THE SPREAD OF COILED BASKETRY IN THE PREHISTORIC GREAT BASIN

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Revised, 7 April 2005
Prepared for *Unraveling the Boundary: Perishable Technologies Across and Between the Prehistoric Great Basin and Southwest*, chaired by E. A. Jolie and M. E. McBrinn, 70th Annual Society for American Archaeology Meetings, Salt Lake City, Utah, March 30th–April 3rd, 2005.

Coiled basketry, as compared to twined or plaited basketry, constitutes the last major development in the basketweaving repertoire of the prehistoric inhabitants of the Great Basin. Despite its increasing abundance and functional importance through time, very little is known of the timing and manner of its spread throughout the region. Over the past thirty years, several scholars have speculated as to when and where coiling spread across the Great Basin. In this paper, we re-examine these explanations in light of new dates and discoveries, with the aim of illuminating the complexity of the technology's spatial and temporal trajectory. We conclude by offering a new hypothesis for the spread of coiled basketry that synthesizes previous research with new interpretations and suggests avenues for future study.

Coiled basketry technology has considerable time depth in the Great Basin and is well represented in large perishable artifact assemblages. Functionally, coiling appears in a variety of forms, most notably shallow, concave parching and winnowing trays, pitched water containers or jugs, and wide mouthed bowls of various sizes. Other forms, like large globular storage vessels existed, but positive identification of basket form is often complicated by the incomplete nature of surviving specimens. Several forms in particular, like conical burden baskets (e.g. Rozaire 1974:68), trinket baskets and hats, appear to be restricted to the western Great Basin (Jolie 2004). Open coiled sifting (?) trays have only been documented in the eastern Great Basin and, if not intrusive from the Southwest, may be quite ancient (Adovasio 1986b; Hewitt 1980). Decoration on coiled work is extremely rare in the eastern Great Basin, but it is abundant in the western Great Basin in the character of elaborate geometric designs, paint or pigment and colorful bird feathers secured beneath stitches (Baumhoff and Heizer 1958; Burgett 2004; Jolie 2004).

COILED BASKETRY TECHNOLOGY IN TIME AND SPACE

In several publications during the 1970s and 1980s, Adovasio (1970a, 1974, 1980, 1986b) and colleagues (Adovasio and Andrews 1983; Adovasio et al. 1976; Andrews et al. 1986) defined the Eastern, Western, and Northern Basin Basketry regions. The Eastern Basin Basketry Region

includes the entire state of Utah north of the Colorado River, adjacent parts of western Wyoming, southern Nevada, southern Idaho, and northwestern Colorado (Adovasio 1986b; Adovasio with Illingworth 2000). The Western Basin Basketry Region encompasses most of western Nevada as well as adjacent portions of east-central California and much of the central Great Basin (Adovasio 1986b). The Northern Basin Basketry Region encompasses southern Oregon and adjacent parts of northern California and northwestern Nevada (Adovasio 1986b; Adovasio et al. 1976; Andrews et al. 1986).

These technological complexes were defined as distinct geographical loci visible throughout prehistory on the basis of Adovasio's detailed attribute analyses of textiles from virtually all textile-bearing sites in the Great Basin. We employ these basketry regions here and refer broadly to their individual chronologies in our discussion of coiling's spatial and temporal trends. As necessary, we will comment on refinements or revisions to the chronologies of these regions that have been informed by recent research. Before addressing the issues surrounding the spread of coiled basketry in the Great Basin, however, it is instructive to first review the spatial and temporal scope of the technology as it correlates with Adovasio's postulated basketry regions. Our descriptive terminology follows Adovasio (1977).

The earliest coiled basketry in the Great Basin derives from the Eastern Basin Basketry Region, with specimens dated to the eighth millennium B.P. from Hogup and (Adovasio 1970b), Cowboy (Hewitt 1980) caves in Utah (see also Sand Dune and Dust Devil caves [Lindsay et al. 1968]). All of these examples of early coiling come in the form of shallow, concave-based parching trays on single element foundations (whole or half rod) with interlocking stitches (Adovasio 1986b; Adovasio with Illingworth 2000; Jolie and Burgett 2002). Adovasio's (1970a,

1974, 1986b; Adovasio with Illingworth 2000) research suggests that coiling was innovated independently in the eastern Great Basin and he notes that there appears to be a correlation with the development of coiled basketry for parching nutritious seeds and nuts and the onset of "harder" times, marked by an intense climatic shift, during the middle Holocene (Grayson 1993:244–45). Over time coiling increases in frequency with one-rod foundations and their variants remaining most popular, specifically including the unique one-rod-and-bundle stacked foundations. By 6500 B.P. coiling dominates basketry assemblages in the Eastern Basin Basketry Region at the expense of twined wares and, shortly thereafter, stacked and bunched multiple-rod foundations appear which are viewed as progressive elaborations of earlier one-rod techniques (Adovasio 1986b; Adovasio with Illingworth 2000).

In the Western Basin Basketry Region at this time, Adovasio (1986b) indicates that coiling first appears in the form of parching trays and containers employing multiple-rod foundations with noninterlocking or intentionally split stitches. He further observes that this early western coiling resembles the multiple-rod coiling from the Eastern Basin Basketry Region, but with differences in splice treatments and other minor construction details (Adovasio 1986b).

Interestingly, roughly 4,000 years ago in the Eastern Basin Basketry Region, there is a clear shift in the frequencies of coiled basketry types and a reversal of preferred cordage final twist direction from Z to S. Adovasio (with Illingworth 2000) suggests that this is most parsimoniously accounted for, given the simultaneous appearance of a new projectile point style (Rosegate), by a population influx. Despite this shift, however, the one-rod-and-bundle foundation technique maintains its dominance in basketry assemblages. By 2000 B.P., popular one-rod foundation techniques are documented in southern Nevada, eastern Idaho, northwest

Colorado and parts of Wyoming and are associated with the spread of the Fremont archaeological culture (ca. 2100–500 B.P.) (Adovasio 1986b; Adovasio with Illingworth 2000; Adovasio et al. 2002).

Between 4000 B.P. and 800 B.P. in the Western Basin Basketry Region, multiple-rod foundation coiling techniques retain their popularity. Three-rod bunched foundations with intentionally split stitches are by far the most common, exhibiting increasing variety in the symmetrical and asymmetrical arrangement of foundation types with time (Adovasio 1986b; see also Burgett et al. 2002). Several one-rod and two-rod varieties are used, but less frequently. Significantly, all known coiled basketry from sites in the Northern Basin Basketry Region post-dates 1500 B.P. (Adovasio 1986b; Andrews et al. 1986). When coiling is present, it is only in minor quantities in the form of bowls and water containers or jugs produced on single or multiple-rod foundations with noninterlocking, interlocking, or intentionally split stitches. We should like to point out at this juncture, though, that preserved coiling specimens from the central portion of the Great Basin are rare and always from post-1000 B.P. contexts (e.g., Adovasio and Andrews 1983; Fowler 1990). The data from adjacent California are even scarcer, with the existing record favoring twining over coiling (Adovasio 1974).

From roughly 800 B.P. up until the historic period, coiled basketry technology across the three basketry regions strongly mirrors the types and forms documented for the historic inhabitants of the Great Basin. In the Eastern Basin Basketry Region, parching trays and the signature one-rod-and-bundle stacked foundation coiling disappear entirely. In the Western Basin Basketry Center, the once ubiquitous parching and winnowing trays are no longer found and the multiple-rod foundation coiled baskets that do exist strongly resemble historic coiling. Looking to

the north we see that coiling remains a minority technique, with wares similarly sharing affinities to historic coiled basketry. The sharp discontinuity seen after 800 B.P. in coiled basketry traditions has been well documented for not only other basketry types, but also projectile points and pottery, among other manufactures (Adovasio 1986a, 1986b; Adovasio and Pedler 1994; Adovasio et al. 2002; Andrews et al. 1986; Fowler 1994; Fowler and Dawson 1986). This abrupt change in material culture has been taken to reflect the expansion of Numic language-speaking populations into their historic territories around this time (Madsen and Rhode 1994).

HYPOTHESIZING THE SPREAD OF COILED BASKETRY

If we turn now to hypotheses put forth to account for the spatial and temporal patterns seen in the distribution of prehistoric coiled basketry we find that, at present, two primary hypotheses exist. First, Adovasio (1970a, 1974, 1980, 1986b; with Illingworth 2000) has suggested on the basis of his own extensive analyses that coiling spread in an east-to-west fashion across the Great Basin. Following its very early establishment in the Eastern Basin Basketry Region, coiling diffused westward, reaching the western Great Basin some 2,000 years later, by roughly 6500 B.P. In this scenario, the Northern Basin Basketry Region received coiling from the Western Basin Basketry Region to its south at an even later date, likely due to the lack of an economic need for coiled basketry technology in a region dominated by a well-established twined basketry industry.

Dawson (1970–1992, 1990), in contrast, has posited a more elaborate alternative explanation for the spread of coiled basketry. Though he admits the possibility of an east-to-west spread, he favors the argument that the Western Basin Basketry Region acquired coiled basketry around 4000 B.P. from Penutian language-speaking migrants who left the Columbia River basin.

Like Adovasio, Dawson attributed the lack of coiled basketry in the Northern Basin Basketry Region to a local and elaborate twined basketry tradition. It is unclear if Dawson believed that the migrants acquired much, if any, coiled basketry from the Eastern Basin Basketry Region or from points further north, like the Plateau or Northwest Coast.

As an extension of his hypothesis, Dawson further suggested that the Lovelock archaeological culture (ca. 4000–1000 B.P.) of western Nevada rapidly adopted and greatly elaborated on the new basketry technique. As a result, the coiled basketry of neighboring groups west of the Sierras in California were in part descended from or, at least, heavily influenced by Lovelock Culture coiled basketry. Dawson based his spread hypothesis on the then-available archaeological and linguistic data for the arrival of Penutian language-speakers in prehistoric California 3,000–4,000 years ago (e.g., Hattori 1982; Moratto 1984) and his own study of basketry design elements, which he argued supports ties with the Plateau cultural province. He found further evidence for a late arrival of coiled basketry in work in which Heizer (1949), discussing early central California prehistory, noted the absence of suitable bone awls for basketry manufacture prior to about 4000 B.P.

Taken individually, these two hypotheses offer very different accounts of the spread of coiling. Yet, when considered together in light of new dates, discoveries and analyses, a synthetic hypothesis explaining the spread of coiled basketry begins to emerge.

NEW DATES, DISCOVERIES AND ANALYSES

Recent AMS radiocarbon assays run on prehistoric Great Basin basketry, in conjunction with new discoveries and reanalyses of existing collections provide valuable new data and analytical tools for present-day researchers that allow reevaluation of earlier work. Of a series of

recent AMS determinations run on coiled basketry, two are worth considering in more detail here. The first constitutes the earliest directly dated coiling known from the Western Basin Basketry Region. A small red ochre palette from Kramer Cave at Falcon Hill on the northwestern shore of Winnemucca Lake (Hattori 1982:84–85, Figure 28) has yielded an age determination of 3830±30 B.P. (UCR-3969) (NSM Records). The specimen is close coiled with a three rod bunched foundation and stitches split on the non-work (concave) surface. Previously, the earliest coiling from the Western Basin Basketry Region was placed at close to 6500 B.P., but only two published dates were cited by Adovasio (1970b:28) which would suggest such a great antiquity. Given their poor contextual information, however, neither of these two dates should be considered reliable (Jolie 2004:235–236).

Recent research by the senior author that included the analysis of previously unpublished coiled basketry specimens and reanalyses of existing collections amplifies our understanding of Western Basin Basketry Region coiling (Jolie 2004). These analyses demonstrate that the Lovelock coiling tradition is, technically and stylistically, highly standardized from very early on in the region's coiled basketry sequence. In many major and minor technical details the earliest well-dated specimens are virtually identical to coiling made some 3,000 years later. Recognizing the considerable antiquity of this tradition and a suite of major technical attributes (e.g., foundation types, stitch types, work direction) shared with many historic California coiled basketry traditions (Elsasser 1978), this observation may lend some support to Dawson's (1970–1992, 1990) suggestions that Lovelock coiling is ancestral to coiling traditions in northern California. In this vein, pre-800 B.P. coiling from the Northern Basin Basketry Region, given its technological similarities to Western Basin Basketry Region wares, is best considered intrusive (cf. Cressman

1942:49–49).

In light of these observations and Heizer's (1949) note on the antiquity of coiling in California, it seems unlikely that coiled basketry technology is much more than 4,500–5000 years old in the Western Basin Basketry Region. This falls more in line with Dawson's hypothesis than Adovasio's. Evidence for a northern origin for Great Basin coiling, however, is largely unsupported by newer linguistic prehistory reconstructions that place the Penutian homeland firmly in southern Oregon (e.g., DeLancey and Golla 1997; Foster 1996:87–90) amidst a twined basketry tradition of venerable antiquity. Further, there is a clear lack of evidence for both technically similar coiled basketry and coiled basketry of comparable antiquity from the Plateau (Adovasio 1974; see also Conn and Schlick 1998; Haeberlin et al. 1928). As well, the basketry design elements that constituted a primary line of evidence in Dawson's hypothesis have been recognized as weak indicators of cultural affiliation due to their fluidity transmission between cultures and wide distribution (cf. Burgett 2004).

The second date significant to our discussion derives from a piece of feather decorated half-rod-and-bundle stacked foundation coiling sewn with non-interlocking stitches. This specimen, from Hogup Cave, Utah, yielded an AMS age determination of 6440±50 B.P. (UCR-4012/UCIAMS-1287) (Jolie 2004), making it the oldest piece of feather decorated coiled basketry known and considerably older than analogous specimens from the western Great Basin. This specimen exhibits feather decoration in the exact same technique seen in Western Basin Basketry Region specimens and, thus, contributes another trait that may support an east-to-west spread of coiled basketry technology. Taken together with coiling recently recovered from Bonneville Estates Rockshelter in eastern Nevada that yielded an AMS age determination of 7190±50 B.P.

(calibrated?) (Graf et al. 2002; see also Jolie and Burgett 2002), the antiquity of coiled basketry in the Eastern Basin Basketry Region has been reaffirmed. Yet, given the slightly earlier dates on coiled basketry from lower and Trans-Pecos, Texas, and Mexico (Andrews and Adovasio 1980; MacNeish et al. 1967; Taylor 1966; see also Adovasio 1974, 1980), we wonder if the technology may not have actually originated in Mexico rather than the eastern Great Basin.

How might we account for a lag of 4,000 years between the first appearances of coiling in the Eastern Basin Basketry Region and Western Basin Basketry Region? We submit that if one considers the timing of these events in the context of well-documented paleoecological change and a revised understanding of coiled basketry's chronology in the western Great Basin the pattern may begin to make sense. In the east, coiled basketry is well established in the character of one-rod foundation types and their variants at the beginning of the hot and dry middle Holocene. By roughly 4500 B.P. in the east, we see the appearance of multiple-rod foundation types, specifically, variants of the three-rod bunched foundation types that become ubiquitous in the west (Adovasio 1970b; Adovasio with Illingworth 2000; Rudy 1957). Notably, we also find evidence for substantial climatic amelioration that made large portions of the Great Basin more hospitable during the Late Holocene than they had been previously (Grayson 1993). Coincident with this climatic shift is the fluorescence of the Lovelock archaeological culture in the western Great Basin characterized by intensive use of lake-marsh resources (Grosscup 1960; Hattori 1982; Heizer and Krieger 1956; Heizer and Napton 1970; Loud and Harrington 1929; Napton 1969, 1970). Regional data support a view that sees dramatic increases in population size, and an elaboration of material culture and long-distance exchange at this time (Elston 1982, 1986; Bennyhoff and Hughes 1987). It is both possible and plausible that this climatic shift towards

more mesic conditions facilitated increased population densities that, in turn, would have facilitated the spread or transmission of coiled basketry technology across the Great Basin. This important point is grounded in the large body of literature on cultural transmission (dual-inheritance) theory (Boyd and Richerson 1985) that documents the great extent to which the rapidity of the spread of cultural knowledge and innovation increases in line with population size (Neiman 1996; Shennan 2001). That three-rod bunched and other multiple-rod foundation types first appear around 4500 B.P. in the east suggests that coiling of the three-rod bunched variety in the Western Basin Basketry Center could not be 6,500 years old if it had originated in the east.

SUMMARY AND CONCLUSIONS

In sum, the new dates, discoveries and analyses that we have considered briefly here suggest a revision and merging of the two existing hypotheses posited to explain the spread of coiled basketry. In the synthetic and, admittedly, preliminary hypothesis we advocate here, coiled basketry first appeared in the Eastern Basin Basketry Region by at least the eighth millennium B.P. Around 4500 B.P. coiling had reached the Western Basin Basketry Region from the east, some 2,000 years later than suggested by Adovasio. It thereafter continued to spread into California and later the Northern Basin Basketry Region. The well-established and standardized Lovelock coiling tradition had considerable impact on the development of coiling throughout California and the western Great Basin. Dawson's northern origin for coiled basketry associated with migrants from the Columbia River basin is rejected. From the beginning, this process of transmission was probably facilitated by increasing population densities resulting from the improved climatic conditions concomitant with the onset of the Late Holocene.

In closing, it should be pointed out that although our primary concern here has been with

when, where and how coiling spread, a related and, arguably, more important question to address is *why* the technology spread. In the future our research will make it a goal to explore in greater depth the questions of how and why coiled basketry technology may have spread across the prehistoric Great Basin. This research will not be complete without greater attentiveness to broader trends in other classes of material culture and a consideration of the push-pull factors that undoubtedly affected the trajectory of coiled basketry technological development in the many "friction zones" along the edge of the three major basketry regions. We look forward to examining all of these issues in more detail.

Acknowledgments

Many of the issues and ideas raised in this paper were stimulated by the senior author's Master's thesis research (Jolie 2004) at the University of Nevada, Reno, under the direction of Catherine S. Fowler. For this, he wishes to extend his sincerest thanks to the many people who helped him during the course of that study.

Ruth Burgett Jolie and Judith K. Polanich offered valuable comments on some of the ideas presented in this paper. Christopher J. Millington provided graphical expertise and assistance during the production of the maps we employ. Financial support for this research has been provided by a University of Nevada, Reno, Liljeblad Endowment award to the Nevada State Museum, Carson City.

Finally, the late Lawrence E. Dawson's impact on the study of basketry and textiles in California and the Great Basin cannot be overstated. As should be clear by now, his contributions to the topic at hand are profound. Though he certainly would not have agreed with all of the things we have said, we wish to acknowledge our indebtedness to him and the intellectual legacy

he has left behind. This paper is dedicated to his memory.

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