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Evidence of a Mesa Verde Homeland for the Tewa Pueblos

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One of the most enduring and compelling questions of southwestern archaeology is what happened to the many thousands of people who lived in the Mesa Verde region in the AD 1200s. By the middle decades of that century, Ancestral Pueblo people had lived in the region for more than six hundred years, the Montezuma Valley itself was home to approximately twenty thousand people (Varien et al. 2007), and many thousands more lived on Mesa Verde Proper and in southeastern Utah (Glowacki 2006). Yet by AD 1285, the entire region was empty (see Varien, this vol.).

Current research suggests that final depopulation of the region was preceded by several decades of population decline (Duff and Wilshusen 2000; Varien et al. 2007) and that a portion of the late–AD 1200s population perished during the final depopulation of several villages (Kuckelman, this vol.; Kuckelman 2002; Kuckelman, Lightfoot, and Martin 2002; Lightfoot and Kuckelman 2001). It is unlikely, however, that the entire Pueblo population died in place or reverted to hunting and gathering, so a sizeable portion of the AD 1200s Mesa Verde–region population must have relocated to other areas of the Southwest, where the archaeological record indicates coeval population increase. By this measure, a likely destination for at least some Mesa Verde migrants was the northern Rio Grande region of New Mexico. This region was inhabited long before the Mesa Verde collapse (Dickson 1979; Kohler and Root 2004a; Lakatos 2007; McNutt 1969; Marshall and Walt 2007; Orcutt 1999; Wiseman 1995), but in-migration is a plausible explanation for the dramatic increase in the number and size of new settlements established there between AD 1200 and 1325 (Anschuetz 2005; Crown, Orcutt, and Kohler 1996; Fowles 2004a; Hill, this vol.; Snead, Creamer, and Van Zandt 2004).[1] Many thousands of people appear to have moved into the

northern Rio Grande region during the same period that many thousands of people were also leaving the Mesa Verde region.

In this chapter, I summarize a range of studies I have pursued as part of my doctoral dissertation research (Ortman 2009) to further investigate this hypothesis. This research brings together multiple lines of evidence to suggest that the homeland of at least one Rio Grande ethnic group, namely, the Tewa-speaking pueblos, was in fact in the Mesa Verde region. The basic hypothesis of this chapter is not new, but it is by no means universally accepted. Indeed, despite more than a century of research, there is still no consensus on how the historic pueblos of the Rio Grande relate to earlier archaeological cultures of the San Juan drainage (Boyer et al., this vol.; Cameron 1995; Collins 1975; Cordell 1995; Davis 1965; Dutton 1964; Ford, Schroeder, and Peckham 1972; Lakatos 2007; Lekson et al. 2002; McNutt 1969; Mera 1935; Reed 1949; Steen 1977; Wendorf and Reed 1955).

I focus here on evidence related to the ancestry and language of the Tewa people because genes and language bind more tightly to people and are less subject to social manipulation than material culture. Thus, evidence related to these aspects of human inheritance should provide more reliable indicators of population movement than the material-culture indicators that have been the focus of previous argument. Lipe considers the archaeological dimension of the problem in his contribution to this volume. For a fuller treatment of the analyses presented here, and for my analysis of the archaeology of Tewa origins, readers should consult Ortman (2009).

The Tewa Pueblos

There are seven contemporary pueblos in which Tewa is the dominant language spoken today. Six of these (Ohkay'owinge, Nambe, Pojoaque, Santa Clara, San Ildefonso, and Tesuque) are located in the northern Rio Grande region of New Mexico, and the seventh (Tewa Village) is located on Hopi First Mesa, in Arizona. Based on evidence from place names, oral tradition, historic Spanish documents, and archaeology (Anschuetz 2005; Harrington 1916; Marshall and Walt 2007; Mera 1935; Schroeder 1979), it is clear that Tewa-speaking peoples once occupied a larger portion of the northern Rio Grande region. In the north, ancestral Tewa

sites occur throughout the area bounded by the Santa Fe divide on the south, the Jemez Mountains on the west, the Sangre de Cristo Mountains on the east, and the lower Rio Chama drainage in the north. This area is known to archaeologists as the Tewa basin (Anschuetz 2005). To the south, ancestral Tewa sites also extend across the Santa Fe divide and into the Galisteo basin southeast of Santa Fe.[2]

The seventh Tewa-speaking community, on Hopi First Mesa, formed as a result of a migration from the Rio Grande in 1696, a few years after the reconquest of New Mexico.[3] The history of the Hopi-Tewa is interesting in its own right, but for the purposes of this chapter, the critical point is that all lines of evidence suggest that mutually intelligible dialects of Tewa were spoken throughout the Tewa and Galisteo basins at the time of Spanish contact.[4] This, in turn, suggests that the ancestral form of Tewa, from which all known dialects derive, was spoken in a single speech community at some point in the not-too-distant past. The evidence and arguments reviewed in this chapter suggest that this speech community was located in the Mesa Verde region, and that a large portion of its people migrated to the northern Rio Grande over the course of the thirteenth century.

The Sources of the Tewa Population

The only aspect of migration that is true in all cases is that it involves the movement of people from one place to another. And whereas individuals can change their material practices, learn a new language, or change their place of residence, they cannot alter their genes. Thus, genetic data should provide a reliable means of inferring population movement, if in fact any has occurred. The most direct source of such data is ancient DNA, but due to repatriation and reburial of certain collections, difficulties in obtaining ancient DNA, and the thorough regional sampling needed to address the problem, it may be some time before we are able to address the sources of the Rio Grande Tewa population using such evidence. In the meantime, a practical alternative is to use skeletal morphology as a proxy for genetic data. A number of recent studies have confirmed that phenotypic traits, and especially metric traits, do preserve a signal of regional genetic structure and mating networks (Carson 2006; Cheverud 1988; Konigsberg and Ousley 1995; Relethford

2004; Relethford and Lees 1982; Sparks and Jantz 2002), and the great advantage of phenotypic traits for population genetic analysis is that such data have been collected from skeletal remains with archaeological context for more than a century.

Numerous studies of biological variation have been conducted in the Southwest (e.g., Akins 1986; El-Najjar 1981, 1986; Mackey 1977, 1980; Schillaci 2003; Schillaci and Stojanowski 2005). Several of these have emphasized the biological unity of Pueblo groups over their diversity (Corruccini 1972; El-Najjar 1978; Schillaci, Ozolins, and Windes 2001), but inadequate sample sizes and gaps in regional coverage have limited the interpretability of these results. To improve on these studies, I compiled a large database of craniometric data from published sources, archival documents, and personal files (Ortman 2007, 2009). Multi-observer datasets have their problems, but they are not as intractable for craniometric data as they often are for archaeological datasets. Measurements of skeletal morphology are based on well-defined and unambiguous landmarks, and it is usually possible to distinguish related measurements taken from different landmarks. Also, measurements taken by different analysts using the same landmarks are usually highly correlated. For example, in the dataset I compiled, the correlation between measurements taken by two different analysts for the same specimens is greater than .99 (see Ortman 2009: ch. 5). It therefore appears that, with proper care, it is feasible to compile and analyze multi-observer craniometric datasets.

The dataset I compiled contains data for 12 craniofacial measurements that are unaffected by cradleboarding, collected from remains of approximately 1,200 adults of known sex. These remains were recovered from more than 120 archaeological sites arrayed across the San Juan drainage and Rio Grande region that date before and after the Mesa Verde depopulation. I grouped these samples according to the archaeological district in which each site occurs, following the definitions of Adler and Johnson (1996) for the pre–AD 1275 period, and of Adams and Duff (2004) for the post–AD 1275 period.

To analyze these data, I followed procedures developed by Relethford that estimate the genetic relationship or *R* matrix directly from osteometric data. These methods use a model of metric traits as polygenic traits governed by equal and additive effects of several genes

(see Relethford and Lees 1982). This approach is the current standard in biodistance studies (Konigsberg and Buikstra 1995; Relethford 2003; Relethford and Blangero 1990; Relethford, Crawford, and Blangero 1997; Scherer 2007; Schillaci 2003; Schillaci and Stojanowski 2005; Steadman 1998, 2001; Stojanowski 2005). The advantage of *R*-matrix analysis is that it enables one to estimate three distinct parameters that are useful for investigating regional population structure: the genetic distances between samples, a measure of regional genetic variability known as Wright's F_{ST}, and relative estimates of gene flow for each sample. To maximize the number of variables and cases in the analysis, I pre-treated the data in two ways. First, I included all individuals for which at least four of the twelve measurements are available and estimated missing data using maximum-likelihood methods based on the EM Algorithm (Allison 2001). Second, I controlled for sexual dimorphism by standardizing the raw data in R-mode within sex, then pooling the standardized data for analysis.

Table 10.1 presents a portion of the minimum genetic distance matrix derived from the *R* matrix of the craniometric dataset. Specifically, this table presents distances between samples from regional populations dating before and after AD 1275 in the northern Southwest. The patterns of biological affinity reflected in this table are complex, but one consistent pattern is that post–AD 1275 populations of the northern Rio Grande region, including those from the Santa Fe, Pajarito, Chama, Cochiti, Tano, Pecos, and Salinas districts, appear more closely related to earlier populations of the Four Corners region than they are to earlier populations of the northern Rio Grande, including the Valdez, Kwahe'e, and Galisteo populations.

Figure 10.1 presents a principal-coordinates analysis of the *R* matrix of the craniometric dataset, which provides an overall summary of relationships among the sampled populations. Many details of this figure are interesting, but I will focus here on clusters of samples that appear to represent biological lineages. First, there is a clearly defined cluster of populations in the central area of the chart that includes samples dating after AD 1275 from the Pecos, Chama, Pajarito, Tano, and Salinas districts, and samples dating prior to AD 1275 from the Mesa Verde, McElmo, and southeast Utah districts. Second, the Chaco, Cibola, El Morro, and Cochiti samples form a second, more loosely related

Table 10.1. Minimum genetic distances among regional populations

District	Taos	Chama	Jemez	Pajarito	Santa Fe	Pecos	Tano	Cochiti	Albuquerque	Puerco	El Morro	Salinas
Southeast Utah	.1088	.0432	.0195	.0271	.0611	.0553	.0552	.1857	.1212	.2309	.0819	.0476
McElmo	.0424	.0627	.0431	.0263	.0287	.1182	.0292	.2424	.0487	.1531	.0663	.0980
Mesa Verde	.0949	.0901	.0176	.0316	.0991	.1476	.0318	.2195	.1044	.2417	.0445	.0839
Totah	.0521	.1661	.1763	.0918	.0424	.2250	.1113	.5069	.0881	.0979	.2082	.2168
Piedra	.1693	.0885	.0982	.1290	.1607	.0706	.1139	.2300	.1810	.3362	.2952	.1244
Chaco	.1737	.1185	.0718	.0581	.1586	.2213	.1092	.2288	.2330	.3160	.0249	.0954
Cibola	.1472	.0315	.0319	.0258	.0956	.1333	.0597	.1730	.1730	.2261	.0151	.0807
Valdez	.1063	.2123	.2527	.2260	.1733	.1987	.1861	.4282	.3845	.2365	.1127	.1435
Kwahe'e	.2692	.2851	.1342	.1621	.2626	.2749	.1847	.4300	.2580	.5328	.3540	.2334
Galisteo	.4167	.6759	.7235	.5970	.3553	.5482	.5670	.9319	.5598	.3228	.8344	.6402

Note: Column heads represent regional samples from sites dating after AD 1275, and row heads represent regional samples from sites dating prior to AD 1275. Data are standardized minimum genetic distances derived from the *R* matrix of the craniometric data set.

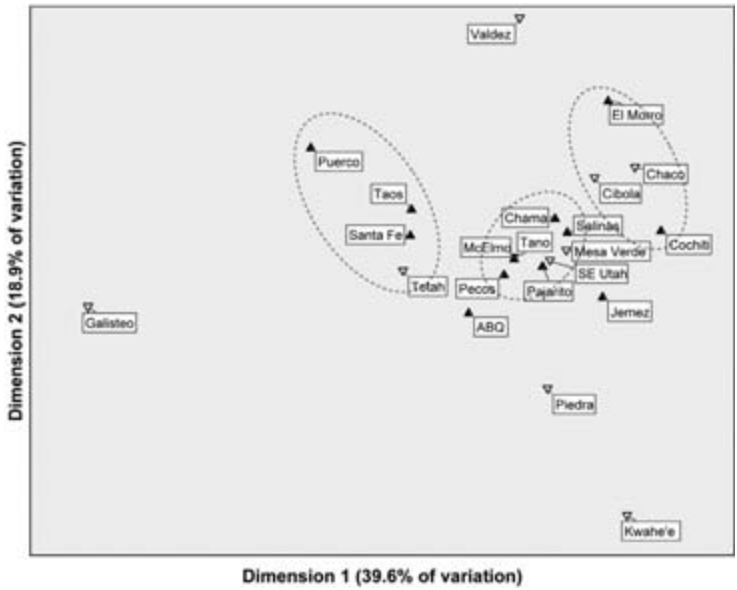

Figure 10.1. Principal coordinates analysis of the *R* matrix of the craniometric data set. The first two eigenvectors have been scaled by the square roots of their eigenvalues. Up-facing solid triangles indicate post–AD 1275 populations, and down-facing open triangles indicate pre–AD 1275 populations. Suggested lineages are circled.

lineage. Third, samples from the Puerco, Taos, Santa Fe, and Totah districts appear to form a third, loosely related lineage.

These results indicate that Late Coalition– and Classic-period populations of several ancestral Tewa districts (Pajarito, Tano, and Chama) descended primarily from earlier Mesa Verde–region populations (southeast Utah, McElmo, and Mesa Verde), and not from early Rio Grande populations (Galisteo, Kwahe'e, and Valdez).[5] They also suggest that ancestors of Eastern Keres communities lived primarily south of the San Juan river, not in the Mesa Verde region or in the Totah. Finally, the grouping of the Santa Fe sample with samples from either end of the Rio Grande region, despite the close affinity of the former with Mesa Verde region samples, suggests that the post–AD 1275 Santa Fe district population resulted from the mixing of indigenous Rio Grande populations with immigrant Mesa Verde populations.[6]

Table 10.2 presents an analysis of gene flow, following the model developed by Relethford and Blangero (1990). The most important parameter for interpreting the results is the residual variance. When this value is significantly less than zero, it indicates that the population in question experienced less than average gene flow, and when it is significantly greater than zero, it indicates that the population experienced greater than average gene flow, relative to the overall pattern of genetic variation among the samples in the analysis. The results of this analysis emphasize two points. First, post–AD 1275 samples from districts occupied by Tewa speakers in historic times (Pajarito, Tano, and Chama) did not experience greater than average gene flow relative to other regional populations, including earlier Rio Grande populations. This suggests that the ancestral Tewa populations of these areas did not result from significant admixture of previously distinct populations. Second, although sample sizes are small, pre–AD 1275 populations of the Tewa basin (Kwahe'e), Galisteo basin (Galisteo), and Taos Valley (Valdez) appear to have been experiencing significant gene flow due to in-migration from one or more genetically distinct populations. Third, this same pattern is also apparent in the post–AD 1275 sample from the Santa Fe district, which was home to a significant Developmental-period population (Dickson 1979; McNutt 1969; Scheick 2007; Stubbs and Stallings 1953). These patterns suggest that, over the course of the thirteenth century, in-migrating Mesa Verde people either swamped or displaced existing populations of the Pajarito, Chama, and Tano districts, but they intermarried with existing populations in the Santa Fe district.

In sum, these analyses of metric traits suggest that ancestral Tewa genes derive primarily from the Mesa Verde region, but that early Rio Grande populations also contributed, in proportion to their numbers, to the resultant ancestral Tewa population.

The History of the Tewa Speech Community

Even if there was a large influx of people to the northern Rio Grande from the Mesa Verde region in the thirteenth century, it would not necessarily mean that these migrants brought the Tewa language with them. Retention of a language by immigrants depends on many factors,

Table 10.2. Relethford-Blangero analysis of craniometric data set

District (major sites)	*N*	Distance from regional centroid	Pheno-typic variance (V_p)	Expected variance (V_e)	Residual variance (V_r)	S.E. (V_r)	P ($V_r \approx 0$)
Period 1							
Cibola (Kin Tiel, Village GK, Whitewater)	33	.0221	0.657	0.929	−0.271	.0175	.0000
Piedra (Navajo Reservoir District)	13	.1157	0.610	0.840	−0.230	.0466	.0004
Southeast Utah (Grand Gulch, Alkali Ridge)	33	.0162	0.738	0.934	−0.196	.0207	.0000
Totah (Salmon, Aztec, Tommy site)	57	.0936	0.898	0.861	0.037	.0211	.1079
Mesa Verde (Wetherill Mesa)	56	.0172	1.001	0.933	0.068	.0266	.0265
McElmo (Lowry, Sand Canyon, Ute Mtn)	58	.0048	1.034	0.945	0.089	.0228	.0024
Valdez (Taos Valley Valdez Phase sites)	8	.1690	1.011	0.789	0.222	.0618	.0042
Galisteo (LA3333)	6	.5914	0.848	0.388	0.460	.0879	.0003
Kwahe'e (Tewa Basin Kwahe'e Phase sites)	11	.1820	1.362	0.777	0.585	.1160	.0004
Chaco (Pueblo Bonito, small sites)	65	.0627	1.700	0.890	0.810	.0801	.0000
Period 2							
Jemez (Kwasteyukwa, Amoxiumqua, Guisiwa)	42	.0198	0.655	0.931	−0.276	.0296	.0000
Taos (Pot Creek, Picuris)	17	.0596	0.686	0.893	−0.207	.0212	.0000
El Morro (Heshotuła, Pueblo de los Muertos)	29	.0503	0.728	0.902	−0.174	.0147	.0000
Pecos (B/W-Glaze A)	89	.0868	0.699	0.867	−0.168	.0239	.0000

Salinas (Gran Quivira)	65	.0685	0.832	0.885	−0.052	.0244	.0567
Pajarito (Puye, Otowi, Tsankawi)	81	.0063	0.918	0.944	−0.026	.0295	.3973
Tano (Las Madres, San Cristobal)	55	.0228	0.934	0.928	0.006	.0140	.6766
Chama (Sapawe, Te'ewi)	30	.0297	0.951	0.921	0.030	.0188	.1384
Puerco (Pottery Mound)	27	.1627	0.910	0.795	0.115	.0370	.0100
Santa Fe (Pindi, Arroyo Hondo)	27	.0389	1.218	0.913	0.305	.0352	.0000
Cochiti (LA70, LA6455)	29	.1917	1.082	0.768	0.314	.0492	.0001
Albuquerque (Tijeras, Paako)	28	.0752	1.266	0.878	0.388	.0575	.0000

Notes: Period 1 < AD 1275, Period 2 > AD 1275. Standard errors are estimated by jackknifing across variables. Significance is estimated from the Student's T distribution (2-tailed, N_{var}-1 degrees of freedom) of the residual variance over its standard error. Regional populations are presented in ascending order of residual variance within each time period.

including the pace and duration of migration, the social scale of migrating groups, and social conditions in the source and destination areas (see Ortman and Cameron, in press). One can imagine several scenarios in which Mesa Verde immigrants would have shifted their language from that of their homeland to that of the destination area. To determine whether the Tewa language was adopted by Mesa Verde immigrants or was brought with them, I have broken down the problem into several smaller and more tractable questions and attempted to answer each one using various lines of evidence.

How Long Has Tewa Been a Distinct Language?

The Tewa language could not have been brought to the northern Rio Grande from the Mesa Verde region if it was not yet a distinct language in the thirteenth century. So, a basic question one needs to answer is: How long has the Tewa language been distinct from other languages of the Kiowa-Tanoan family to which it belongs? Kiowa-Tanoan languages for which there is at least minimal documentation include Northern Tiwa, Southern Tiwa, Tewa, Towa, Piro, and Kiowa. Kiowa is spoken by a community of the southern plains today; the others were spoken in various pueblos of the Rio Grande region at the time of Spanish contact, and all but Piro are still spoken today (Harrington 1909). The traditional view of historical relationships among these languages is that Kiowa is the most divergent dialect and thus separated earliest from the rest, followed by Towa, then Tewa, and then, finally, Northern and Southern Tiwa (Davis 1959; Hale and Harris 1979; Harrington 1909; Trager 1967). In recent years, however, the reality of Kiowa-Tanoan subgroupings has been questioned (Hale and Harris 1979; Kroskrity 1993:55–60; Watkins 1984), so I decided to take a fresh look at Kiowa-Tanoan subgroups using currently accepted methods.

When linguists say that languages are in the same family, what they mean is that it is possible to reconstruct aspects of the language that was ancestral to all the extant dialects of that family. Hale (1967) accomplished this for the Kiowa-Tanoan languages. He reconstructed the phonology (system of phonemes, or meaningful sound contrasts) in the language ancestral to Kiowa, Towa, Tewa, and Tiwa, as well as a system of morphophonemic alternations (predictable changes in pronunciation in certain phonetic environments) that must have characterized the

protolanguage. He also identified the sound changes from the protolanguage in each of the descendant dialects.

The most secure method linguists have found for identifying subgroups within a language family is to identify innovations from the protolanguage that are shared in certain descendant dialects but not in others (see Ross 1997). Because language change is conservative, the probability that the same set of changes would occur independently in two distinct languages is low, the implication being that these changes occurred only once, before the dialects that share these innovations diverged from a common ancestor. The logic is essentially the same as that used in creating biological phylogenies on the basis of shared genetic mutations ("derived" characters).

Hale did not consider the implications of his reconstruction for Kiowa-Tanoan subgrouping, but it can be used to illustrate groups of shared innovations that define the traditional subgroups of Kiowa-Tanoan. For example, the changes that distinguish Tanoan from Kiowa are (1) KT *b > T mV̨, bV; and (2) KT *d > T nV̨, dV. What these symbols indicate is that, sometime after the dialect ancestral to Kiowa became isolated from the dialect ancestral to all other Tanoan languages, initial /*b*/ and /*d*/ sounds in Tanoan words changed to /*m*/ or /*n*/ sounds when the initial /*b*/ or /*d*/ was followed by a nasalized vowel. By the same logic, the shared innovations that define Tiwa-Tewa as a subgroup of Tanoan that excludes Towa are (1) T *ts^{h} > TT s, (2) T *ʐ̨ > TT ʑ̨, and (3) T *g^{w} > TT w. And finally, the innovations that define proto-Tiwa as a subgroup of Tiwa-Tewa that excludes Tewa are (1) TT *ʐ̨ > PTi ts, (2) TT *k^{wh} > PTi x^{w}, and (3) TT *s > PTi ɬ. Thus, patterns of shared phonetic innovations support the traditional view of subgroupings in these languages.[7]

This detour into Kiowa-Tanoan phonology is relevant because establishing the branching pattern of the Kiowa-Tanoan family tree is a step in estimating when Tewa became a distinct language. Based on the analysis above, it is possible to infer that Tewa became a distinct language sometime prior to the diversification of proto-Tiwa into Northern and Southern Tiwa. How might one estimate when this latter event occurred? One method used in historical linguistics to address such questions is the "words and things" approach (Campbell 1998:339–368; Fowler 1983; Hill 2001; Kirch and Green 2001: ch. 4; Mallory 1989:143–185).

The principle behind the method is that, when one can reconstruct a word for a cultural item in a protolanguage, we can also assume that the item itself was known to the speakers of that language. If one can also date the initial appearance of that item using archaeological evidence, one can argue the date of diversification of the protolanguage was sometime after the introduction of that item.[8]

I used this method in combination with sound correspondences worked out by Hale (1967), Davis (1989), and Trager (1942), and extant lexicons for Kiowa-Tanoan languages, to reconstruct a number of proto-Tiwa words for cultural items that appeared relatively late in southwestern prehistory, but prior to the era of Spanish colonization.[9] The reconstructed forms are: *łowo (viga, "wood-pole"), *nąkʰų́ (adobe, "earth-rock"), *cial (gourd rattle), *cud- (shirt), *p'okú- (tortilla, "water-corn"), *t'okʰę (cotton), *pisólo (blanket), *cił mūyu (turquoise), and *todi (macaw). A cognate form is known for each of these terms in both the Taos dialect of Northern Tiwa and the Isleta dialect of Southern Tiwa. Although words for most of these items exist in other Kiowa-Tanoan languages as well, they are not cognate with the Tiwa forms.[10]

All of the items referred to by these terms appear to have been known in the proto-Tiwa speech community before it split into northern and southern branches. Archaeological evidence suggests that this split could not have taken place prior to AD 1200, because this is when the most recent items on this list (tailored shirts and griddle stones on which tortillas were cooked) first appeared in the archaeological record (Jeançon 1929:17; Osborne 2004:37–43; Smiley et al. 1953:38). The remaining items all appeared for the first time between AD 980 and 1100, suggesting that the Tiwa-Tewa split occurred prior to this period. For example, turquoise ornaments and macaws first became widespread with the rise of the Chacoan Regional System after AD 980 (Harbottle and Weigand 1992; Hargrave 1970:54), and roofs supported by vigas resting on load-bearing walls also first occur in the architecture of this period (Lekson 1984; McKenna and Truell 1986; Varien 1999c). Also, the earliest documented use of puddled adobe for wall construction occurs in mid–AD 1000s sites in the Rio Grande (McNutt 1969) and in early AD 1100s sites of the Bis sa'ni community on Escavada Wash, near Chaco Canyon (Marshall 1982:178–185, 348–349). Finally, the cultivation and weaving of cotton fabrics, including blankets, only became

widespread in the northern Southwest after AD 1000 (Ortman 2000b), and gourd rattles are not clearly present in Ancestral Pueblo contexts dating prior to AD 1050 (Ortman 2009: ch. 7).

The Tiwa-Tewa split could have occurred more recently than the period suggested by these data because languages are always in the process of replacing vocabulary. Thus, the absence of a Tewa cognate for a reconstructible proto-Tiwa term does not necessarily mean that the Tiwa-Tewa speech community lacked such a term or knowledge of the associated cultural item. It could be that the Tewa language had a cognate that has been lost since it diverged from proto-Tiwa. However, because seven proto-Tiwa items first appeared within a relatively narrow time frame, one can construct a statistical test to assess the likelihood of Tewa divergence prior to the AD 980–1100 period. The null hypothesis in this case is that the Tiwa-Tewa speech community had not yet split by this period, and that vocabulary replacement is responsible for the absence of cognates for these seven proto-Tiwa terms in Tewa. The question being asked is thus: What is the probability of all seven terms being replaced, given that a certain percentage of cultural vocabulary is still shared between Tiwa and Tewa? Previous lexicostatistical work (Davis 1959) suggests that approximately 57 percent of *basic* vocabulary is still shared between Tiwa and Tewa. In addition, Tiwa and Tewa cognates are available for 70 percent (63 of 90 forms) of the cultural vocabulary I was able to reconstruct in my own study (Ortman 2009: appendix C). Because the binomial probability of the null hypothesis (total vocabulary replacement) is $<.01$ so long as the actual shared cultural vocabulary is at least 48 percent, it would appear reasonable to conclude that Tewa had indeed become a separate language by the AD 980–1100 period. This means there was a distinct Tewa language being spoken somewhere prior to the depopulation of the Mesa Verde region.

Did Tiwa and Tewa Diversify within the Rio Grande Region?

If the Tewa language diversified from proto-Tiwa within the Rio Grande region, it would suggest that thirteenth-century migrants from the Mesa Verde region adopted the Tewa language upon arrival in the Rio Grande region, and it would argue against the idea that Mesa Verde people spoke Tewa prior to the migration. There is some basis for this view.

One of the principles commonly used in linguistics to help define the homeland of a language family is called the "center of maximum diversity" principle (Sapir 1916; also see Bellwood 2005:227–229). The basic idea of this principle is that the homeland of a language family is often in the area where the greatest diversity of descendant dialects is spoken. According to this principle, and based on the fact that all Kiowa-Tanoan languages but Kiowa and Hopi-Tewa are spoken in the Rio Grande region today, it is reasonable to hypothesize that the Kiowa-Tanoan homeland was within the Rio Grande region. This would in turn support the hypothesis that Tewa diverged from Tiwa within this region.

However, three lines of evidence argue against this hypothesis, suggesting instead that the Tewa-Tiwa split occurred outside the Rio Grande region. The first comes from the modern-day distribution of the Tiwa and Tewa speech communities. If the Tiwa and Tewa languages had diversified within the Rio Grande, we would expect the Northern and Southern Tiwa speech communities to have ended up adjacent to each other, with Tewa at one end or the other, but this is not the case. Northern and Southern Tiwa, the most similar Kiowa-Tanoan dialects, are in fact spoken at opposite ends of the Pueblo area in the Rio Grande region, with Tewa, Towa, and Keres in between. It is more parsimonious to explain this distribution as the result of in-migrating groups, including Tewa speakers, splitting what was once a continuous Tiwa language distribution into a northern and southern group.

The second line of evidence comes from cultural vocabulary reconstructed for Kiowa-Tanoan. Hill's (2008a, b) recent work provides suggestive evidence that Kiowa-Tanoan was spoken by Eastern Basketmaker groups, and my own reconstructions of Kiowa-Tanoan cultural vocabulary support this view (see Ortman 2009: ch. 7). Maize macrofossils dating to the Basketmaker II period (ca. 1000 BC to AD 500) have been found in the Rio Grande region (Vierra and Ford 2006), but Basketmaker II sites are far more common in the San Juan region to the west (see Charles and Cole 2006; McNutt 1969). This suggests that the focal area of Kiowa-Tanoan settlement was also west of the Rio Grande region, thus leaving open the possibility that the more recent Tewa-Tiwa split involved the breakup of a social network that was either completely outside the Rio Grande region or encompassed both the San Juan and Rio Grande regions.

The third line of evidence against the *in situ* diversification model comes from a study of place names. From a careful study of Harrington's (1916) encyclopedic compendium and his personal papers, as well as those of Trager, I have identified seventeen topographical features for which toponyms have been recorded phonetically in both the Tewa and Taos (Northern Tiwa) languages. If Tiwa and Tewa diversified within the Rio Grande region, one might expect a certain number of these paired toponyms to date from the period prior to the Tiwa-Tewa split, and thus to be cognate. Table 10.3 lists these seventeen paired toponyms and their English glosses, and it interprets the nature of the relationship between each pair.

There are only three pairs among these seventeen feature names that are possibly cognate, and none are clearly so.[11] However, note that the first pair refers to Sleeping Ute Mountain, a prominent landform in the Mesa Verde region and not in the Rio Grande region. These two forms are not cognate, but because Tiwa has likely been spoken in the Rio Grande region from the time it became distinct from Tewa, it would seem more likely that the Taos form is a loan translation from Tewa. There are two pairs in table 10.3 for which it is clear the Taos form is older than the Tewa form, because the Tewa form incorporates the Tewa term for the Taos people. In addition, there are two pairs for which it is clear that the Tiwa form is the older toponym that was subsequently loaned into Tewa, because the two forms are phonetically similar but the Taos form has a transparent morphological analysis, whereas the Tewa form does not (see Campbell and Kaufman 1976; Shaul and Hill 1998). One of these terms, for Sierra Blanca Lake, refers to a lake that figures prominently in Tewa origin narratives. The fact that the name of this place is a loan from Tiwa suggests that Tewa speakers learned of it from Tiwa speakers who preceded them in occupying the Rio Grande. This will prove important in the analysis of oral tradition later in this chapter.

Finally, there are four sets that are clearly noncognate loan translations for which the direction of translation is unclear, and there are four sets for which the Tewa and Taos forms are clearly unrelated and were coined independently. So overall, there is no definite evidence that Tewa and Tiwa speakers have inherited a common stock of place names in the Rio Grande region from the period of time before their languages

Table 10.3. Paired Tewa and Taos place names

Landform (JPH pp.)	Tewa form	Tewa gloss	Taos form	Taos gloss	Interpretation
Ute Mountain (565)	Phaa p'in	Yucca mountain	P^{h}uot'ęp'ianenemą[1]	Basket mountain	Calque from Tewa
Tres Piedras (173)	K'úwák'uu	Mountain sheep rocks	K'uwaqiuną	mountain sheep rocks	Cognate, loan or calque
Tusas Mountains (172)	Kíp'in	Prairie dog mountain	Kit^{h}ɨp'ianena	Prairie-dog-dwelling mountain	Calque from Taos or cognate
Ojo Caliente (159)	P'osíp'oe	Moss-greenness-water	P'ołuop'ó'ona	Water-hot creek	Unrelated
Sierra Blanca Lake (567)	Sip'op^{h}e	[Unexplained]	Tsip'ophúntha[2]	Eye water black at	Tiwa loan
Taos Peak (177)	Mãxwolop'in	[Unexplained]-mountain	Móx^{w}oluna	covering?, -high?	Taos loan
Taos Mountain (175)	Thawíp'in	Taos [dwell-gap] mountains	Pox^{w}iap'ianenemą[1]	Lake mountain	Taos priority
Taos Creek (178)	Thawíp'oe	Taos [dwell-gap] creek	ʔIałop^{h}ayp'ó'ona	Red willow water	Taos priority
Santa Fe (460)	ʔOgap'oegeh	Shell-water-at	Hulp'ó'ona	Shell river	Calque
Orejas Mountain (177)	Deʔoyep'in	Coyote ears mountain	Tux^{w}at'oɬiot^{h}unt^{h}o[1]	Fox ear place	Calque
Sierra Blanca (564)	P'ints'çʔii	Mountain-white	P'ianp'ot^{h}ɨbo[1]	Mountain-white-place	Calque

Tierra Amarilla (111)	Nãnts'eyiwe	Earth-yellow-at	Nąmts'úlito[1]	Earth-yellow-place	Cognate or calque
Jicarilla Peak (339)	T'ümp'in	Basket mountain	P'uot'ịęp'ientha[2]	Basket-mountain-at	Calque
Sandia Peak (44)	Oekuup'in	Turtle mountain	Kep'íanenemą[2]	[?]-mountain	Unrelated
Abiquiu Mountain (130)	Ábeshup'in$^{?}$ây	Abiquiu [chokecherry-end] mountain-little	P'íanp'omúluna[2]	Mountain water jar	Unrelated
Abiquiu (135)	P^{h}éšúbú:$^{?}$u	Stick-end-town	Kult^{h}ɨtta[2]	[?]	Unrelated
Red River (174)	P'îp'oge$^{?}$inp'oe	Red water creek	Tɨsiup'ó'ona	[?]-river	Unrelated

Note: All Tewa data are from Harrington (1916), with page number in parentheses. Taos data are from this same source unless otherwise noted: (1) George L. Trager Papers, U.C. Irvine, box 40; (2) J. P. Harrington Papers, Microfilm Edition, reel 49, frame 0195-019.

became distinct. In contrast, there are a number of toponyms suggesting that Tiwa has been spoken in the Rio Grande region for a longer period of time than has Tewa. This, in turn, argues against the hypothesis that the Tiwa-Tewa split occurred within the Rio Grande region.

How Long Has Tewa Been Spoken in the Northern Rio Grande?

If one could amass evidence that Tewa was spoken in the Rio Grande region prior to AD 1200, it would weaken the argument that Mesa Verde migrants brought the Tewa language with them. It is possible to address this question through the study of place names for archaeological sites in the Rio Grande. Starting once again from Harrington's (1916) compilation, augmented by Ellis (1964), I have correlated archaeological sites with Tewa names with New Mexico state site numbers, and I have used dating information in recent compilations of northern Rio Grande archaeological sites (Anschuetz 2005; Crown, Orcutt, and Kohler 1996; Fowles 2004a, b; Marshall and Walt 2007; Scheick 2007; Snead 1995; Snead, Creamer, and Van Zandt 2004; Trierweiler 1990) and in the New Mexico Archaeological Records Management Section files to estimate the occupation spans of these sites. I have also compiled a list of Taos names for archaeological sites by working through the personal papers of Harrington and Trager.

Nearly all Tewa ruin names have a clear morphological analysis, and I have found no examples of paired ruin names that are cognate in Tewa and Northern Tiwa. It is therefore highly likely that all Tewa names for ancient settlements were coined by Tewa speakers. It also appears that Tewa names were established for these sites when they were occupied.[12] This, in turn, means that the Tewa language must have been spoken in the Rio Grande region prior to the abandonment dates of the oldest archaeological sites for which names in the Tewa language are remembered.

Table 10.4 presents a list of names, site numbers, glosses, and occupation dates for the longest-abandoned settlements for which names are remembered in the Tewa or Taos languages. This list is drawn from a larger list of sixty-four such sites for which these data are available. The other sites in this list were abandoned more recently than the sites listed here. Several points are worthy of discussion. First, there are eight sites with remembered names in the Tewa language that were constructed

Table 10.4. Early villages with Tewa (or Taos) names

Form	Site Number	Gloss	Ceramic Dates (AD)
1) Tsipiwiʔówînkeji	LA21422	Flaking-stone issuing gap pueblo ruin	1250–1325
2) Navahuʔówînkeji	LA21427	Cultivable field arroyo pueblo ruin	1250–1325
3) Pʰinikʰwiʔówînkeji	LA180	Dwarf cornmeal gap pueblo ruin	1250–1325
4) P'ibid̲iʔówînkeyi	LA264	Little red mound pueblo ruin	1250–1350
5) K'aatayʔówînkeyi	LA245	Cottonwood grove pueblo ruin	1250–1350
6) Tekʰeʔówînkeyi	LA271	Cottonwood bud pueblo ruin	1200–1350
7) Kaap'oeʔówînkeyi	LA300	Leaf water pueblo ruin	1250–1350
8) Shu̱p'ód̲éʔówînkeyi	LA918	Cicada head pueblo ruin	1275–1350
9) Nakeʔmuu	LA12655	Land point village	1250–1325
10) P'ôkutu̱o (Taos)	LA12741	Water-dry-at (El Pueblito Site)	1050–1190
11) T'oytu̱Ịna (Taos)	LA260	People-house (Pot Creek Pueblo)	1260–1320
12) Phaa p'in-	5MT5006	Yucca mountain village ruin	1240–1280

Sources: 1) Harrington 1916:236; Trierweiler 1990:50; 2) Harrington 1916:244; Trierweiler 1990:50; 3) Harrington 1916:245; Hewett 1906:16; 4) Harrington 1916:380; Ortman 2009; 5) Harrington 1916:380; Ellis 1964; 6) Harrington 1916:336; 7) Harrington 1916:150; 8) Harrington 1916:150; 9) Hewett 1906:25-26; Vierra et al. 2003; 10) George L. Trager Papers, U.C. Irvine, Box 40; Fowles 2004b:230; 11) George L. Trager Papers, U.C. Irvine; Crown (1991); 12) Jeançon (1925:39); Glowacki 2001.

and abandoned during the Late Coalition period, AD 1275–1350, the period that brackets the final depopulation of the Mesa Verde region.

Second, table 10.4 includes an ancestral Northern Tiwa site (LA12741, the El Pueblito Site) abandoned at the end of the Late Developmental period, approximately AD 1190. This is the longest-abandoned village-sized site in the northern Rio Grande for which I have identified a name in the Tewa or Taos language. Sites abandoned at the end of the Developmental period in the Tewa basin, such as the Pojoaque Grant

site (LA835), do not appear to have Tewa names. The fact that no Late Developmental aggregates have Tewa names but at least one such site has a Taos name generally supports the conclusions of the paired toponym analysis, namely, that Tiwa has been spoken in the northern Rio Grande for a longer period of time than has Tewa.

Third, the only site with a Tewa name abandoned earlier than the end of the Coalition period is actually a site in the Mesa Verde region. The name of this site is known from an oral tradition surrounding it, recorded by Jean Jeançon, an archaeologist who worked closely with Tewa people in the early twentieth century:

> In the early days of his contact with the Tewas of Santa Clara, the writer was told stories of the coming of these people from a great village in southwestern Colorado in the dim past. The accounts were so graphic and exact that he copied a map made by his informant of the village, which must have been in ruins at that time, and located in a part of the country in which the man had never been, and only knew from traditions, and a few years later visited a ruin which in situation and surrounding corresponded with the description given him, and was able to identify the place as the one from which the Tewa claimed that they came. While the ruin is a great mound at present, there is enough of [an] outline left to positively identify it with the map and as a result of information given by the writer and from other sources, the name of the ruin was changed from the one by which it had been known to that by which it is known to the Tewa. The site here referred to was formerly known as the Aztec Springs ruins, but is now known as the Yucca House, which is the name that the Tewa call it. (Jeançon 1925:39)

The archaeological site of Yucca House (5MT5006), around which this tradition centers, is a large Ancestral Pueblo village on the east flank of Sleeping Ute Mountain. The site was first described by Jackson (1876:377–378), first mapped by Holmes (1878: plate XL), and later mapped and described by Fewkes (1919:26–27). The site contains a McElmo-style great house that may have been constructed during the Chacoan era, AD 1060–1140 (Marshall et al. 1979:313; Powers, Gillespie, and Lekson 1983:174–177), but a recent review of pottery, tree-ring dates, and architectural details (Glowacki 2001) indicates that the surrounding village dates from the Late Pueblo III period (AD 1240–1280) and represents a "canyon-rim pueblo"

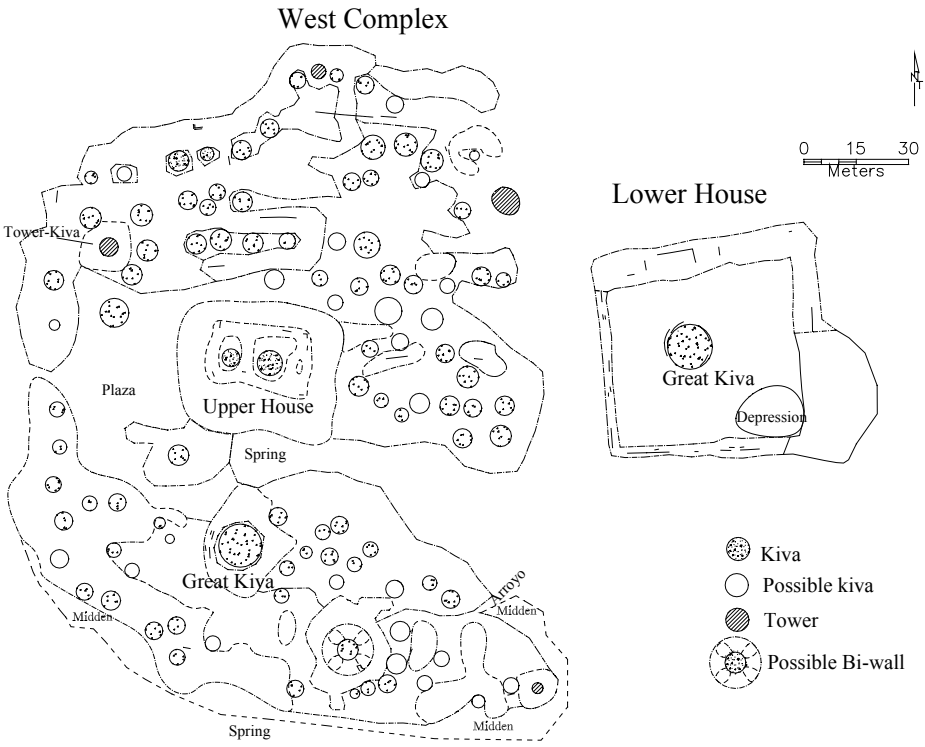

Figure 10.2. Yucca House (5MT5006), an Ancestral Tewa village that combines a bowl-shaped, canyon-rim pueblo characteristic of the late Pueblo III Mesa Verde region and a rectilinear plaza pueblo characteristic of the Late Coalition–period Rio Grande. (Courtesy Crow Canyon Archaeological Center)

analogous to Sand Canyon Pueblo (Lipe and Ortman 2000; Ortman and Bradley 2002). Yucca House was thus one of the last villages occupied by Ancestral Pueblo people in the Mesa Verde region, and its inhabitants were likely involved in the final depopulation of this region. Even though we don't know what Jeançon's informant's map looked like, Yucca House (fig. 10.2) has several distinctive features, including a great house and a large rectangular enclosure with a kiva in the plaza that may represent an early expression of the plaza-oriented village plan that became the standard form throughout the Pueblo world by the early AD 1300s. These features distinguish Yucca House from other large sites in the area, and they would have been identifiable even from a rough-sketch map.

In light of the tradition surrounding Yucca House recorded by Jeançon, it is significant to add that Harrington independently recorded place names for related topographical features in the vicinity of Yucca House. He recorded the name Phaa p'in ("Yucca Mountain") for "a mountain somewhere near the Montezuma Valley in southwestern Colorado" that "gives Montezuma Valley its Tewa name" (Harrington 1916:565). Neither Harrington nor his informant knew precisely where this mountain was, but it is clear that this term applies to Sleeping Ute Mountain because this feature is labeled using a calque of the Tewa name (Sierra del Datil, "Mountain of Yucca Bananas") in the 1778 Pacheco Map of the Dominguez-Escalante Expedition (Warner 1995:144–145). Harrington also recorded a Tewa name for the Montezuma Valley (*Phaa p'innae'ahkongeh*, "Plain of the Yucca Mountain"), along with statements to the effect that ancestors of the Tewa lived in this area in the past: "This is a large valley in southwestern Colorado. It is said that in ancient times when the Tewa were journeying south from Sip'op^{h}e the K'osa, a mythic person who founded the K'osa society of the Tewa, first appeared to the people while they were sojourning in this valley" (Harrington 1916:564).

Thus, the tradition surrounding Yucca House recorded by Jeançon, and the additional place names and traditions recorded by Harrington, provide substantive evidence that Tewa-speaking people once inhabited the Mesa Verde region. Namely, these traditions surround an ancestral village and link to an archaeological site and environs that exhibit evidence of occupation during the late 1200s, and thus were plausibly occupied by people who emigrated to the Rio Grande region.

In summary, this analysis of native names for archaeological sites suggests that the Tewa language has definitely been spoken in the northern Rio Grande from the Late Coalition period onward. There is no evidence to suggest whether or not Tewa was spoken in the northern Rio Grande during the Developmental period, but there is positive evidence that Tiwa was spoken in this region at that time. Finally, there is positive evidence that Tewa was spoken in the Mesa Verde region in the thirteenth century.

Was Tewa Spoken in the Mesa Verde Region?

Thus far, I have discussed evidence that Tewa has been a distinct language from some time prior to the middle AD 1000s, that it was spoken

in the northern Rio Grande region from at least the middle decades of the AD 1200s, and that it may have been spoken in the Mesa Verde region prior to that time. Is there additional archaeoliguistic evidence that might buttress this final claim? I believe there is, and that this evidence lies in material expressions of conceptual metaphors embedded in the Tewa language.

Conceptual metaphors are cognitive models that use the imagery of a concrete source domain to conceptualize and reason about an abstract target domain (Fauconnier 1997; Fauconnier and Turner 1994; Gibbs 1994; Kovecses 2002; Lakoff 1987, 1993; Lakoff and Johnson 1980, 1999). In previous work, I have suggested that such metaphors can be deciphered from patterns in material culture, using methods derived from cognitive linguistic research (Ortman 2000b, 2008a; Ortman and Bradley 2002; also see David, Sterner, and Gavua 1988; Hays-Gilpin 2008; Potter 2002, 2004; Preston Blier 1987; Sekaquaptewa and Washburn 2004; Tilley 1999; Whitley 2008). I have also argued that the conceptual metaphors of past speech communities can be reconstructed linguistically, through attention to: (1) *polysemy*, the multiple senses of words; (2) *etymology*, the ways in which new words are formed; and (3) semantic change identified through the comparative method (Ortman 2003, 2008c, 2009: ch. 9; Sweetser 1990:23–48). When a metaphor is embedded in the origins, subsequent history, or related senses of a word, it implies that the concept was conventional among *past* speakers of the language, at the time the word was coined or when the new sense was attached to it. It should therefore be possible to identify the past location of a speech community by linking systems of conceptual metaphors enshrined in language to the archaeological expressions of these systems in a plausible previous homeland.

In previous work, I have reconstructed several *material metaphors* that were expressed in Mesa Verde–region material culture during the final decades of Ancestral Pueblo occupation. Each of these metaphors utilized the imagery of containers, actual pots and baskets, as the source domain (fig. 10.3). Reconstructions of these metaphors have been presented in Ortman (2000b, 2006, 2008a, 2008b, 2009) and in Ortman and Bradley (2002), and readers interested in the details should consult these sources. Table 10.5 lists the deciphered metaphors, along with specific expressions of these concepts in Mesa Verde–region material

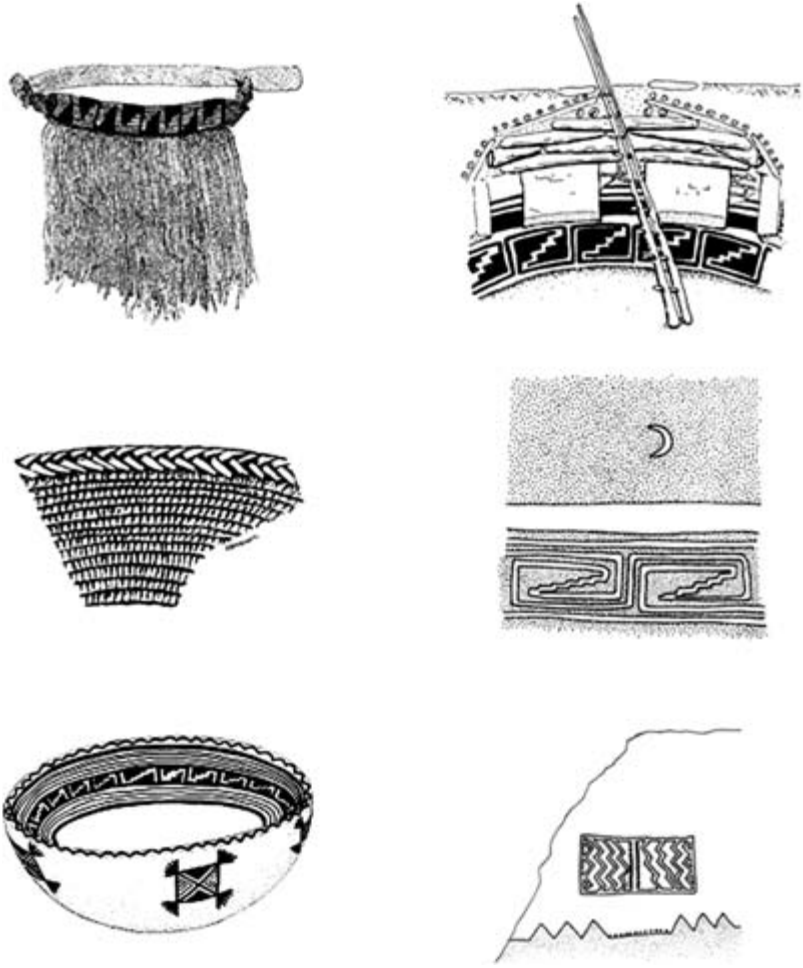

Figure 10.3. Container imagery in Mesa Verde–region material culture. Upper left, plain-weave skirt; middle left, coiled basket; lower left, painted bowl with band design and blanket motif on exterior; upper right, cutaway of kiva with pottery-band mural and cribbed roof; middle right, kiva mural combining pottery-band design below and sky imagery above; lower right, horizon scene with blanket image in the sky. (Courtesy Crow Canyon Archaeological Center.)

Table 10.5. Expressions of container metaphors in Mesa Verde material culture

Pottery vessels are textiles
Pottery bowls are coiled baskets
Pottery bowls are plaited baskets
Cooking pots are coiled baskets
Buildings are containers
Granaries are seed jars
Kiva walls are pottery bowls
Kiva roofs are coiled baskets
The community is a pottery vessel
Villages are pottery bowls
Plazas are pottery bowls
The world consists of containers
The sky is woven
The earth is a pottery bowl
The emergence place is a water-filled vessel

culture. In the following paragraphs, I summarize the conclusions of these studies.

Twelfth- and thirteenth-century pottery of the Mesa Verde region was decorated in a thoroughly geometric style, with designs in black paint on a white-slipped surface. Many researchers have noted parallels between the painted designs on this pottery and the woven objects recovered from contemporaneous cliff dwellings. I have studied these correlations and found abundant evidence that this stylistic unity derived from a conceptualization of painted pottery vessels as woven objects (Ortman 2000b), especially coiled and plaited basketry. I've also found that cooking pots were manufactured using techniques analogous to coiled and twined basketry and imitated the surface textures of baskets (Ortman 2006).

Mesa Verde people also conceptualized buildings as containers for people, in the same way that actual pots and baskets contained food (Ortman 2008a). For example, the central component of residential architecture was a small subterranean kiva, and one of the primary ways the walls of such structures were decorated was with a mural painted in a style identical to the banded designs on pottery bowls. In addition,

there are a number of granaries that were decorated as pottery seed jars, and the cribbed roofs of most kivas mirror the appearance and construction of an overturned, coiled basket. Also, the architecture of thirteenth-century, canyon-rim villages and plazas, and the communal activities that took place in these spaces, suggest that villages and plazas in the AD 1200s were imagined as communal pottery serving bowls (Ortman 2006, 2009: ch. 9; Ortman and Bradley 2002; also see fig. 10.2).

Finally, Mesa Verde people appear to have conceptualized the world as consisting of containers (Ortman 2008a). A second common theme of architectural mural decoration consists of dado patterns in which the lower portion is red, the upper portion is tan to white, and there are sets of projecting triangles and dots running along the boundary between the two colors. These compositions appear to be abstractions of the horizon with projecting landforms, and this landscape imagery is combined with container imagery in several compositions (fig. 10.3). This, in turn, suggests that Mesa Verde people imagined the world as consisting of an earthen pottery bowl below and a woven, vegetal basket above. In addition, pottery vessels were used to represent the emergence place itself. Many kivas in Ancestral Pueblo sites have a small, round hole in the floor north of the hearth. This feature is called the sipapu, after the Hopi term, and represents the emergence place for many pueblo groups today. During the AD 1200s, sipapus in Mesa Verde–region kivas were often created using an olla neck or mug with the bottom broken out (Cattanach 1980:51; Morris 1991:674; Ortman and Bradley 2002; Rohn 1971:74). This suggests that the emergence place was imagined as a pottery vessel containing water.

It is important to emphasize that the conclusions presented above are supported in every case by a range of patterns in material culture that are consistent with generalizations concerning the ways humans express conceptual metaphors in everyday behavior. A metaphor hypothesis accounts for these diverse patterns readily and parsimoniously. Another point to emphasize is that the material metaphors I have reconstructed for Mesa Verde culture are not isolated and unrelated, but rather form a coherent conceptual system. And although expressions of certain concepts do occur across broader areas of the Southwest, the container imagery discussed here forms a coherent complex only in the Mesa Verde region (see, for example, Ortman 2008a). These facts support

the claim that these metaphoric expressions reflect the cognitive unconscious of the people who inhabited the Mesa Verde region during the twelfth and thirteenth centuries. In other words, it is reasonable to view the conceptual metaphors behind these material expressions as ideas that had become deeply ingrained through the enculturation process, and that were materialized in a number of mutually reinforcing ways in ritual and in daily life. One would therefore expect these concepts to have influenced the language of Mesa Verde people as well.

With knowledge of these material metaphors in hand, I have examined major sources of Kiowa-Tanoan lexical data to determine whether these same concepts are enshrined in the etymologies and meanings of relevant words in specific languages. Analyses of these data (Ortman 2003, 2008b, 2008c, 2009: ch. 10) suggest that nearly all the metaphorical expressions identified in the Mesa Verde archaeological complex have reflexes in the Tewa language, whereas other Kiowa-Tanoan languages contain little to no evidence of these metaphors. One example of a Tewa word whose etymology reflects a Mesa Verde metaphor is natʔú ("pottery"), which is a compound of nan ("earth, clay") and tʔú ("baskets"). Another example is the word for a pitched roof, tʔúpʰáʔdiʔ, the etymology of which—tʔún ("[coiled] basket") + pʰe ("stick, timber") + di ("of")—expresses the metaphor ROOFS ARE BASKETS. These data suggest that at one time, people who spoke Tewa made pots and roofs that expressed basket imagery. Weaving imagery does not appear to have actively structured Rio Grande black-on-white pottery decoration (Ortman 2009: ch. 13), but it clearly did structure Mesa Verde pottery traditions (Ortman 2000). Likewise, kiva roofs in Rio Grande sites do not have a basket shape, but the cribbed roofs of most Mesa Verde kivas do look like overturned, coiled baskets (Ortman 2008a). Thus, it is difficult to imagine how natʔú or tʔúpʰáʔdiʔ could have come to exist in the Tewa language if it had never been spoken in the Mesa Verde region.

In other cases, it is the multiple senses of Tewa words that express Mesa Verde metaphors. One example is provided by the multiple senses of p'okwin. The core sense of this word is clearly "lake" because this is its primary meaning in Tewa; the word incorporates the Tewa term for water (p'o), and it is cognate with Tiwa terms for "lake" (p'axwiane in Northern Tiwa, p'ahwi:re in Southern Tiwa). Yet the Tewa term is also

applied to a kiva, to a ceremonial bowl, or to a ruin. These extended senses form what Lakoff (1987) calls a conceptual chain. In Tewa belief, the original people emerged from a lake, and as mentioned previously, the kiva is one representation of this emergence place (cf. p'okwi-k^{h}oyi ["lake + roof hatch of a kiva"]). Also, the primary object of ceremonial leaders whose activities take place inside the kiva is a ceremonial bowl (p'okwingéh ["lake-place"] or p'okwisą̈ʔą̈wéh ["lake-bowl"]) that is filled with water and used to represent p'okwin during ceremonies. In addition, the souls of these leaders are believed to become ancestral cloud beings (ók^{h}ùwà, cf. ok^{h}úwá ["cloud"]) after death, and to dwell under the surface of lakes. A ruin, then, is the dwelling place of ancestors who have become clouds, and thus ruins are also p'okwin. These multiple senses of p'okwin link lakes with the emergence place, kivas, and pottery bowls and clearly reflect several metaphorical expressions involving containers and kivas in Mesa Verde material culture. Several of these concepts are expressed in Tewa basin archaeology, but in all cases they appear earlier in Mesa Verde archaeology.

Finally, an example of semantic change within Kiowa-Tanoan that implies the development of a Mesa Verde metaphor in the Tewa language is found in the history of Tanoan *búlu ("pottery bowl"). At some point after Tewa became distinct from Tiwa, reflexes of this form began to be applied to bowl-shaped topographical features (bú:ʔú ["large dell"], be:ʔe ["small dell"]), plazas (búpíngéh [bú:ʔú + pín ("heart, middle") + géh ("place")]), and villages (bú:ʔú ["village"])[13]. This semantic change implies that, at one point in the history of the Tewa speech community, Tewa-speaking people constructed bowl-shaped villages in bowl-shaped settings. There are no ancestral Tewa villages in the Rio Grande region that fit this description, but such villages were typical of the Late Pueblo III period in the Mesa Verde region, as noted earlier. So if Tewa had never been spoken in the Mesa Verde region, one would have to ask how the Tewa language came to apply a word for bowl-shaped things to villages.

These and a variety of additional data (see Ortman 2009: ch. 10) lead to the following conclusions: (1) evidence for all the conceptual relationships expressed by Mesa Verde container metaphors is embedded in the Tewa language, (2) northern Rio Grande material culture does not express many of the conceptual relationships that are fossilized

in words of the Tewa language and expressed directly in Mesa Verde region material culture, and (3) the Mesa Verde metaphors that are fossilized in the Tewa language are not embedded in other Kiowa-Tanoan languages. These findings strongly suggest that the Tewa speech community was located in the Mesa Verde region during the AD 1200s and that this speech community shifted its location from there to the northern Rio Grande over the course of the thirteenth century.

Social Memory of Mesa Verde Occupancy by Tewa Speakers

The final line of evidence I examine in this chapter is Tewa oral tradition. Ethnographers have published several statements regarding the prior homeland of the Tewa Pueblos, and these accounts regularly mention the Mesa Verde region as a prior homeland. Jeançon recorded an explicit statement by Aniceto Swaso, a Tewa from Santa Clara Pueblo:

> We were a long time coming down to this country; sometimes we stop long time in one place, but all the time it was still too cold for us to stay, so we come on. After while some people get to what you call Mesa Verde, in Colorado. . . . Then they began to get restless again and some go west on the San Juan River, some of them come by way of the Jicarilla Apache country, some come the other way by way of Cañon Largo, Gallinas, and the Chama. (Jeançon 1923:75–76)

Alfonso Ortiz, a Tewa anthropologist, also recorded statements to the effect that the Tewa people lived in southwestern Colorado prior to moving to the Rio Grande valley:

> Many Tewa elders show a very detailed knowledge of the region north and northwest of San Juan into what is now southwestern Colorado. This is true even if they have never been there themselves . . . such detailed knowledge does lend credence to the Tewa's migration traditions and claims that they once occupied an area considerably to the north and northwest of where they are now. (Ortiz 1969:148–149)

In the early twentieth century, certain Tewa people also remembered the name of an ancient homeland located far to the northwest of the

present-day Tewa basin. Harrington reported that "the old cacique of Nambé seemed to know a vague place in the north named Tewayóge 'great Tewa place' (*Tewa* name of the tribe; *yo* augmentative; *ge* 'down at, over at')" (1916:572). Ellis confirmed and amplified Harrington's statement in a report on the past use of territory for agriculture by Nambé Pueblo:

> The Tewas on the east side of the Rio Grande referred to their territory as Teguayo, 'Place of the Tewas,' even as they also referred to their earlier home in the northwest on the San Juan, apparently either in Mesa Verde or a little farther east in the Upper San Juan around Aztec and the basin of the Navajo Reservoir. As 'Teguayo' was also used to designate a mythical ancestral place of origin, the term puzzled the Spaniards, but causes little difficulty if one realizes that the Pueblos (like ourselves) often duplicate some old names in new areas. (Ellis 1974:2)

References to Tewayó, a mythic land northwest of Santa Fe, occur in Spanish documents dating as far back as the Pueblo Revolt period. For example, Tewayó is plotted northwest of colonial New Mexico in a map dating to the AD 1680s (see Bloom 1934). However, the Spanish became confused regarding the location and significance of this place, and this confusion has led many recent scholars to discount the idea that Tewayó referred to an ancient homeland (e.g., Hodge 1912:712; Sanchez 2006; Tyler 1952). Untangling the historical and scholarly confusion surrounding Tewayó is beyond the scope of this chapter (but see Ortman 2009: ch. 8). Here, it is sufficient to note that its significance and location were finally cleared up by Fray Silvestre Vélez de Escalante in a letter he wrote to Fray Morfi, his superior, a few years after the Dominguez-Escalante Expedition of 1776:

> Before finishing this letter I desire to indicate what is my opinion, at least, upon the Tehuayo and upon the Gran Quivira, whose imaginary greatness has given much to think over from the beginning of the last century to the present. The Tehuayo, according to the diary of Oñate and other ancient narratives, should be considered at the most two hundred leagues to the northwest from Santa Fe; and it is nothing but

> the land by way of which the Tihuas, Tehuas, and the other Indians transmigrated to this kingdom; which is clearly shown by the ruins of the pueblos which I have seen in it, whose form was the same that they afterwards gave to theirs in New Mexico; and the fragments of clay and pottery which I also saw in the said country are much like that which the said Tehuas make today. To which is added the prevailing tradition with them, which proves the same; and that I have gone on foot more than three hundred leagues in the said direction up to 41 degrees and 19 minutes latitude and have found no information whatever among the Indians who today are occupying that country of others who live in pueblos. (Twitchell 1914:278–279)

Escalante focused on the Pueblo Indian traditions of which he had first-hand knowledge and attempted to link these traditions to his direct experiences in the lands northwest of Santa Fe. Those experiences included visits to Ancestral Pueblo ruins on the rim of the Dolores River valley in the Mesa Verde region (Warner 1995). Escalante thus determined, through archaeological and ethnographic observations, that the most likely location of Tewayó, the ancient homeland of the Tewa people, was in fact in the Mesa Verde region. In so doing, he brought Spanish understanding of Tewayó in line with Tewa oral traditions that were remembered by at least a few individuals well into the twentieth century.

Before concluding this section, it is important to address one aspect of Tewa oral tradition that could be construed as evidence that these pueblos originated in the Rio Grande region and not in the Mesa Verde region. The Tewa origin narrative has been recorded independently by several researchers, including Alfonso Ortiz (1969:13–14), Elsie Clews Parsons (1994:9–15), and Jean Jeançon (n.d.). In all cases, this narrative refers to the primordial place of emergence as Sip'op^{h}e, which lies beneath a brackish lake called ʔOkhąngep'okwinge or "Sandy Place Lake." Harrington (1916:567) associated these names with Sierra Blanca Lake in the San Luis Valley of Colorado. The question these data raise is: Why do Tewas consistently talk about their place of emergence as a lake near the headwaters of the Rio Grande if in fact they lived to the northwest, in the Mesa Verde region, before migrating to the northern Rio Grande region?

There are a few reasons why I think Tewa origin narratives do not undermine the hypothesis suggested by other lines of evidence. First, following the earlier discussion of p'okwin, the notion that Tewa people emerged from a lake does not necessarily mean that they emerged from a specific lake. Naranjo relates an interview she had with an elder Tewa man regarding this issue in the following passage:

> *P'oquin* is a high-context word [that] simply means 'lake' [in English]. But in Tewa that's not the case. *P'oquin* is a metaphor that means many things. [For example,] the *p'oquin* is a kiva too, so it's a sacred place. Where there is a *kha-je*, there is a *p'oquin*, or sacred place. Therefore, those places that are *p'oquin* [include] not only the kiva but where you collect Douglas Fir for ceremonial dances; where you bring the Douglas fir to is a prayer shrine, a *p'oquin*. If we came from *P'oquingeh*, it does not mean that we came from a body of water, literally, although that's the way anthropologists and archaeologists have interpreted it. That's the only way they can interpret it if they don't know Tewa [and] they don't understand the many contexts and meanings of *p'oquin*. (Naranjo 2006:53–54)

This passage suggests that ʔOkhąngep'okwinge, in the San Luis Valley, may simply represent the prototypical "lake" in Tewa worldview, based on its characteristics and geographical relationship to the historic Tewa territory, rather than being the actual place where Tewa ethnogenesis occurred.

Tewa worldview provides a solid basis for thinking of Sandy Place Lake in this way. Ortiz explains:

> All peoples try to bring their definitions of group space somehow into line with their cosmologies, but the Pueblos are unusually precise about it. This precision has many, almost inexhaustible, implications because the Pueblos attempt to reproduce this mode of classifying space on a progressively smaller scale. Since all space is sacred and sacred space is inexhaustible, these models of the cosmos can be reproduced endlessly around them. . . . All the Pueblos also have a well-elaborated conception and symbolization of the middle or center of the cosmos, represented by a sipapu, an earth-navel, or the entire village. Usually there are many centers because sacred space can be recreated again and again without ever exhausting its reality. . . . The elaboration of the notion

> of the center has the further implication that the dominant spatial orientation, as well as that of motion, is centripetal or inward. . . . Thus a Pueblo priest, when setting out a dry painting, will first carefully set out the boundaries and then work his way *inward* toward the center. (Ortiz 1972:142–143)

This centripetal orientation reinforces Naranjo's explanation that Tewa people conceive of the world as having layers of lakes, which are located at the far edges of the world, on the tops of their cardinal mountains, at springs closer to home, and within the kivas in their villages. Notice also that, due to this centripetal orientation, events that happened longest ago happened farthest away. Finally, the characteristic Tewa ritual circuit, which is followed in recounting emergence narratives, kiva ceremonies, and plaza dances, always begins in the north (Kurath 1969; Laski 1959; Ortiz 1969). What all this means is that the prototypical emergence place must be a lake located in the far north, beyond the edge of the current Tewa world. Sandy Place Lake fits these criteria perfectly.

Second, as Ellis hinted in her discussion of Tewayó, Pueblo people tend to map pre-existing cosmographical ideas onto whatever environment they find themselves in. In other words, as one moves through the world, the system of lakes that place that person in the center moves as well. A documented example of this process is that the primary cardinal mountain and associated lake of each Tewa pueblo varies in accordance with its geographical location (see Ortiz 1969; Ortman 2008b). This leaves open the possibility that Tewa cosmographical ideas developed elsewhere and were translated to the northern Rio Grande landscape as ancestral Tewas settled into it. This process appears to be reflected in the transfer of directional shrine systems and cardinal mountains from the Mesa Verde region to the Tewa basin (Ortman 2008b), and it is also suggested by the analysis of paired Tewa-Taos place names discussed earlier in this chapter. Specifically, the Tewa name for the actual emergence place, Sip'op^{h}e, is unanalyzable in Tewa, and it appears to be a loan from the proto-Tiwa toponym *tsip'aphún- ("eye-water-black").[14] This toponym loan from Tiwa suggests that Tewa speakers learned of Sierra Blanca Lake from Tiwa speakers, who maintained similar cosmographical beliefs as they settled the northern Rio Grande landscape.

Conclusions

In this chapter, I have amassed a range of evidence suggesting that the Tewa language, and most ancestral Tewa genes, originated in the Mesa Verde region. A summary of this evidence is as follows:

- Metric traits collected from human skeletal remains suggest that Late Coalition– and Classic-period populations of the Tewa and Galisteo basins descended primarily from earlier Mesa Verde region populations.
- Metric traits also suggest that pre–AD 1275 populations of the Rio Grande experienced significant in-migration, and that after AD 1275, immigrants from the Mesa Verde region intermarried with indigenous populations of the Santa Fe district but swamped or displaced existing populations of the Pajarito Plateau, Chama drainage, and Galisteo basin.
- Reconstructed cultural vocabulary suggests that the Tewa language was distinct from other Kiowa-Tanoan languages prior to the AD 980–1100 period.
- Analysis of paired Tewa and Taos place names suggests that Tewa diverged from Tiwa outside the northern Rio Grande region.
- Analysis of Tewa and Taos names for archaeological sites in the northern Rio Grande indicates that Tiwa can be documented in this region from the Late Developmental period, but Tewa can only be documented from the Late Coalition period.
- At least one named ancestral village in southwestern Colorado and events that occurred there were remembered in the early twentieth century, and this site can be identified by matching up archaeological surface remains with the description of the site in the oral tradition.
- Additional toponyms and associated traditions for the environs surrounding this ancestral village have also been recorded independently, despite the fact that neither the informant nor the investigator had been to these places themselves.
- The Tewa language enshrines a number of material metaphors that are not fossilized in other Kiowa-Tanoan languages and are expressed by Mesa Verde material culture, but that in many cases are not expressed by northern Rio Grande material culture.

- Ethnographers have recorded several statements by Tewa people indicating their belief that their former homeland was in southwestern Colorado.
- In the early twentieth century, certain people in Tewa-speaking communities knew the location and Tewa name of this previous homeland.
- Knowledge of the location and name of this homeland was even more widespread among Tewa people in the seventeenth century, and it is reflected in Spanish documents of the period.

Taken together, these data make a strong case that a form of speech directly ancestral to all Tewa dialects was spoken in the Mesa Verde region in the thirteenth century, and that this language was brought to the Rio Grande as a result of large-scale population movement from the Mesa Verde region during that century. There are certainly alternative explanations one might develop for certain of these lines of evidence, but I think the fact that there are so many logically independent lines of evidence leading to the same conclusion offers a significant challenge to models of Tewa origins that do not involve substantial in-migration from the Mesa Verde region.

These findings do not necessarily indicate that the entire population of the Mesa Verde region moved to the northern Rio Grande during the thirteenth century. Indeed, it seems far more likely that the Mesa Verde–region population dispersed broadly, and that groups of immigrants joined existing communities across the Pueblo world. What these data do suggest, however, is that the many thousands of people who migrated to the Tewa and Galisteo basins in the thirteenth century colonized a frontier landscape in such a way that the language, gene pool, and historical identity of the immigrants was preserved.

The evidence discussed here also does not indicate that Tewa was the only Pueblo language ever spoken in the Mesa Verde region. Indeed, by the time Tewa emerged as a distinct language, Ancestral Pueblo people had already been living in the Mesa Verde region for several centuries. Recent syntheses of Mesa Verde–region archaeology indicate that the Ancestral Pueblo occupation of this region occurred in two roughly three-hundred-year cycles of population growth and decline (Varien et al. 2007), and there is nothing in the data presented here to rule out

the possibility that the dominant language of the early cycle was different from that of the late cycle. However, these data do suggest that a form of Tewa speech ancestral to all extant dialects was the dominant language throughout the Mesa Verde region during the second cycle of Ancestral Pueblo occupation.

Finally, the many lines of evidence suggestive of a Mesa Verde homeland for the Tewa pueblos do not suggest that contemporary Tewa culture and society bear a straightforward relationship to the earlier culture and society of the Mesa Verde region. As Lipe and Boyer and others note in their contributions to this volume (chapters 11 and 12), there are surprisingly few characteristics of Late Coalition– and Classic-period material culture that necessarily derive from Mesa Verde material traditions. Indeed, the degree of material discontinuity between Mesa Verde and northern Rio Grande material culture is striking, given the wide range of evidence suggesting that Mesa Verde immigrants formed the majority of the ancestral Tewa population. The problem deserves much more attention than can be devoted to it here. For now, I will simply state that it appears difficult to account for the disjunctions between Mesa Verde and Rio Grande material culture without positing a significant social movement, perhaps akin to the Pueblo Revolt of 1680, which would have encouraged Mesa Verde migrants to discard many homeland traditions in favor of traditions developed by earlier peoples of the Rio Grande and by earlier immigrants. I believe that there are more material continuities than some would propose, but regardless, it may not be a stretch to suggest that a widespread, contagious, and perhaps militant desire for significant social change was part of the social dynamic that led to the final depopulation of the Mesa Verde region. Glowacki (this vol.) makes a similar suggestion, as do Cameron and Duff (2008).

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Notes

1. However, Boyer and others (this vol.) and Maxwell (1994) suggest that robust intrinsic growth could account for these changes. For an extended discussion of previous studies of population in the northern Rio Grande, see Ortman (2009: ch. 3).

2. The people of these Galisteo-basin villages were labeled T^{h}anut'owa, or "down-country people," by their northern brethren. Throughout this paper, unless otherwise noted, Tewa terms are presented using the orthography developed by Esther Martinez for the San Juan dialect (Martinez 1982).

3. Most previous writers considered these immigrants to have derived from Southern Tewa villages (Dozier 1954; Kroskrity 1993; Parsons 1994), but it is also possible that these immigrants were of Northern Tewa origin (Marshall and Walt 2007:40–47; Yava 1978). All accounts are in agreement that the Hopi-Tewa immigrants came primarily from the northern village of Ts'ą̈wa̲di, located on the lower Rio Santa Cruz, across the Rio Grande to the east of Santa Clara Pueblo. It is also clear that inhabitants of several Tano villages moved north and joined their northern kinsmen during the Pueblo Revolt, and that many people from San Cristobal in particular ended up at Ts'ą̈wa̲di by the early 1690s (Marshall and Walt 2007). However, it is unclear whether Ts'ą̈wa̲di was an established village when the Southern Tewas settled there, and Hopi-Tewas remember their homeland village by its Northern Tewa name rather than the Southern Tewa names Yam P'ham-ba or San Cristobal, both of which were transferred to Ts'ą̈wa̲di when the Southern Tewas moved there (Harrington 1916:486).

4. For example, Harrington (1916:483–485) collected a short vocabulary from a Pueblo Galisteo descendant in 1908 that showed that the southern and northern dialects were mutually intelligible as recently as AD 1794, when the last inhabitants of Pueblo Galisteo moved to Santo Domingo Pueblo. Kroskrity (1993:55–60, 71–77) also compared the phonology and basic vocabularies of the present-day Hopi-Tewa and Ohkay'owinge dialects and found them to be very similar, suggesting that they were even more so in 1696. Finally, Speirs (1966:30–36) highlighted several phonological differences between the dialect of Santa Clara Pueblo and that of the other five northern Tewa Pueblos, but found none that interfered with mutual intelligibility.

5. Note that post–AD 1275 regional samples from other portions of the northern Rio Grande, including Pecos, Jemez, Salinas, and Albuquerque, also exhibit

significant affinity with at least one Mesa Verde region sample. This suggests that people from the Mesa Verde region may have migrated to destinations throughout the northern Rio Grande region, in addition to areas occupied by Tewa-speaking people in historic times.

6. In an earlier work (Ortman 2009: ch. 5), I demonstrate that these patterns in biological affinity are not due to missing data estimation or to sampling error, and I also show that, according to the theory of neutral genetic variation, ancestral Tewa populations could not have descended directly from earlier local populations.

7. The situation is somewhat more complicated than is presented here, but these details do not affect the overall conclusion. See Ortman (2009: ch. 6) for an extended analysis of Kiowa-Tanoan phonology.

8. I have pursued this method in lieu of glottochronology because most linguists no longer believe the latter is useful for dating language splits.

9. The list of sources consulted for Kiowa-Tanoan lexical data include Elizabeth Brandt (personal communication, 2006), Frantz and Gardner (1995); Hale (1962); J. P. Harrington (1916, 1928); C. T. Harrington (1920); Henderson and Harrington (1914); Martinez (1982); Robbins, Harrington, and Freire-Marreco (1916); Trager (1946); Laurel Watkins (personal communication, 2008); and Yumitani (1998). In another work (Ortman 2009: ch. 7), I discuss ninety forms that are reconstructed to form various subgroups of Kiowa-Tanoan and analyze their dates of first appearance in the archaeological record. The discussion here is abstracted from this larger analysis.

10. Several of these words ("viga," "adobe," "tortilla") were created from existing words. The terms for "cotton" and "blanket" are probably loans from Uto-Aztecan—e.g., the Tohono O'odham *tokih* ("raw or absorbent cotton, cotton string, any material made of cotton" [Saxton et al. 1983]) and the Hopi *pösaala* ("blanket, rug, wrap, especially a man's" [Hill 1998:441])—and the term for "turquoise" is probably from Keres (the proto-Keres **šúwimu* means "turquoise" [Miller and Davis 1963:326]). I have not been able to identify a source for "macaw," "moccasin," or "shirt."

11. When working with place names, it is difficult to distinguish true cognates from calques or loan translations because toponyms are often compounds, and to the extent that these compounds have transparent morphological analyses, they can be translated into other languages. When this occurs between closely related languages, like Tewa and Taos, the resultant translation will combine morphemes that are themselves cognate. In addition, toponyms can be simplified during the translation process or through the loss of morphemes over time, thus diluting evidence of cognacy.

12. Tewa names for sites that are ruins today typically end in ʻówînkeyi (ʻówîn ["village"] + keyi ["ruin"]) to distinguish them from ʻówînge or occupied villages (e.g., Okeʼówînge for San Juan Pueblo; Thawiʼówînge for Taos Pueblo). However, there is evidence that ʻówînkeyi were originally ʻówînge. For example, the site known today as Yûngeʼówînkeyi was occupied and recorded as Yûngeʼówînge in

sixteenth-century sources (Harrington 1916:227). Also, the ancestral Keres site of Tyuonyi (occupied ca. 1350–1550) is known in Tewa as Puqwige'ówînkeyi, "pueblo ruin where the pottery bases were wiped thin" (Harrington 1916:411; Kohler, Herr, and Root 2004:239). Tewa oral tradition indicates that this name derives from the practices of its ancient inhabitants (Harrington 1916:411; Kohler, Herr, and Root 2004:239), which in turn suggests that the name originated when the site was occupied. These and other examples suggest that 'ówînkeyi are sites that were named by Tewa speakers during their period of occupancy.

13. The various Tewa reflexes of proto-Tanoan *búlu are related via sound symbolism. In a large number of paradigms for Tewa forms, the front vowels /e/ and /a/ indicate smaller scale, whereas the back vowels /o/ and /u/ indicate larger scale (Harrington 1910:16). As examples, compare ʔi pije, "to this place," with hae pije, "to yonder place," and ʔo pije, "to that remote place"; compare heʔe, "small groove, arroyito," with huʔu, "large groove, arroyo"; compare pʰigi, "small and flat," with pʰagi, "large and flat"; and compare be:gi, "small and round," with bu:gi, "large and round." The Tewa forms be:, "pottery bowl, vessel, fruit"; be:ʔe, "small dell"; and bú:ʔú, "large dell, village, plaza," also follow this pattern, with smaller entities indicated by a front vowel and larger entities by a back vowel.

14. If the Tewa form were cognate, the original sound would be a /ts/ instead of /s/. It is also important to note that this place is viewed as the emergence place among Southern Tiwa speakers (Harrington 1920) in addition to Tewas.