Journal of California and Great Basin Anthropology | Vol. 31, No. 2 (2011) | pp. 121–134

The Children of Rogers Lake: Knap Time as a Clue to Site Function in the Western Mojave Desert

MICHAEL R. WALSH
Cotsen Institute of Archaeology, University of California, Los Angeles

Learning a craft by trial and error leaves an identifiable signature in the material record, one that crosscuts time periods, cultures, and crafts. Novice training is also strongly correlated with specific non-material variables, including the makeup of the student-teacher population, the location, and the timing of novice training. Based on intrinsic characteristics, an assemblage of projectile points from the western Mojave Desert is attributed to novices learning to knap. Inferences are derived from this assemblage regarding resident site population, the likely season of site occupation, and therefore the likely site function. It is suggested that, no matter the specific craft, identification of novice artisan training areas may provide a valuable clue to hunter-gatherer site demography, seasonality, and resource acquisition.

We have begun to recognize novice artisans in prehistory (Bamforth and Finlay 2008; Ferguson 2008; Geribàs et al. 2010). This has not only enhanced our ability to explain variability in artifact assemblages (Arnold 2011), it provides a voice to a neglected segment of society, children and adolescents (Finlay 1997; Högberg 2008; Shea 2006; Stapert 2007). In addition, as we shall see, novice work may provide clues to site function and seasonal settlement patterns.

Scholars have securely identified novice work areas dedicated to learning a wide variety of crafts, and there appear to be numerous material correlates to learning any craft through trial and error (e.g., Arnold 2011; Bagwell 2002; Crown 2002; Milne 2005). With a growing number of case studies revealing common rules for the material by-products of novice training, it has become feasible to identify novice activities based on assemblage attributes alone. But novice work also appears to correlate strongly with specific social, behavioral, and demographic contexts. Although these contexts may differ from craft to craft, the location, timing, and makeup of the teacher-student population is consistent for any given craft. Because the location, timing, and constituent population of most hunter-gatherer sites correspond to specific site functions during a tightly-scheduled seasonal round, a novice training assemblage alone may provide a clue to site function and season of occupation. I propose to illustrate this assertion using data recovered from CA-LAN-1585, a Late Prehistoric site near Rodgers Lake in the western Mojave Desert (Fig. 1).

What follows is a brief cross-cultural outline of the material correlates of artisan training as well as the consistent settings of novice training locations. Next we will examine an unusual assemblage of projectile points and other lithic artifacts recovered from LAN-1585. The assemblage meets several of the criteria commonly used to identify novice training. In light of this we can suggest the functional context of the site within the annual subsistence round prevalent during the Late Prehistoric period in this portion of the Desert West.

CORRELATES OF CRAFT TRAINING

Material Evidence of Novice Training

Virtually all scholars have cited clear qualitative differences between the skill levels of expert and novice artisans (Arnold 2011; Crown 2002:111, 115; Eren et al. 2011:234; Ferguson 2008:57–60; Pigeot 1990:132; Stahl 2008). "Quality" can be difficult to quantify, but several measures have been proposed for stone knapping in particular. Most of these are loosely related to artifact

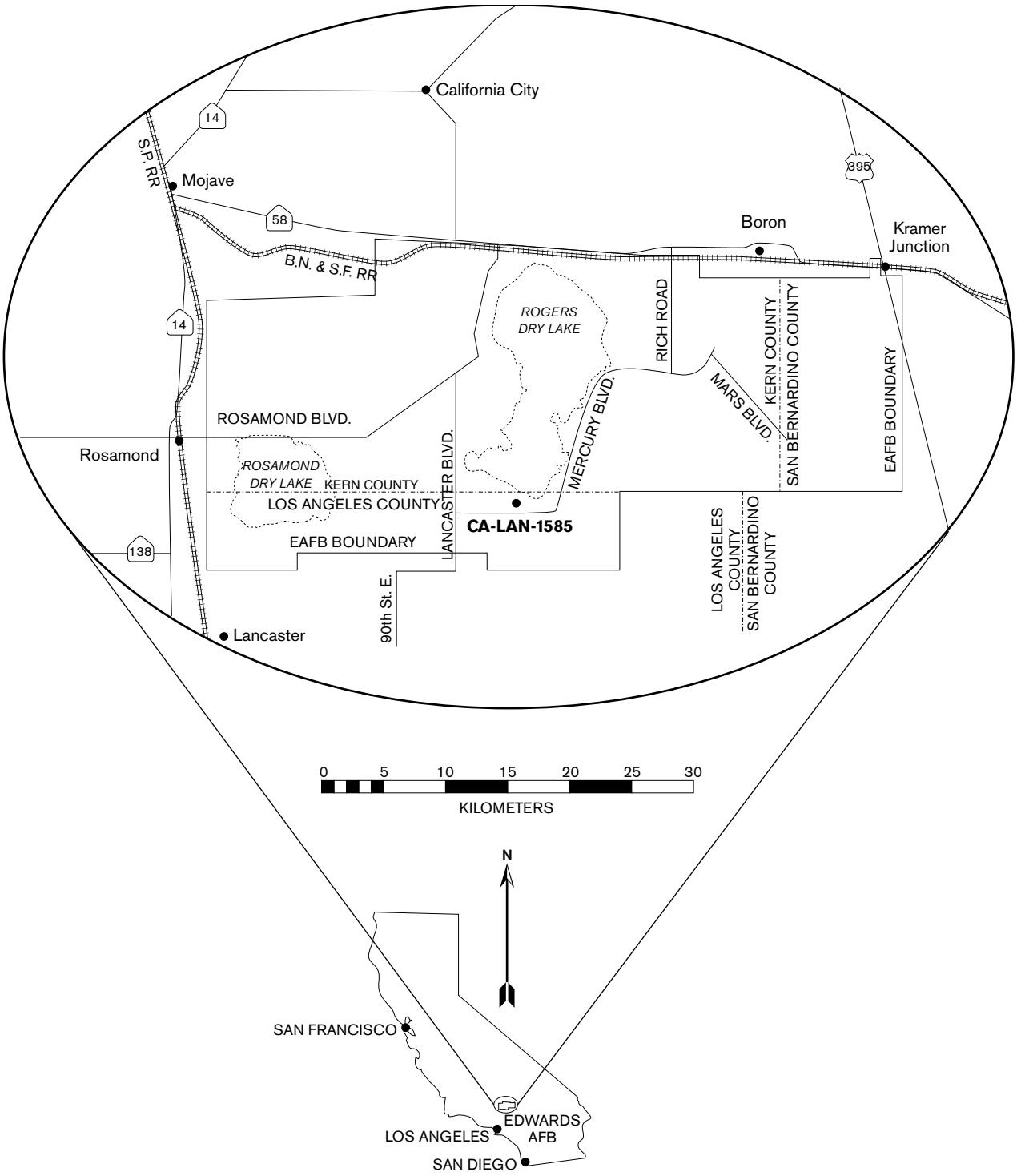

Figure 1. General location of CA-LAN-1585.

symmetry in cross-section, profile, and silhouette (Shea 2006:213). Biface thinning, for example, is a difficult task to master, and it can be measured by the ratio of biface thickness to width (Ferguson 2008:60–61). Effective pressure flaking is equally difficult for novices because it requires a combination of experience and strength. Core-refitting has revealed repetitive mistakes in striking angles, improper flake sequences, poor platform

preparation, and both excessive and inadequate striking force (Bamforth and Finlay 2008:6; Geribàs 2010:2861; Milne 2005:331; Pigeot 1990:132; Shelly 1990:191–192; Tehrani and Reide 2008:324). Novice-made artifacts may be typologically accurate but unusually small, have an "expedient" character, or show conspicuously sinuous edge lines (Milne 2005:334; Shea 2006:213–214). Novices also leave behind inordinate amounts of waste material (Shea 2006:213), as well as large numbers of unfinished or broken artifacts (Arnold 2011). The novice assemblage may be intermingled with expertly-made, presumed heuristic examples, and novice and expert alike often discard the artifacts at the manufacturing location (Milne 2005:334; Pigeot 1990:138; Tehrani and Reide 2008:324). Thus, dual "quality" suggests an educational, not an economic assemblage.

Novices may create artifacts with attributes that appear to be "nonsensical," the byproduct of simple repetition of one or a few facets of artifact manufacture. For example, very young potters in the Puebloan Southwest may begin by forming ceramic balls, mud pies, and snakes for the simple goal of learning to create symmetrical objects (Bagwell 2002:94). It is no great leap to imagine the "snake" as a precursor to the clay fillet used to manufacture coiled pots. Similarly, Arnold (2011) has noted multiple holes drilled in single shell walls, apparently the result of a repetitive exercise in boring holes and in handling a bead drill. Analogously, either percussion or pressure flaking may be practiced with wholesale disregard for artifact form, the goal simply being one of learning to wield a hammerstone or pressure-flaking tool.

Novices make use of substandard raw materials, including waste materials discarded by experts (Arnold 2011; Crown 2002:123; Ferguson 2003, 2008:53; Shea 2006:214). Indeed, they may use raw materials that are altogether inappropriate for tool use. In this regard, a modern stone-knapping experiment made use of fired-clay bricks as surrogate cores and blanks (Geribàs et al. 2010:2859). The bricks were suitably isotropic to provide consistent conchoidal fractures, and thus proved a useful medium for instruction. Finally, novices may use substandard tools of the trade, particularly when the manufacturing tools are costly or easily broken (Stapert 2007:21). Note that all of these factors will feed into the overall low "quality" of novice assemblages.

In the end, "quality" is essentially an evaluation of "…aesthetics, symmetry, regularity, and precision…" (Bamforth and Finlay 2008:4). In making these evaluations, however, we must be aware of the fact that experts may experiment with elaborate forms (Costin and Hagstrum 1995) or attempt to show-case their relative talents (Olausson 2008). Either may result in numerous failures, despite a high level of artisan skill. We must also recognize that stone knappers produce measurable variations in debitage assemblages no matter their level of experience (Williams and Andrefsky 2011), and that even experts exhibit innate differences in individual talent and motor skill (Eren et al. 2011). It must be added that novices obviously should improve with practice. Individuals should show improved skill over a potentially lengthy apprenticeship, eventually but imperceptibly grading into "expert" at their craft. Thus, a cohort of novices may show a wide range of skill levels. Clearly, the earliest stages of learning are the most discernible.

To summarize, a novice assemblage should be identifiable as such through multiple measures. These include the combined subjective and objective evaluation of artifact quality, attention to raw material selection, and assessment of discard patterns. It should be obvious that all or even most of the above attributes may not be revealed by any single artifact. Analyses should therefore be assemblage-based, but as importantly should maintain regional perspectives of contemporary assemblages, as well as a grasp of the "normal" variation among artifacts of a given type. Identification of novice artisans may well depend on the experience level of the *archaeologist*.

Location, Demography, and Timing of Novice Training

Novice training is usually located where raw materials are abundant or easily accessed (Arnold 2011; Milne 2005:337–338). This includes permanent or semi-permanent villages where raw materials may be stockpiled (Thomas 1983:73). However, the use of discarded or substandard materials by novice artisans impacts and relaxes this stipulation to some degree, and perhaps "expendable" raw materials is the more relevant guideline. Crafts are taught only where and when the "appropriate" people gather, meaning the teacher(s) and the student(s) (Shea 2006:213). The key is to identify the "appropriate" population for a given craft, which

will vary by gender, but may also vary depending on whether crafts are performed at the household level or by true craft specialists (Arnold 2011; Costin and Hagstrum 1995). Archaeologists are adept at making these distinctions for most crafts, and I will not belabor this issue.

In addition, there must be available discretionary time for the appropriate population (Arnold 2011; Milne 2005:337; Pigeot 1990:138). It must be emphasized that discretionary time for training in the present sense is limited to time available for tool manufacture. It is recognized that overall "training" is multi-faceted and an ongoing and complex process—learning to make a projectile point is just a step in learning to *hunt*, but it is the point that leaves the most visible archaeological remnant. Given the many gender-fixed resource collection strategies, as well as the myriad of other gendered activities, men and women (and boys and girls) may have entirely different periods and locations of discretionary time.

It is perhaps simplest to identify the "appropriate" teaching population, while the "student" population is less clear. For instance, for present purposes it is assumed that all or most adult hunters made projectile points and bifaces for personal use, and that they taught these crafts to their male children. However, it is not possible to suggest at what age novice training began. Ferguson (2008:61) has emphasized the necessity for hand and forearm strength, particularly for pressure flaking, and found it to be measurably variable even among adult novices. However, Shea (2006:213) has suggested that 10-year olds are able to muster the strength, coordination, and cognitive focus for some knapping. Indeed, Högberg (2008:118) observed that a modern *six-year old* was able to reproduce crude but recognizable tool forms using direct and bipolar percussion. It is quite likely the case that training in stone knapping and other crafts began quite early in life, perhaps first as imitative and unsupervised "play" (Bagwell 2002:94; Ferguson 2008:53; Findlay 1997:207; Högberg 2008:116–117). It is not feasible to suggest an age at which training became formalized.

In summary, the prerequisites for novice training include the presence of teachers and students, discretionary time for that particular population, and access to raw materials. While these appear to approach the level of truism, they are nontrivial *necessary preconditions* to craft training. As absolute requirements, independent evidence for craft training is essentially *predictive* of these preconditions. Thus, the identification of craft training areas on their own terms may be used to reconstruct the primary functions of sites, which I shall argue shortly are apt to converge most frequently at only a limited number of seasonally- and functionally-specific sites. We proceed now to a brief discussion of the Late Prehistoric site LAN-1585.

CA-LAN-1585

In order to avoid repetitive citation, all descriptive statements made concerning LAN-1585 are documented in Walsh and Green (2002:179–203).[1] The site lies within a large dune complex approximately 1.3 km. southwest of Rogers Lake, within the confines of Edwards Air Force Base (Fig. 1). The site consists of a sparse artifact deposit limited almost entirely to the surface, covering some 88,000 m.^{2}, but primarily concentrated in three discrete activity loci. The primary focus here is on a single locus, Locus 1 (Fig. 2), which revealed all of the artifacts under present discussion, and over 90% of the total artifact inventory at the site. The locus is spread over shifting dune sands lying atop a sterile clay hardpan. Dunes are of fine-grained homogenous sand rising above the pan to heights ranging from 40 cm. to over 100 cm. Subsurface remains are very scant, averaging less than a single artifact per 10 cm. level for each of four 1m.x1m. excavation units in Locus 1. In all cases, subsurface artifacts consisted solely of debitage.

Flaked and ground stone tools observed in surface contexts at Locus 1 suggest bi-gender activities. Ground stone includes one whole and six fragmentary manos and one large metate clearly suggesting "site furniture." A small rectangular piece of abraded green slate suggests a pendant fragment; in addition, five weathered fragments of marine shell were located on the surface. One shell fragment is *Haliotis* sp. nacre, while the others are too small to identify beyond "cockle or scallop" and "clam." None of the shell shows any form of purposeful modification, and all may be detritus from ornament or other artifact manufacture. Obviously marine shell, as well as the green slate, is definitively exotic to the site locale. There are no hints of structural remains, nor were any

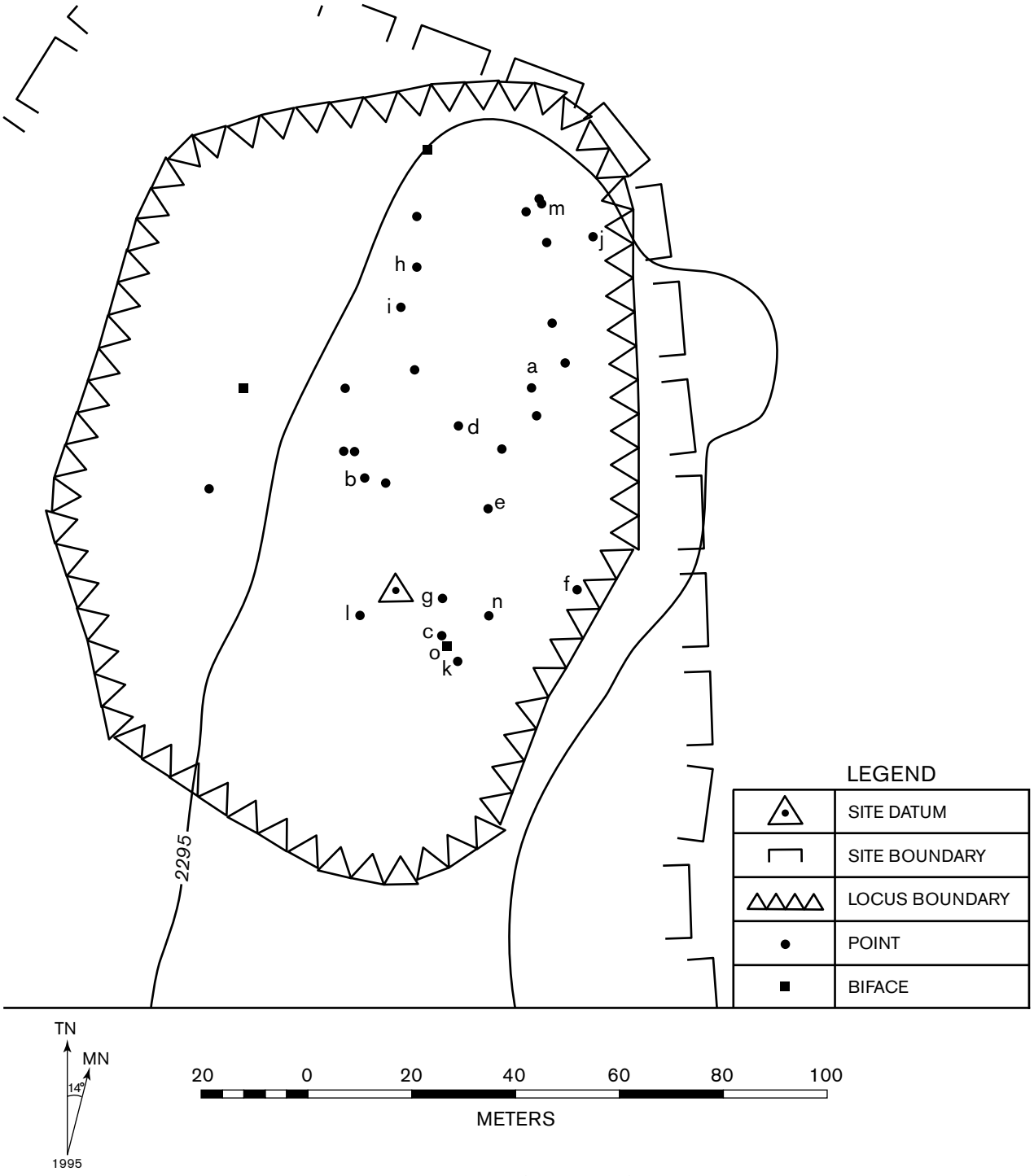

Figure 2. Locus 1, CA-LAN-1585.

discrete hearths observed, despite a few widely-scattered local stones that may be fire-affected. Small charcoal flecks and just six charred bone fragments were widely distributed throughout the vertical profiles of the test excavations. None of the bone fragments were identifiable to species, but in every case fragment size suggests a very small rodent. The site overall suggests limited occupation of short duration by one or a very few families.

All chronological indicators (artifact types and obsidian hydration data) point to the Late Prehistoric

(A.D. 1100–historic; Sutton et al. 2007:242–243). Locus 1 yielded 28 projectile points or point fragments, of which 20 were sufficiently intact to fit into the Cottonwood series (Triangular and a single Leaf-shaped specimen). The remaining eight unknown points were fragments, but based on estimates of parent-artifact size were all potentially derived from Cottonwood points. The site at large yielded just one additional point fragment, a non-diagnostic tip. Several bifaces were recovered, none of which appears to show use-related edge-wear. In all, Locus 1 shows a truly remarkable number and concentration of points and bifaces for the region at large (cf. Earle et al. 1997:153–154), made all the more intriguing by the suggestion of *short-term occupation and little or no evidence for game hunting or processing*. The points, and a selected biface, will be the focus of the discussion that follows.

Cottonwood Projectile Points at LAN-1585

It must be stated at the outset that this particular study is plagued by the very nature of the primary artifact type under evaluation. Cottonwood points may be the *worst* imaginable type for quantifying novice-related variation in the loose notion of "quality." The minimalist character of Cottonwood Triangular points from the Mojave Desert is practically their most salient feature. A serviceable Cottonwood point can be (and frequently was) made through only minor modification of a simple waste flake of suitable shape and size. Indeed, their minimalist character led to an early belief that Cottonwood points were a simple stage in the manufacture of Desert Side-notched points (Justice 2002:367). Definitively "finished" points presumed to be expertly made may exhibit one or more of the characteristics expected of novice-made pieces, and especially may show inattention to strict artifact symmetry (see Lanning 1963:Plate 7; Rozaire 1962). On a more positive note, the minimalist character of Cottonwood points reduces the need for multi-staged manufacture, and so it is unlikely that crude specimens simply represent an early stage of manufacture.

That caveat in place, a selection of points from LAN-1585 shows obvious extremes in skill levels (Fig. 3). These are purposefully placed in a sequence of visibly descending "quality" (Fig. 3a through Fig. 3n), and the gradient in apparent skill-level highlights the difficulty in drawing a definitive line between "expert" and "novice" in mid-range, despite the ease in distinguishing between the extremes. It also underscores the difficulty in studying novice activities utilizing small sample sizes, and the utter futility of attempting to do so for any single artifact.

Attempts to generate multivariate criteria for assessing point quality had little success. The most convincing quantitative co-variables appeared to be measures of point symmetry and pressure flaking prowess, admittedly an awkward marriage of interval scale and presence-absence data. Symmetry here was measured in relationship to an imaginary line formed along the point base and one drawn directly from the basal mid-point through the point tip—that is, directly along the long axis of the point. Asymmetry was indicated by the amount of deviation from perpendicular (90 degrees). Pressure flaking prowess was indicated by flake scars removed with sufficient force to reach or cross the longitudinal (center) axis of the main body of the point (Ferguson 2008:60–61). A total of 14 points in the assemblage were sufficiently intact to reliably measure deviation from symmetry (not all of these are illustrated). In five cases where even a single pressure flake scar reaches or exceeds the center axis, symmetry is less than five degrees removed from the perpendicular (e.g., Fig. 3a, b, c, and d). Conversely, in all eight cases where flake scars fail to reach the center axis of the point body (e.g., Fig. 3i, j, and l), symmetry exceeds five degrees of deviance. In only one example (not illustrated) did flake scars fail to reach the midline of a symmetrical point. This latter observation highlights the inherent difficulty in studying Cottonwood quality—manufacture from simple cortex-free flakes may eliminate the need to reveal pressure flaking prowess. Nevertheless, while I claim no persuasive statistical relationship for this small sample, a mild pattern emerges where pressure flaking prowess may have contributed to increased point symmetry. There may be promise in this direction with a larger sample size, and the symmetry-flaking prowess measure may be worth pursuing in other artifact types as well.

The novice correlate of "artifact thinning," as measured by the ratio of artifact width to thickness, utterly fails with regard to the present collection. This is almost certainly due to the manufacture of Cottonwood points from simple, relatively small flakes, a fact that essentially determines point thickness. Flake selection

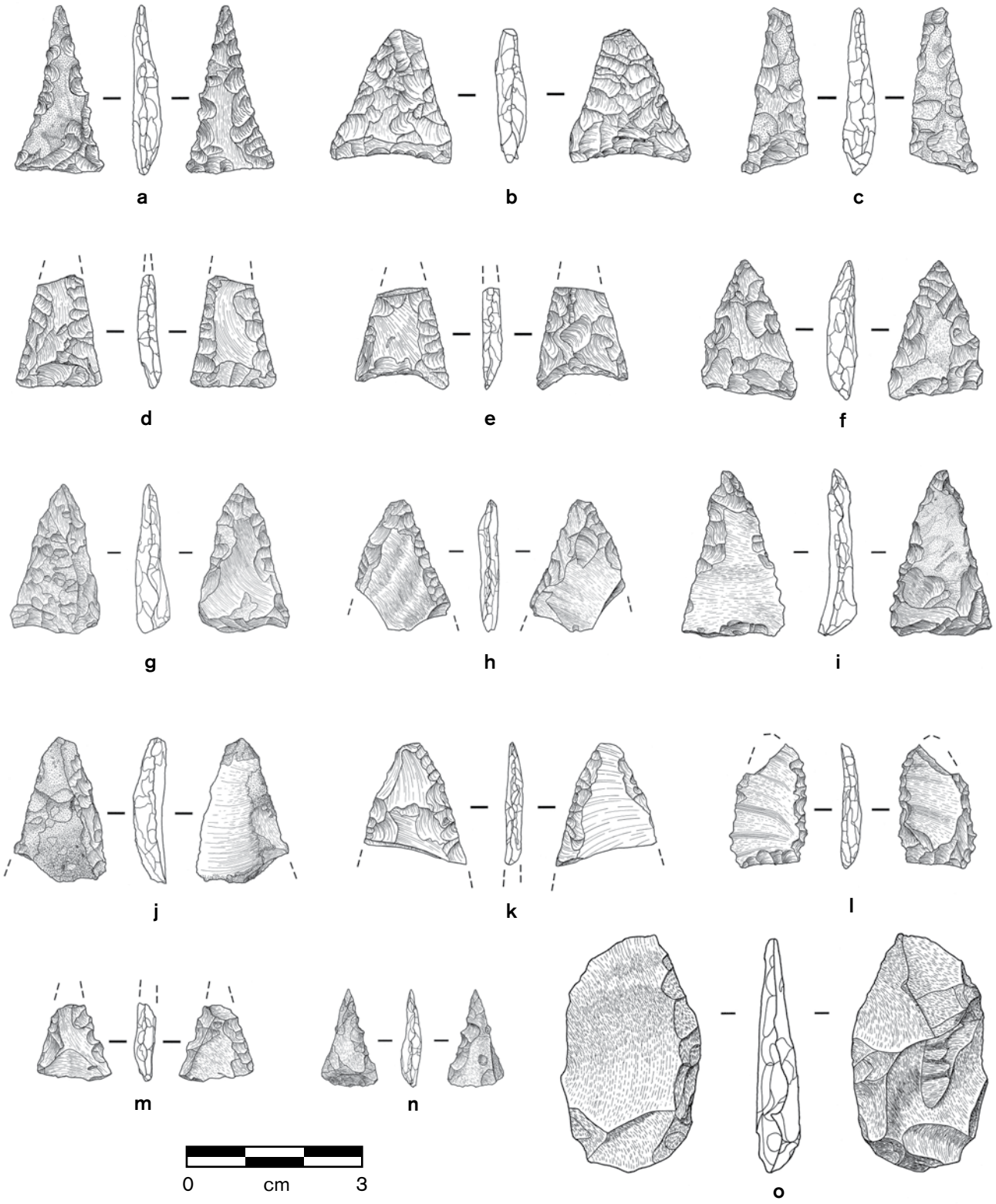

Figure 3. Selected Cottonwood Triangular points from CA-LAN-1585 (a-n) and siltstone biface (o).

is the primary determinant of point thickness. Larger or more complex point types or bifaces are probably better suited to certain tests of skill level (Eren et al. 2011:234).

Selection of sub-standard flakes appears to have some utility in distinguishing among points in the assemblage. Six specimens (21%) have bases formed from hinge or step fractured flakes (e.g., Fig 3i, and j), a likely consequence of a mistake in the initial removal of the flake blank from the core, because point manufacture appears to have been limited to pressure-flaking alone. Several points appear to exhibit an expedient character (e.g., Fig. 3i, j, and l). Breakage rate is high (n=21, 75%). Unfortunately, it is not always possible to distinguish breakage through use, breakage during manufacture, or simple selection of a broken flake from the outset.

Points at LAN-1585 are mostly of chert (n=21, 75%). Chert was obtained at various source localities surrounding Edwards AFB, the largest and nearest located in the Bissell Hills some 10 km. to the northeast of LAN-1585. There are no topographical or other impediments to chert collection from this or any other chert source. The identical spectrum of chert sources is observed in waste materials from the vast majority of sites at Edwards AFB, attesting to the low cost of importing chert. Rhyolite is next in frequency in the point assemblage (n=4, 14%). Volcanic materials occur sporadically over this portion of the western Mojave Desert in the form of small outcrops and occasional lag deposits (Dibblee 1960). Identical materials are common at sites in the region, again suggesting a low cost. One point fragment is of chalcedony. Chalcedony is problematic in its origin, although raw chalcedony nodules have been reported along the eastern and southeastern margins of Rogers Lake (Walsh et. al 2001:27). Definitively exotic materials include a whole point made of obsidian and a fused shale tip fragment (neither is illustrated). The nearest obsidian sources lie in the Coso Hills to the north (Gilreath and Hildebrandt 1997), and several fused shale sources are known for eastern Ventura County (Hughes and Peterson 2009). Perhaps not surprisingly, both the obsidian point and the fused shale fragment appear to have been expertly flaked. It is reasonable to suggest that points using waste materials readily at hand were worked by novice and expert alike, but that experts alone made use of exotic materials.

Novice artisanship is indicated by one biface that blurs the categories of "inappropriate material" and "nonsensical" (Fig. 3o). It is made of friable *siltstone* with a Mohs hardness under 2.5 (fingernail) and would be inappropriate for a cutting task of any sort. The siltstone shows isotropic flaking properties, however, and may have provided a suitable practice piece for either flaking or for wielding a hammerstone or baton (recall the modern experiment using clay bricks). A use of discarded flakes as point "blanks," as well as a use of inappropriate materials such as siltstone, would certainly have alleviated the cost of materials used by novices.

Finally, the distribution of the 28 points over the site locus bears emphasis. Locus 1 covers a total of approximately 14,100 $m.^2$, but it is clear that the points are clustered within less than half this area (Fig. 2). This is a remarkable number of points for any site in the region, and a truly extraordinary number in such a restricted space. It may be reasonably suggested that the points were manufactured at their place of discovery. Although field protocols did not call for fine-screening methods, one-eighth-inch mesh screening of four excavation units and controlled surface collection at five locations at Locus 1 fortuitously revealed 16 very small pressure flakes, all of chert (Walsh and Green 2002: Appendix B). We can never know how many or even whether selected points were retained when the site was abandoned, but the points remaining in the archaeological deposit have the bimodal character of a teaching assemblage made and casually discarded on the spot.

For Cottonwood points in particular, multiple measures of novice artisanship are called for, and very small numbers of points should be approached only with caution. There is no "magic formula" for identifying a novice-made point, or one within any other artifact form. The critical observations will surely vary from artifact type to artifact type, and examples within certain artifact forms will be easier to identify as "inexpert" than others based on intrinsic qualities, especially artifact complexity. With no suggestion that the artifact "type" is invalid in any way, it may be worthwhile nevertheless to examine "point blanks" and other "unfinished" artifact forms with a fresh eye. In the present case, the combination of varied levels of flaking prowess, asymmetry, use of substandard

and waste materials, discrete spatial distribution, casual discard, and use of inappropriate materials is highly suggestive of novice training. We proceed now to the behavioral correlates of novice training.

SEASONAL SCHEDULES IN THE WESTERN MOJAVE DESERT

CA-LAN-1585 clearly dates to the local Late Prehistoric period, post-A.D. 1100–historic times. This is based on the exclusive manufacture of Cottonwood points as well as on obsidian hydration dates from the site that suggest an occupation as late as A.D. 1500–1600 (Walsh and Green 2002:199). Most scholars agree that by this time known ethnographic territories were fully in place, and many or most subsistence practices conformed to patterns observed in the ethnographic present (Arnold and Walsh 2010:134-135). The precise ethnographic affiliation for this portion of the western Mojave Desert remains something of an open question, however, principally because this region was a vaguely defined hinterland for various ethnographic peoples better known for their core territories in the mountains and foothills to the west, south, and north. Reasonable arguments have been made for peopling by the Kitanemuk (Blackburn and Bean 1978:564; Kroeber 1925:611; Sutton 1993:3–4), the Desert Serrano or Vanyume (Earle 1990; Earle et al. 1997:60), and the Kawaiisu (Underwood 2006; Zigmond 1986:399).

This is no minor issue, because our best ethnographic models of local cultural ecology derive from Numic populations, particularly the Owens Valley Paiute, the Shoshone, and the Kawaiisu (Arnold and Walsh 2010:134–136; Bettinger 1999:49–51; Steward 1933, 1938). The Takic-speaking Kitanemuk and Serrano are quite a bit more obscure, particularly in their desert contexts. Moreover, the Owens Valley may be the most productive environment in the entire Great Basin (Thomas 1983:32, 34). Even setting aside ethnic issues, models derived from the Owens Valley may be only vaguely applicable to the somewhat less salubrious western Mojave Desert. Nevertheless, it has been suggested that the Kitanemuk, for example, shared more cultural traits with their Numic neighbors to the north than with their linguistic relatives to the south (Blackburn and Bean 1978:564). In any case, for lack of a practical alternative, the basic model of Late Prehistoric subsistence practices and scheduling for the Owens Valley and Numic-speakers is applied here.

The signature adaptation of the Late Prehistoric is the "processor's" strategy (Bettinger 1999; Bettinger and Baumhoff 1982:488–489). In this strategy, productive patches of plant foods were exploited intensively and exhaustively for the purpose of generating surpluses for use during the lean winter months. Tree crops and grass seeds that could be obtained in surplus quantity supplanted a reliance on large game and generalized daily foraging (the "traveler's" strategy). The annual round involved an extended residence by most or all community members in permanent or semi-permanent winter villages, located at or very near water, and stocked with stores obtained during the previous year (Thomas et al. 1986:266). By early spring, with stores dwindling or gone, near-village forays were made for edible greens, roots, and berries (Zigmond 1986:400). By late spring and early summer, more distant forays were made in search of grass seeds and tree crops that could be exploited intensively during extended stays (Coville 1892:352–353; Moerman 1998:437; Thomas et al. 1986:266). Often the target resource was processed on-site for greater efficiency in transport to storage facilities at the winter village (Driver 1937:68–69; Thomas et al. 1986:267). These sites had the character of "satellite" villages which—in the Owens Valley—may have been occupied for a month or more (Arnold and Walsh 2010:136; Basgall and Giambastiani 1995; Bettinger 1999:50; Steward 1938), although it is unlikely that Mojave Desert satellite villages were occupied for more than a few days. Summer likely saw populations atomized into single-family groups or small bands employing a modified "traveler's" strategy, featuring short-term residence but always with the goal of garnering a surplus at productive locales at or near widely-scattered springs. The fall ripening of tree crops such as piñon nuts, acorns, and mature mesquite beans saw a return to the satellite village strategy of exhaustive exploitation. Fall was the usual occasion for rabbit drives as well, generally a community-wide and even a multi-community affair (Thomas et al. 1986:268).

SITE FUNCTION AT LAN-1585

An extended residence in winter villages provided the greatest opportunity for novice training, in terms

of having an appropriate population in residence, some available discretionary time, and stockpiled raw materials. Just as clearly, LAN-1585 is *not* a winter village. A winter village should exhibit relatively substantial domestic dwellings, plentiful site furniture of wide variety, distinctive work areas, diverse tool manufacture and repair, ceremonial items and ceremonial or public spaces, storage (including a stockpiling of raw materials), luxury and trade items, dedicated refuse areas including middens, and perhaps cemeteries (Hector 1990; Steward 1933:238; Thomas 1983:73). A short-term early spring or high summer foraging location is similarly contraindicated owing to site furniture and non-utilitarian items (Thomas 1983:85).

Instead, LAN-1585 has the appearance of a satellite village, a much scaled-down version of the winter village, with some (but not all) of the features of a winter village (Bettinger 1999:50; Walsh and Green 2002:200–201). These indicators at LAN-1585 include site furniture (metate, manos) and a small amount of luxury, trade, or non-utilitarian items (slate pendant fragment, shell fragments). To this list I will add *the presence of a novice-training assemblage* suggestive of an extended stay. The question is—which functional type of satellite village is represented? This question subsumes the reciprocal issues of both the targeted resource and the precise season of occupation.

The primary resources amenable to intensive and exhaustive exploitation in this portion of the Mojave Desert include Joshua tree (*Yucca brevifolia*), mesquite (*Prosopis glandulosa*), and ricegrass (*Oryzopsis hymenoides*). At present, mesquite is rare in the immediate vicinity of LAN-1585, represented by a few small, impoverished stands within a few kilometers of the site. However, modern agriculture has lowered the local water table dramatically. A survey from the early twentieth century shows numerous flowing wells—now long dry—in and around the Rogers Lake area (United States Geological Survey 1908), so mesquite in the Late Prehistoric was undoubtedly more plentiful. Joshua trees are abundant to this day in the vicinity of LAN-1585, as is ricegrass (Computer Sciences Corporation 1994:219). Mesquite was targeted in both the spring and the fall, while Joshua and ricegrass was exploited from the spring into the very early summer months.

Mesquite, Fall

Green mesquite beans and blossoms were collected in the spring but were consumed immediately (Bean and Saubel 1972:108; Fowler 1986:67; Rhode 2002:19). Neither green beans nor blossoms were amenable to storage as a surplus. Mature mesquite beans gathered in the late summer and early fall, however, provided a storable winter staple for many desert groups (Bean and Saubel 1972:109; Driver 1937:68–69; Fowler 1986:67; Moerman 1998:437; Rhode 2002:20; Thomas et al. 1986:267; Zigmond 1981:54). Processing into meal on-site eased the burden of transport to winter villages, and was done using deep, typically wooden or bedrock mortars and long, cylindrical chisel-ended pestles (Fowler 1986:67; Lanning 1963:247). Fall mesquite collection was typically an activity that engaged the entire family in collecting pods, clearing brush and pruning, and hunting small game that shared an attraction to the mature pods (Anderson 2005:316; Bean and Saubel 1972:115). At LAN-1585, ground stone consisted solely of a metate and several manos at Locus 1, and a small pestle (12.4 cm. in length) recovered from the site at large (Walsh and Green 2002:195). Evidence for fall mesquite processing is lacking. Moreover, it is unlikely that over a few days' time at most, either men or boys enjoyed ample discretionary time required for novice training. It appears unlikely that the site represents a fall mesquite collection camp.

Joshua Tree, Spring

Joshua tree harvesting was largely confined to the middle and late spring (Mead 2003:450). Blossom pods and their seeds, as well as artichoke-like "hearts" formed by new growth at branch tips, were eaten (Coville 1892:353). However, Joshua products could neither be consumed immediately nor dried and stored unless they were cooked, a process requiring fairly elaborate rock-lined pit ovens closely tended over a period of two days and nights (Rhode 2002:102; Moerman 1998:618, fn. 84; Zigmond 1981:69). Given the paucity of fire-affected rock at the site, it is unlikely that Joshua was the target resource for an intensive processor's camp here.

Grass Seeds, Late Spring-Early Summer

Ricegrass provided an important subsistence staple, and it was harvested in the very late spring or early summer (Rhode 2002:174). Women alone were responsible for

collecting and processing the hard seeds. Ripe seeds were whisked into burden baskets with wicker seed-beaters (Coville 1892:353), or bunches of grass were cut with a sharp-edged wooden stick to be threshed by beating with sticks and winnowed in basketry trays (Kelly 1964:41; Rhode 2002:174–172; Steward 1938:32; Zigmond 1981:47). The seeds were eaten dry (Zigmond 1981:46), or processed into flour using a mano and metate (Kelly 1964:42). Flour was mixed with water to form a mush, which could be consumed immediately or formed into cakes and dried for storage (Moerman 1998:370–371; Rhode 2002:174). As a significant winter staple, ricegrass was a common target resource for processor's camps (Basgall and Giambastiani 1995; Bettinger 1999:50; Mead 2003:282; Zigmond 1981:46). Note that the only preserved remnants of ricegrass harvest and processing are stone manos and metates. Both artifact forms are present at LAN-1585.

I suggest that another preserved artifact assemblage points equally to ricegrass harvest—a novice stone-knapper's training area. In 1932, Isabel Kelly described a Southern Paiute encampment that today would be recognized as a "processor's camp" in search of a surplus for winter. She quoted a consultant's assessment of the division of labor in this manner: "The women [worked]; the men hunted rabbits and sat around" (Kelly 1964:44). It appears that among the potential resources at LAN-1585, men and boys had the greatest amount of discretionary (free) time during ricegrass exploitation.

SUMMARY

CA-LAN-1585 consists of a low-density artifact deposit that dates to the Late Prehistoric period in the western Mojave Desert. It is confined mainly to surface materials, but reveals a variety of flaked and ground stone artifacts and other materials suggesting activities that cross-cut gender lines and involve both utilitarian and non-utilitarian artifacts. This range of items is characteristic of sites occupied for an extended duration for the purpose of intensively and exhaustively exploiting resources in and around the site. It is thus highly suggestive of a processor's temporary encampment, one dedicated to collecting surplus resources for use as winter stores. The site does not meet the standard of "satellite village" set by the resource-rich Owens Valley to the north, but reflects an analogous strategy "writ small" due to the diminished resource base and lower population density of the western Mojave Desert.

The site also reveals an unusual configuration, frequency, and spatial distribution of Cottonwood Triangular points. Many of these points meet the expectations for tools made by novices, drawn from material correlates that cross-cut cultures, time frames, and crafts. Among these expectations are inexpert flaking technique, use of substandard or discarded raw materials, use of wholly inappropriate materials, lack of utilization, and an apparent casual discard of practice pieces by novice and expert alike. This latter dualistic quality of the discarded points may be the most provocative evidence for novice training at the site (see also Milne 2005:334; Pigeot 1990:138; Tehrani and Reide 2008:324).

In addition to these material expectations, there are strong behavioral and contextual correlates of novice-training which cross-cut cultures, time frames, and crafts. Having reasonably identified a novice assemblage, it is possible to narrow the field of appropriate contexts (site functions) for training sessions. In the present case, a restricted number of resources were potential targets for intensive and exhaustive exploitation by Late Prehistoric populations in this portion of the western Mojave Desert. These resources varied by season, by the method and labor force required for exploitation, and by their processing requirements. Only one of these site functions—serving as a processor's camp dedicated to ricegrass collection in the late spring or early summer—is reasonably consistent with the general site assemblage *and* the presence of a novice knapping area.

Finding novice assemblages may be difficult in many contexts, and may be uncommon in any event. It must be emphatically stated that the presence of the appropriate teacher-student population, ample discretionary time, and expendable raw materials *does not* guarantee that novice training would take place at a location. Instead, where novice activities are identified through independent means, it may be reasonably assumed that the other three correlates (appropriate population, free time, materials) were in place. Village sites are clearly apt to be the most promising localities for identifying such assemblages; larger sample sizes and wider varieties of select artifact types should improve our ability to identify—and to quantify—novice assemblages in more concrete terms.

With these measures in hand, identifying novice-made artifacts wherever they occur may be fruitfully applied to sites of somewhat more elusive site function than the winter village. The implications that novice assemblages may have for anthropological archaeology are substantial and need not be limited to accounting for assemblage variability, nor even to the modest inferences about site function and seasonality suggested here.

NOTES

[1]Artifacts are held at the Curation Facility, Base Historic Preservation Office, Edwards Air Force Base, California.

ACKNOWLEDGMENTS

The maps were adapted by Terisa M. Green. Figure 3 was drawn by Clarus J. Backes, Jr. Helpful comments were provided by Mark Allen, Clarus Backes, Todd Braje, Mark Sutton, and an anonymous reviewer. I alone am responsible for the final data presentation and interpretation.

REFERENCES

Anderson, M. Kat
2005 *Tending the Wild: Native American Knowledge and the Management of California's Natural Resources*. Berkeley: University of California.

Arnold, Jeanne E.
2011 Detecting Apprentices and Innovators in the Archaeological Record: The Shell Bead-Making Industry of the Channel Islands. *Journal of Archaeological Method and Theory* 19. DOI: 10.1007/s10816-011-9108-1

Arnold, Jeanne E., and Michael R. Walsh
2010 *California's Ancient Past: From the Pacific to the Range of Light*. Washington, D. C.: SAA Press.

Bagwell, Elizabeth A.
2002 Ceramic Form and Skill: Attempting to Identify Child Producers at Pecos Pueblo, New Mexico. In *Children of the Prehistoric Puebloan Southwest*, Katheryn A. Kamp, ed., pp. 90–107. Salt Lake City: University of Utah.

Bamforth, Douglas B., and Nyree Finlay
2008 Introduction: Archaeological Approaches to Lithic Production Skill and Learning. *Journal of Archaeological Method and Theory* 15:1–27.

Basgall, Mark E., and Mark A. Giambastiani (eds.)
1995 *Prehistoric Use of a Marginal Environment: Continuity and Change in Occupation of the Volcanic Tablelands, Mono and Inyo Counties, California*. [*Center for Archaeological Research Publication* 12.] Davis: University of California.

Bean, Lowell John, and Katherine Siva Saubel
1972 *Temalpakh: Cahuilla Indian Knowledge and Usage of Plants*. Banning, California: Malki Museum Press.

Bettinger, Robert L.
1999 From Traveler to Processor: Regional Trajectories of Hunter-Gatherer Sedentism in the Inyo-Mono Region, California. In *Settlement Pattern Studies in the Americas: Fifty Years since Viru*, Brian R. Billman and Gary F. Feinman, eds., pp. 39–55. Washington, D.C.: Smithsonian Institution.

Bettinger, Robert L., and Martin A. Baumhoff
1982 The Numic Spread: Great Basin Cultures in Competition. *American Antiquity* 47(3):485–503.

Blackburn, Thomas C., and Lowell John Bean
1978 Kitanemuk. In *Handbook of North American Indians*, Vol. 8, California, Robert F. Heizer, ed., pp. 564–569. Washington, D.C.: Smithsonian Institution.

Computer Sciences Corporation
1994 *Plant Species of Edwards Air Force Base*. Report on file at Environmental Management Office, Edwards AFB, California.

Costin, Cathy L., and Melissa B. Hagstrum
1995 Standardization, Labor Investment, Skill, and the Organization of Ceramic Production in Late Prehispanic Highland Peru. *American Antiquity* 60:619–639.

Coville, Federick V.
1892 The Panamint Indians of California. *American Anthropologist* 5:351–361.

Crown, Patricia L.
2002 Learning and Teaching in the Prehispanic American Southwest. In *Children in the Prehistoric Southwest*, Katheryn A. Kamp, ed., pp. 108–124. Salt Lake City: University of Utah.

Dibblee, Thomas W.
1960 Geology of the Rogers Lake and Kramer Quadrangles, California: Geological Investigations of Southern California Deserts. *United States Geological Survey Bulletin* 1089B. Washington, D.C.

Driver, Harold E.
1937 Culture Element Distributions, VI: Southern Sierra Nevada. *University of California Anthropological Records* 1(2):53–154. Berkeley.

Earle, David D.
1990 New Evidence on the Political Geography of the Antelope Valley and Western Mojave Desert at Spanish Contact. In *Archaeology and Ethnohistory of Antelope Valley and Vicinity*, Bruce Love and William H. DeWitt, eds., pp. 87–104. *Antelope Valley Archaeological Society Occasional Papers* 2.

Earle, David D., Barry L. Boyer, Reid A. Bryson, Robert U. Bryson, Mark M. Campbell, James J. Johannesmeyer, Kelly A. Lark, Cole J. Parker, Matthew D. Pittman, Luz M. Ramirez, Margaret R. Ronning, and Jackson Underwood
1997 *Cultural Resources Overview and Management Plan for Edwards AFB, California, Vol. 1: Overview of Prehistoric Cultural Resources*. Report on file at Base Historic Preservation Office, Edwards AFB, California.

Eren, Metin I., Bruce A. Bradley, and C. Garth Sampson
2011 Middle Paleolithic Skill Level and the Individual Knapper: An Experiment. *American Antiquity* 76:229–251.

Ferguson, Jeffrey R.
2003 An Experimental Test of the Conservation of Raw Material in Flintknapping Skill Acquisition. *Lithic Technology* 28:113–131.
2008 The When, Where, and How of Novices in Craft Production. *Journal of Archaeological Method and Theory* 15:51–67.

Finlay, Nyree
1997 Kid Knapping: The Missing Children in Lithic Analysis. In *Invisible People and Processes*, J. Moore and E. Scott, eds., pp. 203–212. London: Leicester University.

Fowler, Catherine S.
1986 Subsistence. In *Handbook of North American Indians, Vol. 11, Great Basin*, Warren L. D'Azevedo, ed., pp. 64–97. Washington, D.C.: Smithsonian Institution.

Geribàs, Núria, Marina Mosquera, and Josep Maria Vergès
2010 What Novice Knappers Have to Learn to Become Expert Stone Toolmakers. *Journal of Archaeological Science* 37:2857–2870.

Gilreath, Amy J., and William R. Hildebrandt
1997 Prehistoric Use of the Coso Volcanic Field. *Contributions of the University of California Archaeological Research Facility* 56. Berkeley.

Hector, Susan H.
1990 The Farm Drop Zone Archaeological Investigations, Edwards Air Force Base, California. In *Archaeology and Ethnohistory of Antelope Valley and Vicinity*, Bruce Love and William H. DeWitt, eds., pp. 77–85. *Antelope Valley Archaeological Society Occasional Papers* 2.

Högberg, Anders
2008 Playing with Flint: Tracing a Child's Imitation of Adult Work in a Lithic Assemblage. *Journal of Archaeological Method and Theory* 15:112–131.

Hughes, Richard E., and Polly A. Peterson
2009 Trace Element Analysis of Fused Shale: Implications for Revised Understanding of Obsidian Source Use Shifts in Southern Coastal Alta California. *California Archaeology* 1:29–53.

Justice, Noel D.
2002 *Stone Age Spear and Arrow Points of California and the Great Basin*. Bloomington: Indiana University.

Kelly, Isabel T.
1964 Southern Paiute Ethnography. *University of Utah Anthropological Papers* 69. Salt Lake City.

Kroeber, Alfred L.
1925 Handbook of the Indians of California. *Bureau of American Ethnology Bulletins* 78. Reprint (1976). New York: Dover.

Lanning, Edward P.
1963 Archaeology of the Rose Spring Site, INY-172. *University of California Publications in American Archaeology and Ethnology* 49(3). Berkeley.

Mead, George R.
2003 *The Ethnobotany of the California Indians*. La Grande, Oregon: Quality Books.

Milne, S. Brooke
2005 Paleo-Eskimo Novice Flintknapping in the Eastern Arctic. *Journal of Field Archaeology* 30:329–345.

Moerman, Daniel E.
1998 *Native American Ethnobotany*. Portland, Oregon: Timber Press.

Olausson, Deborah J.
2008 Does Practice Make Perfect? Craft Expertise as a Factor in Aggrandizer Strategies. *Journal of Archaeological Method and Theory* 15:28–50.

Pigeot, Nicole
1990 Technical and Social Actors: Flintknapping Specialists at Magdalenian Etiolles. *Archaeological Review Cambridge* 9(126–141).

Rhode, David
2002 *Native Plants of Southern Nevada: An Ethnobotany*. Salt Lake City: University of Utah.

Rozaire, Charles
1962 A Complete Serrano Arrow. *The Masterkey* 36(1):8–14.

Shea, John J.
2006 Child's Play: Reflections on the Invisibility of Children in the Paleolithic Record. *Evolutionary Anthropology* 15:202–216.

Shelley, Phillip H.
1990 Variation in Lithic Assemblages: An Experiment. *Journal of Field Archaeology* 17:187–193.

Stahl, Jenny
2008 Who Were the Flintknappers? A Study of Individual Characteristics. *Lithic Technology* 33:161–172.

Stapert, Dick
2007 Neanderthal Children and their Flints. *Palarch's Journal of Archaeology of Northern Europe* 1:16–39.

Steward, Julian H.
1933 Ethnography of the Owens Valley Paiute. *University of California Publications in American Archaeology and Ethnology* 33:233–350. Berkeley.

1938 Basin-Plateau Aboriginal Sociopolitical Groups. *Bureau of American Ethnology Bulletins* 120. Washington, D.C.

Sutton, Mark Q.
1993 Archaeological Studies in Rosamond, Western Mojave Desert, California. *Occasional Papers in Anthropology* 3. Bakersfield: Museum of Anthropology, California State University, Bakersfield.

Sutton, Mark Q., Mark E. Basgall, Jill K. Gardener, and Mark W. Allen
2007 Advances in Understanding Mojave Desert Prehistory. In *California Prehistory: Colonization, Culture, and Complexity*, Terry L. Jones and Kathryn A. Klar, eds., pp. 229–245. Lanham, Maryland: Alta Mira.

Tehrani, Jamshid J., and Felix Reide
2008 Towards an Archaeology of Pedagogy: Learning, Teaching, and the Generation of Material Culture Traditions. *World Archaeology* 40:316–331.

Thomas, David H.
1983 The Archaeology of Monitor Valley 1: Epistemology. *Anthropological Papers of the American Museum of Natural History* 58(1). New York.

Thomas, David H., Lorann S. A. Pendleton, and Stephen C. Cappannari
1986 Western Shoshone. In *Handbook of North American Indians, Vol. 11, Great Basin*, Warren L. D'Azevedo, ed., pp. 262–283. Washington, D.C.: Smithsonian Institution.

Underwood, Jackson
2006 Discovering the Desert Kawaiisu. In *A Festschrift Honoring the Contributions of California Archaeologist Jay von Werlhof*, Russell L. Kaldenberg, ed., pp. 179–191. [*Maturango Museum Publication* 20.] Ridgecrest, California.

United States Geological Survey
1908 Better Known Springs and Wells in the Mojave and Adjacent Deserts, Southeastern California and Southwestern Nevada. *Water Supply Paper* 224, Plate 1. Washington, D.C.: U.S. Geological Survey.

Walsh, Michael R., C. W. Clewlow, Jr., and April J. Van Wyke
2001 *Cultural Resource Testing and Phase II Evaluation of Seven Archaeological Sites Along the Edwards Air Force Base Research Laboratory (AFRL) Waterline, Kern County, California*. Report on file at Base Historic Preservation Office, Edwards AFB, California.

Walsh, Michael R., and Terisa M. Green
2002 *Phase II Cultural Resource Evaluation for Thirty-Two Sites, Management Regions 3 and 5, South Central Region, Edwards AFB, California*. Report on file at Base Historic Preservation Office, Edwards AFB, California.

Williams, Justin P., and William Andrefsky, Jr.
2011 Debitage Variability Among Multiple Flint Knappers. *Journal of Archaeological Science* 38:865–872.

Zigmond, Maurice L.
1981 *Kawaiisu Ethnobotany*. Salt lake City: University of Utah.
1986 Kawaiisu. In *Handbook of North American Indians, Vol. 11, Great Basin*, Warren L. D'Azevedo, ed., pp. 398–411. Washington, D.C.: Smithsonian Institution.