Prehistoric Basketry from the Fort Rock Basin and Vicinity

by

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Abstract

Dry cave sites in the Fort Rock Basin have produced a remarkable assemblage of woven artifacts, including basketry, matting, clothing, and cordage. This paper presents a review of sites from the basin and surrounding areas which have produced fiber artifacts, outlines fundamental details of the weaving tradition represented in these collections, and discusses the associated chronological evidence. These materials provide evidence for a continuous tradition of twined construction that spans 10,000 years, and was retained in the basketry of the historic Klamath-Modoc. Throughout the sequence, principal features include a predominance of z-twist wefts, common use of tule and related wetland plants, two-ply cord warps in close-twined baskets, and decoration with false embroidery and overlay techniques. The most obvious chronological pattern in the assemblages is seen in sandal forms. In the Fort Rock Basin, Fort Rock style sandals have been recovered exclusively from pre-Mazama contexts, while Multiple Warp sandals are known only from post-Mazama times.

Introduction

Basketry Fundamentals

The archaeological renown of Oregon's Fort Rock basin vicinity stems not only from its contribution to establishing the antiquity of human occupation in the western hemisphere (Cressman 1939, 1940, 1951; Cressman et al. 1940), but from the exceptional record of perishable artifacts--basketry, sandals, matting, and cordage--found in dry caves of the area (Fig. 1). The basketry from sites throughout the Great Basin of the western U.S. represents "the longest and perhaps the best-controlled basketry sequence in the world" (Adovasio 1986:194). Within the Great Basin, Adovasio (1970, 1986) recognizes three major basketry regions based principally on differences in construction techniques. The Northern Region, including south-central Oregon and immediately adjacent areas of northeast California and northwest Nevada, is distinguished by an unbroken tradition of twined construction spanning 10,000 years.

For the archaeologist, the term basketry refers not only to baskets *per se*, but also to a variety of objects made of the same materials and by the same construction techniques. This may include clothing (hats, skirts, shawls, rain capes, leggings, and sandals), mats, house coverings, fish traps and

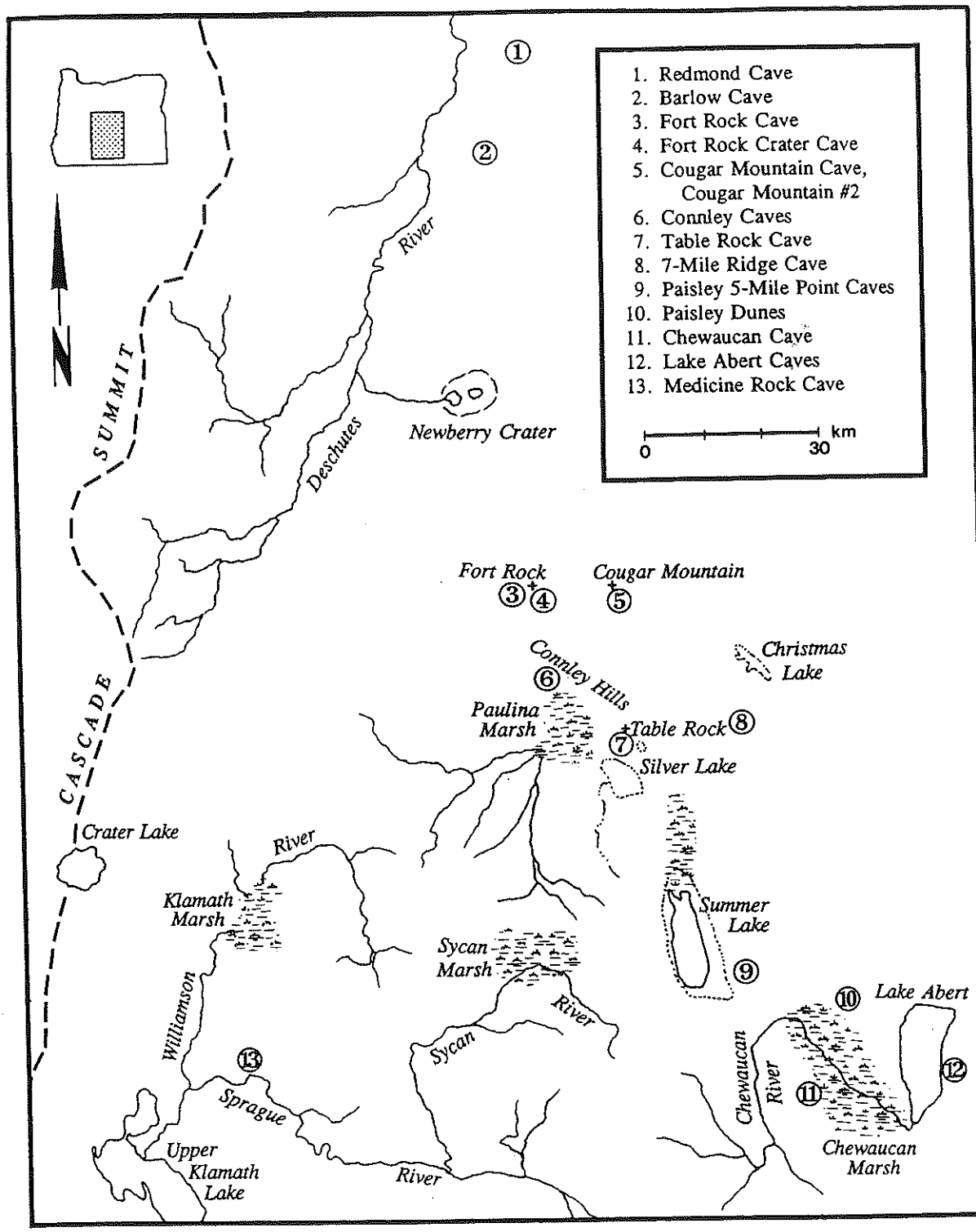


Figure 1. Location of sites discussed in the text.

weirs, and even watercraft. The Indians of the Northwest were particularly noted for their use of plant fibers. Otis Mason (1884:299), an anthropologist writing for the Smithsonian Institution, noted that:

> Along the western coast of the United States from Puget Sound to Lower California are many separate stocks of Indians, quite easily recognized by the material and ornamentation of their basketry. . . . Some of these tribes are called Diggers because they subsist on roots, seed, etc. It would be more reasonable to call them "basket" Indians.

Basketry can be sorted by construction technique into three basic classes. ***Interlace Weaving*** (including plaiting and "wickerware") is perhaps the simplest basket making technique. The structure is formed by the over-and-under interlacing of elements. The elements don't engage each other in any way beyond the over-and-under interlacing. Plaiting (where warp and weft are of similar dimension and flexibility) was reasonably common among many Northwest Coast groups; wickerware was rare among all historic native groups in the West, but was a predominant technique of the archaeological "Lovelock Culture" of western Nevada. ***Coiled*** basketry is built up from a spirally oriented foundation element. Coiled basketry is sometimes also called sewn basketry, because the outer coil is attached to the previous one by stitching. The coiling technique was predominant in Salish basketry to the north of Oregon, as well as being highly developed among many California and Great Basin groups to the south. Archaeological examples of coiled basketry are rare in Oregon, and invariably occur only in late prehistoric contexts. ***Twining*** is a construction technique that requires a pair of horizontal weft elements to twist, or twine, around vertical warp elements. Warps can be rigid or flexible. Twining was the most common native basketry construction technique in native Oregon and along the north Pacific Coast.

The basketry material discussed in this paper includes all collections from the Fort Rock vicinity housed at the State Museum of Anthropology at the University of Oregon (see Connolly 1986); references to accession records refer to holdings at the State Museum.

Historical Notes and Definitions

The best known prehistoric basketry from the Fort Rock basin and vicinity was collected and described primarily through the efforts of Luther Cressman (1940; Cressman et al. 1942), who began exploring the well preserved cultural remains in dry eastern Oregon caves in 1934. His first major cave excavations were in the Catlow Valley's Catlow and Roaring Springs caves between 1934 and 1938. Almost all of the basketry from these sites was twine ware, and most of this was of a particular type that Cressman (Cressman et al. 1942:33) named "Catlow Twine." It is a flexible, close twined basketry that was made with a two-ply cord warp of split tule or cattail, and weft pairs of the same materials. The cord warp invariably has a counter-clockwise (or "z") twist, and the weft pairs are similarly twined with a z-twist, resulting in the pitch of the stitch being oriented down to the right. In the present discussion, close twined basketry with two-ply cord warps of tule will be identified as Catlow Twine.

Precisely this type of basketry was made historically by the Klamath; Cressman (1986:123) observed that this type of basketry "is not a part of the historic Northern Paiute inventory [who occupied the area at contact], but certainly the historic Klamath basketry is lineally descended from the fine basketry of the prehistoric period." Anthropologist Leslie Spier (1930:179) described the making of the cord warps by the Klamath:

> Bowls, gambling or sifting trays, hats, and all other solid twined wares are manufactured in the same way. The small twined bowls (*moksE*) have warps of two-ply tule cords . . . . Such cords are rolled on the thigh. The two-ply cords are made by doubling a length of material, rolling the strands side by side down the thigh under the palm, then without raising the hand, rolling one strand around the other by a quick movement up the thigh.

Cressman's excavations at Fort Rock Cave in 1938 and 1939 revealed a large cache of sandals, all of similar construction, which were appropriately identified as the Fort Rock type (Cressman et al. 1942:57). Construction of the flat sole started at the heel and proceeded toward the toe by close twining over five heavy warps (Fig. 2). A toe flap was formed by subdividing the heavy warps into finer cords and weaving the many resulting warps with an open twine construction. The toe flap was then folded over to cover the foot. No heel pocket was made. The sandal was attached with a cord across the toe flap and another attached to the edge of the sole, perhaps to be wrapped around the ankle (Cressman et al. 1942:57).

Another sandal form found in the region was called the Multiple Warp type (Cressman et al. 1942:58). Instead of the Fort Rock sandal's usual five warps,

> there are in this type from 8 to 14 [or more] arranged in a series of parabolas around the heel but not in a flat plane. They are twined so that . . . the rear end forms a heel pocket. . . . The toe cover consists of extensions of the warps bent loosely back over the sole and rarely twined in any way.

The toe flap in the Multiple Warp type is held against the foot by a tie rope that is passed through a series of loops on both sides of the sole, and laced back and forth across the foot (Fig. 3).

A third sandal type was described by Cressman, the Spiral Weft type. In this sandal the sole warps run from side to side, rather from rear to front, and the weft is twined in a spiral from the center, much like the start of a twined basket. A heel pocket is generally attached, but there is no toe flap (Cressman et al. 1942:59).

The Sites

Paisley Five Mile Point Caves

Cressman's principal objective during the summer of 1938 was to complete excavations at Roaring Springs Cave. However, Cressman moved his crew from Catlow Valley on July 11 of that year to Paisley in the Chewaucan-Summer Lake basin, where several small cave sites at Five Mile Point were investigated. These caves had been reported to Cressman by Walter Perry, an artifact collector who regularly notified Cressman of his findings. Perry (1937) dug a test pit in what Cressman later called Paisley Cave #1 and reported to Cressman that "I found a 'mano' on a hearth just below the clean white pumice" later determined to be from the volcanic eruption of Mount Mazama approximately 7000 years ago. In Paisley Cave #2 he reported finding "several pieces of twisted tule cord, fragments of heavy matting, a fragment of open work basketry, fragment of leather, and a large sandal (at 20") woven from tule and with peculiar binding arrangement."

Figure 2. Fort Rock sandal type from below Mazama pumice at Fort Rock Cave; note the flat sole without a heel pocket and the twined toe flap (artifact 1-34291, accession 60).

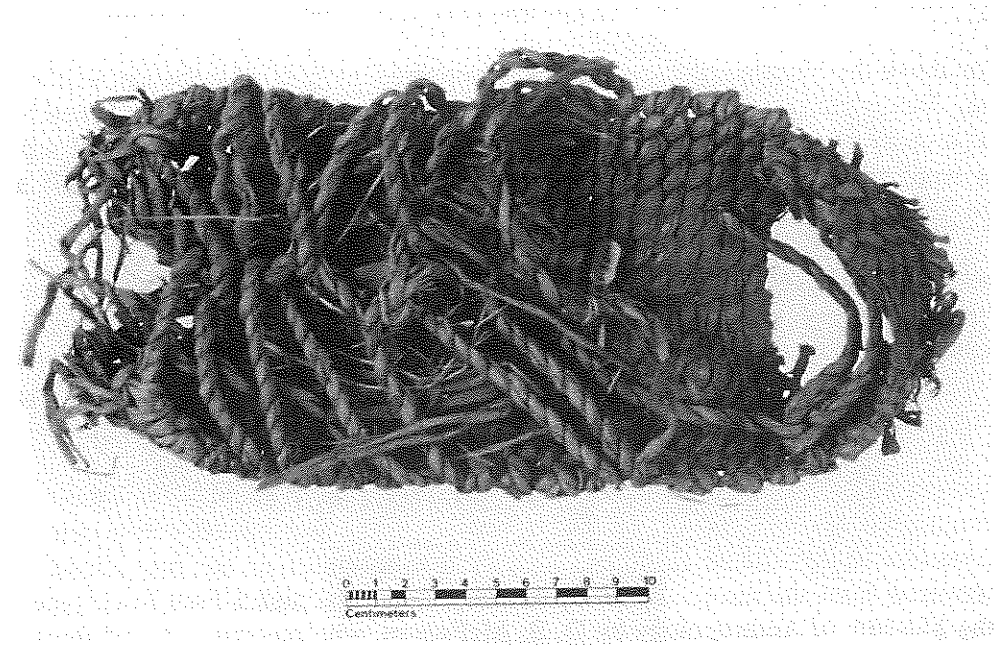


Figure 3. Multiple Warp sandal type from Paisley Cave #2; note heel pocket (around worn heel) and looping ties in place of a toe flap (artifact 1-5341, accession 100BP).

Cressman took his field crew to examine the Paisley caves during July of 1938, where they dug for several days. A brief return trip was made during the summer of 1939. Paisley Cave #1 contained two distinct occupation layers separated by Mazama pumice. One nearly complete and two fragments of Multiple Warp type sandals were found above the pumice, as well as Catlow Twine basketry, twined matting, and lithic and wood artifacts (Fig. 4). A series of distinct fire lenses were observed in the profile below the pumice. Lithic tools, a fragment of sagebrush bark matting and rope and a strand of two-ply tule cord were recovered from the pre-Mazama occupation level. Cressman et al. (1942:39) believe that decorated basketry recovered by Perry in 1937 came from below the pumice.

Paisley Dunes

Walter Perry found a grave containing a double burial in sand dunes about five miles east of Paisley in June of 1936. Charred fragments of undecorated Catlow Twine basketry, thought by Perry to have been a woman's basketry hat, were found in the grave (Accession 100BA).

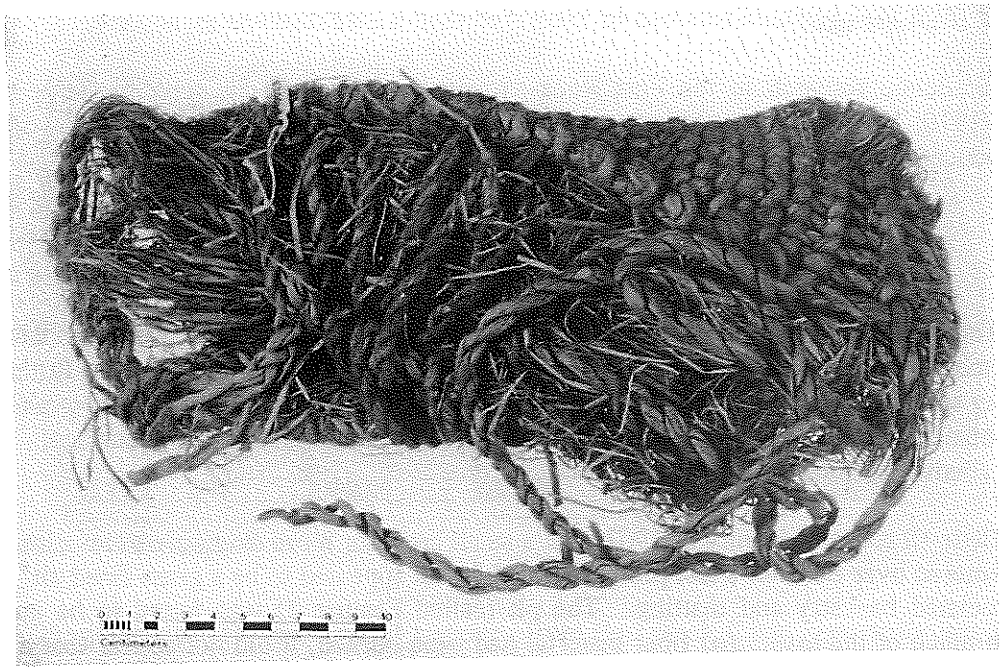
Fort Rock Cave

Walter Perry also alerted Cressman to Fort Rock Cave where, in 1937, he had dug three exploratory pits; in one he penetrated a layer of culturally sterile pumice below which he found "Dust, ash, bones, obsidian" (Perry 1937). Following Cressman's brief visit to the Paisley Caves in 1938, Cressman moved his crew to Fort Rock Cave where they worked from July 18 to 26, verifying the stratigraphy noted by Perry. The pumice layer was originally thought to derive from nearby Newberry volcano (Cressman and Williams 1940:77), but was later determined to be from Mt. Mazama.

From above the Mazama pumice Cressman recovered artifacts of wood, as well as chipped and ground stone. Below the pumice were chipped and ground stone tools, an *Olivella* shell bead, wooden artifacts, and a cache of approximately 95 twined sandals or sandal fragments made of sagebrush bark. The sandals were all similarly constructed, and Cressman (Cressman et al. 1942:57) appropriately identified the form as the Fort Rock type sandal.

Cressman and Williams (1940:68) reported that "all of the sandals are more or less charred, as is practically all inflammable material from under the pumice." Because of this condition the material was extremely fragile, so all was treated with a preservative. Unfortunately, there was no way of knowing at the time that this would render these specimens unusable for radiocarbon dating, which was developed more than a decade after the Fort Rock discovery.

In September of 1938, following Cressman's excavations, local resident Estelle N. Crampton collected a fragment of undecorated Catlow Twine basketry (Fig. 5), reportedly from below the Mazama pumice. Cressman and Williams (1940:64) identify this specimen as the only close twined basket fragment recovered from the cave. In 1950, basketry fragments and a Fort Rock type sandal were donated to the Museum of Anthropology by D. B. McFadyen, who reportedly found them in the cave's below-pumice deposits. This untreated sandal fragment was submitted for radiocarbon analysis, and returned a date of 9053 $\pm$ 350 radiocarbon years ago). The accompanying basketry had both single- and two-ply (cf. Catlow Twine) tule warps and z-twist wefts, and was decorated with false embroidery. If this basketry was truly from a pre-Mazama context, it would be the earliest known example of decorated basketry from the Northern Great Basin. Cressman (1951:308; 1986:123) believes the association is



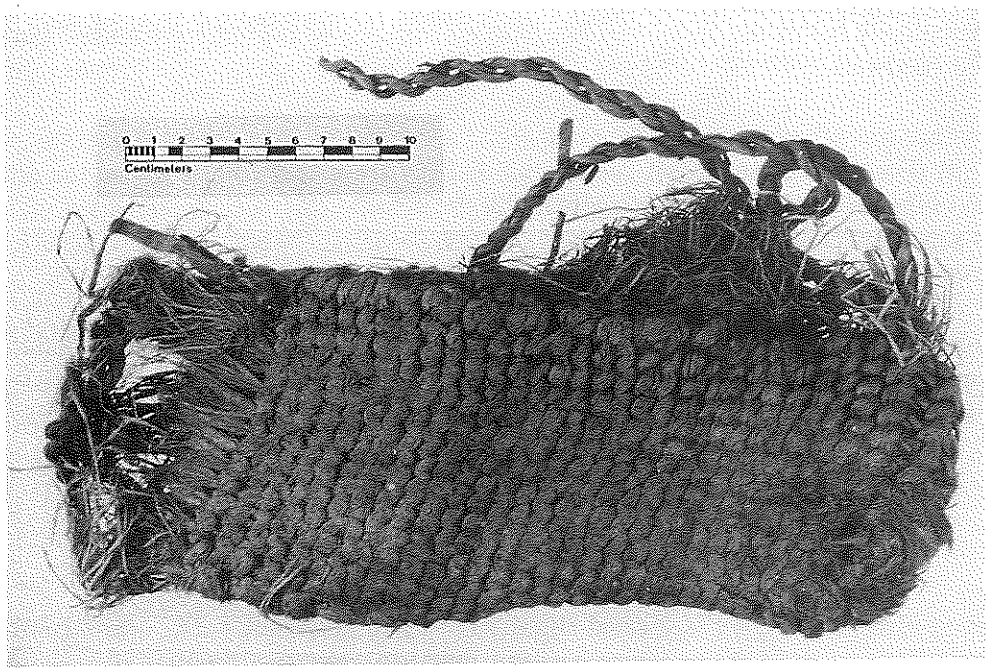


Fig. 4 Multiple warp sandal from Paisley Cave #1, top and bottom views (artifact 1-10023, accession 61)

valid, while Adovasio (1986:196) remains skeptical. Bedwell (1973) reports that a second sandal, recovered from the cave by Cressman in 1965, returned a date of 8500 ± 140 BP.

Academic research in the Fort Rock vicinity was resumed in the mid-1960s by Stephen F. Bedwell (1970, 1973) as a dissertation project under Cressman's direction. Bedwell's work at Fort Rock Cave produced no perishable artifacts.

Table Rock Cave #1

Table Rock Cave #1, a rockshelter on the east side of Table Rock, was first visited by Bedwell on December 4, 1966 during a reconnaissance of the area to identify sites for further excavation. According to his fieldnotes, he dug a small test hole in which he "Found basketry, possible sandal and worked obsidian piece (lost). All foregoing found at approx. 45 cm below surface. Took charcoal sample" (Bedwell 1966).

Bedwell returned in July of 1967 with a small crew for more extensive excavation. A 1x4 meter trench centered over Bedwell's test probe revealed "what appeared to be a grass-lined pit" (Bussey 1967) with associated basketry and matting. The pit (called Feature 1) was found to be an infant burial. Although much of the associated fiber material had been burned, it did not appear that a full cremation had taken place. With the burial was at least one piece of finely woven Catlow Twine basketry with overlay decoration, an artifact of animal hide that may have been a blanket or article of clothing, and several pieces of matting.

Immediately below the burial was "material contiguous with [the] baby burial" but considered to be unrelated (Bedwell 1970:44). Feature 3 included several mats and another circular tray.

Another test pit excavated at the south end of the shelter led to the discovery of another grass-lined oval pit (Feature 2), measuring 1.9 m long and 90 cm wide. The pit contained grass, sage, and rabbitbrush twigs. Near the pit was a diagonally twined circular tray, a carrying basket with grass bundle warps and sage bark wefts, grass mats with both grass and sage wefts, and tule matting. A piece of matting from this feature returned a date of 5220 ± 210 BP.

Summarizing the discoveries at this site, Bedwell (1970:43) suggested that "Table Rock #1 was not an occupation site, but consisted of three apparently unrelated features only: a burial and two cache pits." This assessment of the site by the excavator appears to contradict Cressman's published assertion (1986:122, 1977:148) that the infant burial (Feature 1) is associated with the Feature 2 radiocarbon date.

Seven Mile Ridge Cave

Seven-Mile Ridge Cave is located slightly over five miles due south of the town of Christmas Valley. Bedwell excavated the site during his 1967 field trip, but never reported the results of this work. Bedwell's cultural chronology for the Fort Rock Basin was based largely on the stratified Connley Cave deposits, the upper levels of which had been destroyed by relic collectors. Because of this, Bedwell focused on the time prior to 3000 years ago, and omitted consideration of Seven-Mile Ridge Cave (Bedwell 1970; Bedwell and Cressman 1971:8-9). Bedwell's work at this site was finally reported by Marchesini (1989; 1994).

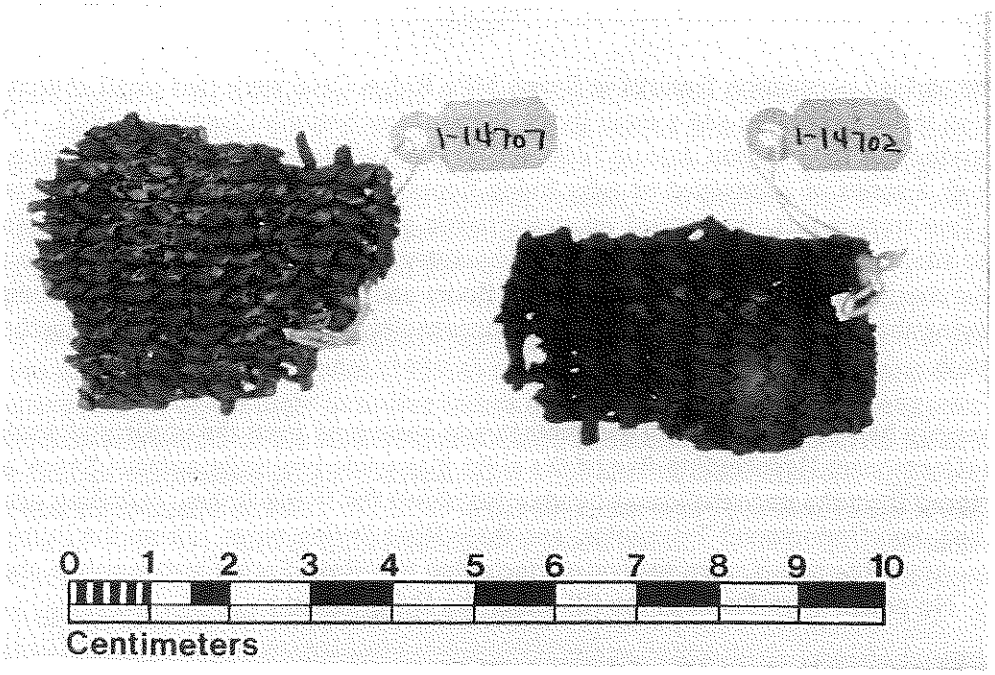


Figure 5. Fragments of "Catlow Twine" basketry from Fort Rock Cave, reportedly associated with the sagebrush bark sandal dated to 9053±350 radiocarbon years ago. Both are made with a z-twist weft; specimen 1-14702 (r) is undecorated, while specimen 1-14707 has a false embroidery element overlying the structural fibers (accession 100KC).

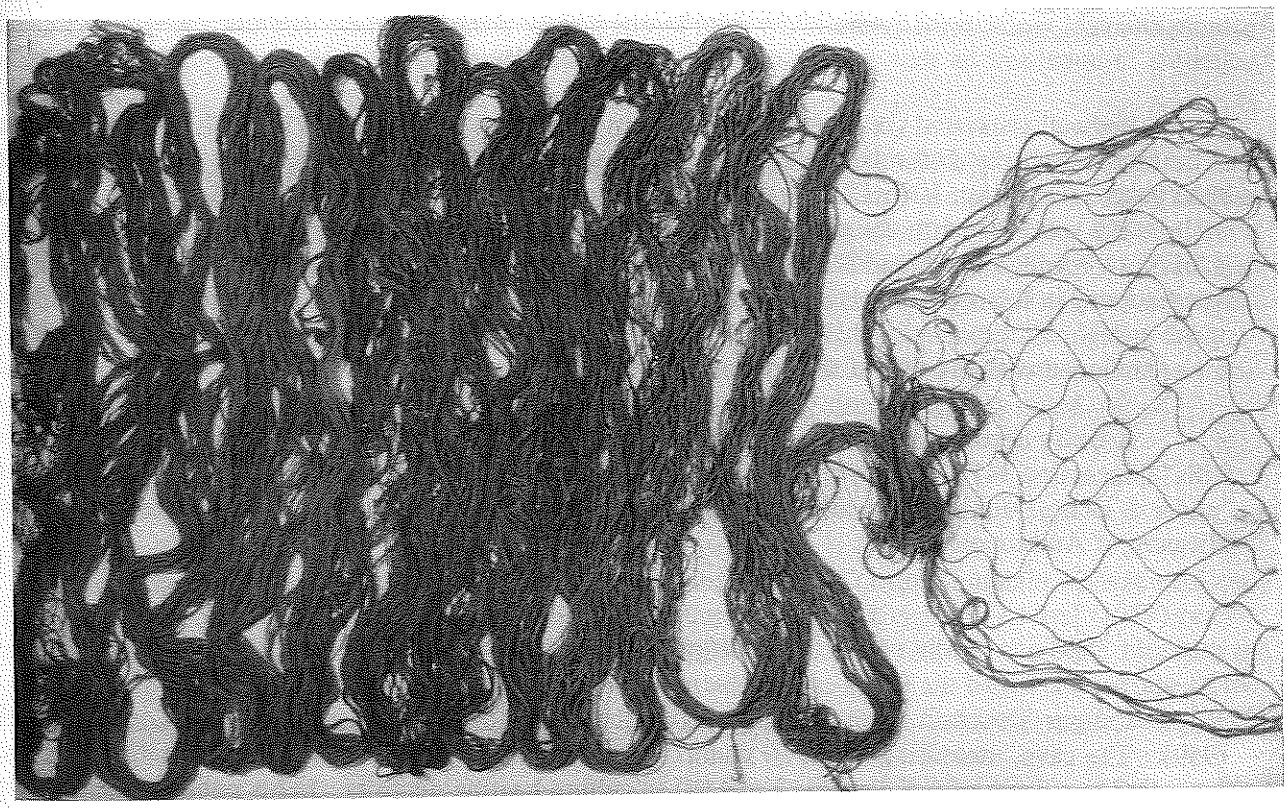


Figure 6. Net of *Apocynum* ("Indian hemp") fiber from Chewaucan Cave, (artifact 1-31283A, accession 263).

The earliest occupation features at Seven Mile Ridge Cave were two small charcoal and ash lenses buried in fill below the site's main living floors (Marchesini's Component VII). Charcoal from one lens produced a radiocarbon date of 2250 ± 100 BP. While no direct evidence for a structure was reported, a series of compacted or ashy living floors up to three meters in diameter were exposed. Two storage pits, interpreted on stratigraphic grounds to have been the last cultural features made at the site, were also excavated; a piece of basketry from Pit No. 1 returned a date of 1060 ± 80 BP. Marchesini (1989) identified these living floors and storage pits as features (Components) II-VI. Overlying the living floors was a deposit of unconsolidated dust and manure (Marchesini's Component I).

Roughly half of the lithic tool assemblage was recovered from the upper unconsolidated sediments (Component I), including five of the eight diagnostic projectile points. Seven arrow points were recovered from the unconsolidated overburden above the living floors, including one Desert Side-Notched, one Cottonwood Triangular, and three Rose Spring types. From the living floors and pit features only three points were recovered, including two Rose Spring arrow points and one Elko dart point. No points were found in the fill under the living floors.

By contrast, only about 1% of the site's 73 fiber artifacts came from Component I (a single cordage fragment), while 8% came from the lowest Component VII sediments. The vast majority (90%), including all the basketry, was recovered from the living floors and storage pits. The assemblage from this component includes three fragments of Catlow Twine basketry (one decorated with overlay), matting, cordage, and parts of three Multiple Warp sandals.

Connley Caves

Bedwell excavated six caves on the southern face of the Connley Hills in 1967. The upper levels of the site were badly disturbed by artifact collectors, which "stirred or removed the deposits of the last 3000 years" (Cressman 1986:123), and was the principal reason why the scope of Bedwell's Fort Rock Basin study was limited to the period preceding this time. Bedwell noted, however, that no basketry, matting, or cordage was found at the Connley Caves "with the exception of a fragment of Catlow Twine type basketry in the upper levels of Connley #6 overlooked by the pothunter who excavated the interior of the cave." Unfortunately, this artifact does not appear on Bedwell's catalog for the site, and it was not accessioned with the rest of the collection from the site.

A badly decomposed multiple warp sandal was found in June 1961 "in a small cave in Connley Hills" (Accession 341). The precise location of the cave was not given. The sandal was reportedly found "under 1 inch of dirt and a small rock" near the cave entrance. The artifact was donated to the State Museum of Anthropology.

Cougar Mountain Cave

Cougar Mountain Cave was dug during the spring of 1958 by amateur John Cowles (Cowles 1959). The cave, measuring about 10 meters across the mouth and 10 meters from front to back, was excavated to a depth of 6.5 feet (ca. 2 meters) in culture-bearing deposits. In his published manuscript, Cowles references material from 0 feet at the bottom to 6.5 feet at the surface. He noted a pumice layer at the four foot level (2.5 feet from the surface). Although he thought this to be Newberry pumice, as Cressman originally believed the volcanic ash in Fort Rock Cave to be, it is almost certainly the 7000

year old Mazama tephra. As Cressman found at Fort Rock Cave, the cultural deposit was underlain by water-washed gravels. Cowles (1959:3) found that cultural debris continued down to the cobble layer, and he believed that the cave "was inhabited soon after the water subsided enough so it became habitable." Cowles (1959:48) also reported a layer of "manure" at the two foot level which suggested "a definite lapse of time during which the cave was not inhabited by humans. This is further substantiated by a thinning of artifacts at this level."

Fiber artifacts were found throughout the deposit, although material from the bottom of the excavation was extremely fragile; Cowles (1959:4) reported that "Capillary action from the cave bottom brought moisture into the lower eight to twelve inches of the cave." Cowles' report suggests that leather was more common at the base of the cultural deposit, and diminished in frequency as basketry increased "at about the time of the notched points first appearance" at approximately the two and a half foot level. He reported that three-strand braiding occurred in the cave, but was "confined to the lower two feet of the cave" (Cowles 1959:49), as was the occurrence of bison bones. A tule sandal from the top of the lowest one-foot level of site (see Cowles 1959, Plate 24 lower right) produced a radiocarbon date of 8510 $\pm$ 250 years ago (Ferguson and Libby 1962).

Provenience information has been preserved for eight of eleven sandals recovered from the cave, including six Fort Rock type sandals from below Mazama pumice and two Multiple Warp sandals from above the pumice. The remaining three sandals, including two of toddler size about four centimeters in width, are of the Multiple Warp type. Other notable patterns in the footwear include an apparent pair (one of which was radiocarbon dated) of Fort Rock type sandals from the lowest (one foot) level of the site with eight warps, and one from the 1½ foot level with six warps; Fort Rock type sandals typically have five warps. The two deepest sandals were made of tule, while others from below Mazama pumice were made of sagebrush bark. One sagebrush bark sandal was stuffed with an insulation of shredded sagebrush bark.

Unfortunately, no provenience information survives for the bulk of the woven materials. Two basketry fragments appear to be an interlace weave (cf. Lovelock Wickerware [Adovasio 1970]) rather than twined construction. These are the only examples of this construction known from the Fort Rock Basin; only one other example of wicker construction is known from Oregon, a combination twined and wicker object of rigid materials from a near-surface context in Roaring Springs Cave (Cressman et al. 1942:40). Both the Cougar Mountain Cave specimens are of flexible construction, having fine 2-ply z-twist cord warps, and tule wefts. Most of the close twine basketry fragments (15 of 27) in the assemblage have been decorated with overlay; no false embroidery decoration was noted.

Cougar Mountain Cave #2

Located about 100 meters west of Cougar Mountain Cave, Cougar Mountain #2 was explored in 1958 by Thomas D. Hamilton of the US Geological Survey during a visit to Cowles' (1959) nearby excavation. Hamilton later donated a small collection of items from the site to the State Museum of Anthropology (Accession 423). The artifacts were reportedly from 10-50 cm below the surface of the cave floor. Among the items donated was a badly deteriorated fragment of Catlow Twine basketry with overlay decoration.

Bedwell (1970) also excavated in Cougar Mountain Cave #2, during his 1967 Fort Rock field trip. Bedwell recovered no perishable items, but he recorded an excavation profile at the site. The top 50 cm of fill (where the basketry was reportedly recovered) consisted of "a fine gray layer containing

some silt mixed with considerable gray fine ash" (Bedwell 1970:31). The site's strata were identified in the field and in the museum's accession records as I through V from top to bottom of the deposit, but in the published descriptions (Bedwell 1970, 1973) the stratum designations are condensed and reversed, I to III from bottom to top. Further, the published descriptions do not always correspond to field designations (In "Area A" the unit described in the field as Stratum III corresponds to strata I and II in the published descriptions). In the published works, a radiocarbon date from Cougar Mountain Cave #2 (11,950 $\pm$ 350 BP) is identified as coming from Stratum 4, although no Stratum 4 is identified in the published text or stratigraphic profile. According to accession notes, the dated material came from the lowest culture-bearing level of the site.

Fort Rock Crater Cave

A small cave located on the east side of the Fort Rock tuff ring was brought to Cressman's attention in the spring of 1955 by several boys who had dug in the site. Cressman and his students spent two days excavating the cave during May of that year, and collected some basketry and cordage artifacts. Later that spring, further excavations in the cave were undertaken by several collectors from Eugene, whose collection of perishable artifacts from the site was the subject of a short article (Scheans 1956).

Further excavations were undertaken in the cave during June of 1964 by Christopher Ray, an amateur archaeologist vacationing in the area from out of state. A small collection and accompanying fieldnotes from the cave were donated to the State Museum of Anthropology (Accession 429). Although Ray recovered no botanical artifacts, his notes and sketch maps compare well with Scheans' (1956:2) description of the cave's stratigraphy. The upper stratum was a unit of mixed sediment, rock, ash, and artifacts about a meter and a half thick. Stratum 2 was an approximately one meter thick volcanic (presumably Mazama) pumice deposit. The pre-pumice sediments were silt.

Scheans (1956:2) reported that charcoal was observed in the below pumice silt, but it was not excavated due to the instability of the trench walls. By the time Ray entered the cave in 1964, the upper two strata had been almost entirely removed, and his excavation focused on the below-pumice silt.

Below the pumice, Ray noted "Fibrous material . . . lying directly upon the surface of the soil under pumice in a series of random bundles." The following day he recorded "careful cleaning of fibrous material on surface of soil under pumice," including a fragment of twisted sagebrush bark that was among the items donated to the museum. All other perishable artifacts from the site were recovered from deposits overlying the volcanic pumice.

Most of the decorated basketry recovered from Fort Rock Crater Cave (13 of 15 pieces) had false embroidery; the remaining two pieces had one strand overlay elements. Several pieces of diagonally twined basketry and matting were reported, including a rolled cylinder of close diagonal twine basketry that held a number of partially decomposed feathers. One fragment of open simple twined basketry had extra weft twists between each warp, as a technique to space the warps and create an open mesh structure. Scheans (1956:2) also reports a piece of matting that had been sewn (cords passed through slits in whole tule stems), rather than twined.

Some of the basketry from the site had evidently been layered in a cache. These materials were damp when recovered, and dried to a consolidated mass. Many individual pieces were layered in the mass, which cannot now be separated for analysis.

Lake Abert Caves

Frank A. Payne, an amateur collector who kept Cressman apprised of his discoveries, spent several days in October 1943 exploring the Abert Rim area on the eastern side of Abert Lake. An apparent lava tube at the north end of the lake was dug out (Cave #1 in Payne's notes, later recorded as 35LK1406) as was a small rockshelter approximately a quarter mile south of Poison Creek near the southern end of the lake (Cave #2, later recorded as site 35LK1407). Collected materials were subsequently donated to the State Museum (Accession 100II).

Payne (1942:3) described Cave #1 as being "only 7 feet wide at the floor level and 16 feet from front to back, with a depth of about 12 inches, making approximately 112 cubic feet of material to screen" which were removed in four hours. He reported the following findings (Payne 1942:3-4):

> Such fragments of artifacts as I found were evenly distributed throughout the material screened. None of them were of importance, much to my disappointment. There were no bone tools and only one arrowhead in the cave, most of what I found being in the form of fragmentary twine, basketry and matting . . .
>
> I found a fire lens about 3 feet in diameter and 6 inches deep three feet back from the entrance against the south wall of the cave, which faced west. There was no cracked or even charred bone such as is usually found around a fire lens. Probably the cave had been used for nothing more than a place to sleep or as a lookout.

Payne described Cave #2 as a sheltered area measuring 12 feet wide and six feet from front to rear. Digging at the site was described as follows (Payne 1942:1):

> In the afternoon I worked out cave No. 2. . . . There I found a cache of basketry and some tule matting, but it was in bad condition because the cave is not always dry. The material was covered with 11 inches of dirt and rat dung which I screened carefully without finding anything else. There was no fire lens or other evidence of fire, suggesting that the cave had been used only to sleep in, as did the fact that the mat appeared to have been spread out on a level from one side of the cave to the other.

Chewaucan Cave

Chewaucan Cave is located on the southeast side of Tucker Hill, a ridge that partially divides the upper and lower Chewaucan marshes in the Summer Lake-Chewaucan basin. The cave was partially dug by two families on an outing in June of 1967. This same summer Bedwell (1970, 1973) conducted excavations in the Fort Rock basin, and learned of the discovery at Tucker Hill. He and Cressman contacted the excavators, who agreed to donate the materials to the State Museum of Anthropology (Accession 263). One of the excavators also contributed a brief written description of the circumstances of the discovery.

The cave was described as ten to fifteen feet wide and five to six feet high at the entrance. The cave was reportedly "filled to within inches of the ceiling with silt, sticks, fecal matter, bones and stone. . ." and the roof of the cave was "heavily sooted." The excavators dug around large roof fall boulders and sifted the fill. On the first day "five or six projectile points" were found as well as "pieces of tule mat, cordage, and two sizes of fiber netting. Charred bones of mammals, birds, and fish were found."

Similar materials were found the following day, with the exception of a large twined grass bag "located about eight feet in from the mouth of the cave and two feet below the surface." The bag was lying on a bed of grass and was covered with a piece of matting. A rope of sagebrush bark was looped around the bag. A portion of the large grass bag was submitted for radiocarbon analysis, and returned a date of 340 $\pm$ 80 years BP.

Inside the bag were two large, close-twined basketry trays, a leather bag, and a piece of leather wrapped around pieces of cordage, sinew, and leather. Each of the basketry trays was folded closed and contained other materials, and the leather bag also contained other artifacts (Fig. 6). One of the twined trays was folded over two bundles of *Apocynum* netting, each "about two feet long and five inches in diameter." They were later unfolded and found to be about 1.2 meters high. The longer of the two nets is about 25 meters long. Anthropologist Verne Ray describes the use of such nets by the Modoc:

> Nets . . . were placed in localities where rabbits would become entangled in the mesh. Similar nets, with meshes varying according to the game sought, were used for taking geese, ducks, and other waterfowl. They were made of Indian hemp cordage, the height being about three feet, the length ten feet or longer. They were placed parallel to the river bank or lake shore about six feet out. The nets were held by poles driven vertically into the lake or river bottom. The nets were set at night, visited the following morning, then brought in to be set at a different place the next night. The game birds became entangled in the loosely hanging net while they fed at night.

The second tray contained pieces of badger fur. The leather bag contained a highly polished conical maul, 14 U-shaped sticks thought to be snare parts, a pouch made of a badger head with the eye sockets and mouth sewn shut, and a long strip of fur (actually two furs sewn together) resembling mink.

Medicine Rock Cave

Medicine Rock Cave, located next to the Sprague River near Chiloquin, was excavated by Luther Cressman in 1947, during the course of investigations in the Klamath Lakes area conducted during the late 1940s. An impressive series of occupation zones separated by sterile deposits, including a water-deposited pumice lens presumably derived from the 7000 year old eruption of Mt. Mazama, indicated that the cave was used intermittently throughout the Holocene (Cressman 1956). Faunal remains from the cave were almost exclusively fish bones and mussel shells, leading Cressman (1956:402) to suggest that occupation in the cave was probably "largely limited to the periods of the fish runs." Two fragments of charred tule basketry or matting were recovered from the deposits.

Barlow Cave

Robert Sawyer of Bend found some fiber artifacts in a cave located about four miles northeast of Pilot Butte near Bend in March of 1931. He donated the small assemblage--which contained basket fragments, cordage, three fiber bundles, and a Multiple Warp sandal fragment--to the State Museum of Anthropology (Accession 37).

Redmond Cave

Robert F. Heizer dug a small test pit in Redmond Cave in the spring of 1941. No fiber artifacts were found in the excavation, but a Multiple Warp sandal fragment (16 warps) made of sagebrush bark was reportedly found on the ground surface near the cave entrance (Accession 100GB).

Discussion

This review of prehistoric basketry materials from the Fort Rock Basin and vicinity permits a number of general observations regarding prehistoric fiber arts. With rare exceptions, close simple twine basketry is identical to the "Catlow Twine" material first described by Cressman et al. (1942). This type has a two-ply z-twist flexible cord warp of tule or related marsh plant, and a z-twist weft of the same material. This basic structure may be undecorated, or trimmed with overlay or false embroidery elements. Of 104 occurrences of close simple twine basketry in the present inventory (Table 1) fully 94% (n=98) are of this basic type. Only six occurrences vary from the this classic construction. Five specimens are distinguished only by the use of single element flexible warps (three from Paisley Caves, and one each from Fort Rock Cave and Fort Rock Crater Cave). A single specimen from Cougar Mountain Cave is constructed with a single element warp and an s-twist weft; this piece is also unusual in that it appears to be a fragment of a strap with the warp zig-zagging back and forth to support three weft rows.

Considering the larger sample of open and close twining, 97% (200 of 207 occurrences) was constructed with a z-twist weft. Only seven s-twist constructions occur; four are in the Cougar Mountain Cave assemblage, one occurrence is at Paisley Cave #1, and two specimens are from Table Rock Cave. This small sample of s-twist twining includes the only two occurrences of rigid (willow?) warp and weft twining in the Fort Rock basin.

Cordage is predominantly two-ply z-twist material. Two-ply cordage accounts for 98% (396 of 403 occurrences) of all plied cords in the inventory. Of the two-ply cords, 87% are z-twist (with s-spin elements), but there is a significant difference by material. For cords of tule, grass, and sagebrush bark, 97% of all two-ply strands are z-twist, but for hemp cords (*Apocynum* or nettle), which appear to have been used predominantly for netting, only 12% (5 of 43 occurrences) show a z-twist.

Twelve pieces of three strand braid occur in the Cougar Mountain Cave assemblage, the only place in the Fort Rock basin these structures have been recovered. It is perhaps noteworthy that in his brief volume on the site, Cowles (1959:35) reported that "[n]o braiding appeared above the two-foot level."

The Cougar Mountain Cave assemblage also includes two fragments of interlace weaving, structurally similar to the "Lovelock Wickerware" known from western Nevada (Adovasio 1970). This is the first known occurrence of this construction in the Fort Rock basin. Both fragments are similar in structure and material, and may have originated from a single artifact. Both have fine two-ply z-twist cord warps (processed sage or hemp?), and tule wefts.

Table 1. Frequency distribution of fiber artifacts by type at each site.

	Paisley Cave #1	Paisley Cave #2	7-Mile Ridge Cave (Upper)	7-Mile Ridge Cave (Middle)	7-Mile Ridge Cave (Lower)	Cougar Mtn. Cave #2	Fort Rock Cave #2	Table Rock Cave (Fea 1)	Table Rock Cave (Fea 2)	Table Rock Cave (Fea 3)	Fort Rock Cave	Lake Abert Cave #1	Lake Abert Cave #2	Chewaucan Cave	Barlow Cave	Redmond Cave	Paisley Dune	Cougar Mountain Cave	Medicine Rock Cave
Basketry and Matting[1]																			
CST,Z,U	2	1	-	2	-	-	11	-	-	-	1	-	10	-	1	-	1	11	-
CST,Z,O	1	1	-	1	-	1	2	1	-	-	-	-	1	2	-	-	-	16	-
CST,Z,F	1	-	-	-	-	-	9	-	-	-	23	-	-	-	-	-	-	-	-
CST,Z,1	1	2	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
CST,Z,1,F	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
CST,S,U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
CDT,Z,U	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	2	-
CDT,Z,F	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-
CDT,S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Interlace	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
OST,Z	7	3	-	4	-	-	16	2	5	3	16	2	1	2	1	-	-	19	2
OST,S	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
ODT,Z	-	-	-	-	-	-	3	-	-	1	1	-	-	-	-	-	-	4	-
ODT,S	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	3	-
Cordage																			
Z^t_t--tule	22	18	1	45	5	-	7	-	-	7	-	13	-	1	1	-	-	83	-
Z^t_s--sage	6	6	-	2	-	-	10	1	-	5	39	3	-	1	10	-	-	27	-
Z^t_g--grass	3	3	-	3	-	-	3	-	-	-	-	2	-	3	1	-	-	10	-
Z^t_h--hemp[2]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-
S^z_t--tule	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S^z_s--sage	3	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	6	-
S^z_g--grass	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S^z_h--hemp	3	2	-	5	-	-	-	-	-	-	-	10	-	4	-	-	-	14	-
Z^t_s--sage	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Z^t_t--tule	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
S^z_s--sage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Z,2 S^z_s--sage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-
S,2 Z^t_t--tule	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
3 strand braid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-
Sandals																			
Multiple Warp	5	4	-	3	-	-	-	-	-	-	-	-	-	-	1	1	-	5	-
Fort Rock	-	-	-	-	-	-	-	-	-	-	93	-	-	-	-	-	-	6	-

1. CST=Close simple twine (all CST basketry in this sample is "Catlow Twine" except those designated "CST,1" which have single element warps), CDT=Close diagonal twine, OST=Open simple twine, ODT=Open diagonal twine, Z=z-twist weft, U=undecorated, O=Overlay decoration, F=False embroidery decoration.
2. Includes nets and net fragments.

Conclusions

In his basketry chronology for the Northern Great Basin, based largely on the stratified deposits of Dirty Shame Rockshelter in the extreme southeastern corner of the state, Adovasio (1986; cf. Andrews et al. 1984) identified three stages. During Stage 1, from 11,000 to 7000 years ago, basketry was dominated by simple open and close twining with z-twist wefts, and lacked any decorative embellishment. Fort Rock and Spiral weft sandals were made, and diagonal twining and coiling were absent.

Several footnotes--and corrections--can be made to these general patterns, based on the Fort Rock basin basketry assemblages. Cressman (1986:123, cf. 1951:308) asserts that fragments of basketry decorated with false embroidery "were properly associated with the sandal" which ultimately produced a radiocarbon date of 9053 $\pm$ 350 years ago "and, therefore, carry the same date." Adovasio (1986:196) remains skeptical of the association. It is unfortunate that provenience records for the large Cougar Mountain Cave assemblage are largely non-existent (essentially limited to selected figure captions in Cowles' 1959 publication), but in Plate 32 (Cowles 1959:40) a fragment of close twined basketry with overlay decoration is identified as having been recovered "from below pumice." Finally, two pieces of Catlow Twine basketry, one decorated with overlay and one with false embroidery, were recovered by amateur Walter Perry when he first explored Paisley Cave #1 in 1937. Cressman et al. (1942:39) report that

> Since it was only later that the importance of the stratigraphic sequence became evident, it is not absolutely certain whether the specimens came from above or below the pumice. Perry, an unusually careful observer, believes they came from below. Evidence from subsequent excavation leads me to concur in his opinion, for at the point where the test pit had been dug most of the top deposit was a mass of white ash. No other basketry came from below the pumice, but there were loose warps which prove that basketry was made.

Adovasio's (1986:196; cf. Adovasio et al. 1976:7) claim that diagonal twining is absent during this time contradicts its reported presence below Mazama ash at Fort Rock Cave (Cressman et al. 1942:56), as well as its occurrence in Zone VI (ca. 9500-8000 years ago) at Dirty Shame Rockshelter (Adovasio et al. 1977:7; Andrews et al. 1984:27). Thus, not only it is highly possible that both overlay and false embroidery decorative techniques were in use during Stage I times, but diagonal twining appears to have been as well.

Spiral Weft sandals are entirely absent from the Fort Rock Basin. Fort Rock sandals are exclusive to pre-Mazama deposits at Fort Rock and Cougar Mountain Caves. Multiple Warp sandals occur in post-Mazama contexts at Cougar Mountain, Redmond, Connley, and Paisley caves. A significant variation in construction is noted for the Fort Rock type at Cougar Mountain Cave, where six and eight warp specimens occur in addition to the usual five-warp forms.

According to Adovasio (1986), all forms from Stage 1 continue in Stage 2 (7000-1000 years ago), with the addition of diagonal twining and the appearance of s-twist wefts. Adovasio asserts that Spiral Weft sandals dominate early in Stage 2, Fort Rock sandals disappear by 5900 BP, and Multiple Warp sandals appear and dominate during late Stage 2. Decorated twining occurs throughout this period, and coiling is absent.

As noted above, Spiral Weft sandals do not occur in the Fort Rock basin, and their predominance elsewhere (at Dirty Shame Rockshelter, and Catlow and Roaring Springs Caves in extreme southeast Oregon) may reflect an important regional pattern for the mid-Holocene period. In agreement with Adovasio's characterization of Stage 2, false embroidery and overlay decoration are common in Fort Rock basin assemblages.

Adovasio (1986) reports that during Stage 3, 1000 BP-contact, coiling appears in minor quantities and the decorative embellishments of Stage 2 occur only rarely. Significantly, the only specimens of close twined basketry clearly assignable to this time, two trays from Chewaucan Cave, are decorated with overlay. No coiled basketry is known to occur in the Fort Rock basin.

Final Considerations

While it is clear that a number of important basketry assemblages are known from the Fort Rock Basin and vicinity, there remains a critical need for better chronological controls. Of the 14 sites discussed here, only five have produced radiocarbon dates, and only two of these were from controlled scientific excavations.

The most striking change discernable from the available evidence appears to be in sandal construction. Fort Rock type sandals occur exclusively in pre-Mazama contexts in the Fort Rock basin, while Multiple Warp sandals occur exclusively in post-Mazama times. Spiral Weft sandals, an important type in extreme southeast Oregon sites, are not known to occur in the Fort Rock Basin vicinity.

In spite of the chronological limitations, it appears that from earliest times and continuing throughout the entire period of human occupation in the region, basketry manufacture--and decorative techniques--remained fundamentally unchanged. Throughout the sequence, close twined basketry was typically made with a two-ply z-twist flexible cord warp with a z-twist weft. Overlay and false embroidery decoration were probably used from earliest to most recent times. Open twined constructions were also overwhelmingly made with z-twist wefts.

Certainly one of the most noteworthy aspects of the prehistoric basketry tradition of the Fort Rock region is its apparent unbroken continuity over a span of nearly 10,000 years. While Catlow Twine basketry has been found throughout all of southeastern Oregon, Cressman (1986:123, cf. 1936:38-39) recognized that this region's archaeological basketry differed from that of the Northern Paiute, who occupied most of southeast Oregon historically. By contrast, he observed that "most of the ethnographic traits of Catlow Twine [were] carried on among the Klamath-Modoc" into the historic period (Cressman et al. 1942:45). Only in the method of starting the basket (the bunching of warp elements in historic structures) was a consistent variation noted; in other details of construction, form, materials, and decorative techniques both historic Klamath-Modoc and prehistoric basketry are indistinguishable. Cressman (1986:123) concluded that "certainly the historic Klamath basketry is lineally descended from the fine basketry of the prehistoric period."

While coiled basketry has been found in small quantities in southeast Oregon archaeological contexts, none has been found within the Fort Rock basin area. Adovasio and Andrews (1986:51-52) believe that the coiled basket fragments found at Dirty Shame Rockshelter, and Catlow and Roaring Springs Caves, "are indicative of the arrival of the Northern Numic speakers" (Northern Paiute) to the northern Great Basin. Thus, it appears that coiled basketry was present during late prehistoric time in

extreme southeastern Oregon, but absent from south-central Oregon, including the Fort Rock basin area. This distribution supports the report (Kelly 1932:72) that the Klamath once occupied territory east to Steens Mountain, while the Paiute were formerly "living east of Steens Mountain, in Oregon, but eventually they drove out the Klamath and took possession" of all territory east of the Klamath Basin. In light of the basketry evidence, it is probable that until just prior to the historic period, the Fort Rock vicinity was used primarily by ancestors of the historic Klamath-Modoc.

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ARCHAEOLOGICAL RESEARCHES IN THE NORTHERN GREAT BASIN: FORT ROCK ARCHAEOLOGY SINCE CRESSMAN

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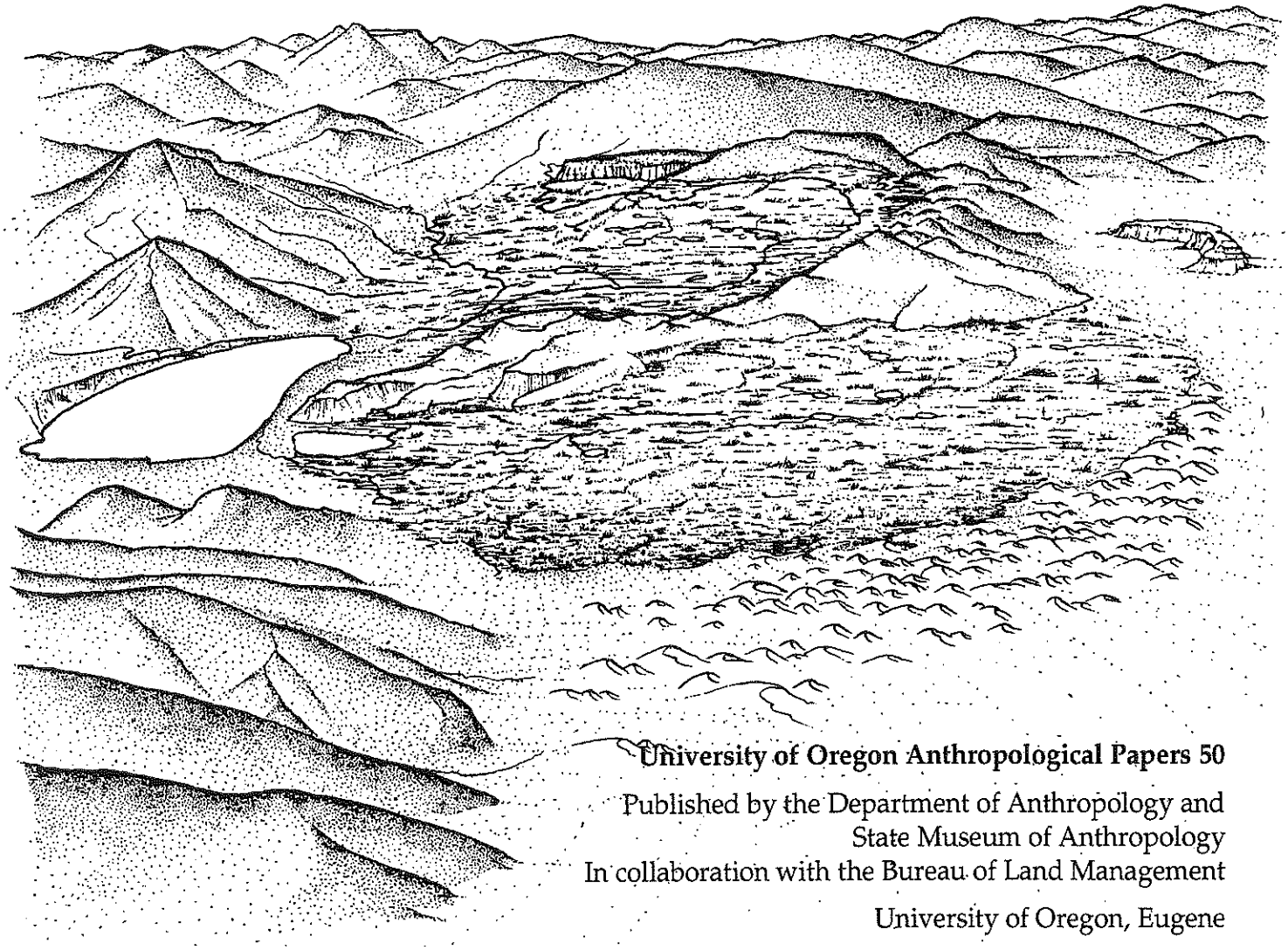

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