample size as well, because middle samples are large and have been found to associate with this temper. This trend in principal Component 2 to exhibit more chalcedonic sandstone tempered material is far from perfect, reminding us again that these are multivariate point locations.

In an effort to understand the extent to which sample size enters into the second principal component (PC2), a number of orderings are shown on Table 2.46: by diversity index (H'), evenness (J), the number of temper categories in each time-space group (s), and raw counts (n). The groups for which the letters stand may be found in Tables 2.41 or 2.44.

Of the five groups less than zero on PC2, three are in the first five of H' and J, 4 are less than seven in s, and four are in the first four groups in terms of sample size. Groups G, D, and C are in the lower portions of all of the various orderings. These three groups have the highest relative frequencies of undifferentiated sandstone temper of all 11 groups. Clearly that fact produces low diversity and evenness values, and the relatively small n's in combination with

Table 2.46. Ordering for second principal component analysis.

Statistic	Group Order	
	Low	High
PC2	A, D, G, C, I (PC2=0), H, B, K, E, J, F	
H'	G (.419), D, C, E, K (.869), A, F, H, I, B, J (.696)	
J	G (.260), D, C, K, E (.423), H, F, J, I, B, A (.631)	
s	A (4), G, D (5), C (6), B E F I (7), H J K (8)	
n	A (34), G, D, C, B, I (146), H, F, K, J, E (1157)	

the high sandstone frequency lead to small s's. Significant Spearman's rank order correlations exist between the second principal component and three of the four measures listed, the exception being evenness (J). The strongest of the significant correlations is between Component 2 and n (r_s=.900), the weakest with H' (r_s=.654). As correlations also exist in pairings of H', J, n and s, it is not surprising that these also correlate with Component 2. This exercise demonstrates that elements contributing to the ordering given by principal components can be identified, but that a simple one-to-one identification of the component's "cause" cannot be made and supports the sample size interpretation of Component 2.

A comparison of the results of the analyses is instructive as to the relationship of these variables to time and within-site space. This is so because the grouping structure given to the data is derived from those dimensions although, as noted, there is some reason to question how well ordered some deposits are with respect to time. The eigenvalues of the principal components index the percentage of the variance in the sample explained by each component. In the case of the rough sort types, which presumably have the most direct relationship to time, the first component does give a rudimentary chronological ordering. This first component explains the highest percentage of variance of the three analyses, which conforms to the contention that the use of ceramic type as a typing variable (that is, time-space is the grouping variable compared across various typing variables) should be most closely related to time. The vessel form and temper analyses both have first components which explain less variance and second components which explain more variance than their counterparts in the rough sort type analysis. It has been shown that temporal ordering is present on the first temper axis, but that it is absent in the vessel form analysis, which seems to produce clearer space groupings than it does time groupings. The amounts explained by these two first components are very similar which, perhaps, is gratifying if it is taken to mean that time is more likely to explain variations in temper and provenience to explain variation in vessel form.

When the first two components of each analysis are combined, the variance explained is quite similar--from 64.5% (vessel form) to 72.3% (temper). Again, accepting the concept that the simplified interpretations of components presented are crudely correct, it can be said that space does enter into variability in ceramic type distributions, though to a lesser degree (13.1% in the second component) than in vessel form (first component=43.4%). Perhaps it is significant that while time grouping appears on this relatively important vessel form component (21.1% 2nd component), provenience still plays a role. Temper sample sizes become important (30.4% 2nd component) earlier than do form or type samples. Finally, form components remain larger than do type and temper components, though it is not possible to compare the temper values because they are based on eight components rather than eleven. This suggests that it may be more difficult to explain vessel form distributions in time and space than it is to explain type distributions (in other words, the vessel form eigenvalue percentages of variance explanation are more diverse and even H', 1.803 vs. 1.466, and J, 0.783 vs. 0.637, for form and type respectively).

In presenting a comparison such as this one, it must be stressed again that attributing a single dimension to any of the axes is a very broad simplification. Clearly, many things enter into the generation of each axis including sample size, typing variable composition, time and space. In choosing to characterize a component by one of these dimensions, it is only being said that one dimension is visible. The choices and their acceptance or rejection are somewhat subjective and are conditioned by other findings. That they do seem to work out lends credence to their meaning.

In short, these analyses do produce plots of groups that are useful, but their interpretation is hampered by the impossibility of fully understanding what goes into the placement of points. The analyses' utility, then, lies in first condensing many variables and corroborating trends and suspicions based on simpler inspections and second, serving as a correction or suggestion for incorrectly divided or minimally different groups.

Pithouse C, Kiva D, and Kiva E Comparisons within and between Structures

On the basis of Truell's recommendation, some further examination of ceramic distributions was made for three structures: Pithouse C, Kiva D, and Kiva E. These structures contain fairly intact deposits that represent different phases of occupation of the site. Kiva E and Pithouse C had discernible natural layers and were so excavated, but Kiva D was excavated in arbitrary levels. This brief analysis first examines the within-structure deposits for differences and then compares the deposits from the three structures. All of these manipulations use only sherds from within the defined layers or levels in each structure; unassigned sherds comprise from 22% (Kiva E) to 67% (Kiva D) of the total sample sherds from these proveniences. Some of the unassigned sherds are floor contact and floor feature sherds (mercifully, each structure has only one floor). These comparisons do not include the floor sherds. Only in Kiva E is the number of floor sherds considerable (Appendix E:Tables E.6-E.8). The culinary sherds inadvertently omitted from the analysis probably have their greatest impact in these intra-structure analyses (Appendix E). The following has been edited with regard to the impact of that addition and the tables have been updated (Appendix E:Tables E.6-E.8).

Pithouse C is in all respects the earliest of the three structures; it also has the most complicated stratigraphy. Some lumping of layers is necessary for testing in all three structures. In Pithouse C, the following larger groups were made:

1) Layers 1 and 2--both are aeolian, with some trash in Layer 2.

2) Layers 3, 4, 5, 6--these layers are largely trash, except Layer 6, which is aeolian. Layers 4 and 5 are intentional fill and Layer 3 is a dense trash layer.

3) Layers 9 and 10--these layers are floor fill. Layers 7 and 8 have been omitted. Layer 7 contains very few sherds and Layer 8 contributed no sherds to the detailed analysis sample. These two layers form a distinct stratigraphic break between Layer 6 and Layer 9,

Figure 2.23 a. *Sherd examples from Pithouse C by layer. Rows 1 and 2 from Layer AAA' (FS 4760), rows 3 and 4 from Layer A' (FS 5080), and rows 5 and 6 from Layer A (FS 5234).*

since Layer 8 contains burned roofing material (though not necessarily from the roof of Pithouse C). Even with this distinct break, little difference is present between Layers 9 and 10 and the upper fill (examples of sherds recovered from Pithouse C layers may be seen in Figure 2.23). A comparison of strictly the dense Layers 3-6 and Layers 9-10 does show a significant difference, which results mostly from the presence of relatively more later graywares in Layers 3-6 and relatively more redware in the floor fill. Proportions of early to late divisions should increase with layer or level number (that is, there should be more early sherds deeper in the structure). The graywares follow this nicely, excluding Layers 1 and 2, which have very few sherds. The two whiteware comparisons do not follow this, however; the mineral-painted ceramic proportions are distinctly reversed (leaving out Red Mesa Black-on-white), and the carbon-painted ceramics are similar in proportion from layer to layer. A significant difference is

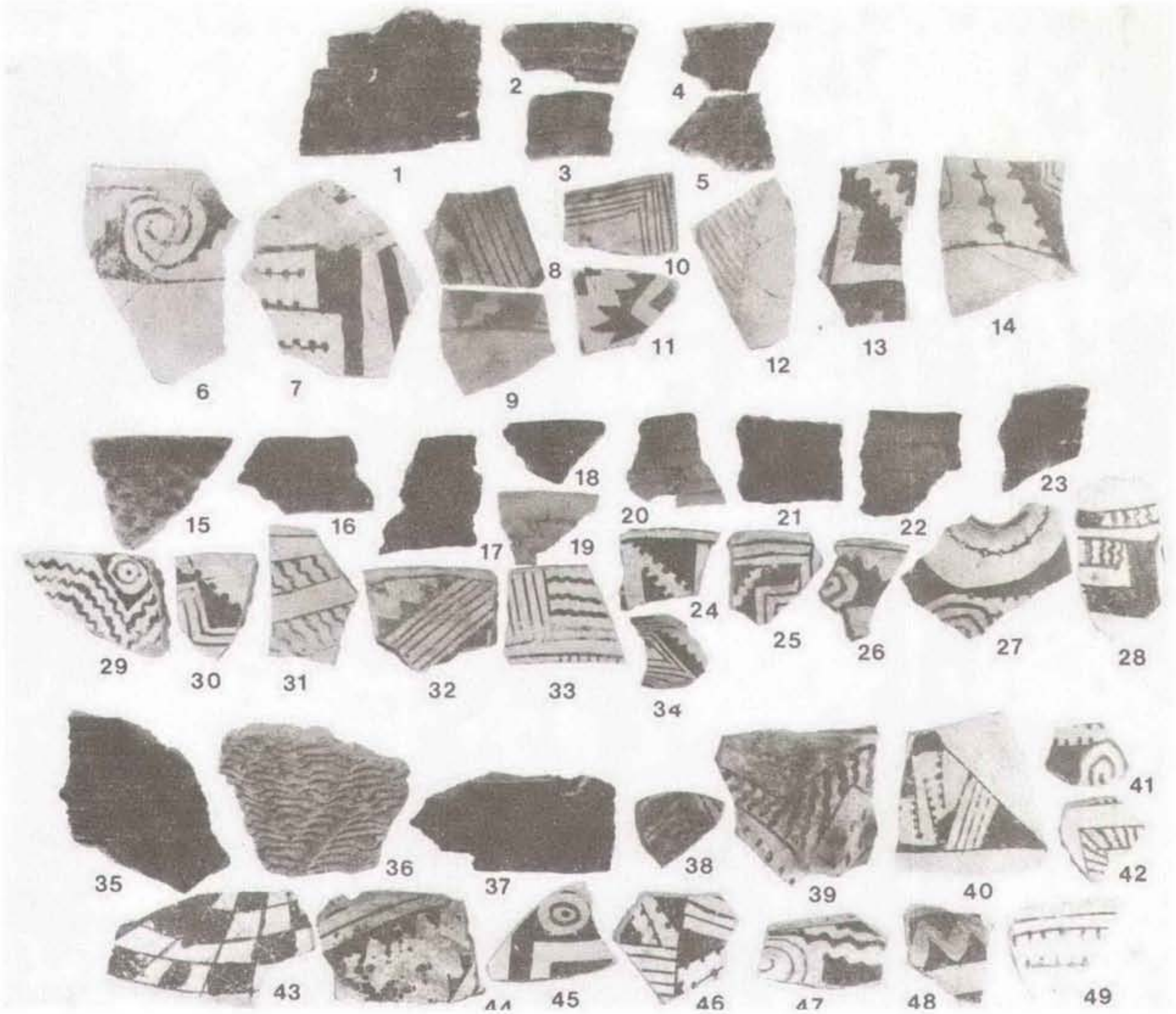


Figure 2.23 b. *Sherd examples from Pithouse C by layer. Rows 1 and 2 from Layer C (FS 5468), rows 3 and 4 from Layer F, floor fill (FS 3056), and rows 5 and 6 from the floor (FS 5455) and hearth (FS 5973).*

also generated by a test of vessel form by layer; the difference is mainly in grouped, very low frequency forms--pitcher, canteen, seed jar, and tecomate, which are scarce nearer the floor. Major forms are very similarly distributed between layers, except for a higher frequency of ladles in the floor fill. There is no significant difference in tempers between layers.

Kiva D's distributions confirm Truell's impressions of homogeneity of fill in this structure (sherd examples in Figure 2.24). Because of the apparent homogeneity, Kiva D levels were grouped into the stratigraphically more or less equal groups of Levels 1-3, 4-6 and 7-11 for testing. The single item that deviates from expected proportions is the presence of more redwares in the lowest lev-

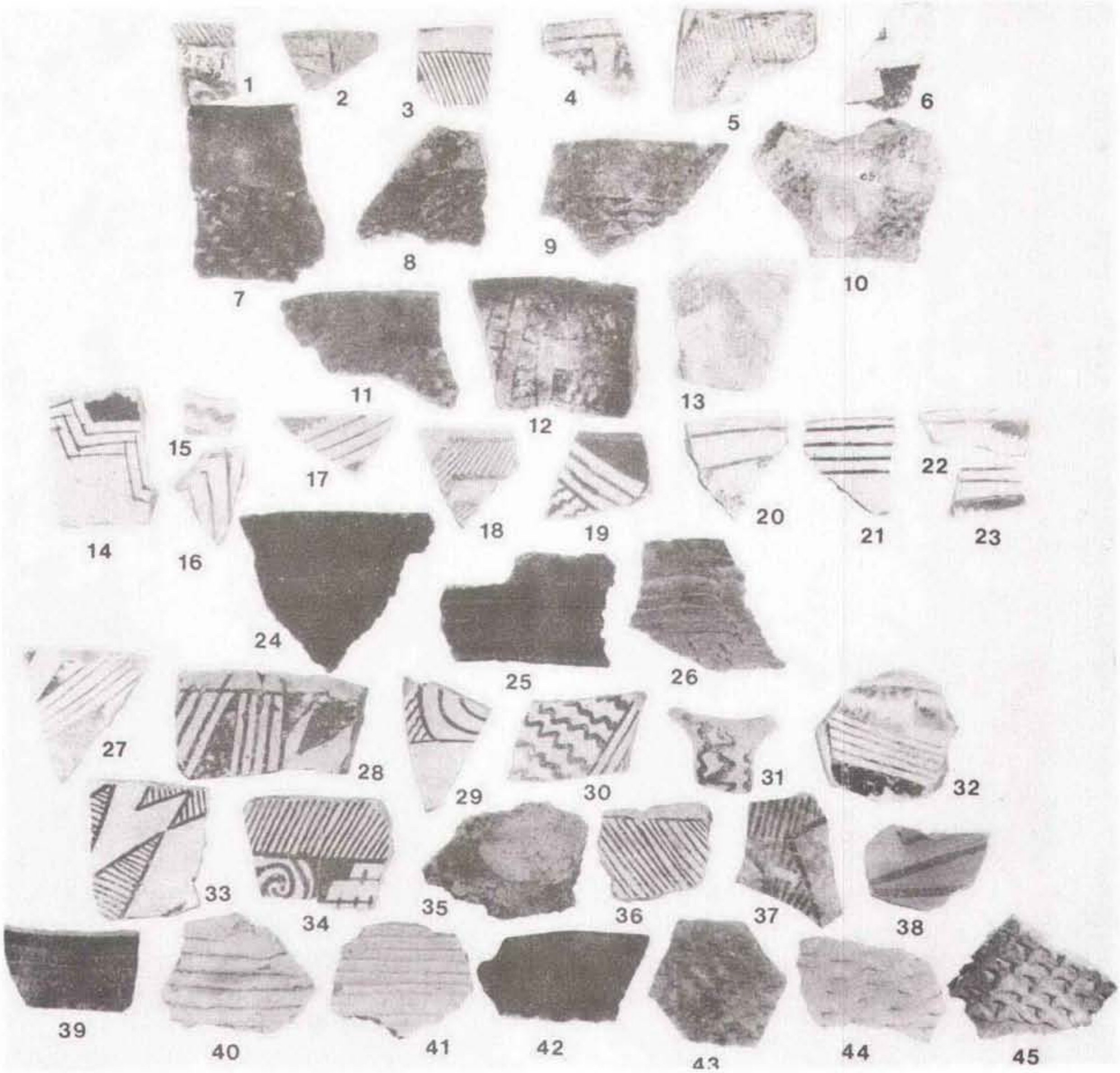


Figure 2.24. *Sherd examples from Kiva D by levels. Rows 2 and 2 from Microstratum 1, row 3 from Microstratum 2, rows 4 and 5 from Microstratum 3, rows 6, 7 and 8 from the floor.*

els, hinting at a pattern similar to that at Pithouse C. The similarity does not, however, extend to ladle distribution, which is very similar in all three level groups; the proportions of bowls to ladles in all of these Kiva D level groups, in fact, is similar to that for the floor fill in Pithouse C, suggesting that perhaps the trash fill of Pithouse C is anomalously low in ladles.

The layer groups test for Kiva E are:

1) Layers 1 and 2--disturbed aeolian-alluvial fill.

2) Layers 3 and 4--distinctly different, heavy trash fill.

3) Layers 5 and 6--constructional debris with trash and sandy floor fill respectively.

The number of floor sherds in Kiva E is substantial (Figure 2.25), and combining them with Layers 5-6 makes the Layer 3-4 and lowermost unit (Layers 5-6 plus floor sherds) sample sizes slightly more equitable. Tests of the floor sherds with the Layer 5-6 sherds show only one significant difference in vessel form, which stems largely from a paucity of gray jar sherds from the floor (Table 2.47). There is, however, a significant difference in ware distribution between the large Layer 3-4 group and the Layer 5-6 plus floor sherd group. All the expected value deviations suggest that the lower unit is earlier enough to register in the ceramics; the frequencies of earlier graywares, mineral-on-whites, and carbon-on-whites are all greater

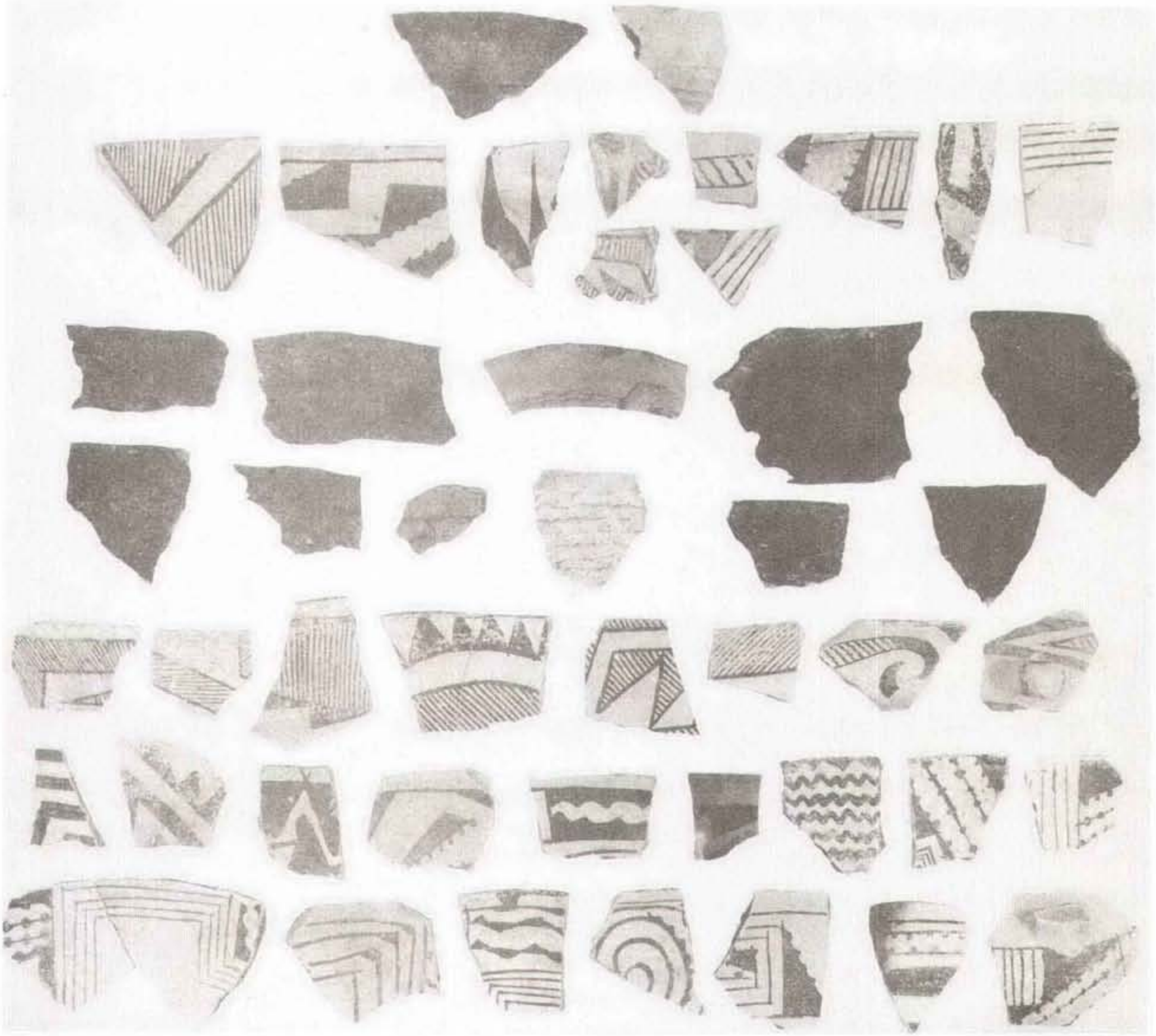


Figure 2.25 a. *Sherd examples from Kiva E by layer. Upper two rows from Layers 1 and 2 (FS 4341); remaining rows from Layer 3 (FS 4681).*

than expected in the lower unit, but quantities of all three are small.

In contrast with the association of graywares with room floors, all three structures show lower grayware jar percentages among the floor sherds than for the other levels, with the difference in Kiva E most marked (Tables 2.48B, 2.49B, and 2.50B). It is of interest that the percentage of grayware jars decreases through time as seen in these three structures (28.0 to 21.0 to 17.6%, corrected figures from Appendix E), as does the percent of grayware found on the floors. A plausible explanation for this occurrence is that grayware-related activities shifted toward the surface. This is, of course, not an entirely independent conclusion, nor really warranted by sample sizes, but it may be related to the larger, much discussed transition.

Forms, again, are very similarly distributed between layers--more markedly here than in Pithouse C or Kiva D. There is a single exception to this and that is the inordinately large number of white pitchers in Layers 3 and 4 of Kiva E. The lack of difference in type groups suggests that this inflated pitcher count

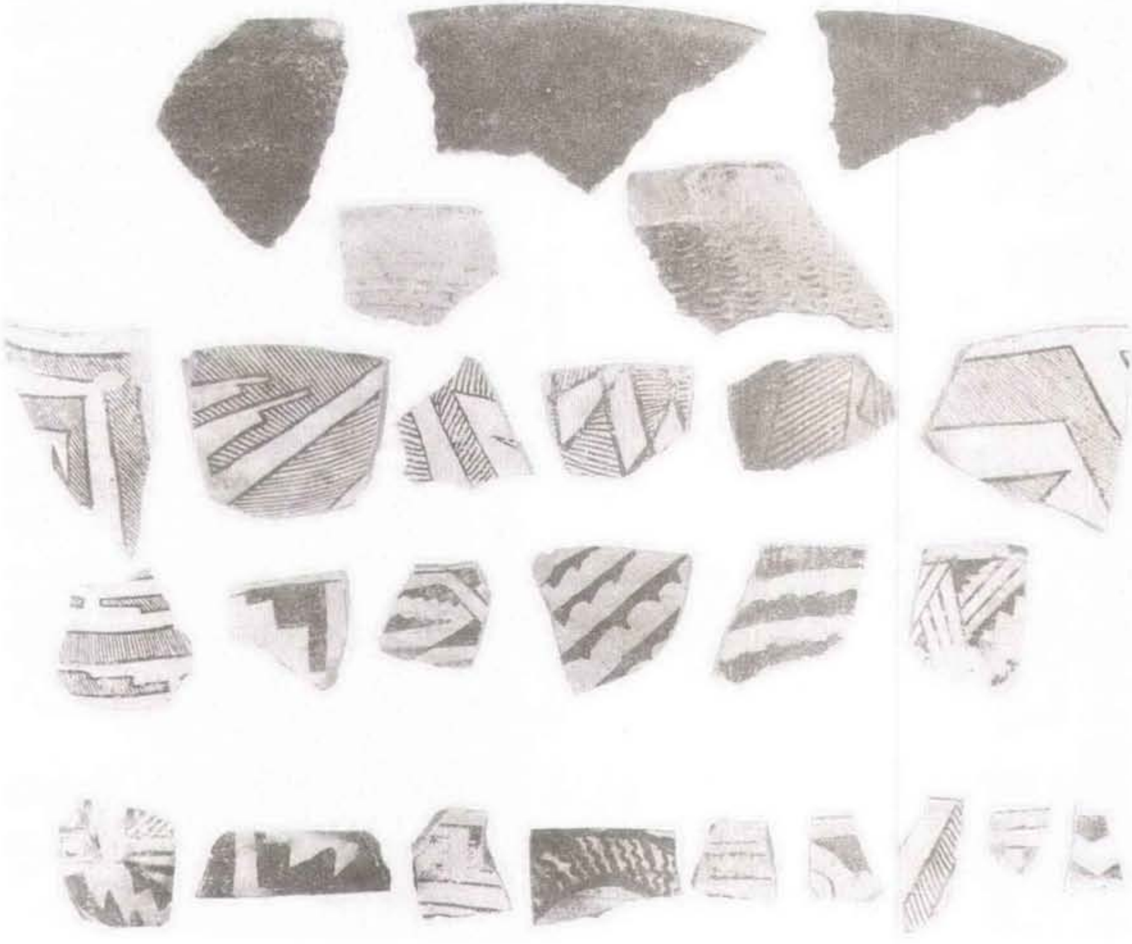


Figure 2.25 b. Sherd examples from Kiva E by layer. Upper three rows from Layer 4 (FS 5294); remaining two rows from Layer 5 (FS 6173).

Table 2.47. Chi-square results from within and between structure comparisons for Pithouse C, Kiva D, and Kiva E.

Table	Test Entries	n	Controlling Group	Dimensions	χ^2	df	p	C	Small Expected
PITH. C									
2.48A	Subdivided wares by lumped layers	559	-	3x9	22.872	16	.117	.198	11 cells<5 4 cells<1
	Ware groups except smudged by Layers 3-6, 9-10	521	42% Red Mesa 69% Layers 3-6	2x8	15.428	7	.031	.170	3 cells<5 none <2
2.48B	Bowls, ladles, closed, jar/ olla, grayware jar by 3 lumped layers	581	49% bowls 65% layers 3-6	3x5	16.837	8	.032	.169	3 cells<5 1 cells<1
2.48C	SS, Ch SS, all Tr, SJ temper by 3 lumped layers	589	78% sandstone 65% layers 3-6	3x4	11.846	6	.065	.140	4 cells<5 1 cell <5
KIVA D									
2.49A	Gray, white, red/smudged by 3 lumped levels	419	76% whiteware 61% levels 1-3	3x3	10.503	4	.033	.156	2 cells<5
2.49B	Bowls, ladles, closed, jar/ olla, grayware jar by 3 levels	442	49% bowls 61% levels 1-3	3x5	14.201	8	.077	.176	1 cell <5
2.49C	SS, Ch SS, SJ, Tr, Tr+SS by 3 lumped levels	461	74% sandstone 60% levels 1-3	3x5	12.733	8	.121	.164	4 cells<5
KIVA E									
2.50A	Subdivided wares by layers 3-4, 5-6+ floor sherds	884	36% Red Mesa 81% layers 3-4	2x9	16.401	8	.037	.134	2 cells<5
	Early M/w, Red Mesa B/w, later M/w, C/w by Layers 5-6, floor sherds	182	45% later M/w	2x5	6.693	4	.153	.188	2 cells<5
2.50B	Bowls, ladles, all w closed grayware jar by 3 lumped layers	1,077	49% bowls 85% layers 3-4	3x4	1.469	6	.962	.034	
	Same forms by Layers 5-6, floor sherds	221	56% bowls	2x4	13.869	3	.003	.243	
2.50C	SS, Ch SS, Tusayan SS, SJ, Tr+SS by Layers 3-4, 5-6+ floor	1,210	78% sandstone 80% layers 3-4	2x6	2.851	5	.723	.045	2 cells<5
	SS, Ch SS, Tr, Tr+SS by Layers 5-6, floor sherds	228	78% sandstone	2x4	5.839	3	.120	.158	2 cells<5

Table 2.47. (continued)

Table	Test Entries	n	Controlling Group	Dimensions	χ^2	df	p	C	Small Expected
THREE STRUCTURE COMPARISONS									
2.48-2.50A	Subdivided wares by all sherds from assigned strata	1,843	47% Kiva E	3x9	152.369	16	.000	.276	
2.48-2.50B	Bowls, ladles, canteens/seed jars, pitchers, ollas, white jars, red bowls, gray jars by 3 structures	2,118	51% Kiva E 49% bowls	3x8	79.742	14	.000	.190	
2.48-2.50C	SS, Ch SS, iron bearing SS, SJ, Tr, Tr+SS by three structures	2,199	77% sandstone	3x6	18.045	10	.054	.090	1 cell <5

The above three tests use only sherds from stratigraphic units that were assigned numbers; floor sherds are not included.

is not due to a typological anomaly. An examination of expected values for Layers 5 and 6 shows that the observed early grayware is more than expected, Red Mesa Black-on-white less, later carbon-painted ceramics more, and later mineral-painted wares more. Thus, the ambiguity between "earlies" and "lates" between layers within the structure is evident if early:late proportions are examined following the expected stratigraphic progression for graywares and carbon-painted wares, but not mineral-painted wares.

Within structures, then, grouped types on the whole conform poorly to the stratigraphic ordering expected. The most abundant types--the mineral-painted wares--conform the least. This may be attributed to several things:

1) The span of filling of the structures was short enough that little visible ceramic change occurred; that the grayware and carbon-painted wares seem more sensitive shows that this time factor is not a strong one.

2) The "late mineral-on-white" group includes the "type" PII-III mineral-on-white, which easily encompasses unidentifiable Red Mesa Black-on-white sherds, early Red Mesa Black-on-white, and perhaps some earlier types as well. Removal of that group greatly reduces sample sizes, <u>but</u> no change in relative proportions results.

3) To some degree, the mineral-painted wares may be less indicative of temporal change.

4) Once again, mixing of deposits may have influenced these results.

Having seen that there is little difference in form, type, or temper in the ceramic assemblages from these three structures, it is reasonable to compare whole structure contents (again using only items from identified layers). On this basis, significant differences between structures are present in forms and wares (Table 2.47). Proportional relationships of early to late groups seriate the three structures as the scarce absolute dates would suggest they should be ordered:

1) Pithouse C (A.D. 785$\pm$42, archaeomagnetic date from the floor).

2) Kiva D (A.D. 1000$\pm$40, archaeomagnetic date from Pit Structure F which underlies Kiva D).

3) Kiva E (A.D. 1085$\pm$65 C^{14} from the hearth).

The ratio of early mineral-on-white to late mineral-on-white declines through "structural time," as does the ratio of Red Mesa Black-on-white to late mineral-on-white. This suggests the temporal scale at which the mineral-painted types may be sensitive. The grayware ratios show the marked change and only in the graywares is the early group larger in size than the later group. Contrary to the within-structure conformance of the carbon-painted wares, Kiva D has a higher ratio of early to late items in this group than does Pithouse C. Kiva D also has the highest ratio of later mineral-painted wares:later carbon-painted wares, which fits with the conventional wisdom that carbon-painted wares tend to be later than mineral-painted wares in the Chaco Canyon sequence.

Points contributing to the behavior of these ratios probably include:

1) The division of graywares into early and late (see distributions in the time dimension above) puts the terminal date for "early" later than it does for

Table 2.48. Pithouse C ceramic distributions by lumped layers.[a]

	Layers 1-2	Layers 3-6	Layers 9-10	Floor	Total
A. TYPES					
Plain gray	1	26	15	1	43
Lino gray	0	3	0	0	3
Wide neckbanded	4	16	11	2	33
Narrow neckbanded	2	14	9	0	25
Neck corrugated	2	3	0	0	5
PII corrugated	0	12	7	0	19
Unident. corrugated	1	32	2	0	35
Polished BMIII-PI M/w	0	4	1	0	5
Unpol. BMIII-PI M/w	0	1	0	1	2
Early Red Mesa B/w	2	14	4	2	22
Red Mesa B/w	16	153	67	10	246
Puerco B/w	0	3	0	0	3
Gallup B/w	1	0	1	1	3
Exotic M/w	0	3	1	0	4
PII-III M/w	4	64	29	4	101
BMIII-PI Pol. C/w	0	4	1	0	5
Chuska, Red Mesa design	1	2	3	1	7
Chuska C/w	0	2	3	0	5
PII-III C/w	0	7	3	0	10
Unidentified whiteware	4	26	10	1	41
Decorated redware	1	2	4	1	8
Plain red	0	0	2	0	2
Polished smudged	1	3	0	0	4
TOTAL	40	394	173	24	631

Layer 7 = 11 sherds. No layer assignment = 478. Total 1,120.
Absent types: Lino Fugitive, polished tan-gray, PII-III corrugated, PIII corrugated, Escavada Black-on-white, Chaco Black-on-white, BMIII-PI unpolished Carbon-on-white, Chuska Black-on-white, Tusayan Carbon-on-white, Chaco-McElmo Black-on-white, Mesa Verde Black-on-white.
[a] This table is updated by Appendix E, Table E.6, to show 33 additional graywares.

Table 2.48. (continued)

	Layers 1-2	Layers 3-6	Layers 9-10	Floor	Total
B. VESSEL FORM					
White bowl	15	194	76	14	299
Ladle	4	22	18	0	44
Pitcher	1	6	2	0	9
Canteen	1	0	0	1	2
Seed jar	1	1	0	0	2
Tecomate	1	2	0	0	3
Olla	0	1	4	1	6
Whiteware jar	5	50	22	2	79
Duck pot	0	0	1	0	1
Miniature	0	2	0	0	2
Effigy	0	3	0	1	4
Redware bowl	1	1	3	1	6
Smudged bowl	1	3	0	0	4
Grayware jar	10	102	43	3	158
TOTAL	40	387	169	23	619

Layer 7 = 11. Unknown forms = 23. No layer assignment = 467.
Absent forms = gourd jar, cup, pipe, red jar, and grayware pitcher.

	Layers 1-2	Layers 3-6	Layers 9-10	Floor	Total
C. TEMPER					
Unidiff. sandstone	33	303	126	16	478
Chalcedonic sandstone	2	24	12	0	38
Magnetitic sandstone	0	6	0	0	6
San Juan igneous	1	3	8	2	14
Trachyte	0	30	17	5	52
Trachyte + sandstone	2	22	6	1	31
Unidentified igneous	2	2	0	9	4
TOTAL	40	390	169	24	623

Layer 7 = 11. Unobservable temper = 10.
No layer assignment, known temper, not floor = 476.
Absent tempers = Tusayan sandstone, iron oxide bearing sandstone.

Table 2.49. Kiva D ceramic distributions by lumped levels.[a]

	Levels 1-3	Levels 4-6	Levels 7-11	Floor	Total
A. TYPES					
Plain gray	2	1	0	1	4
Lino gray	1	1	0	0	2
Polished tan-gray	0	1	0	0	1
Wide neckbanded	14	1	1	1	17
Narrow neckbanded	11	4	4	0	19
Neck corrugated	4	0	0	0	4
PII corrugated	14	11	5	0	30
PII-III corrugated	2	1	0	0	3
PIII corrugated	3	0	0	0	3
Unident. corrugated	5	1	0	1	7
Polished BMIII-PI M/w	3	2	0	0	5
Unpol. BMIII-PI M/w	4	2	0	0	6
Early Red Mesa B/w	8	1	1	0	10
Red Mesa B/w	98	29	24	2	153
Escavada B/w	0	0	1	1	2
Puerco B/w	8	2	2	0	12
Gallup B/w	34	16	12	6	68
Exotic M/w	3	1	5	1	10
PII-III M/w	32	10	15	5	62
BMIII-PI Pol. C/w	0	0	1	0	1
Chuska, Red Mesa desn.	3	1	2	0	6
Chuska B/w	1	0	1	0	2
Chuska C/w	1	1	0	0	2
Tusayan C/w	1	0	0	0	1
PII-III C/w	2	0	1	0	3
Unident. whiteware	24	10	10	0	44
Decorated redware	4	1	4	0	9
Polished smudged	0	2	2	0	4
TOTAL	282	99	91	18	490

Level 98 = 33.
No level assignment, not floor = 458.
Absent types--Lino Fugitive, Chaco Black-on-white, BMIII-PI unpolished Carbon-on- white, Chaco-McElmo Black-on-white, Mesa Verde Black-on-white, plain red, and brownware.

Table 2.49. (continued)

	Levels 1-3	Levels 4-6	Levels 7-11	Floor	Total
B. VESSEL FORM					
White bowl	140	39	38	11	228
Ladle	32	11	11	0	54
Pitcher	7	3	6	1	17
Canteen	2	0	1	0	3
Seed jar	5	0	0	0	5
Tecomate	1	0	0	0	1
Olla	11	2	4	0	17
Whiteware jar	17	19	11	3	50
Effigy	0	2	0	0	2
Redware bowl	3	0	3	0	6
Smudged bowl	0	2	2	0	4
Redware jar	0	1	1	0	2
Grayware jar	53	19	10	2	84
Grayware pitcher	1	1	0	0	2
TOTAL	272	99	87	17	475

Level 98 = 33.
Unknown form = 20. No level assignment = 453.
Absent forms = gourd jar, cup, duck pot, miniature, and pipe.

	Levels 1-3	Levels 4-6	Levels 7-11	Floor	Total
C. TEMPER					
Undiff. sandstone	213	65	64	15	357
Chalcedonic sandstone	11	7	1	0	19
Tusayan sandstone	1	0	0	0	1
Magnetitic sandstone	1	0	0	0	1
San Juan igneous	5	3	7	1	16
Trachyte	30	14	9	2	55
Trachyte + sandstone	17	9	7	0	33
Unidentified igneous	1	1	2	0	4
TOTAL	279	99	90	18	486

Level 98 = 33.
Unobservable temper = 5. No level assignment = 457.
Absent temper is iron oxide bearing sandstone.

[a] This table is updated by Appendix E, Table E.7, to include 22 omitted graywares.

Table 2.50. Kiva E ceramic distributions by lumped layers.[a]

	Layers 1-2	Layers 3-4	Layers 5-6	Floor	Total
A. TYPES					
Plain gray	0	10	1	0	11
Lino gray	0	3	2	0	5
Lino fugitive red	0	0	1	0	1
Polished tan-gray	0	1	0	0	1
Wide neckbanded	0	4	1	1	6
Narrow neckbanded	0	6	2	1	9
Neck corrugated	0	4	2	0	6
PII corrugated	2	55	8	2	67
PII-III corrugated	1	24	3	0	28
PIII corrugated	0	10	3	0	13
Unident. corrugated	3	14	1	0	18
Polished BMIII-PI M/w	0	4	1	3	8
Unpol. BMIII-PI M/w	0	5	0	3	8
Early Red Mesa B/w	0	7	1	1	9
Red Mesa B/w	10	263	28	29	330
Escavada B/w	0	14	0	1	15
Puerco B/w	2	68	4	2	76
Gallup B/w	11	114	18	16	159
Chaco B/w	0	13	0	1	14
Exotic M/w	5	36	8	8	57
PII-III M/w	6	158	20	20	204
BMIII-PI Pol. C/w	0	2	2	1	5
BMIII-PI Unpol. C/w	0	1	0	0	1
Chuska, Red Mesa desn.	0	5	1	1	7
Chuska B/w	0	6	1	1	8
Chuska C/w	0	9	6	1	16
Tusayan C/w	2	17	2	1	22
PII-III C/w	0	10	3	1	14
Mesa Verde B/w	0	1	0	0	1
Unident. whiteware	2	87	9	8	106
Decorated redware	1	25	3	3	32
Polished smudged	1	19	3	4	27
Brownware	0	3	0	0	3
TOTAL	46	998	134	109	1,287

Total = 1,513.
No layer assignment, not floor = 226.
Absent types--Chaco McElmo, plain red.

Table 2.50. (continued)

	Layers 1-2	Layers 3-4	Layers 5-6	Floor	Total
B. VESSEL FORM					
White bowl	23	447	57	67	594
Ladle	5	114	15	11	145
Pitcher	1	59	3	4	67
Canteen	0	8	1	2	11
Seed jar	0	7	0	2	9
Tecomate	0	9	4	0	13
Olla	0	25	3	1	29
Whiteware jar	6	119	18	8	151
Duck pot	0	4	0	0	4
Miniature	0	6	1	0	7
Effigy	0	5	0	0	5
Pipe	0	2	1	0	3
Redware bowl	1	20	3	3	27
Smudged bowl	1	19	3	4	27
Grayware jar	6	123	21	4	154
Grayware pitcher	0	1	0	0	1
TOTAL	43	968	130	106	1,247

Unknown form = 40.
No layer assignment = 226.
Absent forms--gourd jar, cup, red jar.

	Layers 1-2	Layers 3-4	Layers 5-6	Floor	Total
C. TEMPER					
Undiff. sandstone	35	762	90	87	974
Chalcedonic SS	1	40	5	4	50
Tusayan sandstone	2	16	2	1	21
Iron oxide SS	1	4	0	1	6
Magnetetic SS	0	9	0	1	10
San Juan igneous	1	19	3	3	26
Trachyte	2	76	16	6	100
Trachyte + SS	4	60	14	6	84
Unidentified igneous	0	7	2	0	9
TOTAL	46	993	132	109	1,280

Unobservable temper = 10.
No layer assignment = 223.
[a] This table is updated by Appendix E, Table E.8, to include 106 omitted graywares.

either of the decorated wares; hence the failure of "early" carbon-painted wares and mineral-painted wares to outnumber later ones even in Pithouse C.

2) The high proportion of later mineral-on-white to later carbon-on-white in Kiva D may result from its temporal placement prior to the increase in carbon-painted sherds late in the sequence, but late enough to contain substantial later mineral-on-white. Pithouse C has so few items from either of these groups that it should be excluded from the comparison.

The chi-square test of wares from the three pitstructures shows a significant difference with a high coefficient of contingency (Table 2.47). As would be predicted by the ratio results above, statistically expected values within the table conform quite well to ceramic/chronological expectations. Kiva D is generally intermediate, with Pithouse C and Kiva E taking up the "correct" extremes. Red Mesa Black-on-white is more frequent than expected in Pithouse C and less in Kiva E showing, again, that it is probably the "purest" Red Mesa Black-on-white fill. The Kiva E fill postdates Red Mesa Black-on-white's heyday, although Red Mesa Black-on-white is still the predominant type. The largest deviations from expected are in the early graywares (high in Pithouse C, low in Kiva E), the late mineral-on-whites (the reverse of early graywares), and later carbon-on-whites (high in Kiva E, low in both Pithouse C and Kiva D), which corroborate the above interpretation of Kiva D's intermediate position.

The forms of vessels from the three structures are also significantly different (Tables 2.47-2.50). Taking Pithouse C, Kiva D, and Kiva E as a sequence, the relative frequency of ladles is considerably less at first. Conversely, the assemblages from the three structures show steady decreases in the frequencies of grayware jars. The numbers of whiteware pitchers and redware bowls increase, and whiteware jars, and especially bowls, remain fairly constant throughout the occupation. The increase in the frequency of pitchers has been shown typologically elsewhere. The decrease in the frequency of grayware jars may be related to the increased use of "special" whiteware jars (ollas), which suggests that the use of grayware as well as whiteware may have become more specialized, use rate and durability being equal. Still, the decrease in grayware jars seems somewhat anomalous, due to some combination of factors, including disposal practice and use patterns late in the site's occupation.

The differences in tempers among ceramics from Pithouse C, Kiva D, and Kiva E are considerably less than the differences among wares and forms. The probability that different ceramic tempers are distributed randomly in the structures is less than .10, but greater than .05. Type series trends lead us to expect certain temporal changes in temper (certain temporal trends?), but these three lots do not conform to some of these patterns. Four trends are noted:

1) Steady predominance of undifferentiated sandstone temper--expectation met.

2) Decrease in chalcedonic cement sandstone temper--expectation met, but decrease not as marked as expected.

3) Early emphasis on San Juan igneous temper followed by low but continuous presence. The distribution is

counter to this trend in that the assemblage from Kiva D has the highest relative frequency of this temper. Pithouse C is, perhaps, a bit too late to contain ceramics indicating the early spurt of San Juan igneous temper seen in assemblages from 29SJ 628 and 29SJ 629. Kiva E, while containing later carbon wares, is not quite late enough to contain evidence of the late rise in this temper type seen at 29SJ 389 and 29SJ 633 (Toll et al. 1980). Although ceramics from Kiva D do have more of this temper than those from the other two structures, the difference is not a large one (Pithouse C 2.2%, Kiva E 2.0%, Kiva D 3.3%).

4) A steady increase in the occurrence of trachyte temper. Once again, ceramics from Kiva D contain the highest relative frequency. Kiva E contains practically the same relative quantity of trachyte-tempered material as does Pithouse C (14.8% vs. 14.3% [corrected]); the low frequency of graywares in Kiva E surely contributes to the low overall frequency of trachyte temper (but see Appendix E).

Kiva E is distinguished by containing 1.7% of the typologically generated temper, Tusayan sandstone, which is absent in Pithouse C, and 0.3% (1 sherd) in Kiva D. This occurrence in Tusayan whiteware bowls pins this deposit into a fairly specific time slot sometime in the late eleventh century, because these types seem to have occurred in any abundance only at that time. It places Kiva E as a late deposit--somewhat earlier than the late mix deposit in Kiva 10 at Pueblo Alto, which contains very little Tusayan whiteware (Toll et al. 1980:109), and later than the earlier eleventh century deposit in Kiva D. The closest match at Pueblo Alto is in Kiva 16, which contains a similar increased frequency of Tusayan Whiteware (Toll and McKenna 1987). Although in many other respects the ceramic differences between assemblages from Kiva D and Kiva E are minimal, this singular occurrence of Tusayan sherds in Kiva E does tend to set it apart.

Whole Vessels

Table 2.51 presents the whole and restored vessels recovered from 29SJ 627 (Figures 2.26-2.34). It demonstrates the scarcity of intact vessels on floors and the propensity for whole vessels to be found in burials. Although the latter is a primary deposit context, it is likely to be secondary in terms of vessel function. The occurrence of bowls among all whole vessels is about 40%, which is considerably less than the occurrence of bowls among the sampled sherds. However, of the burial vessels, 60% are bowls, which is slightly higher than the sample occurrence. Thus, a preference for bowls with burials is suggested. The only whole grayware vessel found in a burial is a miniature, although a portion of a larger grayware jar was found with Burial 2. The whiteware forms, ladle and pitcher (one each), are easily thought of as personal items; but the inclusion of a Red Mesa Black-on-white olla with Burial 1 is perhaps unusual. Burial 1, a female, has by far the largest number of vessels associated with it (five) and also had a cache of 10 projectile points and a parrot-shaped concretion (Figure 2.26). Truell notes that a layer of clay was intentionally deposited on top of Burial 1 at interment. The ceramic associations and sex of this individual suggest a possible involvement with ceramics, but the goods certainly do not entail a potter's complete kit.

There are considerably fewer ceramics and other goods accompanying Burial 2, an adult male about 30 years old at death than were found with Burial 1; they consist of only a bowl and a seed jar fragment (Figure 2.27). Burials 3 and 5, both infants, have ceramic grave goods at least equivalent to those of Burial 2 (Figure 2.28, not all vessels shown). Burial 3 had three whole vessels associated with it, while Burial 5 contained a bowl, a ladle with no handle, and a large corrugated sherd. It is noteworthy that three of the four burials with ceramic offerings included broken vessels and that both of the infant burials had miniature vessels associated with them.

Four out of the five whole ollas recovered were found in primary contexts; two were built into storage cists. The high relative frequency of ollas in the whole vessel count, and especially among the primary context vessels, indicates that their expected use was in a stationary position. Because only nine of the whole vessels not associated with burials are from floors, and because no provenience has more than one floor vessel, it is not possible to discuss feature function based on the whole vessels found in primary contexts. Some associations may be noted, however, if a leap of faith is made to view ceramics from the fill as well as the floor as indicative of function. As was found in the time-space sherd distributions, grayware jars are associated with living rooms and with kiva fill (note that most of the whole grayware jars are later types). Bowls, also, were found in living areas; in structures only.

The make-up of the whole vessel assemblage (Table 2.51C) exhibits several relative frequencies that are different from those in the overall sample. These differences show a number of things about the analysis, deposition at the site and ceramic survival, and curation.

1) Deposition and survival of whole vessels favors later vessels, which can be seen by the fact that while types contemporary with Red Mesa Black-on-white constitute 56% of the temporal types, only 42% of the whole vessels fall into this category. Post-Red Mesa Black-on-white types are 30% of the whole sample and 45% of the whole vessels; pre-Red Mesa Black-on-white types are about 13% of both assemblages (a significant chi-square is generated mostly by the discrepancy in the later types). Earlier types are better represented in burials, with later types less so. Thus, unless a vessel is removed from use by placing it in a burial, the likelihood is that it will be "used up"; further, there is a suggestion that some vessels placed with burials may already be largely non-functional for the living.

2) Several relatively rare types are found as "whole" vessels and, as such, form larger percentages of the whole vessel group than do those types in the entire sample. This is true mainly of the decorated wares of which vessels from the following types were recovered: three Tusayan whiteware, three San Juan whiteware, two San Juan redware, two polished smudged, a brownware, and six Chuska whitewares (1.5-9.0% of the whole vessel group). Each of these types is rare in the whole sample (Table 2.2). Graywares with igneous temper are equal in number to sandstone-tempered graywares; igneous-tempered

Table 2.51A. Provenience, context, orifice and volume of whole vessels at 29SJ 627.

Provenience	Floor	Context	Vessel	Temper	Orifice	Volume
Pithouse A						
Antechamber	1	Fill	Early Red Mesa B/w bowl	Fine SS <half sherd	150	718
Pithouse B						
Fill	1	Fill	Red Mesa B/w bowl	Coarse SS <half sherd	200	1,796
Pithouse C						
Test Trench 24	1	Fill	Newcomb B/w bowl	Trachyte + SS	200	-
Storage Pit 6	1	Structure	Tunicha B/w olla	Trachyte	90	25,130
Level 4	1	Fill	Deadman's B/r bowl	San Juan igneous	140	644
Layer 10	1	Fill	Red Mesa B/w ladle	Medium SS > half sherd	90	105
Layer 4	1	Fill	Tunicha B/w bowl	Trachyte	210	-
Pit Structure F						
Fill	1	Fill	Red Mesa B/w bowl	Medium SS >half sherd	130	279
Level 5	1	Fill	Red Mesa B/w bowl	Medium SS >half sherd	200	4,578
Floor	1	Contact	Red Mesa B/w ladle	Fine SS >half sherd	110	210
Room 1						
Burial 1	2	Contact	Kiatuthlanna B/w bowl	Medium SS with sherd	190	2,033
Burial 1	2	Contact	Red Mesa B/w bowl	Fine SS	215	2,280
Burial 1	2	Contact	Early Red Mesa B/w bowl	Medium SS	180	1,100
Burial 1	2	Contact	Red Mesa B/w pitcher	Medium SS <half sherd	80	1,190
Burial 1	2	Contact	Red Mesa B/w olla	Chalcedonic SS <half sherd	---	--

Table 2.51. (continued)

Provenience	Floor	Context	Vessel	Temper	Orifice	Volume
Room 4						
Storage Jar 1	1	Structure	Red Mesa B/w olla	Medium SS with sherd	---	--
Firepit	2	Contact	Kiatuthlanna B/w ladle	Medium SS <half sherd	65	40
Room 5						
Floor	1	Contact	PII corrugated jar	Trachyte	---	--
Burial 5	1	Structure	Mancos B/w ladle	Coarse SS with sherd	125	510
	1	Structure	PII corrugated miniature	Very coarse SS	35	110
Layer 3, Level 2	2	Fl. fill	Red Mesa B/w bowl	Medium SS <half sherd	130	886
Room 6						
Floor	1	Contact	Chaco B/w olla	Medium SS with sherd	80	14,000
Level 1	1	Fill	Chaco B/w olla	Medium SS with sherd	85	--
Floor	2	Contact	Nava B/w cup	Trachyte <half sherd	90	270
Room 8						
Layer 2 Level 2	1	Fill	PII-III corrugated jar	Medium SS with sherd	230	
Room 9						
Burial 2	2	Contact	Red Mesa B/w bowl	Medium SS with sherd	110	350
Layer 4 Level 1	3	Fill	Chaco B/w ladle	Fine SS with sherd	85	100

Table 2.51. (continued)

Provenience	Floor	Context	Vessel	Temper	Orifice	Volume
Room 11						
Floor	1	Contact	Gallup B/w seed jar	Trachyte + SS	155	6,840
Layer 2 Level 2	3	Fill	Neck corrugated jar	Trachyte	205	--
Room 14						
Layer 1 Level 3	1	Fl. fill	Deadman's B/r seed jar	San Juan w/Hb + SS	110	2,344
Room 15						
Layer 1 Level 2	1	Fill	PII corrugated jar	Trachyte	320	--
Room 16						
Level 1	1	Fill	Forestdale Smudged bowl	Medium SS	210	1,627
Level 2	1	Fill	PII corrugated jar	Medium SS <half sherd	240	--
Layer 1 Level 1	1	Fill	Chaco B/w pitcher	Medium SS with sherd	70	--
Layer 1 Level 1	1	Fill	Mancos ?? B/w pitcher	Igneous + SS	95	1,900
Layer 6	2	Fill	Red Mesa B/w miniature seed jar	Coarse SS >half sherd	40	111
Room 17						
Layer 1 Level 1	1	Fill	Forestdale Smudged bowl	Fine SS >half sherd	100	160
Layer 1 Level 1	1	Fill	Red Mesa B/w ladle	Trachyte half sherd	70	77
Room 21 (Plaza)						
Level 2	1	Fill	PII corrugated jar	Very coarse sandstone	240	--

Table 2.51. (continued)

Provenience	Floor	Context	Vessel	Temper	Orifice	Volume
Room 22						
Floor	1	Contact	Neck corrugated jar	Trachyte	250	--
Room 25						
Level 1	1	Fill	Early Red Mesa B/w bowl	Medium SS with sherd	195	1,120
Kiva D						
Surface	1	Surface	Toadlena B/w ladle	Trachyte + SS >half sherd	---	--
Surface	1	Surface	Early Red Mesa B/w ladle	Coarse Ss	80	71
Fill	1	Fill	Early Red Mesa B/w bowl	Coarse SS >half sherd	205	1,589
Level 1	1	Fill	Newcomb B/w bowl	Trachyte + SS <half sherd	180	1,404
Level 1	1	Fill	Red Mesa B/w ladle	Medium SS >half sherd	100	211
Level 4 Test Trench 25	1	Fill	PII-III corrugated jar	Trachyte	210	--
Level 8	1	Fill	Red Mesa B/w bowl	Fine SS >half sherd	110	200

Table 2.51. (continued)

Provenience	Floor	Context	Vessel	Temper	Orifice	Volume
Kiva E						
Test Trench 29	1	Fill	Chaco B/w pitcher	Medium SS <half sherd	85	--
Vent Recess 1	1	Structure	Mancos B/w bowl	Medium SS with sherd	245	2,577
Layer 3	1	Fill	Puerco B/w canteen	Coarse SS > half sherd	40	2,470
Layer 3	1	Fill	Plain Brownware miniature cup	Fine SS	40	12
Layer 3 Level 3	1	Fill	Red Mesa B/w bowl	Medium SS >half sherd	75	63
Layer 4	1	Fill	Gallup B/w bowl	Medium SS >half sherd	310	5,435
Layer 4	1	Fill	Black Mesa B/w bowl	Medium SS	205	--
Layer 4	1	Fill	Black Mesa B/w bowl	Medium SS	220	3,762
Layer 4	1	Fill	Chuska B/w ladle	Trachyte	100	--
Layer 4	1	Fill	PII corrugated jar	Very coarse SS	235	--
Layer 4	1	Fill	PII corrugated jar	Chalcedonic SS	---	--
Layer 5	1	Fill	Whiteware bowl	Coarse SS >half sherd	125	260
Layer 5	1	Fill	Black Mesa B/w bowl	Medium SS	215	--
Layer 5	1	Fill	PII corrugated jar	Trachyte jar	---	--
Ramada						
Level 1	1	Fill	Early Red Mesa B/w canteen	Fine SS	---	--

Table 2.51. (continued)

Provenience	Floor	Context	Vessel	Temper	Orifice	Volume
North Plaza						
Grid 10 Burial 3	1	Contact	Red Mesa B/w bowl	Coarse SS with sherd	130	470
			Early Red Mesa B/w bowl	Chalcedonic SS	85	160
Plaza						
Grid 1 Test Trench 13	2	Surface	PII corrugated	San Juan w/o hornblende	60	210
Grid 4	-	Fill	Red Mesa B/w duckpot	Medium SS >half sherd	45	120

Table 2.51B. Summary of form distribution.

Form	Kiva	Pithouse	Living Room	Storage Room	Plaza	Ramada	Burials
Bowl	10 (1)	7	3	1	-	-	6 (6)
Ladle	4	2 (1)	2 (1)	1	-	-	1
Seed Jar	-	-	2 (1)	1	-	-	-
Canteen	1	-	-	-	1	-	-
Pitcher	1	-	-	2	-	-	1 (1)
Cup	-	-	1 (1)	-	-	-	-
Duckpot	-	-	-	-	-	1	-
Miniature	1	-	-	-	-	1	1 (1)
Olla	-	1 (1)	2 (1)	1 (1)	-	-	1 (1)
Gray Jar	4		4 (1)	2 (1)	- -	1 3	- -
Total	21 (1)	10 (2)	14 (5)	8 (2)	1	3	10 (10)

( ) indicates number of vessels from non-fill context.

Total = 67; 20 in primary context.

Table 2.51C. Summary of typological age of whole vessels.

Type-Time	Floors	Burials	Other	Total
Pre-Red Mesa[a]	1	3	5	9
Percent of prov.	10.0	33.3	11.4	14.3
Percent of sample				(13.4)
Red Mesa[b]	4	4	18	26
Percent of prov.	40.0	44.4	40.9	41.3
Percent of sample				(56.4)
Post Red Mesa[c]	5	2	21	28
Percent of prov.	50.0	22.2	47.7	44.4
Percent of sample				(30.2)
Totals	9	9	44	63
Sample				(5,020)

[a] Includes all BMIII-PI, Lino Gray, Obelisk Gray, wide neckbanded.
[b] Includes Red Mesa Black-on-white, Red Mesa Chuska Black-on-white, narrow neckbanded, neck corrugated, and San Juan Redware.
[c] Includes Puerco Black-on-white, Escavada Black-on-white, Gallup Black-on-white, Chaco Black-on-white, PII-III Carbon, McElmo Black-on-white, Tusayan Redware, and PII/PII-III/PIII corrugated.

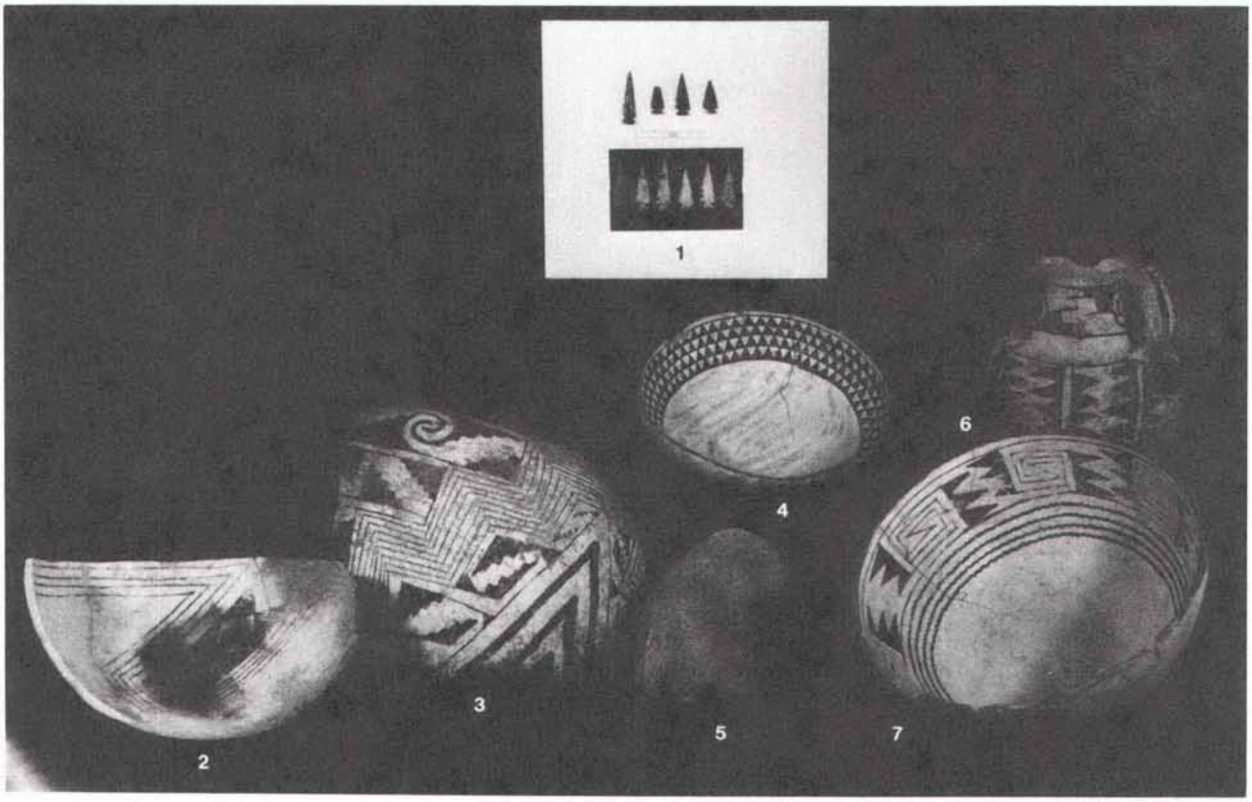


Figure 2.26. *Material accompanying Burial 1 in Room 9. 1) Ten projectile points (FS 85, Nos. 1, 2, 5, 9 on top, Nos. 10, 6, 7, 8, 4, and 3 on bottom). 2) Kiatuthlanna pot (FS 79). 3, 4, 6 and 7) Red Mesa Black-on-white (FS 78, 74, 76, and 75). 5) Parrot concretion (FS 77).*

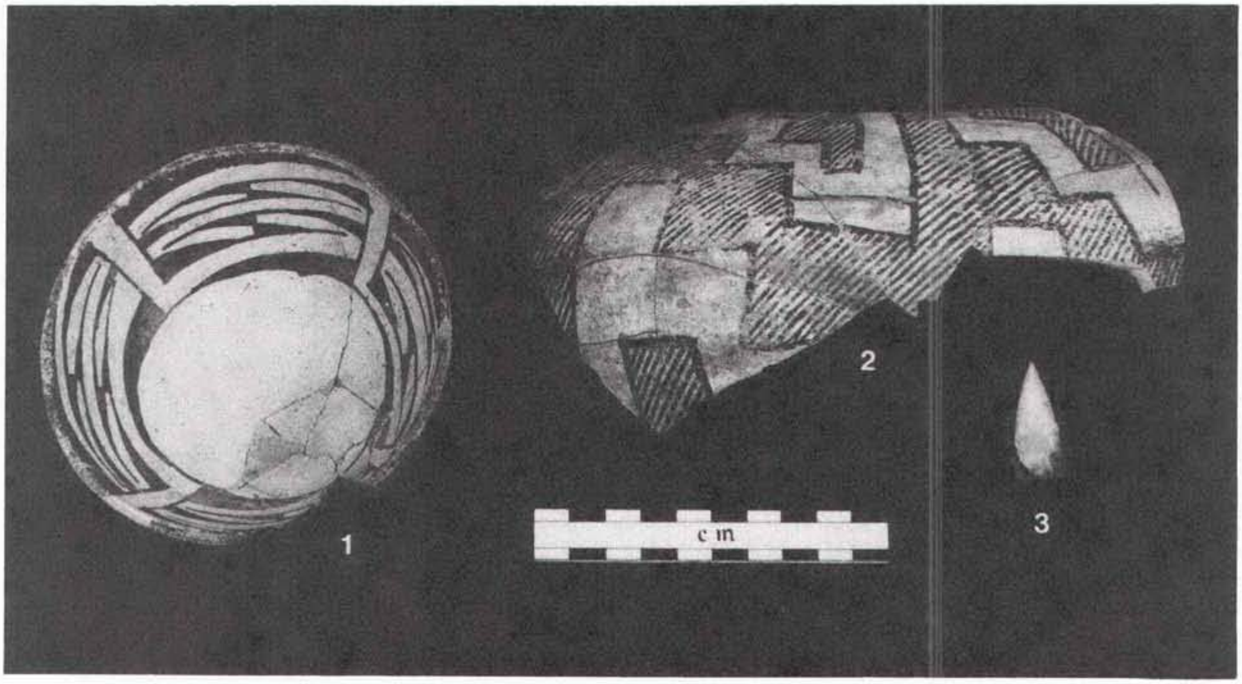


Figure 2.27. *Material accompanying Burial 2. 1) Red Mesa / Puerco Black-on-white bowl (FS 106). 2) Gallup Black-on-white seed jar fragment (FS 446). 3) Projectile point (FS 484).*

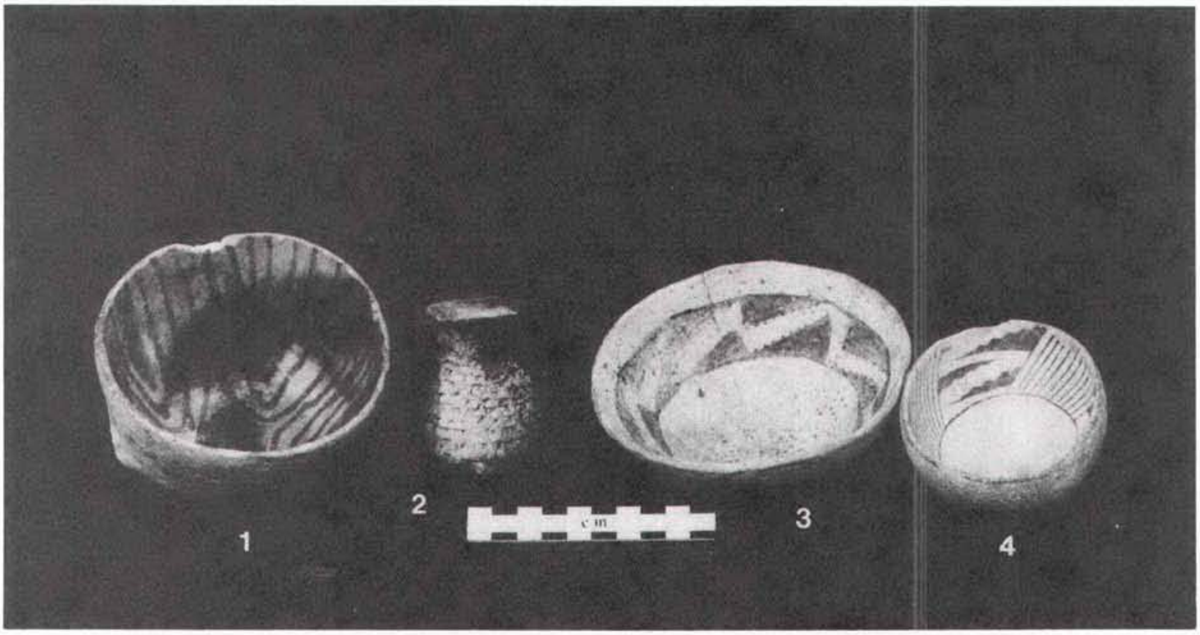


Figure 2.28. *Material accompanying Burials 3 and 5. 1 and 2) Mancos Black-on-white ladle / bowl (FS 4653) and miniature corrugated jar (FS 4658) from Room 5, Burial 5, Floor 1. 3 and 4) Red Mesa Black-on-white bowls (FS 946 and FS 947) from Test Trench 10, Burial 3.*

Figure 2.29. *Whole vessels from rooms. 1) PIII corrugated (FS 656) from Room 7, floor fill, Layer 6, Level 8. 2) PII corrugated (FS 142) from Room 8, Level 2. 3) Deadman's Black-on-white (FS 867). 4) PII corrugated (FS 1395) from Room 15, Floor 1. 5) Chaco Black-on-white (FS 1628) from Room 16, Level 1. 6) Neck corrugated jar (FS 6238) from Room 8, Floor 3. 7) McElmo Black-on-white bowl (FS 4473). 8) Early Red Mesa Black-on-white pitcher (FS 1629).*

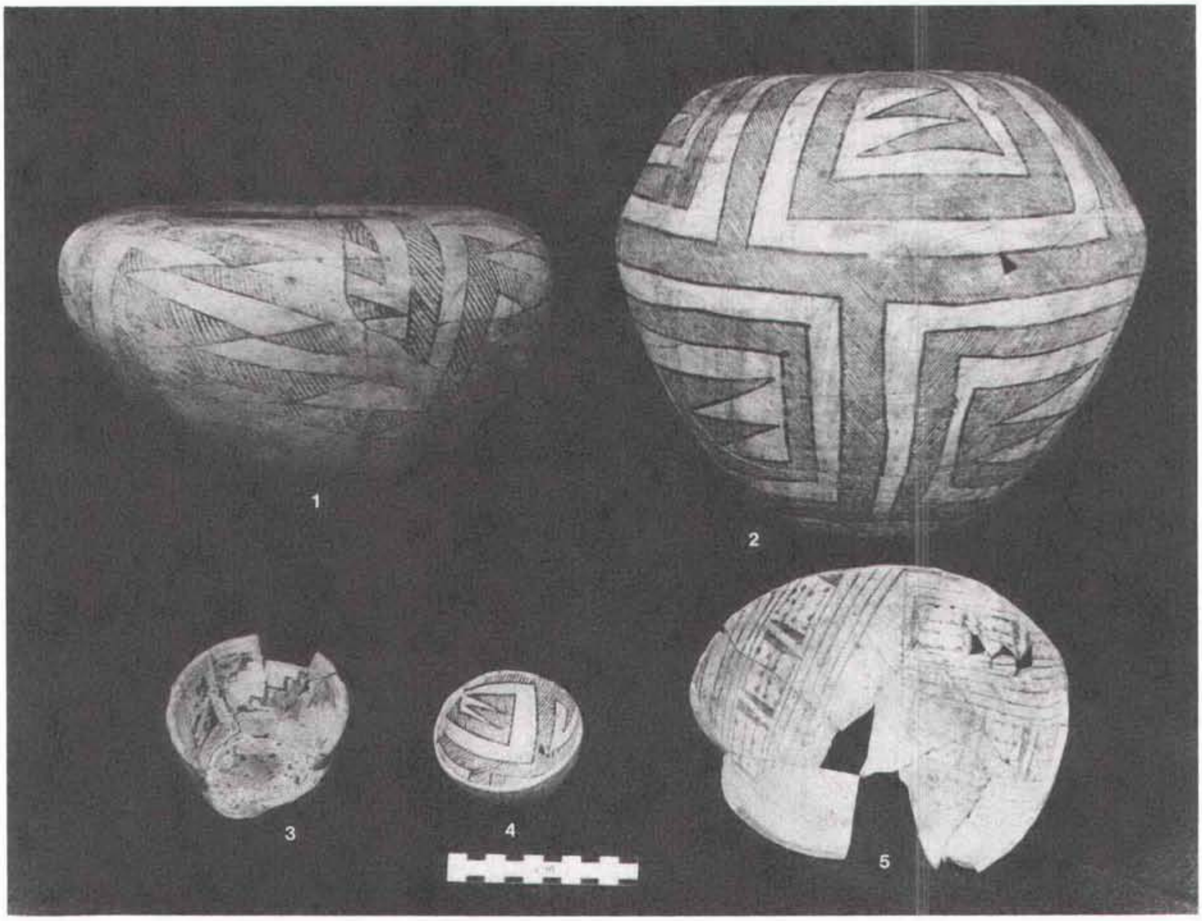


Figure 2.30. *Whole vessels from rooms. 1) Gallup Black-on-white seed jar (FS 832) from Room 11, Level 1. 2) Chaco Black-on-white olla (FS 587) from Room 6, Level 2. 3) Nava Black-on-white "vase" (FS 4846) from Room 6, Levels 1-3. 4) Chaco Black-on-white ladle/bowl (FS 1612) from Room 9, Level 4. 5) Early Red Mesa bowl (FS 6928) from Room 25, Level 1.*

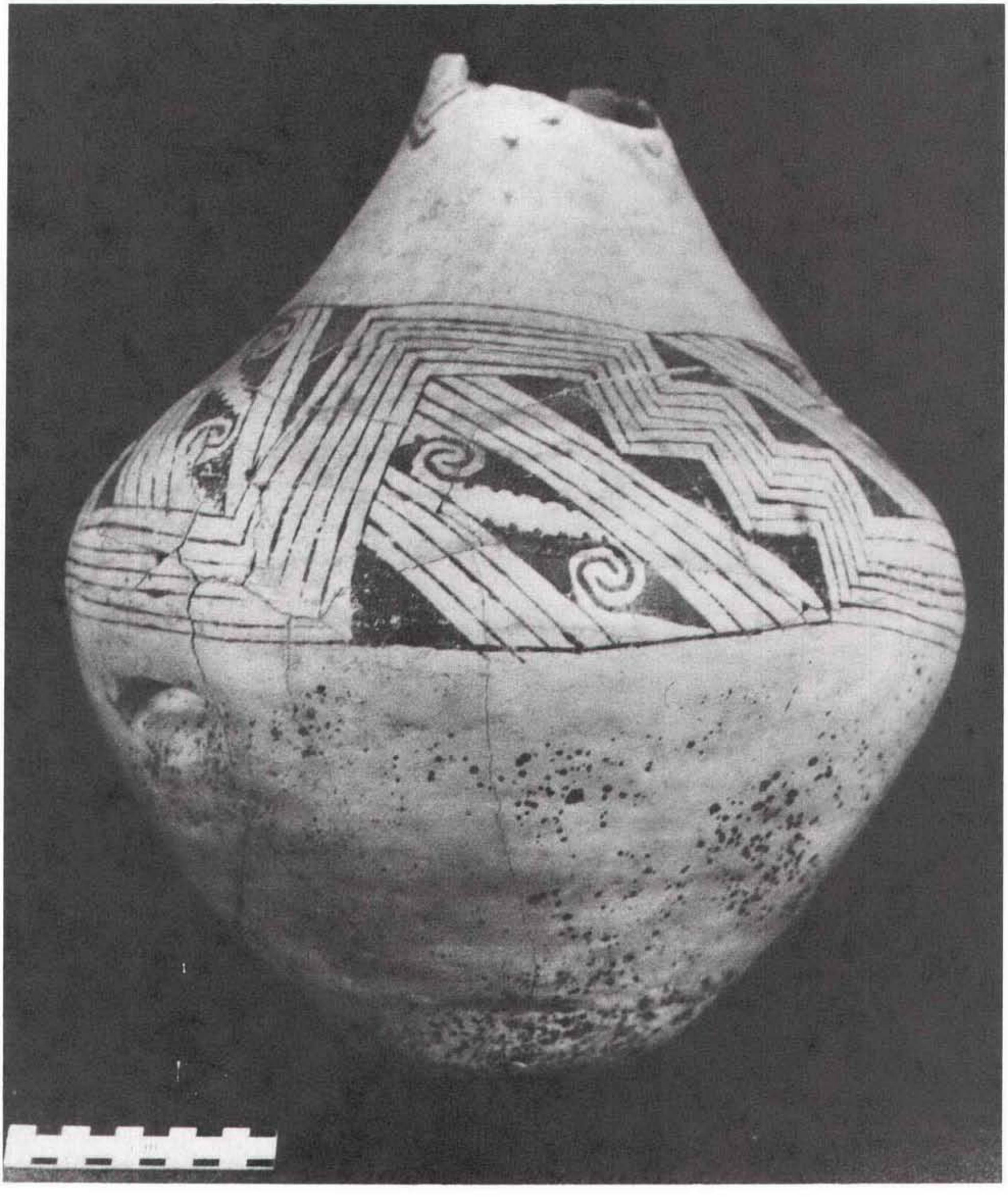


Figure 2.31. *Tunicha Black-on-white olla from Pithouse C.*

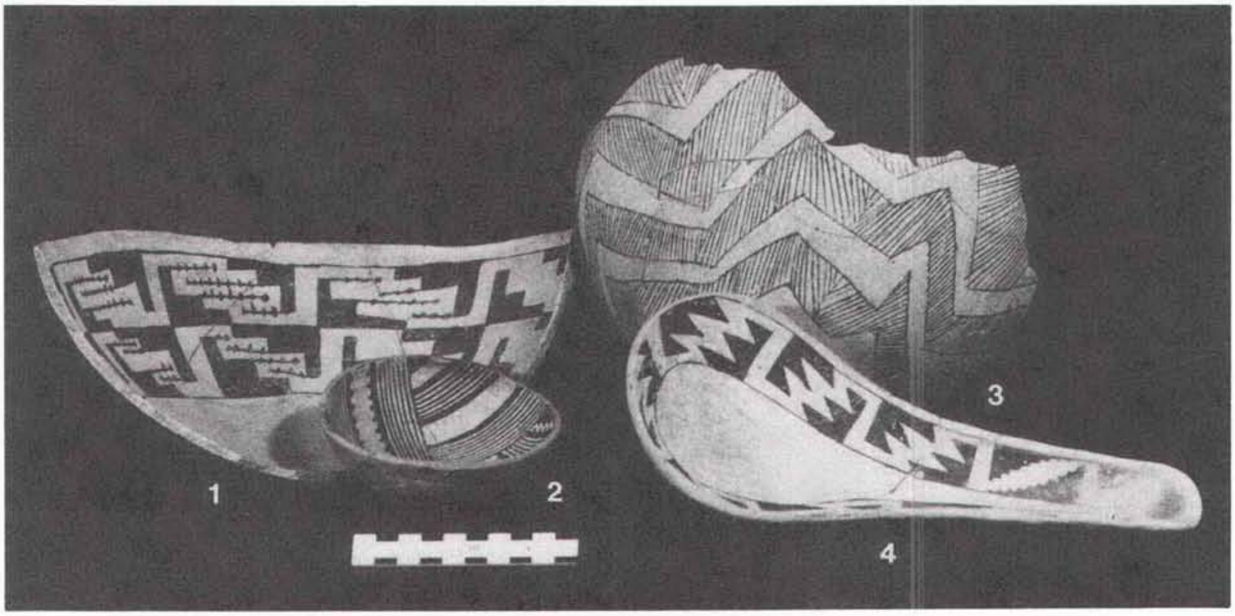


Figure 2.32. *Whole vessels from Kiva D and Pit Structure F. 1) Late Red Mesa Black-on-white bowl (FS 5185) from Kiva D. 2) Red Mesa Black-on-white bowl (FS 3041) from Level 7-8 of Kiva D. 3) Early Gallup Black-on-white jar (FS 5170) from the floor of Kiva D. 4)Late Red Mesa ladle (FS 1843) from the floor of Pit Structure F.*

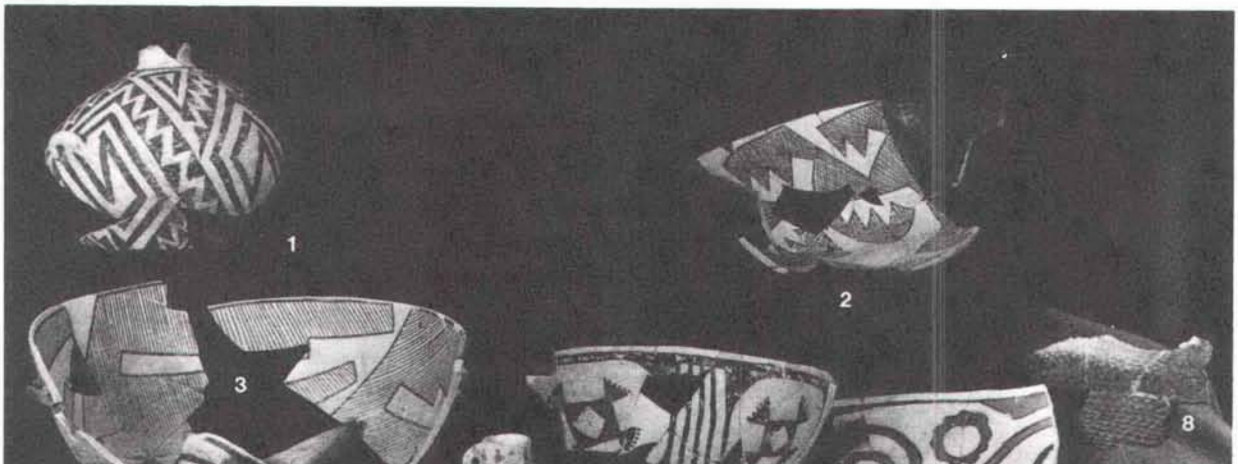


Figure 2.33. *Whole vessels from Kiva E. 1) Puerco Black-on-white canteen (FS 5468). 2) Aztec-Gallup Black-on-white bowl (FS 4681). 3) Two fragments of a Gallup Black-on-white bowl (FS 5294). 4) Puerco Black-on-white ladle. 5) Kiatuthlanna miniature pitcher (FS 764). 6) Black Mesa Black-on-white bowl (FS 5494). 7) Black Mesa Black-on-white bowl (FS 5294). 8) Fragment of a corrugated duckpot (FS 4473).*

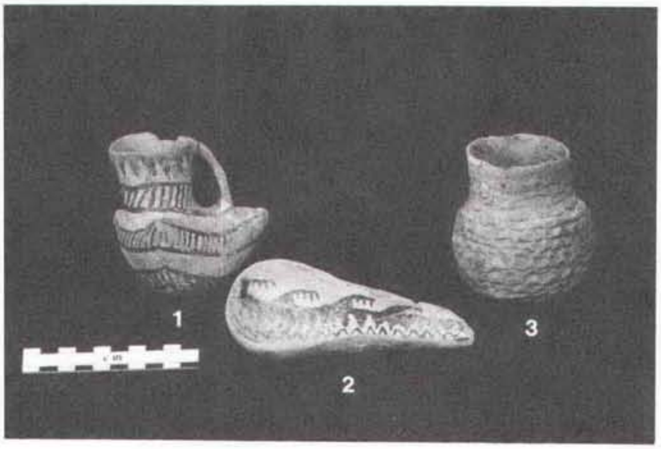


Figure 2.34. Whole vessels from extramural areas. 1) Red Mesa duck-pot from Plaza area. 2) Ladle (FS 5651) from Room 4, Floor 2. 3) Miniature PII corrugated pot from below Cist 9 in Trash Midden.

graywares are, therefore, somewhat more common among whole grayware pots than among fragmentary ones, but they are not wildly disproportionate.

3) The proportions of white pots found do suggest that exotic wares may have been better cared for, but they also show something about the pragmatics of the analysis. It is more likely that exotic types (e.g., Tusayan whiteware, redwares) will show up in equal proportions in the whole vessels and the whole assemblage simply because they are so much less common. The relative counts of PII corrugated as opposed to the other graywares also shows that much PII corrugated must be contemporaneous with Red Mesa Black-on-white, the vastly predominant decorated type.

Bulk Ceramic Distributions

The type counts of bulk ceramics are summarized (Table 2.2) and a detailed inventory of bulk counts by provenience is presented (Appendix A). The heavy predominance of Red Mesa Black-on-white among the decorated types is readily apparent. Other distributions may be summarized by provenience type as follows:

Rooms: The room assemblages are dominated by ceramics from above the first floor (Table 2.52). Below the first floor frequencies of early Red Mesa Black-on-white and Basketmaker-Pueblo I types such as White Mound, Tunicha, Kana'a and LaPlata Black-on-whites (see polished and unpolished BMIII-PI on tables) are higher relative to counts of Red Mesa Black-on-white and later types found above the first floor. Above the most recent floors, Red Mesa Black-on-white is, by far, the most abundant decorated type, but counts of corrugated culinary and Gallup Black-on-white, Puerco Black-on-white, and later carbon-painted types increase markedly. Redware, late Pueblo II-III carbon-painted types, and Showlow Smudged are concentrated in the northern rooms (Rooms 10, 12, 14, and 15). Southern rooms (Room 6, 7 and 11) near Kiva E contain vessels of Gallup and Chaco Black-on-white on the upper floors but lack the variety of types found in the northern rooms. Matching of ceramics between proveniences indicates many of the same vessels are distributed between the northern rooms and the fill of Kiva E.

Table 2.52. Summary bulk sherd counts by provenience by ware.

Major Provenience	N	Culinary n	Culinary %	Mineral/w n	Mineral/w %	Carbons n	Carbons %	Redware n	Redware %	Smudged n	Smudged %	Overage from RS	s	H'	J	% N Above 1st Floor
<u>Surface & N, W</u>																
Test trenches	1,826	1,085	59	700	38	25	1.4	10	0.5	6	0.3	-	5	0.783	0.486	no fl.
Trash mound	18,277	10,116	55-	7,796	43+	190	1.0	127	0.7	48	0.3	-	5	0.788	0.490	no fl.
Plaza/Ramada/Cists	7,320	4,085	56	3,050	42+	87	1.2	67	0.9	31	0.4	-	5	0.809	0.503	no fl.
<u>Pithouse/Structures</u>																
Pithouse B	619	401	65	204	33	7	1.1	5	0.8	2	0.3	-	5	0.755	0.469	100
Pithouse C	10,602	6,090	57	4,153	39	251	2.4	75	0.7	33	0.3	33	5	0.827	0.514	100
Pit Structure F	2,240	1,409	63	780	35	25	1.1	20	0.9	6	0.3	8	5	0.767	0.477	100
Pithouse H	69	43	62x	24	35x	0	0x	1	1.4x	1	1.4x	-	4	0.805	0.581	100
<u>Kivas</u>																
Kiva D	8,913	4,939	55	3,736	42	114	1.3	54	0.6	70	0.8	13	5	0.816	0.507	100
Kiva E	16,426	8,821	54-	6,762	41	420	2.6+	211	1.3+	212	1.3+	70	5	0.905	0.562	100
Kiva G	1,486	896	60	555	37	23	1.5	8	0.5	4	0.3	1	5	0.781	0.486	100

Table 2.52. (continued)

Major Provenience	N	Culinary n	Culinary %	Mineral/w n	Mineral/w %	Carbons n	Carbons %	Redware n	Redware %	Smudged n	Smudged %	Overage from RS	s	H'	J	% N Above 1st Floor
Rooms																
1	642	373	58	252	39	8	1.2	4	0.6	5	0.8	-	5	0.807	0.501	100.0
2	999	540	54-	430	43+	16	1.6	6	0.6	7	0.7	6	5	0.827	0.513	97.2
3	291	182	63	98	34	2	0.7-	4	1.4+	5	1.7+	5	5	0.823	0.511	45.7
4	686	404	59	267	39	9	1.3	2	0.3	4	0.6	2	5	0.783	0.486	76.8
5	1,824+	1,107	61	680	37	15	0.8	9	0.5	13	0.7	-	5	0.771	0.480	88.9
6	469	329	70+	126	27-	12	2.6+	0	0.0-	2	0.4	3	4	0.719	0.519	80.1
7	1,056	666	63	360	34	19	1.8	11	1.0	0	0.0	4	4	0.777	0.560	90.2
8	801	586	73+	197	25-	12	1.8	3	0.4	3	0.4	-	5	0.678	0.421	43.4
9	647	507	78+	131	20-	3	0.5-	1	0.2-	5	0.8	-	5	0.587	0.364	54.1
10	2,220	1,377	62	773	35	28	1.3	11	0.5	31	1.4+	6	5	0.805	0.500	50.2
11	339	229	68+	104	31	6	1.8	0	0.0-	0	0.0-	2	3	0.699	0.636	30.7
12	962	621	65	320	33	5	0.5-	14	1.5+	2	0.2-	6	5	0.750	0.466	89.3
14	421	222	53-	182	43+	5	1.2	7	1.7+	5	1.2+	1	5	0.873	0.543	61.3
15	1,228	717	58	486	40	9	0.7-	11	0.9	5	0.4	1	5	0.782	0.486	95.7
16	1,460+	1,005	69+	401	27-	37	2.5	5	0.3	12	0.8	13	5	0.764	0.475	84.9
17/18	877	588	67	248	28-	23	2.6+	7	0.8	11	1.3+	4	5	0.814	0.506	97.9
19	518	290	56	206	40	19	3.7+	0	0.0-	3	0.6	12	4	0.843	0.608	92.9
20	114	62	54-	47	41	4	3.5+	0	0.0-	1	0.9+	-	4	0.856	0.617	48.2
"21"	69	42	61x	27	39x	0	0.0x	0	0.0x	0	0.0x	-	-	-	-	84.1
22	725	477	66	228	31	11	1.5	4	0.6	4	0.6	2	5	0.760	0.472	82.5
23 1st component	424	255	60	165	39	3	0.7-	1	0.2-	0	0.0-	-	4	0.722	0.521	100.0
24	10	4	40x	4	40x	1	10.0x	1	10.0x	0	0.0-	-	-	-	-	100.0
25 1st component	169	113	67	50	30	4	2.4	1	0.6	1	0.6	-	5	0.799	0.484	100.0
N	84,729	48,581	57	33,542	40	1,394	1.6	680	0.8	532	0.6	240	0.3%	0.857	0.533	
Minimum of Highest 5			68		42		2.6		1.0		0.9		5	0.857	0.533	
Minimum of Lowest 5			55		28		0.7		0.2		0.2					

Table 2.52. (continued)

Major Provenience	N	Culinary n	Culinary %	Mineral/w n	Mineral/w %	Carbons n	Carbons %	Redware n	Redware %	Smudged n	Smudged %	Overage from RS	s	H'	J	% N Above 1st Floor
Rooms																
n	16,941	10,692	63	5,778	34	252	1.5	101	0.6	119	0.7	5	.796	.495		
Mean Sherd Per Room = 737.0, s.d. = 554.7; n = 23																
Trash																
n = 9 (Less Kiva G)																
n	66,292	36,989	56	27,205	41	1,119	1.7	570	0.9	409	0.6	5	.861	.535		

Note: + indicates entries with percentages in the 5 highest in a ware; - indicates entries in the 5 lowest; x indicates provenience has <100 items and was not included in the percentage rankings.
Overage column refers to number of sherds over the rim sherd count following addition of specific red, smudged, and carbon types to the computerized rim sherd counts.

Pit structures and Kivas: A chronological ordering of pit structures from early to late based on ceramics might be seen as Pithouse B, Pithouse C, Pit Structure F-Pithouse H, Kiva D-Kiva G-Kiva E. Pithouse B is an unfinished structure possibly considerably earlier than its ceramic assemblage indicates; the Red Mesa Black-on-white/indented corrugated-plain gray component in Pithouse B is apparently the result of alluviation, with some trash deposition, and it generally reflects the median ceramic assemblage for the site. The remaining pit structures contain trash that reflects the gross sequential unit of deposition at 29SJ 627. Pithouse C exhibits slightly higher levels of Pueblo I ceramics, such as Peña, Kana'a, Tunicha, and early Red Mesa Black-on-white, with a high ratio of plain gray to corrugated culinary. Discounting the contribution of "fill" and the upper levels, which contain ceramics from surface, wall clearing, and the overlying trash mound, the ceramic assemblage from Pithouse C places it more clearly and earlier in time than assemblages from other pit structures. A Tunicha Black-on-white olla in a floor cist (Figure 2.31) strongly suggests the use of Pithouse C at least between A.D. 850 and A.D. 900. Types identified in Pit Structure F are virtually the same as in Pithouse C. However, the slight rise in percentages of Red Mesa, Escavada-Puerco, and Gallup Black-on-white are derived from the entire fill and not concentrations in the upper levels, which suggests filling between A.D. 1000-1060. Only a small test was done in Pithouse H (below Kiva E), and the number of ceramics is too low to be informative; the location of the structure in the site suggests that it more likely is associated with Pit Structure F than with Pithouse C. Kiva E is the provenience with the most abundant and latest ceramics. Although Red Mesa Black-on-white is still predominant in the assemblage, Gallup Black-on-white shows its highest representation and co-occurs with such early Pueblo III carbon types as Sosi-Black Mesa, McElmo, and Chuska Black-on-white, which suggests filling of this structure between A.D. 1075 and A.D. 1125. Although a substantial amount of plain gray is present, the proportions of corrugated to plain gray are reversed compared to those found in the trash of early pit structures. Kiva E contains abundant amounts of Tusayan carbon-painted wares, which is unusual when compared with other large carbon-mix deposits found in Chaco Canyon (Toll et al. 1980). Pottery types and proportions in Kiva G are essentially the same as in Kiva E, but the ceramic density of Kiva G is about six times less than Kiva E. Kiva G is filled with alluvium and probably was occupied, although not constructed, after Kiva E. The latest types present in the fill (one Chaco Black-on-white and one Nava Black-on-white, the Chuskan equivalent of McElmo Black-on-white) may be used to suggest abandonment post A.D. 1110.

Trash Mound: The trash mound generally appears to be ceramically homogeneous (Appendix A). Finer breakdowns by individual grids, however, show a temporal difference in the ceramics from the eastern and western portions of the mound. The eastern portion is ceramically older, the western more recent, with the interface occurring near the intersection of Test Trench 1 and Test Trench 2. The temporal difference is visible primarily in terms of sherd counts, with little stratigraphic demarcation. The difference is only slightly visible in a comparison of complete trench counts from Test Trench 1 with Test Trench 2, with the north-south trending Test Trench 2 less influenced by the early pottery recovered in the easterly portion of Test Trench 1. Again, Red Mesa Black-on-white is the dominant decorated type, but the portion closest to the roomblock contains more Gallup and Puerco Black-on-white and early Pueblo III associated types. It is these deposits that overlay Pithouse C and contribute to the later types in the upper levels of Pithouse C.

Plaza-Ramada Area: The ceramics in the intramural area between the trash mound and roomblock show typological patterns similar to the late Pueblo II-III ceramics from the (upper) rooms and the western side of the trash mound.

Relative Diversity and Frequency of Bulk Ceramics by Provenience

As an added dimension to the examination of ceramic distributions based on the detailed analysis sample, the bulk counts by major provenience are summarized (Appendix A). Theoretically, using bulk counts should not be necessary, since we have claimed that the sample is representative of the vessels present at 29SJ 627. Practically, however, there are some reasons for briefly reverting to the bulk counts:

1) To give a reconstruction of the actual material recovered.

2) To assuage doubts concerning assumptions about the sample and the non-representation of some proveniences with low ceramic frequencies.

3) To provide a comparison with the results from the sample, in order to evaluate the assumptions and errors pertaining to the sample.

4) To provide comparative material because the ceramic analysis in other reports are presented in terms of bulk ceramics.

There is no reason to suspect that bulk ceramic counts are somehow more reliable for functional interpretation. The same problems of redeposition of trash for surface levelling and other prehistoric and historic disturbances apply to the bulk sample; to these problems are added those of differential breakage of vessels and disproportionate representation of wares from larger vessels. In discussing the ceramic distributions of either the sample or the bulk counts, it is very important to keep in mind that few of the ceramics from 29SJ 627 come from contexts that are likely to reflect primary use. Groups of ceramics from bounded spaces probably do represent functional assemblages, but the function is being viewed through the lens of secondary deposition. Sherds from the fill of a storage room or a living room do not necessarily represent the ceramic counterparts to storage or living functions. Difficulties of inference from fill to function are, of course, compounded when a given provenience has more than one use surface.

Distribution patterns of ceramics in the roomblock were formulated in two ways, both based on lumping the ceramics into ware groups consisting of grayware, mineral-on-white and plain whiteware, carbon-on-white, redware, and polished smudged. First, diversity

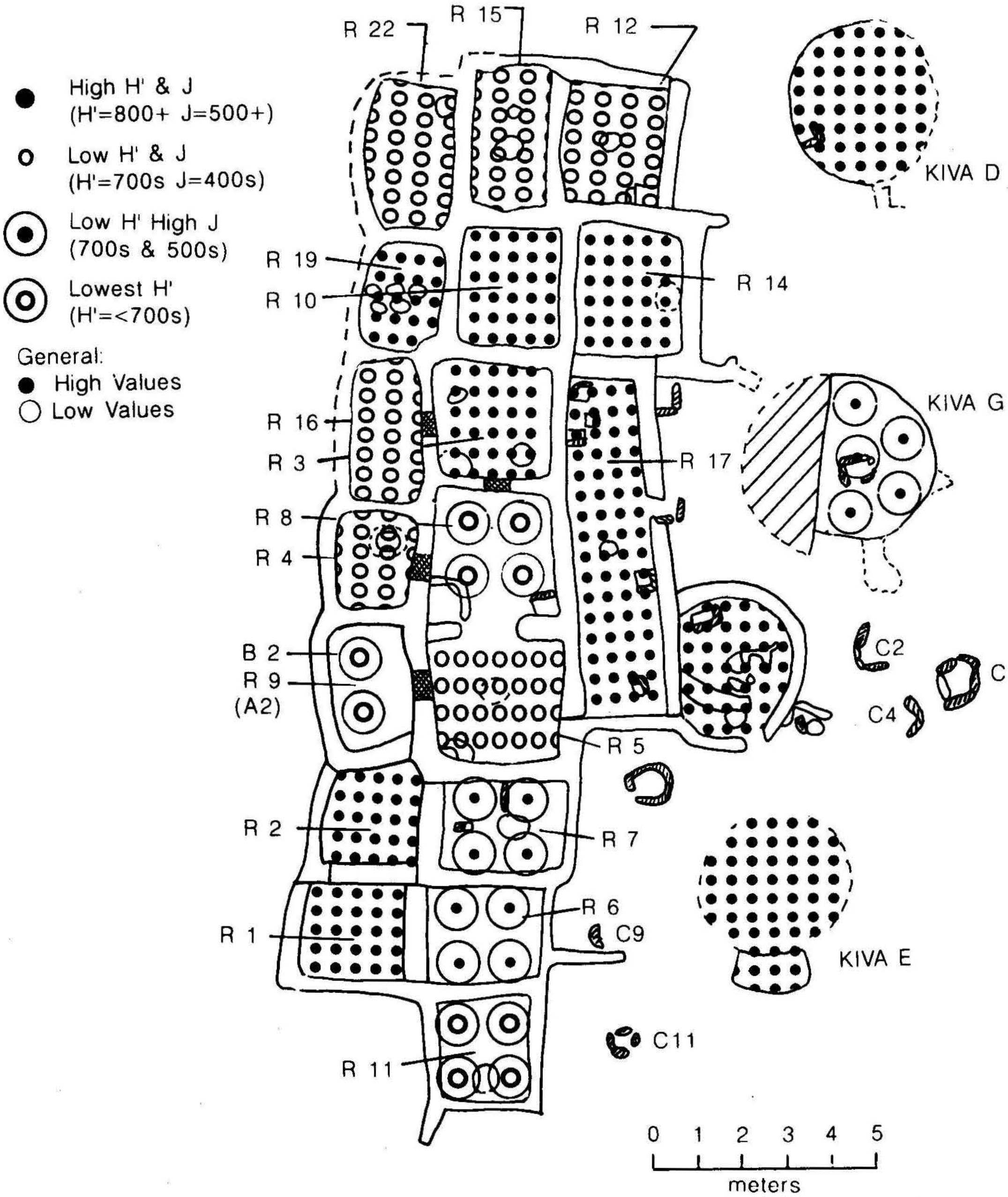


Figure 2.35. ***Bulk sherd distributions--diversity. Diversity and evenness indices are calculated for each room or pit structure based on its ware distribution. Low diversity is considered to be less than .800 and low evenness less than .500.***

and evenness indices were calculated on a ware basis (Table 2.52) and distributions were plotted (Figure 2.35). This was done to divide the assemblages from rooms into two groups, one with high diversity and even representation of wares and one not so blessed. The second approach was to identify those rooms in which a particular ware comprised either markedly higher or lower percentages of the provenience's ceramics when compared to the relative frequencies for the site as a whole. This identification was made on the basis of proveniences falling in the upper or lower 15% of the 30 proveniences containing more than 100 sherds. This procedure very closely approximates the results obtained by using standard deviations of percents, but it avoids a number of the questionable assumptions involved by using that statistic in this case.

One thing immediately evident from these comparisons, and observed in the detailed analysis, is that culinary ware is disproportionally abundant in the roomblock. Room counts include all ceramics from provenience units defined by the final construction period (Phase D), but it can be shown that ceramics from the rooms are dominated by those from above the most recent floors (81.3%). These distributions, therefore, are heavily affected by deposition and disturbance during and after the final occupation.

Diversity measures are used here to reflect the ceramic distribution in the roomblock. It is not possible to assign absolute cultural meanings to high and low diversity and evenness indices, but expectations are that multipurpose areas should have high ceramic diversity and special purpose areas lower diversity. Assuming that trash is not selectively deposited and that alluvial deposits draw from the site's ceramics randomly, these deposits should reflect the overall ceramic assemblage in diversity and evenness. The wares contributing to either index, as seen in the percentage distributions, can be used to interpret the function of the provenience in question. Clusters of similar diversity can be found in 29SJ 627 (Figure 2.35). This suggests ceramic distributions at 29SJ 627 are not random, as might be expected from trash reuse for architectural levelling or in uniform, primary trash deposition.

There is a bewildering array of encoded ceramic distributions (Figure 2.36). Nonetheless, there is order to this, and discussion follows two lines: ceramic patterns by units of rooms or by units of ceramics. Although these are almost inseparable points, some ceramic-room unit associations exist that suggest some specialized uses of pottery occurred and remain archaeologically visible. Two of the more striking associations are:

1) Mealing rooms (Room 19 and Room 20) are associated with high numbers of whitewares (both mineral-painted and carbon-painted) and less with culinary, red, and smudged wares. From this, it might be suggested that whiteware served as part of the grinding complex; bowls possibly for catchments and bowls and/or jars as containers for ground and unground meal.

2) Storage rooms (Rooms 4 and 9, Rooms 16 and 19) are ceramically paired in terms of one being high in culinary ware and the other high in whiteware. Those storage rooms with floor features are high in whiteware and those without features are high in culinary ware. The patterning of these distributions is the same (Figure 2.36). Tentatively, this distribution may suggest differentiated storage facilities; long term (culinary) and short term (whiteware). There are several difficulties with this interpretation, one of which is that Room 19 has already been noted as a mealing room, but this does not necessarily preclude short term storage of the processed meal

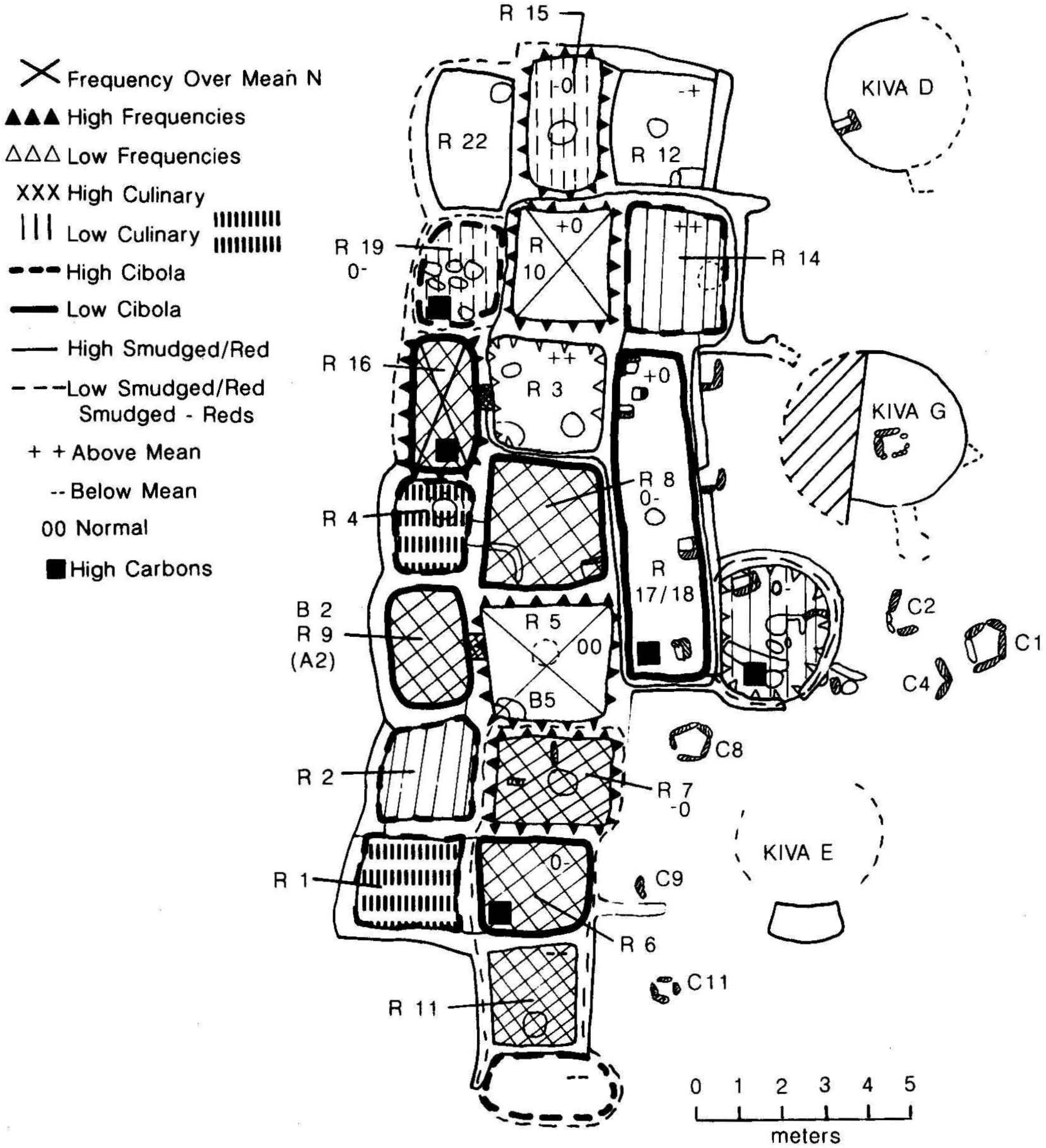


Figure 2.36. Bulk sherd distributions--frequencies. Frequencies are evaluated in terms of percentage relative to other rooms / structures (see Table 2.48).

pending (daily?) use; a similar argument might be made for Room 20. Another difficulty is the unknown amount of disturbance that occurred with the placement of Burial 2 in Room 9 and the subsequent use of the room, which includes a "floating" hearth. Room 9 contains a relatively high percentage of culinary ware and also has the lowest evenness index; its complexion is thus one of a room associated with grayware use, perhaps involving both cooking and storage, but the picture is a complicated one.

The general ceramic-unit patterns are tempered more by taphonomic or depositional caveats that make acceptance of the following dependent on how rash one feels. Major distributions include:

1) A central core of rooms (Rooms 4, 16, 3, 8, 17/18, and possibly Room 20) containing about average or smaller numbers of sherds and exhibiting low diversity indices; the main exception is Room 16. These rooms are bracketed to the north and south by trash filled (apparently abandoned) rooms.

2) An abundance of redware and, more markedly, smudged ware in the northern rooms, and a dearth of these wares in the southern rooms.

3) Higher levels of culinary wares in the southern rooms and lower relative amounts in the northern rooms.

From this one might argue that the central core of rooms associated with Kiva G were the last occupied unit at 29SJ 627 because they exhibit the lowest number of ceramics, the most discrete ware distributions, and represent an integration of the more extreme patterns of the northern and southern rooms. From front to back, individual room and row assemblages are marked by whiteware (Room 20), carbon-painted and smudged ware (Room 17/18), culinary wares (Room 8), smudged and redware (Room 3), and whitewares (Room 4), and culinary wares (Room 16). These rooms are evenly divided in measures of diversity (Figure 2.35), which is crosscut by measures of abundance and relative frequency of wares (Figure 2.36).

One striking feature is that no core room that is considered to be a living area has a higher than expected level of Cibola ceramics. Storage Room 4 has the highest relative frequency of mineral-on-white ware and may be classed functionally with Rooms 8 and 16 that are within the suite that is dominated by one ware. While Rooms 4 and 16 may represent different types of storage, Room 8 has a corner firepit and here high culinary ware proportions may suggest actual use of ceramics in cooking. Closer inspection of Rooms 3 and 8 is necessary because here the majority of the ceramics were recovered from below Floor 1; in these rooms, however, the relative frequencies of wares are the same above and below the first floor. The higher indices of Rooms 3 and 17/18 are most strongly affected by the relative amounts of smudged, red and carbon wares. Room 20 also has a high diversity index and is ceramically like the western tier of rooms, particularly Room 19, which concurs with their mutual designation as mealing rooms (Table 2.52). So it is the higher relative abundance of the minor wares in Room 3 and Room 17/18 that is of interest when compared with the more restricted assemblages of Rooms 4, 8 and 16.

Room 3 and Room 17/18 are architecturally as different as night and day. Room 3 is small and contains three first floor heating pits but no firepit. Room 17/18 is by far the largest room at the site and contains many formal floor features; thus, it is the most likely communal or multifunctional room. The relatively high H' and J indices for Room 17/18 can be interpreted as supporting this interpretation <ins>if</ins> "communal" activities can be viewed as responsible for drawing a wider cross-section of ceramics to one area. Room 17/18 features include mealing bins, firepits, and storage facilities; a big ceramic difference between the "mealing" aspects of Room 17/18 and those in Rooms 19 and 20 is that the frequency of culinary ware in Room 17/18 is somewhat greater than the mean percent, while Cibola wares are in the lower 15% of all occurrences. Thus, wares are relatively equally represented in the assemblage, which suggests the overlap of tasks or social contexts involving different ceramic groups.

The ceramic sample from Room 3 is relatively small, and less than half comes from above the last floor. The relative frequencies of smudged wares and redwares are higher than usual in Room 3, but there is some chance of a sampling error, especially since high relative frequencies of redwares occur above the first floor elsewhere as well. Perhaps the most distinctive aspect of Room 3, then, is the paucity of ceramics in a putative living room.

Room 14 also has a distinctive ceramic assemblage, with the highest diversity index of any of the rooms; it is the only room with a diversity index higher than that for the whole site. The reasons for this high index are that Room 14 has the highest relative frequency of Cibola whiteware of all the rooms, as well as relatively high percentages of smudged and redwares. Room 14 is adjacent to Room 17/18 and is thus in the same position relative to Rooms 19, 22, and 12 and the central core of rooms, the Plaza, and pit structures. Room 14, however, lacks floor features and it is difficult, therefore, to attribute to it a function similar to that of Room 17/18. The apparently non-random ceramic distribution in Room 14 suggests that its fill was not alluvially deposited and the low frequency suggests that it was not trash-filled; its functions may have included storage for frequently used service items, if fill and floor are related.

The ceramic assemblages of the northern and southern rooms might be generally attributed to discard, but the rooms to the south of Rooms 4 and 8 (Rooms 1, 5 and 9) are also burial locations. No two burial rooms have ceramic patterns that are alike, although these rooms do lie in the area of the site marked by the lowest diversity and evenness of wares. Clearly, Rooms 1 and 2 are ceramically different from the remainder of the southern rooms, and it is possible that removal of the upper floors in both rooms may be responsible for this. Ceramics associated with Burial 1 in Room 1 (Figure 2.26) may contribute to the difference as this individual may represent a status burial of the "subordinate dimension" (Akins and Schelberg 1981), who had been provided with a variety of goods. That burials in rooms may affect post-occupational ceramic patterns is likely, but at present no strong correlations can be found. The absence of later ceramics in the burial rooms may suggest that such rooms were avoided subsequent to interments.

This section has discussed the ceramics of the roomblock along more traditional, bulk count lines, focussing on the spatial variation of wares. Comparisons with site distributions show that rooms with similar ceramic characteristics can be identified. After considering which rooms were most likely the loci of final period discard--based on high frequencies, matched vessels with trash filled kivas, and abandonments following interments--a core of rooms possibly representing the final occupational locus was examined in more detail. Ceramic assemblage distributions revealed the central suite to be evenly divided between areas of high and low ceramic diversity. This initially suggested that patterns of ceramic use in rooms might be divided into multifunctional and specialized components. Because the room with the highest ceramic diversity and the room with the most features, as well as high ceramic diversity, are both at the front of the roomblock between the rest of the core suite and the plaza and kivas, some credence is given to both the meaningfulness of the deposits and this method of looking at them. Thus, a picture emerges of one possible multifunctional room (Room 17/18) and five rooms with more limited functions. It is also apparent that "storage rooms" do not always contain graywares, nor living rooms whitewares. The ceramic contents of rooms at 29SJ 627 indicate that there are patterns in the distribution of graywares and whitewares among featureless (storage?) rooms. These patterns may have some functional significance, but any interpretations must remain guarded because of the vagaries of deposition.

Summary

A multitude of tests has been presented in the foregoing report--such a number, in fact, that it is probably nearly impossible to sit down and read the report. Its utility rests in addressing specific subsets of ceramic concern rather than a flowing narrative on prehistoric pottery. This same plethora of tests and comparisons makes a comprehensive summary impractical. Therefore, this summary attempts only to give a brief overview of some of the aspects of the ceramics from 29SJ 627, leaving many of the fine points to those interested in specific problems. Following the recap of some of the more interesting points of the report is a section summarizing what we know (and how we "know" it) about levels of ceramic import evidenced at 29SJ 627. Perhaps the most disheartening aspect of the ceramics is that in spite of having viewed them over, under, sideways, and down for a long time, we realize how far from complete our examination is.

Sample

The make-up of the bulk collection from 29SJ 627 is what archaeologists have learned to expect from Anasazi sites of similar age and location--a great deal of grayware, somewhat less whiteware mostly with mineral paint and a smattering of redwares and smudged wares. The analysis that occupies most of this report, however, deals with a rim-oriented, matched-sherd sample in which the whitewares greatly outnumber the graywares. While the sampling and matching procedure to some degree favors the whitewares, it is our contention that this proportion more nearly approximates the vessels represented in the site's assemblage. There is support for this contention in similar proportion reversals in similarly treated sites, 29SJ 629 and Pueblo Alto. At 29SJ 1360, where the ceramics are in an unusually unfragmented condition, the whitewares outnumber the graywares even in the bulk counts. It has been found at this site, as at the others, that the bowl form constitutes over half of the whitewares in all time periods.

While the fact that traditional types have problems as analytical units is recognized, types are used as preliminary subdivisions in many phases of this study. Because an explicit and extensive portion of the report is devoted to presenting and assessing the variability within those initial groups, a number of the problems associated with types are circumvented. Types provide groups of ceramics that are likely to be similar in age and general tradition of manufacture, thereby eliminating the need to make extensive preliminary sorting analyses and permitting the examination of temporal developments, at least within broad limits. Nearly a third of the entire detailed analysis sample is Red Mesa Black-on-white; next in abundance are Gallup and Puerco Black-on-white, though those types are far less common than Red Mesa Black-on-white. The large quantity of Red Mesa Black-on-white places the heaviest use of the site in the years A.D. 875-1050. Types attributed to later periods tail off from the high Red Mesa Black-on-white frequency and even those thought to postdate Gallup and Puerco Black-on-white (ca. A.D. 1040-1150 in the main, apparently extending to ca. A.D. 1200) outnumber those attributed to periods before A.D. 875. The early occupation, therefore seems to be the lightest use of the site as excavated, especially considering that there is evidence that types remain in use after their putative terminal production dates. Types present at 29SJ 627 suggest that some use of the site continued into the twelfth century, though the latest use also appears relatively minor. Assuming dates of A.D. 975-1025 and A.D. 1000-1125 for the two most abundant utility categories, narrow neckbanded and Pueblo II corrugated, reconfirms the assertion that the most intense use of the site was in the late tenth and early eleventh centuries, especially since PII corrugated is nearly twice as abundant as narrow neckbanded. That the third most abundant utility type is wide neckbanded (ca. A.D. 775-900) argues for use spanning the tenth century.

Variety in Types

The great majority of temper at 29SJ 627 falls into the broad category of undifferentiated sandstone; the implications of this temper for locality of production are further discussed below. Trachyte temper from the Chuska area is the second most abundant temper that is found much more frequently in graywares than in other wares. Its relative occurrence increases in both gray and whitewares in the later ceramics, including the mineral-painted types, most notably Gallup Black-on-white. Chalcedonic cement sandstone temper, presumed to be from areas south of Chaco Canyon, is present at 29SJ 627; but its relative frequency is less than it is in comparable types at 29SJ 629.

The examination of abundant whiteware types (Red Mesa, Puerco, and Gallup Black-on-white) for internal variability shows that items placed in each of the types seem to be drawn from a similar pool of temper and paint possibilities in fairly similar proportions. While within-type variability is clearly present, it is notable that there is a dominant, modal group within each type. In whitewares, it consists of fine to medium sandstone temper with black paint; within that modal group, three-fourths also contain more than half sherd temper. For the decorated types, the temper distribution in Gallup Black-on-white shows the greatest diversity of areal production; that is, while each type has representatives of various temper-paint combinations, more such combinations are better represented in Gallup Black-on-white. Puerco Black-on-white, thought to be contemporaneous with Gallup Black-on-white, is less diverse than either Red Mesa or Gallup Black-on-white.

The inventory of designs in Red Mesa Black-on-white is larger and more diverse than it is in either of the two succeeding types. This results from two primary causes: the size of the Red Mesa Black-on-white sample and the fact that Puerco and Gallup Black-on-white are separated on the basis of motif. When Puerco, Escavada, and Gallup Black-on-white are combined into a single group more or less equivalent in temporal span and value to Red Mesa Black-on-white, the macro group is found to be more diverse than Red Mesa Black-on-white in design. Puerco and Gallup Black-on-white exhibit several similarities that suggest that they are influenced by similar demands and constraints and that they are, in fact, parallel developments. Three notable examples of these parallelisms are that slip distributions on bowls shift from the more common pattern in Red Mesa Black-on-white of two sides to one side; polishing makes a similar shift; and both Puerco and Gallup Black-on-white bowls are, on the average, larger than Red Mesa Black-on-white bowls, with the two former exhibiting remarkably similar means. In Red Mesa Black-on-white, as well as later types, there is some association of design with temper group, but it becomes more marked in the later types. Thus, there are two trends apparent that seem to run counter to one another but which, when taken together, give a coherent interpretation. That is, while there seems to be increased areal definition in design on the one hand, there is, at the same time, a regional consistency in surface treatment. In conjunction with the increased representation of producing areas in the assemblage, a case can be made for a broader-based regional supply system. Added definition is definitely needed for the broad sandstone group, but the suggestion is, nonetheless, quite distinct.

A similar trend to greater diversity of sources may also be found in the graywares, which are regularly more diverse in source than are the whitewares. Further, later graywares also have larger diameters than do the earlier ones. Many social significances could be attributed to this trend of vessel size increase in the whiteware and grayware vessels, but they are sufficiently speculative and hard to substantiate, so they are left for the adventuresome reader. Within each type, regardless of time of production, there is a truly remarkable similarity of metric attributes between temper groups, again suggesting the regional nature of pottery production. The multivariate analyses performed on the utility wares showed that only the width of the rim fillet was consistently significantly different between temper groups within types, and the amount of that difference is very small in physical terms.

This diversity within types has several likely sources. The time spans of production of all the types in question are such that obviously several generations of potters must have been involved in making pots that fell into these groups. That variety is compounded by the fact that ceramics falling into these groups were produced in several areas of the region. The design tests on technological subgroups show that some areal tradition in the use of motifs existed, but that common motifs were used in all the areas known to be present. The trachyte-tempered groups seem to be the most cohesive in the use of design and surface treatment, but this is probably at least partly because that is the best defined areal group. The motif-temper association in this case seems to cross within-temper group paint differences, which may give some idea of the scale on which design similarities operated.

Ceramic Distribution within the Site

In Volume I, Truell points out that the ceramics found in the various structures are, on the whole, not likely to go with the use of the structures. This, of course, makes functional interpretations of ceramics by means of their provenience unfeasible for virtually the whole collection. Whole and reconstructed vessels might be an exception, but very few of these came from primary contexts other than burials. It is possible, however, to segregate types of deposit in terms of location and apparent age and to discuss distributions in those terms. For this purpose, the project's time-space matrix was used in addition to stratigraphic examination of three pit structures and an overview of the proveniences of the bulk (as opposed to the detailed analysis) collection.

The time assignments given to various provenience lots were made on the basis of inspection of rough sort types present and, to lesser degrees, on the basis of chronometric dates and architecture. Because this procedure is somewhat impressionistic and is based on raw counts, the groups were subjected to both simple and multivariate tests using type groups to see if, in fact, they show the serial ordering implied. We are not in a position to verify the dates assigned, only the sequence. With one exception, the groups do seem to be ordered according to the dates assigned, although that ordering was not so sharp as to have been completely "discovered" by the multivariate technique. The exception to these assignments is the assemblage from the midden, which was divided into A.D. 920-1020 and A.D. 1020-1040 segments. The tests suggested that the assemblages from the midden were quite similar in terms of type composition and that their affinity was to the earlier groups, including the A.D. 920-1020 floor materials. The midden assemblage seems to differ from the later trash deposits in the pit structures and the materials found on the floors in vessel form and temper as well as types. Tecomates, a form frequently found in Lino Gray but in some whiteware types as well, are abundant in the midden relative to other proveniences.

Ceramics from the earliest time group, A.D. 820-920, are few in number, but were found to conform to the expected in terms of both temper and vessel form. Ceramic types from the two larger, later time groups, however, differ from one another in vessel form assemblage. This difference stems from a trend that repeats from the type analysis--the later types, especially Gallup Black-on-white, show a substantial increase in the occurrence of pitchers, a form synonymous with Chaco Canyon in many people's minds. Pitchers comprise less than 15% in any type, but they do seem to be associated with Gallup Black-on-white, which does seem to be associated with the "Bonito Phase." Note that pitchers are very much present at this "small site." The later period at 29SJ 627 is also characterized by more closed forms of other sorts than is the period preceding it. There is a suggestion from the principal components analysis that vessel form distribution is more complex than is type or temper distribution in that more components are necessary to explain the variance in the vessel form analysis by time-space group than in comparable type and temper runs. Although differences in vessel form can be found between time groups, the fact that most forms occur in most time slots surely contributes to the added complexity in accounting for differences.

The room floors and fill exhibit high relative frequencies of later materials, graywares in particular. This is consonant with the idea that the rooms were probably the last features in use, which would have produced the trash fill found in the later pit structures. For those mistrustful of the sample, similar associations are apparent in the bulk count distributions. Redwares remain at a remarkably consistent 2-3% in most time-space groups. Smudged wares are somewhat more variable, from a low of 0.5% in the non-trash fill of rooms to a high of 4.5% on pit structure floors. Somewhat surprisingly, carbon-painted wares are not heavy contributors to significant differences in type distributions.

The results of the stratigraphic comparisons within Pithouse C, Kiva D, and Kiva E were somewhat disappointing. The differences found between units within structures are all fairly minor--four of the 13 tests conducted are significant at the .05 level and some of these result from small cell entries. In both Pithouse C and Kiva D there are more redwares than expected near the floor. In Kiva E there are fewer grayware jars near the floor, perhaps showing some distinction between trash filling and use of the structure. Typological orderings in the fill of the structures are confused: in Pithouse C, grayware frequencies are "correct" but mineral-on-white is reversed; in Kiva D, there is no difference other than the redwares; and in Kiva E, no difference. The three structures can be ordered on the basis of their type complements, which correspond to the scarce absolute dates (Kiva C, then Kiva D and Kiva E). Although there has been some contention about whether or not Kiva E is actually later than Kiva D, the assemblage in Kiva D shows the stronger dominance of mineral-on-white ceramics and the Kiva E assemblage is distinctive for the site in the presence of far more Tusayan Whiteware than other proveniences. The structural sequence indicates a decrease in relative frequencies of grayware jars and, yet again, an increase in the relative frequency of whiteware specialized closed forms.

Overview and Discussion of Levels of Ceramic Imports

An overview approximation of the quantity of confidently identifiable ceramic imports to 29SJ 627 is given (Table 2.53). A number of assumptions and simplifications are necessary to compile such a table and some distortions are inevitable. It is desirable to include vessels from all classes and as nearly complete a sample as possible. A combination of typological production span and provenience was used to place items temporally. All items that could be classified into specific types with "known" production spans were used in the import estimates. The spans of most production types are greater than 100 years (Windes 1984; Figures 2.1-2.2); and where an item was recovered from a provenience assigned to a 100 year or less time period, the item was assigned to that period. In the frequent event that the time period assigned a provenience was more than 120 years (Tables 2.42 and 2.44) or, less often, that a specimen was found in a provenience outside its production span, items were placed into time segments corresponding to their main period of production (e.g., Red Mesa Black-on-white in A.D. 920-1040). There are several large, "generic" classes of ceramics that have no default time period based on type, such as plain gray, or, under the "rough sort" typology in effect, decorated redwares or exotic mineral-on-white. These items could be placed only by provenience time assignment, which leads to a substantial group (n=928) of cases that cannot be temporally placed for this analysis. This is especially so at 29SJ 627, where a high percentage of the proveniences were assigned to broad time segments. Items which could not be observed for temper were also excluded unless clearly typologically imported (redware or exotic mineral-on-white, for example). This attempt to maximize the number of vessels included in the analysis counterposed by the inability to place all sherds resulted in 89.2% of the temper sample being included (6,443 of 7,225).

The long occupation of 29SJ 627 means that a very wide span of typological time is represented. Operationally, the effect of this system is that considerable amounts of material are placed typologically. For example, few of the earliest types from 29SJ 627 are found in deposits that match the time span assigned to those types. This is due to prehistoric curation and deposition lag, to frequent assignment of long time spans to proveniences and, no doubt, to dating problems. Thus, while 29SJ 627 was probably at most briefly in use before A.D. 800, there are more items representing the pre-A.D. 800 segment than the A.D. 800-900 segment in this treatment. In essence, then, when an item is in a context later than its most likely span of production, it is dropped back to the production span. In ceramic probabilities this makes sense, but because the procedure treats all sites the same, it is less attuned to site probabilities. At a given site there is also a higher probability that proveniences are assigned to the main occupation of the site, A.D. 920-1040 at 29SJ 627 for example, so that generic types that may be holdovers from earlier periods may be placed late relative to their time of production. By making the weighting even more complicated (only dropping back to the latest part of a type's span according to provenience time assignment, for exam-

Table 2.53. Summary of identifiable ceramic imports through time at 29SJ 627.[a]

Time/ Identification	Grayware n	Grayware % import	Whiteware n	Whiteware % import	Redware n	Redware % import	Smudged n	Smudged % import	Overall n	Overall % import
Pre-800/										
Trachyte	2	1.4	23	11.5	-	-	-	-	25	7.3
San Juan	3	2.1	8	4.0	-	-	-	-	11	3.2
Chalcedonic SS	2	1.4	7	3.5	-	-	-	-	9	2.6
Total import	7	1.4	38	19.0					45	13.2
Total n	141		200[b]							
Ware % of:										
Import		15.6		84.4						
Total		41.3		58.7						
800-920/										
Trachyte	21	12.2	12	10.0	2	33.3	-	-	35	11.7
San Juan	2	1.2	5	4.3	4	66.7	-	-	11	3.7
Chalcedonic SS	31	18.0	6	5.2	-	-	-	-	37	12.4
Total import	54	31.4	23	19.2	6	100			83	27.9
Tota n	172		120		6				298	
Ware % of:										
Import		65.1		27.7		7.2				
Total		57.7		40.3		2.0				
Pre-920/										
Trachyte	23	7.3	35	10.9	2	33.3	-	-	60	9.4
San Juan	5	1.6	13	4.1	4	66.7	-	-	22	3.4
Chalcedonic SS	33	10.5	13	4.1	-	-	-	-	46	7.2
Total import	61	19.5	61	19.1	6	100			126	19.7
Total n	313		320		6				639	
Ware % of:										
Import	48.4		48.4			4.8				
Total	49.0		50.1			0.9				
920-1040/										
Trachyte	178	25.5	378	9.8	5	6.8	-	-	561	12.0
San Juan	5	0.7	49	1.3	57	77.0	-	-	111	2.4
Chalcedonic SS	60	8.6	209	5.4	-	-	-	-	269	5.8
Little Colorado	-	-	2	0.1	-	-	-	-	2	0.0
Typological	-	-	53	1.4	12	16.2	29[c]	93.5	94	2.0
Total import	243	34.8	691	17.9	74	100.0	29	93.5	1,037	22.2
Total n	698		3,871		74		31		4,674	
Ware % of:										
Import		23.4		66.6		7.1		2.8		
Total		14.9		82.8		1.6		0.7		

Table 2.53. (continued)

Time/ Identification	Grayware n	Grayware % import	Whiteware n	Whiteware % import	Redware n	Redware % import	Smudged n	Smudged % import	Overall n	Overall % import
1040-1100										
Trachyte	77	36.0	97	20.6	-	-	-	-	174	25.4
San Juan	1	0.5	4	0.8	-	-	-	-	5	0.7
Chalcedonic SS	13	6.1	2	0.4	-	-	-	-	15	2.2
Total import	91	42.5	103	21.9					194	28.3
Total n	214		471						685	
Ware % of:										
Import		46.9		53.1						
Total		31.2		68.8						
Post 1100										
Trachyte	44	36.1	39	27.3	-	-	-	-	83	31.3
San Juan	1	0.8	4	2.8	-	-	-	-	5	1.9
Chalcedonic SS	6	4.9	-	-	-	-	-	-	6	2.3
Typological	-	-	41	28.7	-	-	-	-	41	15.5
Total import	51	41.8	84	58.7					135	50.9
Total n	122		143[d]						265	
Ware % of:										
Import		37.8		62.2						
Total		46.0		54.0						
Unplaced types										
Trachyte	11	10.8	117	16.2	2	3.5	-	-	130	14.0
San Juan	-	-	19	2.6	26	45.6	-	-	45	4.8
Chalcedonic SS	8	7.8	16	2.2	-	-	-	-	24	2.6
Typological	3[e]	2.9	69	9.5	29	50.9	40	88.9	141	15.2
Total import	22	21.6	221	30.5	57	100.0	40[c]	88.9	340	36.6
Total n	102		724		57		45		928	
Ware % of:										
Import		6.5		65.0		16.8		11.8		
Total		11.0		78.0		6.1		4.8		

Unplaced Exotics: 38 Chuska whiteware; 91 exotic mineral/white; 57 redware; 40 fine SS smudged.

	Grayware n	Grayware %	Whiteware n	Whiteware %	Redware n	Redware %	Smudged n	Smudged %	Overall n	Overall %
GRAND TOTALS										
TOTAL IMPORT	468		1,160		137		69		1,834	
Total n	1,449		5,529		137		76		7,191	
% imported		32.3		21.0		100		90.8		25.5
Ware % of import		25.5		63.2		7.5		3.8		
Ware % of total		20.2		76.9		1.9		1.1		

Little Colorado whiteware is identified by paste and carbon paint.

[a] Overall effects of added culinary sherds may be found in Appendix E, Table E.9.

[b] 32 of these are carbon-painted with sandstone tempers; they are not counted as imports.

[c] Coarse sandstone tempered smudged wares are considered Lino Smudged and possibly local.

[d] 39 of these are sandstone tempered carbon-on-white; they are not counted as imports.

[e] Brownwares.

ple), the system could be yet further refined, but time, patience and descriptive capacity have all run out. The assumptions and default placements are discussed more fully elsewhere (Toll 1986).

Vessels are considered imports if their temper is trachyte, chaldeconic sandstone, or San Juan igneous (Table 2.53) or if it can be identified as non-local from surface characteristics, such as the San Juan or Tusayan series. Both periods when carbon-painted ceramics are more abundant in Chaco ceramic assemblages are represented. Carbon-painted ceramics present something of a dilemma in that they are almost certainly imported during some periods. In other periods, a substantial percentage is likely to be nonlocal, but it is thought that some (most notably Chaco-McElmo Black-on-white) were made in Chaco Canyon. A conservative estimate of import is made (Table 2.53), and thus carbon-painted sherds not in a distinctive series, such as Tusayan whiteware, are considered imported only if they have non-local temper. If an item is typologically exotic and has an exotic temper, it is listed in the table under the temper. A second result of the broad typological span is that there are ceramic default dates that fall outside provenience date assignments, which means that there are no redware or polished smudged ware placements in the earliest and latest time groups.

There is one area in which the estimates at 29SJ 627 may be somewhat inflated in relation to estimates at other sites; no distinction was made between mixes of trachyte and sand temper with respect to relative quantities of the two. At other sites where this distinction was made, cases with more sand than trachyte tempering material are not counted with the trachyte-tempered imports. These considerations notwithstanding, this ordering is comparable to that used at other sites and can be considered indicative of real trends. A summary of time group placement follows:

Pre-A.D. 800. This time period has no provenience placements, but is the default for all BMIII-PI whitewares, Lino Gray and Lino Fugitive Red, and Obelisk Gray ("polished tan-gray"). Indented corrugated sherds from early time group proveniences are excluded. Polished smudged wares and redwares are absent here because of the lack of proveniences assigned to the time groups involved.

A.D. 800-920. This period is the default and, at 29SJ 627, sole placement for wide neckbanded; it contains some BMIII-PI whitewares as well as some early Red Mesa Black-on-white and Red Mesa Black-on-white placed by provenience. The segment relies mainly on provenience placement and may be underrepresented because of typological placement of Lino variants and BMIII-PI types in the pre-A.D. 800 segment.

Pre-A.D. 920. Because of the likely distortions in the pre-A.D. 800 and A.D. 800-920 groups, the two combined are also presented (Table 2.53). This combination gives a more equable white-gray ware distribution that is more in line with expectations for early pottery. The combined period should cancel some of the distortions in placement.

A.D. 920-1040. Quite correctly, this segment contains the majority of the sherds from the site (65%). The majority of usable provenience time assignments fall within this span, and two of the four most abundant specific types (Red Mesa Black-on-white, as well as early Red Mesa Black-on-white, and narrow neck-banded) default to this group. Items allocated by time group include both indented corrugated and plain gray, the whitewares and redwares, and polished smudged.

A.D. 1040-1100. The other two abundant types, Gallup Black-on-white and PII corrugated, as well as Escavada and Puerco Black-on-white, default to this group. There are, however, very few proveniences assigned to the corresponding time span and no red or polished smudged wares are placed here, which probably incorrectly depresses the import estimate. Plain gray sherds are not placed in this segment.

Post-A.D. 1100. Defaults to this time period are late carbon types (Chaco-McElmo Black-on-white, PII-III carbon-on-white, Tusayan whiteware) and PII-III and PIII corrugated. There are no proveniences assigned to time groups after A.D. 1120 at 29SJ 627, so all inclusions in this category are typological.

Unplaced. This group contains the highest level of import because of the presence of higher-than-normal percentages of exotics such as redware, polished smudged wares, and exotic mineral-on-white. This higher frequency adds 1.7% to the overall import figure derived from the placed types alone.

Entries in the table are calculated to show:

1) % Import columns--the percentage of the total number of a given ware in a particular time group that are identifiable imports.

2) Total Import rows--again, the percentage of the total ware in a time group that fits this definition of imported.

3) Ware % of Import rows--the n of imported wares is divided by the total n of imports.

4) Ware % of Total--the total n of each ware is divided by the total n of the time period. This is useful for comparing to the ware % of imports as a sort of expected value.

Taken at face value, Table 2.53 shows a trend toward increasing importation of ceramics through time, from around 13% to around 36%. A number of shifts may be noted through time. Proportions of the imports in the pre-A.D. 800 group are very different from those in the other segments. The percentage of imported utility ware is the smallest of all time segments and the whiteware the largest; moreover, the whiteware import percentage is considerably more than the grayware figure. This period has the lowest overall import percentage, which reflects, in part, that the level of trachyte-tempered ceramic imports, especially in the utility wares, is extremely low early in the sequence. Tempers in this time group are very nearly all sandstones and mostly coarse-grained. This fact can be taken to show a very much higher percentage of import, but that interpretation requires an additional assumption (Table 2.54 and discussion).

In the subsequent periods, the percentage of identifiable imports that is grayware exceeds the percentage of the total of each period that is grayware.

Table 2.54. Grain size of unidentified sandstone through time and import totals at 29SJ 627, assuming coarse sandstone is not local.[a]

Time/SS Grain Size	Grayware n	Grayware %	Whiteware n	Whiteware %	Total	Overall Maximum Percent
Pre-A.D. 800						
Fine	-	-	6	3.9	6	
Medium	3	2.3	50	32.3	53	
Coarse	68	52.7	75	48.4	143	
Very coarse	58	45.0	24	15.5	82	
Total	129	-	155	-	284	
Total C+VC	126	97.7	99	63.9	225	
Import estimate	133	94.3	137	68.5	270	79.2
A.D. 800-920						
Fine	1	0.9	33	34.0	34	
Medium	14	12.0	50	51.5	64	
Coarse	62	53.0	12	12.4	74	
Very coarse	40	34.2	2	2.1	42	
Total	117	-	97	-	214	
Total C+VC	102	87.2	14	14.4	116	
Import estimate	156	90.7	33	28.4	195	66.3
Pre-A.D. 920						
Fine	1	0.4	39	15.5	40	
Medium	17	6.9	100	39.7	117	
Coarse	130	52.8	87	34.5	217	
Very coarse	98	39.8	26	10.3	124	
Total	246	-	252	-	498	
Total C+VC	228	92.7	113	44.8	341	
Import estimate	289	92.3	170	53.8	465	73.2
A.D. 920-1040						
Fine	3	0.7	727	23.0	730	
Medium	49	10.8	1,840	58.3	1,889	
Coarse	216	47.6	565	17.9	781	
Very coarse	186	41.0	26	0.8	212	
Total	454	-	3,158	-	3,612	
Total C+VC	402	88.5	591	18.7	993	
Import estimate	645	92.4	1,284	33.1	2,034[b]	43.5
A.D. 1040-1100						
Fine	7	5.7	78	21.5	85	
Medium	13	10.7	179	49.3	192	
Coarse	44	36.1	99	27.3	143	
Very coarse	58	47.5	7	1.9	65	
Total	122	-	363	-	485	
Total C+VC	102	83.6	106	29.2	208	
Import estimate	193	90.2	209	44.4	402	58.7
Post A.D.1100						
Fine	1	1.4	28	47.5	29	
Medium	7	9.9	23	39.0	30	
Coarse	22	31.0	7	11.9	29	
Very coarse	41	57.7	1	1.7	42	
Total	71	-	59	-	130	
Total C+VC	63	88.7	8	13.6	71	
Import estimate	114	93.4	51	35.7	165	62.3

[a] Coarse sandstone is summed with totals in Table 2.53.
[b] Includes two coarse sandstone-tempered polished smudged.

There is a steady increase in the percentage of graywares imported. The increase consists entirely of vessels with trachyte temper, which comprise 85% of the imported graywares in the A.D. 1040-1100 period (36% of the total grayware for the period). Chalcedonic sandstone temper, as noted in the type discussions, never reaches the high relative frequencies seen in graywares at 29SJ 629, but it does show a moderate decline later, corresponding to more general findings (Toll 1984).

The whiteware distributions are the converse of the graywares in that after A.D. 800, the percentage of imports that are whitewares is less than the percentage of the time periods' sherds that are whitewares. The increase in trachyte-tempered material is also present in the whitewares, but the relative occurrence is about half that in the graywares. The only imported temper type which is regularly more abundant in the whitewares than the graywares is San Juan igneous, and its frequency is always low. San Juan igneous temper is most abundant before A.D. 920, which is also consistent with the findings at 29SJ 628 and 29SJ 629. The relative frequencies of San Juan temper are never as high as they are at 29SJ 628 and 29SJ 629. This is probably related to the fact that 29SJ 627 is, on the whole, later than these two sites and, with mixing and larger samples, the other tempers are overshadowed by the very large quantities of undifferentiated sandstone.

Chalcedonic sandstone temper reaches its peak occurrence in pre-A.D. 920 grayware. The results are in accord with those from 29SJ 1360, in that the peak percentages are in the A.D. 800-920 group, which mainly occurs in wide neckbanded. There is at 29SJ 629, however, a high percentage of chalcedonic sandstone temper in the A.D. 920-1040 segments, which occurs in narrow neckbanded and neck corrugated. Chalcedonic sandstone temper is present in the A.D. 920-1040 group at 29SJ 627, but at a reduced percent. As trachyte temper increases steadily in occurrence until reaching an apparent plateau around 36% of total grayware, chalcedonic sandstone temper decreases to around 5%. The percentages of trachyte temper at Pueblo Alto are higher, but the same trends are present.

The redwares from 29SJ 627 are about two-thirds San Juan igneous-tempered and are especially abundant in the A.D. 920-1040 period. That Chuska redware (Sanostee Black-on-red) was an early and relatively scarce product is visible in its steadily declining occurrence. The expected increase in sand-tempered and sherd-and-sand-tempered redwares (Tusayan and White Mountain Redwares) is suggested in the small occurrence of "typological" redware imports in A.D. 920-1040. The considerably higher occurrence of sandstone-tempered redwares in the unplaced category is very likely late (A.D. 1100+) and accounts for the absence of this increase (Table 2.53). As was noted in the chronology section, the substantial occurrence of San Juan Redware post-A.D. 1000 is somewhat anomalous. <u>All</u> of the redwares in this group come from proveniences assigned to A.D. 1020-1040 (which are placed in A.D. 1040-1100 here), so that it is not inconceivable that these are post-production breakage, meaning that neither the dating of the types nor the time assignments for the provenience are necessarily incorrect. The 2% occurrence of smudged wares is consistent with information from other sites, although somewhat low; their absence in the earliest and latest groups is not consistent and is again a provenience assignment artifact (see unplaced group in Table 2.53).

The final time period shows an extreme increase in whiteware and, hence, overall import. It is obvious that much of the increase over the preceding period rests with the typological class which, in this case, consists entirely of Tusayan Whiteware. This is a default placement for this group and some of its members are probably earlier. Even with the total exclusion of Tusayan whiteware as imports, however, the relative frequency of imports is 35.5% (Table 2.53), which is a considerable increase from the preceding period. It is not uncommon for sites both large and small to show higher relative frequencies of imports in poorly represented, terminal time segments.

It has been claimed that more often than not that bowls were transported long distances (e.g., Whittlesey 1974). Clearly, the high numbers of trachyte-tempered jars run counter to that claim (Table 2.25). There are, however, classes of imported wares that support this contention; Tusayan whitewares, redwares of all series, and polished smudged wares are predominately bowls. A comparison of form distributions within import classes provides another opportunity for assessment of possible scales of operation. As noted, trachyte-tempered grayware jars are abundant; whiteware forms with trachyte temper are quite similar in distribution to those of the modal sandstone group. San Juan igneous-tempered graywares are uncommon--in contrast to the Chuska vessels, whitewares outnumber graywares. However, the forms with this temper are again fairly similar to the overall form distribution, which allows for the small size of the San Juan-tempered whiteware group.

Thus, several levels of ceramic catchment might be proposed on the basis of vessel form distributions. The sandstone tempers are found in all forms and were presumably the most available group. Trachyte temper was important fairly early and, as time went on, became increasingly so particularly for gray jars which, because of their size and abundance, seem to be in a special relationship to Chaco Canyon. The (southern?) chalcedonic sandstone temper producing area is similar to the trachyte temper area in its emphasis on grayware jars, as well as supply of most whiteware forms. The San Juan tempers were found in different types of vessels--first, in a minimal supply of grayware often in miniature vessels and in a "normal" if small assemblage of whiteware forms; second, in red bowls. That some other San Juan Redware forms are also present places this series outside the San Juan Whiteware and inside the White Mountain Redware, Tusayan Whiteware and polished smudged types relative to the bowl-as-import assumption.

Thus far, in this summary of imports to 29SJ 627, the most abundant temper class, undifferentiated sandstone, has been treated as a non-import. This is a wild oversimplification because sandstone and sand are probably the two most available items in the San Juan Basin and the entire Four Corners Region. Further, that there is substantial variability within the temper class in the ceramics from 29SJ 627 cannot be denied. The ubiquity and variability of sandstones has led to the practice of lumping this large category because we do not know enough to confidently subdivide it; thus, Table 2.53 represents a very conservative estimate of the level of ceramic import. Warren (1976:186; 1977:56) maintained that the absence of geologically occurring coarse-grained sandstones in Chaco Canyon proper meant that any ceramics containing coarse sand tempering material (grains larger than 0.5 mm) was an import. We feel that this, too, is an oversimplification, because coarse sands and sandstones are present within an ethnological catchment area for temper (see Arnold 1980). Nonetheless, Warren's assumption (referred to as the "grain size assumption" below) allows a range of import values to be given based on the information recorded here. Although the values (Table 2.53) may be considered minima, values including all coarse-tempered items are not true maxima, since 100% is the absolute maximum and since a fine-tempered, mineral-painted, thin-slipped vessel is only possibly local.

Table 2.54 presents the grain sizes for the category undifferentiated sandstone from the same groups as Table 2.53. The tempers, magnetitic sandstone and rounded iron oxide sandstone, are conceivably local and are not included in the grain size calculations. It can readily be seen that the sandstone-tempered utility wares contain over 80% coarse grains in all time periods (see the technological attribute section for further discussion). As at 29SJ 629, the early whitewares are more than half coarse-tempered and beginning with Red Mesa Black-on-white, the proportion becomes much less. The increase in coarse sandstone temper apparent in the A.D. 1040-1100 period is attributable to the increased use of such tempers in the types Puerco and Escavada Black-on-white. The conventional wisdom assumes that these types are local (Plog 1980a, 1980b), but the grain size assumption rules that many members of these classes are imported.

Having stated that all non-local tempers, plus all coarse-grained sandstone tempers, are not a true maximum, they are the maximum estimate obtainable using this method; the "maximum" column (Table 2.54) combined the coarse-grained tempers and the conservative estimates (Table 2.53). The overall maximum estimates show a drop from 79% to 43% from the pre-A.D. 800 to A.D. 920-1040 periods. There follows an increase in the maximum estimate to 62% in the latest period. This trend is mirrored in the conservative estimates except that the decrease is one of 21% to 18% in the two earliest periods. Warren (1976:72, 83-6) postulated that 80-90% of vessels from early contexts in Chaco Canyon were imported. This figure corresponds well with the maximum estimate arrived at here using her grain size assumption. Based on her other clay and sandstone differentiations, she maintained that a similar level of import was present in the succeeding period as well. The figures here are clearly more conservative and the drop in the maximum import estimate looks entirely unreasonable. Two alternatives explain the discrepancy between Warren's figures and ours:

1) The grain size assumption is incorrect in some unknown degree and

substantial quantities of coarse sandstone-tempered ceramics, especially in the earlier periods, were produced in Chaco Canyon.

2) Warren's identifications of non-local sandstones are correct and reliable, and a drastic change in import levels did not take place.

As usual, it is unlikely that either of these alternatives is completely "right"; rather, some of each is probably valid. Direct evidence for ceramic manufacture in Chaco Canyon is slim in any period, but what evidence there is (scrapers and polishing stones) tends to be early. As can be seen repeatedly in the early types, use of coarse sandstone tempers is heavily dominant in every conceivably Chaco-produced ware (thus excluding the fine-tempered Woodruff series). This leads us to contend that the use of coarse-grained sandstone tempers was likely in Chaco Canyon. Undeniably, ceramics were obtained from other areas. We would question only that any coarse-grained sandstone-tempered sherd is non-local and that the level of imports remained at a steady 80% plus.

The shift to finer tempers in whitewares is a very marked one. In the present approach, it has the effect of making the Red Mesa Black-on-white period appear to have been the time of greatest possible relative quantities of "local" production. The similarity in the percentage of confidently identifiable imports between the pre-A.D. 920 and the A.D. 920-1040 group suggests that a dramatic decrease in import was <u>not</u> likely. Warren's efforts to differentiate clays and sandstones by source area are laudable, but are not sufficiently clearly documented to be used, and knowledge of sandstone formations and clay deposits is far too incomplete to make pronouncements on source. Because the ceramics from the period A.D. 920-1040 evidence the heaviest use of the most ambiguous tempers, any analysis conducted on the current knowledge base is most prone to error and imprecision for that period. Therefore, our method is most prone to underestimation during that period and our figures should be viewed in that light. By the same token, we view figures of 90% with considerable suspicion.

In summary, then, <u>at least</u> 20% of ceramics at 29SJ 627 in <u>all</u> time periods were imported from somewhere outside the canyon. This level compares very well with the minimum estimates for 29SJ 629 for the same general time span. Through time the minimum import figure increases, largely because of the presence of increased quantities of trachyte temper from the Chuska area, which reaches a minimum of 30%. The minimum amount of imports at 29SJ 629 and at 29SJ 1360 does not reach this level, but the occupation of 29SJ 627 extends considerably later than does that at 29SJ 629. Figures for the percentage of imported graywares, in particular, are very close to those at 29SJ 629 and 29SJ 1360, although the importance of chalcedonic sandstone temper is much greater at 29SJ 629 and 29SJ 1360. At 29SJ 627, trachyte temper is relatively more important and again the time factor is suggested, but there seem to be true site differences as well, especially in view of the different time periods of occurrence of chalcedonic sandstone temper. Because of the distinct preference for coarse-grained sandstone tempers in graywares, maximum estimates based on grain size and non-local tempers are also very close--close to 90% at all three sites. Whitewares follow very similar patterns at both sites as well; they begin at a minimum level of 21% (29SJ 627) to 26% (29SJ 629), drop somewhat, and then increase to reach higher levels at 29SJ 627 than at 29SJ 629. In the assemblage at 29SJ 1360 there is a steady increase based on higher frequencies of chalcedonic sandstone temper and San Juan igneous tempers (McKenna and Toll 1984:129-130). This remarkable overall similarity among two closely spaced, partially contemporaneous sites suggests similar needs for ceramics from the outside and participation in the same economic pattern. The differences in source of ceramics, however, suggest that mode of acquisition was, to some degree, independent.

Finale

As has been noted, there is yet more that could have been done with this large collection of ceramics (designs might have been more extensively analyzed, site distributions more painstakingly pursued), and there is a whole realm of back-up technical procedures and studies that has not even been broached. However, fall-off is important in more ways than across the San Juan Basin. The return on distribution analyses diminishes rapidly with non-primary contexts and more time has been spent than was available, and the reader falls off his chair only to find the analysts are already on the floor.

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3

A BRIEF SUMMARY OF CHIPPED STONE USE AT SITE 29SJ 627

Catherine M. Cameron

Introduction

Excavations at site 29SJ 627 produced a total of 7,144 chipped stone artifacts. The site was excavated in 1974 and 1975, and the chipped stone materials were analyzed in 1978. Because much of the data from that analysis were incorporated by Truell in her 1981 site report, only a brief chipped stone report was prepared for this site. What follows is an updated version of that brief report. It presents raw data, data organized for easy comparison with that from other sites in Chaco Canyon, and some discussion of patterns of chipped stone use at 29SJ 627 in comparison with those at other Chaco Canyon sites. It does not examine or compare the artifacts from specific proveniences at 29SJ 627, but only contrasts gross temporal groups both within the site and with similar groups at other sites. Access to computer files was not available for the updated version; this limited both the analysis and the verification of some data tables.

Method

Analysis of chipped stone material from sites in Chaco Canyon emphasized regional resource exploitation by the identificaton of sources of raw material (see Cameron 1982 for analytic procedures). Functional variation in the use of chipped stone materials was also examined. Material type categories used were those developed by Warren (n.d.). In this report, Warren's types are combined into the eleven major groups, five non-local and six local (Table 3.1) used in other Chaco Canyon chipped stone analyses (Cameron 1982, 1984, 1987). More detailed morphological and technological analyses were made of all formal tools (Lekson 1979, 1985) and cores (Cameron 1982), and wear pattern analysis was performed on a small sample of the chipped stone artifacts, mostly utilized and retouched flakes (Cameron 1982). In the following report, Lekson's tool type designations are used, but specific core type designations are not used and wear pattern analysis for 29SJ 627 chipped stone is not discussed. The source of obsidian recovered from Chacoan sites was identified by using trace element analysis (Cameron and Sappington 1984).

Sources of local materials used in chipped stone manufacture at 29SJ 627

Table 3.1. Local and non-local material type groups at 29SJ 627.

Material Type	Warren's Type Numbers	Total	%
<u>Non-local materials</u>			
1) Morrison formation chert	1020, 1022, 1040, 2201, 2205	41	0.6
2) Yellow-brown spotted chert	1072	116	1.6
3) Washington Pass chert	1080, 1081	267	3.7
4) Zuni silicified wood	1160, 1161	7	0.1
5) Obsidian	3500-3640	79	1.1
<u>Local materials</u>			
6) High surface chert	1050-1054	685	9.6
7) Cherty silicified wood	1112, 1113	2,630	36.8
8) Splintery silicified wood	1109, 1110	452	6.3
9) Chalcedonic silicified wood	1140-1145	1,891	26.5
10) Quartzite	4000, 4005	140	2.0
11) Others	All other material types[a]	839	11.7
TOTAL		7,144	100.0

[a] Other material types:
1010, 1011, 1012, 1014, 1021, 1030, 1035, 1041, 1042, 1044, 1060, 1061, 1070, 1075, 1090, 1091, 1100, 1111, 1120, 1130, 1131, 1150, 1151, 1152, 1153, 1170, 1200, 1210, 1212, 1214, 1215, 1220, 1221, 1230, 1231, 1232, 1233, 1234, 1235, 1240, 1300, 1310, 1320, 1330, 1400, 1411, 1430, 1551, 1570, 1600, 1610, 1650, 1660, 2000, 2020, 2200, 2202, 2204, 2209, 2220, 2221, 2250, 2500, 2550, 2551, 2650, 2700, 2710, 2919, 3015, 3100, 3150, 3300, 3700, 4009, 4010, 4053, 4060, 4375, 5000, 5010.

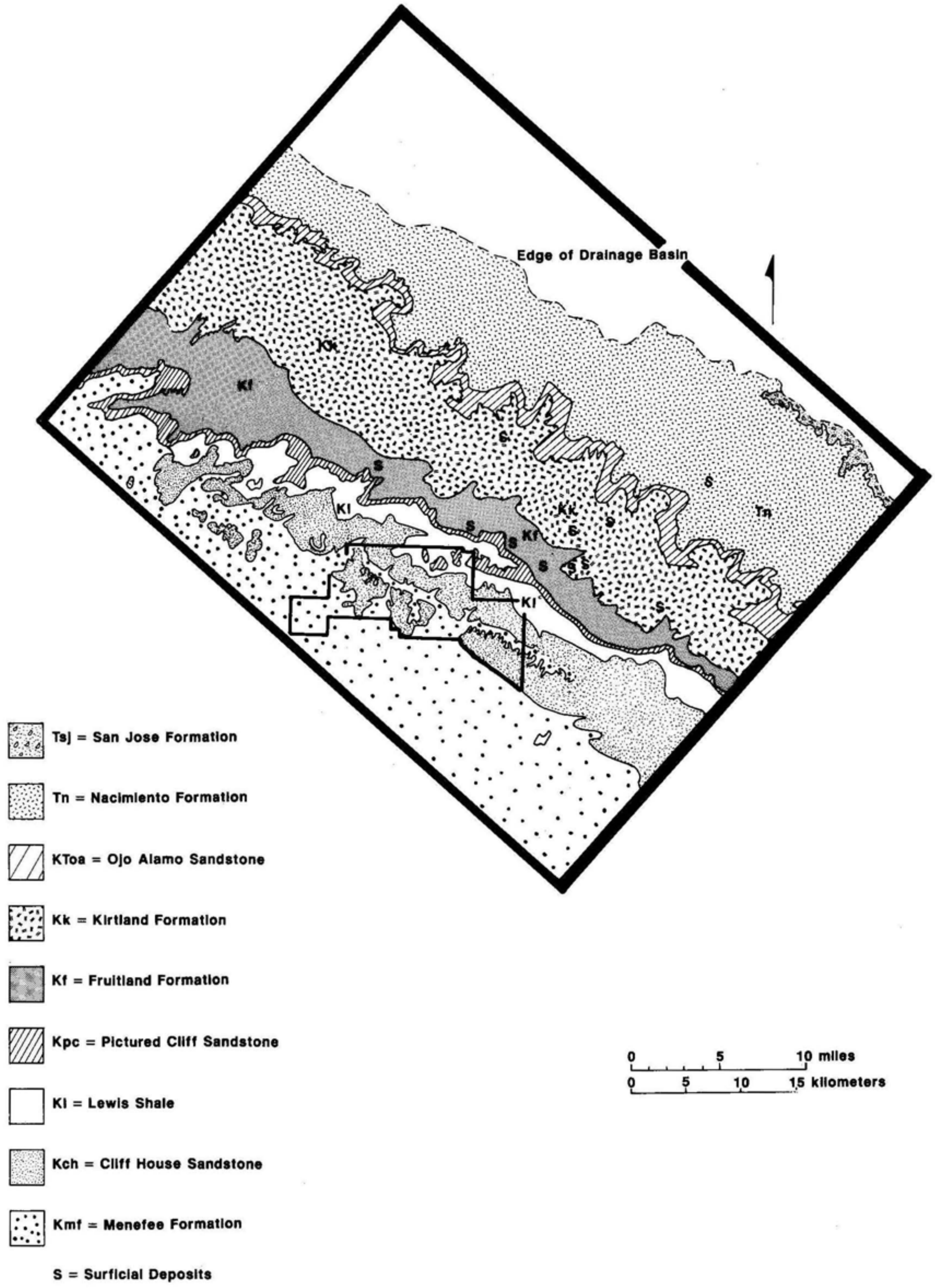

Figure 3.1. Local sources of chipped stone material.

occur within 10 km of the canyon. The materials are primarily silicified woods and pebble cherts (Table 3.1 and Figure 3.1). Silicified wood is found in the Kirtland Formation, the Fruitland Formation, and the Ojo Alamo sandstone. The Ojo Alamo and Quaternary gravel terraces produce pebble cherts and some reworked silicified wood. Most of the locally available material occurs to the north of the canyon.

Non-local materials had sources more than 50 km from Chaco Canyon (Table 3.1). Five types of non-local materials have been identified in the chipped stone collection from 29SJ 627, but some of these may come from more than one source (Figure 3.2). Usable outcrops of Morrison Formation material have been reported only in the Four Corners area (Phil Shelley, personal communication, 1982), but the Morrison Formation does outcrop at many other locations around the San Juan Basin. Occurrences of yellow-brown spotted chert have only been reported in the Zuni Mountains, but other outcrops are possible. The source of Washington Pass chert is known to be restricted to a small area in the Chuska Mountains. Zuni wood may originate in the Chinle Formation of east-central Arizona. It is found only infrequently at sites in Chaco Canyon. Obsidian recovered at 29SJ 627 was from seven different sources located in New Mexico, Arizona, and Utah.

Chipped stone was analyzed using a 10X stereoscopic microscope to identify artifact type. Artifact types included formal tools, retouched flakes, utilized flakes, unutilized whole flakes, angular debris, cores, and unmodified raw material (Table 3.2). In the discussion that follows, unutilized whole flakes, angular debris, and unmodified raw material are combined as "debitage."

The Site

Site 29SJ 627 is important to an understanding of Chacoan archaeology. Of all the village sites excavated by the Chaco Project, it dates most closely to the large sites or greathouses, such as Pueblo Alto, which may have been part of the regional Chacoan system during the late eleventh and early twelfth centuries (Windes 1987). During this period, large quantities of non-local chipped stone material, primarily Washington Pass chert, were imported into the canyon, apparently mostly to the large sites or greathouses. Washington Pass chert constituted 27% of the chipped stone assemblage at Pueblo Alto from A.D. 1050 to 1100 (Cameron 1982, 1984, 1987), indicating extensive contact between populations in the Chuska Mountains and Chaco Canyon. During this same period, large numbers of ceramic vessels and architectural beams were also imported to town sites in Chaco from the Chuska area (Lekson 1984; Toll 1984).

Was access to non-local (and therefore valuable) goods restricted to large sites or greathouses and denied to small sites in Chaco Canyon? This is a key question in understanding the Chacoan system, but answering it requires contemporaneous data from both large and small sites. Unfortunately, there may be no proveniences at site 29SJ 627 that are fully contemporaneous with the most intensive occupation of Pueblo Alto, the only large site or greathouse extensively excavated by the Chaco Project (Windes 1987). Most proveniences

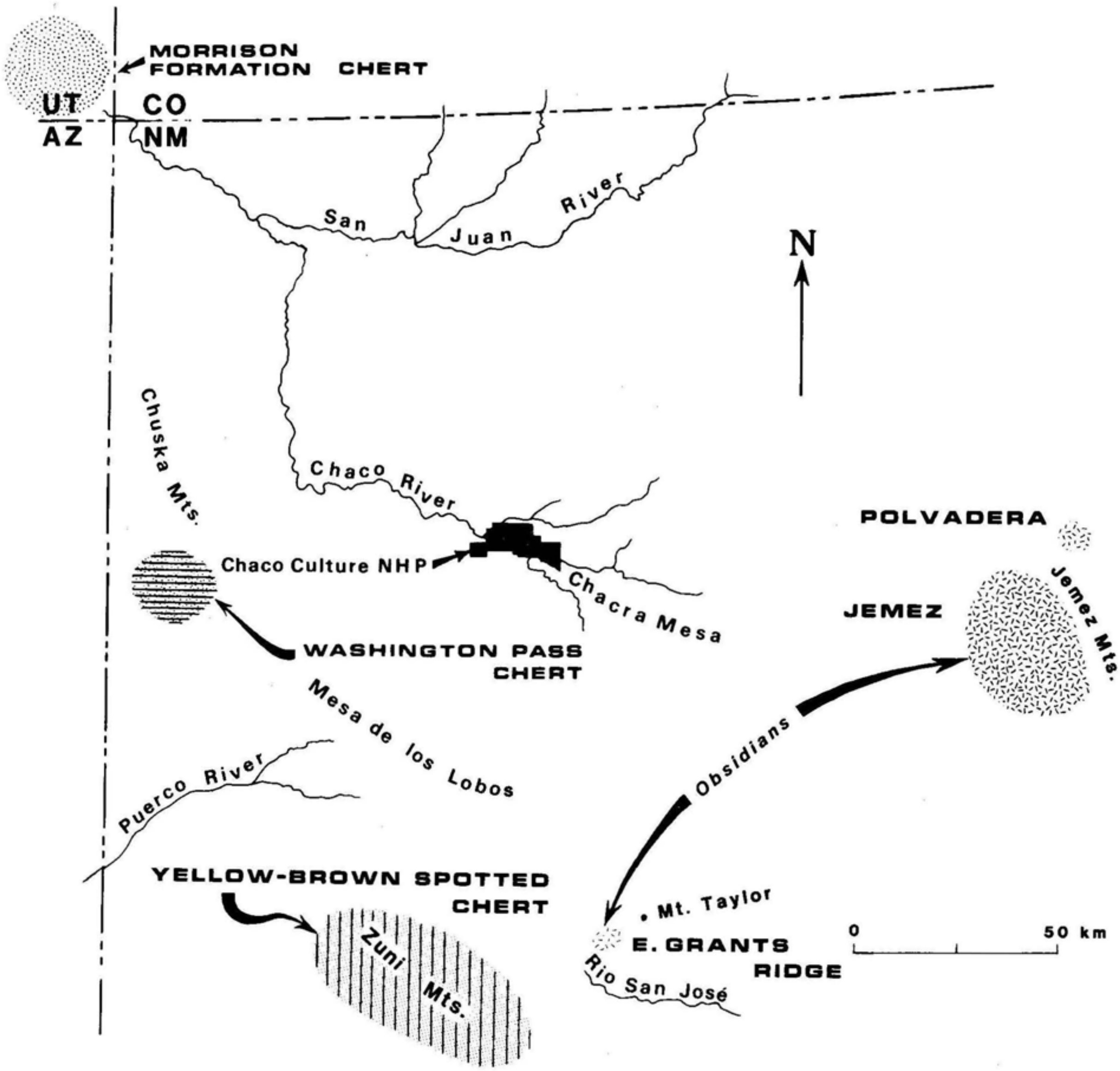

Figure 3.2. Sources of exotic chipped stone.

at site 29SJ 627 date no later than A.D. 1040 (Truell, Volume I), while most of the activity at Pueblo Alto appears to have occurred between A.D. 1050-1100 (Windes 1987). Nevertheless, chipped stone from site 29SJ 627 can provide information on differential access to non-local materials between large and small sites during the early stages of the development of the Chacoan system.

The chipped stone sample from excavated proveniences at site 29SJ 627 may be underrepresented, especially in comparison with examples from other Chaco Canyon sites. Fill at the site was consistently screened only during the second of the two field seasons during which 29SJ 627 was excavated. This undoubtedly decreased the amount of chipped stone and other small artifacts that were recovered.

Table 3.2. Artifact type definitions at 29SJ 627.

Attribute/ Type No.	Description
202	Stemmed projectile point with a narrow distal end for hafting without notches
203	Corner-notched projectile point. Bifacially flaked piece with a point at the proximal end. Distal end consists of haft with notches emanating from the base
204	Side-notched projectile point. Same as No. 203 except notches emanate from the side
205	Triangular point. Bifacially flaked with triangular shape and no visible hafting element
209	Small non-hafted blade. Bifacially flaked piece without visible hafting elements
210	Large non-hafted blade. Large bifacially flaked piece without visible hafting elements
211	Side scraper. Steep unifacial retouch along the long axis of the piece. Retouch may extend over one face
213	Small non-hafted blade. Small bifacially flaked piece without visible hafting elements
214	Asymmetrical bifacially flaked piece. Asymmetrical distal end consists of side notches for hafting. Point or drill
221	Knife. Bifacially flaked piece with bifacial retouch or bifacial edge damage along one or more edges
231	Formal drill. Manufactured projection exhibiting retouch on tip or sides of projection
234	Informal or fortuitous perforator. Natural projection exhibiting retouch on tip or sides of projection
241	Utilized flake. Any piece that exhibits evidence of edge damage due to use: step flakes, feathered flakes, nibbling, polish, rounding. Distinguished from fortuitous damage related to processing or bag wear by regularity and extent of damage
242	Retouched flake. A piece that exhibits intentional retouch on one or more edges or faces but cannot fit easily into one of the tool categories. Distinguished from edge damage by large regularly-spaced feathered flakes emanating from the edge
243	Whole flake. A piece exhibiting a platform, bulb of percussion, and full distal end
249	Angular debris. A piece exhibiting no positive or negative bulb of percussion but with the remains of flake production evidence. These include parts of flake scars, ripple marks, etc.
251	Core. A piece exhibiting no bulb of percussion but from which two or more flakes 2 cm or more in length have been removed
299	Other chipped stone. Any retouched piece not fitting the above two categories
770	Raw material. Pieces of siliceous stone material that do not exhibit any signs of use or manufacture. This category is <u>not</u> included in the chapter discussion or tabulations
Material	Material types follow the system established by Warren (1979)
Cortex frequency	Recorded for pieces exhibiting any cortical material. The number of pieces of the same material and artifact subtype were recorded by provenience
Weight	Each piece was weighed to the nearest tenth of a gram using a Sartorius 1103 read-out scale

Table 3.3. Grouped material type by time period at 29SJ 627.

Material Type	A.D. 920-1000 No.	A.D. 920-1000 %	A.D. 1000-1040 No.	A.D. 1000-1040 %	Total No.	Total %
Morrison formation chert	11	0.4	9	0.5	20	
Yellow-brown spotted chert	16	0.5	29	1.7	45	
Washington Pass chert	54	1.8	73	4.3	127	
Obsidian	35	1.2	17	1.0	52	
High surface chert	269	9.2	180	10.6	449	
Cherty silicified wood	1,135	38.7	672	39.6	1,807	
Splintery silicified wood	194	6.6	119	7.0	313	
Chalcedonic silicified wood	867	29.6	373	22.0	1,240	
Quartzite	59	2.0	34	2.0	93	
Others	294	10.0	193	11.4	487	
TOTAL	2,934	100.0	1,699	100.0	4,633	100.0

Material Selection and Temporal Variation in Materials

Local materials are the most common ones at site 29SJ 627 (Table 3.1). Less than 10% of the total collection was of non-local material. About two-thirds of the chipped stone from 29SJ 627 can be assigned to one of two major periods: A.D. 920-1000 and A.D. 1000-1040. Kiva E contained later material, but this material cannot be accurately dated (Truell, Volume I). The types of chipped stone material used during these two periods at 29SJ 627 are very similar (Table 3.3). Two local types, cherty silicified wood and chalcedonic silicified wood, make up over 60% of the collection during both periods. Non-local materials are rare although they are more common in the later period (7.5%) than in the earlier period (3.9%). This change is due primarily to an increase in the relative frequency of Washington Pass chert after A.D. 1000.

Material type frequencies at site 29SJ 627 appear to be generally similar to material type frequencies at other small sites in Chaco Canyon between A.D. 920 and A.D. 1000 (Table 3.4), although some differences are apparent between assemblages from large and small sites. In comparison with 29SJ 627 and other small sites, large sites during this period have lower frequencies of cherty silicified wood and higher frequencies of "other" local material. The frequency of Washington Pass chert, even in this early period, is higher at large sites (7%) than at small sites (less than 2%).

Site 29SJ 627 is the only small site with significant quantities of chipped stone dating to the period from A.D. 1000 to 1040. Again, only slight differ-

Table 3.4. Grouped material type by period for large and small sites.

	A.D. 920-1000						A.D. 1000-1040					
			Other						Other			
	29SJ 627		Sm. sites		Lg. sites		29SJ 627		Sm. sites		Lg. sites	
Material Type	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Morrison formation chert	11	0.4	21	0.3	8	0.6	9	0.5	-		20	1.3
Yellow-brown spotted chert	16	0.5	14	0.2	1	0.1	29	1.7	-		0	0.0
Washington Pass chert	54	1.8	63	1.1	95	6.8	73	4.3	-		142	9.1
Zuni wood	0	0.0	7	0.1	8	0.6	0	0.0	-		11	0.7
Obsidian	35	1.2	39	0.7	12	0.9	17	1.0	-		10	0.6
High surface chert	269	9.2	480	8.2	127	9.2	180	10.6	-		133	8.5
Cherty silicified wood	1,135	38.7	1,914	32.8	284	20.5	672	39.6	-		330	21.1
Splintery silicified wood	194	6.6	501	8.6	40	2.9	119	7.0	-		61	3.9
Chalcedonic silicified wood	867	29.6	2,054	35.2	488	35.2	373	22.0	-		455	29.1
Quartzite	59	2.0	167	2.6	64	4.6	34	2.0	-		97	6.2
Other	294	10.0	574	9.8	260	18.7	193	11.4	-		304	19.4
TOTAL	2,934		5,834		1,387		1,699		-		1,563	

Table 3.5. Sources of obsidian.

Source Area	No.	%
Jemez Mountains, NM	33	47.8
Grants, NM	4	5.8
Polvadera Peak, NM	6	8.7
Red Hill, NM	21	30.4
San Antonio Peak, NM	2	2.9
Mineral Mountain, UT	1	1.4
Unknown	2	2.9
TOTAL	69	100.0
Not typed	(7)	

ences in material type frequencies are apparent between 29SJ 627 and large sites during this period (Table 3.4). Cherty silicified wood is higher in frequency at 29SJ 627, while chalcedonic silicified wood and "other" local material are more common at large sites. The frequency of Washington Pass chert has increased marginally at 29SJ 627 (to 4%), but it is still even higher at large sites (9%). Although frequencies of nonlocal material are higher at large sites than at small sites after A.D. 1000, the difference does not seem great enough to suggest differential access to source material.

Sources of Obsidian

While obsidian constituted only 1% of the chipped stone at 29SJ 627, trace element analysis indicated that this material (69 pieces) originated from seven different sources located in New Mexico, Arizona, and Utah (Table 3.5). (Seven pieces could not be relocated for trace element analysis and retain their unverified field designation.) More than 30% of the obsidian recovered from the site was in the form of formal tools, which contrasts markedly with the very low percentage of formal tools found in the collection as a whole (1.2%) (Table 3.6). Obsidian debitage was rare, suggesting that obsidian tools were manufactured elsewhere and brought to the site.

Almost half of the obsidian at 29SJ 627 was from the Jemez Mountains in New Mexico. This is the most common type of obsidian found at sites in Chaco Canyon after A.D. 920 (Cameron and Sappington 1984). Another one-third of the obsidian is from the Red Hill, New Mexico, source; it is a type which is most common at sites in Chaco Canyon before A.D. 700. Obsidian from other sources (Grants, NM; Polvadera Peak, NM: San Antonio Peak, NM; Mineral Mountain, UT; or unknown) is rare.

Table 3.6. Grouped material type by grouped artifact type at 29SJ 627.

Material Type	Formal Tools No.	Formal Tools % C/R	Utilized Flakes No.	Utilized Flakes % C/R[a]	Retouched Flakes No.	Retouched Flakes % C/R	Debitage No.	Debitage % C/R	Cores No.	Cores % C/R	Totals No.	Totals %
Morrison formation chert	3	3.5/7.3	13	0.6/31.7	6	1./14.6	18	0.4/43.9	1	0.7/2.4	41	0.6
Yellow-brown spotted chert	1	1.2/0.1	50	2.5/43.1	6	1.2/5.1	55	1.3/47.4	4	2.7/3.4	116	1.6
Washington Pass chert	1	1.2/0.3	121	6.0/45.3	54	10.5/20.2	88	2.0/33.0	3	2.0/1.1	267	3.7
Zuni wood		-		-		-	6	0.1/85.7	1	0.7/14.3	7	0.1
Obsidian	24	27.9/30.4	27	1.3/34.2	23	4.5/29.2	5	0.1/6.3		-	79	1.1
High surface chert	17	19.8/2.5	144	7.1/21.1	42	8.2/6.1	456	10.4/66.6	26	17.3/3.8	685	9.6
Cherty silicified wood	8	9.3/0.3	850	41.8/32.3	243	47.2/9.3	1,465	33.6/55.7	64	42.7/2.4	2,630	36.8
Splintery silicified wood		-	38	1.9/8.4	4	0.1/1.0	408	9.3/90.3	2	1.3/0.4	452	6.3
Chalcedonic silicified wood	9	10.5/0.5	539	26.5/28.5	95	19.4/5.0	1,230	28.2/65.0	18	12.0/1.0	1,891	26.5
Quartzite	1	1.2/0.7	20	1.0/14.3	1	1.2/0.7	115	1.6/82.1	3	2.0/2.1	140	2.0
Others	22	25.6/2.6	230	11.2/27.4	41	8.0/4.9	518	11.9/61.7	28	18.7/3.3	839	11.7
TOTAL	86		2,032		515		4,364		150		7,147	
%		1.2		28.4		7.2		61.1		2.1		100.0

[a] % C/R = column/row percentages.

Non-local tools = 339
Non-local debitage = 171
Debitage/tools = 0.50

Local tools = 2,294
Local debitage = 4,343
Debitage/tools = 1.89

Artifact Types

As discussed above, five basic artifact categories were recognized in the 29SJ 627 chipped stone collection: formal tools, utilized flakes, retouched flakes, debitage (including whole flakes, angular debris, and unmodified raw material) and cores (Table 3.6). As at other sites in Chaco Canyon, tool production at site 29SJ 627 was primarily expedient. Formal tools were rare (only 1% of the total chipped stone assemblage) and utilized and retouched flakes (informal tools) were far more common (35% of the assemblage). Although the low frequency of cores could indicate that chipped stone reduction processes occurred away from the site, it is more likely that the informal nature of the chipped stone technology infrequently resulted in recognizable cores.

Local and non-local materials differed in the frequency in which they were used for formal or informal tools at site 29SJ 627 (Table 3.6). A ratio of debitage to tools (including formal and informal tools) was low for non-local materials (.50), indicating few pieces of debitage per tool, and high for the local materials (1.89). The lower proportion of debitage for non-local materials may indicate both that formal tools of non-local material were manufactured away from the site and that flakes of non-local material were preferentially selected for use as informal tools.

Some differences were apparent in the ways in which different materials were used. As noted above, obsidian was frequently used for formal tools, but it was also used frequently for informal tools. Most of the formal tools were made of local materials, but many of the informal tools were made of non-local materials. For example, more than 60% of the Washington Pass chert flakes had been either utilized or retouched. This again suggests that non-local materials were preferred for use as informal tools. Of the local materials, splintery silicified wood and quartzite were rarely used for formal or informal tools and occurred most frequently as debitage. This may be partly because of the difficulty of seeing use-wear on these two very coarse materials. Furthermore, both materials were commonly used as hammerstones at sites in Chaco Canyon (Cameron 1984; Wills 1977), which may produce flakes that show very little use-wear.

Few temporal differences can be seen in the way in which materials were used at site 29SJ 627 (Table 3.7). The ratio of debitage to tools was almost identical for non-local materials (.50) and local materials (2.0) for both the period from A.D. 920 to 1000 and A.D. 1000 to 1040. Obsidian tools make up a larger proportion of the formal tool assemblage after A.D. 1000, but the total number of pieces of obsidian in each period is small and the difference may be spurious. Continuity in the methods of raw material procurement and chipped stone reduction (Table 3.7) is a further indication that the initial development of the Chacoan system had little effect on chipped stone procurement at village sites in the canyon.

Formal Tools

Formal tools included all items identified as facially flaked points, knives, or drills, all pieces with retouch covering more than one-third of the face, and all drill facets (Cameron 1982; Lekson 1979, 1985 and Appendix F of this volume). A total of 92 formal tools were

Table 3.7. Grouped material type by grouped artifact type by period at 29SJ 627.[a]

Material Type	A.D. 920-1000 Formal Tools	Utilized Flakes	Retouched Flakes	Debitage	Cores	Total	A.D. 1000-1040 Formal Tools	Utilized Flakes	Retouched Flakes	Debitage	Cores	Total
Morrison formation chert	1 2.7/ 9.1	2 0.2/ 18.2	-	8 0.4/ 72.7	-	11	1 4.8/ 11.1	3 0.6/ 33.3	2 1.9/ 22.2	3 0.3/ 33.3	-	9
Yellow-brown spotted chert	1 2.7/ 6.3	7 1.0/ 43.8	-	7 0.4/ 43.8	1 2.6/ 6.3	16	-	10 2.1/ 34.5	3 2.8/ 10.3	14 1.3/ 48.3	2 4.1/ 6.9	29
Washington Pass chert	-	22 3.1/ 40.7	15 6.6/ 27.8	16 0.8/ 29.6	1 2.6/ 1.9	54	1 4.8/ 1.3	31 6.5/ 42.4	16 15.0/ 21.9	25 2.4/ 34.2	-	73
Zuni wood	-	-	-	5 0.3/ 100.0	-	5	-	-	-	1 0.1/ 100.0	-	1
Obsidian	7 18.9/ 20.0	12 1.7/ 34.3	13 5.7/ 37.1	3 0.2/ 8.6	-	35	10 47.6/ 47.6	6 1.3/ 28.6	5 4.7/ 23.8	-	-	21
High surface chert	10 27.0/ 3.7	50 7.1/ 18.6	22 9.6/ 8.2	183 9.5/ 68.0	4 10.3/ 1.5	269	3 14.3/ 1.7	41 8.6/ 22.8	6 5.6/ 3.3	119 11.4/ 66.1	11 22.4/ 6.8	180
Cherty silicified wood	2 5.4/ 0.2	315 44.9/ 27.7	130 56.8/ 11.5	672 34.9/ 59.2	16 41.0/ 1.4	1,135	2 9.5/ 0.3	222 46.3/ 33.0	42 39.3/ 6.3	386 36.9/ 57.4	20 40.8/ 3.0	672
Splintery silicified wood	-	18 2.6/ 9.3	2 0.9/ 1.0	173 9.0/ 89.2	1 2.6/ 0.5	194	-	6 1.3/ 5.0	2 1.9/ 1.7	111 10.6/ 93.2	-	119
Chalcedonic silicified wood	8 21.6/ 0.9	198 28.2/ 22.9	35 15.3/ 4.0	618 32.1/ 71.4	7 17.9/ 0.8	866	1 4.8/ 0.3	100 20.9/ 26.8	22 20.6/ 5.9	244 23.3/ 65.4	6 12.2/ 1.6	373
Quartzite	1 2.7/ 1.7	8 1.1/ 13.6	1 0.4/ 1.7	49 2.5/ 83.1	-	59	-	7 1.5/ 20.6	-	24 2.3/ 70.6	3 2.3/ 70.6	34

Table 3.7. (continued)

Material Type	A.D. 920-1000 Formal Tools	Utilized Flakes	Retouched Flakes	Debitage	Cores	Total	A.D. 1000-1040 Formal Tools	Utilized Flakes	Retouched Flakes	Debitage	Cores	Total
Others	7 18.9/ 2.4	69 9.8/ 23.9	11 4.8/ 3.8	193 10.0/ 66.8	9 23.1/ 3/1	289	3 14.3/ 1.6	53 11.1/ 27.6	9 8.4/ 4.7	120 11.5/ 62.5	7 14.3/ 3.6	192
TOTAL	37	701	229	1,927	39	2,933	21	479	107	1,047	49	1,703
%	1.3	23.9	7.8	65.7	1.3		1.2	28.1	6.3	61.5	2.9	

[a] Second and third numbers in each cell equal column percent/row percent.

Key:

A.D. 920-1000		A.D. 1000-1040	
Tools of non-local material	= 80.	Tools of non-local material	= 88.
Debitage of non-local material	= 41.	Debitage of non-local material	= 45.
Debitage/tools	= 0.51.	Debitage/tools	= 0.51.
Local tools	= 887.	Local tools	= 519.
Local debitage	= 1,925.	Local debitage	= 1,051.
Debitage/tools	= 2.2.	Debitage/tools	= 2.0.

identified at site 29SJ 627 (Table 3.8). Almost 70% of the formal tools were projectile points, another 20% were drills, and the remainder were miscellaneous, mostly indeterminate tools. These relative frequencies are similar to those at other sites in Chaco Canyon (Cameron 1982). The projectile points included stemmed, corner-notched, and side-notched types.

Corner-notched points were the most common tool type, accounting for almost 40% of the formal tools, although eight were associated with Burial 1 (Room 1, Floor 2). Most of the drills were not formally manufactured, but were utilized projections.

More than 40% of the formal tools were of non-local material, which contrasts with the low relative frequency of exotic materials in the assemblage as a whole (7.1%). However, most of these non-local tools were of obsidian. Interestingly, only one tool was of Washington Pass chert, although this was the most common non-local material on the site. These proportions of non-local materials for formal tools are similar to those at other sites in Chaco Canyon (Cameron 1982, 1985, 1987). At site 29SJ 627, specific materials do not seem to have been used for specific tool types, except for drills, which are almost exclusively of local material, primarily silicified wood. This same association of drills with local silicified wood has been found at other sites in Chaco Canyon (Cameron 1984, 1985). A cache of seven fortuitous perforators at 29SJ 627, found in Room 5, is reminiscent of a similar group of drills of the same material found at nearby site 29SJ 629, in association with turquoise working activities (Cameron 1982, 1985; Truell, Volume I).

Conclusions

Chipped stone recovered from site 29SJ 627 was primarily of material that had been procured locally, as was the case at other small sites in Chaco Canyon. Non-local material was found infrequently, although the frequency of non-local material, especially Washington Pass chert, increased slightly after A.D. 1000. Chipped stone technology relied on the production of expedient tools (utilized and retouched flakes), and formal tools were scarce. Formal tools of obsidian appear to have been imported to the site rather than manufactured there, and non-local materials were preferred for use as informal tools over local materials. Formal tools recovered from the site were almost exclusively projectile points and drills. Corner-notched projectile points were the most common point type, and many of the drills were simply utilized projections.

There is no evidence of a difference in access to chipped stone raw material between 29SJ 627 and of Pueblo Alto before A.D. 1040. Although the frequency of Washington Pass chert is slightly higher at Pueblo Alto than at 29SJ 627, the difference is not of a magnitude to suggest that control of the source was being exerted by large sites. While local and non-local materials appear to have been used differently at site 29SJ 627, the lack of temporal trends in chipped stone material procurement and use suggests that the early stages of the development of the Chacoan system (before A.D. 1040) had little effect on the

Table 3.8. Formal tools by grouped material type at 29SJ 627.

	Formal Tool Type[a]														
	Projectile Points					Drills						Msc. Tools			
Material Type	202, 205	203, 206	204, 207, 218	214	215	219	231	234	235	236	237	209	213	Total	%
Morrison formation chert	1	1	2	-	1	-	-	-	-	-	-	2	-	7	7.7
Yellow-brown spotted chert	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Washington Pass chert	1	-	-	-	-	-	-	-	-	-	-	-	-	1	1.1
Zuni wood	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Obsidian	5	9	5	-	-	1	-	-	1	-	-	1	1	23	25.3
High surface chert	-	10	2	-	-	-	-	1	1	-	-	2	-	16	17.6
Cherty silicified wood	-	2	1	1	-	-	-	1	3	-	-	1	2	11	12.1
Splintery silicified wood	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chalcedonic silicified wood	1	1	-	-	-	-	1	-	-	2	7	-	-	12	13.2
Quartzite	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Others	1	13	3	-	1	-	-	-	1	-	-	2	-	21	23.1
TOTAL	9	36	13	1	2	1	1	2	6	2	7	8	3	91	
%	9.9	39.6	14.3	1.1	2.2	1.1	1.1	2.2	6.6	2.2	7.7	8.8	3.3		100.0

[a] Key to formal tools:
202 = Stemmed arrow point.
203 = Corner-notched projectile point.
204 = Side-notched projectile point.
205 = Stemmed arrow point blade fragment.
206 = Corner-notched projectile point blade fragment.
207 = Side-notched projectile point blade fragment.
209 = Miscellaneous blade fragment.
213 = Small non-hafted blade.
214 = Asymmetrical projectile point.
215 = Large corner-notched projectile point.
218 = Renotched side-notched projectile point.
219 = Large side-notched point.
231 = Formal drill.
234 = Informal perforator.
235 = Projection on a flake.
236 = Tiny drill.
237 = Tiny fortuitous perforator.

chipped stone technology of small sites such as 29SJ 627.

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4

ORNAMENTS AND MINERALS FROM SITE 29SJ 627

Frances Joan Mathien

Ornaments and minerals included in this report were recovered during the 1974-1975 excavations at site 29SJ 627 (Truell, Volume I of this report). Although there was some indication of use of this site in the A.D. 600s-early 700s, its major use occurred during three periods: late 700s-early 900s, early 900s-early 1000s, and middle 1000s. Prior to the analysis of ornaments and minerals, a master list of these artifacts was compiled from the field specimen (FS) sheets, artifacts were located, and a list of ornaments and minerals by provenience was compiled (Table 4.1). Dates were then assigned by the site excavator (Truell) and reflect her knowledge of the site stratigraphy and ceramics associated with the proveniences.

The goals of the analysis were to determine material types recovered, sources of these materials that would provide some data on existing trade networks, the types of ornaments found and a description of each, some discussion of minerals that were possibly used as pigments, and discussion of any unusual groupings of materials that would suggest the presence of workshop areas at the site, offerings, or personal wealth.

Methods of analysis have been described by Mathien (1985:19-47). Included in that report are definitions of artifact types and problems that came up during analysis (e.g., correct identification of calcium carbonate beads). Material, artifact type, and all measurements and observations were recorded in a standard format, and tables prepared. Some materials were mainly bulky items that were modified only slightly or not at all (e.g., selenite, hematite, limonite). These materials were given low priority and not treated to full analysis. Although they were counted and listed by provenience, they are not discussed in detail in this report.

Material Types

A total of 28 different materials were recovered; shell was subdivided into 13 species (Table 4.2). Shell species were determined by Helen DuShane of the Division of Malacology, Los Angeles County Museum of Natural History (personal communication 1979), who identified the shells and their modern habitats with reference to Keen (1971). Source information on minerals was provided by David Love, now with the New Mexico Bureau of Mines and Mineral Resources (personal communication, 1979) and A. Helene Warren (personal communication, 1979), both geologists

Table 4.1. Ornaments and minerals by provenience, 29SJ 627.

Provenience	FS No.	No. Material	No. Type	Dating (A.D.)
Pithouse B, clearing above	1265	1 Gypsite	1 Unmodified	900-1000
Pithouse B, clearing debris	1268	1 Turquoise	1 Debris	900-1000
Pithouse B, antechamber, Level 2	1274	1 Selenite	1 Unmodified	900-1000
Pithouse B, main chamber, Level 1	1426	1 Selenite	1 Unmodified	900-1000
Pithouse B, Test Trench 11, above	1572	1 Hematite	1 Modified	900-1000
Pithouse B, Level 3	2020	9 Selenite	9 Unmodified	900-1000
Pithouse B, clearing walls	2247	1 Selenite	1 Unmodified	900-1000
Pithouse B, plaza surface	2882	1 Turquoise	1 Bead	900-1000
Pithouse B, below Floor 1	591	1 Selenite	1 Unmodified	900-1000
Pithouse, Surface E, Room 12	1118	1 Argillite	1 Pendant	900-1000
Pithouse C, area clearing	525	1 Specularite	1 Unidentified	Undated
Pithouse C, area clearing	526	2 Turquoise	1 Modified 1 Unmodified	Undated Undated
Pithouse C, area clearing	528	1 Limonite	1 Unmodified	Undated
SW Plaza above Pithouse C	1256	1 Turquoise	1 Modified	Undated
Pithouse C, clearing above Level 2	1288	5 Selenite	5 Unmodified	900-1000
Pithouse C, clearing above Level 2	1364	2 Selenite	2 Unmodified	900-1000
Pithouse C, Level 1	1378	1 Argillite	1 Zoomorph	900-1000
Pithouse C, Level 1	1587	1 Malachite	1 Unmodified	900-1000
Pithouse C, Level 2	1588	1 Turquoise	1 Bead blank	900-1000
Pithouse C, Level 2	1895	1 Selenite	1 Unmodified	900-1000
Pithouse C, Level 3	1538	7 Selenite	7 Unmodified	900-1000
Pithouse C, Level 3	1550	1 Turquoise	1 Unmodified	900-1000
Pithouse C, looking for north wall	1827	12 Selenite	11 Unmodified 1 Modified	900-1000
Pithouse C, looking for north wall	1829	1 <u>Trachycardium</u> sp.	1 Pendant	900-1000
Pithouse C, north of wall, Level 4	1848	1 Argillite	1 Zoomorph	900-1000
Pithouse C, Level 4	1901	15 Selenite	15 Unmodified	900-1000
Pithouse C, south of wall, Level 5	1851	1 Turquoise	1 Modified	900-1000
Pithouse C, north of wall, Level 5	1855	2 Selenite	2 Unmodified	900-1000
Pithouse C, Level 6	2053	1 <u>Glycymeris</u>	1 Bracelet fragment	900-1000
Pithouse C, Level 6	2055	1 Selenite	1 Unmodified	900-1000
Pithouse C, along north wall	2059	1 <u>Glycymeris</u>	1 Bracelet fragment	900-1000

Table 4.1. (continued)

Provenience	FS No.	No. Material	No. Type	Dating (A.D.)
Pithouse C, north wall	2061	1 Turquoise	1 Modified	900-1000
Pithouse C, Level 7	2068	1 Selenite	1 Unmodified	900-1000
Pithouse C, Level 8	2085	1 Haliotus	1 Pendant	900-1000
Pithouse C, Level 8	2224	1 Glycymeris	1 Bracelet fragment	900-1000
Pithouse C, clearing above plaster	2281	1 Selenite	1 Unmodified	900-1000
Pithouse C, Balk 1, Layer A	2848	1 Selenite	1 Unmodified	900-1000
Pithouse C, Balk 1, Layer B	2795	15 Selenite	15 Unmodified	900-1000
Pithouse C, Balk 1	2802	1 Haliotus	1 Pendant	900-1000
Pithouse C, Balk 1, Layer E	2798	1 Selenite 1 Gypsite	1 Unmodified 1 Unmodified	900-1000 900-1000
Pithouse C, Balk 1, Layer E	2916	1 Selenite	1 Unmodified	900-1000
Pithouse C, Balk 1, Layer E	2918	1 Azurite	1 Unmodified	900-1000
Pithouse C, Balk 1, Layer F	2903	3 Selenite 1 Gypsite	3 Unmodified 1 Unmodified	820-920? 820-920?
Pithouse C, Balk 2, Layer A	2487	1 Selenite 1 Calcite	1 Unmodified 1 Unmodified	900-1000 900-1000
Pithouse C, Balk 2, Layer A	2489	3 Selenite	2 Unmodified 1 Modified	900-1000
Pithouse C, Balk 2, Layer B	2497	12 Selenite 1 Gypsite	11 Unmodified 1 Modified 1 Unmodified	900-1000 900-1000 900-1000
Pithouse C, Balk 2, Layer D	2541	1 Gypsite 1 Turquoise	1 Unmodified 1 Pendant	900-1000 900-1000
Pithouse C, Balk 3, Layer AA	4800	1 Selenite	1 Unmodified	900-1000
Pithouse C, Balk 3, Layer A	5055	1 Glycymeris	1 Pendant	900-1000
Pithouse C, Balk 3, Layer A	5056	1 Glycymeris	1 Bracelet fragment	900-1000
Pithouse C, Balk 3, Layer A	5060	1 Glycymeris	1 Bracelet fragment	900-1000
Pithouse C, Balk 3, Layer A	5062	1 Glycymeris	1 Bracelet fragment	900-1000
Pithouse C, Balk 3, Layer A	5067	1 Turquoise	1 Modified	900-1000
Pithouse C, Balk 3, Layer A	5069	1 Argillite	1 Modified	900-1000
Pithouse C, Balk 3, Layer A	5070	1 Limonite 28 Selenite	1 Unmodified 28 Unmodified	900-1000 900-1000
Pithouse C, Balk 3, Layer A	5073	1 Glycymeris	1 Bracelet fragment	900-1000
Pithouse C, Balk 3, Layer A	5074	1 Turquoise	1 Modified	900-1000
Pithouse C, Balk 3, Layer A	5077	1 Glycymeris	1 Pendant	900-1000
Pithouse C, Balk 3, Layer A	5079	1 Selenite 1 Limonite 1 Gypsum	1 Unmodified 1 Unmodified 1 Unmodified	900-1000 900-1000 900-1000
Pithouse C, Balk 3, Layer A	5233	1 Limonite 5 Selenite	1 Unmodified 5 Unmodified	900-1000 900-1000
Pithouse C, Balk 3, Layer B	5326	8 Selenite	8 Unmodified	900-1000
Pithouse C, Balk 3, Layer B	5330	1 Turquoise	1 Bead	900-1000

Table 4.1. (continued)

Provenience	FS No.	No. Material	No. Type	Dating (A.D.)
Pithouse C, Balk 3, Layer B	5331	1 Turquoise	1 Inlay	900-1000
Pithouse C, Balk 3, Layer D	5728	1 Selenite	1 Unmodified	900-1000
Pithouse C, Balk 3, Layer F	5902	12 Selenite	12 Unmodified	820-920?
Pithouse C, Balk 3, clearing north face, Layers AAA-C	5580	1 Turquoise	1 Button	900-1000
Pithouse C, Balk 3, clearing balk face, Layer AAA-C	5583	1 Azurite	1 Unmodified	900-1000
Pithouse C, Balk 3, clearing balk face, Layers AAA-C	5585	3 Selenite	3 Unmodified	900-1000
Pithouse C, Test Trench 23, Level 1	2479	1 Turquoise	1 Inlay	900-1000
Pithouse C, Test Trench 23, Level 1	2480	2 Selenite	2 Unmodified	900-1000
Pithouse C, Test Trench 24, Level 1	2532	1 Selenite	1 Unmodified	900-1000
Pithouse C, Test Trench 24, Level 1	2533	1 Turquoise	1 Modified	900-1000
Pithouse C, Test Trench 27, Layer F	2909	1 Bone	1 Bead	820-920?
Pithouse C, Test Trench 32	4301	1 Calcite	1 Bead	900-1000
Pithouse C, Test Trench 8, Level 1,2	6104	1 Limonite	1 Unmodified	900-1000
Pithouse C, Layer C	2754	1 Selenite	1 Unmodified	900-1000
Pithouse C, Layer E	2923	1 Copper	1 Unmodified	900-1000
Pithouse C, Layer F	3072	1 Turquoise	1 Modified	820-920?
Pithouse C, Layer F	3075	7 Selenite	7 Unmodified	820-920?
Pithouse C, Layer F	3077	1 Lignite	1 Modified	820-920?
Pithouse C, clearing balk between wall and south retention wall	2744	2 Selenite	2 Unmodified	820-920?
Pithouse C, Layer F, between wing wall and south wall	4178	1 Turquoise	1 Debris	820-920?
Pithouse C, clearing west wall	3004	1 Glycymeris	1 Pendant	900-1000
Pithouse C, wing wall area	4006	1 Selenite	1 Unmodified	900-1000
Pithouse C, wing wall area	4007	1 Selenite 1 Gypsite	1 Unmodified 1 Unmodified	900-1000 900-1000
Pithouse C, wing wall area	4008	1 Azurite	1 Unmodified	900-1000
Pithouse C, Floor 1	5004	1 Glycymeris	1 Pendant	900-1000
Pithouse C, Floor 1	5319	1 Hematite	1 Modified	900-1000
Pithouse C, Floor 1	5320	1 Turquoise	1 Modified	900-1000
Pithouse C, Floor 1	5453	4 Selenite	4 Unmodified	900-1000
Pithouse C, Floor 1	6195	1 Turquoise	1 Modified/pendant blank	900-1000
Pithouse C, Floor 1	6182	6 Selenite	6 Unmodified	900-1000

Table 4.1. (continued)

Provenience	FS No.	No. Material	No. Type	Dating (A.D.)
Pithouse C, Floor 1, hearth	5617	1 Turquoise	1 Debris	900-1000
Pithouse C, Floor 1, hearth	5974	1 Limonite	1 Unmodified	900-1000
Pithouse C, Floor 1, Pit 6	6027	2 Limonite 1 Hematite	2 Unmodified 1 Unmodified	900-1000 900-1000
Pithouse H, Layer 1	7156	1 Selenite	1 Unmodified	900-1000
Room 1, Level 1	659	2 Turquoise	1 Bead blank 1 Debris	1000-1040/50
Room 1, Level 2	229	1 Turquoise	1 Modified	1000-1040/50
Room 1, Level 2	230	1 Selenite	1 Unmodified	1000-1040/50
Room 2, Level 2	548	1 Selenite 1 Limonite	1 Unmodified 1 Unmodified	1000-1040/50 1000-1040/50
Room 2, Level 5	576	1 Lignite	1 Button	1000-1040/50
Room 2, Floor 2, Pit 2	5658	1 Gypsite	1 Unmodified	1000-1040/50
Room 3, Level 1	733	1 Sulphur	1 Unmodified	1000-1040/50
Room 3, Floor 1A	2466	1 Turquoise	1 Modified	1000-1040/50
Room 3, Subfloor 1, Level 1	2465	1 Selenite	1 Unmodified	900-1000
Room 3, Subfloor 1, Level 1	2469	1 Selenite	1 Unmodified	900-1000
Room 3, Subfloor 1, Level 1	2481	1 Turquoise	1 Debris	900-1000
Room 3, Subfloor 1, Level 1	2491	1 Turquoise	1 Pendant	900-1000
Room 3, Subfloor 1, Level 1	2579	1 Hematite	1 Unmodified	900-1000
Room 3, Test Trench 1, south, 60-90 cm below surface	2581	1 Lignite	1 Modified	900-1000
Room 3, Subfloor 1, Level 2	2590	1 Selenite	1 Unmodified	900-1000
Room 3, Subfloor 1, Level 2	2592	1 Selenite 1 Azurite 1 Galena	1 Unmodified 1 Unmodified 1 Unmodified	900-1000 900-1000 900-1000
Room 3, Floor 2, Pit 3	2675	2 Hematite 1 Limonite	2 Unmodified 1 Unmodified	900-1000 900-1000
Room 3, Floor 2, Pit 3	2679	1 Selenite	1 Modified	900-1000
Room 3, Floor 2	2687	1 Azurite	1 Unmodified	900-1000
Room 3, Floor 2, Firepit 1	4489*	1 Shell	1 -	900-1000
Room 3, Posthole 2, Level 2	4503*	1 Turquoise	1 -	900-1000
Room 3, Posthole 3, Level 3	4499	1 Limonite	1 Unmodified	900-1000
Room 3, Subfloor 2, Layer 2	2729	1 Bone	1 Bead	900-1000
Room 4, Level 1	190	1 Argillite	1 Disk	1000-1040/50
Room 4, Level 3	157	1 Turquoise	1 Modified	1000-1040/50
Room 4, Layer 1	5483	3 Selenite	3 Unmodified	1000-1040/50
Room 4, Floor 2	5648	1 Selenite	1 Unmodified	900-1000
Room 4, Floor 2, Pit 2	5655	1 Turquoise	1 Bead	900-1000
Room 4, Floor 2, Pit 2	5657	1 Turquoise	1 Modified	900-1000

Table 4.1. (continued)

Provenience	FS No.	No. Material	No. Type	Dating (A.D.)
Room 4, Floor 2, Pit 2	5660	17 Olivella 2 Glycymeris	17 Beads 2 Beads	900-1000 900-1000
Room 4, Floor 2, Pit 2	5661	1 Gypsite	1 Unmodified	900-1000
Room 4, Subfloor 1, Layer 1	6008	1 Limonite	1 Unmodified	900-1000
Room 4, Subfloor 1, Layer 1	6126	1 Limonitic sandstone	1 Unmodified	900-1000
Room 4, Subfloor 1, Layer 2	5890	4 Limonite	4 Unmodified	900-1000
Room 5, Level 2	163	1 Azurite	1 Unmodified	1000-1040/50
Room 5, Level 2	165	5 Selenite	5 Unmodified	1000-1040/50
Room 5, Level 3	118	8 Selenite	8 Unmodified	1000-1040/50
Room 5, Level 3	120	1 Glycymeris	1 Bracelet fr.	1000-1040/50
Room 5, Level 3	196	16 Selenite	16 Unmodified	1000-1040/50
Room 5, Floor 1, upper plastering	462	8 Selenite	8 Unmodified	1000-1040/50
Room 5, Floor 1, upper plastering	463	1 Turquoise	1 Modified	1000-1040/50
Room 5, Floor 1, Pit 1	2962	1 Turquoise	1 Modified	1000-1040/50
Room 5, Floor 1.1A, Pit 1	4210	1 Turquoise	1 Modified	1000-1040/50
Room 5, Floor 1A, Pit 1	4170	1 Turquoise	1 Modified	1000-1040/50
Room 5, Floor 1, Burial 5	4852	6 Limonite	6 Unmodified	1000-1040/50
Room 5, Subfloor 1, Level 1	2870	5 Gypsite	5 Unmodified	900-1000
Room 5, Subfloor 1, Level 1	2872	1 Turquoise	1 Modified	900-1000
Room 5, Subfloor 1, Level 1	2876*	1 Turquoise	1 -	900-1000
Room 5, Subfloor 1, Level 1	2986	4 Selenite	4 Unmodified	900-1000
Room 5, Subfloor 1, Level 1	2988	1 Turquoise	1 Bead blank	900-1000
Room 5, Subfloor 1, Level 1	2990	15 Selenite 1 Limonite	15 Unmodified 1 Unmodified	900-1000 900-1000
Room 5, Subfloor 1, Level 1	4176	2 Turquoise	2 Debris	900-1000
Room 5, Subfloor 1, Level 2	4270	1 Azurite 3 Selenite 2 Gypsum 4 Gypsite 1 Turquoise	1 Modified 3 Unmodified 2 Unmodified 4 Unmodified 1 Modified/other	900-1000 900-1000 900-1000 900-1000 900-1000
Room 5, Subfloor 1, Level 2	4239	1 Calcite	1 Bead	900-1000
Room 5, Floor 2, Pit 1	4378	2 Selenite	2 Unmodified	900-1000
Room 5, Floor 2, Pit 7	4555	1 Espicinea medialis	1 Unmodified	900-1000
Room 5, Floor 2, Pit 9	4585	1 Calcite	1 Bead	900-1000
Room 5, Floor 2, Pit 12	4706	1 Quartz crystal	1 Unmodified	900-1000
Room 6, Level 1	145	1 Turquoise	1 Unmodified	1000-1040/50
Room 6, Level 1	147	1 Selenite	1 Unmodified	1000-1040/50
Room 6, Level 4	691	3 Selenite	3 Unmodified	1000-1040/50

Table 4.1. (continued)

Provenience	FS No.	No. Material	No. Type	Dating (A.D.)
Room 6, clearing	1885	1 Selenite	1 Unmodified	1000-1040/50
Room 6, Floor 3	6048	1 Hematite	1 Unmodified	900-1000
Room 6, Floor 3, Pit 1	6154	2 Limonite	2 Unmodified	900-1000
Room 7, Level 2	97	1 Azurite	1 Unmodified	1000-1040/50
Room 7, Level 2	153	1 Bone	1 Other	1000-1040/50
Room 7, Level 2	458	2 Selenite	2 Unmodified	1000-1040/50
Room 7, Level 3	781	1 Bone	1 Bead	1000-1040/50
Room 7, Subfloor 1, Level 1	2974	6 Selenite	6 Unmodified	900-1000
Room 7, Subfloor 1, Level 2	4116	1 Selenite	1 Unmodified	900-1000
Room 7, Subfloor 1, Level 1, Test 1	2982	8 Selenite	8 Unmodified	900-1000
Room 7, Floor 2, Pit 1	4133	1 Turquoise	1 Pendant	900-1000
Room 7, Floor 2, Pit 2	4538*	1 Shell	1 -	900-1000
Room 8, Level 2	101	1 Bone	1 Gaming piece	1000-1040/50
Room 8, Level 3	141	1 Limonite	1 Gaming piece	1000-1040/50
Room 8, Subfloor 1, Level 2	2614	1 Azurite	1 Unmodified	1000-1040/50
Room 8, Floor 2, Level 1	2692	10 Turquoise	9 Beads 1 Pendant	1000-1040/50 1000-1040/50
Room 8, Floor 2, Pit 3	2709	1 Lignite 1 Limonite	1 Unmodified 1 Unmodified	1000-1040/50 1000-1040/50
Room 8, Floor 2, Firepit 1	4734	1 Selenite 1 Limonite	1 Unmodified 2 Unmodified	1000-1040/50 1000-1040/50
Room 8, Floor 2, under wall junction	5128	1 Lignite	1 Modified	1000-1040/50
Room 8, Floor 2, contact	5868	1 <u>Glycymeris</u>	1 Bracelet fragment	1000-1040/50
Room 8, Floor 2, contact	5869	8 Selenite	8 Unmodified	1000-1040/50
Room 8, Subfloor 2, Layer 1	4372	1 Turquoise	1 Modified	900-1000
Room 8, Subfloor 2, Layer 1	4375	1 Calcite	1 Bead	900-1000
Room 8, Subfloor 2, Layer 2	5944	11 Selenite	11 Unmodified	900-1000
Room 8, Subfloor 2, Layer 2	5945	1 Selenite	1 Unmodified	900-1000
Room 8, Floor 3, contact	6239	1 Selenite	1 Unmodified	900-1000
Room 8, Floor 3, contact	6444	20 Azurite 1 Malachite	20 Debris 1 Unmodified	900-1000 900-1000
Room 8, Floor 3, contact	6445*	1 <u>Glycymeris</u>	1 Bracelet fragment	900-1000
Room 8, Floor 3, contact	6571	1 <u>Glycymeris</u>	1 Bracelet fragment	900-1000
Room 8, Floor 3, Pit 4	6384	1 Turquoise	1 Modified	900-1000
Room 9, Level 4	541	1 Argillite 1 Selenite	1 Modified 1 Unmodified	1000-1040/50 1000-1040/50
Room 9, Floor 2, Burial 2	447	1 Hematite	1 Paintstone	1000-1040/50
Room 9, Subfloor 3, Level 6	5043	31 Selenite	31 Unmodified	820-920

Table 4.1. (continued)

Provenience	FS No.	No. Material	No. Type	Dating (A.D.)
Room 9, Subfloor 3, Level 6	5112	1 Evaporite	1 Unmodified	820-920
Room 9, Subfloor 3, Level 6	5113	7 Limonite	1 Modified 6 Unmodified	820-920
Room 9, Subfloor 3, Level 7	5123	3 Selenite	3 Unmodified	820-920
Room 9, Subfloor 3, Level 8	6118	7 Selenite	6 Unmodified 1 Debris	820-920
Room 9, Subfloor 3, Level 9	5638	3 Selenite	3 Debris	820-920
Room 9, Subfloor 3, Level 10	5630*	1+Selenite	1+ -	820-920
Room 9, Subfloor 3, Level 10	5488	1 Selenite	1 Unmodified	820-920
Room 9, Floor 4, contact	5340	1 Limonite	1 Unmodified	820-920
Room 9, Floor 4, Pit 1	6136	1 Selenite	1 Unmodified	820-920
Room 10, Level 2	483	1 Turquoise	1 Modified	1000-1040/50
Room 10, Level 3	506	4 Selenite	4 Unmodified	1000-1040/50
Room 10, Floor 1, contact	477	1 Azurite	1 Unmodified	1000-1040/50
Room 10, Floor 1, upper plastering	478	8 Calcite 33 Shale	8 Beads 33 Beads	1000-1040/50 1000-1040/50
Room 10, Subfloor 1A, Fill	4630	1 Glycymeris	1 Bracelet fragment	900-1000
Room 10, Subfloor 1, Layer 2	4904	1 Bone	1 Gaming piece	900-1000
Room 10, Subfloor 1, Layer 3	4779	1 Gypsite	1 Unmodified	900-1000
Room 10, Subfloor 1, Layer 3	4957	1 Selenite 1 Limonite	1 Unmodified 1 Unmodified	900-1000 900-1000
Room 10, Subfloor 1, Layer 4	4899	3 Selenite	3 Unmodified	900-1000
Room 10, Subfloor 1, Layer 4	4902	1 Glycymeris	1 Bracelet fragment	900-1000
Room 10, Subfloor 1, Layer 4	4903	3 Selenite 2 Gypsum	1 Modified 2 Unmodified 2 Unmodified	900-1000 900-1000 900-1000
Room 10, Subfloor 1, Layer 4	4905	1 Turquoise	1 Modified	900-1000
Room 10, Subfloor 1, Layer 4	4906	1 Calcite	1 Bead	900-1000
Room 10, Subfloor 1, Layer 4	4908	1 Mica/muscovite	1 Modified	900-1000
Room 10, Subfloor 1, Layer 4	4915	1 Turquoise	1 Modified	900-1000
Room 10, Subfloor 1, Layer 4, under north wall	7266	1 Selenite 1 Sandstone	1 Unmodified 1 Unmodified	900-1000 900-1000
Room 10, Floor 2	4959	1 Turquoise	1 Debris	900-1000
Room 10, Floor 2, Posthole/pit 1	5628	1 Selenite	1 Debris	900-1000
Room 11, Level 1	834	1 Turquoise	1 Debris	1000-1040/50
Room 11, Level 2	1367	1 Hematite	1 Unmodified	1000-1040/50
Room 11, Floor 3, contact	5771	1 Argillite	1 Modified	1000-1040/50
Room 11, Floor 3, contact	5774	1 Limonite	1 Unmodified	1000-1040/50
Room 11, Floor 3, contact	6336	3 Hematite	3 Unmodified	1000-1040/50

Table 4.1. (continued)

Provenience	FS No.	No. Material	No. Type	Dating (A.D.)
Room 12, Level 2	571	1 Sandstone	1 Modified	920-1120
Room 12, Level 2	573	2 Selenite	2 Unmodified	920-1120
Room 12, Floor 1, contact	583	1 Turquoise	1 Unmodified	920-1120
Room 12, Floor 1, contact	615	1 Turquoise	1 Modified	920-1120
Room 12, Floor 1, contact	722	1 Green chert	1 Unmodified	920-1120
Room 12, Subfloor 1	6009	1 Selenite	1 Unmodified	900-1000
Room 12, Subfloor 1, Layer 1	7264	5 Limonite	5 Unmodified	900-1000
Room 13, Level 1	775	1 Selenite	1 Unmodified	1000-1040/50
Room 15, Level 2	992	7 Selenite	7 Unmodified	1000-1040/50
Room 15, Level 3	738	4 Turquoise	4 Debris	1000-1040/50
Room 15, Level 3	801	1 Trachycardium panamense	1 Pendant	1000-1040/50
Room 16, Level 1	1631	1 Turquoise	1 Modified	920-1120
Room 16, Floor 1, contact	1654	3 Selenite	3 Unmodified	920-1120
Room 16, Floor 1, contact	1655	52 Selenite	52 Unmodified	920-1120
Room 16, Subfloor 1, Layer 1	5103	1 Azurite	1 Unmodified	1000-1040/50
Room 16, Subfloor 1, Layer 1	5106	4 Gypsum	4 Unmodified	1000-1040/50
Room 16, Floor 3, contact	5351	1 Turquoise	1 Pendant	1000-1040/50
Room 16, Floor 3, contact	5359	1 Calcite	1 Pendant	1000-1040/50
Room 16, Floor 3, Firepit 1	6012	9 Turquoise	1 Pendant 1 Pendant blank 6 Inlay 1 Modified	1000-1040/50 1000-1040/50 1000-1040/50 1000-1040/50
Room 16, Floor 3, Pit 3	6166	1 Selenite	1 Unmodified	1000-1040/50
Room 16, Floor 3, Pit 4	6168	1 Limonite	1 Unmodified	1000-1040/50
Room 16, Floor 4, plugged firepit	6800	19 Turquoise	2 Debris 2 Unidentified 15 Modified	900-1000 900-1000 900-1000
Room 16, Floor 4, plugged firepit	7005*	1 Turquoise	1 -	900-1000
Room 16, Floor 4, plugged firepit	7198	1 Turquoise	1 Modified	900-1000
Room 18, Level 1	1408	1 Azurite	1 Unmodified	920-1120
Room 18, clearing floor	1740	1 Turquoise	1 Unmodified	920-1120
SW Room 17/18, wall matrix	5125	1 Calcite	1 Unmodified	920-1120
Room 19, Level 1	1320	8 Selenite	8 Unmodified	1000-1040/50
Room 19, Level 2	1335	1 Sandstone	1 Unmodified	1000-1040/50
Room 19, Level 3	1485	1 Turquoise	1 Debris	1000-1040/50
Room 19, Level 4	1347	1 Bone	1 Bead	1000-1040/50
Room 19, Level 5	2241	1 Turquoise	1 Pendant	1000-1040/50

Table 4.1. (continued)

Provenience	FS No.	No. Material	No. Type	Dating (A.D.)
Room 19, Floor 1, Pit 4	2163	1 Selenite	1 Unmodified	1000-1040/50
Room 19, Floor 1, Pit	2238	1 Turquoise	1 Modified	1000-1040/50
Room 19, Subfloor 2, Level 1	6984	1 Turquoise	1 Unidentified	Undated
Room 19, Subfloor 2, Level 2	7020	1 Glycymeris	1 Bracelet fragment	Undated
Room 20, Subfloor test	6103	1 Selenite	1 Unmodified	900-1000?
Room 21, Ramada 1, Level 1	2329	1 Limonite	1 Unmodified	1000-1040/50
Room 21, Ramada 1, Level 2	2330	1 Hematite	1 Unmodified	1000-1040/50
Room 21, Ramada, Subfloor	7256	1 Calcite	1 Bead	Undated
Room 22, surface overburden	6730	1 Hematite	1 Unmodified	1000-1040/50
Room 22, surface overburden	6731	2 Selenite	2 Unmodified	1000-1040/50
Room 22, Level 1	6523	6 Selenite	6 Unmodified	1000-1040/50
Room 22, Level 2	6903	1 Turquoise	1 Modified	1000-1040/50
Room 22, Floor 1	6961	2 Selenite	2 Unmodified	1000-1040/50
Room 22, Subfloor, Level 2	7341	1 Malachite	1 Unmodified	900-1000
Room 22, Floor 3, contact	7394	1 Turquoise	1 Debris	900-1000
Room 22, Floor 3, Subfloor	7349	1 Turquoise	1 Modified	900-1000
Room 23, Level 1	6217	2 Selenite	2 Unmodified	900-1000
Room 23, Level 1	6219	1 Argillite	1 Modified	900-1000
Room 23, Level 1	6227	1 Bone	1 Gaming piece	900-1000
Room 23, Level 1	6228	1 Limonite	1 Unmodified	900-1000
Room 23, Level 1	6229	1 Turquoise	1 Pendant blank	900-1000
Room 23, Level 1	6230	1 Turquoise	1 Pendant blank	900-1000
Room 23, fill above Floor 1	6308	1 Limonite	1 Unmodified	900-1000
Room 23, Floor 1, contact	6305	2 Selenite	2 Unmodified	900-1000
Room 25, Level 1	6924	2 Selenite	1 Modified 1 Unmodified	900-1000 900-1000
Room 25, Level 1	6925	2 Malachite 3 Turquoise	2 Unmodified 1 Bead blank 1 Debris 1 Unidentified	900-1000 900-1000 900-1000 900-1000
Kiva D, clearing above	1109	4 Selenite	4 Unmodified	1000-1040/50
Kiva D, clearing above	1116	1 Azurite	1 Unmodified	1000-1040/50
Kiva D, clearing above	1117	1 Turquoise	1 Modified	1000-1040/50
Kiva D, clearing above	1165	1 Quartz crystal	1 Unmodified	1000-1040/50
Kiva D, clearing above	1166	1 Malachite	1 Unmodified	1000-1040/50
Kiva D, Level 1, main chamber	1251	3 Glycymeris	3 Bracelet fragments	1000-1040/50
Kiva D, Level 1, main chamber	1252	1 Unident. shell	1 Pendant fragment	1000-1040/50

Table 4.1. (continued)

Provenience	FS No.	No. Material	No. Type	Dating (A.D.)
Kiva D, Level 1, main chamber	1491	7 Selenite	7 Unmodified	1000-1040/50
Kiva D, Level 1, main chamber	1492	1 Lignite	1 Unmodified	1000-1040/50
Kiva D, Level 1, main chamber	1603	2 Selenite	2 Unmodified	1000-1040/50
Kiva D, Level 1, main chamber	1607	1 Turquoise	1 Debris	1000-1040/50
Kiva D, Level 1, main chamber	1608	1 Turquoise	1 Bead	1000-1040/50
Kiva D, Level 1, main chamber	1609	1 Strombus galeatus	1 Pendant	1000-1040/50
Kiva D, Level 1, main chamber	1610	1 Jet	1 Unidentified	1000-1040/50
Kiva D, Level 1, main chamber	1802	1 Turquoise	1 Modified	1000-1040/50
Kiva D, Level 1, main chamber	2258	1 Glycymeris	1 Bracelet fragment	1000-1040/50
Kiva D, Level 2	2253	7 Selenite 1 Hematite	7 Unmodified 1 Unmodified	1000-1040/50 1000-1040/50
Kiva D, clearing out backdirt	2283	1 Azurite	1 Unmodified	1000-1040/50
Kiva D, Test Trench 25, Level 1	2402	1 Selenite 1 Hematite	1 Modified 1 Unmodified	1000-1040/50 1000-1040/50
Kiva D, Test Trench 25, Level 2	2412	2 Selenite	2 Unmodified	1000-1040/50
Kiva D, Test Trench 25, Level 3	2429	1 Selenite	1 Unmodified	1000-1040/50
Kiva D, Test Trench 25, Level 4	2450	1 Malachite	1 Modified	1000-1040/50
Kiva D, Test Trench 25, Level 7	2621	1 Argillite	1 Unmodified	1000-1040/50
Kiva D, Test Trench 25, Level 9	4769	1 Selenite	1 Modified	1000-1040/50
Kiva D, Level 3	2720	5 Selenite	5 Unmodified	1000-1040/50
Kiva D, Level 4	2784	1 Bone	1 Bead	1000-1040/50
Kiva D, Level 4	2786	5 Selenite	5 Unmodified	1000-1040/50
Kiva D, Level 4	2842	9 Selenite	9 Unmodified	1000-1040/50
Kiva D, Level 5	2806	7 Selenite	7 Unmodified	1000-1040/50
Kiva D, Level 5	2810*	1 ?	1 Effigy	1000-1040/50
Kiva D, SE of Circular Feature	2835	1 Selenite	1 Unmodified	1000-1040/50
Kiva D, Level 6	2889	3 Selenite	3 Unmodified	1000-1040/50
Kiva D, Level 6	2894	1 Hematite	1 Modified	1000-1040/50
Kiva D, Level 6	2896	3 Selenite	3 Unmodified	1000-1040/50
Kiva D, Level 7	2925	1 Gypsite	1 Unmodified	1000-1040/50

Table 4.1. (continued)

Provenience	FS No.	No. Material	No. Type	Dating (A.D.)
Kiva D, Level 7	2932	1 Turquoise	1 Debris	1000-1040/50
Kiva D, Level 8	2928	3 Selenite	3 Unmodified	1000-1040/50
Kiva D, Level 8	3036	1 Selenite	1 Unmodified	1000-1040/50
Kiva D, Level 8	3037	1 Turquoise	1 Modified	1000-1040/50
Kiva D, Level 10	3044	2 Selenite	1 Modified 1 Unmodified	1000-1040/50 1000-1040/50
Kiva D, Level 10	4288	1 Selenite	1 Unmodified	1000-1040/50
Kiva D, Level 10	4293	1 Selenite	1 Unmodified	1000-1040/50
Kiva D, Balk 1, Micro 1	4751	1 <u>Glycymeris</u>	1 Bracelet fragment	1000-1040/50
Kiva D, Balk 1, Micro 2	4721	3 Selenite	3 Unmodified	1000-1040/50
Kiva D, Balk 1, Micro 3	4772	1 <u>Haliotus</u>	1 Pendant	1000-1040/50
Kiva D, Balk 1, Micro 3	4947	2 Turquoise	2 Debris	1000-1040/50
Kiva D, Balk 1, Micro 3	4948	2 Selenite	2 Unmodified	1000-1040/50
Kiva D, Floor 1, contact	5203	1 <u>Glycymeris</u>	1 Bracelet fragment	1000-1040/50
Kiva D, Floor 1, contact	5308	3 Selenite	3 Unmodified	1000-1040/50
Kiva D, Floor 1, contact	7094	1 Turquoise	1 Unmodified	1000-1040/50
Kiva D, Floor 1, Pit 7	5261	1 Shale	1 Bead	1000-1040/50
Kiva D, ventilator tunnel	5687	3 Gypsite	3 Unmodified	1000-1040/50
Kiva D, ventilator shaft fill	6145	2 Selenite	2 Debris	1000-1040/50
Kiva D, Subfloor 1, test	5788	1 Selenite 1 Azurite	1 Unmodified 1 Modified	1000-1040/50 1000-1040/50
Kiva D, SW recess	4713	1 Limonite 1 Selenite	1 Unmodified 1 Unmodified	1000-1040/50 1000-1040/50
Kiva E, Test Trench 39	4039	1 Bone	1 Bead	920-1120
Kiva E, facing north wall	4138	1 Gypsum	1 Unmodified	920-1120
Kiva E, Level 2	4332	1 Selenite 1 Limonite	1 Unmodified 1 Unmodified	920-1120 920-1120
Kiva E, Level 2	4344	1 <u>Glycymeris</u>	1 Bracelet fragment	920-1120
Kiva E, Level 2	4389	1 Argillite	1 Zoomorph	920-1120
Kiva E, Level 3A	4762	1 <u>Glycymeris</u>	1 Noseplug	920-1120
Kiva E, Layer 3A	4475	1 Bone	1 Bead	920-1120
Kiva E, Layer 3A	4477	7 Selenite 1 Gypsum	7 Unmodified 1 Unmodified	920-1120 920-1120
Kiva E, Layer 3A	4478	6 Selenite	6 Unmodified	920-1120
Kiva E, Layer 3A	4671	1 Jet	1 Modified	920-1120
Kiva E, Layer 3B	4683	5 Selenite 1 Gypsum 1 Gypsite 1 Limonite	5 Unmodified 1 Unmodified 1 Unmodified 1 Unmodified	920-1120 920-1120 920-1120 920-1120
Kiva E, Layer 3B	4689	10 Selenite	10 Unmodified	920-1120
Kiva E, Layer 3B	4691	1 Bone	1 Gaming piece	920-1120

Table 4.1. (continued)

Provenience	FS No.	No. Material	No. Type	Dating (A.D.)
Kiva E, Layer 3B	4752	2 Bone	2 Gaming pieces	920-1120
Kiva E, Layer 3B	4753	5 Selenite	5 Unmodified	920-1120
Kiva E, Layer 3B	4765	1 Bone	1 Bead	920-1120
Kiva E, Layer 4	5023	1 Glycymeris	1 Bracelet fragment	920-1120
Kiva E, Layer 4	5020	1 Freshwater clam	1 Pendant	920-1120
Kiva E, Layer 4	5297	42 Selenite 1 Sulphur 1 Hematite	42 Unmodified 1 Unmodified 1 Unmodified	920-1120 920-1120 920-1120
Kiva E, Layer 4	5294 *	1 ?	1 Effigy	920-1120
Kiva E, Layer 4	5305	1 Argillite	1 Modified	920-1120
Kiva E, Layer 4	5878	1 Bone	1 Bead	920-1120
Kiva E, Layer 4	5882	1 Bone	1 Gaming piece	920-1120
Kiva E, Layer 5	5735	1 Cerethidia albondosa	1 Pendant	920-1120
Kiva E, Layer 5	5736	8 Selenite 1 Gypsite 1 Hematite	8 Unmodified 1 Unmodified 1 Unmodified	920-1120 920-1120 920-1120
Kiva E, Layer 5	5738	1 Calcite	1 Bead	920-1120
Kiva E, Layer 5	5744	1 Bone	1 Bead	920-1120
Kiva E, Layer 6, Floor 1, fill	6668	1 Selenite	1 Unmodified	920-1120
Kiva E, Layer 6, Floor 1, fill	6672*	1+Hematite	1+ -	920-1120
Kiva E, Test Trench 37, Level 1	4885	1 Bone	1 Bead	920-1120
Kiva E, Test Trench 37, Level 1	4886	2 Selenite	2 Unmodified	920-1120
Kiva E, Test Trench 37, Level 2	4935	1 Bone	1 Bead	920-1120
Kiva E, Test Trench 37, Level 2	4939	1 Bone	1 Bead	920-1120
Kiva E, Test Trench 37, Level 3	4943	1 Selenite	1 Unmodified	920-1120
Kiva E, above bench	4892	1 Selenite 1 Limonite	1 Unmodified 1 Gaming piece	920-1120 920-1120
Kiva E, clearing west wall above bench	5088	17 Selenite 1 Limonite 1 Hematite	17 Unmodified 1 Unmodified 1 Unmodified	920-1120 920-1120 920-1120
Kiva E, fill	6914	1 Turquoise	1 Unidentified	920-1120
Kiva E, Balk 1, Layer 3	5912	1 Shale 1 Malachite 1 Selenite	1 Pendant 1 Unmodified 1 Unmodified	920-1120 920-1120 920-1120
Kiva E, Balk 1, Layer 3	5920	1 Glycymeris	1 Bracelet fragment	920-1120
Kiva E, Balk 1, Layer 3	6057	1 Shale	1 Bead	920-1120
Kiva E, Balk 1, Layer 4	6003	1 Bone	1 Whistle	920-1120

Table 4.1. (continued)

Provenience	FS No.	No. Material	No. Type	Dating (A.D.)
Kiva E, Balk 1, Layer 4	6004	1 Bone	1 Whistle	920-1120
Kiva E, Balk 1, Layer 5	6177	4 Selenite	4 Unmodified	920-1120
Kiva E, Balk 1, Layer 5	6180	1 Limonite	1 Unmodified	920-1120
Kiva E, Balk 3, Layer A	5086	1 Turquoise	1 Pendant	920-1120
Kiva E, west wall	5093	1 Argillite	1 Ring	920-1120
Kiva E, facing west wall	4756	1 Argillite	1 Pendant	920-1120
Kiva E, clearing	6478	1 Limonite	1 Unmodified	920-1120
Kiva E, wall clearing	6584	1 Turquoise	1 Modified	920-1120
Kiva E, Floor 1, contact	6677	1 Calcite	1 Bead	920-1120
Kiva E, Floor 1, contact	6712	2 Turquoise	1 Modified 1 Debris	920-1120 920-1120
Kiva E, south recess	5949	1 Azurite	1 Modified	920-1120
Kiva E, south recess	5950*	1+Mineral	1+ -	920-1120
Kiva E, south recess	5956	1 <u>Glycymeris</u>	1 Pendant	920-1120
Kiva E, south recess	5957	3 Selenite	3 Unmodified	920-1120
Kiva E, south recess	5959	1 <u>Lymnaea bulemoides Lea</u>	1 Other	920-1120
Kiva E, south recess	5966*	1 -	1 Zoomorph	920-1120
Kiva E, south recess	5999	1 Turquoise	1 Modified	920-1120
Kiva E, south recess	5952	6 Bone	6 Beads	920-1120
Kiva E, Hole 1	7101	1 Selenite	1 Unmodified	920-1120
Pit Structure F, Level 5	6333	1 Aragonite	1 Debris	900-1000
Pit Structure F, Level 5	6431	11 Selenite	11 Unmodified	900-1000
Pit Structure F, Level 5	6434	4 Gypsite	4 Unmodified	900-1000
Pit Structure F, Level 5	6436	6 Limonite	6 Unmodified	900-1000
Pit Structure F, Level 5	6437	2 Hematite	2 Unmodified	900-1000
Pit Structure F, Level 5	6439	1 Hematite	1 Unmodified	900-1000
Pit Structure F, Level 5	6481	1 Selenite	1 Unmodified	900-1000
Pit Structure F, Level 6	6528	2 Limonite 1 Hematite	2 Unmodified 1 Unmodified	900-1000 900-1000
Pit Structure F, Level 6	6529	2 Turquoise	1 Pendant blank 1 Modified	900-1000 900-1000
Pit Structure F, Level 6	6530	1 Argillite	1 Modified	900-1000
Pit Structure F, Level 6	6531	31 Selenite 1 Limonite	31 Unmodified 1 Unmodified	900-1000 900-1000
Pit Structure F, Level 7	6604	1 Selenite 1 Limonite	1 Unmodified 1 Unmodified	900-1000 900-1000
Pit Structure F, wall niche, fill	6885	3 Limonite	3 Unmodified	900-1000

Table 4.1. (continued)

Provenience	FS No.	No. Material	No. Type	Dating (A.D.)
Pit Structure F, Floor 1, contact	6890	1 Glycymeris	1 Bracelet fragment	900-1000
Pit Structure F, Floor 1, contact	6891	1 Selenite 1 Limonite	1 Unmodified 1 Unmodified	900-1000 900-1000
Pit Structure F, Floor 1, contact	6921	2 Calcite	2 Modified	900-1000
Pit Structure F, Floor 1, Pit 12	6949	1 Limonite	1 Unmodified	900-1000
Pit Structure F, ventilator fill	6946	1 Gypsite	1 Unmodified	900-1000
Pit Structure F, Posthole 3	7123	1 Turquoise	1 Modified	900-1000
Pit Structure F, antechamber, subfloor ventilator	4256	1 Argillite	1 Modified	900-1000
Kiva G, clearing plaza	6351	1 Selenite 1 Limonite	1 Unmodified 1 Modified	1000-1040/50 1000-1040/50
Kiva G, clearing plaza	6353	4 Turquoise	2 Modified 2 Beads	1000-1040/50 1000-1040/50
Kiva G, Level 2	6542	3 Selenite	3 Unmodified	1000-1040/50
Kiva G, Level 3	6567	1 Selenite	1 Unmodified	1000-1040/50
Kiva G, Level 8	6839	1 Selenite	1 Unmodified	1000-1040/50
Kiva G, Level 9 and Level 10	6996	1 Selenite 1 Hematite	1 Unmodified 1 Unmodified	1000-1040/50 1000-1040/50
Kiva G, Floor 1, contact	7298	1 Calcite	1 Bead/disk	1000-1040/50
Kiva G, Firepit 1	7192	1 Azurite	1 Unmodified	1000-1040/50
Kiva G, ventilator tunnel	7248	4 Olivella dama	1 Bead 3 Unidentified	1000-1040/50 1000-1040/50
Kiva G, ventilator tunnel	7249	22 Turquoise	1 Unidentified 1 Modified 1 Bead 19 Bead blanks	1000-1040/50 1000-1040/50 1000-1040/50 1000-1040/50
Kiva G, Floor 1, ventilator tunnel	7142	8 Turquoise	1 Pendant 3 Bead blanks 4 Beads	1000-1040/50 1000-1040/50 1000-1040/50
Kiva G, ventilator tunnel	7151	1 Olivella dama	1 Bead	1000-1040/50
Ramada 5, east Room 14, Level 2	4738*	1 Mineral	1 -	1000-1040/50
Ramada 5, east Room 14, Level 2	4774	1 Turquoise	1 Other	1000-1040/50
Ramada 5, east Room 14, Pit 1	4464	1 Selenite	1 Unmodified	900-1000
Plaza south of Pithouse B, Test Trench 10, Burial 3	974	1 Turquoise	1 Debris	900-1000
Plaza south of Pithouse B, Test Trench 10, Burial 3	973	4 Limonite	4 Unmodified	900-1000
Plaza, southwest surface	1245	1 Turquoise	1 Bead	Undated
Plaza, southwest surface, trash	1255	8 Turquoise	1 Bead 7 Debris	Undated Undated

Table 4.1. (continued)

Provenience	FS No.	No. Material	No. Type	Dating (A.D.)
Plaza, clearing east of room block	1019*	1+Limonite	1+ -	Undated
Plaza, north Kiva D and Pithouse A	6485	11 Limonite	11 Unmodified	Undated
Plaza, north Kiva D and Pithouse A	7041	1 Gypsum	1 Unmodified	Undated
Plaza, north Kiva D and Pithouse A	7043	1 Selenite 2 Limonite	1 Unmodified 2 Unmodified	Undated
Plaza Test Trench 36, to Surface 2	4809	1 <u>Glycymeris</u>	1 Bracelet fragment	Undated
Plaza Test Trench 36, to Surface 2	4811	3 Limonite	3 Unmodified	Undated
Plaza Test Trench 36	6000	1 Limonite	1 Unmodified	Undated
Clearing, west of Pithouse A, east of Room 12	7051	1 Malachite	1 Unmodified	Undated
Trash Area, Surface	3	1 Malachite 2 Turquoise	1 Modified 1 Bead blank 1 Modified	900-1050 900-1050 900-1050
Trash Area, Surface	5603	1 <u>Glycymeris</u>	1 Pendant	900-1050
Trash Area, Surface	5489*	1 -	1 Pendant	900-1050
Trash Mound, Test Trench 1, clearing trash pit Level 2	2685	2 Turquoise	1 Pendant blank 1 Debris	1000-1040/50 1000-1040/50
Trash Mound, Test Trench 1, Surface	2582	1 Calcite	1 Unmodified	1000-1040/50
Trash Mound, Test Trench 1, Surface	2441	1 Selenite	1 Unmodified	1000-1040/50
Trash Mound, Test Trench 1, Level 2	2443	1 <u>Glycymeris</u>	1 Bracelet fragment	1000-1040/50
Trash Mound, Test Trench 2, Level 1, eastern segment	39	1 Turquoise	1 Inlay	900-1000
Trash Mound, Test Trench 2, Level 1	59	1 Calcite	1 Bead	900-1000
Trash Mound, Test Trench 2, Level 1	60	3 Turquoise	2 Modified 1 Bead blank	900-1000
Trash Mound, Test Trench 2, Level 1, western segment	2221	1 <u>Glycymeris</u>	1 Bracelet fragment	1000-1040/50
Trash Mound, Test Trench 2, Level 2, eastern segment	182	2 Turquoise	2 Debris	900-1000
Trash Mound, Test Trench 2, Level 2, eastern segment	183	1 Azurite	1 Modified	900-1000
Trash Mound, Test Trench 2, east, clearing wall	2312	1 Turquoise	1 Bead blank	1000-1040/50
Trash Mound, Test Trench 2, east, clearing wall	2309	1 Gypsite	1 Unmodified	1000-1040/50
Trash Mound, Test Trench 15, Level 1	2286	1 Argillite	1 Pendant	1000-1040/50

Table 4.1. (continued)

Provenience	FS No.	No. Material	No. Type	Dating (A.D.)
Trash Mound, Test Trench 20, Level 1	1483	1 Turquoise	1 Bead blank	Undated
Trash Mound, Test Trench 20, Level 1	1484	1 Bone	1 Gaming piece	Undated
Trash Mound, Test Trench 22, Level 1	2351	1 Turquoise	1 Unmodified	1000-1040/50
Trash Mound, Grid EL-2, Level 3	2379	1 Olivella dama	1 Bead	900-1000
Trash Mound, Grid EL-2, Level 4	2405	1 Selenite	1 Unmodified	900-1000
Trash Mound, Grid FL-2, Layer 1	4694*	1+Minerals	1+ -	900-1000
Trash Mound, Grid FL-2, Layer 2	4704	1 Selenite	1 Unmodified	900-1000
Trash Mound, Grid GL-2, Level 1	2366	1 Glycymeris	1 Bracelet fragment	900-1000
Trash Mound, Grid GL-2, Level 2	2301	1 Selenite	1 Unmodified	900-1000
Trash Mound, Grid GL-2, Level 4	2347	2 Selenite 2 Gypsite	2 Unmodified 2 Unmodified	900-1000 900-1000
Trash Mound, Grid HL-2, surface	2315	1 Turitella leucostoma	1 Other	Undated
Trash Mound, Grid IL-1, 26 cm below surface	2357	1 Turquoise	1 Pendant blank	1000-1040/50
Trash Mound, Grid IL-1, Level 3	2380	2 Selenite	2 Unmodified	1000-1040/50
Trash Mound, Grid IL-1, Level 4	2384	1 Limonite	1 Unmodified	1000-1040/50
Trash Mound, Grid JL-1, surface	1168	1 Turquoise	1 Bead	1000-1040/50
Trash Mound, Grid JL-1, surface	2493	2 Turquoise	1 Modified 1 Bead	1000-1040/50 1000-1040/50
Trash Mound, Grid JL-1, surface	2616	1 Limonite	1 Unmodified	1000-1040/50
Trash Mound, Grid JL-1, surface	4198	3 Turquoise	3 Debris	1000-1040/50
Trash Mound, Grid JL-1, Level 1	2538	1 Selenite	1 Unmodified	1000-1040/50
Trash Mound, Grid JL-1, Layer 2	2619	1 Turquoise	1 Debris	1000-1040/50
Trash Mound, Grid JL-2, surface	2663	1 Azurite	1 Modified	1000-1040/50
Trash Mound, Grid JL-2, Layer 1	2664	1 Turquoise	1 Pendant blank	1000-1040/50
Trash Mound, Grid JL-2, Layer 3	2662	1 Turquoise	1 Debris	1000-1040/50
Trash Mound, Grid KL-1, 37 cm below surface	1257	1 Geothite	1 Modified	1000-1040/50

Table 4.1. (continued)

Provenience	FS No.	No. Material	No. Type	Dating (A.D.)
Trash Mound, Grid KL-1, Layer 1	2437	1 Turquoise	1 Modified	1000-1040/50
Trash Mound, Grid KL-1, Level 2	2395	1 Glycymeris	1 Bracelet fragment	1000-1040/50
Trash Mound, Grid KL-1, Layer 2	2438*	1+Minerals	1+ -	1000-1040/50
Trash Mound, Grid KL-1, Level 4	2332	2 Selenite	2 Unmodified	1000-1040/50
Trash Mound, Grid KL-2, Level 2	2423	1 Argillite 1 Selenite	1 Flake 1 Unmodified	1000-1040/50
Trash Mound, Grid KL-2, Level 3	2386	1 Selenite	1 Unmodified	1000-1040/50
Trash Mound, Grid KX, Layer 1	3005	1 Turquoise	1 Pendant	1000-1040/50
Trash Mound, Grid KX, Layer 1	6728	1 Selenite	1 Unmodified	1000-1040/50
Trash Mound, Grid KX, Layer 1	7251	1 Azurite	1 Unmodified	1000-1040/50
Under wall of Rooms 3, 10, 14, 17, 18	7280	1 Turquoise	1 Modified	Undated
Surface, southwest Kiva C	1944	1 Calcite	1 Bead	Undated
Surface of site	5248	1 Turquoise	1 Modified	Undated
Surface near trailer	4401	1 Haliotus	1 Pendant	Undated
Surface, anthill south of Test Trench 2	1945	1 Turquoise	1 Modified	Undated
Test Trench 3, Level 3	1195	6 Selenite	6 Unmodified	900-1000
Test Trench 4	1142	1 Shale	1 Other	Undated
Test Trench 4, Level 1	585	1 Turquoise	1 Inlay	Undated
Test Trench 5, surface	644	1 Bone	1 Gaming piece	Undated
Test Trench 5	666	1 Argopectin circularis	1 Pendant	Undated
Test Trench 5	924	1 Turquoise	1 Unidentified	Undated
Test Trench 5, Level 1	2213	1 Selenite	1 Unmodified	Undated
Test Trench 7	656	1 Turquoise	1 Bead blank	1000-1040/50
Test Trench 7	802	4 Turquoise	3 Debris 1 Modified	1000-1040/50 1000-1040/50
Test Trench 10, Burial 3	974	1 Turquoise	1 Debris	900-1000
Test Trench 10, Burial 3	973	4 Limonite	4 Unmodified	900-1000
Test Trench 11, Level 1	1182	1 Limonite	1 Modified	1000-1040/50
Test Trench 12, Level 1	1211	1 Turquoise	1 Debris	Undated
Test Trench 13, Level 1	2759	2 Selenite	2 Unmodified	900-1000
Test Trench 30, west intersect	4544*	1 Shell	1+ -	Undated

Table 4.1. (continued)

Provenience	FS No.	No. Material	No. Type	Dating (A.D.)
Test Trench 35, clearing wall	6718	1 Glycymeris	1 Bracelet fragment	1000-1040/50
Trash east of Grid Stake AX	648	1 Limonite	1 Unmodified	900-1000
Trash east of Grid Stake AX	651	1 Hematite	1 Unmodified	900-1000
Trash east of Grid Stake AX	652	1 Turquoise	1 Modified	900-1000
TOTAL		1,378		

* Not found in collection.

formerly associated with the Chaco Project. Other mineral locations are listed in Northrop (1959).

These materials include:

--Aragonite: Possibly found locally in the Kirtland-Fruitland formations. Definitely found within the San Juan Basin.

--Argillite: Also called red dog shale or burned shale. Found locally in the gravels at Chaco Canyon area.

--Azurite: From the mountain ranges peripheral to the San Juan Basin (Zuni, San Juan, and Nacimiento Mountains).

--Bone: Some (artiodactyls and Lepus californicus) were from species that were used in the subsistence base; others (particularly birds) were casual or seasonal migrants to the local area; while other bird bones definitely were imported.

--Calcite: Probably local; found in Upper Cretaceous beds in the San Juan Basin. Travertine form is widespread as deposits in mineral spring waters.

--Chert, green: Locally available in Chaco Canyon.

--Copper: No deposits within the San Juan Basin. Copper is available in New Mexico and Arizona, but the prehistoric Southwesterners did not make ornaments from it. All copper ornaments were imported from the south (Mexico).

--Evaporite: Condition of the artifact was such that better identification of mineral was impossible; therefore, source is unknown.

--Galena: Found in the Grants District of McKinley County.

--Goethite: Iron oxide, probably found within the Chaco area.

--Gypsite: Abundant in the Chaco area.

--Gypsum: Abundant in the Chaco area.

--Hematite: Found in the Cliff House formation at Chaco Canyon.

--Jet: Material could not be positively identified, but probably is a shale or lignite, both of which are available locally.

--Lignite: Available in coal seams in Chaco Canyon.

--Limonite: Found in the Cliff House formation at Chaco Canyon.

--Limonitic sandstone: Available in Chaco Canyon.

Table 4.2. Ornament and mineral material types, 29SJ 627.

Material	No.	Relative %	Source	A.D. 820-920	A.D. 900-1000	A.D. 900-1050	A.D. 920-1120	A.D. 1000-1040/50	Undated
Aragonite	1	0.07	Local	-	1 Debris	-	-	-	-
Argillite	18	1.31	Local	-	1 Pendant 2 Zoomorphs 4 Modified	-	1 Zoomorph 1 Pendant 1 Modified 1 Ring	1 Disk 2 Modified 1 Unmodified 1 Pendant 1 Flake	-
Azurite	40	2.90	Basin	-	5 Unmodified 2 Modified 20 Debris	-	1 Unmodified 1 Modified	9 Unmodified 2 Modified	-
Bone	31	2.25	Local/ Basin	1 Bead	1 Bead 2 Gaming pieces	-	14 Beads 4 Gaming pieces 2 Whistles	1 Other 3 Beads 1 Gaming piece	2 Gaming pieces
Calcite	25	1.81	Local	-	6 Beads 2 Modified 1 Unmodified	-	2 Beads 1 Unmodified	8 Beads 1 Bead/disk 1 Pendant 1 Unmodified	2 Beads
Chert, green	1	0.07	Local	-	-	-	1 Unmodified	-	-
Copper	1	0.07	External	-	1 Unmodified	-	-	-	-
Evaporite	1	0.07	?	1 Unmodified	-	-	-	-	-
Galena	1	0.07	Basin	-	1 Unmodified	-	-	-	-
Goethite	1	0.07	Local	-	-	-	-	1 Modified	-
Gypsite	31	2.25	Local	1 Unmodified	22 Unmodified	-	2 Unmodified	6 Unmodified	-
Gypsum	13	0.94	Local	-	5 Unmodified	-	3 Unmodified	4 Unmodified	1 Unmodified
Hematite	27	1.96	Local	-	2 Modified 10 Unmodified	-	3 Unmodified 1 -	1 Paintstone 9 Unmodified 1 Modified	-
Jet	2	0.15	?	-	-	-	1 Modified	1 Unidentified	-
Lignite	6	0.44	Local	1 Modified	1 Modified	-	-	1 Button 2 Unmodified 1 Modified	-
Limonite	101	7.32	Local	1 Modified 7 Unmodified	49 Unmodified	-	5 Unmodified 1 Gaming piece	16 Unmodified 1 Gaming piece 2 Modified	18 Unmodified 1 -
Limonitic sandstone	1	0.07	Local	-	1 Unmodified	-	-	-	-
Malachite	10	0.73	Basin	-	5 Unmodified	1 Modified	1 Unmodified	1 Unmodified 1 Modified	1 Unmodified

Table 4.2. (continued)

Material	No.	Relative %	Source	A.D. 820-920	A.D. 900-1000	A.D. 900-1050	A.D. 920-1120	A.D. 1000-1040/40	Undated
Mica-muscovite	1	0.07	Basin	-	1 Modified	-	-	-	-
Mineral, unknown	7	0.51	?	-	1 -	1 Pendant	1 Effigy 1 Zoomorph 1 -	2 -	-
Quartz crystal	2	0.15	Basin	-	1 Unmodified	-	-	1 Unmodified	-
Sandstone	3	0.22	Local	-	1 Unmodified	-	1 Modified	1 Unmodified	-
Selenite	723	52.43	Local	66 Unmodified 4 Debris	285 Unmodified 6 Modified 1 Debris	-	172 Unmodified	181 Unmodified 3 Modified 2 Debris	2 Unmodified
Shale	37	2.68	Local	-	-	-	1 Pendant 1 Bead	34 Beads	1 Other
Shell:									
Argopectin circularis	1	0.07	External	-	-	-	-	-	1 Pendant
Cerithidea albondosa	1	0.07	External	-	-	-	1 Pendant	-	-
Episcinea medialis	1	0.07	External	-	1 Unmodified	-	-	-	-
Freshwater clam	1	0.07	Basin	-	-	-	1 Pendant	-	-
Glycymeris gigantea	39	2.83	External	-	2 Beads 4 Pendants 13 Bracelet fragments	1 Pendant	3 Bracelet fragments 1 Noseplug 1 Pendant	12 Bracelet fragments	2 Bracelet fragments
Haliotus cracherodii	4	0.29	External	-	2 Pendants	-	-	1 Pendant	1 Pendant
Lymnaea bulemoides Lea	1	0.07	External	-	-	-	1 Other	-	-
Olivella dama	23	1.67	External	-	18 Beads	-	-	2 Beads 3 Unidentified	-
Strombus galeatus	1	0.07	External	-	-	-	-	1 Pendant	-
Trachy-cardium panamense	1	0.07	External	-	-	-	-	1 Pendant	-

Table 4.2. *(continued)*

Material	No.	Relative %	Source	A.D. 820-920	A.D. 900-1000	A.D. 900-1050	A.D. 920-1120	A.D. 1000-1040/40	Undated
Trachy-cardium sp.	1	0.07	External	-	1 Pendant	-	-	-	-
Turitella leucostoma	1	0.07	External	-	-	-	-	-	1 Other
Unident.	4	0.29	?	-	2 -	-	-	1 Pendant fragment	1 -
Specularite	1	0.07	Basin	-	-	-	-	-	1 Unidentified
Sulphur	2	0.14	Basin	-	-	-	1 Unmodified	1 Unmodified	-
Turquoise	213	15.45	External	1 Modified 1 Debris	3 Beads 4 Bead blanks 3 Inlay 3 Pendants 34 Modified 1 Unmodified 14 Debris 6 - 1 Modified/ other 1 Button 1 Modified/ pendant blank 3 Pendant blanks	1 Bead blank 1 Modified	2 Unmodified 5 Modified 1 Unidentified 1 Pendant 1 Debris	25 Bead blanks 22 Debris 19 Modified 3 Unmodified 6 Pendant 4 Pendant blanks 6 Inlay 1 Other 1 Unidentified 18 Beads	5 Modified 1 Unmodified 2 Unidentified 2 Beads 1 Bead blank 8 Debris 1 Inlay
TOTALS	1378	99.99		85	557	5	244	432	55
Percent		100.1		6.2	40.4	0.4	17.7	31.4	4.0

--Malachite: Found in small amounts near Haystack, Grants District of McKinley County, as well as in mountains around the periphery of the San Juan Basin.

--Mica-muscovite: Found in Grants District of McKinley County and in the mountains peripheral to the San Juan Basin. (Recently, Dodge [1990] shaved pieces of selenite in order to obtain a smoother surface. The debris from this procedure is nearly identical in appearance to the small flakes identified as Mica-Muscovite, which leads to some uncertainty with regard to this identification.)

--Mineral, unidentified: Unknown.

--Quartz crystal: Crystals are found near Gallup.

--Sandstone: Found locally in Chaco Canyon.

--Selenite: Abundant in coal strata with especially good crystals in Chaco Canyon.

--Shale: Menefee shale is part of local formation; Mancos shales are found around the periphery of the San Juan Basin.

--Shell (note that names of shells are listed according to terminology used by malacologists and that the names and dates included in titles do not refer to citations in the references but are part of the formal nomenclature, Keen, 1971.)

Argopectin circularis (Sowerby, 1835): Pelecypoda (bivalves or clams) found from Cedros Island, Baja California Norte, throughout the Gulf of California and south to Peru. Common on sandy mud flats.

Cerithidea albondosa Gould and Carpenter, 1857: Gastropoda (snails) found in northern part of the Gulf of California, Mexico, on tidal flats.

Episcynia medialis Keen, 1971: Gastropoda found from Guaymas, Sonora, Mexico, south to Banderas Bay, Nayarit-Jalisco, Mexico. It probably adheres to another shell during transport.

Freshwater clam: No further indentification possible. If species requires year-round supply of water, closest sources would be the San Juan River and Rio Grande.

Glycymeris gigantea (Reeve, 1843): Pelecypoda available from Bahia Magdalena, Baja California Sur to Acapulco and in the Gulf of California north to approximately Mulege, Baja California Sur. On west coast of Mexico only beach valves are found north of Mazatlan, Sinaloa.

Haliotus cracherodii Leach, 1817: Gastropoda found from Coos Bay, Oregon, to Cabo San Lucas, Baja California Sur, Mexico. Does not occur in Gulf of California. Common on rocks at low tide.

Lymnaea bulemoides Lea Keep, 1935: Freshwater gastropoda.

Olivella dama (Wood, 1828, ex Mawe MS): Gastropoda found from head of the Gulf of California, Mexico, south to Panama.

Strombus galeatus Swainson, 1823: Gastropoda found throughout the entire Gulf of California, and from Mexico to Ecuador.

Trachycardium sp.: Pelecypoda.

Trachycardium sp., possibly Trachycardium panamense (Sowerby, 1833): Pelecypoda found throughout the Gulf of California south to Costa Rica.

Turitella leucostoma Valenciennes, 1832: Gastropoda found from Cedros Island, Baja California Norte, throughout the Gulf of California, Mexico, to Panama.

Unidentified. Several shell species could not be identified.

--Specularite: Closest documented deposit is in Zuni Mountains.

--Sulphur: Found in Gallup District of McKinley County.

--Turquoise: Not available within the San Juan Basin. Nearest source is over 100 airline miles from Chaco Canyon, but other sources were utilized throughout the Southwest (Mathien 1981:Appendix C).

Table 4.2 also provides a distribution of material types by period. Definite changes can be seen when these are examined diachronically.

A.D. 820-920

A total of 85 artifacts (6.2% of the ornaments and minerals from this site) made from seven materials were attributed to this period. Selenite was found in larger quantities than any other mineral, and all minerals except the turquoise pieces were probably locally available. There are no shells on the site that date to this period, even though some species are found in other sites dated to this time (Mathien 1985). Only one finished ornament (a bone bead) was present; this represents 1.2% of the ornamental and mineral artifacts from this period.

A.D. 900-1000

The largest number of artifacts recovered from this site was assigned to this period (557 or 40.4%). Again, selenite is the most abundant material type. The number of different materials has increased to 21, with six different species of shell. New shell species not previously recorded from excavated Chacoan sites during this period, or earlier (Mathien 1985) include:

Episcynia medialis: One of two pieces recovered from Chaco Canyon was found at 29SJ 627; the other was from Kin Kletso. Partial explanation for the lack of recorded evidence might be the small size of this species and the fact that it had been found adhering to other species. Alone, this shell could easily be missed during excavations.

Trachycardium sp.

In addition to these two species of shell, the use of mica-muscovite is first recorded in excavated sites in Chaco Canyon during this period at this site.

The other shell species and mineral types found at 29SJ 627 during this period do not represent any new or unusual materials, although they are all found at other Chaco Canyon sites in this and earlier periods.

Although most of the artifacts examined from this period were minerals that are available locally (hematite, limonite, and selenite), the majority of the ornaments or pieces that had been shaped into a form that suggested use as an ornament were imported from outside of the San Juan Basin. Shell and turquoise pieces greatly outnumber the argillite, bone, and calcite ones by approximately 6:1.

A.D. 1000-1040/50

A total of 432 artifacts (31.33% of those analyzed from this site) were dated to this period. Two new shell species, Strombus galeatus and Trachycardium sp., were recovered, in addition to the ones previously discussed. Strombus galeatus is rarely recovered. Another shell of this species was recorded from Chetro Ketl. It had been collected previously and sent to Helen DuShane for identification during the current project. Stombus gracilor is reported from Pueblo Bonito (Judd 1954:89). Trachycardium sp. (probably T. panamense) is the only recorded shell of this species from any of the Chacoan excavations. However, two shells of this genus have been recorded from this site (see above).

As noted for the A.D. 900-1000 period, most of the artifacts examined were made from locally derived materials, but there was a greater proportion of imported material used for ornaments (approximately 84 ornaments made from materials imported from outside the San Juan Basin, 34 from the Basin or local, and 18 local) than was found during the earlier period.

A.D. 900-1040/50

Very little material (five artifacts or 0.36% of all artifacts from this site) was recovered and assigned to this period.

A.D. 920-1120

A total of 245 pieces (17.7% of the site collection) was assigned to this period, which overlaps the three previous periods, and most of the material is very similar. Again, selenite was the most common mineral recovered. A single Lymnaea bulemoides Lea shell was a new addition to the list of shell species; the other recorded example of this species from a Chacoan site occurs at Pueblo Alto (Mathien 1987).

A single Turitella leucostoma shell was recovered from an undated provenience; this species was also reported from Pueblo Bonito (Judd 1954:89). An unmodified piece of copper-chalcopyrite was recovered from the A.D. 900-1000 component of this site.

To summarize material types, the most notable discoveries at 29SJ 627 were the new shell types at small sites and the use of mica-muscovite or shaved selenite. While some shell species had been found at a few large sites prior to recent excavations, three of the species are known only from this site. Also at 29SJ 627, some of the best dates for the use of these materials were established.

Artifact Classes

Artifacts were assigned to classes; those which had been fashioned into ornaments or other pieces were divided into 15 categories (Table 4.3).

Beads

Beads were made from a variety of materials. Distinct in both material and shape are 19 tubular bone beads. Table 4.4 summarizes the data for each bead by period. A number of animal species were utilized; these were identified by Nancy Akins and Steve Emslie (Table 4.5). Two species, Branta canadensis and Grus canadensis are not abundant in the area today; the other species are commonly found in Chaco Canyon.

All the bone tubes dated around A.D. 920-1120 were found in Kiva E. The only two bone whistles also came from this provenience (see below). Based on the construction of the bone whistles, where one tube was inserted into another (Figure 4.1), it is possible that FS 4885, FS 4475, FS 5878, and FS 5952, which have diameters over one centimeter, may have functioned as parts of similar artifacts. Their diameters compare favorably with the diameter measurements from the two bone whistles, where the larger two tubes measure 1.07 and 1.00 cm. The remaining bone tubes have an average diameter of 0.75 cm. In general, the bone tubes from this site were fairly well made, with grinding visible on both ends and polish around the exterior.

Beads made from minerals were more numerous (Table 4.6). All were discoidal. While argillite, calcite, shale, and turquoise were used, shale beads are most numerous. This sample may be biased by the discovery of 33 shale beads in one provenience (FS 478 from Room 10, Floor 1), which had eight calcite beads and dates to A.D. 1000-1040/50. Also from this period is the largest number of turquoise beads in a single provenience (nine from FS 2692, plus one pendant), from Room 8, Floor 2. These 50 shale, calcite, and turquoise beads (out of a total of 79) account for 63% of all the mineral beads recovered from this site.

During the analysis of beads from Chaco Canyon sites, it seemed as if there were differences in the sizes, depending on the type of material used and the period during which they were made. Examination of three sets of beads from 29SJ 627 reveals that they are more alike within provenience and material type and are different from other beads of the same material from other proveniences. The calcite beads from FS 478 average 0.36 cm in diameter (var.=.000048; s.d.=.0074), while the entire collection of calcite beads from this site (n=20) ranges in diameter from 0.34 to 1.24 cm. The bead with the largest diameter is from the same period as the eight from FS 478. None of the other calcite beads is as large.

For the shale beads a similar situation exists. Average diameter for the 33 beads in FS 478 is 0.22 cm (var.=.00016; s.d.=.004). When compared with the two other shale beads, one from the same time period (FS 5621, A.D. 1000-1050) measures 0.34 cm, while the other one (FS 6501, A.D. 920-1020) is 0.24 cm.

A total of 23 turquoise beads were recovered at 29SJ 627 (Table 4.6); one of these is tubular (FS 5330, Figure 4.2) and the remainder are discoidal. Using the estimated dates assigned by Truell, three of these were recovered from proveniences dating to A.D. 900-1000, and two were undated. Eighteen were assigned dates from A.D. 1000-1050; in this group the average diameter of beads is 0.51 cm (var.=0.0235; s.d.=0.71). Turquoise beads at this site tend to be larger than the calcite and shale beads (range 0.19-0.74 cm) from the same period. Be-

Table 4.3. Artifact classes at 29SJ 627.

Class	A.D. 820-920	A.D. 900-1000	A.D. 900-1050	A.D. 920-1120	A.D. 1000-1040/50	Undated
Beads	1 Bone	1 Bone 6 Calcite 2 Glycymeris 18 Olivella 3 Turquoise	-	14 Bone 2 Calcite	3 Bone 8 Calcite 1 Calcite bead/disk 34 Shale 2 Olivella 18 Turquoise	2 Calcite 2 Turquoise
Bead blanks	-	4 Turquoise	1 Turquoise	-	25 Turquoise	1 Turquoise
Bracelet fragment	-	13 Glycymeris	-	3 Glycymeris	12 Glycymeris	2 Glycymeris
Buttons	-	1 Turquoise	-	-	1 Lignite	-
Disks	-	-	-	-	1 Argillite 1 Calcite (see above)	-
Effigy/Zoomorph	-	2 Argillite	-	1 Argillite 1 -	1 Effigy 1 -	-
Gaming pieces	-	2 Bone	-	4 Bone 1 Limonite	1 Bone 1 Limonite	2 Bone
Inlay	-	3 Turquoise	-	-	6 Turquoise	1 Turquoise
Noseplug	-	-	-	1 Glycymeris	-	-
Other/ unidentified	-	3 Turquoise 1 Unidentified shell	-	1 Lymnaea bulemoides Lea 1 Turquoise	1 Bone 1 Jet 3 Olivella 2 Turquoise	1 Specularite 1 Shale 1 Turitella
Paintstone	-	-	-	-	1 Hematite	-
Pendants and pendant fragments	-	1 Argillite 4 Glycymeris 2 Haliotus 1 Tracyh. sp. 3 Turquoise	1 - 1 Glycymeris	1 Argillite 1 Shale 1 Cerithidea albondosa 1 Freshwater clam 1 Glycymeris 1 Turquoise	1 Argillite 1 Calcite 1 Haliotus 1 Strombus 1 Trachy. pan 1 Unidentified shell 6 Turquoise	1 Argo. circ. 1 Haliotus
Pendant blanks	-	4 Turquoise	-	-	4 Turquoise	-
Ring	-	-	-	1 Argillite	-	-
Whistles	-	-	-	2 Bone	-	-

Legend: Argo. circ = Argopectin circularis
Glycymeris = Glycymeris gigantea
Haliotus = Haliotus cracherodii
Olivella = Olivella dama
Trachy. pan = Trachycardia panamense
Trachy. sp. = Trachycardia sp.

Table 4.4. Bone tube beads from 29SJ 627.

Dating	FS No.	Dimensions in cm			Comments
		Length	Diam. 1	Diam. 2	
A.D. 820-920	2909	1.89	0.95	0.71	Ground 2 ends, polished all over. Groove cut near one end, other had striations. Lepus californicus.
A.D. 900-1000	2729	2.65	1.31	1.09	Ground 2 ends, polished. Aves sp.
A.D. 1000-1040/50	781	3.29	1.37	1.20	Ground 2 ends, polished and cut one end. Meleagris gallopavo.
	2784	4.01	0.40	0.37	Ground 2 ends, but 1 jagged. Polished. Lepus californicus.
	1347	5.34	0.73	0.52	Ground 2 ends, polished. Aves sp.
A.D. 920-1120	4039	3.01	0.84	0.76	Ground 2 ends. Nicely polished. Buteo sp.
	4885	3.00	1.30	1.16	Ground 2 ends, striations, polished. Aves sp.
	4935	2.95	0.63	0.54	Ground 2 ends, striations, polished. Bronta canadense.
	4939	3.57	-	-	Broken longitudinally. Ground 2 ends. Unkown bird or mammal.
	4765	3.86	0.93	0.75	Ground 2 ends, nicely polished. Dark brown. Meleagris gallopavo.
	4475	7.11	1.32	0.93	Broken one end, ground both ends. Many striations. Meleagris gallopavo.
	5878	2.48	1.24	0.86	Ground 2 ends, but irregular. Polished. Perpendicular striations. Few cut marks near and perpendicular to ends. Unknown bird or mammal.

Table 4.4. *(continued)*

Dating	FS No.	Dimensions in cm Length	Diam. 1	Diam. 2	Comments
	5744	4.77	0.80	0.49	Ground 2 ends, but irregular. Polished. Grus canadensis.
	5952	2.97	1.60	0.97	Ground 1 end, other irregular. Polished. Bronta canadense.
A.D. 920-1120	5952	4.03	-	-	Broken longitudinally, ground 2 ends. Aves sp.
		2.56	0.61	0.54	Ground 2 ends, polished. Aves sp.
		4.84	0.73	0.63	Ground 1 end, other broken. Slight polish. Buteo sp.
		3.10	1.28	1.17	Ground 2 ends, slight polish. Aves sp.
		2.90	-	-	Broken longitudinally, ground 2 ends. Aves sp.

Table 4.5. Animal species used for beads.

No. of Beads	Species	Local/Non-local
7	Aves sp. (bird)	Local
2	Branta canadensis (Canadian goose)	San Juan Valley
1	Grus canadensis (Sandhill crane)	Casual appearance
2	Buteo sp. (hawk)	Local
3	Meleagris gallopavo (turkey)	Local
2	Lepus californicus (rabbit)	Local
2	Unknown bird or mammal	Local ?

cause the tuquoise beads were recovered from the floors in two different rooms, and because neither of these two proveniences shows any evidence of workshop debris, it is difficult to explain these differences and similarities. It may reflect the work of different craftsmen or even the different purposes for which beads were made, e.g., at one time as part of different pieces of jewelry such as necklaces or bracelets, or at another time as an offering.

Table 4.7 lists the shell beads recovered from 29SJ 627. Two Glycymeris gigantea (FS 5660), dating A.D. 900-1000, were found with 17 Olivella dama beads (Figure 4.3). The Glycymeris beads are discoidal and approximately the same diameter. The Olivella beads are usually ground at the top, but exhibit no other manufacturing. Their size ranges from 1.52- 0.95 cm in length and from 0.73 to 0.50 cm in width. A single bead at the small end of this size range is considerably different from the others. Excluding this bead, the average length for these beads is 1.41 cm with a range from 1.25-1.54 cm (var.= 0.0072; s.d.= 0.087). When the diameters of these beads are compared, the average for 16 beads is 0.669 cm with a range from 0.61 to 0.73 (var.=0.0014; s.d.=0.039). When all 17 are included in the calculations, the average diameter is 0.658 cm (var.=0.0029; s.d.=0.0557).

Because there are few other shell beads for comparison, the similarities of these artifacts within one provenience may be due only to selection factors for a particular jewelry item rather than to specific manufacturing techniques for the period in question. Overall, the comparisons of size and material type of beads indicate that there are some differences among the groups. It would be an error, however, to conclude that the period during which they were made or the mineral used were the only factors that affected these observations.

Bead Blanks

Table 4.8 presents data on turquoise bead blanks. Based on this information, it is possible to suggest that some bead manufacturing may have taken place at this site prior to A.D. 1000, but that the major work effort was between A.D. 1000-1050. The provenience of FS 7249 (Figure 4.2), the ventilator tunnel of Kiva G, does not indicate where this manufacturing took place; Truell

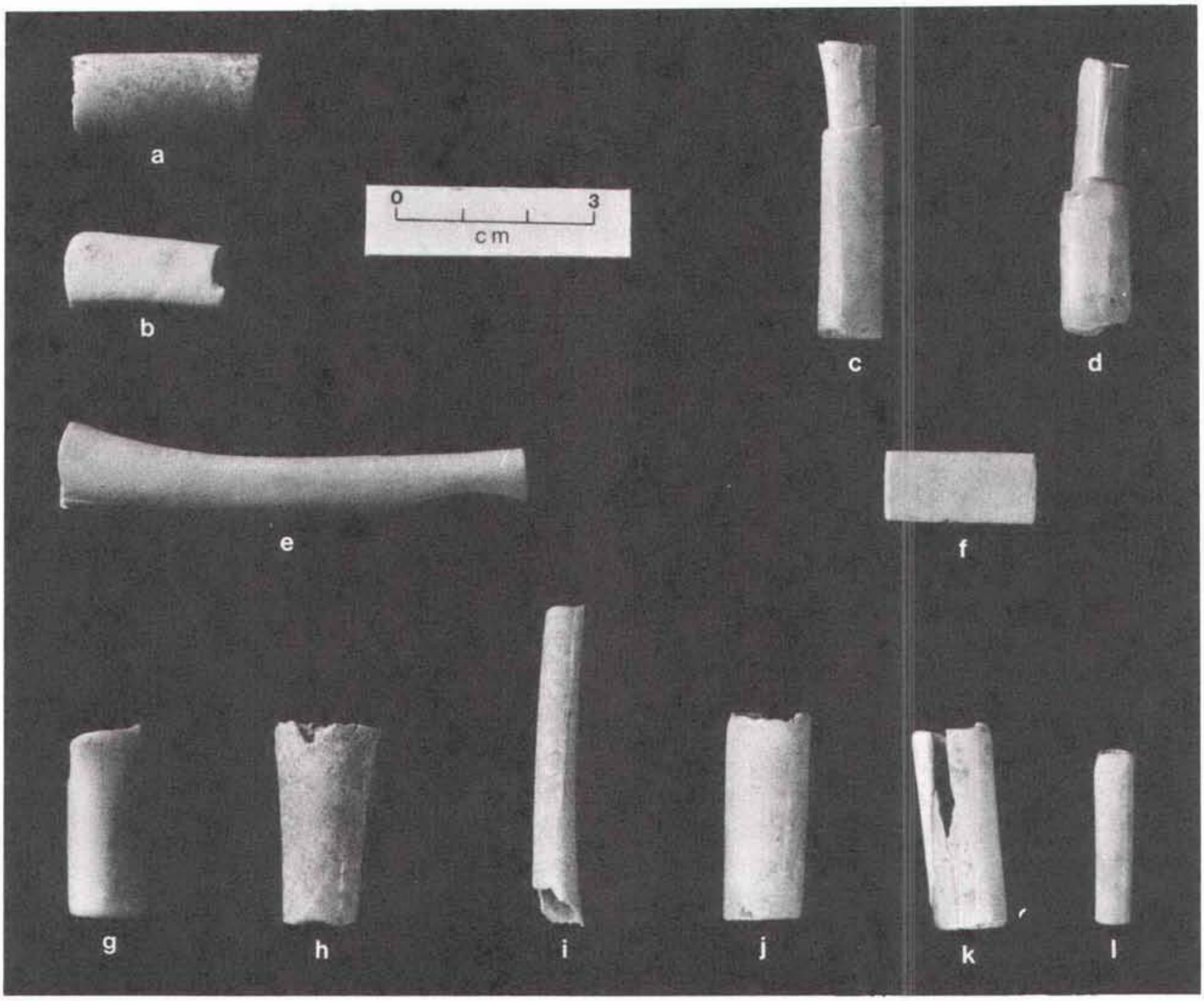

Figure 4.1. *Bone artifacts from 29SJ 627: Beads / whistles (a-FS 5878, b-FS 4885, c-FS 6003, d- FS 6004, e-FS 4475, g-l-FS 5952); and an unusual fragment (f-FS 153) (Chaco Center Negative No. 24549).*

thought this was an offering. Additional materials from the vent tunnel (FS 7142) exhibit similarities in size, manufacturing technique, and color. Measurements on these combined groups give an average diameter for 22 bead blanks of 0.559 cm (range=0.41-0.62 cm; var.=0.0011; s.d.=0.0343).

Bracelet Fragments

A total of 20 Glycymeris gigantea shell pieces were classified as bracelet fragments (Table 4.9). Three have been marked with an asterisk, which indicates a perforation in the umbo area, but there is no evidence that the pieces had been reground (Figure 4.4). These may

Table 4.6. Mineral beads from 29SJ 627.

Dating	FS No.	Dimensions in cm. Diam.	Thick.	Perf.	Comments
Calcite					
A.D. 900-1000	4585	0.57	0.22	0.20	Ground all sides, periphery. Drilled 2 sides.
	4239	0.34	0.14	0.19	Ground all sides, periphery. Drilled 2 sides.
	4375	0.43	0.21	0.19	Ground all sides, periphery. Drilled 2 sides.
	4906	1.11	0.32	0.43	Ground all sides, periphery. Drilled 2 sides. Broken 1/4.
	59	0.44	0.15	0.18	Ground all sides, periphery. Drilled 2 sides.
	4301	0.69	0.29	0.18	Ground all sides, periphery. Drilled 2 sides.
A.D. 920-1120	5738	0.57	0.26	0.23	Ground all sides, periphery. Drilled 2 sides.
	6677	0.53	0.24	0.19	Ground all sides, periphery. Drilled 2 sides.
A.D. 1000-1050	478	0.35	0.17	0.16	Ground all sides, periphery. Drilled 1 side.
		0.36	0.14	0.16	Ground all sides, periphery. Drilled 2 sides.
		0.36	0.18	0.15	Ground all sides, periphery. Drilled 1 side.
		0.36	0.19	0.18	Ground all sides, periphery. Drilled 2 sides.
		0.35	0.20	0.14	Ground all sides, periphery. Drilled 1 side.
		0.35	0.15	0.15	Ground all sides, periphery. Drilled 1 side.
		0.35	0.17	0.15	Ground all sides, periphery. Drilled 1 side.
		0.37	0.16	0.16	Ground all sides, periphery. Drilled 2 sides.
	5359	0.48	0.23	0.17	Ground all sides, periphery. Drilled 2 sides.
	7298	1.24	0.17	0.21	Ground all sides, periphery. Drilled 1 side. Disk with hole?
Undated	7256	0.52	0.19	0.19	Ground all sides, periphery. Drilled 1 side.
	1944	0.56	0.13	0.16	Ground all sides, periphery. Drilled 2 sides.
Shale					
A.D. 1000-1050	5621	0.34	0.13	0.12	Ground all sides, periphery. Drilled 2 sides.

Table 4.6. (continued)

Dating	FS No.	Dimensions in cm Diam.	Thick.	Perf.	Comments
	478	0.22	0.08	0.11	Ground all sides, periphery. Drilled 1 side. Polished.
		0.21	0.11	0.11	Ground all sides, periphery. Drilled 2 sides. Polished.
		0.22	0.10	0.09	Ground all sides, periphery. Drilled 1 side. Polished.
		0.22	0.10	0.10	Ground all sides, periphery. Drilled 2 sides. Polished.
		0.22	0.09	0.11	Ground all sides, periphery. Drilled 2 sides. Polished.
		0.22	0.09	0.10	Ground all sides, periphery. Drilled 2 sides. Polished.
		0.22	0.11	0.11	Ground all sides, periphery. Drilled 1 side. Polished.
		0.22	0.10	0.11	Ground all sides, periphery. Drilled 2 sides. Polished.
		0.21	0.09	0.11	Ground all sides, periphery. Drilled 1 side. Polished.
		0.22	0.10	0.11	Ground all sides, periphery. Drilled 2 sides. Polished.
		0.22	0.09	0.11	Ground all sides, periphery. Drilled 1 side. Polished.
		0.21	0.08	0.11	Ground all sides, periphery. Drilled 2 sides. Polished.
		0.21	0.10	0.11	Ground all sides, periphery. Drilled 1 side. Polished.
		0.22	0.10	0.10	Ground all sides, periphery. Drilled 1 side. Polished.
		0.22	0.08	0.12	Ground all sides, periphery. Drilled 1 side. Polished.
		0.21	0.08	0.10	Ground all sides, periphery. Drilled 1 side. Polished.
		0.21	0.08	0.11	Ground all sides, periphery. Drilled 1 side. Polished.
		0.22	0.09	0.10	Ground all sides, periphery. Drilled 2 sides. Polished.
		0.22	0.10	0.11	Ground all sides, periphery. Drilled 2 sides. Polished.
		0.22	0.08	0.12	Ground all sides, periphery. Drilled 1 side. Polished.
		0.22	0.10	0.10	Ground all sides, periphery. Drilled 1 side. Polished.
		0.22	0.09	0.10	Ground all sides, periphery. Drilled 1 side. Polished.
		0.21	0.08	0.10	Ground all sides, periphery. Drilled 1 side. Polished.
		0.22	0.09	0.10	Ground all sides, periphery. Drilled 1 side. Polished.
		0.22	0.09	0.11	Ground all sides, periphery. Drilled 2 sides. Polished.
		0.22	0.09	0.10	Ground all sides, periphery. Drilled 1 side. Polished.
		0.22	0.10	0.11	Ground all sides, periphery. Drilled 1 side. Polished.
		0.22	0.10	0.10	Ground all sides, periphery. Drilled 2 sides. Polished.
		0.22	0.11	0.11	Ground all sides, periphery. Drilled 1 side. Polished.
		0.22	0.08	0.13	Ground all sides, periphery. Drilled 1 side. Polished.
		0.22	0.09	0.10	Ground all sides, periphery. Drilled 2 sides. Polished.
		0.22	0.10	0.10	Ground all sides, periphery. Drilled 1 side. Polished.
		0.22	0.10	0.10	Ground all sides, periphery. Drilled 1 side. Polished.
Shale					
A.D. 920-1120	6507	0.24	0.11	0.11	Ground all sides, periphery. Drilled 2 sides. Polished. Gray.

Table 4.6. (continued)

		Dimensions in cm			
Dating	FS No.	Diam.	Thick.	Perf.	Comments
Turquoise					
A.D. 900-1000	2882	0.30	0.10	0.05	Ground all sides, periphery. Drilled 2 sides. 10 BG 7/6.
	5655	0.55	0.25	0.15	Ground all sides, periphery. Drilled 2 sides.
	5330	1.19	0.42	0.41	Ground two ends, polished. Drilled 2 sides. Perforation 0.24 cm. Tubular.
A.D. 1000-1050	2692	0.73	0.25	0.16	Ground 2 sides. Drilled 2 sides. Broken 1/2.
		0.49	0.14	0.14	Ground 2 sides. Drilled 2 sides.
		0.44	0.12	0.13	Ground 2 sides. Drilled 1 side.
		0.31	0.11	0.10	Ground 2 sides. Drilled 2 sides. Polished.
		0.31	0.15	0.11	Ground 2 sides. Drilled 2 sides.
		0.56	0.15	0.13	Ground 2 sides. Drilled 2 sides.
		0.54	0.20	0.17	Ground 2 sides. Drilled 2 sides. Polished.
		0.66	0.18	0.11	Ground 2 sides. Drilled 2 sides. Polished.
		0.74	0.29	0.17	Ground 2 sides. Drilled 2 sides. Polished.
	1608	0.62	0.21	0.19	Ground 2 sides. Drilled 2 sides. 10 GY 7/2.
	6353	0.49	0.29	0.24	Ground 2 sides. Drilled 2 sides. Half. 10 BG 9/2.
		0.27	0.10	0.05	Ground 2 sides. Drilled 2 sides. 10 BG 6/8.
	7249	0.59	0.23	0.16	Ground 2 sides. Drilled 2 sides. Polished. 5 G 7/2.
	7142	0.64	0.15	0.16	Ground 2 sides. Drilled 2 sides. 10 GY 6/4.
		0.58	0.38	0.23	Ground 2 sides. Drilled 2 sides. 5 GY 7/2.
		0.59	0.23	0.19	Ground 2 sides. Drilled 2 sides. 5 GY 7/2.
		0.45	0.10	0.12	Ground 2 sides. Drilled 2 sides. 7.5 BG 7/6.
	1168	0.19	0.13	0.06	Ground 2 sides. Drilled 2 sides. Half. 10 BG 7/6.
Undated	1254	0.85	0.30	0.22	Ground 2 sides. Drilled 2 sides. 10 G 8/2.
	1255	0.26	0.13	0.09	Ground 2 sides. Drilled 2 sides. 10 G 8/2. Half.

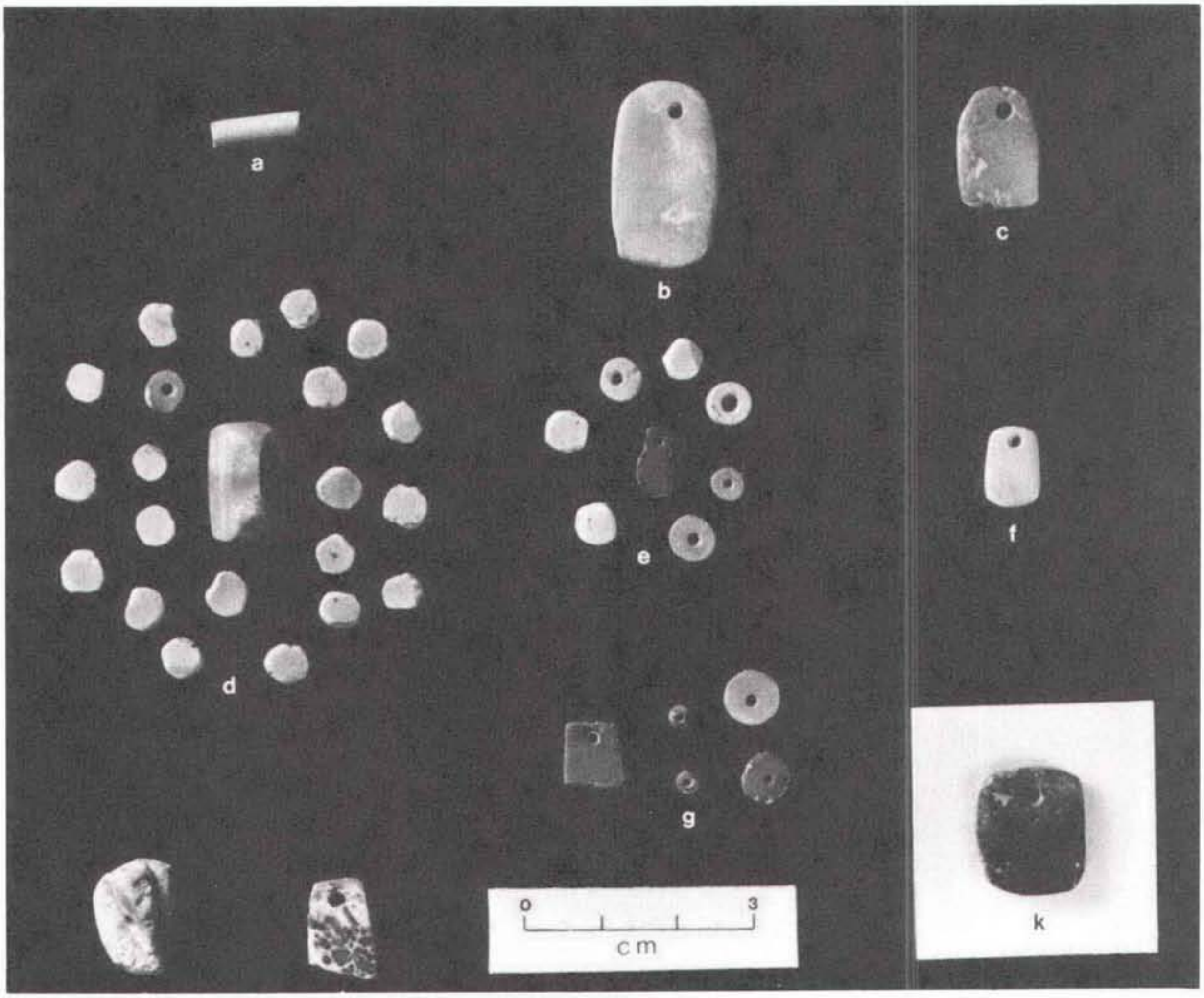

Figure 4.2. *Turquoise artifacts from 29SJ 627: Tubular bead (a-FS 5330); bead blanks (d-FS 7249); possible button (h-FS 5580); and pendants (b-FS 4133, c-FS 5351, e-FS 7142, f-FS 2241, g- FS 2692, i-FS 2491, k-FS 5086) (Chaco Center Negative No. 24548).*

have been used as pendants. Pieces that showed definite regrinding on the broken edges or redrilling have been classified as pendants (see below).

Buttons

A single lignite button (FS 576) was found in the fill of Room 2, which has an estimated date of A.D. 1000-1050. The button is in a poor state of preservation (Figure 4.5), and measurements are approximate. Diameter range is 1.53-1.75 cm; thickness is approximately 1.00 cm. A perforation goes through the bottom in a fashion similar to modern decorative buttons.

A turquoise piece (FS 5580), dating A.D. 900-1000, is irregular in shape, ground on two sides and similar to a button (Figure 4.2). It measures 1.54 x

Table 4.7. Shell beads from 29SJ 627.

Dating	FS No.	Dimensions in cm. Diam.	Thick.	Perf.	Comments
Glycymeris					
A.D. 900-1000	5660	0.88	0.33	0.31	Ground 2 sides, drilled 2 sides.
		0.87	0.43	0.30	Ground 2 sides, drilled 1 side.
		Length	Width	Perf.	
Olivella					
A.D. 900-1000	5660	1.49	0.70	0.21	Ground 1 end.
		1.52	0.68	0.23	Ground 1 end.
		1.38	0.67	0.13	Ground 1 end.
		1.48	0.73	0.17	Ground 1 end.
		1.54	0.73	0.22	Ground 1 end.
		1.51	0.70	0.14	Ground 1 end.
		1.34	0.62	0.19	Ground 1 end.
		1.31	0.61	0.20	Ground 1 end.
		1.41	0.66	0.12	Ground 1 end.
		1.25	0.65	0.23	Ground 1 end.
		1.47	0.67	0.25	Ground 1 end.
		1.32	0.61	0.23	Ground 1 end.
		1.38	0.65	0.13	Ground 1 end.
		1.33	0.63	0.22	Ground 1 end.
		1.44	0.68	0.21	Ground 1 end.
		1.48	0.71	0.22	Ground 1 end.
		0.95	0.50	0.31	Ground 1 end.
	2379	1.50	0.74	0.32	Ground 1 end.
A.D. 1000-1050	7248	1.13	0.53	-	Fragment.
	7151	0.68	0.59	-	Ground 1 end.

1.10 x 0.68 cm in length, width, and thickness, and has a 0.19 cm perforation.

Disk

One piece of well worked argillite was classified as a disk (Figure 4.6). FS 190, from Room 4, Level 1, was ground on two sides and all around the periphery. If it had a perforation, it would be very much like the argillite pendants recovered from this site. Thus, it could also have been classified as a pendant blank. It measures 2.05 cm in diameter and is 0.25 cm thick. One calcite bead is also disk shaped but was analyzed as a bead due to its perforation and size.

Effigy/Zoomorph

FS 2810 was recovered from the fill of Kiva D, which has estimated dates of

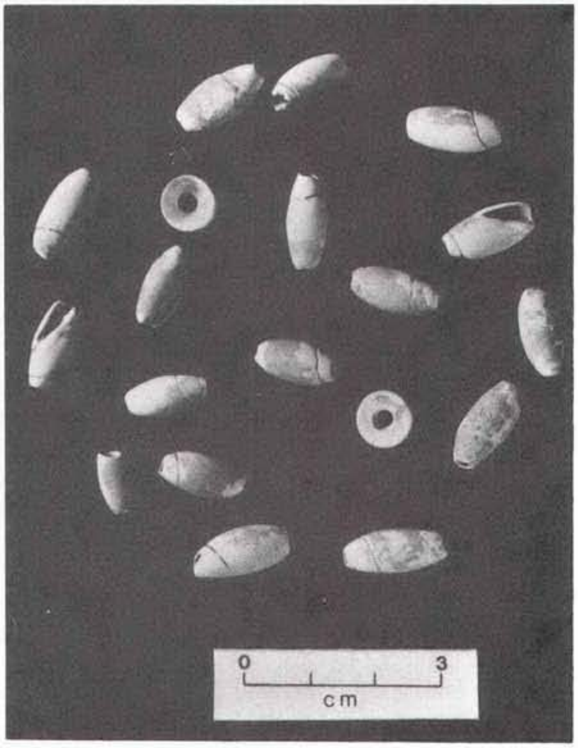

Figure 4.3. Olivella dama *beads from 29SJ 627: FS 5660 (Chaco Center Negative No. 24550).*

A.D. 1000-1050. Unfortunately, this piece was not found in the laboratory. It may have been similar to other zoomorphs.

Another zoomorph was listed in the catalog sheets as FS 5966, from the South recess of Kiva E. However, it was not found in the lab.

Three other artifacts are zoomorphic in form (Figure 4.6). FS 1378, from Kiva C, Level 1, is an argillite piece in the shape of a bird. Ground on two sides and all edges, it also has striations on the flat surfaces. It measures 1.72 x 1.55 x 0.31 cm in length, width, and thickness. It is dated A.D. 900-1000.

FS 1848 from Kiva G, Level 4, is also made of argillite and dates A.D. 900-1000. Irregular in shape (similar to a whale), it had been ground on two sides and along all edges. Striations are visible on these surfaces. It measures 4.27 x 1.38 x 0.55 cm in maximum length, width, and thickness.

FS 4389 is an argillite frog from Kiva E. Again, striations appear on the ground surfaces, as do carvings which give it its frog-like appearance. It measures 2.01 x 1.32 x 0.27 cm in maximum length, width, and thickness. It dates A.D. 920-1120.

Gaming Pieces

Nine bone pieces and two other artifacts were classified as gaming pieces (Table 4.10). All of the bone pieces are fairly thick, usually oval or roughly oval in shape. The exception is FS 644, which was rectangular with rounded edges. Several have a cross-hachure design carved on one surface. Distribution by proveniences clusters in two areas, the fill of Kiva E and Room 8. The two limonite pieces (Figure 4.7) are not flat;

Table 4.8. Turquoise bead blanks from 29SJ 627.

Dating	FS No.	Dimensions in cm. Diam.	Thick.	Perf.	Comments
A.D. 900-1000	60	0.41	0.09	0.10	Ground 2 sides, drilled 1 side but incomplete. 1/4 bead, irregular shape. 10 BG 7/8.
	1588	0.43	0.17	0.08	Drilled 2 sides. 1/2 bead. 10 BG 7/8.
	6925	0.32	0.05	0.06	Ground 2 sides, drilled 2 sides. 1/4 bead. 2.5 BG 6/6.
	2988	0.68	-	-	Ground 2 sides.
A.D. 1000-1050	659	0.31	0.12	0.05	Ground 2 sides, drilled 2 sides. 1/2 bead. 7.5 BG 7/8.
	7249	0.53	0.20	-	Ground 2 sides, periphery. Beveled 2. 5 GY 7/2.
		0.55	0.25	-	Ground 2 sides, periphery. Beveled 1. 5 GY 7/2.
		0.57	0.29	-	Ground 2 sides, periphery. Beveled 1. Polished. 10 GY 7/2.
		0.59	0.26	-	Ground 2 sides, periphery. 5 GY 7/2.
		0.59	0.26	-	Ground 2 sides, periphery. Beveled 2. 10 GY 7/2.
		0.62	0.23	-	Ground 2 sides, periphery. Beveled 2. 10 G 8/2.
		0.51	0.29	-	Ground 2 sides, periphery. Beveled 1. 5 G 7/2.
		0.60	0.28	-	Ground 2 sides, periphery. Beveled 1. 5 GY 7/2.
		0.55	0.27	-	Ground 2 sides, periphery. 5 GY 7/2.
		0.56	0.22	-	Ground 2 sides, periphery. 5 GY 7/2.
		0.56	0.27	-	Ground 2 sides, periphery. 5 GY 7/2.
		0.52	0.26	-	Ground 2 sides, periphery. Beveled 2. 5 GY 7/2.
		0.59	0.25	-	Ground 2 sides, periphery. 5 GY 7/2.
		0.60	0.31	-	Ground 2 sides, periphery. 5 GY 7/2.
		0.59	0.18-0.27	-	Ground 2 sides, periphery. 5 GY 7/2.
		0.54	0.22	-	Ground 2 sides, periphery. 5 GY 7/2.
		0.54	0.24	-	Ground 2 sides, periphery. 5 GY 7/2.
		0.47	0.23	-	Ground 2 sides, periphery. 5 GY 7/2.
		0.56	0.25	-	Ground 2 sides, periphery. 5 GY 7/2.
	7142	0.56	0.25		Ground 2 sides, periphery. 5 GY 7/2.
		0.55	0.23		Ground 2 sides, periphery. 5 G 8/1.
		0.56	0.24		Ground 2 sides, periphery. 5 G 8/1.
A.D. 1000-1050	2312	0.43	0.11	0.11	Ground 2 sides, drilled 1. Irregular edges. 7.5 BG 8/4. 1/4 piece.
	656	0.56	0.22	0.09	Drilled 2 sides. Disk. 2.5 BG 6/6.
A.D. 900-1050	3	0.51	0.09	0.08	Ground 2 sides, polished 2 sides, drilled 2 sides. 1/2 piece. 10 BG 7/8.
Undated	1483	0.49	0.16	-	Ground 2 sides, periphery. No perforation. 5 GY 7/2.

Table 4.9. Glycymeris bracelet fragments from 29SJ 627.

Dating	FS No.	Dimensions in cm. Length	Width/Diam.		Comments
A.D. 900-1000	6445				Missing.
	6571	3.29	0.46-0.29		Ground and polished all sides, ends.
	4630	4.71	0.41-0.27		Ground all sides.
	4902	1.62	0.50-0.32		Ground all sides.
	6890	3.09	0.64-0.55		Ground all sides. Polished and striations.
	2366	1.22	0.69-0.25		Ground all sides.
	2053	2.82	0.58-0.35		Ground all sides. Polished.
	2059	4.89	0.88-0.45	*	Ground all sides. Drilled 2 sides; reused as pendant. Perf. 0.15 cm.
	2224	6.99	0.65-0.42		Ground all sides. Striations.
	5056	3.86	0.58-0.41		Ground all sides. Striations.
	5060	4.28	0.47-0.43	*	Ground all sides. Polished. Drilled 2 sides; reused as pendant. Perf. 0.21 cm.
	5062	2.63	0.54-0.30		Ground all sides.
	5073	3.27	0.32-0.24		Ground all sides. Polished. Striations.
A.D. 1000-1050	120	1.81	0.65-0.41		Ground all sides. Polished, beveled 1 side, striations.
	5868	4.63	0.59-0.31		Ground all sides.
	1251	3.89	0.40-0.27	*	Ground all sides, both ends. Polished, beveled 1 side, striations. Drilled through umbo, 0.17 cm. perf.
		3.80	0.51-0.26		Ground all sides. Beveled 1 side, striations.
		0.82	0.39-0.25		Ground all sides.
	2258	2.62	0.41-0.22		Ground all sides. Polished, striations.
	4751	4.11	0.39-0.37		Ground all sides.
	5203	2.73	0.84-0.53		Ground all sides.
	2221	2.76	0.58-0.35		Ground all sides. Polished.
	6718	2.17	0.69-0.41		Ground all sides. Striations.
	2395	4.05	0.63-0.33		Ground all sides. Polished, striations.
	2443	5.44	0.73-0.34		Ground all sides. Polished, striations. Cuts/lines periphery.
A.D. 920-1120	4344	5.33	0.76-0.46		Ground all sides. Polished, beveled 1 side.
	5023	4.60	0.61-0.33		Ground all sides. Polished.
	5290	3.14	0.62-0.20		Ground all sides. Polished.
Undated	7020	3.69	0.58-0.34		Ground all sides. Polished.
	4809	2.80	0.43-0.21		Ground all sides. Polished.

* Perforation in umbo of the shell.

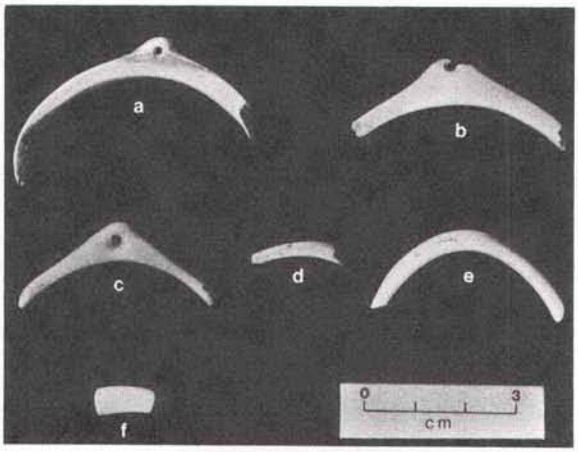

Figure 4.4. Glycymeris gigantea *artifacts from 29SJ 627: bracelet fragments that may have been used as pendants (a-FS 2059, b-FS 5060, c-e-FS 1251); and noseplug (f-FS 4762) (Chaco Center Negative No. 24551).*

they are more cylindrical but have a long oval shape. These, also, were found in Kiva E and Room 8. Both had been ground, and one has polish and striations on the surfaces. Whether or not they truly were used as gaming pieces is conjecture, but their discovery in the same proveniences and the similarity in shape suggested similar uses.

Inlay/Tesserae

All ten pieces which were classified as inlay because of their shape and size are made of turquoise (Table 4.11), and six of these (FS 6012) are from a single provenience (Room 16, Floor 3). Other turquoise items were also recovered from the plugged firepit of Floor 4. All tesserae are approximately similar in

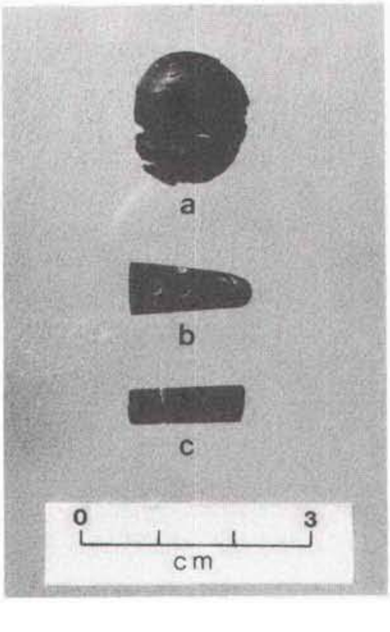

Figure 4.5. *Black ornaments from 29SJ 627: Button (a-FS 576); other shaped piece of lignite (b-FS 1610); and unusual piece of specularite (c-FS 525) (Chaco Center Negative No. 24552).*

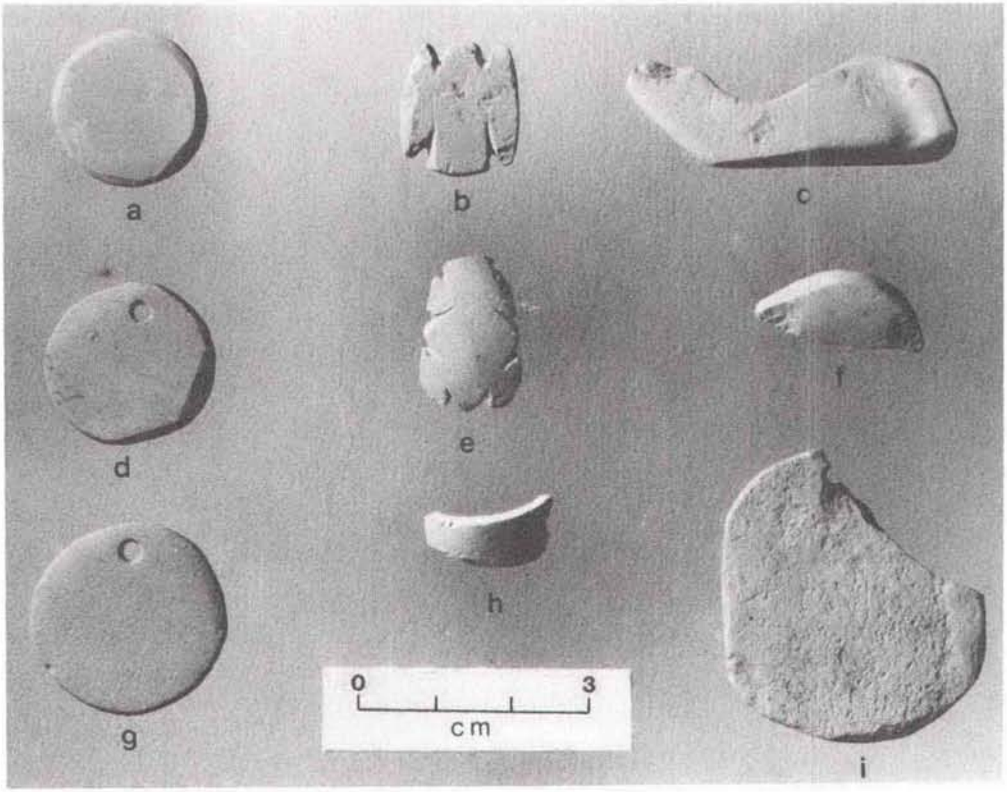

Figure 4.6. *Argillite ornaments from 29SJ 627: Disk (a-FS 190); zoomorphics (b-FS 1378, c-FS 1848, e-FS 4389); an irregular piece (f-FS 1142), pendants (d-FS 1118, g-FS 4756, i-FS 2286); and ring fragment (h-FS 5093) (Chaco Center Negative No. 24553).*

shape and manufacture and are blue-green in color. The Floor 4 firepit probably dates to the earlier end of the A.D. 900-1000 period. The six pieces from FS 6012 are generally closer in size to each other than they are to the remaining pieces from the other proveniences at this site. Average length of these six is 0.40 cm. The other four average 0.73 cm in length.

Noseplug

One Glycymeris gigantea piece (FS 4762, Figure 4.4) was found in Kiva E, which dates A.D. 920-1120. It is 1.22 cm long, 0.39-0.56 cm in diameter, and had been ground on all sides and both ends. It is polished, and striations are present on two sides. Its form is unique and most resembles descriptions of noseplugs in DiPeso (1974). Whether that was its true function is unknown; it also could have been used as a lip plug.

Other/Unidentified

Five unusual pieces were classified as "other/unidentified" because they are unique and do not resemble anything defined in the classification system; these are described below. The other

Table 4.10. Gaming pieces from 29SJ 627.

Dating	FS No.	Dimensions in cm. Length	Width	Thick.	Comments
Bone					
A.D. 900-1000	4904	2.27	1.15	0.24	Roughly oval. Ground on edges, polished 1 side. No species identification.
	6227	1.85	0.60	0.20	Oval with flat ends. Ground 2 sides, 4 edges. Polished 2 sides and edges. Striations. Cross hatching. Species unknown.
A.D. 1000-1050	101	2.22	0.70	0.21	Oval. Ground 2 sides, 4 edges. Cross hatching. Artiodactyl.
A.D. 920-1120	4752	2.56	1.30	0.26	Oval. Ground 1 side, edges. Striations 1 side. Piece looks as if manufacturing is incomplete. Artiodactyl.
		2.39	1.24	0.22	Oval. Ground 1 side, edges. Striations. Incompletely manufactured. Artiodactyl.
	4691	2.47	1.18	0.18	Oval. Ground 2 sides and edges. Striations 2 sides. Polished 2 sides. Cross hatching. Species unknown.
	5882	1.77	0.85	0.25	Oval. Ground 2 sides and edges. Polished. Cross hatching. Unknown large mammal.
Undated	644	3.61	1.39	0.21	Rectangular with rounded edges. Ground 2 sides, 4 edges. Striations and polish 1 side. Unknown large mammal.
	1484	2.49	1.18	0.25	Oval. Ground 2 sides and edges. Striations 1 side, polished 2 sides. Cross hatching. Unknown large mammal.
Limonite					
A.D. 1000-1050	141	3.82	1.16	0.67	Oval. Ground and polished with striations on all sides and edges.
A.D. 920-1120	4892	2.85	1.12	0.53	Oval. Ground vs. natural?

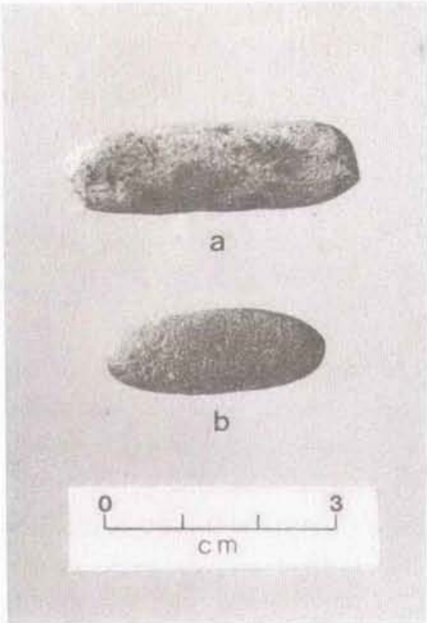

Figure 4.7. Limonite gaming pieces from 29SJ 627: a-FS 141 and b-FS 4892 (Chaco Center Negative No. 24554).

items in Table 4.12 are different, but not as remarkable.

FS 153 is an artiodactyl bone fragment recovered from Level 2 of Room 7 (Figure 4.1). It is rectangular in shape, ground on two sides and four edges. It had been polished on these surfaces and has striations on the two flat surfaces. It measures 2.32 x 1.10 x 0.25 cm in length, width, and thickness. It dates to the A.D. 1000-1050 period.

FS 1142 is an irregularly shaped piece of shale. It had been ground on two sides and one edge and measures 2.19 x 0.98 x 0.47 cm in length, width, and thickness. It could be a broken piece of a pendant or disk (Figure 4.6). This piece was not dated.

FS 5959, from Kiva E recess, is a fragment of a Lymnaea bulemoides Lea shell. It measures 0.63 x 0.45 x 0.32 cm and dates to the A.D. 920-1120 period.

FS 2315 is a Turitella leucostoma shell which had been broken off at the top (Figure 4.8). Spiral in shape, it measures 1.60 x 0.41-0.71 x 0.43-0.66 cm and was recovered from Grid HL-2, a provenience for which dating is unknown.

FS 1610 from the fill of Kiva D, is a piece of black material, nicely ground on all sides/edges and bearing evidence of four attempts at perforations, none of which went all the way through. Because two of these are in the top side of one long, flat surface (Figure 4.5), they may be similar to the strand dividers described by DiPeso (1974). However, the two attempted perforations along the opposite sides and lack of drilling attempts on the reverse face only provoke questions which cannot be answered by this investigator.

The specularite piece, FS 525, from the clearing above Pithouse C, is cylindrical and nicely worked. It has a single groove carved around the perimeter, which may have held a string from slipping so that the piece could have hung as a pendant (Figure 4.5).

Table 4.11. Turquoise inlays from 29SJ 627.

Dating	FS No.	Dimensions in cm. Length	Width	Thick.	Comments
A.D. 900-1000	39	0.83	0.46	0.09	Rectangular. Ground 2 sides, 2 edges. Polished 2 sides. 10 BG 7/8.
	5331	0.91	0.39	0.17	Rectangular. Ground and polished 2 sides. Possible pendant blank.
	2479	0.41	0.37	0.09	Rectangular. Ground 2 sides, 3 edges. Beveled and polished 2 sides.
A.D. 1000-1050	6012	0.47	0.35	0.10	Rectangular. Ground 2 sides, 4 edges. 7.5 BG 7/6.
		0.43	0.32	0.10	Rectangular. Ground 2 sides, 2 edges. 7.5 BG 7/8.
		0.45	0.29	0.10	Rectangular. Ground 2 sides, 4 edges. 7.5 BG 7/8.
		0.43	0.29	0.10	Rectangular. Ground 2 sides, 3 edges. 7.5 BG 7/8.
		0.38	0.31	0.13	Rectangular. Ground 2 sides, 4 edges. 5 BG 7/8.
		0.28	0.28	0.11	Rectangular. Ground 2 sides, 3 edges. 7.5 BG 7/6.
Undated	585	0.80	0.40	0.10	Rectangular. Ground 2 sides, polished.

Paintstone

While numerous pieces of limonite and hematite, as well as other soft materials, were recovered from the site, FS 447, a piece of hematite, was classified as a paintstone because of evidence of grinding on all sides and edges. It is polished on two sides and three edges and is fairly large in size. It measures 6.00 x 1.26 x1.26 cm and was found in Floor 2 of Room 9 with Burial 2.

Pendants

Pendants were made from a variety of material types and shell was noticeably varied. Data on these are listed in Table 4.13.

Three argillite pendants are discoidal (Figure 4.6). FS 2286 is broken on one quarter and is twice as large as FS 4756. The third pendant is intermediate in size, but on the smaller end of the size range. All three contrasted with the calcite pendant (FS 5359) and gray shale pendant (FS 5912), which is rectangular in shape and discolored on exterior surfaces. Broken at the top end, it was nicely made with striations on all the flat surfaces.

Table 4.12. Other/unidentified objects from 29SJ 627.

Dating	FS No.	Dimensions in cm. Length	Width	Thick.	Perf.	Comments
Bone						
A.D. 1000-1050	153	2.32	1.10	0.25	-	Rectangular. Ground and polished 2 sides, 4 edges.
Jet						
A.D. 1000-1050	1610	1.63	0.69	0.39	0.21	Ground all sides, edges. Four perforations. Striations all sides, edges. Irregular.
Shale						
Undated	1142	2.19	0.98	0.47	-	Irregular/other. Ground 2 sides,1 edge.
Shell						
Lymnaea bulemoides Lea						
920-1120	5959	0.63	0.45	0.32	-	
Olivella dama						
1000-1040/50	7248	0.83 0.79 0.35	0.61 0.48 0.47	- - -	- - -	Fragment. Fragment. Fragment
Turitella leucostoma						
Undated	2315	1.60	0.41-.71	0.43-.66	-	Unmodified.
Unidentified A.D. 900-1000	4489					Missing from laboratory collections.
Specularite						
Undated	525	1.52	0.48	0.45	-	Ground and shiny on all sides, edges. Cylindrical.
Turquoise						
A.D. 900-1000	6800	0.57	0.42	0.10	0.10	Irregular. Ground 2 sides, polished 2. Drilled biconically. Broken. 5 BG 7/8.
	4270	0.41	0.40	0.22	0.16	Irregular. Ground and polished on all sides, edges. Beveled 4 edges. 7.5 BG 7/6.
		0.58	0.44	0.23	-	Ground 2 sides, 3 edges. Beveled 1 side.
A.D. 1000-1050	7249	1.60	1.06	0.71	-	Rectangular. Ground and polished on all sides and edges. Beveled 4 edges. Carved 2 areas. 5 G 6/6.
	4774	1.10	0.80	0.20	-	Irregular/other. Ground 1 side. Polished 1 side.
A.D. 920-1120	6914	1.34	1.09	0.44	-	Irregular. Ground 2 sides, 1 edge. Fragment. 5 BG 8/4.
A.D. 900-1000	6925	0.90	0.69	0.20	-	Irregular. Ground 2 sides, 1 edge. Polished 1 side. Broken. 2.5 BG 6/8.

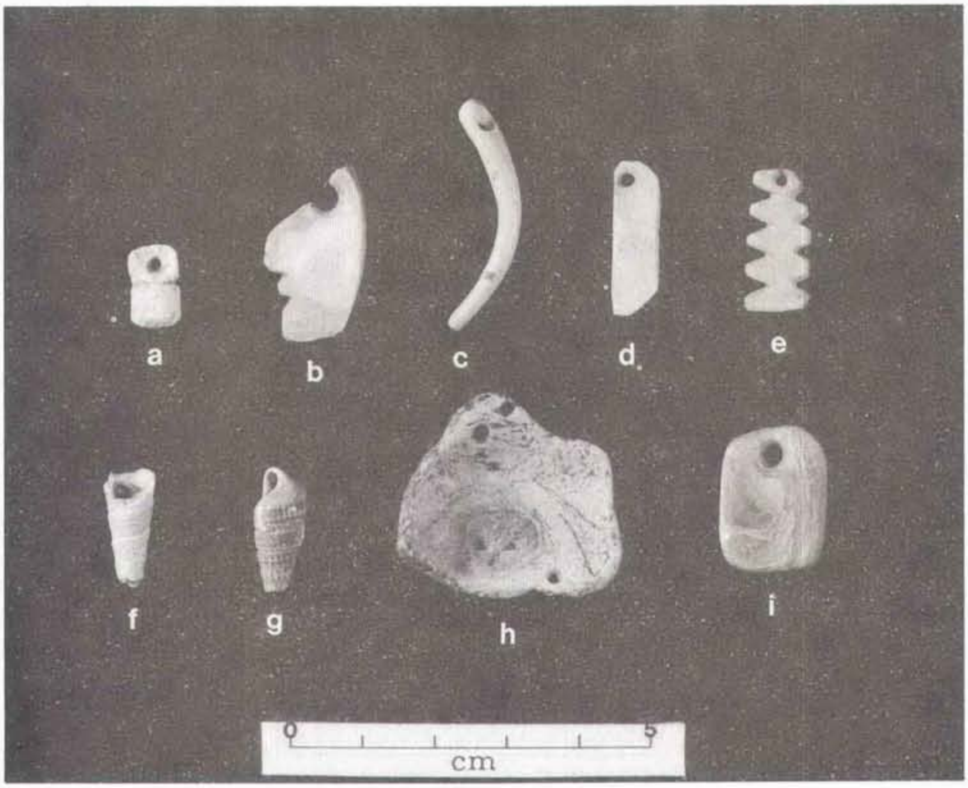

Figure 4.8. *Unusual shell items from 29SJ 627: a-FS 1829,* Trachycardium *sp.; b-FS 2802,*Haliotus gigantea*; c-FS 5956 and d- FS 5077* Glycymeris gigantea*, e-FS 666,* Argopectin circularis*; f-FS 2315,* Turitella leucostoma*; g-FS 5735,* Cerithidea albondosa*; h-FS 1609,* Strombus galeatus*; and i-FS 4772,* Haliotus cracherodii *(Chaco Center Negative No. 24529).*

Shells account for over half of the pendants (16 of 31). One, FS 5753, a Cerithidea albondosa shell, is a spiral with only an added perforation at the top (Figure 4.8). Six Glycymeris gigantea shell bracelet fragments had been reworked and some even redrilled and used as pendants. Several others were outstanding for their shape and manufacturing; some are illustrated in Figure 4.8.

--FS 666, made of Argopectin circularis and zoomorphic in form.

--FS 2802, made of Haliotus cracherodii and unusual in form.

--FS 1609, made of Strombus galeatus. This piece has three perforations and may have been used as a pectoral.

--FS 1829, made of Trachycardium sp. has a groove carved all around it just below the perforation.

--FS 801, made of Trachycardium sp., probably T. panamense. It looks as if a broken piece of shell had been ground along the edges and a perforation placed in one corner.

Table 4.13. Pendants from 29SJ 627.

Dating	FS No.	Dimensions in cm. Length	Width	Thick.	Perf.	Comments
Argillite						
A.D. 1000-1050	2286	3.86	3.46	0.42	0.26	Discoidal. Ground 2 sides, 4 edges. Biconical perforation.
A.D. 920-1120	4756	2.04	2.22	0.34	0.22	Discoidal. Ground 2 sides, 4 edges. Biconical perforation and striations.
A.D. 900-1000	1118	2.58	-	0.27	0.25	Discoidal. Ground 2 sides, edges. Biconical perforation and striations.
Calcite						
A.D. 1000-1050	5359	0.48	0.48	0.23	0.17	Rectangular. Ground 2 sides, 4 edges. Biconical perf.
Mineral, unknown						
A.D. 900-1050	5489					Missing.
Shale						
A.D. 920-1120	5912	1.30	1.13	0.42	0.23	Rectangular. Ground 2 sides, 3 edges. Broken 1 end. Biconical perf., striations, gray.
Argopectin circularis						
Undated	666	1.96	0.91	0.27	0.16	Zoomorphic. Ground all sides, edges. Polished 1 sides. Biconical perf.
Cerithidea albondosa						
A.D. 920-1120	5735	1.68	0.88	0.73	0.35	Spiral. Drilled 1 side.
Freshwater clam						
A.D. 920-1120	5020	2.51	1.57	0.14	0.33	Rectangular. Ground 4 ends, drilled 1 side. Broken, 1/3.
Glycymeris gigantea						
A.D. 900-1000	5055	3.62	0.75	0.49	0.26	Bracelet fragment converted. Ground all sides, drilled biconically, striations.
	5077	2.15	0.66	0.22	0.48	Irregular fragment. Ground all sides, ends. Polished drilled biconically. Striations.
	3004	4.22	0.53	0.44	0.19	Bracelet fragment. Ground all sides, beveled one side.
	5004	4.32	0.51	0.38	0.24	Bracelet fragment ground on both ends. Umbo drilled biconically.
A.D. 920-1120	5956	3.18	0.48	0.36	0.28	Ground all sides and edges. Polished. Drilled biconically. Striations.
A.D. 900-1050	5603	2.35	1.04	0.58	0.30	Ground all sides and ends. Umbo drilled biconically.
Haliotus cracherodii						
A.D. 900-100	2085	1.95	1.22	0.08	0.16	Ground 2 sides, 2 edges. Drilled biconically.
	2802	2.43	1.38	0.26	0.36	Ground 1 side. Carved 2 sides (side notches). Biconical perf. Irregular shape.
A.D. 1000-1050	4772	2.00	1.47	0.31	0.31	Rectangular with rounded edges. Ground 4 ends. Drilled one side.
Undated	4401	1.38	1.43	0.19	0.20	Rectangular. Round 3 sides. Carved, 4 marks. Drilled biconically. Broken 1/2.
Strombus galeatus						
A.D. 1000-1050	1609	3.21	3.12	0.43	0.14	Irregular flat triangle with 3 perforations. Ground along edges.

Table 4.13 (continued)

Dating	FS No.	Dimensions in cm. Length	Width	Thick.	Perf.	Comments
Trachycardium panamense						
A.D. 1000-1050	801	1.95	1.40	0.38	0.26	Flat triangular piece. Ground 3 sides, striations.
Trachycardium sp.						
A.D. 900-1000	1829	1.15	0.70	0.49	0.15	Rectangular. Ground all sides and ends. Carved groove. Drilled biconically.
Turquoise						
A.D. 900-1000	2491	1.34	0.94	0.29	0.10	Trapezoidal. Ground 2 sides, polished 2. Drilled biconically.
	4133	2.44	1.40	0.38	0.10	Trapezoidal. Ground 2 sides, polished. Drilled biconically.
	5999	0.97	0.71	0.17	0.19	Broken.
A.D. 1000-1050	2692	0.89	0.81	0.26	0.14	Rectangular. Ground 2 sides, polished 2, beveled 1, drilled 2.
	5351	1.61	1.08	0.24	0.10	Oval. Ground and polished 2 sides. Drilled biconically.
	6012	0.46	0.39	0.35	0.09	Rectangular/trapezoidal. Ground 2 sides, 3 edges, polished 1 side, beveled 1. 7.5 BG 7/8.
	2241	1.07	0.73	0.22	0.10	Rectangular. Ground 2 sides, polished. Drilled biconically.
	7142	0.90	0.50	0.11	0.11	Irregular. Ground 2 sides and edges. Beveled 1. 7.5 BG 6/8.
	3005	0.58	0.27	0.12	0.11	Triangular disk. Ground 2 sides, 3 edges. Drilled biconically. Broken 1/2. 10 G 8/2.
A.D. 920-1120	5086	1.69	1.44	0.30	0.21	Rectangular. Ground all sides and edges. Polished 2 sides, beveled 3. Drilled biconically. 5 GY 5/2.
Pendant Fragments						
Unidentified Shell						
1000-1040/50	1252	4.00	1.25	0.70	0.43	Irregular. Ground all sides, edges. Polished. Striations. Drilled biconically in two places. Broken.
Pendant Blanks						
Turquoise						
A.D. 900-1000	6229	0.34	0.64	0.18	-	Irregular. Ground 2 sides, 3 edges, beveled 3. Broken 1/4. 5 BG 7/4.
	6230	1.76	1.07	0.43	-	Oval. Ground 2 sides, edges, beveled 2. 5 BG 6/8.
	6529	0.59	0.39	0.14	-	Rectangular/trapezoidal. Ground all sides, edges, polished 1 side, beveled 2. 10 BG 7/8.
	2541	0.60	0.89	0.26	0.19	Irregular. Ground 2 sides, polished. Drilled 1 side, but incomplete. 1/4 pendant.
A.D. 1000-1050	2685	1.10	0.82	0.18	-	Rectangular. Ground all sides, edges. 5 BG 7/6.
	2357	2.07	1.52	0.53	-	Rectangular. Ground all sides, edges. 5 G 7/2.
	2664	0.85	0.76	0.26	-	Rectangular/trapezoidal. Ground and polished 1 side. 2.5 BG 6/6.
	6012	0.38	0.38	0.12	0.09	Rectangular. Ground 2 sides, 2 edges. Incomplete perforation drilled from 1 side, 7.5 BG 7/6.

There is a total of ten turquoise pendants from this site. They range in size and shape, as well as time. Similar to turquoise pendants from other sites, the predominant shape is rectangular/trapezoidal. Classification as to shape is arbitrary because none is perfectly rectangular and none is an extreme trapezoid. Usually, the upper portion is slightly narrower than the bottom (Figure 4.2).

Pendant Fragments/Blanks

A single unidentified shell, FS 1252, with an irregular shape, had been ground along the sides and edges. Two holes had been drilled at one end, which had been broken off (Table 4.13).

Eight turquoise pendant blanks (Table 4.13) were identified because of the similarity in shape to pendants, but not all of them have an indication of a perforation. The majority are rectangular, and the colors tend to range widely among the greens and blue-greens.

Ring

A fragment of an argillite ring (FS 5093) was recovered from the west wall of Kiva E. It had been ground on all sides and striations are present on these surfaces. The recovered fragment measures 1.66 x 0.70 x 0.14 cm in length, width, and thickness (Figure 4.6).

Whistles

Two definite two-part bone whistles were recovered, both from Balk 1, Layer 4, of Kiva E, dated to A.D. 920-1120 (Figure 4.1). FS 6003 was made from the bones of Aves sp. and Buteo sp. It measures 4.38 cm in maximum length, 1.00 cm in diameter for the Aves sp. bone, and 0.93 cm in maximum diameter for the Buteo sp. FS 6004 is 4.25 cm in maximum length, with the larger Grus canadensis bone having a maximum diameter of 1.07 cm and the Bubo virginiansus bone having a maximum diameter of 0.72 cm. Both have polish and striations.

Other Minerals

Among the minerals not used for ornaments are several which may represent pigments; other uses are also possible. Paint pigments have been analyzed for two sites in Chaco Canyon. At Pueblo Alto, Breternitz and White (1987) identified hematite, gypsum, and yellow ochre; at Chetro Ketl, charcoal, shales, specularite iron, malachite, iron oxides, hematite, geothite, limonite, gypsum, and azurite were used (Dodgen 1978). Combined totals of these minerals from throughout 29SJ 627 are given in Table 4.14.

White is the predominant color, followed by yellow, blue, red, and green. This is slightly different from the pattern seen at other small sites, where white is followed by brown/red, yellow, then blues and greens. Part of this may be due to the fact that one (FS 6444 from Room 8, Floor 3) had 20 pieces of azurite, 19 of which were fragments probably broken off from one larger piece. If these are counted only once, the blue-greens would trail the brown-red-yellows, and they would follow patterns from the other sites. Because some of these materials, particularly lignite, are often used for several purposes, such as fill in post holes, positions are not certain in the color/pigment spectrum.

Worthy of mention is a single piece of unmodified copper ore. This nodule was found in Pithouse C, Layer E. It is dated to the A.D. 900-1000 period, probably the earlier end.

Two unmodified quartz crystals (Figure 4.9) were also recovered. One (FS 1165) from the clearing of Kiva D, is 2.9 cm in length and 0.50 cm in diameter. It has six natural facets. The other (FS 4706) from Room 5, Floor 2, is irregular in shape. It measures 1.43 x 1.16 x 0.87 cm in length, width, and thickness, and dates from the mid- to late-1000s.

Unusual or Notable Groupings

In addition to the examination of ornaments and minerals by function, the data were examined to determine whether there were any notable clusters or combinations. Six unusual groups of artifacts have been identified from this site:

Room 4, Floor 2, Pit 2, dated A.D. 900-1000, contained a number of ornaments including 17 Olivella and two Glycymeris shell beads, plus one turquoise bead and one unmodified piece of turquoise.

Room 8, Floor 2, dated A.D. 1000-1050 had nine turquoise beads and one turquoise pendant, but no evidence of manufacturing debris.

Room 10, Floor 1, upper plastering, dated A.D. 1000-1050, had eight calcite beads and 33 shale beads on it.

Room 16, Floor 3, had nine pieces including one pendant, one pendant blank, six inlay, and one modified turquoise. These were part of a plugged firepit dated A.D. 1000-1040/50. Floor 4 also had a plugged firepit, dated A.D. 900-1000, which contained 21 modified and unmodified turquoise pieces, but no evidence of pendant or bead manufacture. Similarity in pattern suggests these may be from the same occupation, but with remodeling of the room sometime during this period.

Kiva E, fill, dating A.D. 920-1120, had an unusual number of bone artifacts: 16 beads, three gaming pieces,

Table 4.14. Minerals from 29SJ 627.

Mineral	No. of pieces	Relative percent	Color
Azurite	40 (20 in 1 FS)	4.17	Blue
Gypsite	30	3.13	White
Gypsum	13	1.35	White
Hematite	27	2.81	Brown/red
Lignite	5	0.52	Black
Limonite	94	9.91	Yellow/brown
Malachite	10	1.04	Green
Selenite	738	77.03	White
	957	99.96	

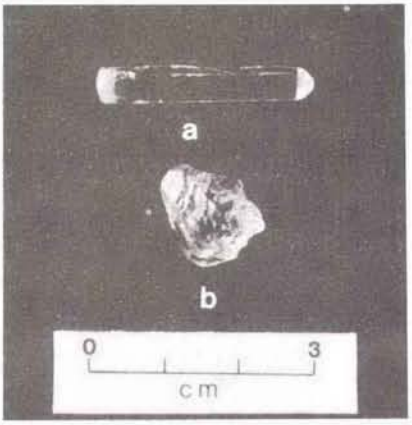

Figure 4.9. *Quartz from 29SJ 627: a-FS 1165 and b-FS 4706 (Chaco Center Negative No. 24529).*

and two whistles. This is 50% of all bone ornaments from the entire site. However, this area contained an extremely dense artifact deposit in the trash fill.

Kiva G, ventilator tunnel, dated A.D. 1000-1050, contained what looked like the debris of a turquoise workshop area: 30 pieces classified as 22 bead blanks, five beads, one pendant, one unidentified, and one modified. Also there were five Olivella dama shell pieces, both beads and fragments. This does not represent a workshop area. The turquoise pieces may be sweepings from a workshop area elsewhere in the site or an offering placed in the ventilator tunnel at the time of closing of the structure.

Color of Turquoise

A total of 156 turquoise artifacts were color coded using a Munsell color chart. As noted above, several groups of turquoise artifacts from specific proveniences tend to be very closely grouped as to hue. Figure 4.10 depicts graphically the result of plotting all 156 colors; 103 of the most numerous hues or 66% of the pieces coded for color are listed below in Table 4.15.

The remainder have only one or two in each color category. When these color codes are regrouped by hue alone, the greatest number fall into 7.5 BG, followed by 2.5 BG, and 10 BG. While the fourth highest peak in Figure 4.10 is for 5 GY, 39% of the pieces were in the range of 7.5 BG to 5 B; and 69.8% of the pieces were in the 2.5 BG to 6 B range. This suggests that the pieces found in one provenience may have been chosen for their similarity in color and for a particular object being made at a specific time. Several groups were pulled out (Table 4.16).

Summary and Conclusions

Site 29SJ 627 is important for several reasons. First, it was possible to document the introduction of new shell types from different periods at this site; two shell species, Episcinia medialis and Trachycardium sp., were recovered from the A.D. 900-1000 deposits, and Strombus galeatus appeared in the A.D. 1000-1040/50 deposits. These have not been noted in excavated Chaco Canyon sites at such early dates prior to the current research project. Second, this site con-

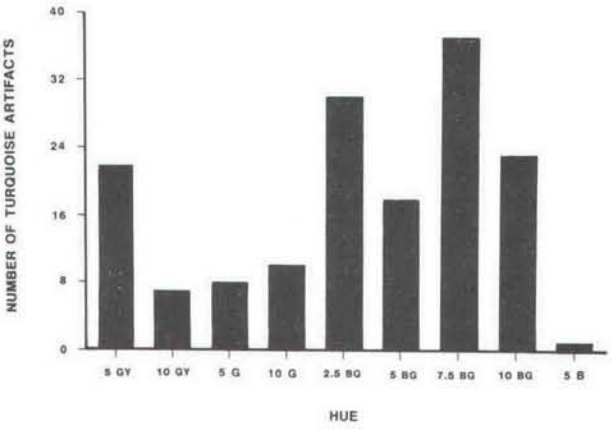

Figure 4.10. Turquoise hues at 29SJ 627.

Table 4.15. Colors of turquoise artifacts.

Total number	Color code	Relative percent
21	5 GY 7/2	13.46
12	7.5 BG 7/6	7.69
10	10 BG 7/8	6.41
10	7.5 BG 7/8	6.41
10	10 G 8/2	6.41
9	2.5 BG 6/6	5.76
8	7.5 BG 6/8	5.12
7	10 BG 6/8	4.48
6	2.5 BG 8/4	3.84
5	2.5 BG 6/8	3.20
5	10 BG 7/6	3.20

Table 4.16. Groups of turquoise artifacts and their colors.

FS and Location	Color	Comments
FS 1255 (8 total) Plaza, SW surface trash	2 = 10 G 8/2 1 = 7.5 BG 6/8 4 = 7.5 BG 7/6 1 = 5 B 7/6	There is considerable range in color from definite greens to blue.
FS 6012 (9 total) Room 16, Floor 3, Firepit 1	5 = 7.5 BG 7/8 3 = 7.5 BG 7/6 1 = 5 BG 7/8	This group is very closely related in chroma and value as well as hue. Given the fact that color coding was difficult because some pieces are variable throughout, this is a very close relationship.
FS 7142 (8 total) Kiva G, ventilator tunnel, cache	1 = 7.5 BG 6/8 1 = 10 GY 6/4 3 = 5 GY 8/2 1 = 7.5 BG 7/6 2 = 5 G 8/1	There is considerale mix in this group, which ranges from green/yellows to blue/greens.
FS 7249 (22 total) Kiva G, Ventilator tunnel, cache	16 = 5 GY 7/2 2 = 5 G 7/2 1 = 10 G 8/2 2 = 10 GY 7/2 1 = 5 G 6/6	Again, the closeness of the chroma and value a well as the total number clustering at the green end of the spectrum suggests selection for color consistency.
FS 6800 (19 total) Room 16, Floor 4, plugged firepit	1 = 2.5 BG 7/6 1 = 7.5 BG 7/6 2 = 5 BG 6/8 1 = 7.5 BG 5/8 5 = 2.5 BG 6/6 3 = 2.5 BG 6/8 1 = 10 GY 6/4 2 = 5 BG 5/8 2 = 2.5 BG 5/8 1 = 7.5 BG 6/8	The single 10 GY 6/4 piece stands out among the range of blue/green pieces. These latter are somewhat homogeneous, but are not as close as those in FS 6012 and FS 7249.

tained enough small groups of beads to suggest that uniformity of size may be related to the manufacture of a single piece, but that it may vary slightly with type of material. Third, the color of turquoise artifacts within certain proveniences indicates that there might have been similar selection factors at work when particular sets of beads/pendants were being made at one time. Unfortunately, no specific workshop areas could be discerned even though several offerings were recovered.

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5

AN ANALYSIS OF THE FAUNAL REMAINS FROM 29SJ 627

Nancy J. Akins

Introduction

Site 29SJ 627 is located in a rincon below the mouth of Vincente Arroyo and west of the Visitor's Center on the left side of Chaco Wash. The site consisted of 25 rooms and seven pit structures. It was occupied for at least 300 years, from the late A.D. 700s through the late A.D. 1000s or early 1100s, although this occupation may not have been continuous. Excavation was carried out under the direction of Marcia Truell (1980, Volume I) in 1974 and 1975, with minor explorations in 1978, but not all material was screened.

A total of 6,752 non-human bones were recovered from the site. These were identified and put into a computer format from February through April of 1978. The non-turkey avian remains were identified by S. Emslie and the herpetological specimens by J. Applegarth.

Taxa

A list of the taxa represented in the assemblage from 29SJ 627 can be found in Table 5.1. Brief comments on each of these follow.

Rabbits

Sylvilagus cf audubonii, cottontail rabbit, was numerically the second most abundant species in the assemblage. From 35 to 99 individuals are indicated, which accounts for from 6.7 to 6.9% of the estimated meat consumed at the site, as represented by the faunal remains recovered.

Butchering was found on seven elements, only 0.7% of the total. These all represented hind legs, mostly feet, which suggests that this portion was the most likely to be discarded before consumption. Two probably articulated hind feet also support this supposition. The other two articulations recorded for this species were two cases of mandible halves stuck together.

Evidence of burning and "cooking brown" was present on more Sylvilagus bones than those of any other taxon at the site except for the unidentified rodent group, which is an artifact of sample size. Only 68.1% were not altered. Most of these were "cooking brown," and Sylvilagus had the highest percentage for this site, 26.7%.

Table 5.1. Taxa found at 29SJ 627.

Family	Genus and Species	Common Name
Mammals:		
LEPORIDAE	Sylvilagus cf Audubonii	Desert cottontail rabbit
	Lepus californicus	Black-tailed jack rabbit
SCIURIDAE	Spermophilus or Šciurus sp.	Unknown squirrel
	Cynomys gunnisoni	Gunnison's prairie dog
GEOMYIDAE	Thomomys bottae	Botta's pocket gopher
HETEROMYIDAE	Perognathus sp.	Pocket mice
	Dipodomys ordii	Ord's kangaroo rat
	Dipodomys spectabilis	Banner-tailed kangaroo rat
CRICETIDAE	Peromyscus sp.	White-footed mice
	Neotoma sp.	Woodrats
	N. cinerea	Bush-tailed woodrat
CANIDAE	Canis sp.	
	C. latrans	Coyote
	C. lupus	Wolf
	C. familiarus	Domestic dog
	Urocyon cinereoargenteus	Gray fox
	Vulpes vulpes	Red fox
MUSTELIDAE	Taxidea taxus	Badger
FELIDAE	Felis rufus	Bobcat
CERVIDAE	Cervus elaphus	Wapiti or elk
	Odocoileus hemionus	Mule deer
ANTILOCAPRIDAE	Antilocapra americana	Pronghorn
BOVIDAE	Ovis canadensis	Mountain sheep
Birds:		
ACCIPITRIDAE	Buteo sp.	Hawks
	B. regalis	Ferruginous hawk
	Aquila chrysaetos	Golden eagle
MELEAGRIDIDAE	Meleagris gallopavo	Turkey
STRIGIDAE	Bubo virginianus	Great horned owl
ALAUDIDAE	Eremophila alpestris	Horned lark
CORVIDAE	Corvus corax	Common raven
Amphibians:		
PELOBATIDAE	Spea sp.	
	S. bombifrons	Plains spadefoot toad
	S. multiplicata	Western spadefoot toad
BUFONIDAE	Bufo sp.	
	B. woodhousei	Woodhouse's toad
Reptiles:		
IGUANIDAE	Phyrnosoma douglassi	Mountain short-horned lizard

Table 5.2. Sylvilagus mandibles from 29SJ 627.

Category	Left	Right
Dentary depth:		
Number	23	14
Mean	1.14	1.15
Standard deviation	0.05	0.08
Variance	0.002	0.006
Range	1.05 - 1.25	0.95 - 1.27
Length of tooth row:		
Number	23	14
Mean	1.26	1.24
Standard deviation	0.06	0.06
Variance	0.004	0.003
Range	1.09 - 1.38	1.13 - 1.34
29SJ 628 mean depth	1.12	1.10
29SJ 628 mean length	1.23	1.22

The Sylvilagus mandibles (Table 5.2) were measured following Findley et al. (1975). As a group, they were slightly larger than those from 29SJ 628 (Akins 1981f).

Lepus californicus, the jack rabbit, was numerically the most abundant taxon found at the site. Between 33 and 87 MNIs (minimum number of individuals) were represented. As an economic species, it appears to have been one of the most important ones, as it provided as much as from 17.0 to 18.8% of the meat consumed at the site, estimated from the faunal remains.

A total of 25 or 1.8% of the Lepus fragments had indications of butchering. Like Sylvilagus, these were often limb elements, but they also included one cut on an innominate and another on a scapula. Seven of the eight recorded articulations for this species were feet. Again, this suggests that the feet were often discarded prior to preparation and consumption. A quarter of the Lepus bones demonstrated some evidence of cooking.

Sciurids

Two elements, a femur shaft and a humerus shaft, were considered to represent true squirrel species, but their incomplete nature and lack of comparative materials prevented positive species identifications.

C. gunnisoni, the prairie dog, was fairly common at the site, with between 18 and 56 individuals represented, one of which was an articulated skeleton. These accounted for between 3.2 and 3.7% of the estimated meat consumed (estimated from the faunal collection). The wide range represented by these figures makes it difficult to compare this assemblage with those from other sites. No butchering was detected for this species, but a significant percent of the bone was burned or exhibited "cooking brown" (23.7%).

Rodents

Several taxa of rodents were represented. Many of these were burrowing species that were undoubtedly post-occupational. Ten articulated skeletons were found (Table 5.3). Three elements of T. bottae (pocket gophers) or 11.1% showed evidence of burning or "cooking brown," and one D. ordii (kangaroo rat) element was completely burned. This suggests that at least some of the rodents represented were utilized as food sources. Six percent of the bones found at the site had been gnawed on by rodents. Gnawed bones were more often found in the shallow surface rooms than in the deeper pit structures.

Carnivores

C. latrans, the coyote, was represented by a fair number of elements that were widely distributed across the site. These represent between two and 15 individuals. Few were found in the rooms; they tended to cluster in the test trenches, Pithouse C, and the trash midden. Most of the body parts were represented, which accounts for the low MNI. No evidence of butchering was recorded, although 11.3% of the elements exhibited "cooking brown" and 3.8% were completely burned.

C. lupus, the wolf, is not a common species in assemblages from the smaller archeological sites in Chaco Canyon. Three elements were recovered at 29SJ 627: a tooth, an atlas vertebra, and a metatarsal. These all came from early proveniences that date between A.D. 920 and 1020. The tooth, a maxillary canine, was quite polished and had been broken into two pieces, one of which was recovered from Pithouse H and the other from Pithouse C, Balk 3, Layer AA'. The atlas was also found in Pithouse C, Balk 3, and the metatarsal in Test Trench 2 in the trash midden. Even though this species was represented in three proveniences, only one individual may be represented.

C. familiarus, the dog, was represented by a fair number of elements and between five and nine individuals, two of which were articulated. The age distribution, assuming the immature animals were dogs, consisted of at least two less than one month old, at least one about four months old, another less than six months old, and at least one adult.

Four of the adult C. familiarus elements, decidedly smaller than normal, were about the size of V. vulpes. They were found dispersed in proveniences across the site and suggest that a smaller variety of domestic dog lived at 29SJ 627. These bones were found in proveniences that date mainly in the A.D. 1020 to 1040s, but one was from an A.D. 920-1020 deposit. It is possible that all three of these elements represent one dog that was just much smaller, rather than a new variety.

One C. familiarus humerus had light cuts on the distal end. This could have resulted from the removal of the lower front limb bones for use as bone tools. One element was recorded with

Table 5.3. Number of fragments, MNIs and MNI/E for 29SJ 627.

Type of Fauna	Fragments (E)			Minimum MNI			Maxmum MNI	
	No.	%	No. Id.	No.	%	MNI/E	No.	%
Sylvilagus sp.	992	14.7	27.4	35	19.3	0.03	99	19.9
L. californicus	1,345	19.9	37.1	33	18.2	0.02	87	17.5
Squirrel sp.	2	0.0	0.0	1	0.5	0.50	2	0.4
C. gunnisoni	355	5.3	9.8	18[a]	9.9	0.05	56[a]	11.3
T. bottae	24	0.4	0.7	5	2.8	0.21	12	2.4
Perognathus sp.	5	0.1	0.1	1	0.5	0.20	3	0.6
D. ordii	32	0.5	0.9	4[a]	2.2	0.10	10[a]	2.0
D. spectabilis	8	0.1	0.2	3	1.6	0.37	6	1.2
Peromyscus	27	0.4	0.7	11 (8)[a]	6.1	0.16	17 (8)[a]	3.4
Neotoma sp.	23	0.3	0.6	1	0.5	-	8	1.6
N. cinerea	7	0.1	0.2	3[a]	1.6	0.33	6[a]	1.2
Canis sp.	33	0.5	0.9	-	-	-	6	1.2
C. latrans	53	0.8	1.5	2	1.1	0.04	15	3.0
C. lupus	3	0.0	0.1	1	0.5	0.33	3	0.6
C. familiarus	84	1.2	2.3	5[aa]	2.8	0.04	9[aa]	1.8
Small C. familiarus	5	0.1	0.1	1	0.5	0.20	5	1.0
U. cinereoargentes	1	0.0	0.0	1	0.5	1.00	1	0.2
V. vulpes	2	0.0	0.0	1	1.1	0.33	1	0.2
T. taxus	3	0.0	0.1	1	0.5	0.33	2	0.4
L. rufus	12	0.2	0.3	2	1.1	0.16	5	1.0
C. elaphus	4	0.1	0.1	1	0.5	0.25	4	0.8
cf C. elaphus	1	0.0	0.0	-	-	-	1	0.2
O. hemionus	224	3.3	6.2	6	3.3	0.03	33	6.6
A. americana	65	1.0	1.8	3	1.6	0.05	13	2.6

Table 5.3. (continued)

Type of Fauna	Fragments (E) No.	Fragments (E) %	Fragments (E) No. Id.	Minimum MNI No.	Minimum MNI %	MNI/E	Maximum MNI No.	Maximum MNI %
O. canadensis	73	1.1	2.0	4	2.2	0.05	15	3.0
Buteo sp.	6	0.1	0.2	-	-	-	3	0.6
B. regalis	2	0.0	0.0	1	0.5	0.50	2	0.4
A. chrysaetos	6	0.1	0.2	1	0.5	0.16	6	1.2
M. gallopavo	190	2.8	5.2	19 (8)[a]	9.9	0.06	42 (8)[a]	8.4
B. virginianus	2	0.0	0.0	1	0.5	0.50	1	0.2
E. alpestris	1	0.0	0.0	1	0.5	1.00	1	0.2
C. corax	1	0.0	0.0	1	0.5	1.00	1	0.2
Spea sp.	24	0.4	0.7	5[aa]	2.8	-	13[aa]	2.6
S. bombifrons	2	0.0	0.0	2	1.1	1.00	2	0.4
S. multiplacata	3	0.0	0.1	3[aa]	1.6	1.00	3[aa]	0.6
Bufo sp.	1	0.0	0.0	-	-	-	1	0.2
B. woodhousei	2	0.0	0.0	2[aa]	1.1	1.00	2[aa]	0.4
P. douglassi	1	0.0	0.0	1	0.5	1.00	1	0.2
Small-medium mammal	1,013	15.0	-	-	-	-	-	-
Rodent	49	0.7	-	-	-	-	-	-
Medium mammal	65	1.0	-	-	-	-	-	-
Artiodactyl-large mammal	1,561	23.1	-	-	-	-	-	-
Aves	125	1.9	-	-	-	-	-	-U
unknown	316	4.7	-	-	-	-	-	-
Totals	6,752	99.9	99.5	181	98.9	-	497	99.7

[a] Each [a] represents an articulated skeleton.

"cooking brown," one as slightly burned, and another as completely burned.

For the site as a whole, 1.3% of the dog bone fragments had been gnawed on by carnivores. These fragments were spread throughout the site.

U. cinereoargenteus, the gray fox, was represented by one ulna. It is not uncommon to find small numbers of this species represented at archeological sites in Chaco Canyon. Other recorded occurrences are at 29SJ 724, 29SJ 423, and 29SJ 628 (Akins 1981a, 1981d, 1981f).

V. vulpes, the red fox, has rarely been reported in assemblages from archeological sites in Chaco Canyon. Judd (1954) lists this species as being present at Pueblo Bonito, but no other references were found. According to Bailey (1931), this fox was trapped in the Farmington to Shiprock area in the early 1900s, so it could have been present near Chaco Canyon. Findley et al. (1975) note that these animals generally prefer a mountainous habitat.

The yellow-red fur was probably the reason for taking this species. The elements (an ulna and a thoracic vertebra) were found in Pithouse C and Kiva G. This distribution suggests that more than one individual could have been represented.

T. taxus, the badger, is commonly reported in assemblages from archeological sites in Chaco Canyon. Only three elements were found at this site, all were parts of limbs. None was burned or butchered.

F. rufus, the bobcat, has been reported at almost every archeological site excavated in Chaco Canyon. Two to five individuals were represented by 12 elements, predominantly limb bones.

Artiodactyls

C. elaphus, elk, was definitely represented at the site. A portion of a femur and two hoof cores were found as well as two large proximal rib fragments. The ribs could possibly be Bison bison but due to the presence of other C. elaphus bones at the site, they were considered to be cf. C. elaphus. The proveniences in which the various bones were found date toward the earlier occupation of the site, generally from A.D. 820 to 1020. Because of the large size of this animal, the calculations of 6.7 to 13.0% of the total meat consumed at the site are undoubtedly somewhat high.

O. hemionus, deer, was by far the most commonly utilized of the artiodactyls, with from 6 to 33 individuals represented. All body parts were recovered, which suggests that entire animals were being returned to the site. Seven instances of butchering marks were recorded. All of these involved lower leg elements. A total of 10.3% of the elements showed either "cooking brown" or burning. From 23.1 to 31.0% of the estimated meat consumed at the site may have come from this species.

A. americana, pronghorn, was the least common of the three major artiodactyls recovered from this site. Three to 13 individuals were represented, and all body parts were present. Two instances of butchering marks were recorded, both on lower limb bones, and 18.5% had "cooking brown" or were burned. The economic contribution of this species was fairly small, representing only 4.8 to 7.6% of the estimated meat consumed.

O. canadensis, mountain sheep, was the second most common artiodactyl found at the site (four to 15 MNIs). Most body parts were represented, although there was a lack of thoracic vertebrae and identifiable ribs. This lack is more likely to be due to difficulties in identification of those fragments than to an actual absence of that body part. Again, it appears as though the entire animal was returned to the site. The only butchering recorded for this species was on a cervical vertebra that had been cut in half lengthwise. Only 2.8% of the elements were recorded with "cooking brown" or as burned. Between 10.8 and 18.8% of the estimated meat consumed at 29SJ 627 was calculated to have come from this species.

Birds

B. regalis, the ferruginous hawk, was represented by a humerus and a femur which could represent one or two birds. This species has been reported at numerous Chaco Canyon sites: 29SJ 724, 29SJ 628 (Akins 1981a and 1981f), Pueblo Alto (Akins 1987), Bc 362, Chetro Ketl, Una Vida, Bc 51, and Talus Unit (Hargrave n.d.).

B. virginianus, the great horned owl, was indicated by an immature left carpometacarpus and radius that represent one individual. This species is one of the less common birds found at recently excavated Chaco Canyon sites, with only one recovered from Pueblo Alto. Hargrave (n.d.) lists instances from Kin Kletso, Bc 50, Bc 51, Chetro Ketl, Bc 236, and Una Vida.

M. gallopavo, turkey, was fairly well represented by between 19 and 42 individuals, many of which were immature and articulated. The age distribution on the site level included two less than three days old, eight that were two weeks old, one that was four weeks old, one that was less than two months old, and one that was six months old. At least five adult birds were represented, three of which were males. It is the scattering of the adult elements throughout the site that increases the number of individuals. Clearly, the abundance of immature articulated skeletons suggests that the birds were raised at the site.

Only one element showed signs of butchering, a tarsometatarsus with a portion removed, possibly to make beads or a bone tool. Of the adult elements, 11.6% were recorded with "cooking brown" or as burned. Turkeys have not been considered here as an economic (food) species because evidence of burning was not that common (compared to Sylvilagus at 31.9%, Lepus at 25.0%, and C. gunnisoni at 23.7%). If they had been considered as such, their contribution would fall between that of Sylvilagus and L. californicus at 68,150 g.

Turkeys are not a practical food source in areas where water, surplus crops, and abundant wild forage are not available. The amount of stored food required to raise a bird to eating size is not worth the small amount of meat recovered. A small number of birds were undoubtedly raised at this site, but probably for their feathers.

E. alpestris, the horned lark, is a small bird that lives in Chaco Canyon today. One element was recovered at 29SJ 627, one at Shabik'eshchee Village (Akins 1981c), and 16 from Pueblo Alto (Akins 1987). Hargrave (n.d.) lists other occurrences only at Bc 236 and the Talus Unit.

C. corvax, the common raven, was represented by one element. This species has been found at almost every Chaco Canyon archeological site studied (Akins 1985).

Amphibians and Reptiles

Both species of Spea., spadefoot toads, found in Chaco Canyon today (Jones 1970) were represented at the site. These were most likely post-occupational burrowers rather than an exploited species. The most interesting instance was an S. multiplicata that fell or burrowed into an olla buried in the floor of Pithouse C.

Bufo sp. and B. woodhousei were represented by partial individuals from Kivas D and E. This true toad, if present in Chaco Canyon today, must be fairly rare. Jones (1970) noted that he had seen none during his studies within Chaco Canyon and that Harris collected none closer than 20 miles from the canyon. Range maps indicate that an occurrence of this toad was likely. The articulated individuals from this site further suggest this.

P. douglassi, the mountain short-horned lizard, was represented by one element, a vertebra. This species is found in Chaco Canyon today, generally in mixed grassland associations (Jones 1970).

Numerical Observations

The number of fragments (E), the minimum and maximum MNIs, and the MNI/E are listed for the various species recovered from 29SJ 627 (Table 5.3). Although the total number of bones is fairly large, 46.4% of these were not identifiable to species. Most of these were either large mammal or artiodactyl (mostly artiodactyl) bone fragments which were too broken up for further identification.

To obtain the minimum MNI, the assemblage from the entire site was considered as one unit. To obtain the maximum MNI, calculations were made by provenience, although some proveniences were further subdivided. By assuming that each of the 71 provenience units was independent of the others, and by adding the MNIs, we get a number that is too large. The two figures, maximum MNI and minimum MNI, should be thought of as parameters. The difference between the minimum and maximum MNIs is largely related to the number of provenience divisions.

The MNI/E (Grayson 1978) is an indicator of how well each individual of a species was represented. According to Grayson, species represented by an MNI/E greater than 0.15 contribute more than they should to the percentages. By this index, only nine of the 31 species represented at 29SJ 627 can be considered to be well sampled.

The economic contribution for each species and the residual artiodactyl elements were also considered (Table 5.4). The artiodactyl contribution, as a whole, is roughly comparable to that from other contemporaneous sites in Chaco Canyon (Table 5.5).

Table 5.4. Estimated meat available and meat consumed for 29SJ 627

			Minimum MNI					Maximum MNI			
	Estimated Meat Wt.		Estimated Meat Available		Estimated Meat Consumed[a]			Estimated Meat Available		Estimated Meat Consumed[a]	
Species	(g)	MNI	gram	%	gram	%	MNI	gram	%	gram	%
Sylvilagus sp.	382	35	13,370	2.6	13,370	6.9	99	37,818	1.6	37,818	6.7
L. californicus	1,100	33	36,300	7.1	36,300	18.8	87	95,700	4.1	95,700	17.0
Squirrel sp.	260	1	260	-	260	0.1	2	520	-	520	0.1
C. gunnisoni	370	17	6,290	1.2	6,290	3.2	56	20,720	0.9	20,720	3.7
T. bottae	68	5	340	0.1	340	0.2	12	816	-	816	0.1
D. ordii	28	3	84	-	84	-	10	280	-	280	-
D. spectabilis	70	3	210	-	210	0.1	6	420	-	420	0.1
Neotoma sp.	90	1	90	-	90	-	8	720	-	720	0.1
N. cinerea	110	2	220	-	220	0.1	6	660	-	660	0.1
C. elaphus	120,000	1	120,000	23.6	25,080	13.0	5	600,000	25.8	37,800	6.7
O. hemionus	28,100	6	168,600	33.1	5,985	31.0	33	927,300	39.9	12,954	23.1
A. americana	16,850	3	50,550	9.9	1,471	7.6	13	219,050	9.4	2,727	4.8
O. canadensis	28,100	4	112,400	22.1	3,640	18.8	15	421,500	18.1	6,093	10.8
Artiodactyl[b]	-	-	-	-	-	-	-	-	-	14,851	26.4
Totals			508,714	99.7	193,204	99.8		2,325,504	99.8	561,704	99.7

[a] Estimates based on Gillespie (1981).
[b] Uses the ratio of A. americana to O. hemionus and O. canadensis.

Table 5.5. Percentages of small mammal versus artiodactyl utilization.

MNI	29SJ 1360[a]	29SJ 629[b]	29SJ 627
Minimum MNI:			
% small[c]	18.8		28.9
% artiodactyl[d]	74.2		57.4
Maximum MNI:			
% small	23.2	35.0	27.4
% artiodactyl	61.0	49.0	65.1
% unidentified artiodactyl elements	24.1		23.1

[a] Akins (1981e).
[b] Gillespie (1981).
[c] Total of Sylvilagus, L. californicus, and C. gunnisoni (economic contribution).
[d] Total of O. hemionus, A. americana, O. canadensis, and unidentified artiodactyls.

Table 5.6 better indicates how the figures were derived for the artiodactyls, and Table 5.7 provides similar information for the carnivores. At best, the carnivore contribution could have been close to that of Sylvilagus.

For an economic comparison, the total grams of protein listed (Table 5.4) can be converted into man-days of animal protein. Wing and Brown (1980) give figures of 125 k per 100 g of meat and a 2000 calorie per day requirement. When a 10% dependence on meat is assumed, the faunal collection from 29SJ 627 represents between 1,207 and 3,511 man-days or 3.3 to 9.6 man-years of animal protein, not much for a site occupied for as long as this one. Even if the meat available total is used, the amount represented only accounts for 8.7 to 39.8 man-years, still far too low.

Explanations for this low meat estimate merit some consideration. First, possibly the 10% contribution is too high, or second, large quantities of meat were being processed away from the site and there are no identifiable remains. This would be especially true for the artiodactyls, even though the presence of all body parts suggests that some animals were brought back to the site in their entirety. Third, we cannot expect to have recovered more than a percentage of the discarded bone. If domestic dogs consistently destroyed discarded bones or dragged them away from the site, this would have reduced the assemblage considerably.

Miscellaneous Observations

Butchering

Sixty-one cases of butchering were recorded, which is 0.9% of the total assemblage. The taxon, kind of butchering observed, and the location of the butchering evidence are described (Table 5.8). As expected, most of the evidence of butchering is found on bones from ani-

Table 5.6. Derivations of meat consumed based on artiodactyl remains.

	Minimum MNI					Maximum MNI				
Body part[a]	C. elaphus	O. hemionus	A. americana	O. canadensis	Artiodactyl	C.elaphus	O. hemionus	A. americana	O. canadensis	Artiodactyl[b]
Head	-	9,900	1,980	3,300	-	-	16,500	5,940	3,300	14,320
Cervical vertebrae	-	2,500	1,500	5,000	-	-	2,500	-	6,000	2,000
Thoracic vertebrae	-	2,900	1,740	-	-	-	8,700	1,740	-	13,190
L. vert. pelvis	-	7,720	2,320	3,860	-	-	34,740	2,320	15,440	21,100
Ribs	11,640	3,210	1,930	-	-	23,280	3,210	1,930	-	49,430
Front leg	-	8,700	1,740	14,500	-	-	33,700	8,700	20,300	22,600
Hind leg	12,360	20,580	2,060	6,800	-	12,360	20,580	4,120	13,720	18,770
Feet	1,080	4,340	1,440	2,880	-	2,160	9,610	2,520	2,170	7,100
Total	25,080	59,850	14,710	36,400	-	37,800	129,540	27,270	60,930	148,510

[a] Estimates based on Gillespie (1981).

[b] For the major proveniences, the provenience ratio was used; for the others, the site ratio of 4:1 was used.

Table 5.7. Carnivores at 29SJ 627.[a]

Species	Estimated Meat Wt. (g)	Minimum MNI: MNI	Minimum MNI: Est. Meat Available	Minimum MNI: Est. Meat Consumed[b]	Maximum MNI: MNI	Maximum MNI: Est. Meat Available	Maximum MNI: Est. Meat Consumed[b]
Canis sp.	4,500	-	-	-	6	27,000	20,260
C. latrans	5,500	2	11,000	6,560	15	82,500	29,810
C. lupus	13,500	1	13,500	9,369	3	40,500	17,226
C. familiarus	3,500	3	10,500	4,788	7	24,500	14,308
Small C. familiarus	3,000	1	3,000	2,082	5	15,000	4,500
U. cinereoargentes	2,250	1	2,250	216	1	2,250	216
V. vulpes	3,000	1	3,000	2,034	1	3,000	2,034
T. taxus	5,000	1	5,000	1,060	2	10,000	1,060
F. rufus	5,000	2	10,000	4,466	5	25,000	11,630
Totals			58,250	30,575		229,750	101,044

[a] Immatures and articulations are not included.
[b] Figures are based on Gillespie (1981).

Table 5.8. Butchering at 29SJ 627.

Taxa	No. Element	Type of Butchering	Location
Sylvilagus (7)	1 metatarsal	Portion removed--straight cut	Distal
	1 calcaneus	Portion removed--diagonal cut	Distal anterior
	1 calcaneus	Portion removed--straight cut	Proximal
	2 calcanei	Length-wise, in half	
	1 femur	Portion removed--straight cut	Proximal distal
	1 tibia	Portion removed--straight cut	Distal
L. californicus (25)	1 scapula	Portion removed--straight cut	Proximal
	2 humeri	Portion removed--diagonal cut	Distal posterior
	1 humerus	Light cuts	Midshaft medial
	1 ulna	Portion removed--straight cut	Proximal
	1 calcaneus	Portion removed--diagonal cut	Proximal
	6 calcanei	Length-wise--in half	
	5 calcanei	Portion removed--diagonal	Proximal distal
	2 calcanei	Portion removed--straight	Proximal
	1 calcaneus	Portion removed--straight	Midshaft
	1 calcaneus	Portion removed--straight	Distal midshaft
	2 innominate	Portion removed--diagonal	Midshaft
	2 tibias	Portion removed--straight	Proximal
C. familiarus (1)	1 humerus	Light cuts	Distal
O. hemionus (7)	1 ulna	Chopping	Distal
	1 metacarpal	Light cuts	Distal lateral
	1 calcaneus	Portion removed--diagonal	Posterior
	1 calcaneus	Light cuts	Posterior
	1 metatarsal	Light cuts	Distal anterior
	1 metatarsal	Light cuts	Distal, medial, lateral
	1 phalanx	Length-wise--in half	
A. americana (2)	1 metacarpal	Light cuts	Distal medial
	1 metatarsal	Light cuts	Distal anterior
O. canadensis (1)	1 cervical vertebra	Cut lengthwise in half	
M. gallopavo (1)	1 tarsometatarsus	Portion removed--straight	Proximal
Small-medium mammal (2)	1 metatarsal	Light cuts	Midshaft
	1 long bone frag.	Portion removed--diagonal	Midshaft
Medium mammal (1)	1 skull fragment	Portion removed--diagonal	
Artiodactyl-large mammal (13)	1 thoracic vertebra	Portion removed--straight	Proximal
	1 humerus	Portion removed--straight	Distal
	1 tarsal	Portion removed--straight	
	1 innominate	Light cuts	Midshaft posterior
	1 femur	Light cuts	Proximal anterior
	1 femur	Light cuts	Proximal medial
	1 tibia	Light cuts	Proximal anterior
	1 tibia	Light cuts	Distal medial
	1 long bone frag.	Portion removed--diagonal	Medial
	4 long bone frags.	Light cuts	Midshaft
AVES (1)	1 unknown	Portion removed--straight	

mals that are considered to be economic species or on unidentifiable fragments.

Checking

The checking or weathering evidence on bone elements is given by provenience (Table 5.9). The preservation of bone at 29SJ 627 was fairly good, with only 15.5% of the bones recorded as weathered.

Burning

The percentage of burning and "cooking brown" is given for each taxon that exhibited either of these (Table 5.10). The three groups with the largest percentages of bone altered by processing are the three small economic species, Sylvilagus, Lepus, and Cynomys, species small enough to have been cooked in their entirety.

Out of curiosity, the occupational fill of heating pits and firepits was examined to see how many bones from these proveniences were actually burned. Only three elements were recovered from heating pits, and none of these was cooked or burned. Firepits produced 136 bones, of which 49 (36.0%) were completely burned, one (0.7%) was partially burned, and 18 (13.2%) had "cooking brown." Of these, 32.3% were from the three small economic species. Most of the rest were unidentifiable bone fragments (64.7%).

Evidence of Use

Evidence of some kind of use was recorded for 57 elements. Tables 5.11 and 5.12 provide breakdowns by taxon and element, then by provenience. Bone tools are further discussed by Miles in Chapter 6.

Other Observations

Information on staining and rounding was recorded (Tables 5.13-5.14). The rounding may suggest that in some proveniences (e.g., Kiva G, Room 10, Room 22, and the trash area), there was more soil movement than in others. The bone also could have been rounded before deposition, as can happen when the chips pass through a digestive system.

Pathologies

Pathologies were recorded, but the large number of bones in the collection prevented relocation of each bone for a more detailed description. Those on which pathologies were noted included two Sylvilagus innominates, one L. californicus rib shaft and a femur, one D. spectabilis femur, one M. gallopavo sternum, and one unknown large mammal long bone shaft.

Articulations

Because animal articulations were not systematically collected and recorded at 29SJ 627, Table 5.15 gives only a sample of probable and definite articulation.

The Proveniences

The analysis of faunal materials from other sites in Chaco Canyon (Akins 1981a, 1981b, 1981c, 1981d, 1981e, 1981f, 1985, 1987) has resulted in the identification of some general trends in faunal exploitation. Evidence from these sites has indicated that sometime during Pueblo II, Sylvilagus, which was

Table 5.9. Checking within proveniences in which it occurred.

Provenience	% without	% with	Provenience	% without	% with
Test Trench 3	60.0	40.0	Room 11	68.8	31.2
Test Trench 6	40.0	60.0	Room 12	72.2	27.8
Test Trench 7	50.0	50.0	Room 13	-	100.0
Test Trench 9	-	100.0	Room 14	91.7	8.3
Test Trench 10	66.7	33.3	Room 15	92.9	7.5
Test Trench 16	-	100.0	Room 16	92.5	7.5
Test Trench 35	9.1	90.9	Room 17	76.3	23.7
Pithouse A Antechamber	80.0	20.0	Room 19	93.3	6.7
Pithouse B	80.4	19.6	Room 21	-	100.0
Pithouse C	89.2	10.8	Room 22	65.0	35.0
Pithouse H	66.7	33.3	Room 23	75.7	24.3
Room 1	68.8	31.2	Room 25	40.0	60.0
Room 2	55.6	44.4	Kiva D	78.0	22.0
Room 3	86.3	13.7	Kiva E	85.1	14.9
Room 4	92.9	7.1	Pit Structure F	96.3	3.7
Room 5	96.6	3.4	Kiva G	88.6	11.4
Room 6	63.6	36.4	Plaza general	73.1	26.9
Room 7	85.9	14.1	Plaza specific	42.6	57.4
Room 8	93.7	6.3	Ramada	70.6	29.4
Room 9	98.9	2.0	Trash Midden	72.4	27.6
Room 10	93.3	6.7	Site Total	84.5	15.5

Table 5.10. Burning percentages at 29SJ 627.

Taxa	None	Cooking brown	Slight	Partial	Complete	Total
Sylvilagus sp.	68.1	26.7	2.4	0.4	2.3	99.9
L. californicus	75.0	17.6	2.4	0.4	4.5	99.9
C. gunnisoni	76.3	17.5	1.7	0.6	3.9	100.0
T. bottae	87.5	4.2	4.2	-	4.2	100.1
Canis sp.	96.9	-	-	-	3.1	100.0
C. latrans	93.9	-	-	-	6.1	100.0
C. familiarus	96.3	1.2	1.2	-	1.2	99.9
O. hemionus	89.7	2.2	0.4	0.9	6.7	99.9
A. americana	81.5	7.7	-	1.5	9.2	99.9
O. canadensis	97.2	1.4	-	-	1.4	100.0
M. gallopavo	93.7 (88.4[a])	2.1	2.6	0.5	1.0	99.9
Small-medium mammal	78.1	15.1	0.7	0.7	5.5	100.0
Rodent	63.3	26.5	-	-	10.2	100.0
Medium mammal	93.6	1.6	-	-	4.7	100.0
Artiodactyl/large	85.8	5.2	0.1	1.0	7.9	100.0
AVES	84.8	3.2	0.9	-	12.0	100.0
Unknown	80.4	12.6	0.9	0.3	5.7	99.9
Site total	80.0	13.1	1.2	0.5	5.1	99.9

[a] Matures only.

Table 5.11. Evidence for use of faunal remains at 29SJ 627.

Kind of Use	Number	Taxon	Element	Fragmentation
Edge rounding (29)	1	Sylvilagus	Tibia	Distal shaft
	2	L. californicus	Mandible	Fragment
	1	"	Humerus	Distal shaft
	1	"	Ulna	Shaft fragment
	1	"	Calcaneus	Fragment
	2	"	Innominate	Acetabulum
	3	"	Femur	Distal
	1	C. gunnisoni	Femur	Shaft fragment
	1	C. familiarus	Femur	Shaft fragment
	1	O. hemionus	Humerus	Distal shaft
	1	O. canadensis	Femur	Distal
	2	Small-medium mammal	Long bone	Shaft fragments
	4	Artiodactyl/large mammal	Long bone	Shaft fragment
	1	"	Unknown	Fragment
	1	Unknown	Humerus	Distal
	5	"	Long bone	Shaft fragment
Striations (2)	1	O. hemionus	Femur	Distal
	1	Artiodactyl	Metatarsal	Shaft fragment
Slight modification (5)	1	L. californicus	Radius	Shaft
	1	"	Metacarpal	Proximal shaft
	1	"	Metatarsal	Distal shaft
	1	Artiodactyl	Metatarsal	Shaft fragment
	1	"	Long bone	Shaft fragment
Drilled (7)	1	Sylvilagus	Tibia	Complete
	1	"	Tibia	Shaft
	1	L. californicus	Tibia	Complete
	1	"	Tibia	Fragment
	1	"	Tibia	Shaft fragment
	1	Artiodactyl	Tibia	Shaft fragment
	1	"	Long bone	Shaft fragment
Polish (5)	1	C. lupus	Canine tooth	Complete
	1	O. hemionus	Calcaneus	Complete
	1	"	Phalanx	Complete
	1	Small-medium mammal	Long bone	Shaft fragment
	1	Unknown	Long bone	Shaft fragment
Other (4)	1	Artiodactyl	Humerus	Shaft fragment
	1	"	Radius	Shaft fragment
	1	"	Metatarsal	Shaft fragment
	1	"	Long bone	Shaft fragment
Unknown (5)	1	Sylvilagus	Tibia	Complete
	1	O. hemionus	Phalanx 2	Complete
	1	O. canadensis	Innominate	Fragmentation
	1	Large mammal	Long bone	Shaft fragment

Table 5.12. Use by provenience.

Provenience	Use	Taxon	Number
Pithouse B, fill	Other	Artiodactyl	1
Pithouse C, fill	Edge rounding	Sylvilagus	1
		L. californicus	5
		C. familiarus	1
		O. hemionus	1
		Artiodactyl/large	2
	Slight modification	Artiodactyl	2
	Drilled		
		Sylvilagus	1
	Possible modification	L. californicus	1
		Sylvilagus	1
Pithouse H, fill	Polish	C. lupus	1
Room 2, Floor 1, fill	Possible modification	O. canadensis	1
Room 7, Floor 1, fill	Slight modification	L. californicus	1
Room 7, Floor 2	Slight modification	Unknown	1
Room 15, Floor 1, fill	Other use	Artiodactyl	1
Room 16, Floors 1 and 2	Striations	O. hemionus	1
	Other	Artiodactyl	1
Room 22, Floor 3, fill	Striations	Artiodactyl	3
Kiva D, fill	Edge rounding	L. californicus	3
		Small-medium mammal	1
	Slight modification	O. hemionus	1
	Drilled		
		L. californicus	1
	Possible modification	Artiodactyl	1
		Unknown	1
Kiva E	Edge rounding	L. californicus	2
		C. gunnisoni	1
		Unknown	1
	Slight modification	O. hemionus	1
	Drilled		
	Polish	Artiodactyl	1
		Small-medium mammal	1
	Possible modification	Unknown	1
		O. hemionus	1
		Artiodactyl-large mammal	1
Pit Structure F	Edge rounding	O. canadensis	1
		Artiodactyl-large mammal	1
		Unknown	
		Sylvilagus	4
	Drilled	L. californicus	1
		O. hemionus	1
	Polish		2
Plaza	Other	Artiodactyl	1
Trash Midden	Edge rounding	L. californicus	1
		Small-medium mammal	1
		Artiodactyl-large mammal	2

Table 5.13. Other observations.

Observation	Taxon	Element	Number
Purple staining	Canis sp.	Radius	1
	O. hemionus	Antler	1
	O. canadensis	Radius	1
	Artiodactyl	Innominate	1
Pigment	M. gallopavo	Phalanx	1
Edge rounding	Sylvilagus	Mandible	1
		Scapula	1
		Humerus	2
		Calcaneus	1
		Innominate	1
		Femur	1
	L. californicus	Humerus	1
		Innominate	1
	O. hemionus	Innominate	1
	Buteo sp.	Phalanx	1
	Small-medium mammal	Long bone fragments	7
	Artiodactyl-large mammal	Humerus	
			1
		Radius	
		Metacarpal	1
		Tarsal	1
		Femur	1
		Long bone fragments	1
	AVES	Innominate	4
		Long bone fragments	
		Long bone fragments	1
	Unknown		4
			12
Total			50

Table 5.14. Observations by provenience.

Provenience	Observation	Number	Percent
Room 8	Rounding	1	1.3
Room 10	Rounding	3	1.7
Room 11	Purple stain	1	6.3
Room 19	Rounding	2	4.4
Room 22	Pigment	1	1.3
	Rounding	2	2.5
Room 23	Rounding	1	1.4
Pithouse C	Purple stain	1	0.0
Kiva E	Rounding	3	0.2
Kiva G	Rounding	1	0.2
Plaza	Rounding	1	0.0
Ramada	Purple stain	1	2.9
	Rounding	1	2.9
Trash Midden	Purple stain	1	0.0
	Rounding	24	5.5

Table 5.15. Articulations from 29SJ 627.

Species	Elements	Number
Sylvilagus sp.	Hind foot	2
	Mandible halves	2
L. californicus	Hind foot	5
	Front foot	2
	Vertebral column	1
C. gunnisoni	Sacrum, coccyl. vert.	1
D. ordii	Hind foot	1
Neatoma sp.	Hind foot	1
C. latrans	Front foot	1
C. familiarus	Thoracic vertebra	1
O. hemionus	Phalanges 1 and 2	1
A. americana	Metapodial and phalanx	1

the most abundant rabbit in the Basketmaker III and Pueblo I collections, decreases in numbers, while L. californicus and C. gunnisoni increases. A reduction in the availability of Sylvilagus (from overuse by man or natural causes) may have forced the Anasazi to substitute L. californicus and C. gunnisoni. At about that same time or slightly earlier, evidence of A. americana, (the most commonly utilized artiodactyl) decreases and evidence of O. hemionus increases. The way in which the assemblages from each provenience do or do not conform to these general trends will be discussed.

The numbers of elements are listed by provenience (Table 5.16). These divisions are not those used to construct the MNI table. The MNI divisions were arrived at after discussions with Truell, consideration of the sample sizes, and consideration of whether or not the division would add to the number of individuals. The numbers of elements and MNI by provenience are listed in Table 5.17, and the MNIs in that table were used to calculate the maximum MNI for 29SJ 627. The assemblages from some of the proveniences are worthy of comment.

Test Trenches

Of the numerous test trenches, one was of interest. Test Trench 3, which was perpendicular to and behind or west of the roomblock, contained several coyote bones from at least two individuals. Other coyote bones were found in Test Trenches 9 and 11, both of which were peripheral to the site. This may suggest some sort of special treatment of carnivore bones.

Pithouse B

Few bones were recovered from this structure; however, one was from an immature C. gunnisoni and may suggest that some of the deposition, if primary, took place between May and July. The ratio of Sylvilagus to L. californicus and C. gunnisoni is similar to that found at 29SJ 1360 (Akins 1981e) from about the same time, but this is based on a very small sample size.

Pithouse C

This structure contained the largest number of bones, comprising 31.3% of the site total. Except for the floor and features, it dates close in time to Pithouse B, however, in this assemblage there is a predominance of Sylvilagus as compared to L. californicus (25:16) and a large sample size. The entire structure was treated as one provenience because almost all of the floor and feature material was unidentifiable fragments, from which additional individuals could not be identified. The fill of this structure undoubtedly took a while to accumulate, so that the two immature Sylvilagus and one L. californicus represented would suggest only that some of the deposition took place between June and October.

Pithouse H

This early structure was found beneath the floor of Kiva E. It is notable only in that it contained a portion of an upper canine tooth from C. lupus that matched another portion from the fill of Pithouse C.

Table 5.16. Numbers of elements by provenience at 29SJ 627.

Provenience		Number	Percent
Test Trenches 3 and 35		21	0.3
Test Trenches 6, 9, 11, and 28		14	0.2
Test Trench 7		2	-
Test Trench 10		3	-
Test Trench 16		1	-
Pithouse A	Antechamber fill	25	0.4
Pithouse B	Fill	56	0.8
Pithouse C	Fill	2,002	29.6
	Floor contact	76	1.1
	Firepit 1	1	-
	Cist 6	11	0.2
	Ventilator	21	0.3
	Heating Pit 11	1	-
	Heating Pit 12	1	-
Subtotal		2,113	31.3
Pithouse H	Fill	5	0.1
	Floor contact	1	-
Subtotal		6	0.1
Room 1	Floor 1, fill	10	0.1
	Floor 2, fill	4	0.1
	Floor 2, Burial 1	2	-
Subtotal		16	0.2
Room 2	Floor 1, fill	7	0.1
	Floor 2, contact	2	-
Subtotal		9	0.1
Room 3	Floor 1, fill	1	-
	Floor 1, contact	3	-
	Floor 1, Firepit 2	1	-
	Floor 1, Heat. Pit 1	1	-
	Floor 1, Posthole 2	1	-
	Floor 2, fill	33	0.5
	Floor 2, Pit 4	9	0.1
	Floor 2, Pit 5 (posthole)	2	-
Subtotal		51	0.7
Room 4	Floor 1, fill	2	-
	Floor 2, fill	24	0.3
	Floor 2, Pit 2	1	-
Subtotal		28	0.4

Table 5.16. *(continued)*

Provenience		Number		Percent	
Room 5	Floor 1, fill	11		0.2	
	Floor 1a, Firepit 1	39		0.6	
	Floor 1a, Pit 4	2		-	
	Floor 2, fill	18		0.3	
	Floor 2, contact	1		-	
	Floor 2, Firepit 3	3		-	
	Floor 2, Pit 2 (ashpit)	5		0.1	
	Floor 2, Other Pit 6	1		-	
	Floor 2, Other Pit 9	2		-	
	Floor 2, Pit 1 (posthole)	1		-	
	Floor 2, Pit 4 (posthole)	4		0.1	
	Floor 2, Pit 5 (posthole)	1		-	
	Floor 2, Pit 11 (posthole)	2		-	
	Floor 2, Pit 12 (posthole)	2		-	
	Floor 2, Pit 18 (posthole)	2		-	
	Floor 2, Pit 8 (heating pit)	2		-	
	Floor 3, fill	9		0.1	
Subtotal			147		2.2
Room 6	Floor 1, fill	7		0.1	
	Floor 2, fill	6		0.1	
	Floor 3, fill	1		-	
	Floor 3, Firepit 1	9		0.1	
Subtotal			23		0.3
Room 7	Floor 1, fill	20		0.3	
	Floor 1, Firepit 1	2		-	
	Floor 2, fill	44		0.6	
	Floor 2, Pit 1 (firepit)	3		-	
	Floor 2, Pit 2 (firepit)	2		-	
	Floor 2, Pit 3	7		0.1	
Subtotal			78		1.1
Room 8	Floor 1, contact	1		-	
	Floor 2, fill	6		0.1	
	Floor 2, contact	14		0.2	
	Floor 2, Firepit 1	4		0.1	
	Floor 2, Firepit 2	3		-	
	Floor 2, Firepit 4	1		-	
	Floor 2, Pit 7	1		-	
	Floor 2, Posthole 1	2		-	
	Floor 2, rodent hole	13		0.2	
	Floor 3, fill	25		0.4	
	Floor 3, contact	3		-	
	Floor 3, Pit 13 (posthole)	1		-	
	Floor 3, Pit 14 (posthole)	1		-	
	Floor 3, Pit 15 (posthole)	3		-	
	Floor 4, fill	1		-	
Subtotal			79		1.2
Room 9	Floor 2, contact	2		-	
	Burial 2	-		-	
	Floor 2a, contact	32		0.5	
	Floor 3, fill	1		-	
	Floor 4, fill	7		0.1	
	Floor 4, Pit 2	1		-	
	Floor 4, Pit 1	6		0.1	
Subtotal			50		0.7

Table 5.16. (continued)

Provenience		Number		Percent	
Room 10	Wall construction	2		-	
	Floor 1, fill	33		0.5	
	Floor 1a, Firepit 3	2		-	
	Floor 1a, Pit 1	2		-	
	Floor 2, fill	102		1.5	
	Floor 2, contact	31		0.4	
	Floor 2, Firepit 3	1		-	
	Floor 2, Pit 4 (cist)	4		0.1	
	Floor 2, Posthole 1	2		-	
Subtotal			179		2.6
Room 11	Floor 1, contact	2		-	
	Floor 3, fill	1		-	
	Floor 3, rodent hole	12		0.2	
	Floor 5, fill	1		-	
Subtotal			16		0.2
Room 12	Floor 1, fill	7		0.1	
	Floor 1, contact	5		0.1	
	Floor 1, Firepit 1	5		0.1	
	Floor 2, fill	1		-	
Subtotal			18		0.3
Room 13	Fill	1		-	
Room 14	Floor 1, fill	5		0.1	
	Floor 1, contact	4		0.1	
	Floor 2, fill	2		-	
	Floor 2, Firepit 1	1		-	
Subtotal			12		0.2
Room 15	Floor 1, fill	14		0.2	
Room 16	Floor 1, fill	10		0.1	
	Floor 1, contact	1		-	
	Floor 2, fill	20		0.3	
	Floor 3, Firepit 1	11		0.2	
	Floor 3, Pit 5	2		-	
	Floor 3, Pit 2 (posthole)	-		-	
	Floor 3, Pit 4 (posthole)	2		-	
	Floor 4, fill	15		0.2	
Subtotal			66		1.0
Room 17-18	Floor 1, fill	36		0.5	
	Floor 1, Firepit 1	4		0.1	
	Floor 2, Firepit 1	10		0.1	
	Floor 2, Firepit 2	6		0.1	
	South wall	3		-	
Subtotal			59		0.9
Room 19	Floor 1, fill	42		0.6	
	Floor 2, contact	3		-	
Subtotal			45		0.7
Room 20	Floor 1, fill	1		-	
Room 21	Floor 1, fill	2		-	
Room 22	Floor 1, fill	36		0.5	
	Floor 1, contact	8		0.1	
	Floor 3, fill	36		0.5	
Subtotal			80		1.2

Table 5.16. (continued)

Provenience		Number		Percent	
Room 23	Floor 1, fill	66		1.0	
	Floor 1, contact	2		-	
	Floor 1, Firepit 3	2		-	
Subtotal			70		1.0
Room 24	Floor 1, fill	2		-	
Room 25	Floor 1, fill	2		-	
	Floor 1, contact	3		-	
Subtotal			5		0.1
Kiva D	Floor 1, fill	671		9.9	
	Floor 1, contact	20		0.3	
	Floor 1, Firepit 1	12		0.2	
	Floor 1, Pit 3	1		-	
	Floor 1, Pit 6	1		-	
	Floor 1, Pit 7	7		0.1	
	Floor 1, Pit 8	1		-	
	Floor 1, Pit 9	1		-	
	Floor 1, ventilator	49		0.7	
	Floor 1, mealing bin	1		-	
Subtotal			764		11.3
Kiva E	Floor 1, fill	1,444		21.4	
	Southern recess, fill	108		1.6	
	Firepit 1	16		0.2	
	Ventilator	11		0.2	
Subtotal			1,579		23.4
Kiva F	Floor 1, fill	372		5.5	
	Floor 1, contact	2		-	
	Floor 1, Firepit 1	2		-	
	Floor 2, Pit 12 (posthole)	5		0.1	
	Floor 1, Pit 14	10		0.1	
	Floor 1, Pit 15 (posthole)	3		-	
	Floor 1, ventilator	37		0.5	
Subtotal			431		6.4
Kiva G	Floor 1, fill	23		0.3	
	Floor 1, contact	2		-	
	Floor 1, Firepit 1	2		-	
	Floor 1, ventilator	17		0.2	
Subtotal			44		0.6
Plaza	All	98		1.4	
Ramada	Floor 1, fill	15		0.2	
	Floor 1, Pit 1	19		0.3	
Subtotal			34		0.5
Trash Midden	Test Trench 1	60		0.9	
	Test Trench 2	80		1.2	
	Grids	370		5.5	
Subtotal			510		7.5
TOTAL		6,752			

Table 5.17. Numbers of elements and MNI by provenience.

Species	Test Trenches 3 and 35		Test Trenches 6, 9, 11, and 28		Test Trench 7		Test Trench 10		Test Trench 16	
	No.	MNI	No.	MNI	No.	MNI	No.	MNI	No.	MNI
Sylvilagus sp.	3	1	-	-	-	-	1	1	-	-
L. californicus	-	-	1	1	-	-	-	-	-	-
Squirrel sp.	-	-	-	-	-	-	-	-	-	-
C. gunnisoni	-	-	-	-	-	-	1	1	-	-
T. bottae	-	-	-	-	-	-	-	-	-	-
Perognathus sp.	-	-	-	-	-	-	-	-	-	-
D. ordii	-	-	-	-	-	-	-	-	-	-
D. spectabilis	-	-	-	-	-	-	-	-	-	-
Peromyscus sp.	-	-	-	-	-	-	-	-	-	-
Neotoma sp.	-	-	-	-	-	-	-	-	-	-
N. cinerea	-	-	-	-	-	-	-	-	-	-
Canis sp.	-	-	-	-	-	-	-	-	-	-
C. latrans	7	2	4	1	-	-	-	-	-	-
C. lupus	-	-	-	-	-	-	-	-	-	-
C. familiarus	-	-	-	-	-	-	-	-	-	-
Small C. familiarus	-	-	-	-	-	-	-	-	-	-
U. cinereoargenteus	-	-	-	-	-	-	-	-	-	-
V. vulpes	-	-	-	-	-	-	-	-	-	-
T. taxus	-	-	-	-	-	-	-	-	-	-
F. rufus	-	-	-	-	-	-	-	-	-	-
C. elephus	-	-	-	-	-	-	-	-	-	-
cf. C. elaphus	-	-	-	-	-	-	-	-	-	-
O. hemionus	1	1	-	-	-	-	-	-	-	-
A. americana	-	-	-	-	-	-	-	-	-	-
O. canadensis	-	-	2	1	1	1	-	-	-	-
Buteo sp.	-	-	1	1	-	-	-	-	-	-
B. regalis	-	-	-	-	-	-	-	-	-	-
A. chrysaetos	-	-	-	-	-	-	-	-	-	-
M. gallopavo	-	-	1	1	-	-	-	-	-	-
B. virginianus	-	-	-	-	-	-	-	-	-	-
B. alpestris	-	-	-	-	-	-	-	-	-	-
C. corax	-	-	-	-	-	-	-	-	-	-
Spea sp.	-	-	-	-	-	-	-	-	-	-
S. bombifrons	-	-	-	-	-	-	-	-	-	-
S. multiplicata	-	-	-	-	-	-	-	-	-	-
Bufo sp.	-	-	-	-	-	-	-	-	-	-
B. woodhousei	-	-	-	-	-	-	-	-	-	-
P. douglassi	-	-	-	-	-	-	-	-	-	-
No. unidentified	10	-	5	-	1	-	1	-	1	-
% unidentified	47.6	-	35.7	-	50.0	-	33.3	-	100	-
TOTAL	21	4	14	5	2	1	3	2	1	-

Table 5.17. (continued)

Species	Pithouse A Antechamber fill No.	MNI	Pithouse B No.	MNI	Pithouse C No.	MNI	Pithouse H No.	MNI
Sylvilagus sp.	1	1	3	1	509	25	-	-
L. californicus	2	1	12	1	513	16	21	1
Squirrel sp.	-	-	-	-	1	1	-	-
C. gunnisoni	-	-	4	3	50	6	-	-
T. bottae	-	-	2	1	5	1	-	-
Perognathus sp.	-	-	-	-	2	1	-	-
D. ordii	-	-	-	-	2	2[a]	-	-
D. spectabilis	-	-	-	-	-	-	-	-
Peromyscus sp.	-	-	-	-	4	1	-	-
Neotoma sp.	-	-	-	-	6	1	-	-
N. cinerea	-	-	-	-	2	1	-	-
Canis sp.	-	-	-	-	7	-	-	-
C. latrans	1	1	2	1	15	1	-	-
C. lupus	-	-	-	-	1	1	1	1
C. familiarus	-	-	1	1	9	1	-	-
Small C. familiarus	-	-	-	-	1	1	-	-
U. cinereoargenteus	-	-	-	-	-	-	-	-
V. vulpes	-	-	-	-	1	1	-	-
T. taxus	-	-	-	-	2	1	-	-
F. rufus	-	-	-	-	7	1	-	-
C. elaphus	-	-	-	-	-	-	-	-
cf. C. elaphus	-	-	1	1	1	1	-	-
O. hemionus	-	-	-	-	31	1	1	1
A. americana	-	-	-	-	26	2	-	-
O. canadensis	-	-	1	1	8	1	-	-
Buteo sp.	-	-	-	-	1	-	-	-
B. regalis	-	-	-	-	1	1	-	-
A. chrysaetos	-	-	-	-	-	-	-	-
M. gallopavo	2	1	1	1	4	1	-	-
B. virginianus	-	-	-	-	-	-	-	-
B. alpestris	-	-	-	-	-	-	-	-
C. corax	-	-	-	-	1	1	-	-
Spea sp.	-	-	-	-	-	-	-	-
S. bombifrons	-	-	-	-	-	-	-	-
S. multiplicata	-	-	-	-	2	2[b]	-	-
Bufo sp.	-	-	-	-	-	-	-	-
B. woodhousei	-	-	-	-	-	-	-	-
P. douglassi	-	-	-	-	-	-	-	-
No. unidentified	19	-	29	-	901	-	3	-
% unidentified	76.0	-	51.8	-	42.6	-	50.0	-
TOTALS	25	4	56	11	2,113	72	6	3

[a] Articulated skeleton.
[b] Two articulated skeletons.

Table 5.17. (continued)

Species	Room 1, Floor 1 No.	Room 1, Floor 1 MNI	Room 1, Floor 2 No.	Room 1, Floor 2 MNI	Room 2, Floor 1 No.	Room 2, Floor 1 MNI	Room 2 Floor 2, Contact No.	Room 2 Floor 2, Contact MNI	Room 3 Floor 1, assoc. No.	Room 3 Floor 1, assoc. MNI
Sylvilagus sp.	-	-	-	-	-	-	-	-	-	-
L. californicus	4	1	-	-	2	1	-	-	-	-
Squirrel sp.	-	-	-	-	-	-	-	-	-	-
C. gunnisoni	-	-	-	-	-	-	-	-	-	-
T. bottae	-	-	-	-	-	-	-	-	-	-
Perognathus sp.	-	-	-	-	-	-	-	-	-	-
D. ordii	-	-	-	-	-	-	-	-	-	-
D. spectabilis	-	-	-	-	-	-	-	-	-	-
Peromyscus sp.	-	-	-	-	-	-	-	-	-	-
Neotoma sp.	-	-	-	-	-	-	-	-	-	-
N. cinerea	-	-	-	-	-	-	-	-	-	-
Canis sp.	-	-	-	-	-	-	-	-	-	-
C. latrans	-	-	-	-	-	-	-	-	-	-
C. lupus	-	-	-	-	-	-	-	-	-	-
C. familiarus	-	-	-	-	-	-	-	-	-	-
Small C. familiarus	-	-	-	-	-	-	-	-	-	-
U. cinereoargenteus	-	-	-	-	-	-	-	-	-	-
V. vulpes	-	-	-	-	-	-	-	-	-	-
T. taxus	-	-	-	-	-	-	-	-	-	-
F. rufus	-	-	-	-	-	-	-	-	-	-
C. elaphus	-	-	-	-	-	-	-	-	-	-
cf. C. elaphus	-	-	-	-	-	-	-	-	-	-
O. hemionus	2	1	1	1	-	-	-	-	1	[e]
A. americana	-	-	-	-	-	-	-	-	1	1
O. canadensis	-	-	-	-	1	1	-	-	-	-
Buteo sp.	-	-	-	-	-	-	-	-	-	-
B. regalis	-	-	-	-	-	-	-	-	-	-
A. chrysaetos	-	-	-	-	-	-	-	-	-	-
M. gallopavo	-	-	-	-	-	-	1	1[d]	-	-
B. virginianus	-	-	-	-	-	-	-	-	-	-
B. alpestris	-	-	-	-	-	-	-	-	-	-
C. corax	-	-	-	-	-	-	-	-	-	-
Spea sp.	-	-	-	-	-	-	-	-	-	-
S. bombifrons	-	-	-	-	-	-	-	-	-	-
S. multiplicata	-	-	-	-	-	-	-	-	-	-
Bufo sp.	-	-	-	-	-	-	-	-	-	-
B. woodhousei	-	-	-	-	-	-	-	-	-	-
P. douglassi	-	-	-	-	-	-	-	-	-	-
No. unidentified	4	-	5	-	4	-	1	-	4	-
% unidentified	40.0	-	83.3	-	57.1	-	50.0	-	66.7	-
TOTALS	10	2	6	1	7	2	2	1	6	1

[d] Immature.

[e] Antler.

Table 5.17. (continued)

Species	Room 3 Floor 2, assoc. No.	MNI	Room 4, Floor 1 No.	MNI	Room 4, Floor 2 No.	MNI	Room 5 Floor 1 & Firepit No.	MNI	Room 5 Floor 1a features No.	MNI
Sylvilagus sp.	22	3	-	-	10	2	1	1	3	2
L. californicus	9	2	-	-	6	1	13	2	23	1
Squirrel sp.	-	-	-	-	-	-	-	-	-	-
C. gunnisoni	3	1	-	-	-	-	6	2	-	-
T. bottae	-	-	-	-	-	-	-	-	-	-
Perognathus sp.	-	-	-	-	-	-	-	-	-	-
D. ordii	-	-	-	-	-	-	-	-	-	-
D. spectabilis	-	-	-	-	-	-	-	-	1	1
Peromyscus sp.	-	-	-	-	1	1[a]	-	-	-	-
Neotoma sp.	-	-	-	-	-	-	1	1	-	-
N. cinerea	-	-	-	-	-	-	-	-	-	-
Canis sp.	-	-	-	-	-	-	-	-	-	-
C. latrans	-	-	-	-	-	-	-	-	-	-
C. lupus	-	-	-	-	-	-	-	-	-	-
C. familiarus	-	-	-	-	-	-	-	-	-	-
Small C. familiarus	-	-	-	-	-	-	-	-	-	-
U. cinereoargenteus	-	-	-	-	-	-	-	-	-	-
V. vulpes	-	-	-	-	-	-	-	-	-	-
T. taxus	-	-	-	-	-	-	-	-	-	-
F. rufus	-	-	-	-	-	-	-	-	-	-
C. elaphus	-	-	-	-	-	-	-	-	-	-
cf. C. elaphus	-	-	-	-	-	-	-	-	-	-
O. hemionus	-	-	-	-	-	-	-	-	-	-
A. americana	-	-	-	-	-	-	-	-	-	-
O. canadensis	-	-	1	1	-	-	-	-	-	-
Buteo sp.	-	-	-	-	-	-	1	1	-	-
B. regalis	-	-	-	-	-	-	-	-	-	-
A. chrysaetos	-	-	-	-	-	-	-	-	-	-
M. gallopavo	-	-	1	1	4	1[d]	-	-	-	-
B. virginianus	-	-	-	-	-	-	-	-	-	-
E. alpestris	-	-	-	-	-	-	-	-	-	-
C. corax	-	-	-	-	-	-	-	-	-	-
Spea sp.	-	-	-	-	1	1	-	-	-	-
S. bombifrons	-	-	-	-	-	-	-	-	-	-
S. multiplicata	-	-	-	-	-	-	-	-	-	-
Bufo sp.	-	-	-	-	-	-	-	-	-	-
B. woodhousei	-	-	-	-	-	-	-	-	-	-
P. douglassi	-	-	-	-	-	-	-	-	-	-
No. unidentified	11	-	0	-	4	-	31	-	14	-
% unidentified	24.4	-	0.0	-	15.4	-	58.5	-	34.1	-
TOTALS	45	6	2	2	26	6	53	7	41	4

[a] Articulated skeleton.
[d] Immature.

Table 5.17. (continued).

Species	Room 5, Floor 2 Fill & assoc. No.	MNI	Room 5 Floor 3, fill No.	MNI	Room 6, Floor 1 No.	MNI	Room 6, Floor 2 No.	MNI	Room 6, Floor 3 No.	MNI
Sylvilagus sp.	6	1	-	-	-	-	-	-	-	-
L. californicus	7	2	1	1	-	-	1	1	1	1
Squirrel sp.	-	-	-	-	-	-	-	-	-	-
C. gunnisoni	-	-	-	-	-	-	-	-	2	1
T. bottae	1	1	-	-	-	-	-	-	-	-
Perognathus sp.	-	-	-	-	-	-	-	-	-	-
D. ordii	-	-	-	-	-	-	-	-	-	-
D. spectabilis	-	-	-	-	-	-	-	-	-	-
Peromyscus sp.	1	1	-	-	-	-	-	-	-	-
Neotoma sp.	-	-	-	-	-	-	-	-	-	-
N. cinerea	-	-	-	-	-	-	-	-	-	-
Canis sp.	-	-	-	-	-	-	2	1	-	-
C. latrans	-	-	-	-	-	-	-	-	-	-
C. lupus	-	-	-	-	-	-	-	-	-	-
C. familiarus	-	-	-	-	-	-	-	-	-	-
Small C. familiarus	-	-	-	-	-	-	-	-	-	-
U. cinereoargenteus	-	-	-	-	-	-	-	-	-	-
V. vulpes	-	-	-	-	-	-	-	-	-	-
T. taxus	-	-	-	-	-	-	-	-	-	-
F. rufus	-	-	-	-	-	-	-	-	-	-
C. elaphus	-	-	-	-	-	-	-	-	-	-
cf. C. elaphus	-	-	-	-	-	-	-	-	-	-
O. hemionus	-	-	-	-	-	-	-	-	-	-
A. americana	-	-	-	-	-	-	-	-	-	-
O. canadensis	-	-	-	-	-	-	-	-	-	-
Buteo sp.	-	-	-	-	-	-	-	-	-	-
B. regalis	-	-	-	-	-	-	-	-	-	-
A. chrysaetos	-	-	-	-	-	-	-	-	-	-
M. gallopavo	-	-	-	-	2	1	-	-	-	-
B. virginianus	-	-	-	-	-	-	-	-	-	-
E. alpestris	-	-	-	-	-	-	-	-	-	-
C. corax	-	-	-	-	-	-	-	-	-	-
Spea sp.	-	-	-	-	-	-	-	-	-	-
S. bombifrons	-	-	-	-	-	-	-	-	-	-
S. multiplicata	-	-	-	-	-	-	-	-	-	-
Bufo sp.	-	-	-	-	-	-	-	-	-	-
B. woodhousei	-	-	-	-	-	-	-	-	-	-
P. douglassi	-	-	-	-	-	-	-	-	-	-
No. unidentified	28	-	8	-	5	-	3	-	7	-
% unidentified	63.6	-	88.9	-	71.4	-	50.0	-	70.0	-
TOTALS	44	5	9	1	7	1	6	2	10	2

Table 5.17. (continued)

Species	Room 7, Floor 1 No.	Room 7, Floor 1 MNI	Room 7, Floor 2 No.	Room 7, Floor 2 MNI	Room 8 Floors 1 and 2 No.	Room 8 Floors 1 and 2 MNI	Room 8 Floors 3 and 4 No.	Room 8 Floors 3 and 4 MNI	Room 9, Floor 2 and Burial 2 No.	Room 9, Floor 2 and Burial 2 MNI
Sylvilagus sp.	2	1	13	1	6	2	12	1	-	-
L. californicus	4	1	7	1	5	1	3	1	1	1
Squirrel sp.	-	-	-	-	-	-	-	-	-	-
C. gunnisoni	2	1	5	1	5	1	4	2[a]	-	-
T. bottae	-	-	-	-	1	1	-	-	-	-
Perognathus sp.	-	-	-	-	-	-	-	-	-	-
D. ordii	-	-	-	-	1	1	-	-	-	-
D. spectabilis	-	-	-	-	-	-	-	-	-	-
Peromyscus sp.	-	-	-	-	-	-	-	-	-	-
Neotoma sp.	-	-	-	-	-	-	-	-	-	-
N. cinerea	-	-	-	-	-	-	-	-	2	2[a]
Canis sp.	-	-	-	-	-	-	-	-	-	-
C. latrans	-	-	1	1	1	1	-	-	-	-
C. lupus	-	-	-	-	-	-	-	-	-	-
C. familiarus	-	-	1	1	-	-	-	-	-	-
Small C. familiarus	-	-	-	-	-	-	-	-	-	-
U. cinereoargenteus	-	-	-	-	-	-	-	-	-	-
V. vulpes	-	-	-	-	-	-	-	-	-	-
T. taxus	-	-	-	-	-	-	-	-	-	-
F. rufus	-	-	-	-	-	-	-	-	-	-
C. elaphus	-	-	-	-	-	-	-	-	-	-
cf. C. elaphus	-	-	-	-	-	-	-	-	-	-
O. hemionus	-	-	1	1	2	1	1	1	-	-
A. americana	-	-	-	-	-	-	1	1	-	-
O. canadensis	1	1	-	-	-	-	1	1	-	-
Buteo sp.	-	-	-	-	-	-	-	-	-	-
B. regalis	-	-	-	-	-	-	-	-	-	-
A. chrysaetos	-	-	-	-	-	-	-	-	-	-
M. gallopavo	1	1	1	1	1	1	1	1	-	-
B. virginianus	-	-	-	-	-	-	-	-	-	-
E. alpestris	-	-	-	-	-	-	-	-	-	-
C. corax	-	-	-	-	-	-	-	-	-	-
Spea sp.	-	-	-	-	1	1	-	-	-	-
S. bombifrons	-	-	-	-	-	-	-	-	-	-
S. multiplacata	-	-	-	-	-	-	-	-	-	-
Bufo sp.	-	-	-	-	-	-	-	-	-	-
B. woodhousei	-	-	-	-	-	-	-	-	-	-
P. douglassi	-	-	-	-	-	-	-	-	-	-
No. unidentified	12	-	27	-	22	-	11	-	0	-
% unidentified	54.5	-	48.2	-	48.9	-	32.3	-	0.0	-
TOTALS	22	5	56	7	45	10	34	8	3	3

[a] Articulated skeleton.

Table 5.17. (continued)

Species	Room 9, Floor 2a No.	Room 9, Floor 2a MNI	Room 9 Floors 3 and 4 No.	Room 9 Floors 3 and 4 MNI	Room 10, fill Floor 1a, feat. No.	Room 10, fill Floor 1a, feat. MNI	Room 10 Floor 2, fill No.	Room 10 Floor 2, fill MNI	Room 10, Floor 2 Feature and Wall No.	Room 10, Floor 2 Feature and Wall MNI
Sylvilagus sp.	3	1	2	1	-	-	19	2	18	3
L. californicus	13	1	1	1	7	1	7	1	1	1
Squirrel sp.	-	-	-	-	-	-	-	-	-	-
C. gunnisoni	-	-	-	-	-	-	7	1	1	1
T. bottae	-	-	-	-	-	-	-	-	-	-
Perognathus sp.	-	-	1	1	-	-	-	-	-	-
D. ordii	-	-	-	-	-	-	-	-	3	1
D. spectabilis	-	-	-	-	1	1	-	-	-	-
Peromyscus sp.	-	-	-	-	-	-	-	-	2	2[a]
Neotoma sp.	-	-	-	-	-	-	-	-	-	-
N. cinerea	-	-	-	-	-	-	1	1	-	-
Canis sp.	-	-	-	-	3	1[d]	2	1	-	-
C. latrans	-	-	-	-	-	-	-	-	-	-
C. lupus	-	-	-	-	-	-	-	-	-	-
C. familiarus	-	-	-	-	-	-	-	-	-	-
Small C. familiarus	-	-	-	-	-	-	-	-	-	-
U. cinereoargenteus	-	-	-	-	-	-	-	-	-	-
V. vulpes	-	-	-	-	-	-	-	-	-	-
T. taxus	-	-	-	-	-	-	-	-	-	-
F. rufus	-	-	-	-	-	-	-	-	-	-
C. elaphus	-	-	-	-	-	-	-	-	-	-
cf. C. elaphus	-	-	-	-	-	-	-	-	-	-
O. hemionus	-	-	-	-	3	1	2	1	-	-
A. americana	-	-	-	-	-	-	-	-	-	-
O. canadensis	-	-	-	-	-	-	-	-	-	-
Buteo sp.	-	-	-	-	-	-	-	-	-	-
B. regalis	-	-	-	-	-	-	-	-	-	-
A. chrysaetos	-	-	-	-	-	-	-	-	-	-
M. gallopavo	-	-	-	-	4	2[d]	-	-	-	-
B. virginianus	-	-	-	-	-	-	-	-	-	-
E. alpestris	-	-	-	-	-	-	-	-	-	-
C. corax	-	-	-	-	-	-	-	-	-	-
Spea sp.	-	-	-	-	-	-	1	1[a]	-	-
S. bombifrons	-	-	-	-	-	-	-	-	-	-
S. multiplicata	-	-	-	-	-	-	-	-	-	-
Bufo sp.	-	-	-	-	-	-	-	-	-	-
B. woodhousei	-	-	-	-	-	-	-	-	-	-
P. douglassi	-	-	-	-	-	-	-	-	-	-
No. unidentified	15	-	11	-	18	-	63	-	15	-
% unidentified	46.9	-	73.3	-	48.6	-	61.8	-	37.5	-
TOTALS	32	2	15	3	37	6	102	8	40	8

[a] Articulated skeleton.
[d] Immature.

Table 5.17. (continued)

Species	Room 11 No.	Room 11 MNI	Room 12 Floor 1, Fill No.	Room 12 Floor 1, Fill MNI	Room 12, Floor 1 and Features No.	Room 12, Floor 1 and Features MNI	Room 13 No.	Room 13 MNI	Room 14, Floor 1 Fill and Contact No.	Room 14, Floor 1 Fill and Contact MNI
Sylvilagus sp.	-	-	-	-	-	-	-	-	3	1
L. californicus	-	-	1	1	-	-	-	-	-	-
Squirrel sp.	-	-	-	-	-	-	-	-	-	-
C. gunnisoni	-	-	-	-	-	-	-	-	4	2
T. bottae	-	-	-	-	-	-	-	-	-	-
Perognathus sp.	-	-	-	-	-	-	-	-	-	-
D. ordii	-	-	-	-	-	-	-	-	-	-
D. spectabilis	-	-	-	-	-	-	-	-	-	-
Peromyscus sp.	-	-	-	-	-	-	-	-	-	-
Neotoma sp.	1	1	-	-	-	-	-	-	-	-
N. cinerea	-	-	-	-	-	-	-	-	-	-
Canis sp.	-	-	-	-	-	-	-	-	-	-
C. latrans	-	-	-	-	-	-	-	-	-	-
C. lupus	-	-	-	-	-	-	-	-	-	-
C. familiarus	-	-	-	-	2	1	-	-	-	-
Small C. familiarus	-	-	-	-	-	-	-	-	-	-
U. cinereoargenteus	-	-	-	-	-	-	-	-	-	-
V. vulpes	-	-	-	-	-	-	-	-	-	-
T. taxus	-	-	-	-	-	-	-	-	-	-
F. rufus	-	-	-	-	-	-	-	-	-	-
C. elaphus	-	-	-	-	-	-	-	-	-	-
cf. C. elaphus	-	-	-	-	-	-	-	-	-	-
O. hemionus	1*	-	2	1	1	1	-	-	-	-
A. americana	-	-	-	-	-	-	-	-	-	-
O. canadensis	-	-	1	1	-	-	-	-	-	-
Buteo sp.	2	1	-	-	-	-	-	-	-	-
B. regalis	-	-	-	-	-	-	-	-	-	-
A. chrysaetos	-	-	-	-	-	-	-	-	-	-
M. gallopavo	-	-	-	-	1	1	1	1	-	-
B. virginianus	-	-	-	-	-	-	-	-	-	-
E. alpestris	-	-	-	-	-	-	-	-	-	-
C. corax	-	-	-	-	-	-	-	-	-	-
Spea sp.	-	-	-	-	-	-	-	-	-	-
S. bombifrons	-	-	-	-	-	-	-	-	-	-
S. multiplicata	-	-	-	-	-	-	-	-	-	-
Bufo sp.	-	-	-	-	-	-	-	-	-	-
B. woodhousei	-	-	-	-	-	-	-	-	-	-
P. douglassi	-	-	-	-	-	-	-	-	-	-
No. unidentified	12	-	4	-	6	-	0	-	2	0
% unidentified	75.0	-	50.0	-	60.0	-	0.0	-	22.2	-
TOTALS	16	2	8	3	10	3	1	1	9	3

* Antler.

Table 5.17. (continued)

Species	Room 14, Floor 2 Fill and Firepit No.	MNI	Room 15 No.	MNI	Room 16, Floor 1 Fill and Contact No.	MNI	Room 16 Floor 2, Fill No.	MNI	Room 16 Floor 3, Features No.	MNI
Sylvilagus sp.	1	1	1	1	-	-	1	1	1	1
L. californicus	-	-	1	1	2	1	10	1	-	-
Squirrel sp.	-	-	-	-	-	-	-	-	-	-
C. gunnisoni	-	-	1	1	2	1	-	-	-	-
T. bottae	-	-	-	-	-	-	-	-	-	-
Perognathus sp.	-	-	-	-	-	-	-	-	-	-
D. ordii	-	-	-	-	-	-	-	-	-	-
D. spectabilis	-	-	-	-	-	-	-	-	-	-
Peromyscus sp.	-	-	-	-	-	-	-	-	1	1
Neotoma sp.	-	-	-	-	-	-	-	-	-	-
N. cinerea	-	-	-	-	-	-	-	-	-	-
Canis sp.	-	-	-	-	-	-	-	-	-	-
C. latrans	-	-	-	-	1	1	-	-	-	-
C. lupus	-	-	-	-	-	-	-	-	-	-
C. familiarus	-	-	-	-	-	-	-	-	-	-
Small C. familiarus	-	-	-	-	-	-	-	-	-	-
U. cinereoargenteus	-	-	-	-	-	-	-	-	-	-
V. vulpes	-	-	-	-	-	-	-	-	-	-
T. taxus	-	-	-	-	-	-	-	-	-	-
F. rufus	-	-	1	1	-	-	-	-	-	-
C. elaphus	-	-	-	-	-	-	-	-	-	-
cf. C. elaphus	-	-	-	-	-	-	-	-	-	-
O. hemionus	1	1	1	1	1	1	-	-	-	-
A. americana	-	-	-	-	-	-	-	-	-	-
O. canadensis	-	-	-	-	-	-	-	-	-	-
Buteo sp.	-	-	-	-	-	-	-	-	-	-
B. regalis	-	-	-	-	-	-	-	-	-	-
A. chrysaetos	-	-	-	-	-	-	-	-	-	-
M. gallopavo	-	-	-	-	-	-	-	-	1	1
B. virginianus	-	-	-	-	-	-	-	-	-	-
E. alpestris	-	-	-	-	-	-	-	-	-	-
C. corax	-	-	-	-	-	-	-	-	-	-
Spea sp.	-	-	-	-	-	-	-	-	-	-
S. bombifrons	-	-	-	-	-	-	-	-	-	-
S. multiplicata	-	-	-	-	-	-	-	-	-	-
Bufo sp.	-	-	-	-	-	-	-	-	-	-
B. woodhousei	-	-	-	-	-	-	-	-	-	-
P. douglassi	-	-	-	-	1	1	-	-	-	-
No. unidentified	1	-	9	-	2	-	9	-	17	-
% unidentified	33.3	-	64.3	-	18.2	-	45.0	-	85.0	-
TOTALS	3	2	14	5	11	5	20	2	20	3

Table 5.17. (continued)

Species	Room 16 Floor 4, Fill No.	MNI	Rm. 17/18, Fl.1 Fill, FP & Wall No.	MNI	Rm. 17/18, FL.2 FP 1 & 2 No.	MNI	Room 19 Floor 1, Fill No.	MNI	Room 19 Floor 2, Contact No.	MNI
Sylvilagus sp.	11	2	2	1	9	2	2	1	-	-
L. californicus	2	1	8	2	2	1	16	3	-	-
Squirrel sp.	-	-	-	-	-	-	-	-	-	-
C. gunnisoni	-	-	-	-	-	-	3	1	-	-
T. bottae	-	-	-	-	-	-	-	-	-	-
Perognathus sp.	-	-	-	-	-	-	-	-	-	-
D. ordii	-	-	-	-	-	-	-	-	-	-
D. spectabilis	-	-	-	-	-	-	-	[b]	-	-
Peromyscus sp.	-	-	-	-	-	-	5	5[c]	-	-
Neotoma sp.	-	-	-	-	-	-	-	-	-	-
N. cinerea	-	-	-	-	-	-	-	-	-	-
Canis sp.	-	-	-	-	-	-	-	-	-	-
C. latrans	-	-	-	-	-	-	-	-	-	-
C. lupus	-	-	-	-	-	-	-	-	-	-
C. familiarus	-	-	-	-	-	-	-	-	-	-
Small C. familiarus	-	-	-	-	-	-	-	-	-	-
U. cinereoargenteus	-	-	-	-	-	-	-	-	-	-
V. vulpes	-	-	-	-	-	-	-	-	-	-
T. taxus	-	-	-	-	-	-	-	-	-	-
R. rufus	-	-	-	-	-	-	-	-	-	-
C. elaphus	-	-	-	-	-	-	-	-	-	-
cf. C. elaphus	-	-	-	-	-	-	-	-	-	-
O. hemionus	-	-	14	1	-	-	-	-	-	-
A. americana	1	1	4	1	-	-	-	-	-	-
O. canadensis	-	-	-	-	-	-	1	1	-	-
Buteo sp.	-	-	-	-	-	-	-	-	-	-
B. regalis	-	-	-	-	-	-	-	-	-	-
A. chrysaetos	-	-	-	-	-	-	-	-	-	-
M. gallopavo	-	-	7	1	-	-	-	-	1	1
B. virginianus	-	-	-	-	-	-	-	-	-	-
E. alpestris	-	-	-	-	-	-	-	-	-	-
C. corax	-	-	-	-	-	-	-	-	-	-
Spea sp.	-	-	-	-	-	-	-	-	-	-
S. bombifrons	-	-	-	-	-	-	-	-	-	-
S. multiplicata	-	-	-	-	-	-	-	-	-	-
Bufo sp.	-	-	-	-	-	-	-	-	-	-
B. woodhousei	-	-	-	-	-	-	-	-	-	-
P. douglassi	-	-	-	-	-	-	-	-	-	-
No. unidentified	1	-	8	-	5	-	15	-	2	-
% unidentified	6.7	-	18.6	-	31.2	-	35.7	-	66.7	-
TOTALS	15	4	43	6	16	3	42	11	3	1

[b] Two articulated skeletons.
[c] Three articulated skeletons.

Table 5.17. (continued)

Species	Rooms 20 and 21 Floor 1, Contact No.	MNI	Room 22, Floor 1 No.	MNI	Room 22 Floor 3, Fill No.	MNI
Sylvilagus sp.	-	-	6	2	4	1
L. californicus	1	1	1	1	-	-
Squirrel sp.	-	-	-	-	-	-
C. gunnisoni	-	-	6	1	3	1
T. bottae	-	-	-	-	2	1
Perognathus sp.	-	-	-	-	-	-
D. ordii	-	-	-	-	-	-
D. spectabilis	-	-	-	-	4	2
Peromyscus sp.	-	-	-	-	-	-
Neotoma sp.	-	-	-	-	-	-
N. cinerea	-	-	-	-	-	-
Canis sp.	-	-	-	-	-	-
C. latrans	-	-	-	-	-	-
C. lupus	-	-	-	-	-	-
C. familiarus	-	-	-	-	-	-
Small C. familiarus	-	-	-	-	-	-
U. cinereoargenteus	-	-	-	-	-	-
V. vulpes	-	-	-	-	-	-
T. taxus	-	-	-	-	-	-
F. rufus	-	-	-	-	-	-
C. elaphus	-	-	-	-	-	-
cf. C. elaphus	-	-	-	-	-	-
O. hemionus	-	-	1	1	-	-
A. americana	-	-	-	-	-	-
O. canadensis	-	-	-	-	-	-
Buteo sp.	-	-	-	-	-	-
B. regalis	-	-	-	-	-	-
A. chrysaetos	-	-	-	-	-	-
M. gallopavo	-	-	2	2[d]	1	1
B. virginianus	-	-	-	-	-	-
E. alpestris	-	-	-	-	-	-
C. corax	-	-	-	-	-	-
Spea sp.	-	-	-	-	11	4
S. bombifrons	-	-	-	-	2	2
S. multiplicata	-	-	-	-	-	-
Bufo sp.	-	-	-	-	-	-
B. woodhousei	-	-	-	-	-	-
P. douglassi	-	-	-	-	-	-
No. unidentified	1	-	28	-	9	-
% unidentified	50.0	-	63.6	-	25.0	-
TOTALS	2	1	44	7	36	12

[d] One immature.

Table 5.17. (continued)

Species	Room 23 Floor 1, Fill No.	Room 23 Floor 1, Fill MNI	Room 23, Floor 1 Contact & Feat. No.	Room 23, Floor 1 Contact & Feat. MNI	Room 24 No.	Room 24 MNI	Room 25 No.	Room 25 MNI
Sylvilagus sp.	22	3	3	1	-	-	-	-
L. californicus	4	1	-	-	-	-	1	1
Squirrel sp.	-	-	-	-	-	-	-	-
C. gunnisoni	2	1	-	-	1	1	-	-
T. bottae	1	1	-	-	-	-	-	-
Perognathus sp.	-	-	-	-	-	-	-	-
D. ordii	-	-	-	-	-	-	-	-
D. spectabilis	-	-	-	-	-	-	-	-
Peromyscus sp.	-	-	-	-	-	-	-	-
Neotoma sp.	1	1	-	-	-	-	-	-
N. cinerea	-	-	-	-	-	-	-	-
Canis sp.	-	-	-	-	-	-	-	-
C. latrans	-	-	-	-	-	-	-	-
C. lupus	-	-	-	-	-	-	-	-
C. familiarus	-	-	-	-	-	-	-	-
Small C. familiarus	-	-	-	-	-	-	-	-
U. cinereoargenteus	-	-	-	-	-	-	-	-
V. vulpes	-	-	-	-	-	-	-	-
T. taxus	-	-	-	-	-	-	-	-
F. rufus	-	-	-	-	-	-	-	-
C. elaphus	-	-	-	-	-	-	-	-
cf. C. elaphus	-	-	-	-	-	-	-	-
O. hemionus	2	1	-	-	-	-	1	1
A. americana	2	1	-	-	-	-	-	-
O. canadensis	-	-	-	-	-	-	-	-
Buteo sp.	-	-	-	-	-	-	-	-
B. regalis	-	-	-	-	-	-	-	-
A. chrysaetos	1	1	-	-	-	-	-	-
M. gallopavo	1	1	-	-	-	-	-	-
B. virginianus	-	-	-	-	-	-	-	-
E. alpestris	-	-	-	-	-	-	-	-
C. corax	-	-	-	-	-	-	-	-
Spea sp.	-	-	-	-	-	-	-	-
S. bombifrons	-	-	-	-	-	-	-	-
S. multiplicata	-	-	-	-	-	-	-	-
Bufo sp.	-	-	-	-	-	-	-	-
B. woodhousei	-	-	-	-	-	-	-	-
P. douglassi	-	-	-	-	-	-	-	-
No. unidentified	30	-	1	-	1	-	3	-
% unidentified	45.4	-	25.0	-	50.0	-	60.0	-
TOTAL	66	11	4	1	2	1	5	2

Table 5.17. (continued)

Species	Kiva D, Fill No.	Kiva D, Fill MNI	Kiva D, Floor 1 Contact, M. Feat. No.	Kiva D, Floor 1 Contact, M. Feat. MNI	Kiva D Firepit 1 No.	Kiva D Firepit 1 MNI	Kiva D, Pit 7 No.	Kiva D, Pit 7 MNI
Sylvilagus sp.	71	7	2	1	-	-	-	-
L. californicus	224	7	1	1	-	-	-	-
Squirrel sp.	-	-	-	-	-	-	-	-
C. gunnisoni	4	1	-	-	1	1	-	-
T. bottae	3	1	-	-	1	1	-	-
Perognathus sp.	2	1	-	-	-	-	-	-
D. ordii	20	1	-	-	1	1	-	-
D. spectabilis	3	1	-	-	-	-	-	-
Peromyscus sp.	1	1	-	-	-	-	3	1
Neotoma sp.	1	-	-	-	-	-	-	-
N. cinerea	1	1	-	-	-	-	-	-
Canis sp.	2	-	2[a]	2[d]	-	-	-	-
C. latrans	-	-	-	-	-	-	-	-
C. lupus	-	-	-	-	-	-	-	-
C. familiarus	1	1	-	-	-	-	-	-
Small C. familiarus	1	1	-	-	-	-	-	-
U. cinereoargenteus	-	-	-	-	-	-	-	-
V. vulpes	-	-	-	-	-	-	-	-
T. taxus	-	-	-	-	-	-	-	-
F. rufus	2	1	-	-	-	-	-	-
C. elaphus	1	1	-	-	-	-	-	-
cf. C. elaphus	-	-	-	-	-	-	-	-
O. hemionus	44	3	2	1	-	-	-	-
A. americana	8	1	-	-	-	-	-	-
O. canadensis	7	1	-	-	-	-	-	-
Buteo sp.	-	-	-	-	-	-	-	-
B. regalis	-	-	-	-	-	-	-	-
A. chrysaetos	1	1	-	-	-	-	-	-
M. gallopavo	20	3[d]	8	1	-	-	1	1
B. virginianus	-	-	-	-	-	-	-	-
E. alpestris	-	-	-	-	-	-	-	-
C. corax	-	-	-	-	-	-	-	-
Spea sp.	8	4	-	-	1	1	-	-
S. bombifrons	-	-	-	-	-	-	-	-
S. multiplicata	-	-	-	-	-	-	-	-
Bufo sp.	-	-	-	-	1	1	-	-
B. woodhousei	1	1	-	-	-	-	-	-
P. douglassi	-	-	-	-	-	-	-	-
No. unidentified	294	-	10	-	7	-	3	-
% unidentified	40.8	-	40.0	-	58.3	-	42.8	-
TOTAL	720	39	25	6	12	5	7	2

[a] Articulated skeleton.
[d] One immature.

Table 5.17. (continued)

Species	Kiva F Other Pit No.	MNI	Kiva G No.	MNI	Plaza No.	MNI	Ramada Fill No.	MNI
Sylvilagus sp.	1	1	2	1	3	1	2	1
L. californicus	-	-	9	2	22	2	3	1
Squirrel sp.	-	-	-	-	-	-	-	-
C. gunnisoni	-	-	3	1	2	1	1	1
T. bottae	-	-	-	-	-	-	-	-
Perognathus sp.	-	-	-	-	-	-	-	-
D. ordii	-	-	-	-	-	-	-	-
D. spectabilis	-	-	-	-	-	-	-	-
Peromyscus sp.	-	-	-	-	-	-	-	-
Neotoma sp.	-	-	-	-	-	-	-	-
N. cinerea	-	-	-	-	-	-	-	-
Canis sp.	-	-	2	-	2	1	3	-
C. latrans	-	-	1	1	-	-	3	1
C. lupus	-	-	-	-	-	-	-	-
C. familiarus	-	-	1	1	-	-	-	-
Small C. familiarus	-	-	-	-	-	-	1	1
U. cinereoargenteus	-	-	-	-	-	-	-	-
V. vulpes	-	-	1	1	-	-	-	-
T. taxus	-	-	-	-	-	-	-	-
F. rufus	-	-	-	-	-	-	-	-
C. elaphus	-	-	-	-	-	-	-	-
cf. C. elaphus	-	-	-	-	-	-	-	-
O. hemionus	9	2	8	1	4	1	2	1
A. americana	-	-	-	-	1	1	1	1
O. canadensis	-	-	-	-	-	-	-	-
Buteo sp.	-	-	-	-	-	-	-	-
B. regalis	-	-	-	-	-	-	-	-
A. chrysaetos	-	-	-	-	1	1	-	-
M. gallopavo	-	-	2	1	3	1	-	-
B. virginianus	-	-	-	-	-	-	-	-
E. alpestris	-	-	-	-	-	-	-	-
C. corax	-	-	-	-	-	-	-	-
Spea sp.	-	-	-	-	-	-	-	-
S. bombifrons	-	-	-	-	-	-	-	-
S. multiplicata	-	-	-	-	-	-	-	-
Bufo sp.	-	-	-	-	-	-	-	-
B. woodhousei	-	-	-	-	-	-	-	-
P. douglassi	-	-	-	-	-	-	-	-
No. unidentified	0	-	15	-	60	-	18	-
% unidentified	0.0	-	34.1	-	61.2	-	52.9	-
TOTALS	10	3	44	9	98	9	34	7

Table 5.17. (continued)

Species	Kiva E, Fill		Kiva E Firepit 1		Kiva E Subfloor Vent		Kiva F, Fill, Fl., M. Features		Kiva F Subfloor Vent	
	No.	MNI	No.	MNI	No.	MNI	No.	MNI	No.	MNI
Sylvilagus sp.	75	5	-	-	2	1	104	7	1	1
L. californicus	231	4	4	1	3	1	71	2	2	1
Squirrel sp.	-	-	-	-	-	-	-	-	-	-
C. gunnisoni	208	16	1	1	-	-	14	2	-	-
T. bottae	4	2	-	-	-	-	2	1	-	-
Perognathus sp.	-	-	-	-	-	-	-	-	-	-
D. ordii	2	1	-	-	1	1	1	1[a]	-	-
D. spectabilis	-	-	-	-	-	-	-	-	-	-
Peromyscus sp.	1	1	-	-	-	-	4	1	-	-
Neotoma sp.	2	1	1	1	-	-	1	1	9	-
N. cinerea	-	-	-	-	-	-	-	-	-	-
Canis sp.	4	-	-	-		-	3	-	-	-
C. latrans	2	1	-	-	-	-	1	1	-	-
C. lupus	-	-	-	-	-	-	-	-	-	-
C. familiarus	63	1	-	-	-	-	-	-	-	-
Small C. familiarus	-	-	-	-	-	-	-	-	-	-
U. cinereoargenteus	1	1	-	-	-	-	-	-	-	-
V. vulpes	-	-	-	-	-	-	-	-	-	-
T. taxus	1	1	-	-	-	-	-	-	-	-
F. rufus	-	-	-	-	-	-	1	1	-	-
C. elaphus	-	-	-	-	-	-	-	-	-	-
cf. C. elaphus	-	-	-	-	-	-	-	-	-	-
O. hemionus	55	2	-	-	-	-	10	1	-	-
A. americana	14	1	-	-	-	-	3	1	-	-
O. canadensis	44	1	-	-	-	-	1	1	-	-
Buteo sp.	-	-	-	-	-	-	-	-	-	-
B. regalis	-	-	-	-	-	-	-	-	-	-
A. chrysaetos	1	1	-	-	-	-	-	-	-	-
M. gallopavo	37	2	-	-	-	-	72	8[f]	-	-
B. virginianus	2	1	-	-	-	-	-	-	-	-
E. alpestris	-	-	-	-	-	-	1	1	-	-
C. corax	-	-	-	-	-	-	-	-	-	-
Spea sp.	-	-	-	-	-	-	1	1	-	-
S. bombifrons	-	-	-	-	-	-	-	-	-	-
S. multiplicata	1	1	-	-	-	-	-	-	-	-
Bufo sp.	-	-	-	-	-	-	-	-	-	-
B. woodhousei	1	1[a]	-	-	-	-	-	-	-	-
P. douglassi	-	-	-	-	-	-	-	-	-	-
No. unidentified	803	-	10	-	5	-	118	-	1	-
% unidentified	51.7	-	62.5	-	45.4	-	28.9	-	7.7	-
TOTAL	1,552	44	16	3	11	3	408	30	13	3

[a] Articulated skeleton.
[f] Six articulated skeletons, all immature.

Table 5.17. (continued)

	Trash Midden				Total	
	Group 1[g]		Group 2[h]			max.
Species	No.	MNI	No.	MNI	No.	MNI
Sylvilagus sp.	20	3	9	2	992	99
L. californicus	55	3	25	4	1,345	87
Squirrel sp.	1	1	-	-	2	2
C. gunnisoni	4	1	4	1	355	56
T. bottae	2	1	-	-	24	12
Perognathus sp.	-	-	-	-	5	3
D. ordii	-	-	1	1	32	10
D. spectabilis	2	2	1	1	8	6
Peromyscus sp.	-	-	-	-	27	17
Neotoma sp.	-	-	-	-	23	8
N. cinerea	1	1	-	-	7	6
Canis sp.	2	-	-	-	33	6
C. latrans	10	1	4	1	53	15
C. lupus	1	1	-	-	3	3
C. familiarus	1	1	3	1	84	9
Small C. familiarus	1	1	1	1	5	5
U. cinereoargenteus	-	-	-	-	1	1
V. vulpes	-	-	-	-	2	2
T. taxus	-	-	-	-	3	2
F. rufus	1	1	-	-	12	5
C. elaphus	1	1	1	1	4	4
cf. C. elaphus	-	-	-	-	1	1
O. hemionus	3	1	13	1	224	33
A. americana	-	-	3	1	65	13
O. canadensis	1	1	2	1	73	15
Buteo sp.	1	-	-	-	6	3
B. regalis	-	-	1	1	2	2
A. chrysaetos	1	1	1	1	6	6
M. gallopavo	2	1	5	1	190	42
B. virginianus	-	-	-	-	2	1
E. alpestris	-	-	-	-	1	1
C. corax	-	-	-	-	1	1
Spea sp.	-	-	-	-	24	13
S. bombifrons	-	-	-	-	2	2
S. multiplicata	-	-	-	-	3	3
Bufo sp.	-	-	-	-	1	1
B. woodhousei	-	-	-	-	2	2
P. douglassi	-	-	-	-	1	1
No. unidentified	222	-	104	-	3,128	-
% unidentified	66.9	-	58.4	-	46.3	-
TOTALS	332	22	178	19	6,752	498

[g] A.D. 920-1020.
[h] A.D. 1020-1120.

The Rooms

Few of the rooms contained faunal remains, therefore, sample sizes were small, especially when the materials were divided by floor associations. In general, there were more L. californicus and C. gunnisoni than Sylvilagus remains above the first floors as opposed to species recovered above the second floors (Table 5.18). This difference between the remains associated with the two floors roughly corresponds to a difference in time between A.D. 950 to 1020, and A.D. 1020 to 1120.

The following are comments of interest and information on seasonality.

Room 4, Floor 2, contained the tibias and tarsometatarsi of an immature M. gallapavo about three days old. This could indicate a mid-May to June deposition (Schorger 1966) if it was a primary one.

Room 5, Floor 1a, had an element of an immature Sylvilagus, which could suggest a June to October deposition if it was primary. On the same floor were large parts of a pair of possibly articulated L. californicus hind feet.

Room 9, Floor 2, had a human burial, Burial 2, resting on it. With the burial was an articulated N. cinerea. Assuming that it was not an offering, this may suggest that the room was left open and the burial was only loosely covered, which allowed the woodrat to make its home with the body.

The fill and floor of Room 17-18 contained four pieces of antler and numerous foot bones from both O. hemionus and A. americana. These suggest a work area or work areas for bone and possibly chipped stone. One of the firepits from the second floor of this same room contained six elements from an immature Sylvilagus--all front foot elements, which suggest a June to October deposition in the pit.

Room 22 was interesting because of it contained the remains of four Spea sp. and two S. bombifrons.

The Kivas

The faunal assemblages from the kivas have more interpretive potential because they contained large numbers of bones, which made it easier to graph and to analyze them statistically.

The alluvial and trash fill of Kiva D contained 720 bones. The distribution was what was expected for the A.D. 1020-1120 period with equal numbers of

Table 5.18. Comparisons of the three small economic species from rooms.

Taxon	Total MNI Above Floor 1	Total MNI Above Floor 2
Sylvilagus	17	13
L. californicus	14	19
C. gunnisoni	12	5

$\chi^2 = 3.72$

df = 2

p = .15561

both species of rabbit. Truell thought that the materials recorded as floor artifacts were actually thrown in at the closing of the kiva. The faunal assemblage also suggests that this was the case. Twenty-five elements were recorded as floor contact artifacts, only 3 of which were rabbit. More rabbits were expected, given that almost 70% of identified elements in the fill were rabbits. An articulated canid (less than one month old) and skull of another (around four months old) (Cornwall 1974) were possibly part of the ritual which closed the kiva. This also may have been true of the cranial case from an O. hemionus and for two M. gallapavo wings that could have been articulated.

Kiva E contained some of the latest trash from the site (mixed with earlier ceramics) and the second largest assemblage of bone from 29SJ 627. Very little was found on the floor, and the feature fill was not enlightening.

Even though this unit contained redeposited Red Mesa ceramics and other associated materials in the trash, there are more L. californicus than Sylvilagus bones. The large number of C. gunnisoni is quite unusual. Sixteen individuals were represented, of which three were immature and five were young adults. It is unusual that the elements contributing to this number were mainly mandibles and lower front leg elements.

Pit Structure F was found below the floor and slightly offset from Kiva D, but even the shallow fill of Pit Structure F produced 408 bones. The predominance of Sylvilagus over L. californicus remains suggests the early age of the structure. The most interesting remains in Pit Structure F were eight articulated skeletons of two-week-old M. gallopavo from roughly the same level of fill. These turkeys probably represent a single hatch. Schorger (1966) noted that a single wild hen can lay as many as 25 eggs a season, but normally lays only 15 to 18 eggs a season. Wild turkeys hatch around mid-May in New Mexico. These hatchlings could have been left in the kiva depression or tossed in after they had expired. Hayes (personal communication, 1989) also suggests that the poults could have followed the mother hen into the pit to forage but were not able to get out when she left. Parts of another bird of this same age were recovered during excavations to find the outline of the ventilator tunnel for Kiva D. Because this excavation could have scooped down into the fill of Pit Structure F, and because this bird was the same age as the other ones, it seems quite likely that they were deposited at the same time.

Only two other immature elements from Pit Structure F suggest a May deposition, one Sylvilagus and one C. gunnisoni element. These are not enough for real confirmation.

No function was assigned to Pit 14, but it is interesting because of its faunal content. The pit was dish-shaped and plugged with a metate fragment. It contained one Sylvilagus bone and nine O. hemionus foot bones that were possibly articulated. This may have been a cache or offering.

Alluvial-filled Kiva G contained remarkably little cultural material. Only 44 bones were recovered.

The Plaza

The assemblage from the plaza was treated as a unit, with a total of 98 bones.

Because these represent diverse areas of the site and more than one time period, it will not be discussed. A large percentage (61.2%) of these bones was unidentifiable.

The Trash Midden

The trash midden proveniences were divided by Truell into two deposition periods. The first was dated roughly A.D. 920 to 1020, and the second A.D. 1020 to 1040. There is evidence of the expected change in rabbit utilization from an even distribution to one with a larger number of L. californicus. Although this division resulted in a fair number of bones, many were small and too fragmented for species identification. Approximately 10% of the midden was excavated.

Temporal Considerations

Even though the faunal assemblage at 29SJ 627 appears to contain a fairly large number of bones, the numbers do not lend themselves to meaningful statistical manipulation. Part of this is due to the large number of unidentifiable fragments, 46.3% of the collection, which, in itself, may be significant. In times of stress, we would expect all resources to be fully utilized, which, in the case of faunal remains, could mean breaking up the elements to extract all the marrow.

In order to evaluate this hypothesis regarding stress, the ratio of unidentified artiodactyl elements was compared to the number of unidentified artiodactyl and large mammal bones, and the identified small to unknown small mammal bones for several Chaco Canyon sites (Table 5.19). Although 29SJ 627 does have more than any other site with which it was compared, it must be remembered that other factors such as bone preservation, carnivore activity, collection strategies, and the duration of site occupation could also have affected the total.

In Table 5.19, the assemblage from 29SJ 423 stands out as being quite different from those of the other sites, but the bone preservation from that site was poor and could account for most of this high ratio. Although the magnitude is not great, there does seem to have been more fragmentation later in time.

The hypothesis that there were subsistence shifts at the site over time was

Table 5.19. Ratios of identified to unidentified elements.[a]

Site	Artiodactyl Ratio	Small Mammal Ratio
29SJ 423	1:12.0	1:1.4
29SJ 299	1:3.6	1:0.35
29SJ 1659	1:2.0	1:0.26
29SJ 628	1:2.8	1:0.04
29SJ 1360	1:3.0	1:0.15
29SJ 627	1:4.2	1:0.38

[a]Data from Akins 1981a-f.

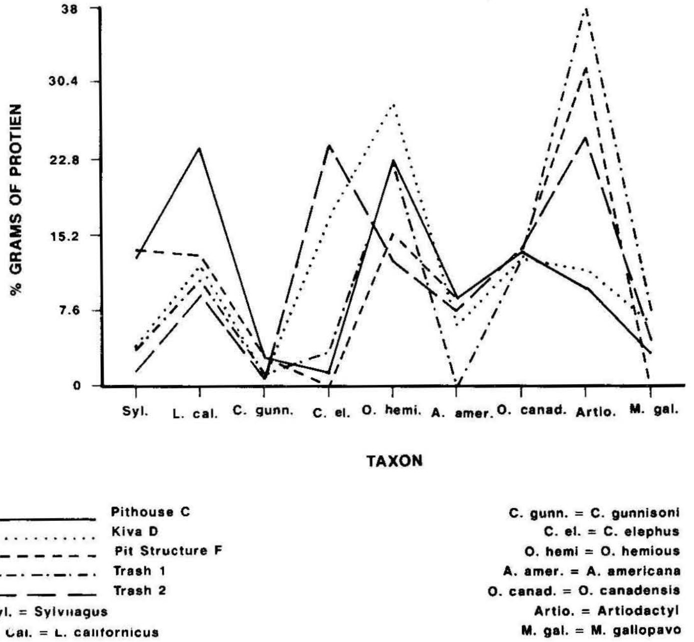

Figure 5.1. Economic contributions at 29SJ 627 calculated using three small mammals, four artiodactyls, turkeys, and unknown artiodactyl bones.

tested, but most of the samples were too small. The site was so subdivided that there were few proveniences with adequate samples (100 or more bones). The assemblage from Kiva E was not considered because of the mixed nature of the fill. Only the assemblages from proveniences dating to two time periods (A.D. 920-1020 and A.D. 1020-1040) were large enough to use for interpretation. Even these periods may be too short and too close in time for any subsistence change to be evident. Subsistence strategies may not change suddenly and are largely determined by the population of the prey species, availability of other non-animal resources, and many other factors.

The economic contribution of the three small mammals, four artiodactyls, turkeys, and unknown artiodactyls was calculated, graphed, and chi-squares were obtained for the five proveniences with adequate sample size (Figure 5.1). The results were not statistically significant.

Next, modified results were obtained by disregarding the C. elaphus (which occurred very sporadically and one small element added a lot of grams) and M. gallopavo (which I do not believe was consistently used as a food source) (Table 5.20 and Figure 5.2). The chi-square for this table was not significant ($X^2 = 6.706$, df = 5, p = 0.2865).

In general, the trend in assemblages from other later sites (29SJ 1360 and 29SJ 629) to contain more L. californicus than Sylvilagus individuals also holds true for the rooms and pit structures. What is different from the other assemblages examined so far is that O. hemionus was the predominant artiodactyl species utilized at 29SJ 627. In fact, Pithouse C is the only provenience in which the MNI is greater for A. americana than for O. hemonius, and even there the number of elements is lower. At 29SJ 1360 (Akins 1981e), which dates to the A.D. 900s and early 1000s, A. americana was clearly the predominant artiodactyl. The inhabitants of both of

Table 5.20. Temporal considerations of economic contributions of some proveniences.

Taxon	Pithouse C A.D. 920-1020			Pit Structure F A.D. 920-1020			Trash 1 A.D. 920-1020			Kiva D A.D. 1020-1040			Trash 2 A.D. 1020-1040		
	MNI	G	%	MNI	G	%	MNI	G	%	MNI	G	%	MNI	G	%
Sylvilagus	25	9,550	13.7	9	3,438	13.9	3	1,146	4.2	8	3,056	5.5	2	764	2.2
L. californicus	16	17,600	25.3	3	3,300	13.3	3	3,300	12.2	8	8,800	16.0	4	4,400	13.0
C. gunnisoni	6	2,220	3.2	2	740	3.0	1	370	1.4	2	740	1.3	1	370	1.1
O. hemionus	1	16,610	23.9	3	3,830	15.5	1	6,700	25.0	4	20,400	37.0	1	6,020	17.7
A. americana	2	6,410	9.2	1	2,160	8.7	-	-	-	1	4,420	8.0	1	3,660	10.8
O. canadensis	1	9,970	14.3	1	3,430	13.9	1	3,860	14.3	1	9,230	16.8	1	6,760	19.9
Artiodactyl	-	7,210	10.4	-	7,809	31.6	-	11,517	42.8	-	8,410	15.2	-	11,926	35.2
Totals	-	69,570	100.0	-	24,707	99.9	-	27,007	99.9	-	55,956	99.8	-	33,936	99.9

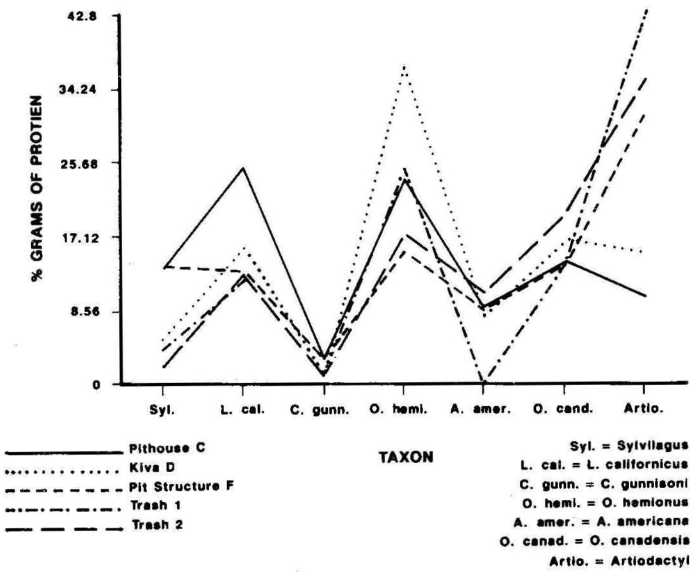

Figure 5.2. Economic contributions at 29SJ 627 calculated without C. elaphus *and* M. gallopavo.

these sites should have had equal access to the flats south of Chaco Canyon and to this species, so it is difficult to postulate an ecological reason for the difference between the species recovered at 29SJ 627 and at 29SJ 1360. In the area known as Marcia's Rincon, this change would have taken place roughly between A.D. 850 (the end of the occupation at 29SJ 628) and A.D. 920, given what is known from the other sites.

Seasonality

Certain aspects of non-continuous occupation can be addressed through a review of the faunal remains. If periods of abandonment occurred for a number of months at a time and consistently at the same time in the annual cycle over the years, this should be discernible. Small mammals are cyclical in reproduction and mature relatively rapidly, so that one would expect to find the very immature only during spring and summer, and young adults during all seasons. Assemblages deposited from March through early May would almost exclusively contain mature animals (Hale 1949).

The above hypothesis regarding time of appearance of animals of different ages is used to test data on rabbits and prairie dogs. By scanning samples from the proveniences within 29SJ 627, it can be seen that some bones representing each possible age distribution are present, although many of the sample sizes are small. Immature animals are well represented. If any one time is missing, it would be early spring occupation; but because the only depositions with adequate sample sizes are trash deposits, where mixing from various seasons might be expected, only a detailed examination (layer by layer) would adequately explore the question. At a gross level, it looks as though there was some occupation of 29SJ 627 during each season, at least some time during the site's use.

Intermittent, non-seasonal occupation of a site is not likely to be demonstrable using the faunal remains.

Conclusions

Although 29SJ 627 contained a fair number of bones, many of these were not identifiable, possibly an indication of subsistence stress, where bones, particularly those of large mammals, were fully utilized by breaking them for marrow. Also, there were so many provenience units (71 in all) that many proveniences had low numbers of elements.

It was not possible to demonstrate that the artiodactyl procurement strategy changed over the occupation of the site, but there was an indication that the larger rabbit (L. californicus) was utilized more than the smaller one (Sylvilagus). Because this trend is seen at other sites from roughly the same time, it most likely was caused by a decrease in the availability of Sylvilagus brought about by an increase in utilization by the growing population within Chaco Canyon.

The question remains, why are the fauna represented at this site (and seemingly at all small sites in Chaco Canyon) so under-represented compared to the minimum number of individuals needed to feed the occupants over the proposed occupation span? At none of these sites does the amount of food represented in the faunal collection measure up to what is expected for the proposed duration of the site occupation. Even though nothing in the faunal record substantiates seasonal or intermittent occupation, that possibility cannot be disregarded. Other explanations are possible. First, a relatively large amount of artiodactyl meat could have been processed and returned to the site without leaving any physical evidence. In many instances, this could help explain the large number of feet in the assemblage. Feet could have been left with the hides or purposefully brought back to the site for tool manufacture. This strategy implies that at least part of the Anasazi population would remain away from the site for the amount of time required to collect and process these stores. The optimum time for this would have been fall, just after the harvest, when the animals would have been in good health. Second, it is hard to estimate the effect domestic dogs had on the sample. Dogs are responsible for some of the fragmentation of bones and may have totally demolished or removed large quantities of bone from the site. Finally, the factors affecting preservation of bone are largely unknown.

Bone tools (Table 5.21) were analyzed separately and are discussed in Chapter 6.

Table 5.21. Taxa utilized for bone artifacts.

Taxon	Element	Fragmentation	Side	Number	MNI
Sylvilagus sp.	Tibia	Shaft fragment	L	1	1
L. californicus	Humerus	Distal	L	1	-
	Ulna	Complete	R	1	-
	Tibia	Complete	R	1	-
		Proximal	R	1	-
		Proximal-shaft	L	1	-
		Proximal-shaft	R	2	-
		Distal	L	2	-
		Distal-shaft	L	1	-
		Shaft fragment	L	4	-
		Shaft fragment	?	1	-
	Femur	Shaft fragment	?	1	4
C. latrans	Ulna	Proximal-shaft	R	1	-
		Proximal-shaft	L	2	-
	Tibia	Proximal-shaft	R	1	2
F. rufus	Ulna	Proximal-shaft	R	1	1
O. hemionus	Antler	-	-	4	-
	Mandible	Fragment	L	1	-
	Humerus	Shaft fragment	R	1	-
		Distal-shaft	L	1	-
	Ulna	Proximal	L	1	-
		Proximal-shaft	R	1	-
	Metacarpal	Distal-shaft	L	2	-
		Distal-shaft	R	1	-
	Metatarsal	Proximal-shaft	L	1	-
		Proximal-shaft	R	1	-
		Distal	R	1	-
		Distal-shaft	R	4	-
		Shaft	L	2	-
		Shaft	R	2	-
	Phalanx	Distal-shaft	?	1	2
A. americana	Metacarpal	Proximal-shaft	R	1	-
		Distal-shaft	L	1	-
		Shaft	?	1	-
	Metatarsal	Proximal-shaft	R	1	-
		Distal-shaft	L	2	-
		Distal-shaft	R	1	-
		Shaft fragment	R	1	-
	Phalanx	Distal-shaft	?	1	9
O. canadensis	Metatarsal	Distal	L	1	1
M. gallopavo	Tibia	Shaft fragment	R	1	-
		Shaft fragment	L	1	-
	Femur	Shaft	L	1	-
		Shaft fragment	L	1	1
Buteo sp.	Ulna	Shaft fragment	L	2	-
		Shaft fragment	R	1	2
B. canadensis	Humerus	Shaft fragment	R	1	-
	Radius	Shaft fragment	R	1	1
G. canadensis	Ulna	Shaft fragment	R	1	-
		Shaft fragment	L	1	-
	Radius	Shaft fragment	R	1	1
B. virginianus	Tibia	Shaft fragment	R	1	1
Unknown small-medium mammal	Long bone	Shaft fragment	?	3	-
Unknown medium mammal	Long bone	Shaft fragment	?	1	-

Table 5.21. (continued)

Taxon	Element	Fragmentation	Side	Number	MNI
Artiodactyl	Humerus	Shaft fragment	?	1	-
		Distal shaft	R	1	-
	Ulna	Shaft fragment	R	2	-
		Shaft fragment	?	1	-
	Radius	Shaft fragment	R	1	-
	Scapula	Fragment	?	1	-
	Metacarpal	Proximal-shaft	?	2	-
		Distal-shaft	?	1	-
		Shaft fragment	?	2	-
	Metatarsal	Distal	?	1	-
		Distal-shaft	?	1	-
		Shaft fragment	?	6	-
	Metapodial	Distal	?	1	-
		Shaft fragment	?	11	-
	Rib	Shaft fragment	?	3	-
	Innominate	Fragment	?	2	-
	Tibia	Shaft fragment	R	6	-
		Shaft fragment	?	2	-
	Femur	Proximal-shaft	L	1	-
		Shaft fragment	L	1	-
		Shaft fragment	R	3	-
		Shaft fragment	?	1	-
	Long bone	Shaft fragment	?	77	-
	Unknown	-	?	3	-
Large mammal	Rib	Shaft fragment	?	1	-
	Long bone	Shaft fragment	?	14	-
	Unknown	-	?	4	-
AVES	Radius	Shaft	?	2	-
	Tibia	Shaft	?	2	-
	Femur	Shaft	?	1	-
	Long bone	Shaft	?	7	-
Unknown	Long bone	Shaft fragment	?	10	-
	Unknown	-	?	1	-

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1979 Paleonutrition: Method and Theory in Prehistoric Foodways. Academic Press, New York.

6

ANALYSIS OF BONE ARTIFACTS FROM 29SJ 627

Judith Miles

Introduction

Site 29SJ 627 is centrally located in the flatlands of Marcia's Rincon in Chaco Canyon, New Mexico (Figure 1.1). Excavations at this site (Figure 1.2) were reported in detail by Truell (Volume I; 1980). The three major roomblock construction periods (Figures 1.3 - 1.5) from which bone artifacts were recovered are

Phase B A.D. 780-early 900s

Phase C A.D. 950-1000

Phase D A.D. mid 1000s

Floors and their associated fill were used as temporal indicators. All but one of the floors can be associated with a roomblock construction period (Truell 1980, and Volume I). The exception is Pithouse C, which was in use following the first two major roomblock construction periods, even though it has only one floor. Therefore, temporal designations for the bone artifacts from Pithouse C are assigned by association with its depositional layers only.

Some of the bone artifacts cannot be associated with particular periods. Specifically included in this category are one artifact from a general association with the site, four from test trenches, nine from the plaza area, and 16 from the trash midden. Most of the bone artifacts (218 out of 250) could be assigned to a temporal context that was usable in this report. Nancy Akins determined the faunal classification, bone element, side, and age. She recorded this information (Chapter 5, Table 5.21), and the provenience information on computer coding forms.

The Inventory

There was a total of 250 worked bones, 150 of which were assigned to 15 specific types, including two that were identified as tool blanks. Two other worked bone pieces were collected and included in the faunal analysis, but these specimens were lost before the bone tool analysis began. The remainder of the collection (98 artifacts) were fragments that could not be assigned to a tool type because critical identifying characteristics were missing.

Table 6.1 is a summary of the inventory of worked bones from 29SJ 627 by functional category and type. Definitional characteristics are those used in the synthetic bone artifact analysis for Chaco Canyon (Miles 1989). The typology is based on general shape, which often coincides with function. Each ar-

Table 6.1. Quantities of bone artifacts by functional class and type at 29SJ 627.

Artifact Class	Artifact Type	Quantity
Piercing/punching	Awls	86
	Awl-spatula[a]	1
	Awls from ulnas	7
	Needles	6
	Pins	1
	Punches	4
Subtotal		105
Scraping/rubbing	End scrapers	5
	End scraper made from humerus	1
	Spatulas	3
	Rubbing tools	1
Subtotal		10
Non-tools	Tinklers	1
	Gaming pieces	7
	Tubular beads	23
	Whistles	2
Subtotal		33
Miscellaneous	Tool blanks	2
	Fragments	98
	Lost artifacts	2
Subtotal		102
TOTAL		250

[a] The spatulate end of this tool should be considered a scraping/rubbing type; as an item, it is listed once in this table.

tifact is fitted into the best descriptive category possible. There are four artifact categories, three functional categories, and one class of miscellaneous artifacts. The first functional category is piercing tools, such as awls, needles, pins, and punches (Figures 6.1-6.4). The second includes types that appear to have been used for scraping or rubbing (Figure 6.5). The third includes gaming pieces, tubular beads, whistles, and tinklers (Figure 6.6). The fourth includes miscellaneous artifacts, tool blanks, and fragments.

Methods

Measuring Technique

The length, width, and thickness were measured for each of the 248 artifacts. Artifacts whose lengths, widths, and thicknesses were not reduced by breakage or weathering were considered complete. Length was measured as the

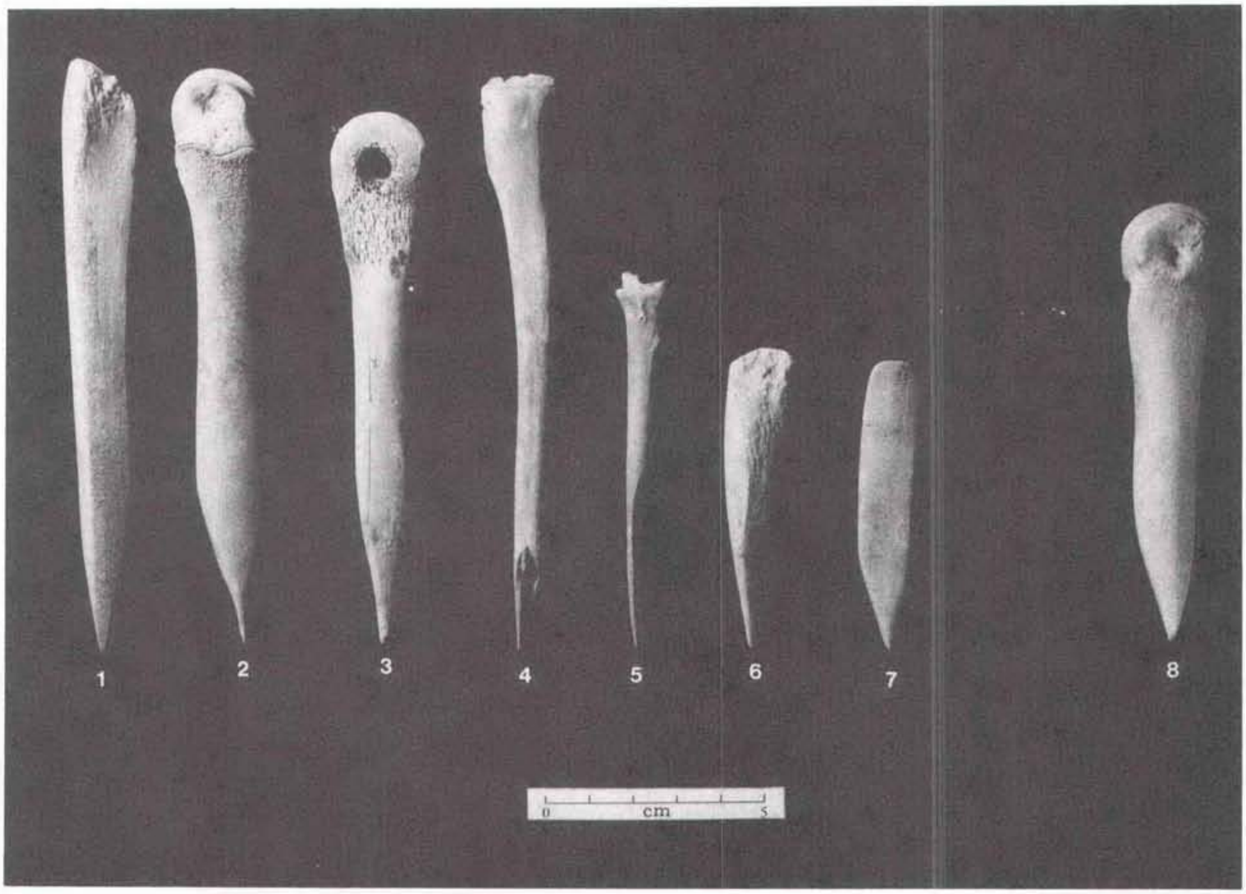

Figure 6.1. *Bone awls from 29SJ 627. These tools were manufactured by bilateral splitting (1,2,3,8), spiral facturing (4.5), and splintering (6.7). Artifacts 1 through 6 were associated with activities ca. AD 780-950 (Chaco Center Negative No. 23139).*

longest line parallel to the long axis of the artifact. Width was measured at the broadest midpoint perpendicular to the long axis. Thickness was measured at a right angle to the width at the same midpoint. Analysis was based on measurements from complete artifacts only.

Tip diameters, recorded in millimeters, were measured 1 mm back from the tip end in order to be consistent with previous analyses (McKenna 1980, 1984; Olsen 1979). Lengths of major scraping facets on spatulas or scrapers were recorded in centimeters at the widest point of the scraping facet. Outer diameters of the open ends of tinklers, tubular beads, and whistles were measured 1 mm back from the ends.

Descriptive Statistics

The statistics (Tables 6.2 - 6.4) show the mean ($\bar{x}$), standard deviation (s.d.), range (R), and the number of individual artifacts in the sample (N).

Except for piercing/punching tools, none of the artifact classes was large enough to use for interpreting differences or constancy in size. Generally, the average values of width, thickness,

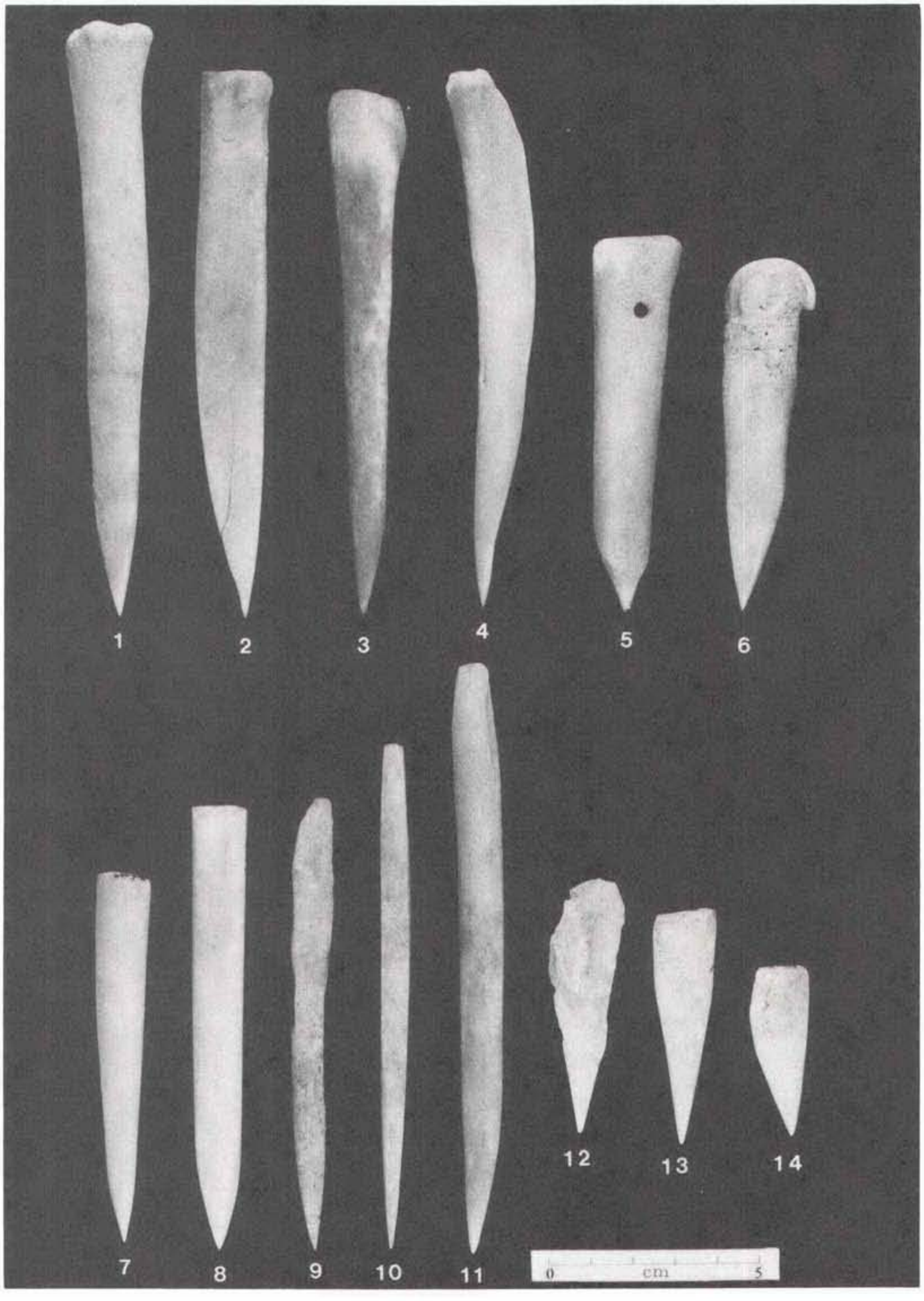

Figure 6.2. *Bone awls from 29SJ 627 manufactured by bilateral splitting (1,6) and splintering (2 through 5 and 7 through 14). These artifacts are from A.D. 1000 (Chaco Center Negative 23141).*

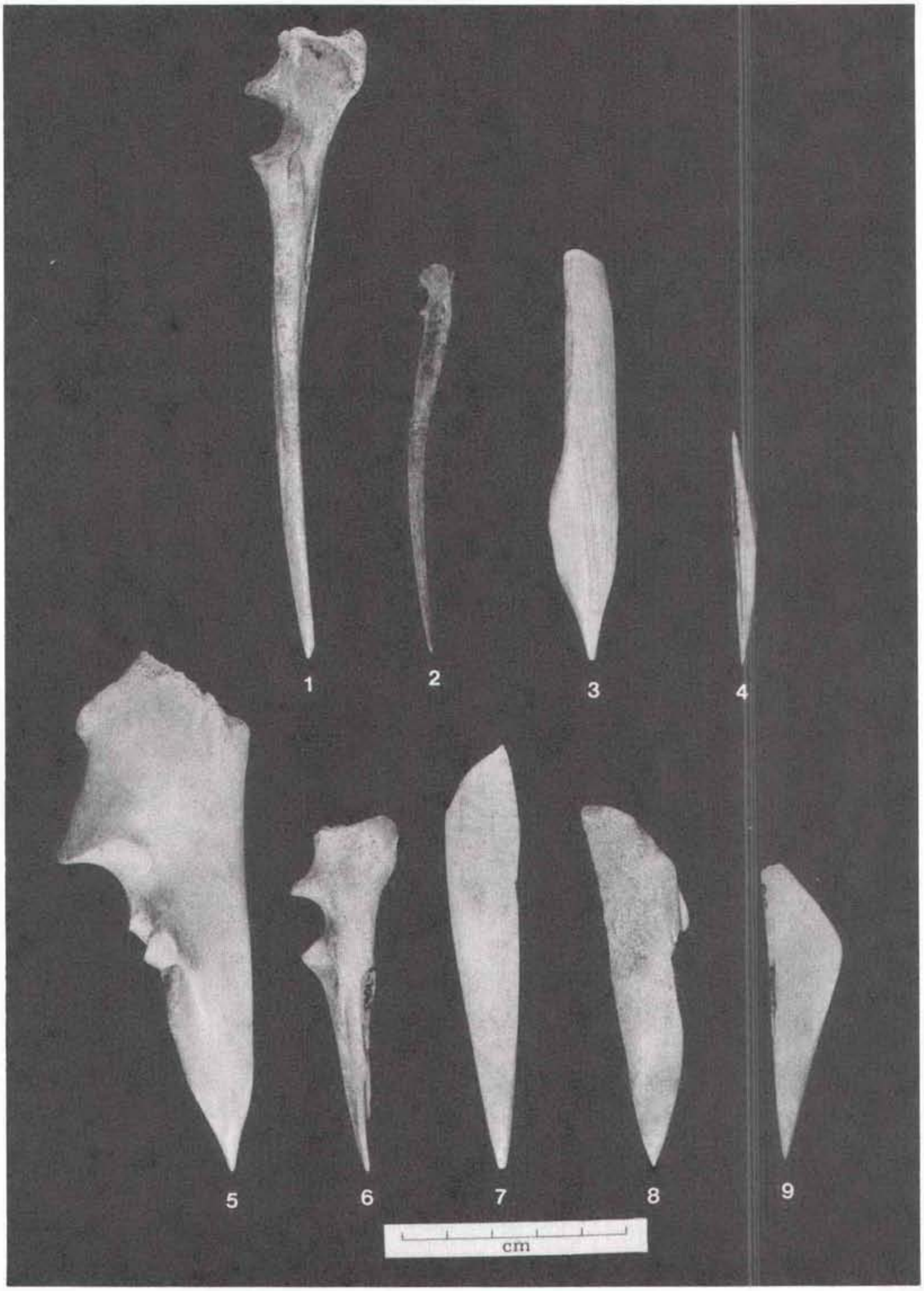

Figure 6.3. *Ulna awls (1,2,5,6) and splinter awls (3,4,7,8,9) from 29SJ 627. These artifats are associated with activities ca. A.D. 780-950 (1,2,4), A.D. 950-1000 (3), and A.D. 1000-1050 (5 through 9). Specimen 4 is a dual tipped awl (Chaco Center Negative No. 23136).*

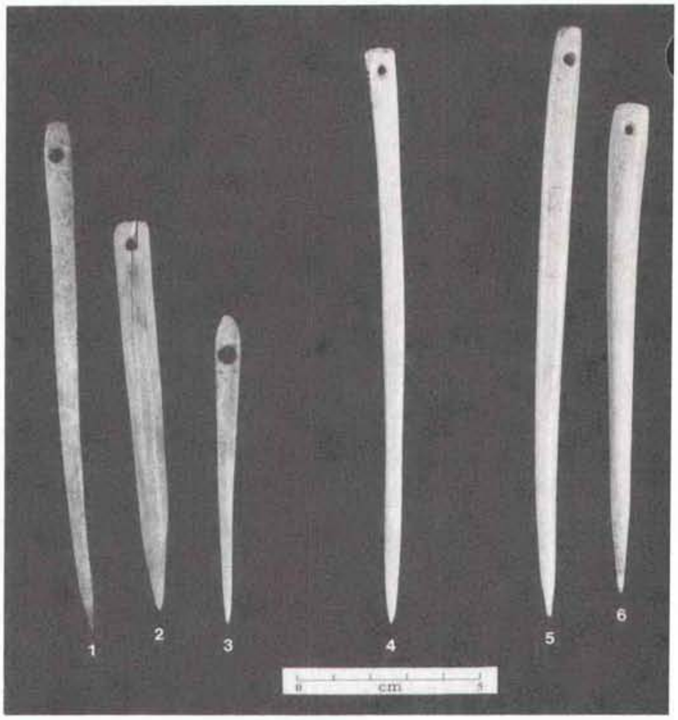

Figure 6.4. *Bone needles from 29SJ 627 associated with activities ca. A.D. 780-950 (1,2), A.D. 950-1000 (3,4), and A.D. 1000-1050 (5,6) (Chaco Center Negative No. 23137).*

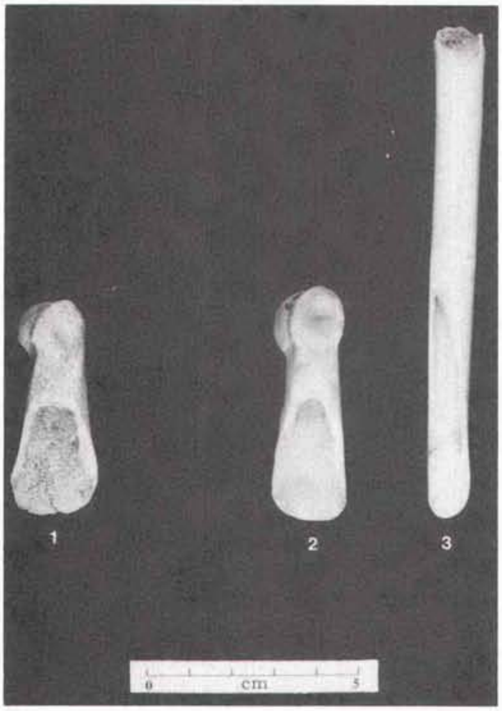

Figure 6.5. *Bone scrapers from 29SJ 627 associated with activities ca. A.D. 950-1000 (1) and A.D. 1000-1050 (2,3) Chaco Center Negative No. 23138).*

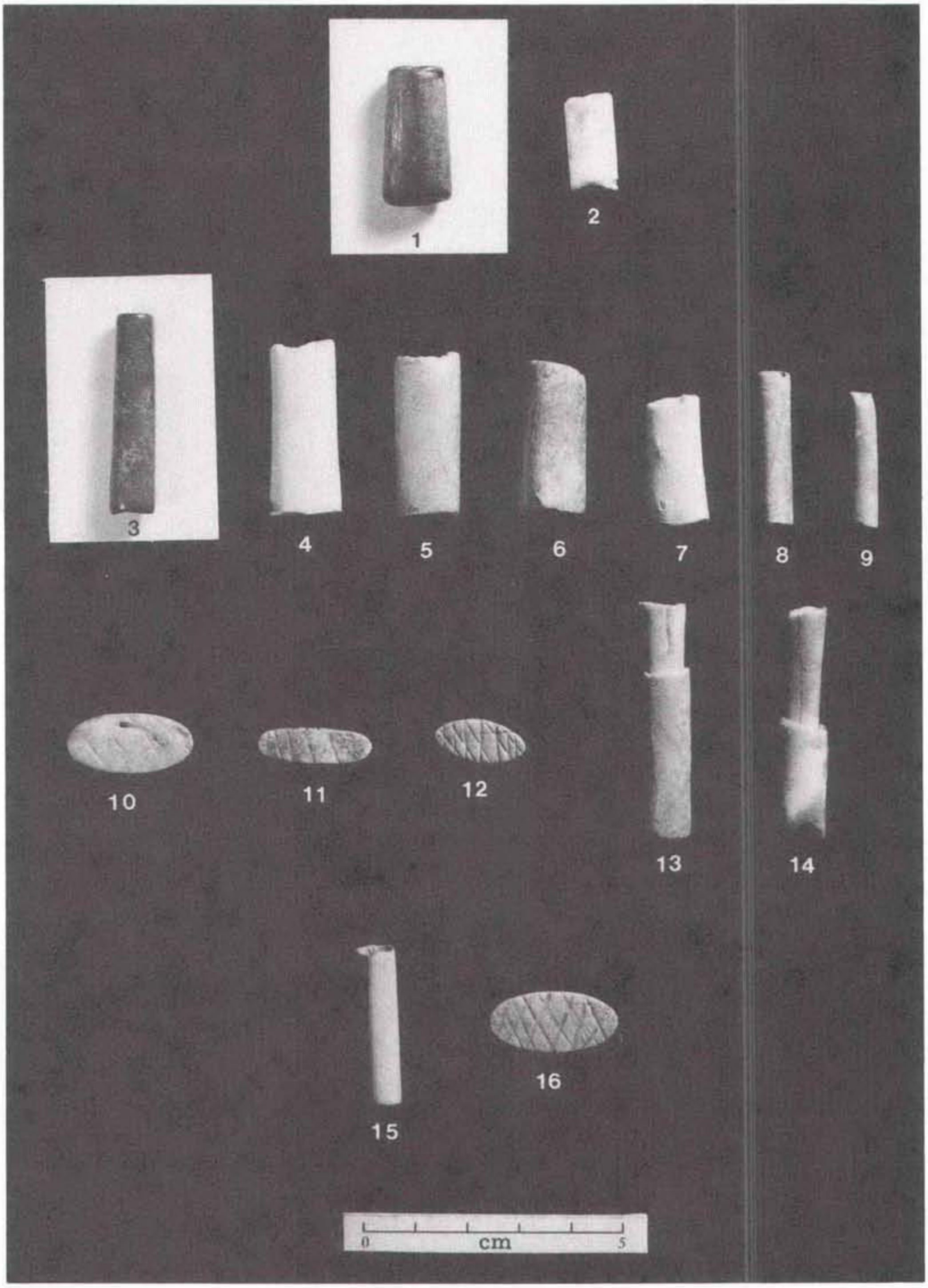

Figure 6.6. *Non-tool bone artifacts from 29SJ 627: tubular beads from ca. A.D. 780-950 (1,2) and A.D. 1000-1050 (3 through 9 and 15); and gaming pieces (10 through 12 and 16) and whistles (13,14) from ca. A.D. 1000-1050 (Chaco Center Negative No. 23140).*

Table 6.2. Descriptive statistics for piercing tools at 29SJ 627.

Dimension Measured	Statistic[a]	Artifact Type: Awl-forms	Needles	Punches
Length (cm)	x̄	9.7	12.8	6.7
	s.d.	2.8	2.9	4.0
	R	4.9-16.1	8.3-15.8	3.0-11.0
	N	63	6	3
Width (cm)	x̄	1.3	0.9	1.2
	s.d.	0.4	0.5	0.1
	R	0.4-2.7	0.5-1.9	1.2-1.3
	N	63	6	3
Thickness (cm)	x̄	0.5	0.5	0.4
	s.d.	0.2	0.2	0.1
	R	0.2-1.6	0.2-0.8	0.3-0.5
	N	63	6	3
Tip diameter (mm)	x̄	1.1	1.0	2.3
	s.d.	0.3	0.2	1.6
	R	0.6-2.7	0.6-1.2	1.2-3.4
	N	47	6	2
Second tip diameter (mm)	x̄	0.5	-	-
	N	1	0	0

[a] Key to descriptive statistics used in Tables 6.2, 6.3, and 6.4:
x̄ = Mean (average) value.
s.d. = standard deviation from the mean value, using N-1.
R = range value between minimum and maximum extremes.
N = number of individual measurements.

and tip diameter varied little from type-to-type within each artifact class. The piercing/punching tools were also the only class large enough to evaluate statistically. The needles and punches varied the most in length; however, the large standard deviation about the mean (x̄) suggests no significant differences in size.

Not all of the dimensions measured were the result of manufacturing processes. The midpoint measurements of thickness and width were rarely affected by manufacture or use, so the natural forms of the bones remain. This, in turn, can be interpreted as the consistent selection of bones from animals of the same species and age. Lengths and tip diameters are the direct result of manufacture and/or use, and they display a great deal of variation. This may also represent the diversity of tasks for which bone artifacts were used.

In a recent study of bone artifacts from the Bis sa'ani community, awls were placed in two groups by length (Breternitz 1982). Awls less than 8 cm in length were classified as short awls, the rest were long awls. A frequency curve was plotted for each of the dimen-

Table 6.3. Descriptive statistics for scraping type tools at 29SJ 627.[a]

Dimension Measured	Statistics	Artifact Type: End Scrapers	Spatulas	Rubbing Tools
Length (cm)	x̄	7.1	11.6	7.9
	s.d.	3.3	-	-
	R	0.5-10.9	-	-
	N	3	1	1
Width (cm)	x̄	1.6	1.1	4.8
	s.d.	0.2	-	-
	R	1.4-1.7	-	-
	N	3	1	1
Thickness (cm)	x̄	0.5	0.9	0.1
	s.d.	0.3	-	-
	R	0.3-0.8	-	-
	N	3	1	1
Tip diameter (mm)	x̄	5.5	7.4	-
	s.d.	6.5	4.5	-
	R	1.4-13.0	4.2-10.6	-
	N	3	2[b]	0
Length of scraping facet (cm)	x̄	1.3	1.4	-
	s.d.	0.7	0.6	-
	R	0.8-2.1	1.0-1.8	-
	N	3	2[b]	0

[a] Refer to Table 6.2 for key.

[b] N is greater for this independent variable than for the N-value of other independent variables within this artifact type because the spatulate end of the awl-spatula is included here.

sions measured during this analysis in order to scan for similar clustering. In the collection from 29SJ 627, as in the one from the Bis sa'ani community, there are two groups of awls (Table 6.5 and Figure 6.7a). The "short" and "long" awls from 29SJ 627 can be characterized specifically by average lengths of 8 cm and 11 cm, respectively. The cut-off mark distinguishing the two groups is around 10 cm. Figures 6.7b and c illustrate the clustering of the average thickness and width of these tools.

When compared with the 8 cm measurement designated to separate the Bis sa'ani awls, the collection of awls from 29SJ 627 is longer, on the average, by about 2 cm. Generally, tip morphology does not fluctuate according to the overall length of awls. This leaves the "handle" portion of the awl as the effective variable as far as length differences are concerned. A question for future analysis could address the idea of natural bone length versus differential wear due to time or function.

Table 6.4. Descriptive statistics for non-tool bone artifacts at 29SJ 627.[a]

Dimension Measured	Statistics	Artifact Type: Tinklers	Gaming Pieces	Tubular Beads	Whistles	Tool Blanks
Length (cm)	$\bar{x}$	12.6	2.3	3.5	4.1	19.2
	s.d.	-	0.3	1.3	0.5	11.4
	R	-	1.8-2.6	1.9-7.2	3.7-4.4	1.1-27.2
	N	1	7	17	2	2
Width (cm)	$\bar{x}$	0.9	1.0	0.9	1.1	1.6
	s.d.	-	0.3	0.3	0.1	0.2
	R	-	0.6-1.3	0.4-1.3	1.0-1.1	1.5-1.8
	N	1	7	17	2	2
Thickness (cm)	$\bar{x}$	0.7	0.2	0.8	1.0	0.5
	s.d.	-	0.0	0.3	0.1	0.0
	R	-	0.2-0.2	0.3-1.2	0.9-1.0	0.5-0.5
	N	1	7	17	2	2
Tip diameter (mm)	$\bar{x}$	1.0	-	8.0	8.4	-
	s.d.	-	-	4.6	1.2	-
	R	-	-	0.8-16.4	7.6-9.3	-
	N	1	-	17	2	-
Second tip diameter (mm)	$\bar{x}$	-	-	7.6	9.8	-
	s.d.	-	-	4.4	0.2	-
	R	-	-	0.8-13.4	9.7-10.0	-
	N	0	0	15	2	0

[a] Refer to Table 6.2 for key.

Table 6.5. Frequency distribution of measurements occurring in standard, equal ranges of lengths, widths, and thicknesses of awl form tools at 29SJ 627.[a]

Dimension Measured	Range	Midpoint of Range	Frequency
Lengths (cm)	4.56-5.45	5.0	3
	5.46-6.45	6.0	5
	6.46-7.45	7.0	8
	7.46-8.45	8.0	9
	8.46-9.45	9.0	8
	9.46-10.45	10.0	3
	10.46-11.45	11.0	8
	11.46-12.45	12.0	6
	12.46-13.45	13.0	6
	13.46-14.45	14.0	4
	14.46-15.45	15.0	1
	15.46-16.45	16.0	2
Widths (cm)	0.05-0.54	0.3	2
	0.55-1.04	0.8	13
	1.05-1.54	1.3	38
	1.55-2.04	1.8	7
	2.05-2.54	2.3	2
	2.55-3.04	2.8	1
Thicknesses (cm)	0.156-0.245	0.2	5
	0.246-0.345	0.3	11
	0.346-0.445	0.4	18
	0.446-0.545	0.5	12
	0.546-0.645	0.6	7
	0.646-0.745	0.7	6
	0.746-0.845	0.8	3
	0.846-1.545[b]	0.9, 1.0-1.5	-
	1.546-1.645	1.6	1

[a] Data graphed in Figure 6.7.
[b] These figures represent seven range groups, all with zero frequencies.

The distribution of awl widths is a classical normal curve with a central tendency to measure approximately 1.3 cm (Figure 6.7b). The thickness appears to cluster around an average value of 0.4 cm and shows a positive skew, which is the effect of one extreme measurement (1.6 cm) at the high end of the horizontal scale (Figure 6.7c).

Results

Changes in Artifacts Through Time

In addition to providing the dimensions of bone artifacts, it is useful to observe a collection for changes in size through time. Again, because of sample size, it was necessary to limit observations to two piercing/punching forms,

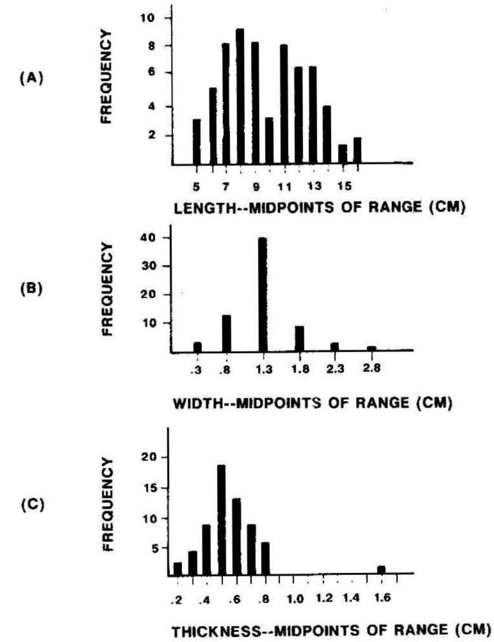

Figure 6.7. Frequency curves to observe distribution of (a) lengths, (b) widths, and (c) thicknesses in awl form tools. (Refer to Table 6.5 for data.)

awls and pins, which are herein referred to as awl forms. The dimensions of the awl forms for each of the three major roomblock construction periods (Table 6.6) show minor fluctuations in average lengths, but the high standard deviations make these differences inconsequential.

Changes in the frequencies of artifact types through time provide some information about the kinds of tools produced and the activities engaged in during the occupation of a site. The data (Table 6.7) must be interpreted carefully to avoid making erroneous inferences based on the frequencies. The greatest amount of change occurs in the numbers of piercing tools and non-tools. The smallest number of piercing tools dates to before A.D. 950. The number of piercing tools dating to past A.D. 1000 was 110% higher, which is considerable but not phenomenal.

The total collection increased over time by 268%, while the number of non-tools increased by 800%. These figures may seem extraordinary and may be a misrepresentation due to a preservation problem, since there were also larger quantities of fragments, and it is likely that the majority are pieces of awls rather than non-tools. Also, the increase in these percentages does not relate directly to the increase in the size of the population. The population at 29SJ 627 peaked between A.D. 950 and 1000. It is very possible that the number of bone artifacts increased as the population increased and the artifacts used by previous generations continued to be used. There are usually higher percentages of artifacts in later deposits if the occupants were picking up, reusing, and wearing out material that was deposited earlier (Al Hayes, personal communication, 1988).

The non-tool category included a count of individual beads even though a significant number of them were found together and likely had been part of a

Table 6.6. Distribution of average dimensions of awl forms through time at 29SJ 627.

	Dimensions Measured						
	Length		Width		Thickness		
Time	$\bar{x}$	s.d.	$\bar{x}$	s.d.	$\bar{x}$	s.d.	N
A.D. 780-950	8.6	2.7	1.1	0.5	0.4	0.2	14
A.D. 950-1000	11.0	3.3	1.4	0.4	0.4	0.1	16
Post A.D. 1000	9.6	2.8	1.3	0.4	0.5	0.3	26

Table 6.7. Condensed listing of bone artifact classes through time at 29SJ 627.[a]

	Artifact Class				
Time Span	Piercing Tools	Scraping Tools	Non-tools	Miscellaneous	N
A.D. 780-950	0.59	0.06	0.09	0.26	34
A.D. 950-1000	0.46	0.02	0.03	0.49	61
Post A.D. 1000	0.34	0.06	0.22	0.38	125

[a] Indices derived by dividing the actual count for a specific cross tabulation by the total number, given in the last column, for the row.

single artifact (e.g., a necklace) rather than representative of several objects.

One final point is that piercing tools throughout the occupation at 29SJ 627 far outnumber the identifiable artifacts in all other categories. Thus, even though the frequencies of other bone artifacts appear to skyrocket, piercing tools are unequivocally the predominant bone artifact.

Bone Tool Production

Two production steps which give bone artifacts their shape were recorded. Six primary and three secondary manufacturing techniques were identified. Primary steps in manufacture include:

Splinter--indiscriminate splitting of bone element resulting in splinters of shaft sections.

Bilateral split--element split longitudinally along sagittal plane producing symmetrical halves.

Groove-and-snap--circumference incised perpendicular to long axis, then element snapped apart at place of groove.

Spiral fracture--bone cut or fractured diagonally to long axis of element.

Indeterminate split--initial split made longitudinally, but location is indeterminable relative to the sagittal plane, resulting in sections that retain an articulating end.

Whole--complete element except for secondary tip or edge refinement.

?--procedure indeterminable, usually due to size or damage of bone.

Secondary steps in manufacture include:

General work--miscellaneous work on bone: multidirectional striations about the tip and/or shaft; some polish limited by area and/or intensity.

Transverse striae--transverse striations on tip and interior cut edge of shaft.

High polish--highly polished on most of surface area.

?--procedure indeterminable.

The identification of these steps is based on a few obvious characteristics (Miles 1989). The results of the analysis of bone artifacts from 29SJ 627 are presented in Tables 6.8-6.10.

The primary manufacturing technique was indeterminable for six pieces of worked bone because they were small or damaged. The secondary steps of manufacturing could not be identified on three other pieces for the same reasons. The majority of the artifacts showed some form of primary modification, which gives each artifact its general shape. Few bone elements were used whole (Table 6.8). Specific alterations are likely to be associated more directly with the degree of precision necessary for a certain job. For instance, splintering or splitting a bone shaft will usually produce a pointed tip and rough edges--a piercing tool. With only minor grinding, a piercing tool is formed, but not enough secondary work has been done for it to be used as a pin or needle. Conversely, a spiral fracture or diagonal cut produces an artifact with a broader tip end, a scraper, which is in a different class after the primary modification. Not surprisingly, the majority of piercing tools in this assemblage are splinter-made, while most of the end scrapers exhibit spiral fracturing or diagonal cutting.

The groove-and-snap method described by Olsen (1979) retains the in-

Table 6.8. Tabulation of primary and secondary manufacturing steps on bone tools at 29SJ 627.

	Secondary Steps				
Primary Steps	General Work	Trans. Stria	High Polish	?	N
Splinters	74	4	3	-	81
Bilateral split	41	7	1	1	50
Groove-and-snap	23	-	4	1	28
Spiral fracture	10	-	-	-	10
Indeterminate split	56	3	-	-	59
Whole	13	-	-	1	14
?	6	-	-	-	6
Totals	223	14	8	3	248

tegrity of each segment formed, with little or no waste of the shaft--an efficient way to produce cylindrical, blunt-ended forms such as beads and whistles. At 29SJ 627, all beads and whistles were probably manufactured by the groove-and-snap method (Table 6.9).

Evidence of refinement by secondary manufacturing was found on 22 of these bone tools (Table 6.8). Details pertaining to striations were not noted, as research to date on this topic has been inconclusive. Reliable interpretations of striations will require more study. However, most bone implements in this collection have multidirectional striations, and only a few exhibit unidirectional striations that usually run transverse to the long axis.

Condition of Bone

Generally, bone artifacts from 29SJ 627 are fragments of compact bone recovered from the fill deposited in structures (Table 6.11). There are approximately twice as many fragments as complete artifacts from pit structures as well as from individual pithouses and kivas. The yield from rooms, however, is almost a 1:1 ratio. The higher fragment-to-complete artifact ratio in subsurface structures is attributed to the fact that these structures simply have more available "fill" space relative to features than the smaller rooms and other structures. This does not mean that there were more activities using bone artifacts in rooms than in pit structures. In fact, the distribution of the bone artifacts reveals just the opposite (see spatial analysis).

Apparently, the bone artifacts were not severely affected by weathering, even though they were from different depositional strata (i.e., surface, general fill, alluvium, roof fall, floor fill, and floor contact). There were miminal effects from erosion, which is even more fortunate, because this site is in the center of an outwash plain and is subjected to periodic alluvial and erosional episodes (McKenna 1986). Because they were so

Table 6.9. Index of different primary manufacturing methods by artifact class at 29SJ 627.[a]

Method of Primary Manufacture	Artifact Class			
	Piercing Tools			
	Awl Forms	Needles	Punches	N
Splintered	0.86	0.12	0.02	43
Bilaterally split	0.94	0.03	0.03	32
Spiral fracture	1.00	-	-	5
Indeterminate split	0.88	-	0.12	17
Whole	1.00	-	-	8

	Scraping Tools			
	End Scrapers	Spatulas	Rubbing Tools	N
Splintered	-	1.00	-	1
Spiral fracture	0.80	0.20	-	5
Indeterminate split	0.67	0.33	-	3
Whole	-	-	1.00	1

	Non-Tools						
	Tinklers	Gaming Pieces	Tub. Beads	Whistles	Tool Blanks	Frags.	N
Splintered	-	0.20	-	-	-	0.80	35
Bilaterally split	-	-	-	-	0.11	0.89	18
Groove-and-snap	-	-	0.82	0.07	-	0.11	28
Indeterminate split	-	-	-	-	-	1.00	41
Whole	0.20	-	-	-	-	0.80	5
	-	-	-	-	-	1.00	6

[a] Index numbers derived by dividing the actual count for a specific cross tabulation by the total number, given in the last column, for the row.

Table 6.10. Indices of the two most employed methods of manufacture through time at 29SJ 627.[a]

Period	Primary Method of Manufacture		N
	Splintering	Bilateral Splitting	
A.D. 780-950	0.67	0.33	21
A.D. 950-1000	0.51	0.47	37
Post A.D. 1000	0.67	0.33	51
Unknown period	0.60	0.40	20

[a] Index numbers derived by dividing the actual count for a specific cross tabulation by the total number, given in the last column, for the row.

well preserved, these artifacts were probably buried most of the time. Minor root etching was found on the surface of several bone artifacts from the upper depositional layers of kivas.

Thirteen completely burned artifacts were recovered from pithouses (Table 6.11). About 73% of them were from Pithouse C. Six badly burned and damaged fragments of worked bone (approximately half of all the badly burned pieces) were located within one layer that was related to the earliest fill of Pithouse C (Phase C, after the second major roomblock construction period). The artifacts were not found in the context in which they were burned. More than likely, the burning occurred in a firepit and they were secondarily disposed of in Pithouse C. None of the excavated burned bone was found in direct association with pithouse features and no rooms appear to have been burned.

The proportions of complete artifacts within the fill that accumulated between each of the major roomblock construction periods were not consistent. Of the artifacts unearthed from layers of fill deposited before the second major roomblock construction period (Phase C), 53% were complete specimens. This is substantially higher than the percentage of complete artifacts from the two later depositions (26% from assemblages between the second and third major roomblock construction periods, Phases C and D; and 39% from assemblages after the third major roomblock construction period, Phase D).

The reasons for these differences are not clear. Initially it was thought that there were fewer complete artifacts because of erosion. However, as noted above, erosion and general weathering probably were not contributing factors to artifact damage. This leaves some unknown human activity to account for the differences.

The Fauna

The distribution of artifact types in relation to taxa is presented in Tables 6.12-6.15. In most instances, the following discussion compares artifact classes.

While the fauna common to Chaco Canyon were the primary resource for

Table 6.11. Condition of bone artifacts by general provenience at 29SJ 627.[a]

General Provenience	Essentially Complete	Fragments	Consolidated Bone	Slightly Eroded	Badly Eroded	Completely Burned
Rooms	0.25	0.17	0.19	0.22	0.30	0.06
Pit structures						
Kivas	0.41	0.48	0.49	0.48	0.25	0.22
Pithouses	0.20	0.21	0.18	0.08	0.25	0.72
Antechamber	0.01	0.02	0.01	0.04	0.05	-
Trash Midden	0.04	0.08	0.07	0.06	-	-
Plaza Area	0.05	0.02	0.02	0.08	0.10	-
Ramada 1	0.01	-	0.01	-	-	-
Isolated Hearth (Cist 10)	0.01	-	0.01	-	-	-
Test Trench 7	0.02	0.01	0.01	0.04	0.05	-
General Association	-	0.01	0.01	-	-	-
Totals	94	154	160	50	20	18

[a] Index numbers derived by dividing the actual count for a specific cross tabulation by the total number, given in the last row, for the column.

Table 6.12. Distribution of faunal taxonomy among piercing type tools at 29SJ 627.

Taxon	Artifact Type: Awls	Awl Spatulas	Ulna Awls	Needles	Pins	Punches	N
Lepus californicus (jack rabbit)	5	-	1	-	-	-	6
Canis latrans (coyote)	-	-	3	-	-	-	3
Felis rufus (bobcat)	-	-	1	-	-	-	1
Odocoileus hemionus (mule deer)	11	-	2	-	-	-	13
Antilocapra americana (pronghorn)	4	-	-	-	-	1	5
Ovis canadensis (mountain sheep)	1	-	-	-	-	-	1
Meleagris gallopavo (turkey)	1	-	-	-	-	-	1
Small-to-medium sized mammal	2	-	-	-	-	-	2
Mid-sized mammal	1	-	-	-	-	-	1
Artiodactyl	53	1	-	4	1	2	61
Medium-to-large sized mammal	5	-	-	1	-	1	7
Aves	1	-	-	-	-	-	1
Unknown bird or mammal	2	-	-	1	-	-	3
Totals	86	1	7	6	1	4	105

Table 6.13. Faunal distribution of scraping/rubbing type tools at 29SJ 627.

Taxon	Humerus End Scraper	End Scraper	Spatula[a]	Rubbing Tool	Total
Odocoileus hemionus (mule deer)	-	2	-	-	2
Antilocapra americana (pronghorn)	-	1	-	-	1
Artiodactyl	1	2	1	1	5
Unknown bird or mammal	-	-	2	-	2
Totals	1	5	3[a]	1	10

[a] The awl-spatula is listed as an item in Table 6.12.

Table 6.14. Faunal distribution of non-tool type bone artifacts at 29SJ 627.

Taxon	Tinklers	Gaming Pieces	Tubular Beads	Whistles	N
	Artifact Type				
Lepus californicus (jack rabbit)	1	-	2	-	3
Branta canadensis (Canadian goose)	-	-	2	-	2
Buteo sp. (hawk)	-	-	2	1	3
Meleagris gallopavo	-	-	3	-	3
Grus canadensis (sandhill crane)	-	-	2	-	2
Artiodactyl	-	4	-	-	4
Medium-to-large mammal	-	2	-	-	2
Aves	-	-	10	-	10
Unknown bird or mammal	-	1	2	-	3
Total	1	7	23	1	32

bone, not all of the animals represented in the collection were from the area. Two ulnas and one radius from sandhill cranes (Grus canadensis) and one radius and one humerus from the Canadian goose (Branta canadensis) were probably imports. These two species were also represented in the assemblages from the nearby sites of Pueblo Alto (Miles 1987), 29SJ 724 (Miles 1983), and the Bis sa'ani community (Breternitz 1982), but in extremely small quantities, especially for the Canadian goose. These low numbers and the high probability of their importation may indicate that the bone was acquired secondarily, during bartering for other trade items. The logical sources for these two species of birds are the major riverways of the Southwest, which are their migration routes (e.g., the Rio Grande). However, there is no clear evidence for down-the-line or direct trade with riverway residents.

Bones from the bison, mountain sheep, tassel-eared squirrel, snowshoe hare, and macaw, which are among the species represented in faunal studies at Chaco Canyon (Akins 1985), were possibly brought from some distance (Gillespie, personal communication, 1980). However, the small proportion of non-local fauna that are represented imply a "dependence" on local game for bone used to make tools.

The species for 74% of the collection (184 artifacts) cannot be determined because these small fragments have no diagnostic qualities. In such instances, the most specific taxonomic level of classification is given (e.g., artiodactyl, Buteo sp., small-to-medium mammal). As in most prehistoric Southwestern

Table 6.15. Faunal distribution of miscellaneous bone artifacts at 29SJ 627.

Taxon	Artifact Type: Tool Blanks	Fragments	Missing Artifacts	N
Sylvilagus sp. (cottontail rabbit)	-	1	-	1
Lepus californicus (jack rabbit)	-	7	-	7
Canis latrans (coyote)	-	1	-	1
Odocoileus hemionus (mule deer)	1	8	-	9
Antilocapra americana (pronghorn)	1	2	-	3
Ovis canadensis (mountain sheep)	-	-	1	1
Bubo virginianus (great horned owl)	-	1	-	1
Small-to-medium mammal	-	1	-	1
Artiodactyl	-	59	1	60
Medium-to-large mammal	-	12	-	12
Aves	-	2	-	2
Unknown bird or mammal	-	4	-	4
Totals	2	98	2	102

communities, artiodactyl bone elements were selected primarily for use as piercing and scraping tools, and bird bones were used for tubular beads (Table 6.16). This is exemplified in the 29SJ 627 collection, in which 81% of the piercing tools and 100% of the scraping tools are made from medium-to-large mammalian bones (probably artiodactyl) and 83% of the bone beads are made of bird bones.

The conscious selection of a particular type of bone to fulfill a specific function is certainly reasonable. For example, hollow bird bones can easily be fashioned into tubular beads and whistles, while the sturdier bones of artiodactyls are practical for more heavy-duty uses such as piercing and scraping. This process was normally followed by most prehistoric people. Implicit in this selection/processing trend is the interpretation that fragments recovered at 29SJ 627 represent piercing and scraping tools (rather than non-tool type artifacts) because the vast majority can be identified as from medium-to-large mammals (Table 6.15). Although 59 artiodactyl bone fragments do not represent 59 individual tools, the difference between frequencies (i.e., 59 artiodactyl bone fragments and 2 bird bone fragments) indicates that most pieces are

Table 6.16. Condensed tabulation of fauna by artifact groups at 29SJ 627.

	Artifact Group			
Faunal Group	Piercing Tools	Scraping Tools	Non-tools	N
Small-to-medium sized mammal	8	-	3	11
Mid-sized mammal	5	-	-	5
Medium-to-large sized mammal	87	8	6	101
Aves	2	-	21	23
Totals	102	8	30	140

from piercing and scraping tools rather than beads and whistles.

No significant changes of preference were noted in the type of fauna used for bone artifacts from the three major roomblock construction periods (Tables 6.17-6.20).

Coyote (Canis latrans) is represented in the collection after the second major roomblock construction period (Phase B, late A.D. 700s-middle 900s), but the frequency of this and other mid-sized carnivores is low throughout the collection.

Spatial Analysis

Bone artifacts were found most frequently in the general fill of rooms and pit structures (Tables 6.21-6.23). The kivas and pit structure antechambers contained 118 bone artifacts, the pithouses had 51, and the rooms had 49. The yield by class from pithouses and kivas is 61 piercing tools, 7 scraping tools, and 27 non-tools. Far fewer artifacts (16) are from other proveniences such as plaza areas, general associations, and the trash midden.

Bone workshop locations can be determined by examining the patterns of association of the architecture, in-situ worked bone locations, and depositional history. The possibility that artifacts were discarded far away from where they were used or moved by other means before excavation was considered. However, this is not true for three reasons. There is no apparent special location for dumping bone artifacts; the users probably did not go far to discard so few artifacts; and there was probably minimal disturbance by scavenging carnivores because there is so little nutritional value in worked and dried bone.

An examination of bone artifacts from all proveniences indicates that the worked bone collection from the trash midden (16 items, most of which were fragments) lacks some information that is necessary to this study. This is due to a combination of factors: the scarcity of bone artifacts from sites, the small sample from the trash mound (less than 10% of it was excavated), and the history and boundaries of the collection units that are somewhat complex and unclear. Samples from the trash midden and an-

Table 6.17. Distribution of fauna among bone artifact types between A.D. 950 and 1000 at 29SJ 627.

	Artifact Types							
	Piercing Tools		Scraping Tools	Non-tools		Misc. Tool		
Taxon	Awls	Needles	End Scrapers	Beads	Tinklers	Blanks	Fragments	N
Lepus californicus (jack rabbit)	-	-	-	-	1	-	3	4
Canis latrans (coyote)	1	-	-	-	-	-	-	1
Odocoileus hemionus (mule deer)	6	-	1	-	-	1	1	9
Antilocapra americana (pronghorn)	2	-	-	-	-	-	2	4
Ovis canadensis (mountain sheep)	1	-	-	-	-	-	-	1
Small-to-medium sized animal	1	-	-	-	-	-	1	2
Mid-sized mammal	1	-	-	-	-	-	-	1
Artiodactyl	13	1	-	-	-	-	18	32
Medium-to-large sized mammal	-	-	-	-	-	-	4	4
Aves	1	-	-	1	-	-	-	2
Unknown bird or mammal	-	1	-	-	-	-	-	1
Totals	26	2	1	1	1	1	29	61

Table 6.18. Distribution of fauna among bone artifact types between A.D. 780-950 at 29SJ 627.

Taxon	Artifact Types: Piercing Tools: Awls	Needles	Pins	Tools: End Scrapers	Non-tools: Beads	Gaming Pieces	Misc. Frags.	Totals
Lepus californicus (jack rabbit)	4	-	-	-	1	-	2	7
Odocoileus hemionus (mule deer)	2	-	-	-	-	-	-	2
Artiodactyl	8	1	1	2	-	-	4	16
Medium-to-large sized mammal	3	1	-	-	-	-	3	7
Aves	-	-	-	-	1	-	-	1
Unknown bird or mammal	-	-	-	-	-	1	-	1
Totals	17	2	1	2	2	1	9	34

Table 6.19. Distribution of fauna among bone artifact types post A.D. 1000 at 29SJ 627.

	Artifact Types													
	Piercing Tools				Scraping Tools			Non-Tools			Miscellaneous			
Taxon	Awls	Needles	Punches	Pins	End Scrapers	Rub. Tools	Spatulas	Beads	Gaming Pieces	Whistles	Tool Blanks	Frags.	Misc.	Totals
<u>Sylvilagus</u> sp. (cottontail rabbit)	-	-	-	-	-	-	-	-	-	-	-	1	-	1
<u>Lepus</u> <u>californicus</u> (jack rabbit)	2	-	-	-	-	-	-	1	-	-	-	2	-	5
<u>Canis</u> <u>latrans</u> (coyote)	2	-	-	-	-	-	-	-	-	-	-	-	-	2
<u>Odocoileus</u> <u>hemionus</u> (mule deer)	4	-	-	-	1	-	-	-	-	-	-	5	-	10
<u>Antilocapra</u> <u>americana</u> (pronghorn)	1	-	-	-	1	-	-	-	-	-	1	-	-	3
<u>Ovis</u> <u>canadensis</u> (mountain sheep)	-	-	-	-	-	-	-	-	-	-	-	-	1	1
<u>Branta</u> <u>canadensis</u> (Canadian goose)	-	-	-	-	-	-	-	2	-	-	-	-	-	2
<u>Buteo</u> sp. (hawk)	-	-	-	-	-	-	-	2	-	1	-	-	-	3
<u>Meleagris</u> <u>gallopavo</u> (turkey)	1	-	-	-	-	-	-	2	-	-	-	-	-	3
<u>Grus</u> <u>canadensis</u> (sandhill crane)	-	-	-	-	-	-	-	2	-	1	-	-	-	3
<u>Bubo</u> <u>virginianus</u> (great horned owl)	-	-	-	-	-	-	-	-	-	-	-	1	-	1
Small-to-medium sized mammal	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Artiodactyl	24	2	1	1	1	1	1	1	4	-	-	27	1	64
Medium-to-large sized mammal	-	-	1	-	-	-	-	-	1	-	-	4	-	6
Aves	-	-	-	-	-	-	-	8	-	-	-	2	-	10
Unknown bird or mammal	2	-	-	-	-	-	2	2	-	-	-	4	-	10

Table 6.20. Condensed tabulations of faunal groups through time at 29SJ 627.

Dates	Small-to-Medium Sized Mammals	Mid-sized Mammals	Medium-to-Large Sized Mammals	Aves	Unknown Bird or Mammal	N
A.D. 780-950	7	-	25	1	1	34
A.D. 950-1000	6	2	50	2	1	61
Post A.D. 1000	7	2	84	22	10	125
Totals	20	4	159	25	12	220

Table 6.21. Distribution of artifact types by rooms at 29SJ 627.

	Room Designation																
Artifact Type	1	2	3	5	7	8	9	10	11	12	15	16	17/18	19	22	23	N
Piercing tools:																	
Awls	-	2	4	1	4	2	1	1	1	-	1	1	1	4	-	-	23
Ulna awls	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	2
Needles	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	2
Scraping tools:																	
End scrapers	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
Humerus end scrapers	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Rubbing tools	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Non-tools:																	
Beads	-	-	1	-	1	-	-	-	-	-	-	-	-	1	-	-	3
Gaming pieces	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	2
Fragments	1	-	1	1	1	1	-	3	-	1	-	-	-	1	2	2	14
Totals	1	2	6	3	7	5	2	4	3	1	2	1	1	6	2	3	49

Table 6.22. Distribution of artifact types by pit structures and other general proveniences at 29SJ 627.

	Structure Designation													
Artifact Types	Ph B	Ph C	K D	K E	PS F	K G	Ante	T.M.	Pl.	R. 1	H. 1	TT 7	G.A.	N
Piercing Tools:														
Awls	1	21	3	20	2	-	2	5	4	1	1	3	-	63
Ulna Awls	-	2	-	2	-	-	-	1	-	-	-	-	-	5
Awl-spatulas	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Punches	-	-	-	2	-	-	-	1	1	-	-	-	-	4
Needles	-	2	1	-	-	-	1	-	-	-	-	-	-	4
Pins	-	-	-	-	-	1	-	-	-	-	-	-	-	1
Scraping Tools:														
End scrapers	-	1	1	2	-	-	-	-	-	-	-	-	-	4
Spatulas	-	-	-	3	-	-	-	-	-	-	-	-	-	3
Non-Tools:														
Beads	-	1	2	17	-	-	-	-	-	-	-	-	-	20
Gaming Pieces	-	-	-	4	-	-	-	-	1	-	-	-	-	5
Whistles	-	-	-	2	-	-	-	-	-	-	-	-	-	2
Tinklers	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Miscellaneous:														
Tool blanks	-	-	-	1	1	-	-	-	-	-	-	-	-	2
Fragments	-	21	17	25	5	1	1	9	3	-	-	1	-	83
Missing Tools	-	-	2	-	-	-	-	-	-	-	-	-	-	2
Totals	1	50	26	78	8	2	4	16	9	1	1	4	-	200

Table 6.23. Condensed distribution of artifact groups by provenience at 29SJ 627.

Provenience	Artifact Group: Pierc. Tools	Scrap. Tools	Non-Tools	Misc.	N
Rooms	27	3	5	14	49
Pit structures:					(169)
Pithouses	27	1	2	21	51
Kivas (includes antechamber)	34	6	25	53	118
Trash Midden	7	-	-	9	16
Plaza areas	5	-	1	3	9
Ramada 1	1	-	-	-	1
Isolated hearth (Cist 10)	1	-	-	-	1
Test Trench 7	3	-	-	1	4
General association (no provenience)	-	-	-	1	1
Totals	105	10	33	102	250

other 16 artifacts found outside structural boundaries were not concentrated in a particular area nor were they of an unusual nature.

The artifacts with greater analytical and interpretive value were found in the rooms and pit structures. The average number of bone artifacts from a pit structure at 29SJ 627 is 24; however, Pithouse B, Pit Structure F, and Kiva G have a combined tally of only 11 artifacts. This implies that discarded workshop materials were concentrated in Pithouse C and Kiva E.

Typically, there are few bone artifacts. Their manufacture and use produced very little in the way of bone debris. Because they were dispersed throughout the general fill of structures/features, there was probably no special place for discarded bone implements or fragments. Therefore, bone artifacts did not accumulate at a rate requiring frequent clean-up and trips to the trash mound for disposal. Also, the site was continuously occupied with a great deal of emphasis on reusing space (Truell, Volume I). This continuity virtually eliminates any chance of depositional build-up of fill until the structures were permanently abandoned.

A total of 220 bone artifacts were assigned to temporal spans. Phase B (first major roomblock construction and use period--late A.D. 700s-middle 900s) bone artifacts were recovered from open work areas or ramadas and the primary living structures or pithouses. Later material was found in kivas and away from the main roomblock. Bone tools recovered from communal grinding rooms date to about 150 years prior to the postulated date of abandoment, but there were none associated with the primary living rooms during the last years of site occupation. Material from Phase D (the third major roomblock construction and use period--middle A.D. 1000s) was limited. Only three bone artifacts were associated with material from the core living and work rooms, and these were linked to a specific activity area, the grinding room (Room 17/18). In the southern room suite, the sample included 10 bone tools, most of which were from Room 7, a possible grinding room.

Non-tool items were found in proveniences that date late in the site's history. They were found mainly in kivas (25/33), because most were fragments that were thrown away into the empty pits. A very small number of non-tools (7/33) were recovered from surface rooms and pithouses. There were no punches, tool blanks, whistles, or tinklers in the rooms; and most of the tubular beads (which may represent one or, a very few jewelry items) were recovered from Kiva E. A closer look at the distribution of non-tools among the kivas proves somewhat interesting. There is a large proportion of complete and nearly complete artifacts from Kiva E, although 69% of the artifacts from Kiva D are unidentifiable fragments.

Also interesting is that punches and tool blanks were found only in kivas. McKenna (1980, 1984) reports on the bone awl manufacturing process at 29SJ 1360, located less than one mile southeast of 29SJ 627. The evidence was locked in time by a fire that ravaged Pithouse B. What remained were artiodactyl metapodials in various stages of alteration as demonstrated by preparation marks on the shafts and clues to the types of tools used to manufacture bone awls. Besides a stone biface and hammerstone, an awl-shaped punch was probably used to split a prepared metapodial "tool blank" bilaterally. The bone paraphernalia comprising the in situ assemblage at 29SJ 1360 is similar to that found in the fill of Kiva E at 29SJ 627.

Summary and Conclusions

The bone artifacts from 29SJ 627 are an excellent collection for analysis within this small site and for comparison with analyses from other similar sites. Facilitating factors include good temporal and spatial controls. Also, a relatively large number of items that were recovered and in good condition.

This report contains details on intrasite analysis. The data collected for the study are adequate for discussions about descriptive information, manufacturing techniques, morphological comparisons, faunal selection, and possible locations of activity areas through time. However, functional analysis is limited to general categories such as piercing, scraping, and non-tools. Inter-site analysis can be found in Miles' synthesis (1989) on the subject.

There were no unusual bone implements in terms of size or general type. Piercing tools, primarily awls, are by far the most numerous of the identifiable types, and the many fragments are also thought to represent mostly piercing tools. Tubular beads are the most numerous non-tool item.

There are two average lengths for awls: 8 and 11 cm. The tip diameters of awls average 1 mm. Punches, on the other hand, have consistently broader tips than other piercing tools due to the dulling effect of use.

Bone artifacts increased in number as did the site population around A.D. 950-1000. A characteristic of the site inventory is the increased occurrence of beads, which most likely indicates that several beads were part of a single ornament. Interestingly, this coincides with the construction of kivas, an architectural feature in which tubular beads are often found.

Manufacturing techniques are efficient and consistent through time. Very little bone was wasted during the process. The first cut or break to the whole bone produces a piece that is much the same shape and size as the final product, and therefore, determines the class of artifact at this initial stage. For awls and other piercing tools, bilateral splitting and splintering of long-bone shafts are the standard first steps. The second step is to refine the shape of the tip end. Tubular beads are segmented by a groove-and-snap method applied along the circumference of a shaft of bone. Once bone implements are made, there is no evidence that suggests reshaping them into other functional forms except for the possibility that broken awl tips may have been reused as punches. Bone tools may have served more than one function, as indicated by the high variability of tip diameters among the piercing tools.

Species representation is also consistent throughout the assemblage. Artiodactyl long bones were used for sturdy piercing and scraping tools, while hollow bird bones and delicate long bones from rabbits were made into tube beads, whistles, and tinklers. Obviously, the fauna most often exploited for bone was artiodactyl. Its prevalence in the collection indicates which type of tool was produced in the greatest quantity rather than the number of animals in the environment.

Canadian geese and sandhill cranes were imported somehow from areas that serve as migration routes for these birds. Other imports are represented in the unmodified faunal remains but not in the worked bone collection. This shows a fair degree of selectivity, because the crane and goose, while not exploited in great numbers, are the exotics found here and in other collections of worked bone from sites in Chaco Canyon.

Activities involving bone tool artifacts were centered in Pithouse C and open ramadas up until the late A.D. 900s. Manufacturing areas cannot be distinguished from use areas during this time because there are no remains that indicate designated manufacturing loci, and the general concept of specialized work areas cannot be seen in the features or artifacts of 29SJ 627.

Bone awls assigned to Phase C, the second major roomblock construction and use period (late A.D. 900s-early 1000s), were most often recovered from grinding rooms. Later bone artifacts, however, were not as closely linked to such rooms.

The bones from Kiva D were essentially useless fragments, whereas Kiva E had many complete and identifiable items. The evidence of awl manufacturing (punches and prepared tool blanks) recovered from Kiva E is also interesting. Truell (1980 and Volume I) thought that the core residents of the roomblock, which exhibits the longest occupation of the site, were primarily associated with Kiva E. Therefore, the occupants of one of the suites that fell to disuse prior to the ultimate abandonment of the core suite and Kiva E were primarily associated with Kiva D. The brief occupation of Kiva D would account for its small number of bone artifacts.

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APPENDIX A

CERAMIC COUNTS BY PROVENIENCE

H. Wolcott Toll and Peter J. McKenna

In this appendix, all of the ceramic counts by rooms, pithouses, pit structures, kivas, trash mound, ramadas, features, test trenches, and excavated proveniences are presented. Note that there is no Room 13.

Table A.1. Room 1

Provenience	CULINARY Plain Gray	Lino Gray & Fugitive	Narrow Neckbanded	Neck Corr.	PII Corr.	Unident. Corr.
Ly 1 Lv 1	77	1	32	-	2	137
Ly 2 Lv 2	19	-	4	1	-	11
Lv 3	17	-	3	-	-	11
Ly 3 Lv 4	24	-	3	1	-	2
Lv 5	4	-	-	1	-	-
Floor 1	14	1	7	1	-	-
N	155	2	49	4	2	161
%	24		8	1		25

Culinary n = 373 50%

Provenience	SERVICE WARE BMIII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Puerco B/w	Gallup B/w	White Ware	PII-III Mineral
Ly 1 Lv 1	-	2	7	22	1	34	111	20
Ly 2 Lv 2	-	-	-	7	1	2	6	6
Lv 3	-	2	-	4	-	-	1	3
Ly 3 Lv 4	-	-	-	4	-	-	3	2
Lv 5	-	-	2	-	-	-	-	-
Floor 1	1	-	2	4	-	-	2	3
N	1	4	11	41	2	36	123	34
%		1	2	6		6	19	5

Provenience	SERVICE WARE BMIII-PI Carbon	PII-III Carbon	Burnham B/w	Forestdale Smudged	Unident. Smudged	San Juan Redware	Unident. Redware	Total	%
Ly 1 Lv 1	1	5	-	-	1	-	2	455	71
Ly 2 Lv 2	-	1	-	-	-	-	1	59	9
Lv 3	-	-	-	-	-	1	-	42	7
Ly 3 Lv 4	-	-	-	1	-	-	-	41	7
Lv 5	-	-	1	2	-	-	-	9	1
Floor 1	-	-	-	-	1	-	-	36	6
N	1	6	1	3	2	1	3	642	101
%		1		1				98	

Service Ware n = 369 50%

Table A.2. Room 2

	CULINARY					
Provenience	Plain Gray	Lino Gray & Fugitive	Narrow Neckbanded	Neck Corr.	PII Corr.	Unident. Corr.
Ly 2 Lv 1	44	3	15	2	5	150
Lv 2	14	-	6	1	-	36
Ly 3 Lv 3	17	1	6	-	-	23
Ly 4 Lv 5	6[a]	-	1	-	1	24
Floor 1	68	1	18	5	1	74
Floor 2	10	1	2	1	-	5
N	159	6	48	9	7	312
%	16	1	5	1	1	31

Culinary n = 541 54%

	SERVICE WARE							
Provenience	BMIII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w
Ly 2 Lv 1	1	-	-	30	-	5	25	3
Lv 2	-	1	-	2	-	2	6	3
Ly 3 Lv 3	-	-	1	6	1	-	6	-
Ly 4 Lv 5	-	-	2	3	1	-	6	-
Floor 1	-	-	-	16	-	-	16	-
Floor 2	1	-	-	1	-	-	1	-
N	2	1	3	58	2	7	60	6
%				6		1	6	1

Table A.2. (continued)

Provenience	SERVICE WARE White Ware	PII-III Mineral	BMIII-PI Carbon	Lino B/g	St. Josephs B/w	PII-III Carbon	Tunicha B/w	Chuska B/w
Ly 2 Lv 1	98	21	1	1	-	1	-	-
Lv 2	31	3	-	-	-	1	-	-
Ly 3 Lv 3	14	7	-	-	-	-	-	1
Ly 4 Lv 5	20	3	-	-	-	1	-	-
Floor 1	33	59	-	-	1	2	1	4
Floor 2	2	-	-	-	-	-	-	-
N	198	93	1	1	1	5	1	5
%	20	9				1		1

Provenience	SERVICE WARE Forestdale Smudged	Upper Gila Corrugated	Unident. Smudged	Deadmans B/r	San Juan Redware	Unident. Redware	Total	%
Ly 2 Lv 1	1	-	-	1	1	1	409	41
Lv 2	-	-	-	-	-	-	107	11
Ly 3 Lv 3	-	-	-	-	-	-	86	9
Ly 4 Lv 5	-	-	-	-	-	1	70	7
Floor 1	-	3	1	-	1	-	299	30
Floor 2	-	-	1	-	-	1	28	3
N	1	3	2	1	2	3	999	101
%							100	

Service Ware n = 458 46%

[a]1 mudware

Table A.3. Room 3

Provenience	CULINARY Plain Gray	Narrow Neckbanded	Neck Corr.	PII Corr.	PIII Corr.	Unident. Corr.
Ly 1 Lv 1	5	4	-	-	-	34
Floor 1	2	1	1	-	-	19
Floor 1A	1	1	-	1	-	5
Ly 2 Lv 1	20	2	-	-	-	16
Lv 2	18	5	1	-	1	2
Floor 2	29	12	1	-	-	1
N	75	25	3	1	1	77
%	26	9	1			26

Culinary n = 182 63%

Provenience	SERVICE WARE BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Puerco B/w	Gallup B/w	Chaco B/w	White Ware	PII-III Mineral
Ly 1 Lv 1	-	-	5	4	10	-	30	-
Floor 1	-	-	3	1	1	1	8	1
Floor 1A	-	-	1	-	1	-	-	1
Ly 2 Lv 1	-	1	8	-	1	-	2	3
Lv 2	-	-	1	-	-	-	2	1
Floor 2	1	1	4	-	-	-	3	3
N	1	2	22	5	13	1	45	9
%		1	8	2	4		15	3

Provenience	SERVICE WARE San Juan Carbon	PII-III Carbon	Forestdale Smudged	Upper Gila Corrugated	Deadmans B/r	San Juan B/r	Unident. Redware	Total	%
Ly 1 Lv 1	-	-	-	1	-	-	-	93	32
Floor 1	-	1	1	-	-	-	-	40	14
Floor 1A	-	-	3	-	-	-	-	14	5
Ly 2 Lv 1	1	-	-	-	-	-	-	54	19
Lv 2	-	-	-	-	2	1	-	34	12
Floor 2	-	-	-	-	-	-	1	56	19
N	1	1	4	1	2	1	1	291	101
%			1		1			97	

Service Ware n = 109 37%

Table A.4. Room 4

	CULINARY							
Provenience	Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	PII-III & PIII Corr.	Unident. Corr.
Fill	5	-	-	2	1	-	-	3
Ly 1 Lv 1	25	-	-	8	1	1	-	54
Lv 2	11	-	-	-	-	-	-	7
Lv 3	2	-	-	1	-	1	-	6
Lv 4	22	1	-	1	-	-	-	14
Floor 1	55	-	1	6	-	2	-	70
Ly 2	17	1	1	20	-	-	1	-
Ly 3	23	-	1	-	-	-	-	-
Floor 2	39	-	-	-	1	-	-	-
N	199	2	3	38	3	4	1	154
%	29			6		1		22

Culinary n = 404 59%

	SERVICE WARE						
Provenience	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Exotic Material
Fill	-	4	5	-	2	2	-
Ly 1 Lv 1	-	-	9	-	5	12	-
Lv 2	-	2	7	-	-	3	-
Lv 3	1	-	3	-	-	1	-
Lv 4	-	1	8	1	-	4	-
Floor 1	-	3	16	6	-	21	1
Ly 2	-	1	16	-	-	-	-
Ly 3	-	-	-	-	-	-	-
Floor 2	1	2	2	-	-	-	-
N	2	13	66	7	7	43	1
%		2	10	1	1	6	

Table A.4. (continued)

	SERVICE WARE							
Provenience	White Ware	PII-III Mineral	BMIII-PI Carbon	McElmo B/w	San Juan Carbon	PII-III Carbon	Sosi-Black Mesa B/w	Newcomb B/w
Fill	1	3	-	-	-	1	-	-
Ly 1 Lv 1	6	13	-	-	-	-	-	-
Lv 2	5	6	-	-	-	-	-	-
Lv 3	2	-	1	-	-	-	-	-
Lv 4	15	-	-	1	-	-	-	-
Floor 1	40	10	1	-	-	1	1	1
Ly 2	14	4	1	-	1	-	-	1
Ly 3	1	6	-	-	-	-	-	-
Floor 2	1	1	-	-	-	-	-	-
N	85	43	3	1	1	2	1	1
%	12	6						

	SERVICE WARE					
Provenience	Forestdale Smudged	Unident. Smudged	San Juan Redware	Unident. Redware	Total	%
Fill	-	-	-	-	29	4
Ly 1 Lv 1	-	-	-	-	134	20
Lv 2	-	-	-	-	41	6
Lv 3	-	-	-	-	20	3
Lv 4	1	-	-	-	67	10
Floor 1	-	1	-	-	236	34
Ly 2	2	-	1	1	81	12
Ly 3	-	-	-	-	31	5
Floor 2	-	-	-	-	47	7
N	3	1	1	1	686	101
%					96	

Service Ware n = 282 41%

Table A.5. Room 5

Provenience	CULINARY Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	PII-III & PIII Corr.	Unident. Corr.
Ly 1 Lv 1	29	-	-	20	-	5	-	51
Lv 2	215	4	1	69	15	11	1	293
Ly 2 Lv 3	39	1	1	12	-	4	-	90
Floor 1	19	-	1	1	14	5	-	46
Floor 1A	5	-	-	-	-	-	-	7
Ly 3 Lv 1	12	-	-	2	-	-	-	9
Lv 2	50	-	-	8	19	-	-	26
Floor 2	7	-	1	11	1	-	-	2
Ly 4 Lv 3	-	-	-	-	-	-	-	-
N	376	5	4	123	49	25	1	524
%	21			7	3	1		29

Culinary n = 1,107 61%

Provenience	SERVICE WARE BMIII-PI Polished Mineral	BMIII-PI Unpol. Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Exotic Mineral
Ly 1 Lv 1	-	2	-	17	-	6	11	2	2
Lv 2	-	2	8	118	9	8	70	-	1
Ly 2 Lv 3	-	-	1	24	3	14	47	3	-
Floor 1	1	1	-	7	2	18	6	-	-
Floor 1A	-	1	-	1	-	1	1	-	-
Ly 3 Lv 1	-	-	-	3	-	1	9	-	-
Lv 2	-	-	1	5	-	-	-	-	-
Floor 2	-	-	1	3	-	-	-	-	-
Ly 4 Lv 3	-	-	-	1	-	-	-	-	-
N	1	6	11	179	14	48	144	5	3
%			1	10	1	3	8		

Table A.5. (continued)

Provenience	White Ware	PII-III Mineral	BMIII-PI Carbon	PII-III Carbon	Forestdale B/w	Unident. Smudged
	SERVICE WARE					
Ly 1 Lv 1	46	3	-	3	1	-
Lv 2	116	-	1	10	-	2
Ly 2 Lv 3	58	17	-	1	2	6
Floor 1	5	11	-	-	-	1
Floor 1A	-	3	-	-	-	-
Ly 3 Lv 1	1	-	-	-	-	-
Lv 2	7	-	-	-	1	-
Floor 2	-	1	-	-	-	-
Ly 4 Lv 3	1	-	-	-	-	-
N	234	35	1	14	4	9
%	13	2		1		

Provenience	Bluff B/r	Deadmans B/r	Unident. Redware	Total	%
	SERVICE WARE				
Ly 1 Lv 1	-	-	-	198	11
Lv 2	-	-	6	960	53
Ly 2 Lv 3	-	-	-	322	18
Floor 1	-	2	-	141	8
Floor 1A	-	-	-	19	1
Ly 3 Lv 1	-	-	-	37	2
Lv 2	1	-	-	118	6
Floor 2	-	-	-	27	2
Ly 4 Lv 3	-	-	-	2	-
N	1	2	6	1,824	
%					100

Service Ware n = 717 39%

Table A.6. Room 6

Provenience	CULINARY Plain Gray	Lino Gray & Fugitive	Narrow Neckbanded	Neck Corr.	PII Corr.	Unident. Corr.
Fill	20	-	1	2	1	5
Lv 1	29	-	6	-	3	166
2	20	1	4	2	1	13
Floor 1	-	-	-	-	-	1
Lv 4	6	-	5	-	-	-
Floor 2	-	-	-	-	-	-
Lv 5	29	-	9	3	-	2
Floor 3	-	-	-	-	-	-
N	104	1	25	7	5	187
%	22		5	1	1	40

Culinary n = 329 70%

Provenience	SERVICE WARE BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Puerco B/w	Gallup B/w	Chaco B/ w	White Ware	PII-III Mineral
Fill	-	5	5	-	-	-	6	2
Lv 1	1	-	5	1	10	-	13	20
2	1	-	13	-	-	-	8	7
Floor 1	-	-	-	-	-	2	-	1
Lv 4	-	-	2	1	-	-	6	2
Floor 2	-	-	-	-	-	-	-	-
Lv 5	1	1	5	-	-	-	4	8
Floor 3	-	-	-	-	-	-	-	1
N	3	1	30	2	10	2	37	41
%	1		6		2		8	9

Provenience	SERVICE WARE BMIII-PI Carbon	Newcomb B/w	Toadlena B/w	Forestdale Smudged	Unident. Smudged	Total	%
Fill	1	1	3	-	-	47	10
Lv 1	-	-	-	-	-	254	54
2	-	-	-	1	-	71	15
Floor 1	-	-	-	-	-	4	1
Lv 4	-	-	-	-	-	22	5
Floor 2	-	-	-	-	-	-	-
Lv 5	1	5	1	-	1	70	15
Floor 3	-	-	-	-	-	1	-
N	2	6	4	1	1	469	100
%						97	

Service Ware n = 140 30%

Table A.7. Room 7

Provenience	Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	PIII Corr.	Unident. Corr.
	CULINARY							
Fill	1	-	-	-	-	-	-	2
Ly 1 Lv 1	23	1	-	16	-	6	-	192
Lv 2	76	-	-	22	-	7	1	164
Lv 3	18	-	-	2	-	4	-	80
Floor 1	-	-	-	-	-	-	-	-
Ly 2 Lv 1	10	-	1	-	6	-	-	-
Lv 2	8	-	-	6	5	-	-	1
Floor 2	10	-	1	1	2	-	-	-
N	146	1	2	47	13	17	1	439
%	14			4	1	2		42

Culinary n = 666 63%

Provenience	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	White Ware	PII-III Mineral
	SERVICE WARE								
Fill	-	-	1	-	-	-	-	-	-
Lv 1 Lv 1	1	6	10	-	5	14	7	67	11
Lv 2	-	3	41	1	2	20	-	72	15
Lv 3	-	-	4	-	-	8	1	20	8
Floor 1	-	-	-	-	-	-	-	-	-
Ly 2 Lv 1	-	-	14	-	-	-	-	4	-
Lv 2	-	-	5	-	1	1	-	4	1
Floor 2	-	-	3	-	-	-	-	7	3
N	1	9	78	1	8	43	8	174	38
%		1	7		1	4	1	16	4

Table A.7. (continued)

Provenience	SERVICE WARE PII-III Carbon	Pena B/w	Newcomb B/w	Burnham B/w	Toadlena Carbon	Chuskan B/r
Fill	-	-	-	-	-	-
Ly 1 Lv 1	1	-	-	1	1	1
Lv 2	1	1	2	-	-	1
Lv 3	2	-	-	-	-	-
Floor 1	-	-	-	-	-	-
Ly 2 Lv 1	-	-	5	-	-	-
Lv 2	-	-	2	-	1	-
Floor 2	-	-	-	-	-	-
N	4	1	9	1	2	2
%			1			

Provenience	SERVICE WARE Bluff B/r	Deadmans B/r	Puerco B/r	San Juan Redware	Unident. Redware	Total	%
Fill	-	-	-	-	-	4	-
Ly 1 Lv 1	1	-	1	3	1	370	35
Lv 2	-	-	-	2	-	430	41
Lv 3	-	1	-	-	-	148	14
Floor 1	-	-	-	-	-	-	-
Ly 2 Lv 1	-	-	-	-	-	40	4
Lv 2	-	-	-	-	-	35	3
Floor 2	-	-	-	-	2	29	3
N	1	1	1	5	3	1,056	100
%						98	

Service Ware n = 390 37%

Table A.8. Room 8

Provenience	CULINARY Plain Gray	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	PII-III & PIII Corr.	Unident. Corr.
Ly 1 Lv 1	1	1	2	1	-	-	-
Ly 2 Lv 2	17	-	9	-	5	-	102
Lv 3	3	-	1	-	-	-	8
Floor 1	1	-	3	-	-	-	30
Ly 3	5	-	1	1	-	1	46
Floor 2	29	1	2	3	11	1	192
Ly 4	-	-	-	-	-	-	-
Ly 5	24	-	1	-	-	-	8
Floor 3	13	1	2	-	-	-	-
N	93	3	21	5	16	2	386
%	12		3	1	2		56

Culinary n = 584 73%

Provenience	SERVICE WARE Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	White Ware	PII-III Mineral	PII-III Carbon
Ly 1 Lv 1	-	-	-	1	-	-	1	-
Ly 2 Lv 2	1	8	-	5	10	29	8	-
Lv 3	-	1	-	2	2	1	1	-
Floor 1	-	-	-	1	4	13	11	4
Ly 3	-	1	-	2	2	6	4	3
Floor 2	5	9	1	2	5	17	7	2
Ly 4	-	-	-	-	-	-	4	-
Ly 5	-	7	-	-	-	13	2	-
Floor 3	2	3	-	-	-	6	-	-
N	8	29	1	13	23	85	38	9
%	1	4		2	3	11	5	1

Provenience	SERVICE WARE Tunicha B/w	Burnham B/w	Chuskan Carbon	Forestdale Smudged	Unident. Redware	Total	%
Ly 1 Lv 1	-	-	-	-	-	7	1
Ly 2 Lv 2	-	-	-	-	-	254	32
Lv 3	-	-	-	1	-	20	2
Floor 1	-	-	-	1	-	67	8
Ly 3	-	-	1	1	-	74	9
Floor 2	-	1	-	-	2	290	36
Ly 4	-	-	-	-	-	4	-
Ly 5	1	-	-	-	-	57	7
Floor 3	-	-	-	-	1	28	3
N	1	1	1	3	3	801	98
%						101	

Service Ware n = 217 27%

Table A.9. Room 9

	CULINARY							
Provenience	Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	PII-III & PIII Corr.	Unident. Corr.
Fill	4	-	-	-	-	-	-	-
Ly 1 Lv 1	9	-	-	1	3	-	-	13
Lv 2	13	-	-	4	1	1	-	18
Ly 2 Lv 3	9	-	1	-	-	-	1	104
Floor 2	14	-	1	4	-	2	1	47
Ly 4 Lv 1	26	2	-	1	-	-	-	2
Floor 2A	1	-	-	-	-	-	-	1
Ly 6 Lv 1	74	3	-	-	1	-	-	3
Lv 2	60	11	-	-	-	-	-	-
Lv 3	26	11	-	-	-	-	-	-
Lv 4	12	1	-	1	-	-	-	-
Lv 5	13	2	-	-	-	-	-	-
Floor 4	5	-	-	-	-	-	-	-
N	266	30	2	11	5	3	2	188
%	41	5		2	1	1		29

Culinary n = 507 78%

	SERVICE WARE								
Provenience	BMIII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	White Ware	PII-III Mineral
Fill	-	-	-	-	-	-	-	-	-
Ly 1 Lv 1	-	-	-	11	-	1	3	15	-
Lv 2	-	-	-	-	1	-	2	12	8
Ly 2 Lv 3	-	-	-	7	1	1	-	15	-
Floor 2	-	2	1	4	-	2	2	1	5
Ly 4 Lv 1	-	3	-	3	-	-	1	4	-
Floor 2A	-	-	-	1	-	-	1	3	-
Ly 6 Lv 1	-	1	1	3	-	-	-	6	-
Lv 2	1	2	-	-	-	-	-	2	-
Lv 3	1	-	-	-	-	-	-	1	-
Lv 4	1	-	-	-	-	-	-	-	-
Lv 5	-	-	-	-	-	-	-	1	-
Floor 4	-	1	-	-	-	-	-	-	-
N	3	9	2	29	2	4	9	60	13
%	1	1		4		1	1	9	2

Table A.9. (continued)

	SERVICE WARE						
Provenience	BMIII-PI Carbon	Lino B/g	Forestdale Smudged	Unident. Smudged	Unident. Redware	Total	%
Fill	-	-	-	-	-	4	1
Ly 1 Lv 1	-	-	-	-	-	56	9
Lv 2	-	-	-	-	-	60	9
Ly 2 Lv 3	1	-	1	-	-	141	22
Floor 2	1	-	-	2	-	89	14
Ly 4 Lv 1	-	1	-	-	-	43	7
Floor 2A	-	-	-	-	-	7	1
Ly 6 Lv 1	-	-	-	-	-	92	14
Lv 2	-	-	2	-	1	79	12
Lv 3	-	-	-	-	-	39	6
Lv 4	-	-	-	-	-	15	2
Lv 5	-	-	-	-	-	16	2
Floor 4	-	-	-	-	-	6	1
N	2	1	3	2	1	647	100
%			1			99	

Service Ware n = 140 22%

Table A.10. Room 10

Provenience	CULINARY Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	PII-III & PIII Corr.	Unident. Corr.
Fill	64	-	2	17	3	1	-	6
Ly 1 Lv 1	41	-	-	5	2	11	3	210
Lv 2	21	-	2	17	3	20	3	395
Ly 2 Lv 3	15	3	-	4	-	7	2	111
Floor 1	-	-	-	-	-	-	-	4
Floor 1A	2	-	-	-	-	-	-	9
Ly 3	104	1	-	28	-	1	-	28
Ly 4	10	1	-	32	17	3	-	117
Floor 2	35	-	1	6	4	1	-	5
N	292	5	5	109	29	44	8	885
%	13			5	1	2		40

Culinary n = 1,377 62%

Provenience	SERVICE WARE BMIII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Exotic Mineral
Fill	-	-	3	31	-	1	2	-	-
Ly 1 Lv 1	2	-	-	27	15	14	37	-	1
Lv 2	-	-	-	23	13	25	55	5	4
Ly 2 Lv 3	2	1	1	21	4	11	15	4	-
Floor 1	-	-	-	-	-	-	1	-	-
Floor 1A	-	-	1	-	-	-	-	-	-
Ly 3	1	2	-	28	-	5	-	-	-
Ly 4	-	2	7	39	-	1	-	-	-
Floor 2	-	-	9	9	-	-	-	-	-
N	5	5	21	178	32	57	110	9	5
%			1	8	1	3	5		

Provenience	SERVICE WARE White Ware	PII-III Mineral	BMIII-PI Carbon	Lino B/g	McElmo B/w	San Juan Carbon	PII-III Carbon
Fill	30	21	1	-	-	-	2
Ly 1 Lv 1	25	16	-	-	-	-	5
Lv 2	64	22	-	-	1	-	3
Ly 2 Ly 3	18	21	1	-	2	1	-
Floor 1	-	-	-	1	-	-	-
Floor 1A	2	-	-	-	-	-	-
Ly 3	57	2	1	-	-	-	1
Ly 4	24	41	-	-	-	-	4
Floor 2	3	5	-	-	-	-	-
N	223	128	3	1	3	1	15
%	10	6					1

Table A.10. (continued)

Provenience	SERVICE WARE Newcomb B/w	Burnham B/w	Chuska B/w	Forestdale Smudged	Showlow Smudged	Unident. Smudged
Fill	-	-	-	-	-	1
Ly 1 Lv 1	-	-	1	-	1	-
Lv 2	-	1	-	1	7	-
Ly 2 Lv 3	1	-	-	1	16	-
Floor 1	-	-	-	-	-	-
Floor 1A	1	1	-	-	-	-
Ly 3	-	-	-	1	-	-
Ly 4	-	-	-	2	-	-
Floor 2	-	-	-	1	-	-
N	2	2	1	6	24	1
%					1	

Provenience	SERVICE WARE Deadmans B/r	Puerco B/r	White Mt. Redware	San Juan Redware	Unident. Redware	Total	%
Fill	-	-	-	-	-	185	8
Ly 1 Lv 1	1	1	-	-	-	418	19
Lv 2	-	-	-	-	1	686	31
Ly 2 Lv 3	-	-	1	-	1	264	12
Floor 1	-	-	-	2	-	5	-
Floor 1A	-	-	-	-	-	17	1
Ly 3	-	-	-	-	1	263	12
Ly 4	-	-	-	-	-	302	14
Floor 2	-	-	-	-	1	80	4
N	1	1	1	2	4	2,220	101
%						97	

Service Ware n = 843 38%

Table A.11. Room 11

Provenience	CULINARY Plain Gray	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	Unident. Corr.
Floor 1	28	-	13	-	3	19
Ly 1 Lv 2	57	2	20	3	-	4
Lv 3	37	-	5	5	-	1
Floor 2	-	-	-	-	-	-
Floor 3	7	-	1	2	-	3
Ly 3 Lv 5	11	1	-	-	-	-
Floor 4	-	-	1	-	-	-
Ly 4 Ly 6	6	-	-	-	-	-
N	146	3	40	10	3	27
%	43	1	12	3	1	8

Culinary n = 259 76%

Provenience	SERVICE WARE BMIII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Puerco B/w	Gallup B/w	White Ware	PII-III Mineral
Floor 1	-	-	-	6	1	8	17	8
Ly 1 Lv 2	-	1	1	9	-	-	13	7
Lv 3	-	-	-	6	-	-	14	-
Floor 2	-	-	-	-	-	-	-	-
Floor 3	-	-	-	1	-	1	2	1
Ly 3 Lv 5	1	-	-	-	-	-	2	1
Floor 4	-	1	-	-	-	-	-	1
Ly 4 Lv 6	-	-	-	1	-	-	-	1
N	1	2	1	23	1	9	48	19
%		1		7		3	14	6

Provenience	SERVICE WARE BMIII-PI Carbon	McElmo B/w	San Juan Carbon	PII-III Carbon	Newcomb	Total	%
Floor 1	1	-	-	-	-	104	31
Ly 1 Lv 2	-	-	-	1	-	118	35
Lv 3	-	-	-	-	-	68	20
Floor 2	-	-	-	-	-	-	-
Floor 3	-	-	-	-	1	19	6
Ly 3 Lv 5	-	1[a]	-	1	-	17	5
Floor 4	-	-	1	-	-	5	1
Ly 4 Lv 6	-	-	-	-	-	8	2
N	1	1	1	2	1	339	
%				1			100

Service Ware n = 80 24%

[a] Chaco-McElmo B/w

Table A.12. Room 12

	CULINARY							
Provenience	Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	PII-III & PIII Corr.	Unident. Corr.
Fill	8	-	2	-	-	-	-	-
Lv 1	28	2	-	6	-	47	1	264
Ly 2 Lv 2	8	-	2	9	-	15	1	141
Floor 1	2	-	-	-	-	1	-	24
Ly 3	51	1	1	3	3	-	-	5
N	97	3	5	18	3	63	2	434
%	10			2		7		45

Culinary n = 619 64%

	SERVICE WARE						
Provenience	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Exotic Mineral
Fill	-	-	-	-	-	-	-
Lv 1	-	25	9	17	59	10	-
Ly 2 Lv 2	1	12	10	-	24	5	-
Floor 1	-	2	-	3	13	-	1
Ly 3	-	14	-	1	-	-	-
N	1	53	19	21	96	15	1
%		6	2	2	10	2	

Table A.12. (continued)

Provenience	SERVICE WARE White Ware	PII-III Mineral	BMIII-PI Carbon	PII-III Carbon	Sosi-Black Mesa B/w	Chuskan Carbon	Forestdale Smudged
Fill	-	1	-	-	1	1	-
Lv 1	23	32	-	1	-	-	1
Ly 2 Lv 2	21	15	-	-	-	-	-
Floor 1	2	1	-	1	-	-	-
Ly 3	13	6	1	-	-	-	-
N	59	55	1	2	1	1	1
%	6	6					

Provenience	SERVICE WARE Bluff B/r	Deadmans B/r	Tusayan B/r	San Juan Redware	Unident. Redware	Total	%
Fill	-	-	-	-	-	9	1
Lv 1	-	-	-	-	4	531	55
Ly 2 Lv 2	-	3	1	1	-	267	28
Floor 1	-	1	-	-	1	52	5
Ly 3	1	-	-	1	1	103	11
N	1	4	1	2	6	962	100
%					1	99	

Service Ware n = 343 36%

Table A.13. Room 14

Provenience	CULINARY Plain Gray	Lino Gray & Fugitive	Narrow Neckbanded	Neck Corr.	PII Corr.	PII-III Corr.	Unident. Corr.
Ly 1 Lv 1	10	-	3	-	-	-	17
Lv 2	7	-	1	-	-	1	21
Lv 3	17	-	1	-	-	1	5
Floor 1	11	2	7	-	2	-	21
Ly 2 Lv 4	14	1	14	-	2	-	55
Floor 2	5	-	2	1	-	-	1
N	64	3	28	1	4	2	120
%	15	1	7		1		29

Culinary n = 222 53%

Provenience	SERVICE WARE BMIII-PI Mineral	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	White Ware	PII-III Mineral
Ly 1 Lv 1	-	1	-	9	5	1	13	-
Lv 2	-	4	5	-	3	-	9	-
Lv 3	-	16	11	-	5	-	9	3
Floor 1	-	9	-	3	6	-	9	-
Ly 2 Lv 4	1	17	-	4	17	-	10	2
Floor 2	-	6	-	-	3	-	1	-
N	1	53	16	16	39	1	51	5
%		13	4	4	9		12	1

Provenience	SERVICE WARE PII-III Carbon	Forestdale Smudged	San Juan Redware	Unident. Redware	Total	%
Ly 1 Lv 1	-	-	-	-	59	14
Lv 2	-	-	1	-	52	12
Lv 3	-	-	-	5	73	17
Floor 1	2	-	-	2	74	18
Ly 2 Lv 4	-	5	1	-	143	34
Floor 2	1	-	-	-	20	5
N	3	5	2	7	421	
%	1	1		2		100

Service Ware n = 199 47%

Table A.14. Room 15

	CULINARY							
Provenience	Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	PII-III & PIII Corr.	Unident. Corr.
Ly 1 Lv 1	43	-	-	10	-	11	1	238
Lv 2	18	-	-	9	-	19	2	254
Lv 3	33	2	2	28	2	1	-	15
Floor 1	-	-	-	3	-	-	-	1
Ly 2 Lv 1	17	-	-	4	-	1	-	3
N	111	2	2	54	2	32	3	511
%	9			4		3		42

Culinary n = 717 58%

	SERVICE WARE							
Provenience	BMIII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w
Ly 1 Lv 1	-	-	3	23	1	14	41	-
Lv 2	-	-	-	17	1	6	41	1
Lv 3	1	1	1	34	-	1	1	-
Floor 1	-	-	-	1	-	-	-	-
Ly 2 Lv 1	-	-	-	6	-	-	-	-
N	1	1	4	81	2	21	83	1
%				7		2	7	

Table A.14. (continued)

Provenience	SERVICE WARE Exotic Mineral	White Ware	PII-III Mineral	BMIII-PI Carbon	McElmo B/w	PII-III Carbon	Sosi-Black Mesa	Chuskan B/w
Ly 1 Lv 1	5	102	21	1	1	3	1	1
Lv 2	-	46	10	-	-	2	-	-
Lv 3	-	70	16	-	-	-	-	-
Floor 1	-	-	3	-	-	-	-	-
Ly 2 Lv 1	-	13	6	-	-	-	-	-
N	5	231	56	1	1	5	1	1
%		19	5					

Provenience	SERVICE WARE Forestdale Smudged	Bluff B/r	Deadmans B/r	Tusayan B/r	San Juan Redware	Unident. Redware	Total	%
Ly 1 Lv 1	1	-	1	1	-	1	524	43
Lv 2	1	-	-	-	-	2	429	35
Lv 3	2	-	2	-	1	1	214	17
Floor 1	-	-	-	-	-	-	8	1
Ly 2 Lv 1	1	1	-	-	-	1	53	4
N	5	1	3	1	1	5	1,228	100
%							98	

Service Ware n= 511 42%

Table A.15. Room 16

Provenience	Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	PII-III Corr.	Unident. Corr.
	CULINARY							
Ly 1 Lv 1	25	-	5	11	2	23	3	364
Ly 2 Lv 2	64	-	1	28	2	7	-	100
Lv 3	5	-	-	2	-	8	1	59
Ly 3-4 Lv 4	4	-	-	3	-	7	1	38
Floor 1	2	-	-	1	-	2	7	99
Ly 5	13	-	-	2	-	1	1	18
Floor 2	-	-	-	-	-	1	-	3
Ly 6	33	2	-	3	-	1	-	19
Floor 3	18	-	2	5	-	1	-	8
N	164	2	8	55	4	51	13	708
%	11		1	4		3	1	48

Culinary n = 1,005 69%

Provenience	BMIII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Exotic Mineral
	SERVICE WARE								
Ly 1 Lv 1	1	1	2	20	21	9	57	2	1
Ly 2 Lv 2	3	-	4	25	2	6	11	-	1
Lv 3	-	-	1	1	-	2	3	-	-
Ly 3-4 Lv 4	-	-	-	3	1	-	6	1	-
Floor 1	-	-	-	-	-	-	15	-	-
Ly 5	-	-	1	3	-	-	-	-	-
Floor 2	-	-	-	-	-	-	-	-	-
Ly 6	3	-	-	11	-	-	4	-	-
Floor 3	-	1	-	9	-	1	3	-	1
N	7	2	8	72	24	18	99	3	3
%			1	5	2	1	7		

Table A.15. (continued)

Provenience	SERVICE WARE White Ware	PII-III Mineral	Lino B/g	Kana'a B/w	PII-III Carbon	Sosi-Black Mesa B/w	Tusayan Carbon	Newcomb B/w	Toadlena B/w
Ly 1 Lv 1	48	20	1	-	-	-	-	1	3
Ly 2 Lv 2	27	15	1	-	2	2	-	-	-
Lv 3	5	7	-	-	-	2	-	-	-
Ly 3-4 Lv 4	1	-	-	-	1	1	-	-	1
Floor 1	-	-	-	-	16	-	-	-	-
Ly 5	3	3	-	-	-	-	-	-	-
Floor 2	1	-	-	-	-	-	-	-	-
Ly 6	11	7	-	-	2	-	1	1	-
Floor 3	14	3	-	1	1	-	-	-	-
N	110	55	2	1	22	5	1	2	4
%	8	4			2				

Provenience	SERVICE WARE Forestdale Smudged	Showlow Smudged	Unident. Smudged	Deadmans B/r	Unident. Redware	Total	%
Ly 1 Lv 1	10	1	-	-	-	631	43
Ly 2 Lv 2	-	-	-	2	-	303	21
Lv 3	-	-	-	-	-	96	7
Ly 3-4 Lv 4	-	-	-	-	-	68	5
Floor 1	-	-	-	-	-	142	10
Ly 5	-	-	1	-	2	48	3
Floor 2	-	-	-	-	-	5	-
Ly 6	-	-	-	-	-	98	7
Floor 3	-	-	-	-	1	69	5
N	10	1	1	2	3	1,460	101
%	1					99	

Service Ware n = 455 31%

Table A.16. Rooms 17/18

	CULINARY						
Provenience	Plain Gray	Lino Gray & Fugitive	Narrow Neckbanded	Neck Corr.	PII Corr.	PII-III Corr.	Unident. Corr.
Balk/fill	4	-	1	-	4	12	74
Ly 1 Lv 1	58	-	12	1	2	-	296
Lv 2	6	1	4	2	2	-	43
Floor 1	9	-	6	1	1	-	34
Floor 2	4	-	1	-	1	-	9
N	81	1	24	4	10	12	456
%	9		3	1	1	1	52

Culinary n = 588 67%

	SERVICE WARE								
Provenience	BMIII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Exotic Mineral
Balk/fill	-	-	-	3	2	8	4	-	-
Ly 1 Lv 1	1	1	1	21	3	24	22	2	1
Lv 2	-	-	-	10	-	1	4	-	-
Floor 1	-	-	-	10	-	1	6	-	-
Floor 2	-	-	-	-	-	-	-	-	-
N	1	1	1	44	5	34	36	2	1
%				5	1	4	4		

Table A.16. (continued)

	SERVICE WARE								
Provenience	White Ware	PII-III Mineral	BMIII-PI Carbon	Chaco-McElmo B/w	McElmo B/w	San Juan Carbon	PII-III Carbon	Sosi-Black Mesa B/w	Chuska B/w
Balk/fill	13	8	1	1	-	1	10	1	1
Ly 1 Lv 1	26	34	-	-	-	-	-	-	-
Lv 2	13	4	-	2	4	-	2	-	-
Floor 1	4	18	-	-	-	-	-	-	-
Floor 2	3	-	-	-	-	-	-	1	-
N	59	64	1	3	4	1	12	1	1
%	7	7			1		1		

	SERVICE WARE								
Provenience	Forestdale Smudged	Upper Gila Corrugated	Unident. Smudged	Puerco B/w	Wingate B/w	Tusayan B/w	Unident. Redware	Total	%
Balk/fill	5	1	-	-	1	2	-	541	62
Ly 1 Lv 1	1	2	-	3	-	-	-	96	11
Lv 2	1	-	-	-	-	-	1	131	15
Floor 1	-	-	1	-	-	-	-	91	10
Floor 2	-	-	-	-	-	-	-	18	2
N	7	3	1	3	1	2	1	877	100
%	1							98	

Service Ware n = 289 33%

Table A.17. Room 19

Provenience	CULINARY Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	PII Corr.	PII-III Corr.	Unident. Corr.
Fill	1	-	-	-	-	-	3
Ly 1 Lv 1	2	-	-	-	-	-	52
Lv 2	8	-	-	1	3	1	68
Lv 3	6	-	-	3	3	-	11
Ly 2 Lv 4	25	-	-	8	1	-	20
Lv 5	3	-	-	45	-	-	1
Floor 1	-	-	-	-	-	-	-
Ly 3 Lv 1	10	-	-	1	-	-	1
Lv 2	4	1	-	-	-	-	-
Lv 3	2	-	-	-	-	-	-
Floor 2	-	-	-	-	-	-	6
N	61	1	-	58	7	1	162
%	12			11	1		31

Culinary n = 290 56%

Provenience	SERVICE WARE Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Exotic Mineral	White Ware	PII-III Mineral
Fill	-	-	-	1	-	-	-	2
Ly 1 Lv 1	-	10	-	4	12	1	19	7
Lv 2	-	5	2	7	29	-	19	2
Lv 3	-	12	1	1	-	-	2	-
Ly 2 Lv 4	-	8	-	-	7	1	10	-
Lv 5	-	13	-	-	-	1	6	6
Floor 1	-	1	-	-	2	-	2	1
Ly 3 Lv 1	-	3	-	-	1	-	-	3
Lv 2	-	-	-	-	-	-	2	-
Lv 3	-	-	-	-	-	-	-	-
Floor 2	2	-	-	-	-	-	1	-
N	2	52	3	13	51	3	61	21
%		10	1	3	10	1	12	4

Table A.17. (continued)

Provenience	SERVICE WARE BMIII-PI Carbon	Lino B/g	San Juan Carbon	Toadlena B/w	Chuska B/w	Forestdale Smudged	Total	%
Fill	-	-	-	-	-	-	7	1
Ly 1 Lv 1	-	-	-	-	8	-	120	23
Lv 2	-	-	-	-	2	-	148	29
Lv 3	2	1	1	-	-	-	45	9
Ly 2 Lv 4	-	-	-	1	3	-	121	3
Ly 5	-	-	-	-	1	3	34	7
Floor 1	-	-	-	-	-	-	6	1
Ly 3 Lv 1	-	-	-	-	-	-	19	4
Lv 2	-	-	-	-	-	-	7	1
Lv 3	-	-	-	-	-	-	2	-
Floor 2	-	-	-	-	-	-	9	2
N	2	1	1	1	14	3	518	
%		12	4		3	1		100

Service Ware N = 228 44%

Table A.18. Room 20

	CULINARY					
Provenience	Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	Unident. Corr.
Ly 1 Lv 1	10	-	-	1	1	3
Lv 2	5	-	-	2	-	4
Floor 1	-	-	-	-	-	2
Ly 2	20	1	1	3	-	9
N	35	1	1	6	1	18
%	31	1	1	5	1	16

Culinary n = 62 54%

	SERVICE WARE							
Provenience	BMIII-PI Unpolished Mineral	Red Mesa B/w	Puerco B/w	Gallup B/w	White Ware	PII-III Mineral	BMIII-PI Carbon	Lino B/g
Ly 1 Lv 1	-	4	-	2	5	-	-	-
Lv 2	2	5	-	-	2	-	-	-
Floor 1	-	2	-	-	4	-	-	-
Ly 2	2	4	1	4	7	3	1	1
N	4	15	1	6	18	3	1	1
%	3	13	1	5	16	3	1	1

	SERVICE WARE			
Provenience	PII-III Carbon	Forestdale Corrugated	Total	%
Ly 1 Lv 1	-	-	26	23
Lv 2	1	-	21	18
Floor 1	-	-	8	7
Ly 2	1	1	59	52
N	2	1	114	100
%	2	1	101	

Service Ware n = 52 46%

Table A.19. Room 21

	CULINARY				
Provenience	Plain Gray	Narrow Neckbanded	PII Corr.	PII-III Corr.	Unident. Corr.
Ly 1-2 Lv 1	4	-	-	1	21
Lv 2	1	-	1	-	4
Floor 1	-	-	-	-	2
Ly 3	4	2	-	-	2
N	9	2	1	1	29
%	13	3	1	1	42

Culinary n = 42 61%

	SERVICE WARE						
Provenience	Red Mesa B/w	Puerco B/w	Gallup B/w	White Ware	PII-III Mineral	Total	%
Ly 1-2 Lv 1	5	1	1	1	9	43	62
Lv 2	1	-	3	1	1	12	17
Floor 1	-	-	-	-	1	3	4
Ly 3	1	-	-	1	1	11	16
N	7	1	4	3	12	69	99
%	10	1	6	4	17	98	

Service Ware n = 27 39%

Table A.20. Room 22

Provenience	CULINARY Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	PII-III Unident. Corr.
Fill	106	2	3	20	3	-	68
Ly 1 Lv 1	43	1	2	6	-	1	24
Lv 2	19	-	1	6	-	2	1
Ly 3 Lv 3	31	-	2	2	-	-	1
Floor 1	22	2	-	-	2	-	1
Ly 4 Lv 1	27	-	-	2	-	-	2
Ly 5	1	-	-	-	-	-	-
Ly 6	8	-	-	-	-	-	-
Ly 7 Lv 2	6	-	-	1	1	-	-
Lv 3	18	-	2	4	-	-	1
Lv 4	24	-	-	3	-	-	-
Floor 3	-	-	-	-	-	-	-
N	305	5	10	44	6	3	98
%	42	1	1	7	1		14

Culinary n = 477 66%

Provenience	SERVICE WARE BMIII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w
Fill	1	1	1	14	1	4	14
Ly 1 Lv 1	-	-	3	7	-	3	1
Lv 2	-	1	1	8	-	-	-
Ly 3 Lv 3	-	-	2	10	-	-	-
Floor 1	-	1	1	2	-	-	-
Ly 4 Lv 1	-	-	-	3	-	-	2
Ly 5	-	-	-	-	-	-	-
Ly 6	-	-	-	-	-	-	-
Ly 7 Lv 2	-	-	-	1	-	-	-
Lv 3	-	-	-	1	-	-	-
Lv 4	-	1	-	2	-	-	-
Floor 3	-	-	-	-	-	-	-
N	1	4	8	48	1	7	17
%		1	1	7		1	2

Table A.20. (continued)

Provenience	SERVICE WARE White Ware	PII-III Mineral	BMIII-PI Carbon	San Juan Carbon	PII-III Carbon	Tunicha B/w	Toadlena B/w
Fill	34	32	-	1	2	-	1
Ly 1 Lv 1	13	8	-	-	1	-	-
Lv 2	4	1	1	-	-	-	-
Ly 3 Lv 3	6	12	1	-	-	-	-
Floor 1	13	6	-	-	-	-	-
Ly 4 Lv 1	2	4	1	-	1	-	-
Ly 5	-	1	-	-	-	-	-
Ly 6	-	-	-	-	-	-	-
Ly 7 Lv 2	2	1	-	-	1	1	-
Lv 3	2	-	-	-	-	-	-
Lv 4	-	1	-	-	-	-	-
Floor 3	-	-	-	-	-	-	-
N	76	66	3	1	5	1	1
%	10	9			1		

Provenience	SERVICE WARE Forestdale Smudged	Bluff B/r	White Mountain Redware	San Juan Redware	Unident. Redware	Total	%
Fill	1	1	-	-	1	311	43
Ly 1 Lv 1	2	-	-	-	-	116	16
Lv 2	1	-	-	-	-	46	6
Ly 3 Lv 3	1	-	1	1	-	69	10
Floor 1	-	-	-	-	-	56	8
Ly 4 Lv 1	-	-	-	-	-	44	6
Ly 5	-	-	-	-	-	2	-
Ly 6	-	-	-	-	-	8	1
Ly 7 Lv 2	-	-	-	-	-	13	2
Lv 3	-	-	-	-	-	28	4
Lv 4	-	-	-	-	-	32	4
Floor 3	-	-	-	-	-	-	-
N	5	1	1	1	1	725	100
%	1					99	

Service Ware n = 248 34%

Table A.21. Room 23

Provenience	CULINARY Plain Gray	Lino Gray & Fugitive	Narrow Neckbanded	Neck Corr.	PII Corr.	Unident. Corr.
Ly 1	62	1	10	-	1	11
Lv 1	72	2	7	3	2	35
Lv 2	24	1	7	-	-	2
Floor 1	13	-	1	-	-	1
N	171	4	25	3	3	49
%	40	1	6	1	1	12

Culinary n = 255 60%

Provenience	SERVICE WARE BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w
Ly 1	-	-	7	-	-	1
Lv 1	1	1	14	2	1	4
Lv 2	-	2	1	-	-	-
Floor 1	-	-	3	-	-	-
N	1	3	25	2	1	5
%		1	6			1

Provenience	SERVICE WARE White Ware	PII-III Mineral	BMIII-PI Carbon	PII-III Carbon	San Juan Redware	Total	%
Ly 1	24	20	-	-	-	137	32
Lv 1	45	12	-	1	1	203	48
Lv 2	3	11	2	-	-	53	13
Floor 1	7	6	-	-	-	31	7
N	79	49	2	1	1	424	
%	19	12					100

Service Ware n = 169 40%

Table A.22. Room 24

Provenience	CULINARY Plain Gray	Unident. Corr.
Floor 1	4	2

Provenience	SERVICE WARE Red Mesa B/w	PII-III Mineral	PII-III Carbon	Unident. Redware	Total	%
Floor 1	1	1	1	1	10	100

Table A.23. Room 25

Provenience	CULINARY Plain Gray	Lino Gray & Fugitive	Narrow Neckbanded	Unident. Corr.
Lv 1	30	1	2	32
Floor 1	28	1	2	15
N	58	2	4	47
%	34	1	2	28

Culinary n = 111 66%

Provenience	SERVICE WARE BMIII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Gallup B/w	White Ware	PII-III Mineral
Lv 1	1	-	-	15	-	12	-
Floor 1	-	1	2	4	5	5	5
N	1	1	2	19	5	17	5
%	1	1	1	11	3	10	3

Provenience	SERVICE WARE BMIII-PI Carbon	Lino B/g	PII-III Carbon	Forestdale Smudged	Unident. Redware	Total	%
Lv 1	1	-	1	-	-	96	57
Floor 1	1	1	-	1	1	73	43
N	2	1	1	1	1	169	
%	1	1	1	1	1		100

Service Ware n = 58 34%

Table A.24. Pithouse B

Provenience	Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	Unident. Corr.
	CULINARY						
Fill	59	3	9	24	-	2	41
Ly 1 Lv 1	25	1	-	19	-	1	15
Lv 2	38	2	-	10	-	1	16
Lv 3	54	1	-	15	2	6	32
Antech.	-	-	-	-	-	-	-
Ly 1 Lv 1	11	3	-	-	-	-	-
Lv 2	10	1	-	-	-	-	-
N	197	11	9	68	2	10	104
%	32	2	1	11		2	17

Culinary n = 401 65%

Provenience	BMIII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w
	SERVICE WARE						
Fill	1	-	-	44	-	1	1
Ly 1 Lv 1	-	-	-	9	-	-	-
Lv 2	-	1	2	22	3	1	3
Lv 3	1	2	2	10	-	1	-
Antech.	-	-	-	-	-	-	-
Ly 1 Lv 1	-	-	-	-	-	-	-
Lv 2	-	1	-	-	-	-	-
N	2	4	4	85	3	3	4
%		1	1	14	1	1	1

Table A.24. *(continued)*

Provenience	White Ware	PII-III Mineral	Chuskan Carbon	BMIII-PI Carbon	Lino B/g	Sosi-Black Mesa B/w	Cortez Carbon Paint
	SERVICE WARE						
Fill	37	6	-	-	1	2	1
Ly 1 Lv 1	8	15	-	1	-	-	-
Lv 2	15	-	-	-	1	-	-
Lv 3	18	-	1	-	-	-	-
Antech.	-	-	-	-	-	-	-
Ly 1 Lv 1	-	-	-	-	-	-	-
Lv 2	-	-	-	-	-	-	-
N	78	21	1	1	2	2	1
%	13	3					

Provenience	Forestdale Smudged	Abajo R/o	Bluff B/r	Deadmans B/r	Unident. Redware	Total	%
	SERVICE WARE						
Fill	1	-	1	1	-	235	38
Ly 1 Lv 1	-	-	-	-	-	94	15
Lv 2	-	-	-	-	2	117	19
Lv 3	1	1	-	-	-	147	24
Antech.	-	-	-	-	-	-	-
Ly 1 Lv 1	-	-	-	-	-	14	2
Lv 2	-	-	-	-	-	12	2
N	2	1	1	1	2	619	
%							100

Service Ware n = 218 35%

Table A.25. Pithouse H (below Kiva E)

Provenience	CULINARY Plain Gray	Wide Neckbanded	Narrow Neckbanded	Unident. Corr.
Ly 1	20	7	2	12
Ly 2	2	-	-	-
N	22	7	2	12
%	32	10	3	17

Culinary n = 43 62%

Provenience	SERVICE WARE Early Red Mesa B/w	Red Mesa B/w	Gallup B/w	White Ware	PII-III Mineral	Forestdale Smudged	Unident. Redware	Total	%
Ly 1	3	5	-	10	4	1	-	64	93
Ly 2	-	-	1	1	-	-	1	5	7
N	3	5	1	11	4	1	1	69	100
%	4	7	1	16	6	1	1	98	

Service Ware n = 26 38%

Table A.26. Pithouse C

Provenience	CULINARY Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	PII-III Corr.	Unident. Corr.
Fill	680	5	12	342	33	17	3	207
Lv 1	137	1	3	60	7	1	-	36
2	120	2	5	48	3	-	-	32
3	169	5	4	72	18	3	-	153
4	110	2	2	32	19	1	-	12
5	65	-	3	17	1	-	-	10
6	97	1	2	28	10	1	-	10
7	15	-	-	2	1	-	-	1
8	33	-	2	15	2	-	-	2
Ly 1 AAA'	67	-	1	21	-	-	-	30
2 AA'	77	-	2	45	3	1	-	17
3 A'	474	3	2	99	60	13	-	115
4 A	374	1	1	111	45	1	-	35
5 B	257	7	1	100	7	2	-	31
6 C	157	4	3	23	2	-	-	19
7 D	67	1	1	29	7	-	-	5
8 E	3	-	1	-	-	-	-	-
9 F	458	1	4	152	9	2	-	34
10	140	-	1	65	3	1	-	4
Floor 1	152	1	4	45	4	2	-	9
N	3,652	34	54	1,306	234	45	3	762
%	34		1	12	2			7

Provenience	SERVICE WARE BMIII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Exotic Mineral
Fill	4	5	41	390	1	4	31	4
Lv 1	1	1	-	50	-	1	-	-
Lv 2	1	4	3	41	-	1	-	-
3	1	6	7	79	4	3	33	-
4	-	1	7	41	-	-	-	-
5	1	1	16	29	-	-	-	-
6	3	2	14	48	-	2	-	-
7	-	-	-	5	-	-	-	-
8	-	-	7	24	-	-	-	-
Ly 1 AAA'	-	-	-	14	-	-	3	-
2 AA'	-	1	12	26	-	-	-	-
3 A'	2	2	14	180	-	12	-	1
4 A	1	1	18	120	-	-	2	-
5 B	2	2	-	105	-	-	1	-
6 C	2	-	8	59	-	2	-	-
7 D	-	-	1	19	-	-	-	-
8 E	1	-	-	-	-	-	-	-
9 F	3	3	29	148	-	1	4	-
10	-	2	16	38	-	2	3	-
Floor 1	-	1	20	31	-	-	-	-
N	22	32	213	1,447	5	28	77	5
%			2	14			1	

Table A.26. (continued)

Provenience	SERVICE WARE White Ware	PII-III Mineral	BMIII-PI Carbon	Lino B/g	Kana'a B/w	McElmo B/w	San Juan Carbon	PII-III Carbon
Fill	360	133	1	-	1	1	-	89
Lv 1	50	12	1	-	-	-	-	2
2	32	26	-	1	-	-	-	-
3	105	54	1	-	-	-	-	3
4	22	13	-	-	1	-	-	3
5	55	2	3	2	-	-	-	2
6	51	13	1	-	-	-	-	2
7	13	-	-	-	-	-	-	-
8	13	-	-	-	-	-	-	-
Ly 1 AAA'	68	3	-	-	-	-	1	-
2 AA'	26	9	-	-	-	-	-	-
3 A'	157	164	-	1	1	-	-	-
4 A	75	93	-	-	-	-	-	9
5 B	177	30	2	2	5	-	-	3
6 C	53	55	-	1	-	-	2	-
7 D	20	11	-	-	-	-	1	-
8 E	5	-	-	-	-	-	-	1
9 F	149	122	4	-	1	-	-	9
10	53	32	-	-	-	-	2	-
Floor 1	51	17	-	-	-	-	1	1
N	1,535	789	13	7	9	1	7	124
%	15	7						1

Provenience	SERVICE WARE Pena B/w	Tunicha B/w	Newcomb B/w	Burnham B/w	Toadlena B/w	Chuskan Carbon	Tusayan Carbon	Forestdale Smudged
Fill	1	1	-	5	3	2	-	6
Lv 1	-	-	-	-	-	-	-	1
2	-	-	1	-	-	2	-	1
3	-	-	-	-	-	-	-	2
4	-	-	-	-	-	-	-	2
5	-	-	-	-	-	-	-	-
6	-	-	1	-	-	-	-	1
7	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-
Ly 1 AAA'	-	-	-	-	-	2	1	-
2 AA'	-	-	1	-	-	-	-	4
3 A'	-	2	2	-	-	13	-	1
4 A	-	1	-	4	-	2	-	3
5 B	-	2	3	4	-	1	-	4
6 C	-	-	3	-	-	4	1	1
7 D	-	-	-	-	-	-	-	2
8 E	-	-	1	-	-	-	-	-
9 F	-	2	4	3	-	1	2	3
10	-	2	6	3	-	4	1	1
Floor 1	-	1	-	-	-	-	-	1
N	1	11	22	19	3	31	5	33
%								

Table A.26. (continued)

Provenience	SERVICE WARE							Total	%
	Lino* & Woodruff Red	Abajo R/o	Bluff B/r	Sanostee R/o	Deadmans B/r	San Juan Redware	Unident. Redware		
Fill	-	-	2	3	8	3	-	2,398	23
Lv 1	-	-	-	-	-	2	-	366	3
2	-	-	-	-	-	-	-	323	3
3	-	-	-	-	1	1	2	726	7
4	-	-	-	2	1	-	-	271	3
5	-	-	-	-	1	-	-	208	2
6	-	1	-	-	2	-	-	290	3
7	-	-	-	-	-	-	-	37	-
8	-	-	-	-	-	-	-	98	1
Ly 1 AAA'	-	-	-	-	-	-	-	211	2
2 AA'	-	1	-	-	1	-	-	226	2
3 A'	-	-	-	-	5	2	-	1,325	12
4 A	-	-	-	-	2	1	-	898	8
5 B	-	-	1	5	3	-	1	761	7
6 C	-	-	-	-	-	2	-	399	4
7 D	-	-	-	-	-	-	-	163	2
8 E	-	-	-	-	-	-	-	12	-
9 F	1	-	-	2	2	6	-	1,161	11
10	1*	-	2	1	2	1	-	385	4
Floor 1	-	-	-	-	-	1	3	344	3
N	2	2	5	13	28	19	6	10,602	100
%								96	

Table A.27. Kiva D

Provenience	CULINARY Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	PII-III Corr.	Unident. Corr.
Surface	31	1	2	20	2	-	5	53
Fill	563	11	10	280	19	48	15	1,355
Lv 1	296	4	3	119	4	20	8	323
2	12	-	1	1	1	1	-	39
3	104	-	11	37	6	8	1	92
4	102	3	-	33	-	6	-	108
5	20	-	3	6	-	1	1	48
6	58	1	1	20	2	8	1	110
7	62	-	-	34	2	2	3	66
8	48	2	2	20	1	3	-	94
9	41	1	-	13	-	3	1	31
10	40	-	-	7	-	1	-	19
11 fl fll	39	-	-	16	-	-	-	30
Balk	-	-	-	-	-	-	-	-
Ly 1 A'	8	-	-	4	5	-	-	3
8 A	1	-	-	-	-	-	-	-
M.S. 1	39	-	-	13	3	5	-	37
2	38	1	-	12	8	2	-	34
3	-	-	-	17	1	3	-	37
Floor	25	-	-	8	-	-	-	16
Subfloor	-	-	-	-	-	-	-	-
N	1,527	23	33	660	54	111	35	2,495
%	17			7	1	1		28

Provenience	SERVICE WARE BMIII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Exotic Mineral
Surface	1	-	-	25	-	-	10	-	1
Fill	1	8	27	307	22	34	234	3	8
Lv 1	3	11	17	236	-	6	116	-	1
2	-	-	-	14	-	1	6	-	-
3	2	1	4	42	1	4	28	-	-
4	2	1	10	35	-	-	24	-	-
5	-	1	3	13	1	-	16	-	-
6	-	1	3	26	1	7	19	1	1
7	-	1	5	18	-	1	33	-	-
8	-	1	1	30	1	3	23	1	-
9	-	1	2	18	1	2	10	-	-
10	-	-	-	20	1	1	8	-	-
11 fl fll	-	-	4	25	2	1	4	-	-
Balk	-	-	-	-	-	-	-	-	-
Ly 1 A'	-	-	-	12	-	-	2	-	-
8 A	-	-	-	-	-	-	-	-	-
M.S. 1	1	-	-	21	1	-	14	-	1
2	-	1	-	10	-	1	4	-	1
3	-	2	-	36	-	2	16	-	-
Floor	2	1	3	17	-	4	6	-	1
Subfloor	-	-	1	-	-	-	-	-	-
N	12	30	80	905	31	67	573	5	14
%			1	10		1	6		

Table A.27. (continued)

Provenience	White Ware	PII-III Mineral	BMIII-PI Carbon	Lino B/g	Kana'a B/w	McElmo B/w	Mesa Verde B/w	San Juan Carbon	PII-III Carbon
	SERVICE WARE								
Surface	24	3	-	-	-	-	1	-	-
Fill	537	326	-	1	-	2	-	-	33
Lv 1	208	85	2	1	-	-	-	-	17
2	9	10	-	-	-	-	-	-	-
3	66	18	-	-	-	-	-	-	4
4	62	50	-	2	-	-	-	-	1
5	19	6	-	2	-	-	-	-	-
6	52	29	1	-	1	-	-	-	2
7	67	33	1	-	-	-	-	-	-
8	60	44	-	-	1	-	-	-	-
9	66	20	-	-	-	-	-	-	-
10	17	13	-	-	-	-	-	-	-
11	17	9	-	-	-	-	-	1	-
Balk	-	-	-	-	-	-	-	-	-
Ly 1 A'	3	6	-	-	-	-	-	-	3
8 A	-	-	-	-	-	-	-	-	-
M.S. 1	23	27	-	-	-	-	-	-	1
2	13	18	-	-	-	-	-	2	-
3	36	19	-	-	-	-	-	1	2
Floor	11	12	-	-	-	-	-	-	-
Subfloor	1	-	-	-	-	-	-	-	-
N	1,291	728	4	6	2	2	1	4	63
%	15	8							1

Provenience	Tunicha B/w	Newcomb B/w	Burnham B/w	Toadlena B/w	Chuska B/w	Chuskan Carbon	Sosi-Black Mesa	Tusayan Carbon
	SERVICE WARE							
Surface	-	-	-	-	-	-	1	-
Fill	4	4	1	-	2	7	1	-
Lv 1	-	-	-	-	3	1	-	-
2	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-
5	-	-	1	-	1	-	-	-
6	-	-	-	-	2	1	-	-
7	-	-	1	1	-	-	-	-
8	-	-	-	-	-	-	-	-
9	-	1	-	-	1	-	-	-
10	-	-	-	-	-	-	-	-
11 fl fll	-	1	-	-	-	-	-	-
Balk	-	-	-	-	-	-	-	-
Ly 1 A'	-	-	-	-	-	-	-	-
8 A	-	-	-	-	-	-	-	-
M.S. 1	-	-	-	-	-	-	-	1
2	1	-	-	-	-	-	-	-
3	-	-	1	-	-	-	-	-
Floor	-	-	-	-	-	-	-	-
Subfloor	-	-	-	-	-	-	-	-
N	5	6	4	1	9	9	2	1
%								

Table A.27. (continued)

Provenience	SERVICE WARE Forestdale Smudged	Gila Corrugated	Showlow Smudged	Unident. Smudged
Surface	-	-	-	1
Fill	8	-	9	4
Lv 1	3	1	-	-
2	-	-	-	-
3	-	-	-	-
4	3	-	-	1
5	1	-	-	-
6	2	-	-	-
7	1	3	-	-
8	12	4	-	-
9	1	-	-	-
10	-	-	-	-
11 fl fll	1	-	-	1
Balk	-	-	-	-
Ly 1 A'	-	-	-	-
8 A	-	-	-	-
M.S. 1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
Floor	6	-	-	7
Subfloor	-	-	-	1
N	38	8	9	15
%				

Provenience	SERVICE WARE Bluff B/r	Sanostee R/o	Deadmans B/r	San Juan Redware	Unident. Redware	Total	%
Surface	-	-	-	-	-	181	2
Fill	-	-	-	2	23	3,909	44
Lv 1	-	-	2	-	4	1,494	17
2	-	-	-	-	-	95	1
3	1	-	-	-	-	430	5
4	-	-	-	-	-	443	5
5	-	1	1	-	-	144	2
6	-	-	-	-	2	351	4
7	-	-	6	1	-	342	4
8	-	-	-	-	-	350	4
9	-	-	2	-	-	215	2
10	-	-	-	-	-	-	-
11 fl fll	-	-	-	-	1	127	1
Balk	-	-	-	-	-	151	2
Ly 1 A'	-	-	-	-	-	46	1
8 A	-	-	-	-	1	1	-
M.S. 1	-	-	1	1	-	190	2
2	-	-	-	-	-	144	2
3	-	-	-	3	-	189	2
Floor	-	-	-	-	2	109	1
Subfloor	-	-	-	-	-	2	-
N	1	1	12	7	33	8,913	101
%						96	

Table A.28. Kiva E

Provenience	CULINARY Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	PII-III Corr.	PIII Corr.	Unident. Corr.
Fill[a]	360	1	3	73	8	35	1	3	973
Ly 1	-	-	-	4	1	1	-	-	7
2	7	-	-	3	1	4	3	-	186
3	387	3	11	119	17	71	28	10	3,073[b]
4	176	5	-	45	4	45	12	2	1,558
5	94	2	-	51	2	17	6	4	645
6	39	-	3	19	-	-	-	-	61
Floor 1	86	-	1	24	3	12	8	3	505
N	1,149	11	18	338	36	185	58	22	7,008
%	7			2		1			43

Culinary n = 8,825 54%

Provenience	SERVICE WARE BMIII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Chaco-McElmo B/w
Fill[a]	7	1	20	164	29	86	126	10	-
Ly 1	-	-	-	10	-	2	2	-	-
2	1	-	1	14	4	8	50	-	-
3	4	7	49	534	73	276	555	56	1
4	3	4	20	145	16	59	296	11	-
5	-	-	-	53	3	9	127	-	-
6	-	1	4	30	-	4	22	2	-
Floor 1	3	2	8	84	1	42	91	20	-
N	20	15	102	1,034	126	486	1,269	99	1
%			1	6	1	3	8	1	

Table A.28. (continued)

Provenience	SERVICE WARE Exotic Mineral	White Ware	PII-III Mineral	BMIII-PI Carbon	Lino B/g	Kana'a B/w	McElmo B/w	PII-III Carbon	Tunicha B/w
Fill[a]	6	364	252	-	2	2	8	1	1
Ly 1	-	3	2	-	-	-	-	-	-
2	2	61	3	-	-	-	1	14	2
3	41	809	803	5	-	-	10	86	1
4	8	300	339	-	-	2	7	52	1
5	7	145	158	1	-	2	1	13	-
6	3	71	23	2	-	-	-	1	1
Floor 1	14	126	71	7	-	-	-	31	-
N	81	1,879	1,651	15	2	6	27	198	6
%		11	10					2	

Provenience	SERVICE WARE Newcomb B/w	Burnham B/w	Toadlena B/w	Chuska B/w	Nava B/w	Chuskan Carbon	Wepo B/w	Sosi-Black Mesa B/w	Tusayan Carbon
Fill[a]	2	5	4	14	-	2	-	26	2
Ly 1	-	-	1	-	-	-	-	2	1
2	-	-	-	-	-	-	-	1	-
3	2	5	5	9	1	5	-	17	5
4	1	1	4	18	-	4	-	5	2
5	-	-	1	10	-	2	1	5	-
6	-	1	-	-	-	1	-	-	-
Floor 1	-	-	-	-	-	-	-	-	-
N	5	12	15	51	1	14	1	56	10
%									

Table A.28. (continued)

	SERVICE WARE							
Provenience	Forestdale Smudged	Showlow Smudged	Unident. Smudged.	Sanostee R/o	Deadmans B/r	Medicine B/r	Tusayan B/r	Puerco B/r
Fill[a]	35	26	-	2	2	1	8	3
Ly 1	-	-	-	-	1	-	-	-
2	2	-	-	-	-	-	-	-
3	41	19[c]	25	2	10	2	17	27
4	16	1	10	-	1	-	5	2
5	6	6	-	1	-	-	-	-
6	1	-	-	1	3	-	-	-
Floor 1	-	-	20	-	-	-	-	-
N	101	52	55	6	17	3	30	32
%	1							

	SERVICE WARE						
Provenience	Wingate B/r	Orange Ware	White Mountain Redware	San Juan Redware	Unident. Redware	Total	%
Fill[a]	1	7	3	12	1	2,692	16
Ly 1	-	-	-	-	-	37	-
2	-	-	-	2	-	370	2
3	1	12	11	13	9	7,258	44
4	1	12	5	1	-	3,208	20
5	-	-	-	4	-	1,378	8
6	-	-	-	3	5	301	2
Floor 1	-	-	-	-	20	1,182	7
N	3	31	19	35	35	16,426	99
%						97	

Service Ware n = 7,601 46%

[a] Includes Test Trench 29, the southern recess, and upper wall clearing; all of which are mostly Layers 1 and 2.
[b] Includes 4 Mogollon corrugated brownware.
[c] Includes 1 Gila Corrugated Smudged.

Table A.29. Pit Structure F

Provenience	CULINARY Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	Unident. Corr.
Fill	14[a]	-	-	9	2	-	-
Lv 1	2	-	-	1	-	-	-
2	5	-	-	-	-	-	-
5	311	6	4	69	12	2	24
6	416	2	1	126	21	-	38
7 ff	56	4	-	15	1	-	-
Floor 1	30	1	1	6	1	3	6
Vent. "A"	-	-	-	-	-	-	-
Lv 2	54	1	-	21	-	-	14
3	-	-	-	1	-	-	-
Balk/vent	83	-	-	15	1	-	30
N	971	14	6	263	38	5	112
%	43	1		12	2		5

Culinary n = 1,409 63%

Provenience	SERVICE WARE BMIII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Exotic Mineral
Fill	-	-	-	-	-	-	-	-
Lv 1	-	-	1	-	-	-	-	-
2	-	-	-	1	-	-	-	-
5	3	5	8	60	1	4	7	3
6	3	3	6	135	5	-	4	-
7 ff	1	3	1	5	-	1	1	-
Floor 1	-	-	3	10	-	-	-	-
Vent. "A"	-	-	-	-	-	-	-	-
Lv 2	-	-	4	27	-	5	-	-
3	-	-	1	1	-	-	-	-
Balk/vent	-	-	-	28	-	4	-	-
N	7	11	24	267	6	14	12	3
%			1	12		1	1	

Table A.28. (continued)

	SERVICE WARE						
Provenience	White Ware	PII-III Mineral	BMIII-PI Carbon	Lino B/g	Kana'a B/w	San Juan Carbon	PII-III Carbon
Fill	2	2	-	-	-	-	-
Lv 1	-	-	-	-	-	-	-
2	1	2	-	-	-	-	-
5	107	18	2	1	4	1	1
6	100	91	-	-	-	-	6
7 ff	17	8	-	-	-	-	-
Floor 1	6	3	-	-	-	-	-
Vent. "A"	-	-	-	-	-	-	-
Lv 2	39	16	-	1	-	-	-
3	-	-	-	-	-	-	-
Balk/vent	16	8	-	-	-	-	-
N	288	148	2	2	4	1	7
%	13	7					

	SERVICE WARE						
Provenience	Pena B/w	Tunicha B/w	Newcomb B/w	Burnham B/w	Chuskan Carbon	Tusayan Carbon	Forestdale Smudged
Fill	-	-	-	-	-	-	-
Lv 1	-	-	-	-	-	-	-
2	-	-	-	2	-	-	-
5	1	-	1	-	1	1	-
6	-	-	-	-	1	-	2
7 ff	-	-	-	-	-	-	-
Floor 1	-	-	-	-	-	-	3
Vent. "A"	-	-	-	-	-	-	-
Lv 2	-	-	-	-	1	-	1
3	-	-	-	-	-	-	-
Balk/vent	-	1	-	-	-	-	-
N	1	1	1	2	3	1	6
%							

Table A.29. (continued)

	SERVICE WARE							
Provenience	Abajo R/o	Bluff B/r	Sanostee R/o	Deadmans B/r	San Juan Redware	Unident. Redware	Total	%
Fill	-	-	-	-	-	-	29	1
Lv 1	-	3	-	-	-	-	7	-
2	-	1	1	-	2	-	15	1
5	2	-	-	-	2	2	657	29
6	-	-	-	1	1	1	967	43
7 ff	-	-	-	1	1	-	117	5
Floor 1	-	-	-	-	-	-	73	3
Vent. "A"	-	-	-	-	-	-	-	-
Lv 2	-	-	-	-	-	-	185	8
3	-	-	-	-	-	-	3	-
Balk/vent	-	1	-	-	1	-	187	8
N	2	5	1	2	7	3	2,240	
%								98

Service Ware n = 831 37%

*1 mudware

Vent "A" is ventilator of F and remodeled antechamber of Pithouse A into which Kiva D and Pit Structure F were built.

Table A.30. Kiva G

Provenience	CULINARY Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	PII-III Corr.	Unident. Corr.
Fill	92	1	-	17	10	2	-	135
Lv 1	10	-	-	4	-	-	-	19
2	25	-	-	4	-	-	-	6
3	16	-	-	1	-	-	-	22
4	26	-	1	17	4	-	-	39
5	28	1	2	7	1	2	-	59
6	15	-	-	4	-	1	-	39
8	9	-	1	2	-	-	-	17
9	7	-	-	2	-	1	-	24
10	4	-	-	-	-	-	-	26
Floor 1	11	1	-	1	-	1	9	156
Floor 2	7	-	-	1	-	1	-	5
N	250	3	4	60	15	8	9	547
%	17			4	1	1	1	37

Culinary n = 896 60%

Provenience	SERVICE WARE BMIII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Exotic Mineral
Fill	-	-	6	37	8	5	19	-	1
Lv 1	3	-	-	6	-	1	5	-	-
2	-	-	-	-	-	-	1	-	-
3	-	1	1	4	-	4	4	-	1
4	-	-	1	6	2	-	6	-	-
5	-	1	-	14	-	5	14	-	-
6	-	-	-	12	1	-	5	-	-
8	-	-	-	18	-	4	3	-	-
9	-	-	-	8	-	-	8	-	-
10	-	-	-	10	-	-	3	-	-
Floor 1	-	-	-	7	1	3	5	1	-
Floor 2	-	-	1	-	-	-	-	-	-
N	3	2	9	122	12	22	73	1	2
%			1	8	1	1	5		

Table A.30. (continued)

Provenience	SERVICE WARE White Ware	PII-III Mineral	BMIII-PI Carbon	Lino B/g	PII-III Carbon	Newcomb B/w	Nava B/w	Chuska B/w	Chuskan B/w
Fill	38	56	-	-	-	1	-	1	3
Lv 1	12	1	-	1	-	-	-	-	-
2	3	-	-	-	-	-	-	-	-
3	18	4	-	-	-	-	1	-	-
4	16	20	-	2	2	-	-	-	-
5	32	24	-	2	1	-	-	-	-
6	13	21	1	-	1	-	-	-	-
8	11	-	-	-	3	-	-	-	-
9	8	10	-	-	2	-	-	-	-
10	5	1	-	-	-	-	-	-	-
Floor 1	6	7	-	-	6	-	-	-	-
Floor 2	1	2	-	-	-	-	-	-	-
N	163	146	1	5	15	1	1	1	3
%	11	10			1				

Provenience	SERVICE WARE Sosi-Black Mesa B/w	Forestdale Smudged	Unident. Smudged	Sanostee R/o	Deadmans B/r	San Juan Redware	Unident. Redware	Total	%
Fill	-	-	1	-	1	2	-	436	29
Lv 1	-	-	-	1	-	-	-	62	4
2	-	-	-	-	-	-	-	39	3
3	1	2	1	-	-	-	-	80	5
4	-	-	-	-	-	-	-	140	9
5	-	-	-	-	-	1	-	193	13
6	-	-	-	-	-	1	-	114	8
8	-	-	-	-	-	-	-	68	5
9	-	-	-	-	-	-	1	71	5
10	-	-	-	-	-	-	-	49	3
Floor 1	-	-	-	-	-	-	1	216	15
Floor 2	-	-	-	-	-	-	-	18	1
N	1	2	2	1	1	4	2	1,486	100
%								99	

Service Ware n = 590 40%

Table A.31. Plaza

	CULINARY							
Provenience	Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	PII-III & PIII Corr.	Unident. Corr.
TT 3	27	-	1	14	3	-	-	6
TT 5 Lv 1	229	3	2	73	4	15	3	408
Lv 2	111	2	3	42	5	6	-	123
TT 7	80	3	-	21	-	6	17	162
TT 16	35	1	1	13	-	-	10	-
Gen. Strip	-	-	-	-	-	-	-	-
Fill	577	15	2	203	27	18	-	698
Lv 1	169	4	2	41	3	21	3	343
Lv 2	77	2	-	17	6	8	2	196
Lv 3	5	-	-	-	-	-	-	9
N	1,310	30	11	424	48	74	35	1,945
%	19			6	1	1	1	28

	SERVICE WARE								
Provenience	BMII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Exotic Mineral
TT 3	-	-	-	29	-	1	2	-	-
TT 5 Lv 1	-	2	4	158	6	37	77	6	6
Lv 2	1	1	-	52	2	5	26	2	1
TT 7	-	-	3	39	3	4	41	3	-
TT 16	-	2	-	16	-	3	-	-	2
Gen. Strip	-	-	-	-	-	-	-	-	-
Fill	4	10	23	264	4	28	103	-	3
Lv 1	-	-	10	87	3	13	71	-	1
Lv 2	1	2	13	47	-	13	26	3	-
Lv 3	-	-	-	1	-	1	1	-	-
N	6	17	53	693	18	105	347	14	13
%			1	10		2	5		

Table A.31. (continued)

	SERVICE WARE							
Provenience	White Ware	PII-III Mineral	BMIII-PI Carbon	Kana'a B/w	McElmo B/w	Chaco McElmo B/w	San Juan Carbon	PII-III Carbon
TT 3	17	12	1	1	2	1	-	-
TT 5 Lv 1	353	55	3	-	-	-	1	12
Lv 2	90	31	3	-	1	-	-	-
TT 7	8	11	-	-	-	-	-	-
TT 16	27	-	1	-	-	-	-	1
Gen. Strip	-	-	-	-	-	-	-	-
Fill	292	308	2	1	-	-	-	21
Lv 1	219	34	-	-	-	1	-	8
Lv 2	83	38	-	2	-	-	1	-
Lv 3	14	-	-	-	-	-	-	-
N	1,103	489	10	4	3	2	2	42
%	16	7						1

	SERVICE WARE							
Provenience	Sosi-Black Mesa B/w	Pena B/w	Tunicha B/w	Newcomb B/w	Burnham B/w	Toadlena B/w	Nava B/w	Chuskan Carbon
TT 3	1	1	-	-	-	3	-	-
TT 5 Lv 1	-	-	-	-	-	-	1	1
Lv 2	-	-	-	1	-	1	-	-
TT 7	-	-	-	-	-	-	-	-
TT 16	-	-	-	-	-	-	-	-
Gen. Strip	-	-	-	-	-	-	-	-
Fill	-	-	1	-	1	-	-	1
Lv 1	1	-	-	2	-	-	-	-
Lv 2	1	-	1	-	-	-	-	1
Lv 3	-	-	-	-	-	-	-	-
N	3	1	2	3	1	4	1	3
%								

Table A.31. (continued)

Provenience	Forestdale Smudged	Upper Gila Corrugated	Showlow Smudged	Unident. Smudged
	SERVICE WARE			
TT 3	1	-	1	-
TT 5 Lv 1	-	-	-	7
Lv 2	1	-	-	2
TT 7	-	-	-	-
TT 16	-	-	-	-
Gen. Strip	-	-	-	-
Fill	4	3	-	-
Lv 1	7	-	-	-
Lv 2	4	-	-	-
Lv 3	-	-	-	-
N	17	3	1	9
%				

Provenience	Abajo R/o	Sanostee R/o	Deadmans B/r	Puerco B/r	San Juan Redware	Unident. Redware	Total	%
	SERVICE WARE							
TT3	-	-	1	1	3	-	131	2
TT 5 Lv 1	-	-	1	-	-	3	-	-
Lv 2	-	-	2	-	-	1	1,988	29
TT 7	-	-	-	-	-	-	404	6
TT 16	-	-	-	-	-	-	112	2
Gen. Strip	-	-	-	-	-	-	-	-
Fill	1	1	2	13	13	-	2,653	38
Lv 1	-	1	1	-	9	-	1,054	15
Lv 2	-	-	-	-	3	-	547	8
Lv 3	-	-	-	-	-	-	31	-
N	1	2	7	14	28	4	6,920	100
%							98	

Table A.32. Ramada

Provenience	CULINARY Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	PII Corr.	Unident. Corr.
Lv 1	34	1	-	13	2	10
Lv 2	5	-	1	10	1	57
Floor 1	26	1	-	2	-	2
N	65	2	1	25	3	69
%	19	1		7	1	20

Provenience	SERVICE WARE BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Exotic Mineral
Lv 1	1	2	21	-	1	4	1
Lv 2	-	1	18	4	7	9	-
Floor 1	1	1	9	-	-	1	-
N	2	4	48	4	8	14	1
%	1	1	14	1	2	4	

Provenience	SERVICE WARE White Ware	PII-III Mineral	Lino B/g	Deadmans B/r	San Juan Redware	Unident. Redware	Total	%
Lv 1	29	16	1	1	1	-	138	40
Lv 2	22	17	-	-	1	2	155	45
Floor 1	4	3	2	1	-	-	53	15
N	55	36	3	2	2	2	346	100
%	16	10		1	1	1	101	

Table A.33. Cists

Provenience	CULINARY Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Unident. Corr.
Cist 1	-	-	-	1	-
Cist 3	-	1	-	-	-
4	1	-	-	2	1
Cist 10	6	-	1	-	13
Cist 12	1	-	-	1	5
N	8	1	1	4	19
%	15	2	2	7	35

Provenience	SERVICE WARE Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	White Ware	Showlow Smudged	Total	%
Cist 1	-	-	1	-	-	-	-	2	4
Cist 3	-	-	-	-	-	-	-	1	2
4	1	2	-	-	-	3	-	10	19
Cist 10	-	3	-	-	4	1	-	28	52
Cist 12	-	3	-	1	1	-	1	13	24
N	1	8	1	1	5	4	1	54	101
%	2	15	2	2	9	7	2	100	

Table A.34. Trash Mound, Test Trench 1

Provenience	Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	PII-III & PIII Corr.	Unident. Corr.
	CULINARY							
Fill	7	-	-	5	2	1	1	4
Ly 1 Lv 1	847	9	19	274	14	8	-	369
Lv 2	387	29	11	91	4	4	-	168
Ly 2 Lv 3	103	3	2	10	-	1	-	85
N	1,344	41	32	380	20	14	1	626
%	28	1	1	8				13

Provenience	BMIII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Exotic Mineral
	SERVICE WARE							
Fill	-	-	-	7	1	-	2	-
Ly 1 Lv 1	5	9	36	310	3	25	80	5
Lv 2	1	6	16	97	3	2	24	1
Ly 2 Lv 3	1	8	1	14	-	-	8	-
N	7	23	53	428	7	27	114	6
%			1	9		1	2	

Provenience	White Ware	PII-III Mineral	BMIII-PI Carbon	Lino B/g	Kana'a B/w	McElmo B/w	San Juan Carbon	PII-III Carbon
	SERVICE WARE							
Fill	6	6	-	-	-	-	-	-
Ly 1 Lv 1	533	586	-	-	4	2	-	27
Lv 2	295	60	6	3	-	-	1	9
Ly 2 Lv 3	97	19	-	-	-	-	-	1
N	931	671	6	3	4	2	1	37
%	19	14						1

Table A.34. (continued)

Provenience	Tunicha B/w	Newcomb B/w	Burhnam B/w	Chuska B/w	Chuskan Carbon	Forestdale Smudged	Unident. Smudged
	SERVICE WARE						
Fill	-	-	-	-	-	-	-
Ly 1 Lv 1	1	1	2	5	2	1	-
Lv 2	-	-	3	1	1	2	4
Ly 2 Lv 3	-	-	1	1	-	2	-
N	1	1	6	7	3	5	4
%							

Provenience	Bluff B/r	Deadmans B/r	San Juan Redware	Unident. Redware	Total	%
	SERVICE WARE					
Fill	-	-	-	-	41	1
Ly 1 Lv 1	2	5	5	10	3,199	66
Lv 2	-	-	-	2	1,232	25
Ly 2 Lv 3	-	-	-	-	362	7
N	2	5	5	12	4,834	99
%						

Table A.35. Trash Mound, Test Trench 2

	CULINARY							
Provenience	Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	PII-III & PIII Corr.	Unident. Corr.
Fill	21	-	4	8	2	-	-	7
Ly 2 Lv 1	100	4	-	27	-	10	4	219
Lv 2	367	7	-	90	1	3	5	125
Ly 2 Lv 3	73	1	-	25	2	3	-	27
N	561	12	4	150	5	16	9	378
%	29	1		8		1		19

	SERVICE WARE								
Provenience	BMIII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Exotic Mineral
Fill	1	3	5	23	-	1	4	-	1
Ly 1 Lv 1	-	1	4	36	5	15	41	1	-
Lv 2	4	3	2	133	-	-	53	-	1
Ly 2 Lv 3	1	1	-	30	-	5	3	-	-
N	6	8	11	222	5	21	101	1	2
%			1	11		1	5		

	SERVICE WARE							
Provenience	White Ware	PII-III Mineral	BMIII-PI Carbon	Lino B/g	Chaco-McElmo B/w	San Juan Carbon	PII-III Carbon	Sosi-Black Mesa B/w
Fill	11	15	-	-	-	-	3	-
Ly 1 Lv 1	94	38	-	-	1	-	-	2
Lv 2	72	99	2	1	1	1	4	1
Ly 2 Lv 3	40	12	2	-	-	-	2	-
N	217	164	4	1	2	1	9	3
%	11	8						

Table A.35. (continued)

Provenience	SERVICE WARE Pena B/w	Tunicha B/w	Newcomb B/w	Chuska B/w	Forestdale Smudged	Showlow Smudged	Unident. Smudged
Fill	-	-	-	-	-	-	-
Ly 1 Lv 1	2	-	1	3	1	-	-
Lv 2	1	1	-	1	2	1	1
Ly 2 Lv 3	-	-	-	-	1	-	-
N	3	1	1	4	4	1	1
%							

Provenience	SERVICE WARE Bluff B/r	Sanostee R/o	Deadmans B/r	San Juan Redware	Unident. Redware	Total	%
Fill	-	-	-	1	-	111	6
Ly 1 Lv 1	1	3	1	6	1	623	32
Lv 2	-	-	-	4	-	985	51
Ly 2 Lv 3	-	-	-	-	2	230	12
N	1	3	1	11	3	1,949	101
%				1		97	

Table A.36. Trash Mound Grids and Test Trench 15 and Test Trench 22

	CULINARY							
Provenience	Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	PII-III & PIII Corr.	Unident. Corr.
Fill	161	-	2	46	6	3	2	377
Lv 1	410	3	1	147	-	6	-	300
Lv 2	211	6	3	74	-	2	-	77
Lv 3	332	5	-	68	-	-	1	173
Lv 4	147	11	1	29	-	2	-	13
Lv 5	13	5	1	-	-	-	-	1
Ly 1	1,159	20	5	334	33	16	2	982
Ly 2	490	17	2	134	8	1	-	164
Ly 3	40	-	-	13	-	-	-	6
Occ. surf.	5	-	-	1	-	-	-	-
N	2,968	67	15	846	47	30	5	2,093
%	28	1		8				20
TT 22	183	3	-	50	-	1	-	215
%	21			6				24

	SERVICE WARE								
Provenience	BMIII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w	Chaco B/w	Exotic Mineral
Fill	-	4	13	77	5	12	95	1	2
Lv 1	18	6	7	157	-	8	49	1	2
Lv 2	1	-	2	78	-	3	12	1	-
Lv 3	5	1	3	57	-	1	14	-	1
Lv 4	1	9	3	30	1	-	1	-	-
Lv 5	-	-	-	-	-	-	-	-	-
Ly 1	9	9	25	349	11	48	117	1	3
Ly 2	3	4	16	116	-	4	4	-	-
Ly 3	-	-	2	7	-	-	-	-	-
Occ. surf.	-	-	-	1	-	-	-	-	-
N	37	33	71	866	17	76	292	4	8
%			1	8		1	3		
TT 22	3	5	1	46	-	3	50	1	-
%		1		5			6		

Table A. 36. (continued)

Provenience	SERVICE WARE White Ware	PII-III Mineral	BMIII-PI Carbon	Lino B/g	Kana'a B/w	Chaco-McElmo B/w	San Juan Carbon	PII-III Carbon	Sosi-Black Mesa B/w
Fill	259	151	-	-	-	-	-	13	-
Lv 1	285	108	3	-	-	-	1	8	-
Lv 2	118	66	-	1	-	-	-	1	1
Lv 3	140	108	2	-	-	-	-	3	-
Lv 4	51	23	-	-	-	-	-	3	-
Lv 5	1	1	-	1	-	-	-	-	-
Ly 1	765	490	4	-	1	1	2	15	2
Ly 2	215	111	5	2	2	-	-	-	-
Ly 3	37	9	-	-	-	-	-	-	-
Occ. surf.	-	-	-	-	-	-	-	-	-
N	1,871	1,067	14	4	3	1	3	43	3
%	18	10							
TT 22	234	86	1	-	-	-	-	-	-
%	26	10							

Provenience	SERVICE WARE Tusayan Carbon	Tunicha B/w	Newcomb B/w	Burnham B/w	Toadlena B/w	Chuska B/w	Chuskan B/w	Forestdale Smudged	Unident. Smudged
Fill	-	-	-	-	-	1	-	1	1
Lv 1	-	-	1	-	-	1	1	5	-
Lv 2	-	1	1	-	1	-	1	4	-
Lv 3	-	1	-	-	-	-	-	1	1
Lv 4	-	-	-	-	-	-	-	2	-
Lv 5	-	-	-	-	-	-	-	5	-
Ly 1	2	-	2	1	-	-	-	-	7
Ly 2	-	-	2	-	-	-	-	-	5
Ly 3	-	-	-	-	-	-	-	-	-
Occ. surf.	-	-	-	-	-	-	-	-	-
N	2	2	6	1	1	2	2	18	14
%								1	
TT 22	-	-	-	-	-	-	-	-	-
%									

Table A. 36. *(continued)*

Provenience	SERVICE WARE Bluff B/r	Sanostee R/o	Deadmans B/r	Puerco B/r	San Juan Redware	Tsegi Orangeware	Unident. Redware	Total	%
Fill	-	-	-	1	7	1	3	1,244	12
Lv 1	1	-	1	1	6	-	3	1,540	15
Lv 2	1	-	-	-	4	-	-	669	6
Lv 3	-	1	-	-	9	-	-	929	9
Lv 4	-	-	-	-	1	-	-	327	3
Lv 5	-	-	-	-	-	-	-	28	-
Ly 1	2	-	4	-	14	-	5	4,440	42
Ly 2	-	-	-	-	3	-	3	1,311	12
Ly 3	-	-	-	-	1	-	-	109	1
Occ. surf.	-	-	-	-	-	-	-	7	-
N	4	1	5	2	45	1	14	10,604	100
%								97	
TT 22	-	-	3	-	-	-	4	890	
%									99

Table A.37. Test Trenches west of site

Provenience	Plain Gray	Lino Gray & Fugitive	Narrow Neckbanded	Neck Corr.	PII Corr.	Unident. Corr.
	CULINARY					
Surface	47	1	18	-	-	75
Trenches W. of site:						
TT 3 Lv 2	6	-	1	-	-	-
Lv 3	18	2	-	-	-	2
TT 8 fill	2	-	-	-	-	2
TT 31 fill	8	-	-	1	-	1
TT 35 fill	51	3	11	-	2	25
N	85	5	12	1	2	30
%	31	2	4		1	11

Provenience	BMIII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w
	SERVICE WARE						
Surface	1	1	-	20	-	3	22
Trenches W of site:							
TT 3 Lv 2	-	-	-	4	-	-	1
Lv 3	-	-	-	1	-	-	-
TT 8 fill	-	-	-	-	-	-	1
TT 31 fill	-	-	-	-	-	-	-
TT 35 fill	-	-	3	32	1	1	11
N	-	-	3	37	1	1	13
%			1	14			5

Table A.37. (continued)

Provenience	SERVICE WARE White Ware	PII-III Mineral	BMIII-PI Carbon	PII-III Carbon	Burnham B/w	Chuskan Carbon
Surface	65	39	-	-	1	2
Trenches W. of site:						
TT 3 Lv 2	2	-	-	-	-	-
Lv 3	6	-	-	-	-	-
TT 8 fill	2	-	-	-	-	-
TT 31 fill	3	2	-	-	-	-
TT 35 fill	44	14	4	3	-	-
N	57	16	4	3	-	-
%	21	6	2	1		

Provenience	SERVICE WARE Forestdale Smudged	Deadmans B/r	San Juan Redware	Total	%
Surface	2	2	2	302	-
Trenches W. of site:					
TT 3 Lv 2	-	-	-	-	-
Lv 3	-	-	-	43	16
TT 8 fill	-	-	-	7	3
TT 31 fill	-	-	-	15	6
TT 31 fill	-	-	-	205	76
N	-	-	-	270	101
%				98	

Table A.38. Test Trenches north of site

	CULINARY							
Provenience	Plain Gray	Lino Gray & Fugitive	Wide Neckbanded	Narrow Neckbanded	Neck Corr.	PII Corr.	PII-III Corr.	Unident. Corr.
TT 6 fill 13	13	-	-	14	-	2	-	25
Lv 1	101	1	-	33	2	-	-	12
TT 9 fill	160	6	-	29	1	2	-	59
TT 10 fill	39	4	-	2	-	-	-	-
TT 11 Lv 1	61	-	-	16	1	-	3	26
Lv 2	1	-	-	-	-	-	-	-
TT 14 fill	13	-	-	4	-	-	-	-
TT 18 fill	-	-	-	1	-	-	-	-
TT 19 fill	32	2	1	3	-	-	-	9
TT 26 Lv 1	26	-	-	2	1	-	-	11
Lv 2	1	-	-	-	-	-	-	-
TT 28 Lv 1	8	-	1	6	-	-	-	-
Lv 2	30	7	2	10	-	1	-	15
N	485	20	4	120	5	5	3	157
%	39	1		10				13

	SERVICE WARE						
Provenience	BMIII-PI Polished Mineral	BMIII-PI Unpolished Mineral	Early Red Mesa B/w	Red Mesa B/w	Escavada B/w	Puerco B/w	Gallup B/w
TT 6 fill	-	-	1	5	-	-	2
Lv 1	-	3	-	20	-	1	1
TT 9 Fill	-	2	5	30	-	-	6
TT 10 fill	-	-	-	5	-	-	-
TT 11 Lv 1	-	-	1	10	1	-	4
Lv 2	-	-	-	-	-	-	-
TT 14 fill	-	-	-	2	-	-	-
TT 18 fill	-	-	-	2	-	-	-
TT 19 fill	-	-	-	5	-	1	2
TT 26 Lv 1	1	-	-	1	-	-	-
Lv 2	-	-	-	-	-	-	-
TT 28 Lv 1	-	-	-	2	-	-	1
Lv 2	-	3	-	9	-	-	6
N	1	8	7	91	1	2	22
%		1	1	7			2

Table A.38. (continued)

Provenience	White Ware	PII-III Mineral	BMIII-PI Carbon	Lino B/w	McElmo B/w	San Juan Carbon	PII-III Carbon
	SERVICE WARE						
TT 6 fill	32	8	-	-	1	-	-
Lv 1	50	-	-	-	-	-	-
TT 9 fill	41	30	1	1	-	1	3
TT 10 fill	8	-	-	-	-	-	-
TT 11 Lv 1	26	1	-	-	-	-	-
Lv 2	1	1	-	-	-	-	-
TT 14 fill	-	1	-	-	-	-	-
TT 18 fill	6	2	-	-	-	-	-
TT 19 fill	-	5	-	-	-	-	-
TT 20 Lv 1	23	-	-	-	-	-	-
Lv 2	3	1	-	-	-	-	-
TT 28 Lv 1	7	5	-	-	-	-	-
Lv 2	28	8	1	-	-	-	-
N	225	62	2	1	1	1	3
%	18	5					

Provenience	Tunicha B/w	Burnhan B/w	Chuskan Carbon	Forestdale Smudged	San Juan Redware	Unident. Redware	Total	%
	SERVICE WARE							
TT 6 fill	-	-	-	2	1	2	-	-
Lv 1	1	-	1	1	-	-	335	27
TT 9 fill	-	1	-	-	-	2	380	31
TT 10 fill	-	-	-	-	-	-	58	5
TT 11 Lv 1	-	-	-	-	-	-	-	-
Lv 2	-	-	-	-	-	-	153	12
TT 14 fill	-	-	-	-	-	-	20	2
TT 18 fill	-	-	-	-	-	-	11	1
TT 19 fill	-	-	-	-	-	-	60	5
TT 26 fill	-	-	-	-	-	-	-	-
Lv 2	-	-	-	-	-	-	70	6
TT 28 Lv 1	-	-	-	-	-	-	-	-
Lv 2	4	-	-	-	-	-	152	12
N	5	1	1	3	1	4	1,239	99
%						97		

APPENDIX B

LISTING OF RETAINED COMPUTER OUTPUTS

Topic/Output Contents

1. FILE LISTINGS			DATE
	1	FA627.A entire final analysis file, including Pithouse C balk; sorted by FS and sherd number; 1,468 lines missing.	8/12/80
	2	FA627.SUBF entire file sorted by temper type.	9/12/80
	3	SAVE.FA627TS listing of analysis file at the end of with all updates in place and added variables.	1/14/82
2. GENERAL INFORMATION/COMBINATIONS			
	1	Frequencies of whole file (12,214 cases), including Pithouse C	9/8/80
	2	Rim sherd types and forms--2 single pages.	1/14/82 & 7/8/81
	3	Type by form, form by temper, type by temper (7,225 cases).	9/2/81
	4	Form by ware by temper; red and white ware only (7,225).	10/8/81
	5	Whole pots by FS and provenience.	7/8/81
3. ROUGH SORT			
	1	Frequencies of rough sort types.	2/10/81
	2	Type frequencies by provenience and layer-level.	11/18/81
	3	Type frequencies from features by structure and floor.	11/22/81
4. TYPE DESCRIPTION MATERIAL			
		Types are Red Mesa B/w, Puerco B/w, Gallup B/w, Wide neckbanded, Narrow neckbanded, and PII corrugated.	
	Whitewares:		
	1	Designs, paint, tempers, diameters, etc.	7/8/81
	2	Paste attributes.	7/22/81
	3	Designs by vessel forms.	8/12/81
	4	Diameter means.	7/8/81
	5	Diameter T-tests.	8/18/81
	6	"Puesga" treats Puerco, Escavada, and Gallup B/w's as one type--paste.	9/22/81
	7	Puesga surface and metric attributes, Escavada B/w description.	9/21/81
	8	Primary types, simplified temper, rims only.	11/3/81

9	Whiteware polish and slip, open vs. closed.	7/31/81
10	Types 22-26, rims only, slip polish, rim decoration by bowl-ladle-closed.	11/1/81
11	Chaco B/w same as 10.	11/4/81
12	Puesga slip, polish, rim decoration.	3/9/82

Graywares:

13	Wide and narrow neckbanded attributes.	5/21/81
14	PII corrugated attributes.	8/26/81
15	Neckbanded metrics; all types' paste attributes.	7/22/81

5. GENERAL TEMPER AND PASTE ATTRIBUTES

1	Sandstone grain size by type.	7/29/81
2	Temper by paste, grain size, paint, sherd temper.	10/7/81
3	Temper by paste.	8/5/81
4	"Table 1" Paste attributes by type; prior to changing some items from PII corrugated to neck corrugated.	8/5/81

6. ATTRIBUTE COMBINATIONS: TYPE-TEMPER-SURFACE

1	Group breakdown.	7/16/81
2	Initial output of frequencies by group--all variables for decorated, metric for utility.	8/10/81
3a	Job steps for grain size divisions.	8/11/81
3	More job attributes.	8/11/81
4	Ordinal and nominal attributes of decorated groups divided into fine and coarse grain sandstone tempers.	8/11/81
5	Orifice diameters of grain size groups--means some revised 8/26 (#6-6).	8/12/81
6	Orifice diameters of grain size groups--revised bowl and ladle figures	8/26/81
7	Utility groups--nominal attributes.	8/10/81
8	Utility groups--metric attributes.	9/3/81
9	Group X attributes.	9/11/81
10	Group Z attributes.	9/10/81
11	Diameter frequencies for white bowls and gray jars, all groups.	9/11/81
12	Gray rim fillet widths.	9/24/81
13	Principal components, all utility groups.	9/10/81
14	Principal components, neckbanded separate from corrugated.	9/21/81
15	Multivariate analysis of variance--decorated bowl diameters utility fillets, flare and diameter.	9/23/81
16	Overly detailed rim diameters by all grain sizes (rather than fine versus coarse).	8/17/81
17	Job creating group codes.	9/3/81

7. SOOTING

1	Sooting by temper, by exposure group, by Types 03, 04, 05.	9/3/81
2	Sooting by types by exposure group.	9/3/81

8. TIME AND SPACE ANALYSIS

1	Vessel form, temper, wares, attribute groups by space and time.	10/19/81
2	Temper, form, type by time-space combinations.	11/1/81
3	Principal components: time-space by type.	12/6/81
4	Principal components: time-space by vessel form.	12/6/81

5	Principal components: time-space by temper.	12/6/81
6	Designs, forms, temper, types by stratigraph of Pithouse C, Kivas D and E.	11/1/81
7	Floor sherds of rooms and kivas by temper, form, type, floor and level category.	11/10/81
8	Same as 7 for Pithouse C.	11/11/81
9	Time-space by all proveniences as pruned for principal components analysis.	1/21/82
10	Type by time group.	3/16/82
11	Frequency of 29SJ 627 time group assignments in master file and frequency of time-space groups placed on 29SJ 627 file.	3/27/83

9. SUMMARY OF IMPORT POSSIBILITIES

1	Revised import summary using both the original file, the added culinary + original; types are weighted by provenience for time assignents; SS grain information included.	6/28/85
2	Type distributions by time and ware for original, added and combined files.	6/27/85

10. ADDED CULINARY CASES (Appendix E)

1	FA 627ADD file information, type by time-space, FS by time-space, contents.	6/28/85
2	Time-ware (import) groups assigned and tabulated by temper and type type by time.	7/11/84
3	Type descriptions and proveniences for added sherds alone.	6/3/83
4	New grayware descriptions for <u>all</u> gray types including the additional sherds with the original sample.	6/21/84
5	Neck corrugated rim flare means for original and combined samples after corrections.	11/7/84
6	Type, form and temper distributions of added sherds by stratigraphic unit in Pithouse C, Kivas D and E.	7/25/85

11. EARLIER MANIPULATIONS

This is a large group of outputs done before the file was in final form. It forms the basis of several reports (Toll 1981, 1984) and includes some analyses not in the 29SJ 627 report.

APPENDIX C

PROVENIENCE OF MATCHED VESSELS

(Field Specimen Groups Containing Portions of
Matched Vessels from 29SJ 627)

Note: Multiple sherds per FS are indicated by numbers behind the FS number.

Kiva E:

Puerco B/w jar

FS	4473	Layer 3A
	4618-2	Layer 3B

Escavada/Puerco B/w bowl

FS	4473	Layer 3A
	4681	Layer 3B

Duck Pot

FS	4487	Layer 3A
	4681	Layer 3B

Puerco B/w bowl

FS	4473-2	Layer 3A
	4681	Layer 3B

Escavada B/w bowl

FS	4473-2	Layer 3A
	4681	Layer 3B

Escavada B/w bowl

FS	4473	Layer 3A
	4681	Layer 3B

Gallup B/w jar

FS	4473	Layer 3A
	4681	Layer 3B

Puerco B/w ladle

FS	4473	Layer 3A
	4486	Layer 3A

Smudged bowl

FS	4473-2	Layer 3A
	4681-2	Layer 3B

Smudged bowl

FS	4473	Layer 3A
	4681	Layer 3B

Puerco B/w handle

FS	4473	Layer 3A
	4681	Layer 3B

Puerco B/w bowl

FS	4473	Layer 3A
	5912	Layer 3, Balk 1
	2704	TT 13, Level 1

Escavada B/w ladle

FS	4473	Layer 3A
	5912	Layer 3, Balk 1

Puerco B/w bowl

FS	4681	Layer 3B
	5912	Layer 3, Balk 1

Whiteware

FS	4681	Layer 3B
	5912-2	Layer 3, Balk 1

Chuska B/w bowl

FS	5294	Layer 4
	5912	Layer 3, Balk 1

Red Mesa B/w miniature jar

FS	4333	Level 2
	4473-4	Layer 3A
	5825	Layer 1 & 2

Burnham B/w ladle

FS	4473-2	Layer 3A
	4681	Layer 3B
	5294-3	Layer 4
	5825	Layer 1 & 2

Gallup B/w bowl

FS	4681	Layer 3B
	5294	Layer 4
	5912	Layer, Balk 1

Gallup B/w bowl
FS 5825 Layer 1 & 2, Balk 1
5912 Layer 3, Balk 1

Gallup B/w bowl
FS 5746 Layer 5
6173 Layer 5, Balk 1

Gallup-Red Mesa B/w jar
FS 4473 Layer 3A
4681-2 Layer 3B
5294-2 Layer 4

Black Mesa B/w bowl
FS 4681 Layer 3B
5294 Layer 4
5746 Layer 5

Sosi B/w bowl
FS 4681 Layer 3B
5294 Layer 4

Whiteware
FS 4473 Layer 3A
5294 Layer 4

Gallup B/w jar
FS 5294 Layer 4
5912 Layer 3, Balk 1

Escavada B/w bowl
FS 4348 Level 2
4473-2 Layer 3A

Gallup-Escavada B/w bowl
FS 4335 Level 2
4336 Fill

Gallup B/w jar
FS 4336 Fill
4681 Layer 3B

Whiteware bowl
FS 4336 Fill
4473 Layer 3A
5912 Layer 3, Balk 1
5948 South recess

Newcomb B/w jar
FS 4336 Fill
4676 Level 2

Gallup B/w jar
FS 4336 Fill
4473 Layer 3A

Tusayan B/r bowl
FS 4681 Layer 3A
5948-2 South recess

White Mountain Redware bowl (?)
FS 6173 Layer 5
6477 Fill

Smudged bowl
FS 4336 Fill
4473 Layer 3A

Sosi B/w bowl
FS 4681 Layer 3B
5948-2 South recess

Neck corrugated jar
FS 4333 Level 2
4335 Level 2

McElmo B/w jar
FS 5746 Layer 5
5948-2 South recess
6477 Fill

Trachyte-tempered jar (P-I?)
FS 5746 Layer 5
6669 Layer 6

Black Mesa B/w bowl
FS 5294-4 Layer 4
5746 Layer 5

Gallup B/w seed jar
FS 5294 Layer 4
5746 Layer 5

Gallup B/w bowl
FS 4681 Layer 3B
5294 Layer 4
2197 Pollen #1?

Chaco B/w bowl
FS 5294 Layer 4
5746 Layer 5

Gallup B/w ladle
FS 4681 Layer 3B
4892-2 Fill
5294 Layer 4

Gallup B/w bowl
FS 5294 Layer 4
5746 Layer 5
5912 Layer 3, Balk 1
6657 Fill

Smudged bowl
FS 4681 Layer 3B
6031 Floor 1, Pit 2

Plain gray bowl
FS 5746-2 Layer 5
5948-2 South recess

Puerco B/w bowl
FS 5294-2 Layer 4
5948 South recess

Red Mesa B/w bowl
FS 5294 Layer 4
6657 Fill

Red Mesa B/w ladle

FS	5746-2	Layer 5
	5948	South recess

Red Mesa B/w ladle

FS	5294	Layer 4
	5746	Layer 5

Escavada B/w ladle

FS	5746-2	Layer 5
	5948	South recess

Whiteware

FS	4032	TT 29
	5746	Layer 5

Escavada B/w bowl

FS	4032	TT 29
	4473-2	Layer 3A

Gallup B/w jar

FS	4032	TT 29
	5948	South recess

Chaco B/w bowl

FS	4032	TT 29
	5912	Layer 3, Balk 1
	2780	TT 13, Level 2

Gallup B/w jar

FS	3064	TT 29
	4032	TT 29
	5294-2	Layer 4
	5912	Layer 3, Balk 1
	5948	South recess

Gallup B/w bowl

FS	4032	TT 29
	5294-13	Layer 4
	5746-9	Layer 5
	5948	South recess

Puerco B/w bowl

FS	4032	TT 29
	5294	Layer 4

Puerco B/w bowl

FS	4032	TT 29
	4473	Layer 3A
	4892	Fill

Puerco B/w bowl

FS	4032	TT 29
	4681	Layer 3B

Escavada B/w bowl

FS	4032-3	TT 29
	4335	Level 2
	5825	Layers 1 & 2, Balk 1

Duck pot

FS	3065	TT 29
	4032	TT 29
	4883	TT 37, Level 1

Black Mesa B/w bowl

FS	4032	TT 29
	4681	Layer 3B

Smudged bowl

FS	4032	TT 29
	5912	Layer 3, Balk 1

Gallup B/w bowl

FS	3064	TT 29
	4681	Layer 3B
	5912	Layer 3, Balk 1

Gallup B/w bowl

FS	4032	TT 29
	4681	Layer 3B

Newcomb B/w jar

FS	3064	TT 29
	5294	Layer 4

Brownware effigy or gourd jar

FS	4681	Layer 3B
	5933	Level 1

Chuska B/w jar

FS	3064-3	TT 29
	4043	South Plaza, Level 1
	4681	Layer 3B
	4883-2	TT 37, Level 1
	5294-10	Layer 4
	5746-2	Layer 5
	5948-4	South recess
	6173	Layer 5, Balk 1
	7098	Hole 1 (in wall)

Red Mesa B/w ladle

FS	4032	TT 29
	4681	Layer 3B

Puerco B/w handle

FS	4473	Layer 3A
	4781	Layer 3B

Gallup B/w bowl

FS	5294	Layer 4
	5746	Layer 5

Tusayan bowl

FS	4032-2	TT29
	4681-7	Layer 3B
	5294-2	Layer 4
	5912-3	Layer 3, Balk 1

PIII corrugated jar

FS	4940	Level 2
	5746-3	Layer 5

PII-III carbon-on-white bowl

FS	4949	TT 37, Level 2
	5746	Layer 5

Smudged bowl

FS	4883-5	TT 37, Level 1
	4940-9	TT 37, Level 2
	5746-2	Layer 5
	5948-7	South recess
	6173-3	Layer 5, Balk 1
	6207	Balk 1, fill

Smudged bowl

FS	4940-2	TT 37, Level 2
	5746-2	Layer 5

Sosi B/w bowl

FS	4473	Layer 3A
	4681-4	Layer 3B
	4883-2	TT 37, Level 1
	4892	Fill
	5294-3	Layer 4
	5912-2	Layer 3, Balk 1

Gallup B/w bowl

FS	4940-2	TT 37, Level 2
	5948	South recess
	6173	Layer 5, Balk 1

Late Red Mesa B/w

FS	4883	TT 37, Level 1
	5746	Layer 5

Gallup B/w bowl

FS	4883-3	TT 37, Level 1
	5746	Layer 5

Aztec B/w bowl

FS	4781-3	Layer 3B
	4883-6	TT 37, Level 1
	4940-4	TT 37, Level 2
	5294	Layer 4
	5746-2	Layer 5
	5948-8	South recess
	6207-2	Balk 1, fill
	6657	Fill

Gallup B/w bowl

FS	4883-3	TT 37, Level 1
	5746	Layer 5

Gallup B/w bowl

FS	4043	South Plaza, Level 1
	6173	Layer 5, Balk 1

Deadmans B/r bowl

FS	1020	Plaza fill
	4681	Layer 3B

Gallup B/w jar

FS	4043	South Plaza, Level 1
	4681	Layer 3B

Whiteware

FS	4043	South Plaza, Level 1
	4681-2	Layer 3B

Red Mesa B/w ladle

FS	1435	Plaza East of Pithouse A
	4473	Layer 3A

<u>Kiva E + Rooms</u>:

Sosi B/w bowl

FS	504-2	Room 10, Level 3
	4473	Layer 3A
	4676	Level 2
	4681	Layer 3B
	5912-2	Layer 3, Balk 1
	6173	Layer 5, Balk 1

Puerco B/w bowl (Degenerate Transitional)

FS	124	Room 10, Level 1
	4681	Layer 3B

Puerco B/w bowl (glaze paint)

FS	124	Room 10, Level 1
	168	Room 15, Level 1
	699	TT 5, Level 2
	2704	TT 13, Level 1
	2780	TT 13, Level 2
	4032	TT 29
	4473	Layer 3A
	4681	Layer 3B

Chaco McElmo B/w jar

FS	4776	Room 10, Subfloor 1, Layer 1
	4883	TT 37, Level 1
	5746	Layer 5
	5948	South recess

Gallup B/w bowl

FS	124	Room 10, Level 1
	6657	Fill

Gila corrugated jar

FS	980	Room 18, Level 1
	4681	Layer 3B

Gallup B/w bowl

FS	124	Room 10, Level 1
	4348	Level 2
	4473	Layer 3A
	4681-2	Layer 3B
	5912	Layer 3, Balk 1
	7081	Room 25, Floor

Black Mesa B/w bowl

FS	124-2	Room 10, Level 1
	2458	Room 8, Subfloor Level 1
	4336	Fill
	4473-2	Layer 3A
	4676	Level 2
	4681-3	Layer 3B
	4892-3	Fill
	5294-15	Layer 4
	5912	Layer 3, Balk 1

McElmo B/w jar

FS	1	Surface
	124	Room 10, Level 1
	980-4	Room 18, Level 1
	1005	Room 17
	1077-2	Pithouse clearing
	1733-2	Room 18-17, balk
	1896	Pithouse C, Level 2
	2458	Room 8, Subfloor Level 1
	4473-4	Layer 3A
	4892-2	Fill

Puerco B/w seed jar

FS	124	Room 10, Level 1
	4681	Layer 3B
	6173	Layer 5, Balk 1

Taylor B/w ladle

FS	1008	Room 17, fill
	5746	Layer 5
	5948	South recess

Gallup-Red Mesa B/w seed jar

FS	5557-2	Room 16, Subfloor 2, Layer 2
	5746	Layer 5

Early Red Mesa B/w bowl

FS	89-3	Room 2, Level 1
	4883	TT 37, Level 1
	5746	Layer 5

Escavada B/w bowl

FS	908	TT 5
	1733	Room 17-18, balk
	4681-2	Layer 3B
	4892	Fill

Escavada B/w bowl

FS	811	Room 14, Level 2
	876-3	Room 14, Level 3
	980-2	Room 18, Level 1
	4473	Layer 3A

Chaco B/w bowl

FS	168-2	Room 5, Level 1
	4032-2	TT 29
	4676	Level 2

Puerco/Escavada B/w bowl

FS	124	Room 10, Level 1
	4473	Layer 3A
	4681-3	Layer 3B
	4883-2	TT 37, Level 1
	5294-6	Layer 4
	5746-2	Layer 5

Gallup B/w jar

FS	554	Room 12, Level 1
	4473	Layer 3A

Red Mesa-Gallup B/w bowl

FS	668	Room 2, Floor 1
	1342	Room 19, Level 3
	4612	Trash Mound, HR-1
	5294	Layer 4

Kana'a B/w jar

FS	5746	Layer 5
	6909	Room 5, fill

Smudged bowl

FS	480	Room 10, Level 2
	4681-2	Layer 3B
	4892-2	Fill

Chuska B/w jar

FS	1455	TT 20
	1752	Room 19, Level 4
	6173	Layer 5, Balk 1

Escavada B/w bowl (indented exterior)

FS	880	Room 16, Level 1
	4473	Layer 3A

Lobo red jar

FS	1733	Room 17-18, balk
	4940	TT 37, Level 2
	5294	Layer 4
	5948	South recess
	6173	Layer 5, Balk 1
	6669-2	Layer 6
	6675	Kiva E floor

Reserve/Puerco B/w bowl

FS	980	Room 18, Level 1
	5244	Layer 4

Corrugated jar (with hematite)

FS	4473	Layer 3A
	6102	Room 20, Subfloor

Smudged bowl

FS	4941	Level 3
	6669	Level 6
	6799	Room 16, Subfloor

Smudged bowl

FS	193-8	Room 5, Level 3
	5294-4	Layer 4
	5912	Layer 3, Balk 1

Gallup B/w jar

FS	1733	Room 17-18, balk
	4676	Layer 2
	5825	Layer 1 & 2, Balk 1

Early Red Mesa B/w bowl

FS	89-3	Room 2, Level 1
	4883	TT 37, Level 1
	5746	Layer 5

Newcomb B/w jar

FS	105	TT 29
	4919	Room 4, Subfloor 1

Smudged bowl

FS	69	Trash Mound, TT 1, Level 2
	4473	Layer 3A
	1077	Pithouse clearing
	2789-2	Pithouse A, Level 4
	4473	Layer 3A
	5104	Room 16, Layer 1

Kiva E + Test Trenches:

Gallup B/w bowl

FS	908	TT 5
	4032	TT 29
	5912	Layer 3A

Puerco B/w bowl

FS	34	Trash Mound, TT 1, Level 1
	4473	Layer 3A

Chuska B/w jar

FS	1154	TT 2, Level 2
	4336	Kiva E, fill
	5294	Layer 4

Chaco-McElmo B/w bowl

FS	2439	TT 1, Level 2
	4681	Layer 3B

Gallup B/w bowl

FS	699	TT 5, Level 2
	4681	Layer 3B

Black Mesa B/w bowl

FS	4940-2	TT 37, Level 2
	4612	Trash Mound, HR-1, Layer 1
	5294	Layer 4
	6207	Balk 1

Whiteware

FS	2780	TT 13
	4473	Layer 3A

Whiteware

FS	4043	South Plaza, Level 1
	4681-2	Layer 3B

Reserve B/w jar

FS	2761	TT 13, Level 1
	5294	Layer 4

Cebolletta B/w bowl

FS	16	Trash Mound, TT 1, Level 1
	4473	Layer 3A
	5294	Layer 4

Escavada B/w bowl

FS	908	TT 5
	4444	Trash Mound, GL-2, Layer 1
	5294-2	Layer 4

Puerco B/w bowl

FS	4051	TT 13, Level 2
	4348	Kiva E, Level 2

Kiva E + Other Pit Structures:

Red Mesa B/w bowl

FS	2935	Kiva D, Level 7
	4681	Kiva E, Layer 3B

Red Mesa B/w bowl

FS	4892	Kiva E, fill
	5294	Kiva E, Layer 4
	5337	Pithouse C, Balk 3, Layer B

Red Mesa B/w bowl

FS	1281	Pithouse C, clearing
	4676	Kiva E, Level 2

Cebolleta/Red Mesa B/w jar

FS	4032	TT 29
	4473-5	Kiva E, Layer 3A
	6574	Kiva G, Level 3

Red Mesa B/w bowl

FS	5746	Kiva E, Layer 5
	6695	Kiva G, Level 5

Smudged bowl

FS	554	Room 12, Level 1
	699	TT 5, Level 2
	5746	Kiva E, Layer 5
	6642-3	Pitstructure F, Floor

Toadlena B/w bowl

FS	980	Room 18, Level 1
	6207	Kiva E, Balk 1
	6695	Kiva G, Level 5

Gallup B/w bowl

FS	1097	Pithouse A, clearing
	4681	Kiva E, Layer 3B
	5825	Kiva E, Balk 1, Layer 1 & 2
	6849	Surface

Black Mesa B/w bowl

FS	1077	Pithouse clearing
	4336-2	Kiva E, fill
	4473	Kiva E, Layer 3A
	4681-2	Kiva E, Layer 3B
	4892	Kiva E, fill
	5294-6	Kiva E, Layer 4
	5912	Kiva E, Balk 1, Layer 3
	5948	Kiva E, South recess
	6207	Kiva E, Balk 1

Sosi B/w bowl

FS	1077	Pithouse clearing
	4473	Kiva E, Layer 3A
	4681	Kiva E, Layer 3B
	5294	Kiva E, Layer 4

Gallup B/w bowl

FS	2789	Pithouse A, Level 4
	4473	Kiva E, Layer 3A

Sosi B/w bowl

FS	1077-3	Pithouse clearing
	4681	Kiva E, Layer 3B
	4883-3	Kiva E, TT 37, Level 1
	4940	Kiva E, TT 37, Level 2
	5294	Kiva E, Layer 4
	5948-2	Kiva E, South recess

Burnham B/w bowl

FS	3056	Pithouse C, Layer F
	6601-2	Kiva E, Level 7
	6669-8	Kiva E, Layer 6

Chuska B/w jar

FS	5294	Kiva E, Layer 4
	5746	Kiva E, Layer 5
	5948	Kiva E, South recess
	6841	Kiva G, Level 8

Puerco B/w bowl

FS	4799	Pithouse C, Layer AA'
	5299	Kiva E, Layer 4

Medicine B/r bowl

FS	1813-3	Pithouse C, fill
	4473	Kiva E, Layer 3A

Red Mesa B/w bowl

FS	4952	Kiva D, Macrostrat 3
	5294	Kiva E, Layer 4

Red Mesa B/w bowl (corrugated exterior)

FS	2886	Pithouse A, Level 6
	4335	Kiva E, Level 2
	4473	Kiva E, Layer 3A

Whiteware jar

FS	1076	Pithouse A, clearing
	5948	Kiva E, South recess

Puerco B/w bowl

FS	504	Room 10, Level 3
	1076	Pithouse A, clearing
	1077-2	Pithouse clearing
	1097	Pithouse A, clearing
	4032	TT 29
	4473-2	Kiva E, Layer 3A
	5294	Kiva E, Layer 4
	5912	Kiva E, Layer 3, Balk 1
	5948	Kiva E, South recess

Burnham B/w jar

FS	2749	Pithouse C, fill
	3064	TT 29
	5900	Pithouse C, Layer F, Balk 3
	16	Pithouse C, fill
	4473-2	Kiva E, Layer 3A
	5912-2	Kiva E, Layer 3, Balk 1
	1169	TT 6
	2858	Pithouse C, Layer F, Balk 1
	2933	Kiva D, Level 7
	4952	Kiva D, Layer A, Balk 1
	5234-3	Pithouse C, Layer A, Balk 3
	6999	Kiva E, Layer 6

<u>Pithouse C</u>:

Early Red Mesa B/w bowl

FS	69	Trash Mound TT 3, Level 2
	1281	Pithouse C, clearing

Early Red Mesa B/w Bowl

FS	2035	Pithouse C, Level 2
	2046	Pithouse C, Level 6

Red Mesa B/w bowl

FS	2035	Pithouse C, Level 2
	2046	Pithouse C, Level 6

Burnham B/w ladle

FS	2035	Pithouse C, Level 2
	5337-2	Pithouse C, Layer B, Balk 3

Red Mesa B/w bowl

FS	4499-2	????
	5576	Pithouse C, Balk 3, fill
	6713-2	Pithouse C, Vent fill

Kiatuthlanna B/w

FS	1281	Pithouse C, clearing
	5080	Pithouse C, Layer A', Balk 3

Red Mesa B/w bowl

FS	1837-2	Pithouse C, fill
	4083-2	Pithouse C, Layer B
	5337-2	Pithouse C, Layer B

Red Mesa B/w bowl

FS	1281	Pithouse C, clearing
	1537	Pithouse C, Level 3
	5234-6	Pithouse C, Layer A, Balk 3

Red Mesa B/w bowl

FS	1813	Pithouse C, fill
	2499	Pithouse C, Layer B, Balk 2

Red Mesa B/w jar

FS	2046	Pithouse C, Level 6
	2683	Pithouse C, fill

Red Mesa B/w bowl

FS	2040	Pithouse C, Level 5
	5973	Pithouse C, Firepit Floor 1

Red Mesa B/w ladle

FS	1281	Pithouse C, clearing
	1837	Pithouse C, fill

Sanostee R/o jar

FS	1281	Pithouse C, clearing
	1837-2	Pithouse C, fill
	5337-3	Pithouse C, Layer B, Balk 3

Whiteware jar

FS	4080	Pithouse C, fill
	5234	Pithouse C, Layer A, Balk 3

Red Mesa B/w seed jar
FS 5337 Pithouse C, Layer B, Balk 3
5455-2 Pithouse C, Floor 1
5973 Pithouse C, Firepit Floor 1

Red Mesa B/w ladle
FS 1837 Pithouse C, fill
5080 Pithouse C, Layer A, Balk 3

Puerco B/w bowl
FS 1537 Pithouse C, Level 3
2040 Pithouse C, Level 5

Red Mesa B/w bowl
FS 5080-2 Pithouse C, Layer A, Balk 3
5576 Pithouse C, Balk 3 fill

Early Red Mesa B/w mini ladle
FS 1849 Pithouse C, Level 5
2546 Pithouse C, Layer C, Balk 2

Kiatuthlanna B/w bowl
FS 1281 Pithouse C, clearing
5234 Pithouse C, Layer A, Balk 3

Red Mesa B/w jar
FS 2072 Pithouse C, Level 7
5900 Pithouse C, Layer F, Balk 3

Red Mesa B/w bowl
FS 2035 Pithouse C, Level 2
2054 Pithouse C, fill

Red Mesa B/w bowl
FS 1853-2 Pithouse C, Level 5
2035-5 Pithouse C, Level 2

Red Mesa B/w jar
FS 2046 Pithouse C, Level 6
2684 Pithouse C, Bench, contact

Whiteware bowl
FS 1837-2 Pithouse C, Level 4
2271 Pithouse C, clearing
2273-2 Plaza surface clearing
2432 Pithouse C, TT 24, Level 1
2790 Pithouse C, Layer B, Balk 1

Red Mesa B/w (?) jar
FS 4047 Plaza, @ cist 1
4080 Pithouse C, fill
5080-2 Pithouse C, Layer A'
5576 Pithouse C, Layer AAA'

Red Mesa B/w bowl
FS 1813 Pithouse C, fill
2499 Pithouse C, Layer C, Balk 2

Red Mesa B/w ladle
FS 1297 TT 13, Level 1
2046 Pithouse C, Level 6

Newcomb B/w jar
FS 908 TT 5, fill
3056 Pithouse C, Layer F
5468 Pithouse C, Layer C, Balk 3

San Juan redware bowl
FS 16 Trash Mound, TT 1, Level 1
5900 Pithouse C, Layer F, Balk 3

Burnham B/w bowl
FS 1813-2 Pithouse C, fill
2516-2 Pithouse C, TT 24

Red Mesa B/w pitcher
FS 4358 Pithouse A, Level 1
5234 Pithouse C, Layer A, Balk 3

Red Mesa-Puerco B/w bowl
FS 1076 Pithouse A, clearing
5337 Pithouse C, Layer B, Balk 3

Newcomb B/w bowl
FS 1281 Pithouse C, clearing
2375 Trash Mound, KL-1, Layer 1
2844-3 Pithouse C, Layer A, Balk 1
4085 Pithouse C, Layer F, Balk 3
5080 Pithouse C, Layer A', Balk 3
5234-4 Pithouse C, Layer A, Balk 3

Newcomb B/w jar
FS 1076 Pithouse A, clearing
2046-2 Pithouse C, Level 6
2413 Trash Mound, KL-1, Layer 1
2684 Pithouse C, fill
5080 Pithouse C, Layer A', Balk 3

Red Mesa B/w bowl
FS 2397-2 Trash Mound, KL-1, Layer 2
5080 Pithouse C, Layer A, Balk 3
2320 Trash Mound, K1-1

Red Mesa B/w handle
FS 2320 Trash Mound, KL-1, Level 4
4760 Pithouse C, Layer AAA' b-3

Red Mesa B/w bowl
FS 2456 Trash Mound, KL-1, Layer 2
6713 Pithouse C, vent fill

Puerco B/w bowl
FS 1077-2 Pithouse clearing
2375 Trash Mound, KL-1, Layer 1
5080 Pithouse C, Layer A' b-3

Red Mesa B/w bowl
FS 1291 Pithouse C, Level 2
1793 Pithouse A, fill

Red Mesa-Puerco B/w bowl
FS 1076 Pithouse A, clearing
5337 Pithouse C, Layer B b-3

San Juan redware jar

FS	886	Room 3, Level 2
	2790	Pithouse C, Layer B b-1

Burnham B/w seed jar

FS	1837	Pithouse C, Level 4
	5455	Room 16, Subfloor 2, Layer 2

Early Red Mesa B/w bowl

FS	1281	Pithouse C, clearing
	2741	Pithouse C, Layer B b-1
	5058	Pithouse C, Layer A'
	5234	Pithouse C, Layer A
	5482	Room 9, Subfloor 3, Layer 2
	5863	Room 8, Floor 2

Deadmans B/r bowl

FS	116	Room 5, Level 3
	1537	Pithouse C, Level 3
	1813-2	Pithouse C, fill
	1849	Pithouse C, Level 5
	2054-2	Pithouse C, fill
	2271	Pithouse C, clearing
	5234	Pithouse C, Layer A b-3

Red Mesa B/w bowl

FS	5234	Pithouse C, Layer A b-3
	6008	Room 4, Layer 1

Red Mesa B/w ladle

FS	4297-2	Room 5, Subfloor 1, Level 2
	5729-2	Pithouse C, Layer D, b-3

Gallup B/w bowl

FS	111	Room 12, Level 1
	1281	Pithouse C, clearing

Red Mesa B/w bowl

FS	2039	Pithouse C, Level 3
	3919	?????

Red Mesa B/w ladle bowl

FS	5234	Pithouse C, Layer A, b-3
	6419	Pit Structure F, Level 5

Piedra B/w jar

FS	5080	Pithouse C, Layer A', b-3
	6533	Pit Structure F, Level 6

Kiva D:

Red Mesa B/w bowl

FS	2899	Level 6
	2933	Level 7

Gila Corrugated Smudged

FS	2933	Level 7
	2935	Level 7
	3030	Level 8

Gallup B/w jar

FS	2933	Level 7
	3030	Level 8

Red Mesa B/w miniature bowl

FS	3041	Levels 8 & 9

Gallup B/w bowl

FS	2933	Level 7
	3030	Level 8
	5789	Subfloor test

Gallup-Red Mesa B/w bowl

FS	5306	Floor fill
	5396	Floor

Payan corrugated

FS	2644	Pithouse A, TT 25, Level 9
	3030	Level 8
	3055	Level 9

Whiteware jar

FS	2447	Pithouse A, TT 25, Level 4
	2935	Level 7

Red Mesa B/w bowl

FS	4281	Level 10
	5306	Floor 1, fill
	5396	Floor 1
	6013-2	Room 16, Layer ?

Red Mesa Escavada B/w bowl

FS	5306	Floor 1, fill
	5396	Floor 1
	6013-3	Room 16, Layer ?

Red Mesa B/w bowl

FS	4909-3	Room 10, Subfloor 2, Layer 2
	4952	Macrostrat 3

Bluff B/r bowl

FS	4120	Room 1, Floor 2, firepit
	4952	Macrostrat 3

Bluff/Abajo B/r jar

FS	1589	Pithouse A, Level 1
	2810	Kiva D, Level 5
	4024	Pithouse A, antechamber fill
	6729	Room 22 surface

Gallup B/w bowl

FS	2252	Pithouse A, Level 2
	4751	Macrostrat, Layers 1-3

Whiteware

FS	1488	Pithouse A, antechamber, Level 1
	4823	Kiva D, fill

Kivas D, E, F, G:

Escavada B/w bowl

FS	4277	TT 33
	5306	Kiva D, Floor 1, fill

Gallup B/w bowl

FS	16	Trash Mound, TT 1, Level 1
	4281	Kiva D, Level 10

Gila Corrugated Smudged

FS	1076-2	Pithouse A, clearing
	1488	Pithouse A, Main Chamber, Level 1
	3030-3	Kiva D, Level 8
	3064	TT 29, Kiva E
	4473-3	Kiva E, Layer 3A
	6103	Room 20, Subfloor test
	685	Room 2, Level 5
	2933-3	Kiva D, Level 7
	2935	Kiva D, Level 7
	3030-2	Kiva D, Level 8

Toadlena B/w bowl

FS	6695	Kiva G, Level 5
	6697	Kiva G, Level 5

Unidentified polished purple

FS	6419	Pit Structure F, Level 5
	6601	Pit Structure F, Level 7

Red Mesa B/w bowl

FS	6533	Pit Structure F, Level 6
	6846	Kiva G, Level 9

Gallup B/w ladle

FS	569	Room 12, Level 2
	6697	Kiva G, Level 9

Gallup B/w seed jar

FS	1097	Pithouse A, clearing
	1488	Pithouse A, Main Chamber, Level 1
	2526	Trash Mound, JL-2
	6697	Kiva G, Level 5

Abajo B/r jar

FS	1038	Pithouse A, Level 1
	2273	Plaza surface

White Mound B/w bowl

FS	2026	Pithouse B, Level 3
	1273	Pithouse B, antechamber, Level 2

<u>Pithouse A:</u>

Whiteware

FS	1056	Pithouse A, antechamber, Level 2
	1076	Pithouse A, clearing

Gallup B/w jar

FS	2425	Pithouse A, TT 25, Level 3
	2789	Pithouse A, Level 4
	2886	Pithouse A, Level 6

Gallup B/w jar

FS	1077	Pithouse A clearing
	1488	Pithouse A, Main Chamber, Level 1

Red Mesa B/w jar

FS	2625	Pithouse A, TT 25, Level 7
	2635	Pithouse A, TT 25, Level 8

Red Mesa B/w bowl

FS	1076	Pithouse A, clearing
	1077	Pithouse A, clearing

Red Mesa B/w bowl

FS	1076	Pithouse A, clearing
	1077	Pithouse A, clearing

Red Mesa B/w bowl

FS	1076	Pithouse A, clearing
	1077	Pithouse A, clearing

Early Red Mesa B/w bowl

FS	1488-2	Pithouse A, Main chamber
	1793	Pithouse A, Main chamber

Red Mesa B/w jar

FS	2447	Pithouse A, TT 25
	2728	Pithouse A, Level 3

Gallup B/w bowl

FS	1488	Pithouse A, main chamber
	1793	Pithouse A, main chamber
	6849	Surface

Gallup B/w jar

FS	1097	Pithouse A, surface
	1488	Pithouse A, Antechamber, Level 1

Kana'a B/w jar

FS	2789	Pithouse A, Level 4
	2838	Pithouse A, Level 4

Lino B/g bowl

FS	2789	Pithouse A, Level 4
	2838	Pithouse A, Level 4

Tunicha B/w bowl

FS	1036	Pithouse A, clearing above
	1077	Clearing

Newcomb B/w jar

FS	1077	Pithouse A, clearing
	1097	Pithouse A, clearing above
	1488-3	Pithouse A, Main chamber, Level 1

Tusayan Redware jar

FS	1038	Pithouse A, clearing above
	2273	Plaza surface

Newcomb B/w ladle

FS	1	Surface
	1077	Clearing

Smudged bowl

FS	2789	Pithouse A, Level 4
	2838	Pithouse A, Level 4

Smudged bowl

FS	1076	Clearing
	4032	TT 29, Kiva E

Reserve B/w jar

FS	2886	Level 6
	4612-2	Trash Mound, HR-1, Layer 1

Red Mesa B/w bowl

FS	2789	Level 4
	4909-2	Room 10, Subfloor 1, Layer 2

Gallup B/w bowl
FS 933 TT 7
2886 Level 7

Escavada B/w bowl
FS 933 TT 7
1076 Clearing

Red Mesa B/w ladle
FS 2568 ?????
2835 Level 5

Red Mesa B/w ladle
FS 2728 Level 3
2835 Level 5

Gallup B/w jar
FS 2625 TT 25, Level 7
2635 TT 25, Level 8

Red Mesa B/w handle
FS 1488 Main chamber, Level 1
2728 Level 3

Gallup B/w bowl (indented exterior)
FS 1076 Clearing
2789 Level 4

Red Mesa B/w bowl
FS 2728 Level 3
2835 Level 5

Red Mesa B/w bowl
FS 2726 Level 3
2835 Level 5

Rooms:

Puerco B/w jar
FS 111 Room 12, Level 1
480 Room 10, Level 2

Chaco B/w jar
FS 111 Room 12, Level 1
480 Room 10, Level 2

Gallup/Escavada B/w
FS 480 Room 10, Level 2
569-2 Room 12, Level 2

Unidentified purplish bowl
FS 480-2 Room 10, Level 2
569 Room 12, Level 2
719-3 Room 12, Floor 1
991 Room 15, Level 2

Gallup B/w jar
FS 504 Room 10, Level 3
569-3 Room 3, Level 2

Escavada B/w jar
FS 52 Trash Mound, TT 3, Level 1
480 Room 10, Level 2

Smudged bowl
FS 2181-3 Room 19, Level 5
7239 Room 10, under north wall

Tusayan B/r bowl
FS 569 Room 12, Level 2
1221 Room 15, Level 1

Sosi B/w jar
FS 1 Surface
554 Room 12, Level 1
1221 Room 15, Level 1

Reserve B/w bowl
FS 1752 Room 19, Level 3
2181-3 Room 19, Level 5

Toadlena B/w jar
FS 52-3 Trash Mound, TT 3, Level 1
752 Room 16, Level 1
1622-2 Room 16, Level 1
1650 Room 16, Level 4
1747 Room 19, Level 3
6729 Room 22, surface

Exotic M/w
FS 52-2 Trash Mound, TT 3, Level 1
105 Room 5, Level 2
480-2 Room 10, Level 2
504 Room 10, Level 3
752 Room 16, Level 1
1076-2 Pithouse A, clearing
1312 Room 19, Level 1
2370 TT 1, Level 1
2494 Trash Mound, JL-1, Surface
2666-4 Trash Mound, JL-2, Surface
2761 TT 13, Level 1
4681 Kiva E, Layer 3B
6465 Surface

Newcomb B/w bowl
FS 752 Room 16, Level 1
4612 Trash Mound, HR-1, Layer
5557 Room 16, Subfloor 2, Layer 2

Gallup/Escavada B/w bowl
FS 52-2 Trash Mound, TT 3, Level 1
752 Room 16, Level 1
1076 Pithouse A, clearing

Escavada B/w bowl
FS 116-2 Room 5, Level 3
699-2 TT 5, Level 2
929 Room 14, Level 4
1077 Pithouse clearing

Escavada B/w bowl
FS 547 Room 2, Level 3
876 Room 14, Level 3
1733 Room 17-18, balk

Red Mesa B/w
FS 547 Room 2, Level 3
127 Room 9, Level 3

Red Mesa B/w jar

FS	89-2	Room 2, Level 1
	1169	TT 6

Tunicha B/w

FS	742	Room 2, Floor 1
	908-2	TT 5

Escavada/Gallup B/w bowl (corrugated exterior)

FS	111	Room 12, Level 1
	742	Room 2, Floor 1
	2666	Trash Mound, JL-2, Surface
	4473	Kiva E, Layer 3A

Gallup/Puerco B/w bowl

FS	34	Trash Mound, TT 1, Level 1
	5667	Room 2, Floor 2

Newcomb B/w jar

FS	2981-2	Room 7, Subfloor 1, Level 2
	5929	Room 6, north wall fill
	6723	Room 6, Level 5

Chaco B/w jar (complete)

FS	87	Room 6, Level 2
	777	Room 6, Level 2

Newcomb B/w

FS	2977	Room 7, Subfloor 1, Level 1
	5845	Room 6, Level 5

Puerco B/r bowl

FS	606	Room 7, Level 1
	2343	Trash Mound, IL-1, Level 1
	2666	Trash Mound, IL-1, Surface

Gallup B/w jar

FS	233	Room 7, Level 1
	699	TT 5, Level 2

Kiatuthlanna B/w bowl

FS	79-2	Room 1, Burial 1
	86	Room 1, Floor 1

Whiteware

FS	52	Trash Mound, TT 3, Level 1
	102	Room 8, Level 2

Smudged bowl

FS	980	Room 18, Level 1
	1733	Room 17-18, balk

Chaco-McElmo B/w jar

FS	1005	Room 17, fill
	1733	Room 17-18, balk

Gallup B/w seed jar

FS	832	Room 11, Level 1
	6190	Room 11, Floor 2, Pit 9

Lino B/g bowl

FS	4700	Trash Mound, FL-2, Layer 2
	7081	Trash Mound, TT 1, Level 1

Red Mesa B/w jar

FS	1275	Plaza Surface
	1297	TT 13, Level 1

Reserve B/w bowl

FS	1221	Room 15, Level 1
	2370	Trash Mound, TT 1, Level 1

Red Mesa B/w jar

FS	1275	Plaza surface
	1297	TT 13, Level 1

Red Mesa B/w bowl

FS	908	TT 5
	3008	Trash Mound, KX

Others:

Whiteware

FS	1-2	Trash Mound, surface
	34	Trash Mound, TT 1, Level 1

Gallup B/w seed jar

FS	699-2	TT 5, Level 2
	933	TT 7

Red Mesa B/w bowl

FS	2375	Trash Mound, KL-1, Layer 1
	2397	Trash Mound, KL-1, Layer 2

Gallup B/w bowl

FS	515	TT 5, Level 1
	6350	Kiva G, surface

Early Red Mesa B/w jar

FS	1084	?????
	2397	Trash Mound, KL-1, Layer 2

Early Red Mesa B/w bowl

FS	3064	TT 29, Kiva E
	1247	South Plaza

Kiatuthlanna B/w bowl

FS	1247	South Plaza
	3064	TT 29, Kiva E

Escavada B/w bowl

FS	524	Kiva area clearing
	1154	TT 2, Level 2

Lino Fugitive Red jar

FS	6471	North of Pithouse A
	7047	North of Pithouse A

Exotic M/w bowl

FS	1752	Room 19, Level 4
	2181	Room 19, Level 5

Burnham/Chuska B/w bowl

FS	933	TT 7
	1312-8	Room 19, Level 1
	1321-2	Room 19, Level 2
	1488	Pithouse A, Level 1
	4032	TT 29, Kiva E

Chuska B/w ladle

FS	1221	Room 15, Level 1
	1348	Room 15, Level 5

Black Mesa B/w bowl

FS	1236-2	Room 16, Level 2
	1241	Room 13, Level 3
	1647	Room 16, Level 4

Gallup B/w jar

FS	1236	Room 16, Level 2
	1622	Room 16, Level 1

Escavada B/w bowl

FS	515	TT 5, Level 1
	752	Room 16, Level 1

Puerco B/r bowl

FS	1005	Room 17, Level 3
	2273	Plaza clearing

Early Red Mesa B/w pitcher

FS	866	Room 3, Level 2
	880	Room 16, Level 1
	1236-3	Room 16, Level 2
	1241-8	Room 16, Level 3
	1629-5	Room 16, Level 1

Toadlena B/w cup (complete)

FS	1885	Room 6, clearing
	2977	Room 7, Subfloor 1, Level 1
	5848	Room 6, balk Floor 1-3
	6723	Room 6, Level 5

Escavada B/w bowl

FS	876	Room 14, Level 3
	980	Room 18, Level 1

Wide neckbanded (fingernailed) jar

FS	1214	TT 15, Level 1
	1221	Room 15, Level 1

<u>Others & Late Carbons</u>:

Red Mesa B/w ladle

FS	6640	Pit Structure F, floor
	1843	Pithouse C, Level 4

McElmo B/w bowl

FS	-2	Room 10, Level 3
	-2	Kiva E, Layer 3
		Kiva E, Layer 3B
		Kiva E, Level 2
		Kiva E, Layer 3A
		Kiva E, Layer 5

Black Mesa B/w bowl

FS	-2	Room 16, Level 2
	-2	Room 16, Level 3
		Room 16, Level 4

Black Mesa B/w bowl

FS	-2	Kiva E, TT 37, Level 2
		Kiva E, balk fill
		Room 11, Floor 3 pit
		Trash Mound, HR-1, Layer 1

Newcomb B/w bowl

FS		Room 6, fill
	-5	Room 6, Level 5
	-4	Room 7, Subfloor 1, Level 1
		Room 7, Subfloor 1, Level 2

Chuska B/w ladle

FS		Kiva E, Level 9
		Room 15, Level 1

Burnham B/w jar

FS		Kiva D, Macrostrat 3
		Kiva E, Floor fill

McElmo B/w bowl

FS		Room 17, fill
		Room 17-18, balk

McElmo B/w bowl

FS	4473-5	Kiva E, Layer 3A
	1005-2	Room 17, fill
	4892-2	Kiva E, fill
	124	Room 10, Level 1
	1077	Pithouse A, clearing
	6690	Kiva G, Level 4
	2458	Room 8, subfloor, Level 1
	1896	Pithouse C, Level 2
	1	Trash Mound, surface
	980-4	Room 18, Level 1
	1733-2	Room 17-18, balk

Red Mesa B/w bowl

FS	4883	Kiva E, TT 37, Level 1
	5294	Kiva E, Layer 4
	6657	Kiva E, fill

Red Mesa B/w bowl

FS	5294-2	Kiva E, Layer 4
	5948	Kiva E, South recess

Gallup B/w miniature pitcher

FS	4676	Kiva E, Level 2
	4681	Kiva E, Layer 3B

Red Mesa B/w ladle

FS	3031	Kiva D, Level 8
	2370	Trash Mound, Layer 1

Gallup B/w "polychrome" pitcher

FS	2886	Kiva D, Level 6
	2789	Kiva D, Level 4

Gallup B/w seed jar

FS	484	Room 9, Floor 2
	4736	Room 8, Floor 2, firepit

APPENDIX D

REFIRING RESULTS AT 29SJ 627 PROVENIENCE, TEMPER, AND OXIDIZED COLOR OF SELECTED SHERDS

Peter J. McKenna

Group	Rough Sort Type	Temper	Core	Refired Color	Windes' Color Group
A. Trachyte Naschitti B/w (381)					
2728-25	Kiva D (2)			5YR7/6	Reddish yellow (5)
4473-199	Kiva E (3)			7.5YR6/6	Reddish yellow (4)
6721-1	Room 16, Floor 4 (1)			5YR7/4	Pink (3)
5746-22	Kiva E (3)			5YR7/6	Reddish yellow (5)
6173-1	Kiva E (3)			5YR6/6	Reddish yellow (5)
225-25	Kiva D (2)			7.5YR8/6	Reddish yellow (4)
6350-21	Kiva G (2)			7.5YR7/6	Reddish yellow (4)
2933-5	Kiva D (2)			7.5YR8/6	Reddish yellow (4)
2728-18	Kiva D (2)			7.5YR7/6	Reddish yellow (4)
34-76	Trash Mound (2)			7.5YR8/4	Pink (2)
Culinary (381)					
647-2	Trash Mound (2)	Narrow neck		5YR6/6	Reddish yellow (5)
647-8	Trash Mound (2)	Narrow neck		2.5YR5/8	Red (6)
1455-1	Plaza (2)	Corrugated neck		7.5YR8/6	Reddish yellow (4)
643-1	Room 4, Floor 1 (2)	Narrow neck		10YR8/2	White (1)
2054-2	Pithouse C (1)	Narrow neck		10YR8/4	Very pale brown (1)
1020-1	Plaza (2)	Narrow neck		2.5YR5/8	Red (6)
647-3	Trash Mound (2)	Narrow neck		7.5YR8/6	Reddish yellow (4)
1537-1	Pithouse C (1)	Corrugated neck		2.5YR5/8	Red (6)
2789-4	Kiva D (2)	Narrow neck		5YR7/6	Reddish yellow (5)
34-20	Trash Mound (2)	Corrugated neck		10YR8/3	Very pale brown (2)
1834-2	Pithouse C (1)	Narrow neck		10YR8/2	White (1)
B. Trachyte mix, Red MesaB/w (881)					
1097-35	Kiva D (2)			7.5YR8/4	Pink (2)
2790-14	Pithouse C (1)			7.5YR8/4	Pink (2)

Group	Rough Sort Type	Temper	Core	Refired Color	Windes' Color Group
2789-18	Kiva D (2)			7.5YR8/4	Pink (2)
2293-1	Trash Mound (2)			10YR8/3	Very pale brown (1)
2509-8	Trash Mound (2)			10YR8/4	Very pale brown (1)
2977-1	Room 7, Floor 2 (2)			7.5YR8/6	Reddish yellow (4)
5080-1280	Pithouse C (1)			10YR8/2	White (1)
2761-26	Plaza (2)			7.5YR8/4	Pink (2)
2370-7	Trash Mound (2)			5YR8/4	Pink (3)
1589-29	Kiva D (2)			7.5YR6/6	Reddish yellow (4)
2494-6	Trash Mound (2)			10YR8/2	White (2)
C. Exotic mineral-on-white					
6465-6	Plaza (2) Cebolleta B/w	Not done		10YR8/3	Very pale brown (1)
4681-195	Kiva E (3) Socorro B/w	Fine SS	Vitrified 5Y7/2	10YR7/1	Light gray (1)
5294-156	Kiva E (3) Socorro B/w	Medium SS	Vitrified 5Y7/2	10YR6/4	(-)
-154	Kiva E (3) Socorro B/w	Medium SS	Vitrified 5Y7/2	10YR6/2	(-)
52-51	Trash Mound (2) Socorro B/w	Medium SS	Vitrified 5Y7/2	10YR7/6	(-)
4032-21	Kiva E (3) Socorro B/w	Fine SS	Vitrified 5Y7/2	10YR6/2	(-)
5948-58	Kiva E (3) Socorro B/w	Very coarse SS	Vitrified 5Y7/2	10YR6/1	(-)
1097-41	Kiva D (2) Reserve-Tularosa B/w	Medium SS		2.5Y8/2	White (1)
5912-92	Kiva E (3) Reserve-Tularosa B/w	Medium SS		10YR8/1	White (1)
4681-54	Kiva E (3) Reserve-Tularosa B/w	Medium SS		2.5Y 8/2	White (1)
34-104	Trash Mound (2) Mancos B/w	San Juan igneous		5YR6/6	Reddish yellow (5)
4883-32	Kiva E (3) Mancos B/w	Coarse SS		7.5YR7/6	Reddish yellow (4)
4032-1	Kiva E (3) Cortez B/w	Medium SS		10YR8/1	White (1)

Group	Rough Sort Type	Temper	Core	Refired Color	Windes' Color Group
6799-16	Room 16, Floor 4 (1) Cortez B/w	Medium SS		7.5YR8/4	Pink (2)
1297-17	Plaza (2) Cortez B/w	San Juan igneous		10YR8/1	White (1)
-25	Plaza (2) Cortez B/w	San Juan igneous +SS		7.5YR7/6	Reddish yellow (4)
5848-60	Kiva E (3) Cortez B/w	Medium SS		7.5YR7/4	Pink (2)
1813-64	Pithouse C (1) Cortez B/w	San Juan igneous +SS		10YR8/3	Very pale brown (1)
6533-42	Pit Structure F (1) Cortez B/w	Medium SS		10YR7/4	Very pale brown (1)
6350-1	Kiva G (2) Mancos B/w	San Juan igneous		7.5YR8/6	Reddish yellow (4)
6799-4	Room 16, Floor 4 (1) Mancos B/w	Medium SS		10YR8/2	White (1)
5746-23	Kiva E (3) Mancos B/w	Pink Chalcedonic SS		10YR8/3	Very pale brown (1)
3030-3	Kiva D (2) Mancos B/w	Pink Chalcedonic SS		5Y 8/1	White (1)
4473-116	Kiva E (3) Mancos B/w	Fine SS		7.5YR7/6	Reddish yellow (4)
6465-1	Plaza (2)	Medium SS		10YR8/1	White (1)
2780-4	Plaza (2)	Medium SS		10YR8/2	White (1)
5912-116	Kiva E (3)	San Juan igneous +SS		10YR8/2	White (1)
1488-29	Kiva D (2)	Medium SS		7.5YR8/4	Pink (2)
1589-40	Kiva D (2)	San Juan igneous		10YR8/4	Very pale brown (1)
5294-121	Kiva E (3)	Medium SS		2.5Y 8/2	White (1)
1488-12	Kiva D (2)	Coarse SS		7.5YR8/2	Pinkish white (2)
1321-8	Room 19, Floor 1 (2)	Medium SS		2.5Y N/8	White (1)
5294-157	Kiva E (3)	Fine SS		10YR7/2	Light gray (1)
D. Chalcedonic sandstone, gray paste with white sherd, Red Mesa B/w					
6849-3	Surface (2)			7.5YR8/2	Pinkish white (2)
2704-5	Plaza (2)			7.5YR8/4	Pink (2)
5080-795	Pithouse C (1)			7.5YR8/4	Pink (2)

Group	Rough Sort Type	Temper	Core	Refired Color	Windes' Color Group
2278-4	Trash Mound (2)			7.5YR8/4	Pink (2)
2488-4	Pithouse C (1)			5YR6/8	Reddish yellow (5)
5948-19	Kiva E (3)			7.5YR7/4	Pink (2)
E. Chalcedonic sandstone, black paste with white sherd, Red Mesa B/w					
7047-15	Plaza (2)			10YR8/1	White (1)
2886-11	Kiva D (2)		Vitrified	10YR5/1	Gray (-)
6927-4	Room 25, Floor 1 (3)			10YR8/2	White (1)
2401-1	Kiva D (2)			5YR7/6	Reddish yellow (5)
2780-14	Plaza (2)			10YR8/3	Very pale brown (1)
2844-5	Pithouse C (1)			10YR7/3	Very pale brown (1)
4612-16	Trash Mound (2)			5YR7/4	Pink (3)
F. Chalcedonic sandstone, paste-no type, Narrow Neckbanded					
2072-1	Pithouse C (1)			10YR8/1	White (1)
1247-2	Pithouse C (1)			5YR8/4	Pink (3)
4681-31	Kiva E (3)			10YR8/3	Very pale brown (1)
2046-2	Pithouse C (1)			10YR8/3	Very pale brown (1)
870-4	Plaza (2)			10YR8/2	White (1)
7052-3	Plaza (2)			7.5YR8/4	Pink (2)
1161-1	Trash Mound (4)			7.5YR8/6	Reddish yellow (4)
2835-6	Kiva D (2)			7.5YR8/4	Pink (2)
1168-2	Room 5, Floor 1 (3)			7.5YR7/4	Pink (2)
Undifferentiated sandstones					
G. Tan pastes, narrow neckbanded					
1589-8	Kiva D (2)			10YR8/3	Very pale brown (1)

Group	Rough Sort Type	Temper	Core	Refired Color	Windes' Color Group
3064-8	Kiva E (3)			7.5YR7/6	Reddish yellow (4)
1297-3	Plaza (2)			10YR8/4	Very pale brown (1)
1488-9	Kiva D (2)			10YR8/3	Very pale brown (1)
34-16	Trash Mound (2)			5YR8/4	Pink (3)
4297-1	Room 5, Floor 2 (2)			7.5YR8/4	Pink (2)
1589-21	Kiva D (2)			10YR8/4	Very pale brown (1)
H. White pastes, Narrow Neckbanded					
2447-1	Kiva D (2)			7.5YR8/6	Reddish yellow (4)
647-6	Trash Mound (2)			10YR8/3	Very pale brown (1)
6367-2	Test Trench 35 (2)			7.5YR8/4	Pink (2)
34-13	Trash Mound (2)			10YR8/2	White (1)
2375-3	Trash Mound (2)			7.5YR7/6	Reddish yellow (4)
5080-1080	Pithouse C (1)			10YR8/2	White (1)
2377-2	Trash Mound (2)			10YR8/3	Very pale brown (1)
I. Black paste, no sherd, Red Mesa B/w					
4681-59	Kiva E (3)			10YR8/2	White (1)
4676-4	Kiva E (3)			10YR8/3	Very pale brown (1)
4612-12	Trash Mound (2)			10YR8/3	Very pale brown (1)
1813-22	Pithouse C (1)			7.5YR7/4	Pink (2)
4473-76	Kiva E (3)			7.5YR8/2	Pinkish white (2)
2375-6	Trash Mound (2)			7.5YR7/6	Reddish yellow (4)
2370-25	Trash Mound (2)			7.5YR8/4	Pink (2)
1589-98	Kiva D (2)			10YR8/3	Very pale brown (1)
Neckbanded					
1369-1	Pithouse C (1)			10YR8/3	Very pale brown (1)

Group	Rough Sort Type	Temper	Core	Refired Color	Windes' Color Group
1-9	Trash Mound (2)			7.5YR8/4	Pink (2)
1813-12	Pithouse C (1)			10YR8/3	Very pale brown (1)
1633-3	Room 16, Floor 1 (3)			10YR8/3	Very pale brown (1)
34-15	Trash Mound (2)			10YR7/2	Very pale brown (1)
1455-2	Plaza (2)			10YR8/2	White (1)
J. Gray paste, <50% white sherd, Red Mesa B/w					
2937-2	Trash Mound (2)			10YR8/4	Very pale brown (1)
2780-21	Plaza (2)			10YR8/3	Very pale brown (1)
5294-103	Kiva E (3)			10YR8/3	Very pale brown (1)
2040-2	Pithouse C (1)			7.5YR8/6	Reddish yellow (4)
2939-7	Trash Mound (2)			10YR8/2	White (1)
2077-3	Pithouse C (1)			10YR8/4	Very pale brown (1)
5080-1296	Pithouse C (1)			7.5YR7/6	Reddish yellow (4)
-1266	Pithouse C (1)			7.5YR8/4	Pink (2)
4032-61	Pithouse C (1)			7.5YR8/4	Pink (2)
5294-92	Kiva E (3)			5YR7/6	Reddish yellow (5)
-161	Kiva E (3)		Vitrified	10YR6/3	Pale brown (-)
5080-1247	Pithouse C (1)			10YR8/2	White (1)
4032-30	Kiva E (3)			5YR7/6	Reddish yellow (5)
6799-15	Room 16, Floor 4 (1)			10YR8/3	Very pale brown (1)
4032-25	Kiva E (3)			10YR7/2	Very pale brown (1)
3008-4	Trash Mound (2)			5YR7/6	Reddish yellow (5)
6533-33	Pit Structure F (1)			10YR8/2	White (1)
K. Gray paste, >50% black and white sherd, Red Mesa B/w					

Group	Rough Sort Type	Temper	Core	Refired Color	Windes' Color Group
1813-18	Pithouse C (1)			5YR7/4	Pink (3)
-35	Pithouse C (1)			5YR8/4	Pink (3)
1291-9	Pithouse C (1)			7.5YR8/4	Pink (2)
4051-7	Plaza (2)			10YR7/3	Very pale brown (1)
6533-36	Pit Structure F (1)			10YR8/2	White (1)
5294-100	Kiva E (3)			7.5YR8/2	Pinkish white (2)
1567-10	Pithouse B (1)			5YR7/4	Pink (3)
1813-80	Pithouse C (1)			5YR6/6	Reddish yellow (5)
L. Trachyte (381), Gallup B/w (tabled as Brimhall B/w)					
2252-10	Kiva D (2)		5Y6/3	10YR7/4	Very pale brown (1)
5912-98	Kiva E (3)			7.5YR7/6	Reddish yellow (4)
5294-186	Kiva E (3)			10YR8/2	White (1)
69-22	Trash Mound (2)		6/1	10YR8/3	Very pale brown (1)
2349-13	Trash Mound (2)		5Y6/3	10YR7/4	Very pale brown (1)
2810-5	Kiva D (2)			10YR8/3	Very pale brown (1)
5557-6	Room 16, Floor 2 (2)		8/4	7.5YR7/6	Reddish yellow (4)
5948-21	Kiva E (3)			10YR8/3	Very pale brown (1)
1488-51	Kiva D (2)			7.5YR7/4	Pink (2)
2666-5	Trash Mound (2)			5YR8/4	Pink (3)
M. Trachyte-sandstone mix (881), Gallup B/w					
2425-7	Kiva D (2)			7.5YR8/4	Pink (2)
2933-3	Kiva D (2)			10YR8/3	Very pale brown (1)
2899-4	Kiva D (2)			10YR8/4	Very pale brown (1)
2324-10	Trash Mound (2)			5YR7/4	Pink (3)
2939-3	Trash Mound (2)			7.5YR8/4	Pink (2)

Group	Rough Sort Type	Temper	Core	Refired Color	Windes' Color Group
135-2	Room 9, Floor 1 (2)			7.5YR8/4	Pink (2)
2789-6	Kiva D (2)		7.5YR8/4	10YR8/3	Very pale brown (1)
1321-4	Room 19, Floor 1 (2)			5YR8/3	Pink (3)
2939-9	Trash Mound (2)			7.5YR7/6	Reddish yellow (4)
2780-23	Plaza (2)			10YR8/3	Very pale brown (1)
2293-2	Trash Mound (2)			5YR8/4	Pink (3)
<u>Undifferentiated sandstone</u>					
N. Gray paste, >50% white sherd, Gallup B/w					
4473-60	Kiva E (3)			10YR8/4	Very pale brown (1)
5746-38	Kiva E (3)		6/3	10YR7/4	Very pale brown (1)
5948-52	Kiva E (3)			10YR8/3	Very pale brown (1)
2313-3	Trash Mound (2)			5YR7/4	Pink (3)
6173-19	Kiva E (3)			10YR8/4	Very pale brown (1)
4032-55	Kiva E (3)			7.5YR8/4	Pink (2)
4043-10	Plaza (2)			7.5YR8/4	Pink (2)
4681-147	Kiva E (3)			7.5YR8/4	Pink (2)
-167	Kiva E (3)		5YR8/4	7.5YR8/2	Pinkish white (2)
5912-65	Kiva E (3)		6/2	10YR8/3	Very pale brown (1)
-74	Kiva E (3)			7.5YR8/4	Pink (2)
5306-3	Kiva D (2)			7.5YR8/4	Pink (2)
O. Black paste, >50% white sherd, Gallup B/w					
6841-1	Pit Structure F (1)			7.5YR8/4	Pink (2)
4043-30	Plaza (2)			5YR8/4	Pink (3)
4032-32	Kiva E (3)			10YR8/3	Very pale brown (1)

Group	Rough Sort Type	Temper	Core	Refired Color	Windes' Color Group
7287-4	Plaza (2)			10YR8/3	Very pale brown (1)
2358-3	Room 21, Floor 1 (2)			10YR7/2	Very pale brown (1)
4473-95?	Kiva E (3)			10YR8/3	Very pale brown (1)
3030-11	Kiva D (2)			7.5YR8/4	Pink (2)
1589-423	Kiva D (2)			7.5YR7/4	Pink (2)
2810-4	Kiva D (2)		N4	7.5YR8/6	Reddish yellow (4)
P. Gray paste, >50% black and white sherd, Gallup B/w					
1903-2	Room 17, Floor 1 (2)			10YR7/2	Very pale brown (1)
4032-52	Kiva E (3)			10YR8/2	White (1)
2368-5	Trash Mound (2)			7.5YR8/6	Reddish yellow (4)
1488-55	Kiva D (2)			5YR7/6	Reddish yellow (5)
4032-41	Kiva E (3)			10YR8/2	White (1)
1297-15	Plaza (2)			7.5YR8/4	Pink (2)
2939-28	Trash Mound (2)			7.5YR8/2	Pinkish white (2)
4681-58	Kiva E (3)			7.5YR8/4	Pink (2)
4348-3	Kiva E (3)			10YR7/2	Very pale brown (1)
Early Red Mesa B/w "classics"					
947-?	Burial bowl			10YR8/6	Reddish yellow (2)
2397-?	Canteen			5YR7/6	Reddish yellow (5)
SAA-1 refiring of late carbons					
Sosi B/w					
4473-222		Medium SS, white paste		10YR8/3	Very pale brown (1)
4883-23		Coarse SS, black paste		5YR8/3	Pink (3)
4681-117		Iron Oxide, SS, no type		7.5YR8/4	Pink (2)
-115		Coarse SS, white paste		7.5YR8/5	Pink (3)

Group	Rough Sort Type	Temper	Core	Refired Color	Windes' Color Group
-35		Medium SS, no type		7.5YR7/6	Reddish yellow (4)
-93		Fine SS, no type		10YR8/3	Very pale brown (1)
4883-11		Medium SS, white paste		7.5YR8/4	Pink (2)
4681-89		Medium SS, no type		7.5YR8/4	Pink (2)
5948-33		Coarse SS, white paste		10YR8/3	Very pale brown
5746-17		Medium SS, no type		7.5YR8/4	Pink (2)
-40		Medium SS, black paste		10YR8/4	Very pale brown (1)
5912-61		Medium SS, no type		5YR7/4-7/8	Pink-reddish yellow (3)
6207-4		Medium SS, no type		10YR8/3	Very pale brown (1)
1221-19		Medium SS, no type		7.5YR7/6	Reddish yellow (4)
1076-41		Fine SS, no type		10YR8/3	Very pale brown (1)
1733-?		Coarse SS, black paste		7.5YR8/4	Pink (2)
3064-16		Medium SS, no type		10YR8/3	Very pale brown (1)
5912-62		Coarse SS, black paste		10YR8/4	Very pale brown (1)
5294-117		Medium SS, white paste		10YR8/3	Very pale brown (1)
Kana'a B/w					
6297-1		Very coarse SS, no type		10YR8/3	Very pale brown (1)
5948-49		Coarse SS, white paste		10YR8/3	Very pale brown (1)
5746-46		Coarse SS, black w/>50% white sherd		7.5YR8/6	Reddish yellow (4)
-53		Coarse SS, white paste		10YR8/3	Very pale brown (1)
McElmo B/w					
5294-120		Coarse SS, no type		5YR6.5/8	Reddish yellow (5)
5746-58		Fine SS, no type		10YR8/3	Very pale brown (1)
5294-113		SS + San Juan igneous, no type		7.5YR8/6	Reddish yellow (4)
4681-144		Fine SS, no type		7.5YR8/4	Pink (2)

Group	Rough Sort Type	Temper	Core	Refired Color	Windes' Color Group
4681-118		Fine SS, black w/>50% white sherd		10YR8/2	White (1)
4473-66		Medium SS, black w/>50% white sherd		7.5YR8/5	Pinkish yellow (2)
4681-96		Medium SS, black w/<50% white sherd		10YR8/3	Very pale brown (1)
5912-60		Fine SS, black paste		10YR8/4	Very pale brown (1)
5948-47		Medium SS, black w/>50% white sherd		7.5YR8/6	Reddish yellow (4)
Chaco-McElmo B/w					
4681-165		Fine SS, black with >50% white sherd		10YR8/2	White (1)
Tunicha B/w					
5912-64		Trachyte, gray paste		7.5YR7/6	Reddish yellow (4)
Burnham B/w					
4941-7		Trachyte, gray paste		7.5YR8/4 - 5YR6/8	Pink (2) & reddish yellow (5)
Newcomb B/w					
5912-58		Trachyte, no type		2.5YR6/8	Light red (6)
Toadlena B/w					
5746-59		Trachyte, gray paste		5YR6/6	Reddish yellow (5)
-52		Trachyte, gray with <50% sherd		2.5YR6/8	Light red (6)
4473-39		Trachyte, gray paste		7.5YR6/6	Reddish yellow (4)
4032-71		Trachyte, no type		5YR6/8	Reddish yellow (5)
1650-47		Trachyte, gray w/<50% sherd		5YR6/8	Reddish yellow (5)
1567-13		Trachyte, gray paste		5YR8/4	Pink (3)
1077-87		Trachyte, gray paste		2.5YR6/8	Light red (6)
6697-7		Trachyte, <50% sherd		2.5YR6/8	Light red (6)

Group	Rough Sort Type	Temper	Core	Refired Color	Windes' Color Group
5294-16		Trachyte + SS, <50% sherd		5YR5/6	Yellowish red (5)
5557-3		Trachyte, gray paste		7.5YR7/6	Reddish yellow (4)
5746-54		Trachyte, no type		2.5YR6/8	Light red (6)
4681-72		Trachyte, no type		2.5YR5/8	Red (6)
4612-10		Trachyte, gray w/<50% sherd		5YR6/8	Reddish yellow (5)
Chuska B/w					
1097-47		Trachyte, no type		5YR6/8	Reddish yellow (5)
1622-10		Trachyte, gray paste		5YR5/8	Yellowish red (5)
1312-1		Trachyte, gray paste		2.5YR5/8	Red (6)
1030-4		Trachyte, gray paste		2.5YR6/8	Light red (6)
1076-82		Trachyte, gray >50% sherd		2.5YR6/8	Light red (6)
1077-62		Trachyte, gray <50% sherd		2.5YR5/8	Red (6)
1813-59		Trachyte, gray <50% sherd		5YR6/8	Reddish yellow (5)
6846-1		Trachyte, gray paste		2.5YR6/8	Light red (6)
5294-172?		Trachyte + SS, gray paste		5YR6/8	Reddish yellow (5)
4473-49		Trachyte, gray paste		5YR6/8	Reddish yellow (5)
4032-19		Trachyte, gray paste		2.5YR5/8	Light red (6)
Nava B/w					
5912-109		Trachyte, gray paste		5YR6/8	Reddish yellow (5)
Chuskan whiteware					
5746-73		Trachyte + SS, gray paste		7.5YR7/6	Reddish yellow (4)
Smudged wares - Lino smudged					

Group	Rough Sort Type	Temper	Core	Refired Color	Windes' Color Group
2488-13		Coarse SS, no sherd		10YR8/4	Very pale brown (1)
6008				10YR8/2	White (1)
34				10YR8/2	White (1)
6254-A				10YR8/4	Very pale brown (1)
Woodruff-Forestdale smudged					
444		Trachyte		2.5YR5/8	Red (6)
1097				2.5YR6/8	Light red (6)
1161				5YR7/6	Reddish yellow (5)
1813				2.5YR6/8	Light red (6)
4055				2.5YR5/6	Red (6)
4297				2.5YR6/6	Red (6)
6350				5YR7/6	Reddish yellow (5)
6254-B				7.5YR8/6	Reddish yellow (4)
Forestdale smudged					
752-15		Medium SS, <50% sherd		2.5YR6/6	Light red (6)
-16		Medium SS, <50% sherd		2.5YR5/6	Red (6)
1837-11		Medium SS, >50% sherd		2.5YR5/6	Red (6)
127-4		Medium SS, >50% sherd		5YR6/6	Reddish yellow (5)
1537-16		Medium SS, >50% sherd		2.5YR4/8	Red (6)
2886-15		Medium SS, <50% sherd		2.5YR5/8	Red (6)
980-19		Fine SS, >50% sherd		Not refired	
554-17		Medium SS, >50% sherd		2.5YR6/8	Light red (6)

Group	Rough Sort Type	Temper	Core	Refired Color	Windes' Color Group
480-23		Medium SS, <50% sherd		2.5YR6/6	Light red (6)
3031-1		Medium SS, no type >50% sherd		2.5YR5/8	Red (6)
4892-5		Coarse SS, no type >50% sherd		2.5YR5/6	Red (6)
2181-1		Medium SS, no type >50% sherd		2.5YR6/8	Light red (6)
6213				2.5YR5/8	Red (6)
2780-9		Medium SS, no type >50% sherd		2.5YR5/6	Red (6)
5746-55		Fine SS, no type <50% sherd		2.5YR5/8	Red (6)
2398				10R6/8	Red (7)
????				2.5YR6/8	Light red (6)
2790				2.5YR5/6	Red (6)
3030-B				2.5YR5/8	Red (6)
-C				2.5YR5/8	Red (6)
01				2.5YR6/6	Light red (6)
69				2.5YR6/8	Light red (6)
94				2.5YR6/8	Light red (6)
4010				2.5YR6/8	Light red (6)
4909				2.5YR6/6	Light red (6)
4043				2.5YR6/6	Light red (6)
4336-A				2.5YR5/6	Red (6)
-B				2.5YR6/6	Light red (6)
-C				2.5YR6/8	Light red (6)
4952				2.5YR5/8	Red (6)
6642				2.5YR5/6	Red (6)

Group	Rough Sort Type	Temper	Core	Refired Color	Windes' Color Group
6657				2.5YR6/6	Light red (6)
6574				2.5YR5/6	Red (6)
6729				2.5YR6/6	Light red (6)
7052				10R5/6	Light red (6)
7154				2.5YR6/8	Light red (6)
7239				2.5YR5/6	Red (6)
1077-A				2.5YR6/8	Light red (6)
-C				2.5YR6/6	Light red (6)
1154				2.5YR6/8	Light red (6)
1221				2.5YR5/8	Red (6)
1281				2.5YR5/6	Red (6)
1384				5YR6/8	Reddish yellow (5)
1867				2.5YR6/8	Light red (6)
1488				2.5YR5/8	Red (6)
1837				10R5/8	Red (7)
2303				2.5YR6/8	Light red (6)
2377				5YR6/8	Reddish yellow (5)
2432				2.5YR5/6	Red (6)
2458				2.5YR6/8	Light red (6)
2343				2.5YR6/8	Light red (6)
2393				2.5YR5/8	Red (6)
2557				2.5YR6/8	Light red (6)
2570				2.5YR6/8	Light red (6)
2644				2.5YR6/8	Light red (6)
2704-A				2.5YR6/6	Light red (6)
-B				2.5YR6/8	Light red (6)
2749				2.5YR5/6	Red (6)

Group	Rough Sort Type	Temper	Core	Refired Color	Windes' Color Group
2701				2.5YR5/6	Red (6)
2780-A				2.5YR6/6	Light red (6)
-B				5YR7/8	Reddish yellow (5)
2751				2.5YR5/8	Red (6)
2789				2.5YR5/6	Red (6)
2790				2.5YR5/6	Red (6)
2835				10R5/8	Red (7)
2886				2.5YR6/8	Light red (6)
2935				2.5YR5/8	Red (6)
Gila corrugated smudged					
1038-13		Medium SS, no type <50% sherd		2.5YR5/8	Red (6)
1488				2.5YR4/8	Red (6)
4473				2.5YR6/6	Light red (6)
3030				2.5YR6/6	Light red (6)
Showlow smudged					
52-40	Fine SS, >50% sherd			10YR8/4	Very pale brown (1)
175-33	Medium SS, >50% sherd			5YR7/4	Pink (2)
235-10	Fine SS, >50% sherd			5YR7/6	Reddish yellow (5)
504-20	Fine SS, >50% sherd			7.5YR7/6	Reddish yellow (4)
-21	Fine SS, >50% sherd			5YR8/4	Pink (3)
1017-5	Medium SS, >50% sherd			7.5YR8/4	Pink (2)
1076-96	Fine SS, 100% sherd			2.5YR6/8	Light red (6)
-101	Medium SS, >50% sherd			10YR8/3	Very pale brown (1)
1077-45	Medium SS, >50% sherd			5YR7/6	Reddish yellow (5)
3030-A				2.5YR5/8	Red (6)

Group	Rough Sort Type	Temper	Core	Refired Color	Windes' Color Group
3193-3				2.5YR5/8	Red (6)
16				2.5YR5/8	Red (6)
69				2.5YR5/8	Red (6)
1169-A				Not refired	
-B				5YR7/6	Reddish yellow (5)
1076-A				5YR7/6	Reddish yellow (5)
-B				5YR7/6	Reddish yellow (5)
-C				5YR6/6	Reddish yellow (5)
1077-A				5YR7/6	Reddish yellow (5)
-B				2.5YR5/6	Red (6)
-C				2.5YR6/8	Light red (6)
1435				7.5YR8/4	Pink (2)
1737				2.5YR5/6	Red (6)
2006				2.5YR5/8	Red (6)
2413				7.5YR7/6	Reddish yellow (4)
2761-A				10YR8/3	Very pale brown (1)
-B				10YR8/3	Very pale brown (1)
-C				10YR8/2	White (1)
4883				2.5YR6/8	Light red (6)
6173				10R6/6	Light red (7)
6657				10YR8/4	Very pale brown (1)
7052				2.5YR5/8	Red (6)

APPENDIX E

ADDITIONAL CULINARY SHERDS

H. Wolcott Toll

Through an unfortunate oversight, a box of culinary sherds from 29SJ 627 was discovered after the completion of the main analysis. The dates are presented here separately and compared briefly to the larger group covered by the body of the report. Because integrating this new group into the report would require reworking a large number of sections, these additional sherds do not appear in the main report despite the temptation to integrate them with at least some of the original analysis. The following tables show what changes the inclusion of these vessels makes in the composition of the sample. The treatment of this group of sherds is very much like that for the rest of the report, with the exception that the temper identification was made by McKenna. All we can say is that no one is as sorry as we are. These sherds are included in all tabulations for the overview section prepared in 1984 and 1985, but are not included in Toll (1981, 1984).

Sample Effects

The addition of these sherds, of course, has an effect on the sample's composition, primarily a rise in the grayware percentage, which is balanced by a decline in the percentage of whiteware (Table E.1). In the temper sample, with which most of the report deals, the overall difference is a 3.1% increase in the grayware percentage, most of which is in PII corrugated (+1.9% of the total), narrow neckbanded (+0.6%), and neck corrugated (+5%). Over half of the added vessels are PII corrugated, which is already the largest type group. The largest relative within-type increase is in neck corrugated. The additions do not increase any type to more than 2.5% of the sample that was not already at that level; thus, even if the sherds had not been overlooked, detailed treatment of the types would have been the same. Details of the changes in narrow neckbanded and PII corrugated are presented below. The declines in whiteware percentages would also have occasioned no change, mostly having been absorbed by the very large Red Mesa Black-on-white sample.

The temper sample also is only slightly changed by the additional cases (Table E.2). The largest increase in the grouped graywares is from 23% to 25% trachyte temper, which is compensated by declines in undifferentiated sandstone and chalcedonic sandstone tem-

Table E.1. 29SJ 627 ceramic sample comparison showing added culinary sherds and the combined sample.

Rough Sort Type	Added Count	Added %	Combined Count	Combined %	Combined ±	Original Temper Count	Original Temper %	Combined Temper Count	Combined %
Plain gray	0	0	2,189	17.4	-0.4	162	2.2	162	2.2
Lino gray	1	0.3	136	1.1	0	135	1.9	136	1.8
Lino fugitive	0	0	8	0.1	0	6	0.1	6	0.1
Polished tan	0	0	7	0.1	0	6	0.1	6	0.1
Wide neckbanded	9	3.1	411	3.3	0	150	2.1	159	2.1
Narrow neckbanded	56	19.1	564	4.5	+0.4	244	3.4	300	4.0
Neck corrugated	41	14.0	145	1.2	+0.4	72	1.0	113	1.5
PII corrugated	158	53.9	556	4.1	+0.9	398	5.6	556	7.4
PII-III corrugated	17	5.8	99	0.8	+0.1	81	1.1	99	1.3
PIII corrugated	4	1.4	47	0.4	0	43	0.6	47	0.6
Unidentified corrugated	6	2.0	689	5.5	-0.1	152	2.1	158	2.1
		100.0							23.2
TOTAL GRAY	293		4,861	38.6	+1.4	1,449	20.1	1,742	
BMIII-PI Polished M/w			102	0.8	0	94	1.3		1.3
BMIII-PI Unpolished			70	0.6	0	66	0.9		0.9
E. Red Mesa B/w			220	1.7	-0.1	155	2.1		2.1
L. Red Mesa B/w			2,841	22.6	-0.5	2,307	31.9		30.7
Escavada B/w			60	0.5		53	0.7		0.7
Puerco B/w			241	1.9	-0.1	221	3.1		2.9
Gallup B/w			610	4.8	-0.2	551	7.6		7.3
Chaco B/w			30	0.2	0	26	0.4		0.3
Exotic M/w			172	1.4	0	166	2.3		2.2
PII-III M/w			1,617	12.8	-0.3	1,044	14.5		13.9
TOTAL M/w			5,963	47.4	-1.1	4,683	64.8		62.3

Table E.1. (continued)

Rough Sort Type	Added Count	Added %	Combined Count	Combined %	+	Original Temper Count	Original Temper %	Combined Temper Count	Combined %
BMIII-PI Unpolished C/w			41	0.3	0	33	0.5		0.4
BMIII-PI Unpolished C/w			18	0.1	0	16	0.2		0.2
PII-III C/w			93	0.7	-0.1	71	1.0		0.9
Mesa Verde B/w			2	0.02	0	2	0.03		0.03
Chaco McElmo			1	0.01	0	1	0.01		0.01
Chuska B/w			25	0.2	0	24	0.3		0.3
Chuska Whiteware			95	0.8	0	82	1.1		1.1
Red Mesa Design Chuska			75	0.6	0	58	0.8		0.8
Tusayan Whiteware			47	0.4	0	45	0.6		0.6
									4.4
TOTAL C/w			397	3.2	0	332	4.6		
Unidentified Whiteware			1,102	8.8	-0.2	545	7.5		7.2
TOTAL WHITEWARE			7,463	59.3	-1.4	5,560	77.0		74.0
Plain Red			2	0.01		2	0.03		0.03
Decorated Red			166	1.3	-0.1	135	1.9		1.8
									1.8
TOTAL REDWARE			168	1.3	-0.1	137	1.9		
Polished Smudged			94	0.7	-0.1	76	1.1		1.0
Brownware			3	0.02	0	3	0.04		0.04
GRAND TOTALS			12,588			7,225		7,518	
% of Rough Sort			14.9	+0.3		8.6		8.9	
% of Detailed Analysis						58.8		59.7	

pers. These same changes are observable in the overall temper sample, although, of course, on a smaller scale. The trachyte temper changes from 14.2 to 15.0% of the total (Table E.2; text Table 2.3). Thus, while there are enough additional sherds to make some changes in the sample, the changes are all less than 3% of the temper sample. The forms of the added vessels are 291 grayware jars and two pitchers, which is more or less proportional to the original sample. Jars of all wares are raised from 29.2 to 32.0% (text Table 2.4).

Detailed Type Descriptions

Of the wide neckbanded, narrow neckbanded and PII corrugated, only the latter two had significant numbers added to their totals; narrow neckbanded increased from 244 to 300 and PII corrugated from 398 to 556. The type descriptions are amended here. The percentage of chalcedonic sandstone temper in the 41 added neck corrugated sherds is 14.6%, which is almost the same as the 13.3% for narrow neckbanded; therefore, there really was this type of neck corrugated at 29SJ 627. The percentage for the combined sample (6.2%; Table E.2) remains low and even the 14.6% figure is less than half the figure for neck corrugated at 29SJ 629.

Narrow Neckbanded (Table E.3)

Differences in surface treatment are primarily an increase in the relative quantity of narrow clapboarding and the addition of one technique, festooned corrugation. The added sample shows PII corrugated and narrow neckbanded to be very close in diversity, with a less even distribution of PII corrugated sherds with more varieties of surface treatment. The proportions of sooting noted and the number of handle forms in narrow neckbanded, as well as the type's metrics, remain virtually unchanged by the additional sherds.

The main temper difference, an increase of around 3% in trachyte, mirrors the overall change. Other changes in paste composition are more noticeable, but they are likely to be partially related to a difference in recorders. There are more medium grain sized pastes, probably also likely to be related to the higher frequencies of trachyte and few very coarse tempers, which leads to finer texture indices. There is an expectable increase in the amount of "Chuska gray homogeneous" paste and more white paste with slight declines in the other categories. Fewer cases of vitrification were present in the added sherds, but this also is, to some degree, a matter of judgement.

Pueblo II Corrugated (Table E.4)

Changes in the numbers of PII corrugated sherds are similar to those for narrow neckbanded ceramics. There is little change in surface treatments other than a rise in the percentage of narrow-coiled corrugations, the most abundant surface treatment, which leads to decreases in diversity and evenness of surface treatment distribution. There is a slight decrease in the handle:specimen ratio and in the mean jar orifice diameter. All other measurements and observances of sooting remain nearly the same as in the sample without the added cases. Changes in temper composition are very slight except for a small decrease in chalcedonic sandstone. Once

Table E.2. Update of 29SJ 627 temper types tabulated by rough sort types. (Text Table 2.3 tempers have been lumped and only items with observable temper have been included.)

Rough Sort Type	Sand-Stone	Chalc. SS	Iron Oxide SS	Magn. SS	San Juan	Trachyte	Total
ORIGINAL SAMPLE							
Plain gray	111	12	2	4	1	29	159
Lino gray	114	2	5	11	3	0	135
Lino fugitive red	6	0	0	0	0	0	6
Polished tan-gray	3	0	1	0	0	2	6
Wide neckbanded	100	31	0	1	2	16	150
Narrow neckbanded	156	36	0	1	0	50	243
Neck corrugated	52	1	0	1	1	17	72
PII corrugated	221	21	1	6	4	145	398
PII-III corrugated	41	3	0	1	1	35	82
PIII corrugated	29	3	0	0	0	11	43
Unidentified corrugated	106	11	0	8	0	27	152
GRAYWARE TOTALS	939	120	9	33	12	333	1,446
GRAYWARE PERCENT	65.0	8.3	0.6	2.3	0.8	23.0	
COMBINED SAMPLE							
Plain gray	111	12	2	4	1	29	159 same
Lino gray	114	3	5	11	3	0	136
Lino fugitive red	6	0	0	0	0	0	6 same
Polished tan-gray	3	0	1	0	0	2	6 same
Wide neckbanded	106	33	0	1	2	17	159
Narrow neckbanded	189	40	0	1	1	69	300
Neck corrugated	68	7	0	4	1	33	113
PII corrugated	306	26	3	11	6	203	556[a]
PII-III corrugated	53	3	0	2	1	39	98
PIII corrugated	30	3	0	0	0	14	47
Unidentified corrugated	108	12	0	10	0	28	158
GRAYWARE TOTALS	1,094	139	11	44	15	434	1,738[a]
GRAYWARE PERCENT	62.9	8.0	0.6	2.5	0.9	25.0	
GRAND TOTALS	5,659	379	24	70	191	1,120	7,476[b]
GRAND PERCENTS	75.7	5.1	0.3	0.9	2.6	15.0	

[a]Includes one unidentified igneous

[b]Includes 33 unidentified igneous, 0.4%

Table E.3. *29SJ 627 narrow neckbanded description, including sherds added after the main analysis (text Table 2.15).*

A. SURFACE ATTRIBUTES

1. Decoration:

Designs	Motif # 1	Motif # 2	n	%
Undifferentiated neckbanding	23	-	23	7.3
Narrow neckbanding 2-5 mm	39	-	39	12.4
Wide neckbanding >5 mm	14	-	14	4.4
Narrow clapboard 2-5 mm	121	-	121	38.4
Wide clapboard >5 mm	86	-	86	27.3
Patterned, narrow	8	-	8	2.5
Patterned, wide	6	-	6	1.9
Festooned indented corrugated	-	2	2	0.6
Incised across coils	-	5	5	1.6
Incised between coils	-	3	3	1.0
Fingernail punctate	-	6	6	1.9
Punctate	-	1	1	0.3
Corrugated, unknown	1	-	1	0.3
Total	298	17	315	
n w/1, 2 designs	281	17	298	
% w/1, 2 designs	94.3	5.7		

Type Design Diversity H' = 1.733
s = 13 J = 0.676

2. Sooting:

	n	%
Sooted	95	31.8
Unsooted	204	68.2
Total	299	100.0

3. Handles:

	n	%
Coil	2	6.1
Multiple coil	2	6.1
Strap	2	6.1
Extended lip	1	3.0
Nubbin lug	13	39.4
Dual nubbin	5	15.2
Strap lug	1	3.0
Tabular lug	3	9.1
Cupule lug	2	6.1
Unknown	2	6.1
Total	33	100.2

handles:items = 1:9

4. Forms:

	n	%
Jars	295	98.3
Pitchers	5	1.7
Total	300	

Table E.3. (continued)

5. Metrics:

		n	Range	x̄	s.d.	C.V.
Jars	Diameter mm	234	50-350	178.0	55.72	31.3
	Rim fillet mm	278	6-33	15.2	4.08	26.9
	Rim flare	184	6-42°	19.6	7.90	40.3
Pitchers	Diameter mm	5	55-150	107.0	37.18	34.8
	Rim fillet mm	5	11-18	14.8	2.59	17.5

B. Paste

1. Temper Composition:

Temper	n	% of Total
Undifferentiated sandstone†	183	61.0
More sherd than sandstone†	6	2.0
All chalcedonic sandstone	40	13.3
Magnetetic sandstone	1	0.3
San Juan with hornblende	1	0.3
Trachyte only	62	20.7
Trachyte with sandstone	7	2.3
Total	300	

2. Texture Attributes:

Grain Size	n	%
Fine	4	1.3
Medium	55	18.3
Coarse	141	47.0
Very coarse	100	33.3
Total	300	

Density	n	%
5%	34	11.6
10%	191	65.2
20%	60	20.5
30%	7	2.4
>40%	1	0.3
Total	293	

Sherd Temper	n	%
None	263	87.7
<half	31	10.3
>half	6	2.0
Total	300	

Undifferentiated Sandstone†

Grain Size	n	%
Fine	2	1.1
Medium	29	15.3
Coarse	88	46.6
Very coarse	70	37.0
Total	189	

Texture Index	n	%
Fine (2.1-4)	3	1.0
Fine-medium (4.1-7)	19	6.5
Medium (7.1-10)	51	17.4
Medium-coarse (10.1-13)	38	13.0
Coarse (13.1-16)	88	30.0
Very coarse (16.1+)	94	32.1
Total	293	

Table E.3. (continued)

3. Clay Attributes:

Clay-temper types	n	%	%
No type assigned	132	44.0	(44.0)
Black with white sherd	10	3.3	6.0
Gray with black sherd	3	1.0	1.8
Chuska gray homogeneous	34	11.3	20.2
Gray with white sherd	4	1.3	2.4
Tan to brown clay	62	20.7	36.9
Black clay	28	9.3	16.7
White clay	27	9.0	9.5
Totals	300		
With assignments	168		(56.0)

Vitrification	n	%
Absent	45	15.0
Present	255	85.0
Total	300	

again, that McKenna may assign finer grain sizes more often than Toll is visible in the finer texture and grain size figures. The same is true of the lower frequency of vitrification, but given that this sample was increased by 158 items, the changes are minor. It is quite clear that the additional sherds are drawn from the same universe as the original sample.

Provenience and Import Effects

Provenience (Tables E.5, E.6, E.7 and E.8)

Happily, the provenience distribution of the added "sample" is quite similar to that of the original sample. The four main proveniences (65% of the addons) are three trash-filled pit structures and the midden, all of which contain large numbers of sherds: Kiva E, Kiva D, and Pithouse C. All of these proveniences contributed over 900 sherds to the original sample so that the additions are 7% or less for the structures represented. The overall distribution by deposit type is extremely similar to the original one when the omitted cases are added. As discussed in the text, context at 29SJ 627 is mostly problematic, so that it is unlikely that the proper inclusion of these culinary sherds would have altered our speculations on function.

It is in the three pit structures, discussed in detail in the text, that this addition probably has its greatest effect. Kiva E, to which the greatest number of sherds was added, shows a substantial increase in the grayware percentage from 12.8 to 17.7%. This amounts to an increase from an abnormally small percentage to a frequency that still looks small, but it is within an expectable range. The "new" sherds are proportional to the stratigraphic units to which they are added, so that the stratigraphic composition remains close to the material originally discussed. Further, the relative quantities of earlier and later graywares remain similar, necessitating no change in chronological interpretation. Effects on the temper sample composition are also small. Each structure

Table E.4. *29SJ 627 Pueblo II corrugated description, including omitted sherds (text Table 2.16).*

A. SURFACE ATTRIBUTES

1. Decoration:

Designs	Motif # 1	Motif # 2	N	%
Undifferentiated neckbanding	8	-	8	1.3
Narrow neckbanding 2-5 mm	2	1	3	0.5
Wide neckbanding >5 mm	1	-	1	0.2
Narrow clapboard 2-5 mm	24	4	28	4.4
Wide clapboard >5 mm	6	1	7	1.1
Narrow corrugated 2-5 mm	334	4	338	52.8
Wide corrugated >5 mm	71	3	74	11.6
Flattened corrugations	-	40	40	6.3
Undifferentiated corrugated	46	-	46	7.2
Corrugated, festoon	2	-	2	0.3
Corrugated, oblique	8	21	29	4.5
Patterned, narrow	43	-	43	6.7
Patterned, wide	4	-	4	0.6
Corrugated, unknown	2	-	2	0.3
Incisions across coils	2	4	6	0.9
Horizontal incisions	-	1	1	0.2
Punctate	-	3	3	0.5
Fingernail punctate	1	4	5	0.8
Total	554	86	640	100.0
n w/1, 2, 3 designs	468	86	554	-
% w/1, 2, 3 designs	84.5	15.5		100,0

Type Design Diversity H' = 1.732
s= 18 J = 0.599

2. Sooting:

	n	%
Sooted	280	50.4
Unsooted	276	49.6
Total	556	100.0

3. Handles:

	n	%
Strap	3	13.0
Nubbin lug	8	34.8
Dual nubbin	2	8.7
Strap lug	3	13.0
Tabular lug	4	17.4
Curved nubbin lug	3	13.0
Total	23	100.0

handles:items = 1:24

4. Forms:

	n	%
Jars	551	99.1
Pitcher	3	0.5
Miniature	2	0.4
Total	556	100.0

Table E.4. (continued)

5. Metrics:

		n	Range	x̄	s.d	C.V.
Jars	Orifice diameter	427	70-350	208.5	53.46	25.6
	Rim fillet	543	10-53	22.6	6.48	28.7
	Rim flare	313	8-49°	29.0	6.70	23.1
Pitchers	Orifice diameter	2	80	80.0	-	-
	Rim fillet	3	13-28	18.7	-	-
	Rim flare	1	18°	-	-	-
Miniatures	Orifice diameter	2	35-60	47.5	17.678	37.2
	Rim flare	1	3°	-	-	-

B. Paste

1. Temper Composition:

Temper	n	% of Total
Undifferentiated sandstone	261	46.9
More sherd than sandstone	45	8.1
All chalcedonic sandstone	26	4.7
Sandstone with rounded iron	3	0.5
Magnetitic sandstone	11	2.0
Trachyte only	189	34.0
Trachyte with sandstone	14	2.5
San Juan igneous with hornblende	1	0.2
San Juan igneous w/o hornblende	1	0.2
San Juan w/o hornblende + SS	4	0.7
Unidentified igneous	1	0.2
Total	556	

2. Texture Attributes:

Grain Size	n	%
Fine	15	2.7
Medium	92	16.6
Coarse	252	45.3
Very coarse	197	35.4
Total	556	

Density	n	%
1-2%	8	1.4
5%	110	19.8
10%	297	53.5
20%	116	20.9
30%	21	3.9
40%	3	0.5
Total	555	

Sherd Temper	n	%
None	477	85.8
<half	32	5.8
>half	40	7.2
All	7	1.3
Total	556	

Table E.4. (continued)

Undifferentiated Sandstone

Grain Size	n	%
Fine	12	3.9
Medium	41	13.4
Coarse	115	37.6
Very coarse	138	45.1
Total	306	

Texture Index	n	%
Very fine (0-2)	18	3.2
Fine (2.1-4)	27	4.9
Fine-medium (4.1-7)	26	4.7
Medium (7.1-10)	73	13.2
Medium-coarse (10.1-13)	81	14.6
Coarse (13.1-16)	123	22.2
Very coarse (16.1+)	207	37.3
Total	555	

3. Clay Attributes:

Clay-temper types	n	%	%
No type assigned	232	41.7	(41.7)
Black with white sherd	13	2.3	4.0
Gray with black sherd	10	1.8	3.1
Black and white sherd	3	0.5	0.9
Chuska gray homogeneous	109	19.6	33.7
Gray with white sherd	13	2.3	4.0
Tan to brown clay	94	16.9	29.1
Black clay	57	10.3	18.0
White clay	24	4.3	7.4
Total	556		
Total with assignment	(323)		(58.1)

Vitrification	n	%
Absent	103	18.6
Present	452	81.4
Total	555	

shows some increase in percentage of trachyte temper, and there is a decrease in chalcedonic cemented sandstone temper in Pithouse C and Kiva D, as the overall results would suggest. The Kiva E additions, however, contain most of the chalcedonic sandstone temper additions, raising slightly both the trachyte and chalcedonic sandstone temper percentages. The most important change, then, is the rise in the relative frequency of grayware in Kiva E. This change is reflected in the text, but the statistical tests have not been recalculated.

Import (Table E.9)

The overall import figures are changed 1.1% or less in the three main time periods. Each of these periods shows its main increase in trachyte temper with small changes in the other classes of import. The largest change comes in the smallest and latest group, which shows 1.6% less import. This change is the result of the reduction of the very high whiteware figure based on Tusayan whiteware; the increased sample size lessens the impact of that group. Sandstone grain sizes are insignificantly affected.

Table E.5. Proveniences of culinary sherds analyzed after the main analysis.

Provenience	Wide Neckbanded	Narrow Neckbanded	Neck Corrugated	PII Corrugated	PII-III Corrugated	PIII Corrugated	Unident. Corrugated	Total
Rooms 1-11	-	8	3	7	-	-	-	18
Room 15	-	1	2	10	-	-	-	13
Room 16	-	-	1	11	-	-	-	12
Rooms 17-23	-	2	1	16		-	-	19
Pithouse "2"	-	4	1	8	-	-	-	13
Pithouse C	5	9	14	4	-	-	1	33
Kiva D	-	2	2	13	4	-	1	22
Kiva E	2	18	1	65	13	3	4	106
Kiva G (5)	-	-	-	4	-	-	-	4
Midden	2	9	13	4	-	-	-	29[a]
Plaza	-	2	3	9	1	1	-	16
Miscellaneous	-	1	-	7	-	-	-	8
Total	9	56	41	158	18	4	6	293

[a]Midden contains 1 Lino Gray not in a column.

Comparison of deposit types from Table 2.45 (text).

	Rooms & Ramadas	Pit Structures	Plaza	Midden	Total
Original totals	981	2,905	374	956	5,216
Original percents	18.8	55.7	7.2	18.3	
Combined totals	1,043	3,083	390	985	5,501
Combined percents	19.0	56.0	7.1	17.4	

Table E.6. 29SJ 627 Pithouse C ceramic distributions by lumped layers (updates text Table 2.48).

Rough Sort Type	Layers 1-2	Layers 3-6	Layers 9-10	Floor	Total
Earlier gray					
Plain gray	1	26	15	1	43
Lino gray	0	3	0	0	3
Wide neckbanded	4	21[a]	11	2	38
Narrow neckbanded	2	20[a]	9	0	31
Neck corrugated	2	8[a]	0	0	10
Later gray					
PII corrugated	0	15[a]	7	0	22
Unidentified corrugated	1	32	2	0	35
All other types, wares	30	288	129	21	468
Combined totals	40	413	173	24	650
Percent	6.2	63.5	26.6	3.7	
Original total	40	394	173	24	631
Percent	6.3	62.4	27.4	3.8	
Combined early gray %	22.5	18.9	19.6	12.5	
Combined late gray %	2.5	11.4	5.0	0	
Combined other ware %	75.0	69.7	72.1	87.5	
Original early gray %	"	15.7	"	"	
Original late gray %	"	11.2	"	"	
Combined other ware %	"	73.1	"	"	
Sandstone temper %	82.5	76.3	74.6	66.7	75.9
Chalcedonic SS %	5.0	6.1	7.1	0	6.1
Trachyte temper %	5.0	14.9	13.6	25.0	14.3
Other temper %	7.5	2.7	4.7	8.3	3.7

No layer assignment. Original: 478 Combined: 492
Totals. Original: 1,120 Combined: 1,155
Absent types remain the same.
[a] Sherds added.

Table E.7. 29SJ 627 Kiva D ceramic distributions by lumped levels (updates text Table 2.49).

Rough Sort Type	Levels 1-3	Levels 4-6	Levels 7-11	Floor	Total
Earlier grayware					
Plain gray	2	1	0	1	4
Lino gray	1	1	0	0	2
Polished tan-gray	0	1	0	0	1
Wide neckbanded	14	1	1	1	17
Narrow neckbanded	12[a]	4	4	0	20
Neck corrugated	5[a]	0	0	0	5
Later grayware					
PII corrugated	22[a]	12[a]	5	0	39
PII-III corrugated	6[a]	1	0	0	7
PIII corrugated	3	0	0	0	3
Unidentified corrugated	6[a]	1	0	1	8
All other types, wares	226	78	81	15	400
Combined totals	297	100	91	18	506
Percent	58.7	19.8	18.0	3.6	
Original totals	282	99	91	18	490
Percent	57.6	20.2	18.6	3.7	
Combined early gray %	11.4	8.0	5.5	11.1	9.7
Combined late gray %	12.5	14.0	5.5	5.6	11.3
Combined other ware %	76.1	78.0	89.0	83.3	79.1
Original early gray %	11.3	8.1	"	"	9.6
Original late gray %	8.5	13.1	"	"	8.8
Combined other ware %	80.1	78.8	"	"	81.6
Sandstone temper %	75.9	65.0	71.1	83.3	73.1
Chalcedonic SS %	3.7	7.0	1.1	0	3.8
Trachyte temper %	17.7	24.0	17.8	11.1	18.7
Other temper %	2.7	4.0	10.0	5.6	4.4

No level assignment. Original: 458 Combined: 464
Totals: Original: 981; Combined: 1,003
Absent types remain the same.
[a] Sherds added.

Table E.8. 29SJ 627 Kiva E ceramic distributions by lumped layers (updates text Table 2.50).

Rough Sort Type	Layers 1-2	Layers 3-4	Layers 5-6	Floor	Total
Earlier grayware					
Plain gray	0	10	1	0	11
Lino gray	0	3	2	0	5
Lino fugitive red	0	0	1	0	1
Polished tan-gray	0	1	0	0	1
Wide neckbanded	0	6[a]	1	1	8
Narrow neckbanded	0	19[a]	3[a]	1	23
Neck corrugated	0	4	3[a]	0	7
Later grayware					
PII corrugated	2	96[a]	13[a]	2	113
PII-III corrugated	2[a]	29[a]	5[a]	0	36
PIII corrugated	0	10	5[a]	0	15
Unidentified corrugated	3	17[a]	2[a]	0	22
All other types, wares	40	867	110	105	1,122
Combined totals	47	1,062	146	109	1,364
Percent	3.4	77.9	10.6	8.0	
Original totals	46	998	134	109	1,287
Percent	3.6	77.5	10.4	8.5	
Combined early gray %	0	4.0	7.5	1.8	4.0
Combined late gray %	14.9	14.3	17.1	1.8	13.6
Combined other ware %	85.1	81.6	75.3	96.3	82.3
Original early gray %	0	2.8	6.7	"	3.0
Original late gray %	13.0	10.3	11.2	"	9.8
Combined other ware %	87.0	86.9	82.1	"	87.2
Sandstone temper %	76.6	76.0	66.7	79.8	75.4
Chalcedonic SS %	2.1	4.4	4.2	3.7	4.2
Trachyte temper %	12.8	14.2	23.6	11.0	14.8
Other temper %	8.5	5.4	6.3	5.5	5.6

No layer assignment. Original: 226 Combined: 255
Totals. Original: 1,513 Combined: 1,619
Absent types remain the same.
[a] Sherds added.

Table E.9. Effects on import percents from the addition of culinary sherds (text Table 2.53).

Period	Chalcedonic	San Juan	Trachyte	Typological	Total Import	Total n
Pre-A.D. 920	49	22	63	0	134	649
Percent import	7.6	3.4	9.7	-	20.6	
Change in %	+0.4	-0.1	+0.9	-	+1.1	
A.D. 920-1040	280	102	623	92	1,097	4,832
Percent import	5.8	2.1	12.9	1.9	22.7	
Change in %	0	-0.3	+0.8	-0.1	+0.5	
A.D. 1040-1100	19	7	205	0	231	787
Percent import	2.4	0.9	26.0	-	29.4	
Change in %	+0.2	+0.2	+0.6	-	+1.1	
Post A.D. 1200	6	5	89	41	141	286
Percent import	2.1	1.7	31.1	14.3	49.3	
Change in %	-1.3	-0.2	0	-1.2	-1.6	

				CONSERVATIVE					
Period/site	Total n	% Grayware	% Whiteware	% GW Import	% WW Import	% Redware	% Smudged	Maximum GW + WW %	GW + WW %
Pre A.D. 920/									
Original	639	49.0	50.0	19.5	19.1	0.9	-	19.3	73.2
Added	649	49.8	48.7	20.1	19.1	0.9	-	20.0	74.0
A.D. 920-1040/									
Original	4,674	14.9	82.8	34.8	17.9	1.6	0.7	20.4	43.5
Added	4,832	17.6	80.1	36.7	17.9	1.5	0.6	21.2	44.7
A.D. 1040-1100/									
Original	685	31.2	68.8	42.5	21.9	-	-	28.3	58.7
Combined	787	40.2	59.8	38.0	21.9	-	-	29.6	61.6
Post 1100/									
Original[a]	265	37.8	62.2	41.8	58.7	-	-	50.9	62.3[a]
Combined	286	50.0	50.0	39.9	58.7	-	-	49.3	77.6

[a] Indicates groups that are placed strictly on typological basis, thereby excluding most redwares and polished smudged and having sample size problems.
† Note small n.

Summary

Omitting this group of culinary wares is an unfortunate detraction from the overall report, but the proportions of most classes of information are only slightly altered by their addition. The area which seems to be most changed is the ratios of other wares to graywares because of the substantial increase in the latter.

APPENDIX F

CHIPPED STONE TOOLS

Stephen H. Lekson

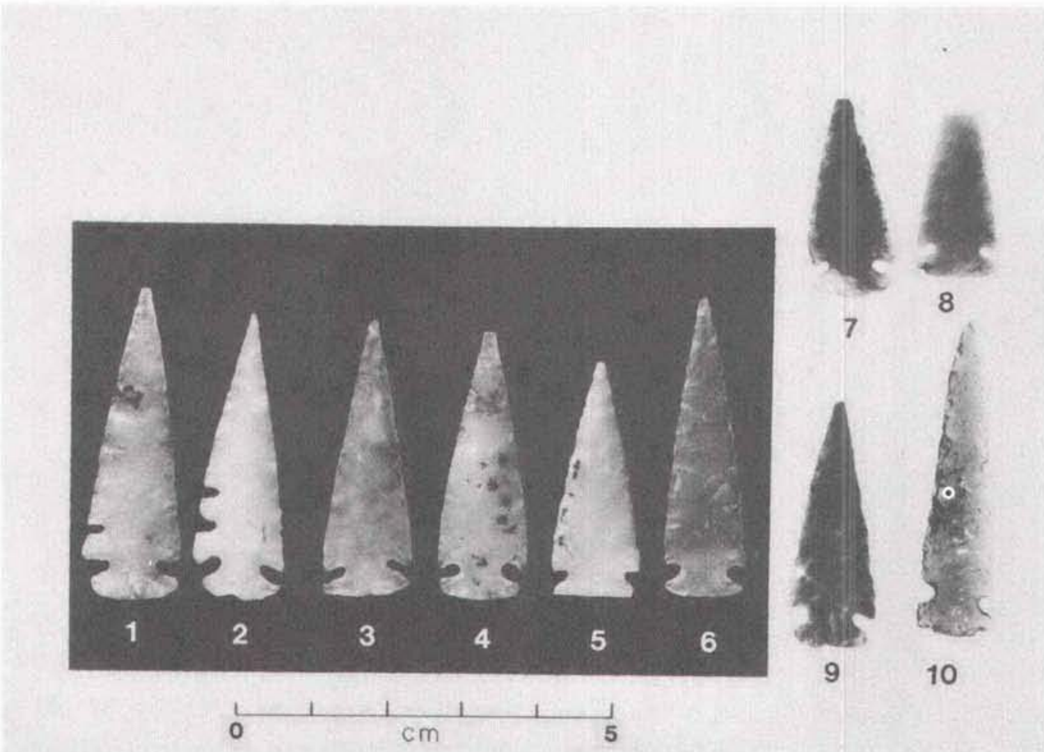


Figure F.1. *Cache of projectile points (FS 85) found in Room 1 with Burial 1 (Chaco Center Negative No. 32043).*

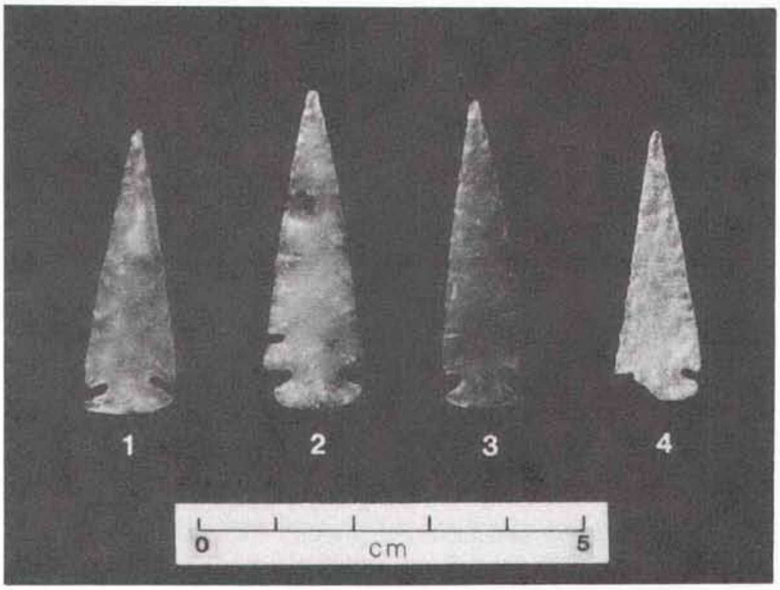


Figure F.2. *Corner-notched arrow points: 1, 2, and 3) FS 85, Room 1, Burial 1; 4) FS 2571, Test Trench 1, Layer 3 (Chaco Center Negative No. 32042).*

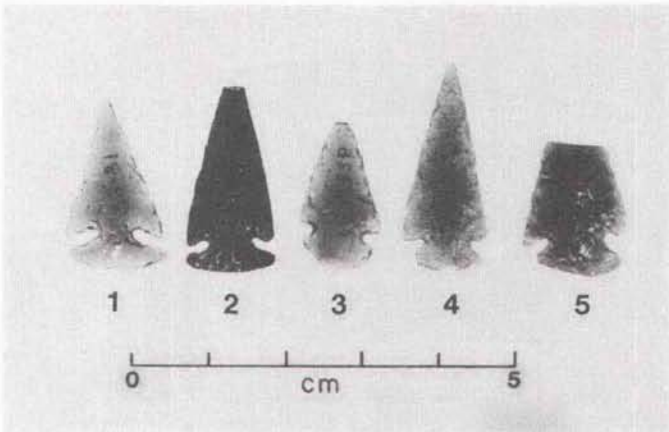


Figure F.3. *Corner-notched arrow points: 1) FS 6828, Room 24, Level 1; 2) FS 5897, Pithouse C, Balk 3, Layer F; 3) FS 2328, Room 1, Level 1; 4) FS 5328, Pithouse C, Balk 3, Layer B; and 5) FS 2472, Kiva D, Level 5 (Chaco Center Negative No. 32038).*

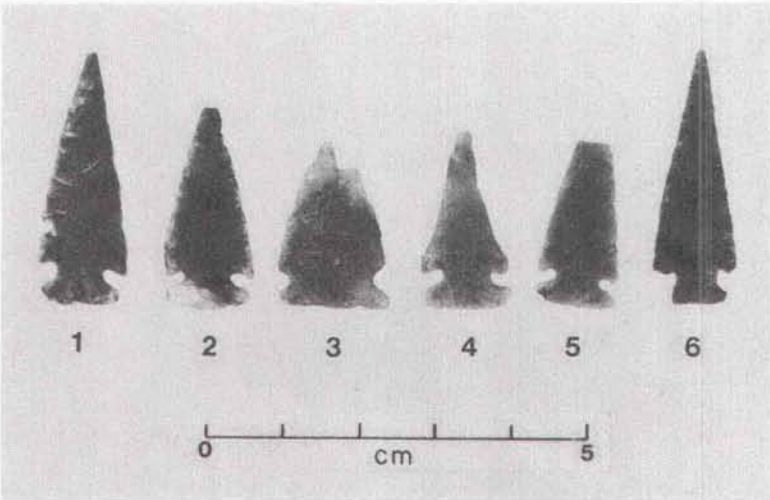


Figure F.4. *Corner-notched arrow points: 1, 2, and 5) FS 85, Room 1, Burial 1; 3) FS 4761, Kiva E, Layer 3A; 4) FS 5892, Room 3, top of wall; and 6) FS 4782, Room 10, Subfloor 1 (Chaco Center Negative No. 32039).*

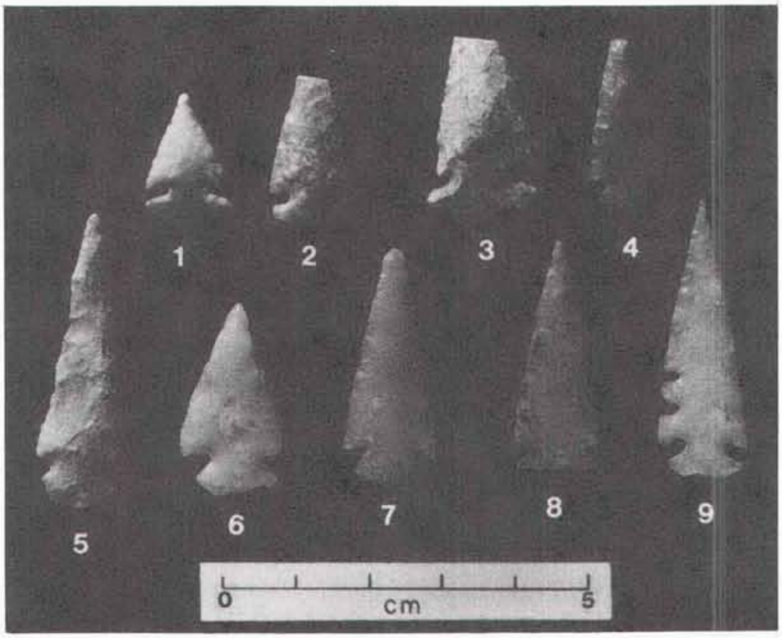


Figure F.5. *Corner-notched arrow points: 1) FS 584, Test Trench 5; 2) FS 4617, Grid HR1, southwest corner, Layer 2; 3) FS 5458, Pithouse C, Floor 1; 4) FS 5332, Pithouse C, Balk 3, Layer 3; 5) FS 5249, Pithouse C, Balk 3, Layer A; 6) FS 5138, Pithouse C, Balk 3, Layer A; 7) FS 527, discovered while cleaning around Pithouse C; 8 and 9) FS 85, Room 1, Burial 1 (Chaco Center Negative No. 32041).*

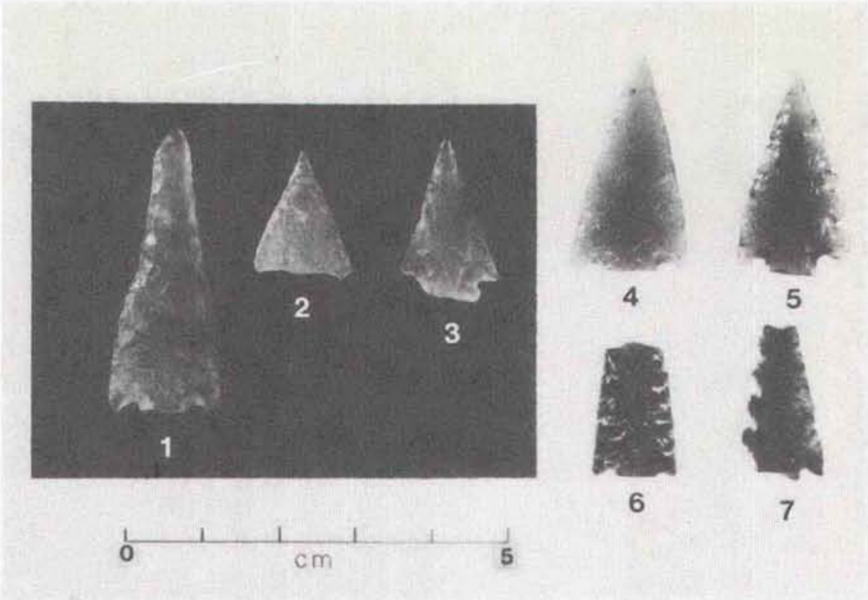


Figure F.6. *Corner-notched arrow point blade fragments: 1) FS 4727, Kiva D, Balk 1, Microstrata 2; 2) FS 6521, Room 22, Level 1; 3) FS 2830, Test Trench 28, Level 1; 4) FS 5586, Pithouse C, Balk 3; 5) FS 430, Room 7, Level 2; 6) FS 1047, Pithouse A, Antechamber, Level 1; and 7) FS 5960, Kiva E, southern recess (Chaco Center Negative No. 32054).*

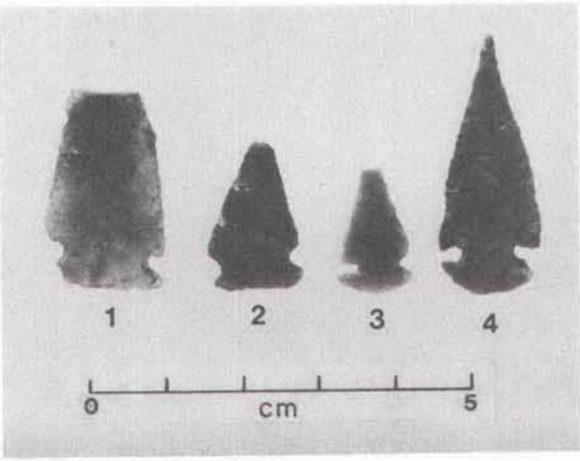


Figure F.7. *Corner-notched arrow points: 1) FS 2803, Pithouse C, Balk 3, Layer B; and 2) FS 61, Trash area, Test Trench 2, Level 1. Transitional to side-notched points: 3) FS 24, Trash Area, Test Trench 1, Level 1; and 4) FS 1240, Room 16, Level 2 (Chaco Center Negative No. 32040).*

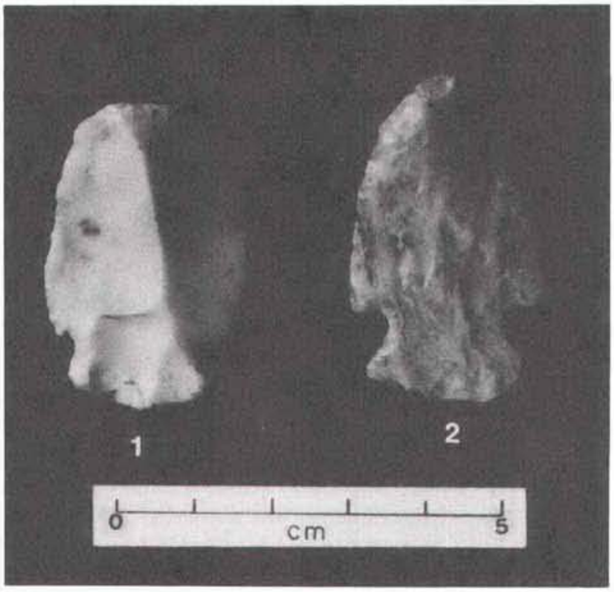


Figure F.8. *Large corner-notched points; note blunt tips: 1) FS 5822, Kiva E, Balk 1, Layers 1 and 2; and 2) FS 804, Test Trench 6, Level 1 (Chaco Center Negative No. 32055).*

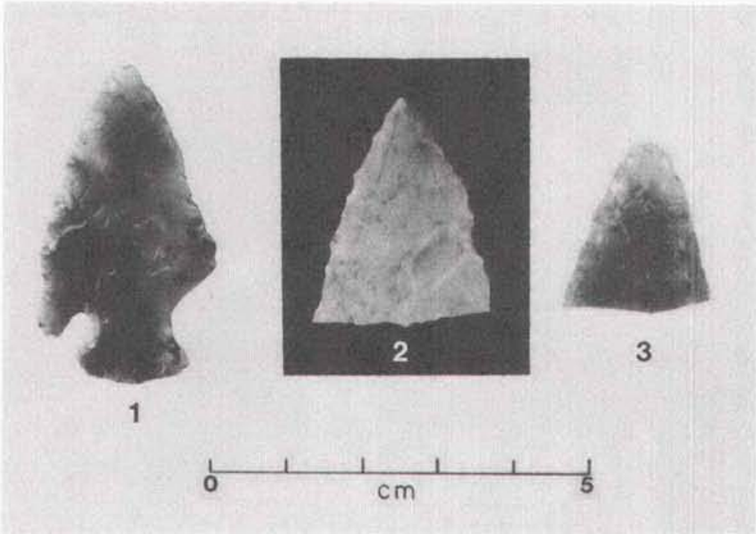


Figure F.9. *Large corner-notched point: 1)* ***FS 4690****, Kiva E, Layer 3B. Large undifferentiated blade fragments: 2) FS 4787A, Room 10, fill; and 3) FS 5127 from atop of the east wall of Room 7 (Chaco Center Negative No. 32053).*

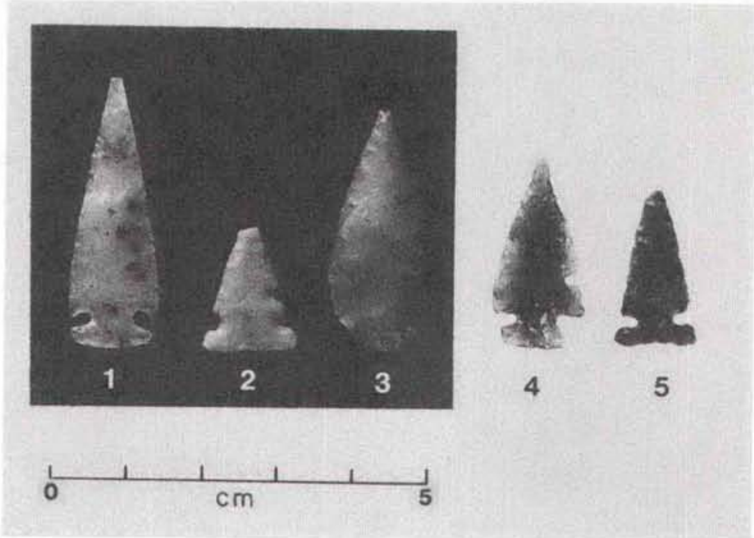


Figure F.10. *Side-notched arrow points; note that number 1 is a transitional form: 1) FS 85, Room 1, Burial 1; 2) FS 2319, Grid IL 1, Level 1; 3) FS 446, Room 9, Floor 2, Burial 2; 4) FS 1943, Trash Mound; and 5) FS 1457, Test Trench 20, southwest of Pithouse A (Chaco Center Negative No. 32036).*

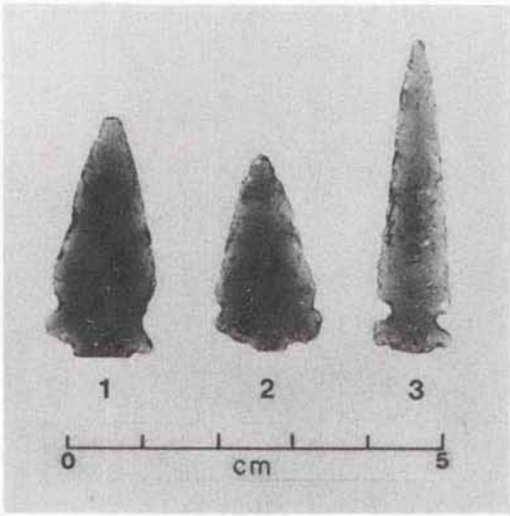


Figure F.11. *Renotched side-notched arrow points: 1) FS 2187, Room 19, southeast corner; 2) FS 172, Room 5, Level 1; and 3) FS 85, Room 1, Burial 1 (Chaco Center Negative No. 32037).*

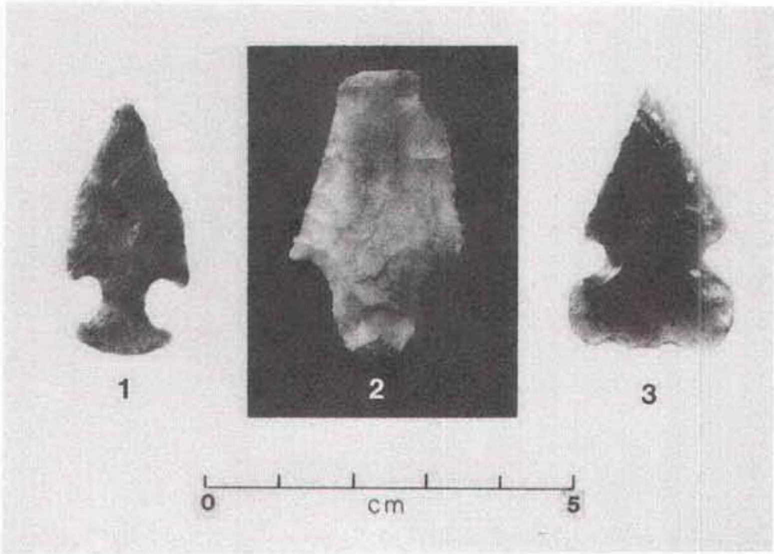


Figure F.12. *Very broad side-notched point (curated Archaic point) resharpened: 1) FS 1486, Plaza, Test Trench 17, west-southwest of Cist 8. Large stemmed point (curated Archaic point): 2) FS 740, Room 16, Level 1. Large side-notched point (probably curated Archaic point that has been reworked): FS 4090, Pithouse C, Test Trench 32, Level 1 (Chaco Center Negative No. 32048).*

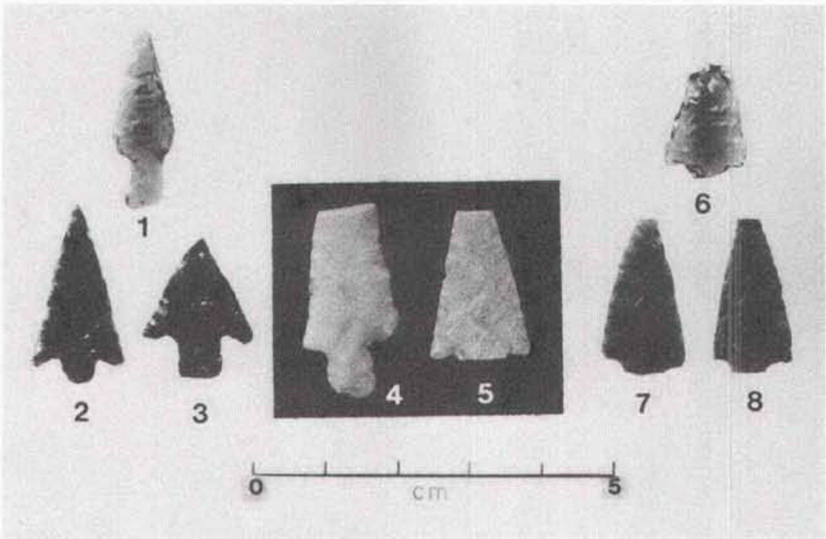


Figure F.13. *Stemmed arrow points: 1) FS 1167, Plaza around Kiva D; 2) FS 803, Test Trench 6, south end of Room 9; 3 and 4) FS 5898 and FS 5063, Pithouse C, Balk 3, Layer F; and 5) FS 5919, Kiva E, Balk 1, Layer 3. Side-notched arrow point blade fragments: 6) FS 4916, Room 4, Subfloor 1; 7) FS 5915, Kiva E, Balk 1, Layer 3; and 8) FS 7026, Room 17/18, southeast of wall (Chaco Center Negative No. 32047).*

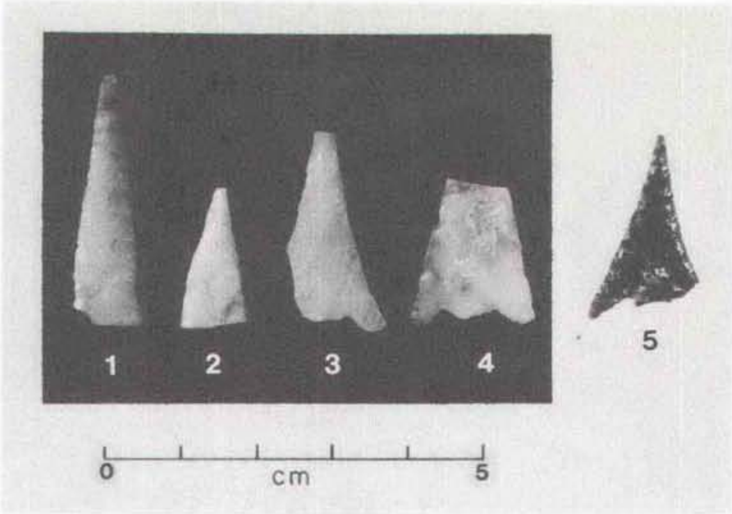


Figure F.14. *Unidifferentiated arrow point blade fragments: 1) FS 4262, Room 5, Floor 2; and 2) FS 5917, Kiva E, Balk 1, Layer 3. Stemmed arrow point blade fragments: 3) FS 6837, Kiva G, Level 5; 4) FS 2308, Grid IL 1, surface; and 5) FS 6490, Room 23, Floor 1 (Chaco Center Negative No. 32052).*

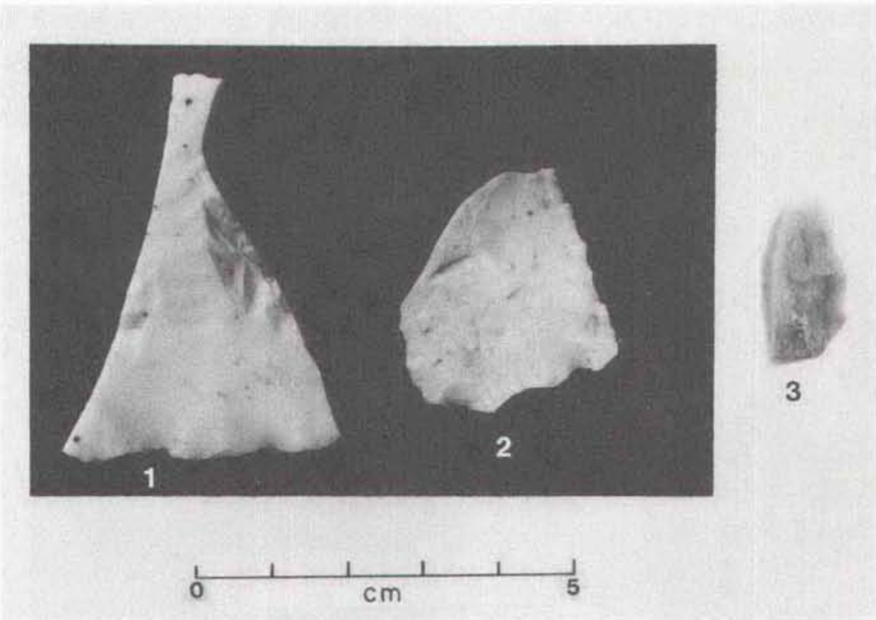


Figure F.15. *Large blade fragments: 1) FS 5578, Pithouse C, Balk 3, Layer AAA-C; 2) FS 5919, Kiva E, Balk 1, Layer 3; and 3) FS 4160, Room 5, Floor 1, Pit 2 (Chaco Center Negative No. 32051).*

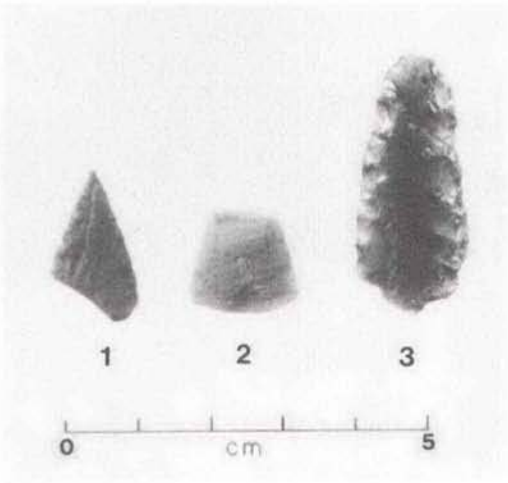


Figure F.16. *Small non-hafted blades: 1) FS 2304, Grid GL 1, Level 3; 2) FS 6312, Room 17/18, Floor 1; and 3) FS 5021, Kiva E, Layer 4 (Chaco Center Negative No. 32049).*

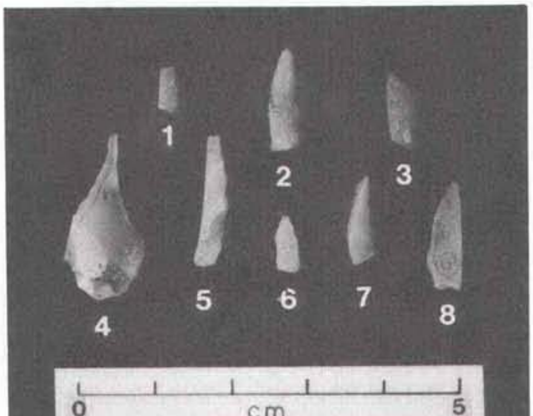


Figure F.17. *Very small drills: 1, 2, 3, 5, 6, 7, and 8) FS 2872, Room 5, Surface 1, Level 1; and 4) FS 2592, Room 3, Level 2 (Chaco Center Negative No. 32056).*

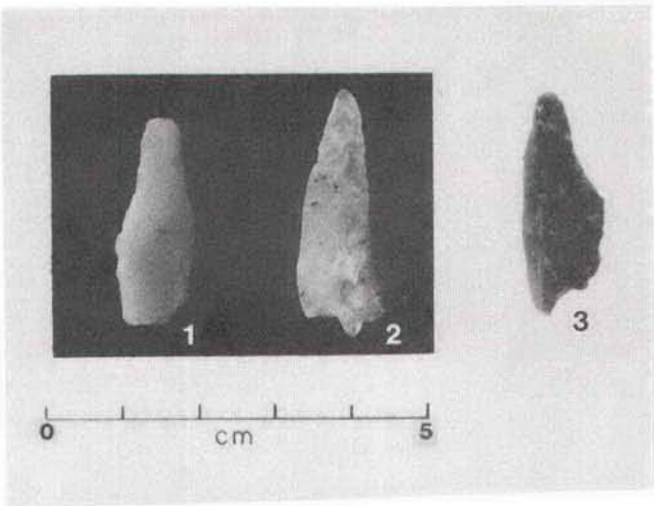


Figure F.18. *Broad drills and perforators: 1) FS 992, Room 15, Level 2; 2 and 3) FS 5741, Kiva E, Layer 5 (Chaco Center Negative No. 32050).*

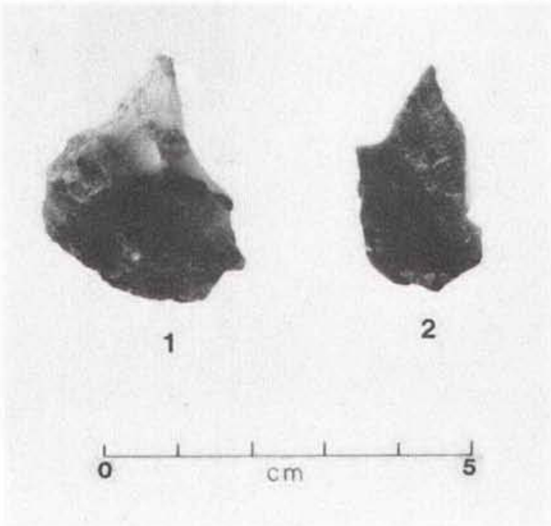


Figure F.19. *Large perforators: 1) FS 2793, Pithouse C, Balk 1, Layer B; and 2) FS 2322, Grid KL 1, Level 4 (Chaco Center Negative No. 32045).*

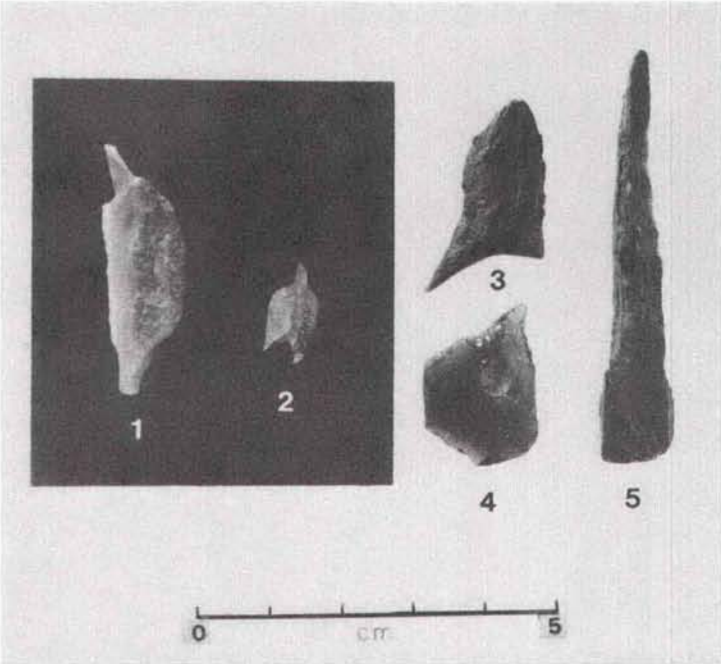
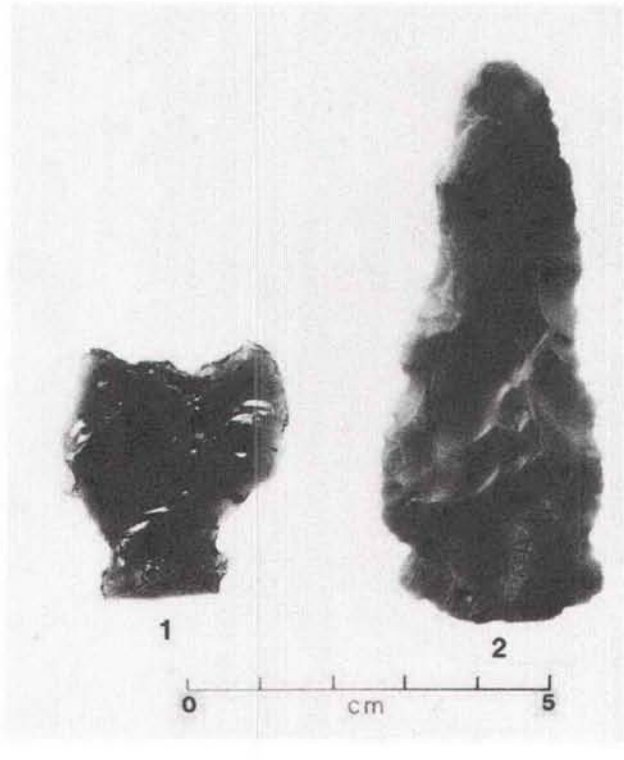


Figure F.20. *Perforators and projections: 1, and 3) FS 4477, Kiva E, Layer 3 A; 2) FS 2352, Grid EL 2, Level 2; 4) FS 4467, Plaza area west of Pithouse A; and 5) FS 4088, Kiva C, Balk 3, Layer F (Chaco Center Negative No. 32044).*

Figure F.21. *Large stemmed ecentric tool: 1) FS 4222, Room 7, Subfloor 2, Level 2. Large asymmetrical waisted point/knife (unfinished ?): FS 4882, Kiva D, Balk 1, Microstrata 3 (Chaco Center Negative No. 32046).*



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