Application of a dating methodology that integrates consideration of interactions between site formation and data retrieval has resulted in the detection of high incidences of multiple components and short reuse episodes on sites of both mobile groups and sedentary farmers. Mobile group reuse of sites previously interpreted as single-use locations is distinguishable, as is their ephemeral use of sites once occupied by more stationary residents. These data reveal that mobile group occupations are quite often masked by our conceptual and methodological frameworks. Noticeably, application of the principles and approaches common to and suitable for sedentary systems can be inappropriate, and in fact, detrimental in the archaeological study of mobile group sites. The customary practice of age-averaging multiple chronometric dates obtained from a single site masks multi-componentcy and episodic reuse. Expectations for “contextual congruence” and the standard practice of eliminating apparent “anomalous” results preclude the possibility of discovering the unexpected, identifying the unusual, and uncovering individual short-lived visitation events. Additionally, misreading of chronometric data may result from reliance on a single dating technique that may not be appropriate when addressing complex occupational sequences.

When various chronometric techniques, including radiometric, are handled as dating methods—rather than simply as useful techniques—they can be considered and applied within the framework of informed theory (e.g., Dean 1978). Yet today, samples are often sought and results are applied and interpreted using accumulated knowledge and implicit models of place-use that are appropriate to sedentary rather than ephemeral occupations. This is especially problematic when attempting to identify and appropriately analyze the often-faint traces of mobile groups on landscapes and sites also.
occupied by more sedentary groups. Focus has been on the most robust component in stratified sites rather than the many less conspicuous short-term occupations that succeed it. Additionally, expectations are that “limited-use” sites will not present evidence of periodic and sequential reuse and so interpretations have tended to focus on a single occupational event rather than a diachronic succession of events. These problems are compounded by the fact that many chronometric techniques are not sufficiently precise to parse multiple components—much less ferret out short-term occupations or to differentiate episodes of reuse—as occur under conditions of high residential mobility or reuse of logistical locations. A revised conceptual framework and minor adjustments in the application of available dating techniques result in access to new forms of knowledge.

These issues are discussed using case studies from the American Southwest (Figure 1) but are applicable to problems throughout the world where similar degrees of mobility prevail.

This article is distilled from an on-going systematic effort to address the problem of detecting and dating the ephemeral traces of mobile occupations during the Terminal Prehistoric and Historic periods (A.D. 1300–1800). The earlier portion of that time frame is often referred to as the Protohistoric. Remains of Protohistoric occupations are often superimposed on, or intermixed with, the more obtrusive remains of earlier sedentary groups, and the methods discussed here are aimed at unraveling evidence of successive short-term uses on these intensively occupied sites as well as on sites that may present little evidence of use overall. Expectations for differences in periodicity, duration, and intensity of occupation have been derived from the ethnographic and ethnohistoric records and from the development of theory aimed at a general archaeology for the study of mobile groups.

Figure 1. Map of Southern Southwest with sites and regions mentioned in text. (1) Jornada Mogollon Culture Area is as defined by Lehmer (1948), although some consider its boundaries to continue east into the Trans-Pecos area (e.g., Corley 1965). (2) Pintada Rockshelter. (3) FB 9423, North Otero Mesa Tipi Ring Site. (4) 41EP401 (FB 16715) in the Franklin Mountains. (5) 1800s Apache Site in the Dragoon Mountains. (6) Llano Estacado. (7) Salinas Pueblo area. (8) Cerro Rojo Site. (9) Sharples Site.
Distinctions between the Late and Terminal Prehistoric, Initial Contact, and Early Historic periods illustrate recent advances in our understanding of the nature and timing of changes during this interval. Throughout the American Southwest, fundamental transformations are recognized in local and regional systems in the 1200s (Late Prehistoric) when the predominant pattern of pit-house use is replaced by compounds and pueblos (Cordell 1984:328–337; Reid and Whittlesey 1997:100–101, 146, 190–191; Rouse 1962:27, 31). These developments are concomitant with formation of population aggregations and intensification of increasingly complex agricultural systems that collapsed or reorganized around the A.D. 1400s and then were replaced by Protohistoric groups and systems (Cordell 1984:328–337, 360; Reid and Whittlesey 1997:107–110, 161–165, 198; Rouse 1962:31, 40–48).

This traditional view, however, may require revision. An ever enlarging set of chronometric dates found in direct association with distinct material culture sets is beginning to indicate that Protohistoric groups with at least three general life ways were present in the southern Southwest by or before the 1400s. These were the sedentary Sobaipuri-O’odham Cayetano complex, along with the early Athapaskan Cerro Rojo complex and a variety of Canutillo complex mobile groups (see Seymour 2002, 2004, 2008a, 2009a). Athapaskan presence apparently preceded the other Protohistoric groups with dates in the 1300s, if not the late 1200s (see Seymour 2007a, 2007b, 2008a, 2008b, 2009b). This means that some of these historically known groups overlapped with prehistoric farmers and either contributed to, witnessed, or experienced their disruption.

Like the traditional view that Protohistoric peoples replaced already vanished sedentary groups, our views of these groups themselves also require revision. When mentioned in the 1500s by the first Europeans, many of these groups were very different than those described in the 1600s, suggesting substantial changes had already occurred, making use of direct historical approaches and uncritical use of documentary sources imprudent (Seymour 2007a, 2008a, 2008b, 2009b). The archaeology of this Terminal Prehistoric and earliest Contact interval provides a view of the nature and timing of change that revises the later historic record. Use of chronological terms such as “Terminal Prehistoric” and “Initial Contact” rather than “Late Prehistoric” and “Protohistoric” refocuses investigations on this critical period, to shorter intervals of time, and separates this sequence of events, processes, and the key players from the better-known prehistoric groups. An ever-increasing database of chronometric dates from an enlarging roster of sites from the Terminal Prehistoric and Initial Contact time frame provide a basis for understanding a range of persistent research issues, including the presence and role of the less conspicuous groups in the procession of local and large-scale events. New data combine with existing and revised approaches of interpretation to form a new view of mobile groups who occupied portions of the Southwest as Europeans first encountered the region.

**Contextual Congruence: Diachronic Reoccupation vs. Anomalies**

Dean (1978:251) discusses the principle of contextual congruence, which posits that dating anomalies may be detected on the basis of apparent inconsistencies between the dates and other archaeological data. [It is the archaeologist’s] reservoir of accumulated knowledge that enables him to place the site into some sort of temporal, spatial, and relational framework. This frame of reference permits the recognition of dates that are inconsistent with the expected temporal position of the site.

While seeking contextual congruence is common practice and fundamental to interpreting and evaluating dates, expectations for contextual congruence create one avenue of interpretive misdirection and can impede our understanding of mobile group sites, making it difficult to recognize these ephemeral components. Preconception of a specific occupation range creates a set of secondary assumptions about the interrelation of features and artifacts in the archaeological context. These preconceptions may remain set, even in the face of chronometric evidence to the contrary. Some researchers have discarded dates that produced consistent results, even from two separate chronometric techniques, in favor of aligning a preconceived occupational span with the presence of artifacts
believed to be diagnostic (see Seymour 2008c:Table 2).

The existing conceptual model causes results to be interpreted with respect to existing understandings of the data. It also assumes that when there are divergent dates the prudent scholar will exclude these as anomalous because they do not conform to expectations derived from existing knowledge (e.g., Seymour 2008c). Based upon probabilities, statistical outliers can be reasonably excluded because they are not likely to relate to or inform on the dominant or most easily recognized component. Yet, these statistical outliers may be the first hint of a secondary component or an unexpected event. A revised working model would encourage practitioners to also explore the possibility that the supposed anomalous dates provide evidence of an occupational scenario that differs from expectations. This involves entertaining alternative models of site formation that allow for extremely subtle indications of multiple components associated with repeated occupations, including later occupations in the fill of prehistoric structures.

This places the chronometric data requirement higher up on the list of research issues to be addressed during site investigations. It also necessitates a flexible research design that recognizes the role of dates in understanding other research issues and that can accommodate a change in course when initial expectations are not met. Dates run concurrent with fieldwork or between seasons allow time to incorporate results that may take 6 to 12 months to receive, and enable the researcher to objectively rule out archaeological evidence of another component before rejecting the results because they are truly anomalous. With access to results while fieldwork is underway, researchers can look specifically for evidence of repeated use while still in the field; that is, when appropriate methodologies can be applied to the collection of these often unobtrusive data.

This procedure has been instrumental in defining Terminal Prehistoric and Early Historic complexes throughout the southern Southwest. These complexes are known historically to have occurred but until recently have defied archaeological recognition; in these cases in particular, the timely collection of chronometric dates during ongoing fieldwork has been crucial to the identification of individual and sequential mobile occupational events. In many instances, the availability of dates, where previously there had been few or none, has fundamentally changed understandings of the local or regional sequence.

Concentration on the “richer” archaeological record of sedentary peoples has also impeded an improved understanding of mobile groups. When lacking accurate accumulated knowledge of sites and components left by mobile peoples, even the most parsimonious inferences can be biased toward the better-known, more intensively studied groups, such as sedentary farmers. This is the risk of resorting to “common sense” in the face of anomalies that call for rigorous analysis. Schiffer (1987:309) has added to Dean’s (1978) earlier work in warning against this intellectual trap.

As Schiffer (1987) notes, “the traditional way to deal with conflicting (i.e., variable) dates is to select only those dates that are in agreement with one’s prior positions on chronological issues; the widely practiced art of ‘accepting’ and ‘rejecting’ dates” (1987:309). This practice is particularly problematic if the site lacks well-defined and continuous strata—the connective tissue that allows observation of interruptions, intrusions, and sequential occupations. The often-subtle indices of multi-componentcy and reuse are most likely to be missed when the researcher has pre-packaged a set of chronological assumptions concerning a site’s occupational history. Such bundled conceptual frameworks are difficult to unravel because they are so handy to tote around. But as Jeffrey Dean (personal communication 2006) notes,

The purpose of identifying potential anomalous dates (which are anomalous relative to some defined target event), through the application of contextual congruence or any other principle, is not to ignore or discard them. Rather, it is to highlight apparent irregularities that have to be explained. Explanation should lead to the identification of erroneous dates (which do exist) or of otherwise unrecognized human activities (multiple use episodes, etc.) at the site.

It is precisely the failure to “highlight apparent irregularities that have to be explained” that has impeded recognition of the characteristic signatures of mobile group occupations, both on sites occupied only by mobile groups and those reoccupied by mobile
groups after sedentary occupations.

Regrettably, multiple occupancy and multiple componentcy are generally not expected on sites with limited accumulations of cultural material, which sometimes also have barely perceivable features. Yet, mounting evidence from dozens of recently dated mobile group components is showing that even sites consisting of thin shallow deposits, low accumulation indices, and vestiges of insubstantial features possess evidence of periodic reuse and may actually be persistent places. Methodological approaches appropriate to the tempo, scale, periodicity, and duration of mobile landscape use are beginning to isolate mobile group components on sites that experienced multiple occupancies. By taking into account gradations of mobility and applying innovative approaches, it is now possible to distinguish between (a) short-term episodic use, (b) entirely transient one-time use, and (c) persistent episodic use over a short or long period. Greater progress has also been made in identifying mobile group components that are positioned over complex sedentary sites that were used for decades, if not centuries, even when these layers of use are compacted into thin shallow strata or collapsed onto a single surface as palimpsests. Contextual incongruities, often in the form of anomalous dates, are now seen as gateways to discovery of mobile occupational events, revealing a diachronically dynamic cultural landscape. Contextual incongruities that are portents of distinct occupational events can, in due course, be confirmed by other forms of data.

**Anomalous Dates Case Study:**
**Pintada Rock Shelter**

Pintada Rock Shelter, located along Otero Mesa in southern New Mexico, illustrates the problems that occur when one ignores episodic use sequences and dismisses dates that deviate from a priori expectations. Investigating the Archaic occupation of the site, MacNeish (1998, *2003a) dismissed eight late radiocarbon and obsidian hydration dates that did not fit his reconstruction of the occupational history. The dates derived from a mixed layer that overlaid the Jornada Mogollon component in Zone A in the upper 20 cm of sediments. Projectile points and bifaces diagnostic of the non-Athapaskan mobile Canutillo complex (Seymour 2002, 2009a) correspond well with some of the dates from this zone, clearly indicating a Protohistoric mobile occupation (Seymour and Church 2007). Yet, because the diagnostic attributes of this cultural phenomenon had yet to be defined, MacNeish (1998:165) assumed that the finely crafted tools represented the Archaic occupants—who also produced formal leaf-shaped bifaces that are only superficially similar to the Protohistoric diagnostics (Seymour 2009a). He dismissed the late dates as “unfortunate” and “erroneous,” and in doing so overlooked the Terminal Prehistoric component, collapsing the late-occurring artifacts into his Archaic analysis (see Seymour and Church 2007). Had he attempted to find an explanation for the association of late dates with finely crafted tools, he might have been the first to determine that they are clear indicators of a yet-to-be-defined Terminal Prehistoric (Protohistoric) Canutillo complex occupation.

**Sampling Bias of Sure Bets and Best Cases**

At times, problems arise from the criteria used for selection of materials for dating rather than from the elimination of dates that have been run. Some sites produce so little datable material that all promising samples are submitted. It is also common, however, especially on multiple component sites, to have a larger sampling universe with which to work. In such cases sampling may be biased when the researcher focuses on “strong patterns” (Plog 1984; Upham 1994), which “emphasize obtrusive archaeological remains and conspicuous elements of the archaeological record, even if there is also a low visibility record of human occupation in the region” (Upham 1994:118). These strong patterns or best cases are contexts and chronometric samples that are deemed most likely to provide a usable or expected result and also to confirm and validate target events. For example, when following normal archaeological chronometric sample-selection criteria, mostly large thermal features with an abundance of clearly definable charcoal or the darkest fill will be selected because these have proven time and again to present definitive and expected results. These features are favored because they are single-function (although often multiple-event), and are often predictably situated in particular landscape settings and resource zones. Yet selection of these types of features can lead to a
bias against datable features of other periods that (a) occur in different landscape settings, (b) were used for different purposes, or (c) leave less obvious signatures.

When seeking evidence for Protohistoric mobile group occupations, the “best cases” are defined as the mirror opposite of the traditional model developed for sedentary groups. Mobile group thermal features are often more difficult to identify than those left by sedentary occupations or repeated reoccupations in the Archaic. This is due to the use of smaller pieces of fuel (brush, grass, twigs, etc.) that create a less-distinguishable deposit than wood charcoal (Seymour 1995, 2002, 2003a); the desirability of smaller fires so as not to attract attention (Seymour 1995, 2002; Sweeney 1997:72); foodways involving cooking techniques that do not demand sustained high-temperatures (Ayer 1965:14; Beckett and Corbett 1992:30; Treutlein 1965:53); preparation of staples in roasting pits situated at some distance from the habitation setting (Opler 1996:357); and so on (Seymour 1995, 2002, 2005b, 2007c). Consequently, sample selection must involve thoughtful consideration of the ways in which materials, contexts, and techniques were put to work by people practicing very different lifeways.

Because of their lower visibility, these types of features are often not recognized—which is a challenge that can be particularly problematic on multiple component sites. Thermal features that are more noticeable (because they contain large quantities of fire-cracked rock or dark fill from repeated use) tend to be selected over the vaguest features. Yet, many times isolated deflated burned-rock scatters, vague charcoal-stained sediments, or charcoal-infused ash deposits reflect dates many centuries apart from the more well-defined and obvious features of associated components, but their distinct nature becomes readily apparent only if they are selected for dating. The lower frequency and smaller size of datable material in these features means that they are often bypassed for dating because they are either not noticed or, when facing a limited budget, they are not chosen because they are more costly to run or are not as certain to return a date. A benefit of these less-obtrusive features is that the use of brushy materials (short-lived species) means that they often do not tend to suffer from the “old wood” problem (Schiffer 1982, 1986; Seymour 2003a, 2005b).

“Sampling Bias” Case Study: The End of the Jornada Mogollon

The sampling bias toward large thermal features obtrusively colocated with the most densely distributed artifact scatters can color the characterization of entire occupational sequences. The inadvertent bias away from sampling Terminal Prehistoric and Early Historic period features results from a lack of understanding mobility: degrees of mobility; expected duration of stay; fuel choices; foodway customs; site reuse; and desire to maintain low visibility in the face of enemy threat. These and other aspects of mobile patterns affect the way dates must be sought, selected, and interpreted.

An example of the consequence of not considering the effects of sampling strategies is again provided from the Jornada Mogollon area of southern New Mexico and southwest Texas (e.g., Trans-Pecos). Miller (2001:106) notes a general downward trend in the number of datable contexts from A.D. 1400 to 1500, a period that spans the Terminal Prehistoric and Early Historic periods in the Jornada Mogollon area. More recent work (Seymour 2002, 2003a, 2004, 2007c; Seymour and Church 2007) indicates continued occupation of the Jornada area at levels comparable to earlier periods. This occupation, however, manifests in different types of features, contexts, and landscape settings than the earlier periods, and leaves a lighter footprint. By looking mostly in the valleys (where most contract work has been conducted) the abundant evidence in the adjacent mountains and foothills has been removed from the equation. This practice continues despite the fact that the ethnographic and ethnographic records indicate these nonvalley locations tended to be the focus of activity. Moreover, by ignoring intrusive features, incongruent dates, and out-of-place artifacts reuse of valley-based sites is not being recognized.

Expectations for use by a single culture group for a specified period of time on Jornada Mogollon sites reduces the ability to recognize the unobtrusive evidence of later use by visitors with a different footprint who might use the site and its features in a different way and who organize their space differently, including in a less-focused manner. These biases can be counteracted by understanding the behavioral context of features themselves and the varied lifeway of the region’s more mobile residents during these later periods. The effect can also be neu-
tralized by recognizing the proclivity for these late features on multicomponent sites to be passed over for sampling and dating.

Redefining “Diagnostic”

A narrow definition of what constitutes a temporally or culturally diagnostic artifact exacerbates the difficulties created by dismissing contextual incongruities when assigning dates to components. This problem is enmeshed in how diagnostics are classified and the weight given them when assessing temporal assignments. For example, it is common knowledge that at a general and practical level, Southwestern diagnostics tend to include decorated pottery and exclude plainwares, and include projectile points while generally rejecting other tool forms owing to the belief that only a limited range of items have a distinctive form or style (e.g., Gladwin and Gladwin 1935; Hole and Heizer 1977:173–182; Smith 1976:70–74). The problem of distinguishing a light mobile group footprint begins with a reassessment of artifact attributes that indicate mobile group presence.

The bias toward pottery and projectile points, and the strong emphasis on decorated pottery as an emblem of cultural identity, means that mobile sites and components will be rendered invisible or will be misinterpreted as limited-use settings created by pottery-producing sedentary groups. One reason for this is that mobile groups rarely used or made pottery and when they did it tended to be plainware. Further, the pottery found on mobile group sites was often obtained from other groups, so, as I have previously noted (Seymour 2002, 2003a, 2008d), assignment of cultural affiliation on the basis of a few sherds will often miss-identify the actual occupants. The assemblage for the component as a whole must be examined, and an expectation for an amalgamation of material from more than one group incorporated into interpretative frameworks. It is necessary to consider the succession of events affecting the distribution of incongruent pottery in mobile group settings. This paradoxically depends upon the ability to recognize its incongruence, which in turn is dependent upon consideration of models appropriate to mobile occupation and the ability to recognize other indices of mobility and raiding.

The abundance or distinctive nature of material culture present is often overemphasized and is used as confirmation of cultural and temporal affiliation (see Shepard 1956 for a discussion of reliability of the abundance criterion). This biases interpretations toward assigning occupations to groups who produced and discarded more material culture—especially material culture that the archaeologist can readily assign to a type (also see Upham 1984:239–240). This is most pronounced when the material culture assemblage of the mobile component is impoverished, as is typically the case, but it is especially problematic on multicomponent sites. Low-density and low-diversity assemblages may result for a host of reasons (see Seymour 2005b). Fewer items accumulate because of: (a) limitations on what (and how much) can be transported by people on the move (Ball 1970; Opler 1996:357, 371); (b) the prevalence of multifunctional and more durable tools that limit the number of items potentially broken and left behind (Seymour 2002:323, 2005b); (c) the relatively high percentage of perishable goods (Opler 1966); and (d) unique discard practices (i.e., the tendency for task-specific items to be discarded or stored at a series of locations on an occupational circuit; Ball 1970; Basehart 1960:104–105; Betzinez and Nye 1959; Opler 1974:7; Seymour 2002, 2005b). Under such circumstances even small amounts of distinct, typologically secure material representing another better-known or more sedentary group tend to receive greater emphasis when assessing a site’s temporal and cultural placement.

Diagnostic material culture derived from other groups may occur on mobile group sites for a number of reasons, not just as a result of site reuse. More often than not, material culture from a secondary group on a predominantly mobile group site is incidental, but because it is diagnostic it is frequently assigned greater weight than is warranted, leading to a misinterpretation of the site’s occupational history. Rather than representing an earlier or later occupation, this evidence of other groups may indicate: (a) information on the way the mobile group interacted with other groups (i.e., raiding or trading; Goodwin 1929–1939; Opler 1996:398); (b) scavenging of prehistoric or contemporaneous caches and vacant sites (Goodwin and Bass 1971:231; Opler 1996:389); or (c) an incidental occurrence of an item at a location (such as a stray projectile point or a pot break) as part of the general background scatter of artifacts across the land-
scape (see Seymour 2002, 2005b for examples). The difficulty is in distinguishing the light imprint of mobile groups when more visible items of material culture seize the archaeologist’s attention.

In such cases, it will be useful to extend our modes of recognition, analysis, and inference building to match the conditions presented by the archaeological (and, in many cases, documentary) record. This must be accomplished on its own terms rather than expecting the record to conform to a set of unrealistic or inappropriate models. The documentary (ethnohistoric, ethnographic, and historic) record provides evidence of interethnic contact and unique forms of landscape use relative to earlier groups. When appropriately modeled, these guides can help lay the groundwork for more accurate archaeological expectations, especially when these sources relate information that is in direct reference to the groups and sites being studied. These can help us incorporate high-profile diagnostics into our interpretive models of site use, including accurately assessing data as supplemental or incidental to occupation by a mobile group. This allows us to surmount the awkward reality that sites may contain both an amalgamation of material from more than one group and present only a partial and scant set of materials from the target group.

Diagnostics Case Studies: Raiding Sites and Trading

Component invisibility in the face of highly recognizable diagnostic artifacts is an especially pronounced problem for raiding and trading groups who did not themselves create and discard large numbers of artifacts. For example, when raiding groups are in retreat they may take little of their own material culture with them or they may intentionally clean up (Haley 1981:81–82; Opler 1996:427–428; Seymour 2002:353), which would make themselves less visible. What they do leave often includes materials obtained on the raid. This material, being diagnostic of another group, may be useful for dating the site but frequently leads to inappropriate cultural assignments, such as when the presence of Hopi or Piro sherds on a mobile group site (Gilpin and Phillips 1998:25) are used to assign cultural affiliation to those better-known groups. Yet, it is not uncommon to find discarded horseshoes or non-native accoutrements along Apache raider’s escape routes, as is apparent, for example, at 41EP401 (FB 16715) in the Franklin Mountains near El Paso, Texas (Seymour 2002). Similarly, the most visible evidence on some late Apache sites often includes remnants of discarded containers (nails from wooden boxes; sherds from pottery vessels) that were emptied of their valuable contents to lighten a load—as is evident at a small late (nineteenth-century) Chiricahua Apache habitation site I recorded in the Dragoon Mountains near Tucson, Arizona. Undoubtedly, similar factors are applicable to the use and disposal of indigenous containers and materials obtained during raids. This likely accounts for the distribution of material culture in contexts far beyond the reaches of the donor groups, as seemingly occurs on some of the small specialized dunal sites I have recorded on the Llano Estacado.

While it is generally accepted that mobile groups engaged in raiding and therefore the material culture of other groups ended up in their sites, this acceptance is generally not extended to ceramic vessels (nor is it generally considered in the pre-Contact period owing to the widespread assumption that raiding was a late-Apache adaptation). This is because a late nineteenth-century model of raiding is being adopted that in many instances would preclude the transport of breakable and bulky items. Yet, the fast-and-furious hit-and-run tactics of the late Apache adaptation are not characteristic of the earliest Historic period when substantially different raiding practices are documented in the ethnohistoric record. In the 1530s Cabeza de Vaca records that villagers fled to the hills leaving the village unattended or stayed and acceded to the theft of material to avoid conflict (Hodge 1990; Seymour 2002). This allowed time for looters to remove and carry away select bulky and breakable materials, such as vessels filled with grain that could be used for water-storage or cooking vessels in their new contexts.

Low densities of certain types of artifacts can also be the result of knowledge of resources available at a known destination. The Salinas Pueblos provide a case in point. Documentary (ethnohistoric and historic) records indicate that mobile groups visited the pueblos to trade bison products for corn and processed goods (Baugh 1984, 1991; Kenner 1969; Spielmann 1982; Vehik 2002). Rather than bringing “coals to Newcastle,” Plains nomads transported as many exchangeable goods as possible
would have minimized extraneous utilitarian pottery or other equipment that would have been available at the pueblos (Seymour 2006a, 2007d). Under such circumstances, intrusive (and potentially inferior) pottery might not be expected in the host pueblo’s archaeological contexts. Moreover, since one of the primary purposes of such meetings was to exchange goods, material culture would have moved between or across cultural contexts. It is also likely that such meetings would have included feasting rites outside the pueblo confines, where most of the interface seems to have taken place (Seymour 2005a, 2006a, 2006b, 2007d, 2008f), resulting in the deposition of Puebloan pottery in the mobile group locus.

These processes are consistent with recent research. Mobile group structure outlines have been found on the slopes near Salinas-area pueblos, surrounded by light scatters of Puebloan pottery and artifacts, with an occasional hint of Plains artifacts (such as nonlocal lithic materials and Plains-style tools; Seymour 2005a, 2006a, 2006b, 2007d, 2008f). The Puebloan items result from centuries of Puebloan discard and their limited use of such locations, but also from use of the host’s material culture by visiting mobile groups. Similarly, most of the identifiable (and valuable) Plains items (e.g., nicely crafted bifacial knives) have been recovered archaeologically from purely Puebloan contexts, such as middens and house floors within or immediately adjacent to the pueblo itself. This “transference” is a process that is expected among trading partners but has rarely been incorporated into expectations for distributions of material culture at mobile group encampments surrounding pueblos. Consequently, by privileging the most audible voice—that of decorated pottery and projectile points—over architecture, landscape use, and flaked stone, and by ignoring historically documented processes, mobile groups have been rendered invisible.

**Quantification and Low Frequency Occurrences**

The problem being discussed is compounded by the subtle forms of evidence that help archaeologists distinguish between alternative interpretations for mobile group occupations. Interpretation of this subtle and low-frequency evidence is often obscured rather than illuminated by statistical analysis. Key evidence often comes in the form of a small number of items, creating distributions that significance tests would assign to chance. Archaeologists are trained to seek commonalities rather than differences, and often discard outliers to “improve” their statistical results. Unfortunately, it is these outliers that may signal the presence of mobile groups in mixed assemblages. The oft-faint evidence of mobile groups overlying or cohabiting a sedentary landscape lies outside the field of vision, a viewshed that focuses on the dense cluster at the center of the graph or the linear arrangement of the better-understood and more obvious distributions. This is exacerbated by high thresholds of adequacy—the higher the threshold, the higher the probability that the patterns reflect behavior (rather than poor collection methods, for example), but also the greater the likelihood that less robust signatures will be obscured. In fact, a deliberate consequence is that more unique manifestations are relegated to irrelevance. Regrettably, an unintended consequence is that material evidence of most mobile groups falls at the outer edges of the graph. The classic battleship curves and scatter plots of traditional analyses are useless when searching for the presence of a people who only broke one pot during their entire occupation, especially if that pot was not their own.

The invisibility of so-called unique manifestations is exacerbated by the perceived need for quantification and the value of large numbers. Consequently, the denser and more complex the sedentary ceramic period occupation, the less likely the mobile one will be seen. Relatively speaking, mobile occupations become more and more invisible in comparison to the increased robusticity of the sedentary dataset.

**Quantification and Visibility Case Study: The Cerro Rojo Site**

It is conceptually difficult to bypass the relative abundance and familiarity of one component in order to visualize the less-obtrusive ones. It is even more difficult to envision a component that has not been previously archaeologically defined (even when it is dominant), when small amounts of the material culture of a known more obtrusive group are present. The hilltop site of Cerro Rojo (FB 9609; Seymour 2002, 2003a, 2004) provides an
example. About 300 historic Apache (i.e., Cerro Rojo complex) and Canutillo complex features are intermixed with relatively limited Jornada Mogollon, Archaic, and historic mining components. The dozen or so Jornada manifestations (fire pits, roasting pits, shelters, and shrines) are most visible because they represent a known and more robust signature and include associations of known diagnostic artifacts, though they occur in relatively low frequencies.

Owing to (a) the presence of this more recognizable (though relatively inconsequential) Jornada component, (b) the expectation that lesser known manifestations (such as Apache) are invisible, and (c) the application of inappropriate models of landscape use and settlement types, previous recorders did not recognize 95 percent of the spatial extent of the site or its features. Initially recorded as a 40 m by 100 m fortified site of possible Jornada Mogollon affiliation (Beckes et al. 1977), later recorders expanded the site to 115 m by 85 m, where 15 rock enclosures and several hundred artifacts were acknowledged but it was determined that “there are no overt indications of a protohistoric or early historic occupation at this site” (Baugh and Sechrist 2000:184).

Subsequent examination within a region-wide context reveals that the Jornada components are relatively small and spatially restricted, representing limited-use localities within a larger settlement system. In contrast, the Terminal Prehistoric and Historic mobile group components are widespread and represented by relative dense and abundant evidence. This mountaintop site contains thousands of artifacts and 275 features dispersed in discrete loci across about 130 acres (Seymour 2002, 2004, 2008c, 2009c). Features include 212 structure outlines that are similar in morphology to many throughout the region, including those on a site that was photographed in 1886 during the famous Chiricahua Apache Geronimo’s attempted surrender at Cañon de los Embudos in Sonora, Mexico (Seymour 2009c); and to another, earlier location in the Dragoon Mountains of Arizona that was where the Apache leader Cochise met General Howard to negotiate a treaty in 1872 (Seymour and Robertson 2008). The association of at least eight unique plainware varieties and their dates with diagnostic stone tools confirms a picture of episodic settlement by distinct social groups falling within two (Cerro Rojo and Canutillo) traditions. The Cerro Rojo complex signals the presence of ancestral Apachean raiders (Seymour 2002, 2003a, 2004, 2008c, 2008d). An equally distinctive Canutillo complex found at the Cerro Rojo Site may be assignable to any of a number of ethnohistorically known groups for the region, including the Jano, Jocome, Manso, Suma, or even some other, unknown group (Seymour 2002, 2003a, 2004, 2008c, 2008d).

The prehistoric and historic components are also distinguished by six radiometric and 11 luminescence dates, multiple petrographic analyses, extensive artifact attribute analyses, and test excavations (see Seymour 2004, 2008c). Dates on the later components range from the 1400s/1500s through the early 1800s and are consistent with the area-specific and regionally applicable ethnohistoric record that indicates people like these were present at first contact. In fact, the earliest applicable date (A.D. 1420 ± 80; Sample X1516) predates initial European contact and indicates the occupants could have looked out across the landscape to see the first Europeans crossing the Rio Grande on their way north into New Mexico.

Documentary (ethnohistoric, ethnographic, and historic) records report a mobile pattern of landscape use. These sources also document the coming together of normally dispersed bands and local groups into large aggregations in out-of-the-way places, such as the deep and rugged Hueco Mountains where the Cerro Rojo Site is located (Seymour 2004, 2008c). When the Cerro Rojo Site is interpreted using regionally and temporally specific ethnographic models and ethnohistoric data, its character becomes clear. Cumulative, repeated occupation creates an archaeological pattern of house clusters spread out across the mountain top. The placement of habitation features in discrete loci at Cerro Rojo suggests recurring though intermittent gatherings for specific occasions by a number of individual social groups. These groups maintained spatial separation, presumably as a reflection of geographically based social divisions. Defensive walls and ramparts augment the defensiveness of the setting, tangibly conveying the perilous social world that was characteristic of this time.

Individual episodes of use at Cerro Rojo are marked in part by discrete dates, including radiometric results from charred material and from lumi-
nescence analyses run on pottery and burned caliche. The pottery selected for analysis met the following criteria: (1) plain brownware attributed to Apachean groups; (2) plain brownware inferred to be associated with the river-side mission settlements (Valle Bajo); and (3) plain brownwares of unknown origin but distinct from contemporaneous types and from earlier types associated with the prehistoric Jornada Mogollon occupation. Classifications of Cerro Rojo’s plainware varieties are based on petrographic analysis and visual examination of the technological and compositional attributes, and their placement in this late period is consistent with their luminescence dates.

Despite its association with Apache/Cerro Rojo and Canutillo material culture complexes, it has not been assumed that all late-occurring pottery found at the Cerro Rojo Site is directly attributable to groups who resided there. Some may have been obtained via raiding, trading, and gifting from groups dispersed over a wide interaction sphere. These materials would have been brought to the site during occupation episodes spread out over some five centuries. This inference is derived from dating individual sherds and pot breaks from Cerro Rojo, some of which do not belong to either the Cerro Rojo or the Canutillo complex, and which cannot be assigned to any of the many pottery types described for the Jornada region (Seymour 2002, 2003a, 2004, 2008c, 2008d).

As our knowledge of the distribution of Terminal Prehistoric and Historic plainwares in the Jornada region expands, the chronological and spatial anchoring of materials from Cerro Rojo should assist in developing a picture of the social and political affiliations that unfolded both before and after European contact. This valuable information would not be available but for vigorous pursuit of chronological information using the models suggested here.

Diachronic Occupation on a Single Site and Age Averaging

Age averaging relies on the reasoning that when recognized archaeological correlates on a site point to a limited, short-term occupation, all dates should overlap. Thus, averaging is a way to increase the robusticity of a date set. As Reed and Horn (1990) logically reason when averaging six radiocarbon ages at the Navajo site of Kin’ Atsá (LA 49498), “the tight clustering of the radiocarbon ages also argues for the accuracy of the age determinations because the use of long-dead wood would result in marked differences in ages between samples and greater standard deviation” (1990:288).

Confidence is heightened when multiple dates produce similar results and are averaged because the “old wood problem” and the “cross-section effect” are less likely to be in play (Schiffer 1982, 1986; Smiley and Ahlstrom 1998). Yet, efforts to guard against influence from these two widely recognized problems may introduce other interpretive troubles. Specifically, the practice of averaging results obtained from multiple dates masks multicomponenty and episodic reuse. This logical disjunction is most detrimental in mobile group studies because averaging, or attempting to fit multiple dates into a single synchronic event, means that occupations that take place over spans of centuries or less are frequently obscured. For mobile groups this is particularly problematic; non-occupational activities that take place during even shorter intervals are completely masked.

Schiffer (1987:309) finds statistical techniques for isolating central tendencies unsatisfactory because this approach “is incapable of detecting biases in a series of dates and because it treats all dates as being equally informative about past cultural events.” If one can demonstrate that all samples are extracted from behaviorally complementary or equivalent contexts, such concerns may be obviated. Yet, frequently, this assumption is made prematurely and elements of multiple episodes of use are collapsed into a single occupational narrative. Often, the aggregate of a series of limited-use contexts and short-term activities results in what appears to be a good example of a single-use event. A deeper understanding may be achieved when discordant dating results are allowed to cause interpretive pause as one considers a potential lack of contextual equivalency.

Entertaining alternative models of site formation has the benefit of highlighting subtle indications of multicomponenty and episodic reuse. Some sites produce non-overlapping dates widely separated in time. Often seen as irresolvable anomalies, these sites may have been important locations in specific adaptations occupied for short periods of time in order to complete a single task. These
Age Averaging Case Study: The Sharples Site

A prime example of the potential pitfalls of age-averaging, as well as the ways in which use of two chronometric techniques in an integrated methodology address this repeated-use issue, is provided by work on the Sharples Site (AZ DD:8:44, ASM). This site, situated on a terrace that overlooks the Santa Cruz River near Tubac, Arizona, was mapped, surface collected, and the mobile group component selectively excavated by the author and a volunteer crew. The mobile group occupation is represented by a veneer of material culture that partially overlies a near-surface radiocarbon-dated prehistoric occupation and then used for dating, even if not indicative of specific or identifiable cultural affiliation (Seymour 2003a, 2008d). Understanding can be aided by using parallel or converging lines of evidence that increase confidence levels and take into account the behavioral processes that influence sample discovery, selection, and interpretation.

The string of dates suggests multiple episodes of use and reuse. This scenario is supported by ethnographic descriptions and archaeologically devised models of mobile group landscape use and behavior, and is consistent with other on-site data (Seymour 2009a). The replication of stationary feature types and the relatively high density and diversity of artifacts (that is, relative to most regional mobile group sites) at the Sharples Site provide evidence of what was probably a multiple series of encampments by small residential groups. In any one area artifacts were relatively sparse but cumulatively, over the entire spatial distribution of the component, diversity was relatively high with a replication of tool kit elements and maintenance debris. Pairs of rock hut outlines from mobile groups were scattered around the site without regard to one another or to any formalized plan. Specialized work stations—individually consisting of groundstone, anvil stones, hide working stones, and chipping stations—showed evidence of light use and duplication of purpose, presumably indicating replacement during each visit to the site or perhaps communally focused use areas during a somewhat larger gathering.

Two AMS radiocarbon dates were run on small flecks of charred brushy material, one from a structure, the other from an extramural thermal feature. Both individually and together they provide a general idea that this component was occupied during the inclusive dates of A.D. 1430 to 1630 (Table 1). These two internally consistent radiocarbon results suggest that they are dating events that occurred within relatively the same analytical period. The individual 2-sigma standard deviations of the radiocarbon determinations are quite broad, and when the dates are considered together (overlapping the standard deviations to identify dates that are not statistically different), the statistical interval is extended even more (Figure 2a). Consequently, these results are not especially useful in differentiating between distinct occupations or for suggesting which part of this calibrated date interval is most likely to indicate component use.

In comparison, five luminescence dates were run on plainware sherds (see Table 1). When considered together—overlapping the standard deviations to identify dates that are not statistically different—they seem to narrow the occupation even further, from the mid-1400s to mid-1500s (Figure 2b). Yet, when a single or continuous longer-term use is not assumed and the sample results are exam-
Table 1. Radiocarbon and Luminescence Dates Obtained from AZ DD:8:44 (ASM).

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Material/Context</th>
<th>Measured Conventional Radiocarbon Age</th>
<th>Calibrated Radiocarbon Date (1σ)</th>
<th>Calibrated Radiocarbon Date (2σ)</th>
<th>Luminescence Date (2σ)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>340 ± 40</td>
<td>350 ± 40</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>200 ± 40</td>
<td>410 ± 40</td>
<td></td>
</tr>
<tr>
<td>OSL: X2069</td>
<td>Whetstone Plain, Amado variety, Sample 8</td>
<td>A.D. 1524 ± 60; A.D. 1464–1584</td>
<td>A.D. 1524 ± 60; A.D. 1464–1584</td>
<td>A.D. 1524 ± 60; A.D. 1464–1584</td>
<td>A.D. 1524 ± 60; A.D. 1464–1584</td>
</tr>
</tbody>
</table>

Figure 2. Averaging effects of chronometric results. (a) Radiometric results averaged to produce an A.D. 1450–1650 confidence interval. (b) Luminescence results averaged to produce an A.D. 1484–1564 overlap period.
ined individually—as potentially dating distinct behavioral events—a very different picture emerges. They seem to indicate two distinct periods of mobile group use (Figure 3). This is consistent with mobile group landscape use and itinerancy (Seymour 2002, 2009d). The earliest occupation is indicated by one of many sherds found lying flat on a structure floor (OSL: X2549). The date for this sample (A.D. 1416–1496) is surprisingly consistent with the calibrated 1-sigma result for one of the radiocarbon samples (A.D. 1440–1490; Beta-191895; Table 1; Figure 5). Two additional sherd samples date to the mid-1500s through early 1600s, seemingly representing a second period of use that does not overlap with the sherd-dated structure (Samples 9 [OSL:X2070] and 10 [OSL:X2071a]; see Figure 3).

Another two sherd samples fall within these potential periods (Samples 7 [OSL:X2068] and 8 [OSL:X2069]; see Table 1; Figure 4). If averaged with the previous two samples, as often occurs in traditional analyses, the dates for these final two sherds would fill a gap between the two periods described above, indicating a continuous occupation between the mid-1500s and the mid-1600s. On the other hand, if these latter two overlapping samples are combined and averaged with the one from the structure floor they suggest that the site was occupied in the late 1400s, with a second period of use sometime between the mid-1500s to mid-1600s. It is also possible that these sherds dating to this intermediate period represent a third occupation. In the absence of averaging, the luminescence technique is just precise enough to suggest up to three occupations, perhaps hinting at an episodic series of an even greater number of occupations, as expected for highly mobile hunter-fisher-gatherers. At a minimum, luminescence dating of surface and near-surface sherds provides evidence of two discrete occupations, while the radiocarbon technique isolated only one and could not specifically differentiate the fifteenth-century occupation.

The sherds used to date this occupation provide evidence of a general regional presence by Terminal Prehistoric and Contact period groups. These groups were distinct from their prehistoric predecessors and their ceramics are unlike prehistoric pottery known for the area. For the purposes of dating site use, it is less important to know who the makers of the pottery were than to understand how the pottery found its way into the targeted mobile

Figure 3. Unaveraged dates considered in a mobile framework. Luminescence results considered individually show at least two distinct occupations, as expected for mobile groups.
group contexts (e.g., cultural affiliation and chronological placement are separate analytical endeavors, which regrettably are often collapsed). The sample of dated pottery includes two sherds that are clearly early O’odham and three previously undescribed Terminal Prehistoric plainwares that could have originated with any of a number of groups. The early O’odham pottery (Samples 8 [OSL:X2069] and 10 [OSL:X2071a]) likely originated in a nearby O’odham settlement and were transported to this location by mobile groups who obtained the vessels through raiding or by trade, two well documented forms of interaction in this area (Seymour 2005b, 2007b, 2009a). The historically referenced O’odham site of Tubaca was situated nearby (Dobyns 1995), and an excavated contemporaneous (A.D. 1424–1524) Sobaipuri-O’odham settlement is known from further south on the river, thus placing the O’odham in proximity to these mobile groups who resided at the Sharples Site. On the other hand, the earliest occupation is indicated by a coarse-tempered, rough-surface sherd, one of many found lying flat on a structure floor (OSL: X2549). The sherd corresponds to no described type. Two additional, and technologically distinct, sherd samples (Samples 9 [OSL:X2070] and 10 [OSL:X2071a]; see Figure 3) represent the second period of inferred use. Another two sherd samples may fill the gap between these potential use episodes. Though currently untyped, these sherds seem to be derived from the Sonoran brownware tradition (Samples 7 [OSL:X2068] and 8 [OSL:X2069]; see Table 1; Figure 4), as do most indigenous pottery types in the southern portion of the American Southwest.

Site reuse by mobile groups who move across expansive areas is expected. They are drawn to locations that naturally possess certain important characteristics, and are therefore likely to select many of the same locations repeatedly (Seymour 2009c, 2009d). Resource procurement is typically viewed as an extractive process in which materials are drawn
away from a site. A formulation more consistent with the known behavior of mobile human groups would highlight the key fact that alterations, caused by use or occupation, often enhance a place’s value for future uses. Various kinds of alterations may be expected based on a comparison to a region-wide sample of mobile group sites investigated by the author and others that show: (a) reworking and reuse of discarded tools and materials, (b) shelters that are built within prehistoric structures, and (c) thermal features that have been reused (Seymour 2002, 2003a, 2003b, 2005b; also see Gregory 1981). These expectations also derive from analysis of the ethnographic and ethnohistoric records that document mobile groups reusing prehistoric locations and collecting prehistoric tools for reworking (Flint

Figure 5. Correspondence between dates derived from two different dating techniques reveals a distinct and the earliest mobile occupation. When a single or continuous longer-term use is not assumed and the sample results are examined individually—as potentially dating distinct behavioral events—several potential short-term occupations are distinguishable. The result for earliest luminescence sample (flat-lying sherd on structure floor; A.D. 1416–1496) is surprisingly consistent with the calibrated 1-sigma result for one of the radiocarbon samples (A.D. 1440–1490; Beta-191895).
and Flint 2005:417; Goodwin and Basso 1971:231; Russell 1975:111). These expected alterations include those made as the same group repeatedly returns to a place, or modifications resulting from a totally different set of occupations that make the place useful in ways the earlier occupants could not have imagined. The location may gain value once used because artifacts are left in place, outcrops of raw lithic material are exposed, walls have already been constructed, surfaces are cleared of cobbles, or disturbance contributes to favorable circumstances for edible species to grow. At the Sharples Site the previous prehistoric occupation clearly enhanced the location for future use; the walls of prehistoric structures and a compound were incorporated into the hut walls of later mobile groups, depressions cleared of rocks were reused for various daily activities, and prehistoric stone foundations and discarded tools and debris became raw materials for tools.

Concluding Remarks

Given the high incidence of multiple reoccupations and of later occupation by unrelated groups, it seems essential that alternative hypotheses and methodologies be explored and divergent dates sought. The amount of site reuse detected by recent studies suggests that it is time to reformulate research approaches and consider that multiple dates are likely to be useful and meaningful rather than problematic. Recently obtained data indicate that a single-use scenario is quite rare indeed, even on sites with limited assemblages and flimsy structures. However, unless a researcher looks very specifically for evidence of repeated use while still in the field, such evidence will likely go unnoticed; the signs tend to be faint and sometimes confusing, and data are easily interpreted in alternate ways. I advocate consideration of an observational methodology that, if applied effectively, will ensure that the correct observations will be made on the site and that analysis of the data after the fact will reveal a detailed occupational history.

No current dating technique alone is going to isolate multiple episodes of reoccupation if they all took place within a few decades. Other lines of evidence need to be used, along with careful application of chronometric data, in order to make these occupational distinctions. This requires considering other indices of cultural and temporal affiliation beyond the old standbys of decorated pottery and projectile points and it requires a reevaluation of plainware variability and other indices of diagnosticity. It means taking into account gradations of mobility, and considering various forms of limited reuse. It involves the even more challenging task of identifying mobile group components that are positioned over complex sedentary sites, and being able to isolate them even in cases where datable materials are not present. Such considerations also raise the ethical issues as to whether impacts to the later and lighter components are appropriately mitigated as researchers delve into deeper stratigraphy, and of whether the multiethnic tenure of places is being recognized.

Acknowledgments. My deepest appreciation is extended to Jeffrey Dean, Mark Harlan, Darden Hood, Michael Schiffer, and H. Wolcott Toll for taking the time to comment on drafts of this paper and to Mark Harlan for preparing the Spanish abstract. Ed Rhodes, Jean Luc Schwenninger, James Feathers, William Deaver, and David Hill provided very helpful comments on samples, sampling approaches, or on portions of this paper. Some of the data presented in this paper result from research I conducted while at Lone Mountain Archaeological Services under contract with Fort Bliss. Appreciation is extended to the Sharples family for allowing access to their land to investigate their important site, to Bill Cox for showing the site to me, and to the many volunteers and past employees who assisted during survey and with excavations.

References Cited


Reports 175


Flint, Richard, and Shirley Cushing Flint 2005 *Documents of the Coronado Expedition, 1539-1541: They Were Not Familiar with His Majesty nor Did They Wish to Be His Subjects*. Southern Methodist University Press, Dallas.


2005a Mobile Visitors to the Eastern Frontier Pueblos. Manuscript on file with the National Park Service, Mountainair, New Mexico.


2006b Stranger Sojourners: Mobile Group Visiting Behavior. Manuscript on file with the National Park Service, Mountainair.


2009b Evaluating Eyewitness Accounts of Native Peoples along the Coronado Trail from the International Border to Cibola. New Mexico Historical Review 84(3):399–435.


Seymour, Deni J., and Tim Church

2007 Apache, Spanish and Protohistoric Archaeology of Fort Bliss. Historic and Natural Resources Report 03-06, Cultural Resources Program, Directorate of Environment, Fort Bliss, Texas.

Seymour, Deni J., and George Robertson


Shepard, Anna O.


Smiley, Francis E., and Richard V. N. Ahlstrom


Smith, Jason W.


Spielmann, Katherine Ann


Sweeney, Edwin R.


Trentlein, T. E. (Translator)


Upham, Steadman


Vehik, Susan C.


Submitted June 19, 2009; Revised September 6, 2009; Accepted September 15, 2009