



TABLE OF CONTENTS

Introduction	
<i>Sally J. Cole</i>	3
Durango-Animas and Upper San Juan Rivers, Colorado and New Mexico	
<i>Farming at the Edge of Paradise: Basketmaker II Emergence in New Mexico's San Juan Basin</i> <i>Leslie M. Sesler and Timothy D. Hovezak</i>	9
<i>Refining the Chronology of the Durango Basketmakers</i> <i>Mona C. Charles</i>	21
<i>Pushing the Limits and Tormenting Corn Seeds: Cultural Adaptations and Climatic Change in the Upper San Juan During the Basketmaker II Period and Beyond</i> <i>Benjamin A. Bellorado</i>	33
Southern Chuska Valley, New Mexico	
<i>Basketmaker II in the Southern Chuska Valley, New Mexico</i> <i>Timothy M. Kearns</i>	49
Moab and the Canyonlands, Utah	
<i>Basketmaker Chronology near Moab, Utah</i> <i>Grant Fabrni</i>	73
<i>Basketmaker-Age Woven Perishables of the Moab Region</i> <i>Sharyl Kinnear-Ferris</i>	81
Comb Ridge, Cedar Mesa, Navajo Mountain, and Grand Staircase, Utah and Arizona	
<i>Early Farmers at the Earth's Backbone: Basketmaker II in the Comb Ridge Area</i> <i>Winston Hurst, Francis E. Smiley, and Michael R. Robins</i>	89
<i>New Insights from Old Collections: Cedar Mesa, Utah, Revisited</i> <i>William D. Lipe, R. G. Matson, and Brian Kemp</i>	103
<i>Basketmaker II Occupation of the Navajo Mountain Region</i> <i>Phil R. Geib and Kimberly Spurr</i>	113
<i>The Basketmaker II Horizon: A View from the Grand Staircase</i> <i>Douglas A. McFadden</i>	119

NEW INSIGHTS FROM OLD COLLECTIONS: CEDAR MESA, UTAH, REVISITED

WILLIAM D. LIPE, R. G. MATSON, AND BRIAN M. KEMP

ABSTRACT

Basketmaker II period collections made in the 1970s during the Cedar Mesa Project are being re-examined with new questions and in some cases with new analytical techniques. Included are DNA analyses of human and turkey coprolites, palynology of the latter, and studies of biface production technology and of a defensive site lithic assemblage. Experimental studies will assess the effects of stone-boiling with limestone on maize nutritional qualities. Regional subsistence data synthesis indicates the maize-dominated Cedar Mesa pattern is typical of the northern Southwest.

INTRODUCTION

Cedar Mesa is a highland located in San Juan County, Utah, just north of the San Juan River. In the late nineteenth century, excavations by Richard Wetherill and others in the dry shelters of canyons in and around Cedar Mesa resulted in the first evidence of a distinctive Basketmaker culture stratigraphically below the later "Cliff Dweller" (Pueblo) remains (Blackburn and Williamson 1997; Spangler et al. 2010; Hurst and Turner 1993; McNitt 1957). In recent times, the well-preserved cliff dwellings and rock art of Cedar Mesa, as well as its spectacular scenery, have made the area an internationally known destination for backcountry visitors (Petersen 2002; Tassoni 2001; Roberts 1996; Zwinger 1978).

One of the values of curating archaeological collections is that they can often be studied by new analytical methods not available at the time of the original research. This opens up the possibility to address new research questions not considered earlier. Here we report briefly on recent investigations of Basketmaker II (BM II) period materials originally collected in the early 1970s during fieldwork in southeastern Utah directed by Lipe and Matson as part of the Cedar Mesa Project (Lipe 2007; Lipe and Matson 2007; Matson 1991; Matson et al. 1988, 1990). The project was primarily carried out through surface surveys, but limited excavations were done at several sites. Except for some specimens being studied by Matson at the University of British Columbia, the Cedar Mesa Project collections and records are curated in the Museum of Anthropology at Washington State University (WSU).

The Cedar Mesa Project (CMP) surveys indicated that Archaic period occupation was light (evidence consisted only of Archaic-style points found on

William D. Lipe ■ Department of Anthropology, Washington State University, Pullman, WA 99164-4910, lipe@wsu.edu

R. G. Matson ■ Department of Anthropology, University of British Columbia, NW 6303 Marine Drive, Vancouver, BC V6T 1Z1, Canada, rgmatson@shaw.ca

Brian Kemp ■ Department of Anthropology and School of Biological Sciences, Washington State University, Pullman, WA 99164-4910, bm Kemp@wsu.edu

later sites). There was a substantial Basketmaker II period occupation dating to the late centuries B.C. up to the A.D. 400s. After an occupational hiatus, numerous late Basketmaker III settlements occur, with some evidence of Pueblo I period use in the easternmost part of the mesa. Another hiatus was followed by Pueblo II and III period occupations dating from the middle A.D. 1000s through the mid-to-late 1200s (Matson et al. 1988). Sparse archaeological evidence also exists of later use of the mesa by Utes, Navajos, and Anglo-Europeans.

HUMAN AND TURKEY COPROLITES FROM THE TURKEY PEN SITE

In 1972, as part of the CMP research, R. G. Matson excavated a single test pit at the Turkey Pen site (42SA3714; also 42SA5109) in Grand Gulch (Matson 1991:90–101). This pit sampled an extensive Basketmaker II dry midden dating ca. 200 B.C. to A.D. 450. A 50 × 50 × 140 cm column of the midden was isolated and bagged by stratigraphic layer (Figure 1). The coprolite analyses noted here were conducted on samples from this midden column or from deposits encountered while isolating it.

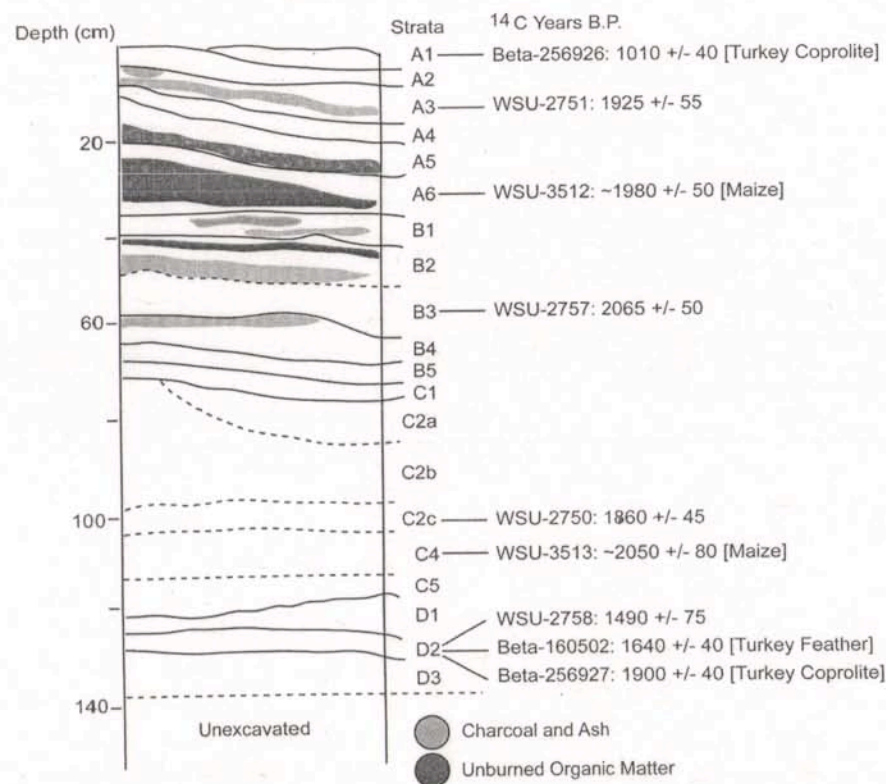


FIGURE 1. Stratigraphy of midden column at Turkey Pen Site, Grand Gulch, with C-14 dates (after Matson 1991:Fig. 2.33 and Speller et al. 2010: Fig. S1)

Large parts of the Turkey Pen midden were heavily dug over in 1979 by professional looters (Powers 1984). The site's popular name stems from an isolated jacal structure that may well have been used to pen turkeys, but probably was not built until the Pueblo II or III period.

Brian M. Kemp and Cara Monroe have initiated analyses of mtDNA from Basketmaker II human coprolites found in the Turkey Pen midden. Several hypotheses about the origins of Basketmaker II populations are, in principle, testable by these analyses. Initial indications are that the kind of genetic information being obtained can test these ideas and preliminary data has revealed genetic continuity between Basketmaker II populations and contemporary Pueblo groups, among others (Kemp et al. 2009). The observed patterns, when verified by further research, will undoubtedly result in novel observations and lead to new ideas about Southwestern population history.

In collaboration with Phil R. Geib, Kemp is also currently analyzing Archaic coprolites from Old Man Cave (Geib and Davidson 1994), located just east of Cedar Mesa. This Archaic "baseline" is crucial for evaluating the degree to which incoming farmers impacted the gene pool of the Southwest and/or indigenous foragers of the Southwest adopted farming technologies. This line of inquiry builds squarely off Kemp's dissertation research (Kemp 2006), as well as a recent article (Kemp et al. 2010).

Brian M. Kemp, Cara Monroe, and WSU undergraduate student Scott Wyatt have also analyzed mitochondrial DNA (mtDNA) extracted from turkey (*Meleagris gallopavo*) coprolites collected from the midden in 1972 (Wyatt et al. 2009; Speller et al. 2010). As is true for humans, mtDNA is strictly maternally inherited among turkeys and is particularly abundant in most cells. These characteristics make mtDNA an ideal molecular marker for studying in ancient remains, artifacts, and coprolites (Kemp et al. 2007; LeBlanc et al. 2007). Concurrently, Camilla Speller and colleagues from Simon Fraser University analyzed mtDNA from turkey bones dating from the A.D. 600s through the 1400s from a number of sites located across the Southwest (Speller et al. 2010).

In both the Basketmaker II samples and those from later periods, a single turkey mtDNA lineage (termed "aHap1") was found to dominate at all sites, represented in 116 of the 143 (~81 percent) successfully analyzed archaeological specimens (Speller et al. 2010). This long-term and wide-spread conservation of a single female line indicates controlled breeding and hence domestication of these turkeys. The "Southwestern domestic" haplotype ("aHap1") is genetically less closely related to most lineages found in contemporary populations of the endemic Southwestern Merriam's turkey (*M. g. merriami*) than to lines found in populations of the Eastern (*M. g. silvestris*) and Rio Grande (*M. g. intermedia*) subspecies; these birds presently reside east and southeast of the area occupied by Ancestral Puebloan groups. The aHap1 haplotype is the least common lineage found among Merriam's turkeys today and may represent descendants of birds that "escaped" from domestic flocks sometime during prehistory (Speller et al. 2010). Identifying a geographic and genetic source for the Southwestern domestic line is obviously a topic for additional research.

Wyatt, Monroe, and Kemp also obtained (from the US National Museum) tissue samples from turkeys collected in the early 1900s of the now-extinct central Mexican subspecies (*M. g. gallopavo*). Analysis of the mtDNA of these birds links them very closely to modern commercially bred and marketed turkeys (Speller et al. 2010). This is consistent with historical accounts that the Spanish took Mexican turkeys to Europe, where they became popular; European breeds then became the basis for turkey husbandry in North America (Speller et al. 2010). The turkeys kept prehistorically at the Turkey Pen site and elsewhere in the Southwest thus appear to record a domestication event separate from the Mexican one. It is possible that future genetic research will identify additional domestication centers of the turkey, which is consistent with practices of animal and plant domestication in the Old World (see Zeder et al. 2006).

BreAnne Nott, a WSU graduate student, has analyzed pollen from Turkey Pen Basketmaker II turkey coprolites, and has found that many samples include maize pollen, often in abundance (Nott 2010; Nott et al. 2009). This is consistent with earlier analyses of turkey coprolites from this midden by Aasen (1984) and Arakawa et al. (2001). These results further indicate that the Grand Gulch turkeys were being treated as domestic animals. The turkeys were evidently living at the site alongside its human occupants, and likely were being fed maize. Also, a few eggshell fragments were collected during the "clean-up" of the 1979 looting episode (Powers 1984). These are probably from the Basketmaker II period occupation of the site, but a later Pueblo period context cannot be excluded.

WHY IS LIMESTONE ABUNDANT ON BM II HABITATION SITE MIDDENS?

A hallmark of BM II habitation sites on Cedar Mesa is the presence of limestone fragments on the middens (Matson et al. 1988). Limestone is very rare on the middens of later sites on Cedar Mesa. We have suggested that limestone was being used in stone-boiling maize, prior to the advent of pottery vessels that would allow liquid to be heated in a container set directly over the fire (Matson 1991:7). It is well known that processing maize in an alkaline environment enhances its nutritional value by making niacin, tryptophan, and lysine more available for human uptake (Katz et al. 1974; Matson 1991:7). Increasing these nutrients might have been important to the Cedar Mesa Basketmakers because they were highly dependent on maize (Matson and Chisholm 1991), but did not yet have beans as a supplemental source of vegetable protein rich in those three amino acids.

However, if limestone used in stone-boiling is to affect the nutritional qualities of maize, it must be heated at temperatures high enough to convert some of its calcite to soluble lime. This process begins at temperatures between 500 and 600°C, and proceeds at a rapid rate at temperatures near 900°C (Gourdin and Kingery 1975:137). Experiments with firing pottery (Blinman and Swink 1997) indicate that open fires fueled with dry juniper regularly reach temperatures of 800 to over 900°C.

Emily Holstad, a WSU graduate student, has conducted an experimental study of the effects of heating limestone and of whether stone-boiling with limestone has effects on the nutritional values of maize (Holstad 2010). She finds that when chunks of limestone from a Cedar Mesa geological source are heated to 600°C and then dropped into distilled water, the pH of the water shows a moderate increase. Chunks heated to either 700 or 800°C result in an increase in the water's alkalinity to pH values between 11 and 12. When stone-boiled with limestone, samples of traditional varieties of maize showed significant increases in the availability for human nutrition of lysine, tryptophan, and methionine. In addition, samples of limestone from a Basketmaker II site on Cedar Mesa showed physical characteristics consistent with having been heated in the past.

ANALYSIS OF BASKETMAKER II FLAKED LITHICS

Matson and University of British Columbia graduate student Jesse Morin have reanalyzed the stone artifacts collected from the "Rock Island Site" (42SA4542; field designation NR C9-5). This is a large habitation site situated in a defensible location on a rock promontory at the juncture of two entrenched canyons; it was partially surface-collected in 1974, and two small test pits were excavated in 1991 (Matson 1994). The goal was to compare this assemblage with those from "ordinary" BM II habitation sites to see if this possible defensive site was distinctive in artifact inventory or lithic source materials. So far, the analysis indicates that the only unusual characteristic of the assemblage is a higher than expected frequency of drills and gravers in this greater than 9,000-piece collection.

Morin and Matson have also tested Phil Geib's (2002) inference that in BM II, indirect punches and wide compound pressure flakers were used to produce very thin, broad bifaces. Using attributes of flake-scar morphology, they were able to show statistically significant differences between BM II and Archaic bifaces from Cedar Mesa, in accord with Geib's model (Morin and Matson 2009; Matson and Morin 2010). William Bryce, a graduate student at Northern Arizona University, has also examined BM II projectile points from Cedar Mesa as part of an ongoing project comparing Eastern and Western Basketmaker point production technology (Bryce 2010).

REGIONAL PATTERNS OF BASKETMAKER II SUBSISTENCE

R. G. Matson and Brian Chisholm are currently continuing to synthesize evidence on BM II subsistence provided by midden, coprolite, and isotopic analyses done on materials from the Southwest in general as well as from Cedar Mesa and neighboring areas. Most pertinent to our Cedar Mesa research are the coprolite analyses by Reinhard (1992) of Turkey Pen materials recovered by Powers (1984), and of samples from nearby Butler Wash by Androy (2003). Macrofloral analyses of Turkey Pen midden samples by Radomski (1999) and Cordas (2000) support the results of earlier work carried out by Lepofsky (1986; reported in Matson and Chisholm 1991) and by Aasen (1984). Data from the Lepofsky, Radomski, and Cordas studies are synthesized in Figure 4.7

of Matson (2006). This large corpus of data points to a maize-dominated diet being widely established in the northern Southwest by the last century B.C. Weedy plants associated with active or abandoned garden plots make up much of the non-domesticated plant resources. This pattern of maize as by far the most important subsistence resource, with many non-maize dietary items also being associated with farming activities, continues from early BM II into later periods. A subset of this regional synthesis was presented at the SAA meetings in 2007 (Matson and Chisholm 2007).

ACKNOWLEDGMENTS

Aspects of the research reported here were supported by grant No. 410-2008-1677 to R. G. Matson from the Social Sciences and Humanities Research Council of Canada, by the Auvil Fellows Program for Undergraduate Research at WSU, and by institutional funds provided by the Department of Anthropology and the School of Biological Sciences at WSU. Mary Collins and Diane Curewitz of the WSU Museum of Anthropology assisted in accessing some of the museum collections that were studied. Susan Matson drafted the profile that is the basis for Figure 1.

REFERENCES CITED

- Aasen, Diane K.
1984 Pollen, Macrofossil and Charcoal Analysis of Basketmaker Coprolites from Turkey Pen Ruin, Cedar Mesa, Utah. Unpublished Master's thesis, Department of Anthropology, Washington State University, Pullman.
- Androy, Jerry
2003 *Agriculture and Mobility during the Basketmaker II Period: The Coprolite Evidence*. Master's thesis, Northern Arizona University, Flagstaff.
- Arakawa, Fumi, Ian Buvit, Celeste Henrickson, David Hyde, Matthew Landt, Jonathan Meyer, Michael Spitzer, and Karisa Terry
2001 Analysis of Turkey Coprolites from Turkey Pen Ruin, Southeastern Utah. Unpublished project report for WSU Anthropology 576: Palynology. On file, Museum of Anthropology, Washington State University, Pullman.
- Blackburn, Fred, and Ray Williamson
1997 *Cowboys and Cave Dwellers: Basketmaker Archaeology in Utah's Grand Gulch*. School of American Research Press, Santa Fe.
- Blinman, Eric, and Clint Swink
1997 Technology and Organization of Anasazi Trench Kilns. In *The Prehistory and History of Ceramic Kilns*, edited by Prudence M. Rice, pp. 85–102. American Ceramic Society, Westerville, Ohio.
- Bryce, William D.
2010 *East Meets West: An Analysis of Style in Basketmaker II Flaked Stone Technology*. Master's thesis, Department of Anthropology, Northern Arizona University, Flagstaff.
- Cordas, Emily
2000 The Analysis of Macroplant Remains from a Midden Deposit in Turkey Pen Ruin In Cedar Mesa, Utah. MS on File, Laboratory of Archaeology, University of British Columbia, Vancouver.
- Geib, Phil R.
2002 Basketmaker II Horn Flaking Tools and Dart Point Production. In *Traditions, Transitions, and Technologies: Themes in Southwestern Archaeology*, edited by Sarah H. Schlanger, pp. 272–306. University Press of Colorado, Boulder.
- Geib, Phil R., and Dale Davidson
1994 Anasazi Origins: A Perspective from Preliminary Work at Old Man Cave. *Kiva* 60(2):191–202.
- Gourdin, W. H., and J. D. Kingery
1975 The Beginnings of Pyrotechnology: Neolithic and Egyptian Lime Plaster. *Journal of Field Archaeology* 2(1/2):133–150.
- Holstad, Emily
2010 *Basketmaker II Stone-boiling Technology at Cedar Mesa, Utah: An Experimental Study*. Master's thesis, Department of Anthropology, Washington State University, Pullman.
- Hurst, Winston B., and Christy G. Turner II
1993 Rediscovering the "Great Discovery": Wetherill's First Cave 7 and Its Record of Basketmaker Violence. In *Anasazi Basketmaker, Papers from the 1990 Wetherill-Grand Gulch Symposium*, edited by Victoria Atkins, pp. 143–191. Utah Bureau of Land Management Cultural Resource Series No. 24. Salt Lake City.
- Katz, Solomon H., M. L. Hediger, and L. A. Valleroy
1974 Traditional Maize Processing Techniques in the New World. *Science* 184:765–773.
- Kemp, Brian M.
2006 *Mesoamerica and Southwest Prehistory, and the Entrance of Humans into the Americas: Mitochondrial DNA Evidence*. Ph.D. dissertation, University of California, Davis.
- Kemp, Brian M., Angélica González-Oliver, Ripan S. Malhi, Cara Monroe, Kari Britt Schroeder, John McDonough, Gillian Rhett, Andres Reséndez, Rosenda I. Peñalozá-Espinosa, Leonor Buentello-Malo, Clara Gorodesky, and David Glenn Smith
2010 Evaluating the Farming/Language Dispersal Hypothesis with Genetic Variation Exhibited by Populations in the Southwest and Mesoamerica. *Proceedings of the National Academy of Sciences* 107(15):6759–6764.
- Kemp, Brian M., Cara Monroe, William D. Lipe, and R. G. Matson
2009 Genetic Analysis of Basketmaker II Coprolites from the Turkey Pen Ruins Site in Southeastern Utah. Paper presented at the Annual Meeting of the Society for American Archaeology, Atlanta, Georgia.
- Kemp, Brian M., Cara Monroe, and David Glenn Smith
2007 Extraction and Analysis of DNA from Archaeological Specimens. In *Archaeological Chemistry: Analytical Techniques and Archaeological Interpretation*, edited by M. D. Glascock, R. J. Speakman and R. S. Popelka-Filcoff, pp. 78–98.
- LeBlanc, Steven A., Lori Kreisman, Brian M. Kemp, Shawn W. Carlyle, Anna Dhody, Francis Smiley, and Thomas Benjamin
2007 Quids and Aprons: Ancient DNA from Artifacts from the American Southwest. *Journal of Field Archaeology* 32(2):161–175.
- Lepofsky, Dana
1986 Preliminary Analysis of Flotation Samples from the Turkey Pen Ruin, Cedar Mesa, Utah. Report on File, Laboratory of Archaeology, University of British Columbia, Vancouver.
- Lipe, William D.
2007 *Bibliography of Reports and Publications Related to the Cedar Mesa Project*. Washington State University Library: Research Exchange. <https://research.wsulibs.wsu.edu:8443/dspace/handle/2376/737> (accessed January 16, 2010).
- Lipe, William D., and R. G. Matson
2007 *The Cedar Mesa Project: 1967–2007*. Washington State University Library: Research Exchange. <https://research.wsulibs.wsu.edu:8443/dspace/handle/2376/738>. (accessed January 16, 2010)
- Matson, R.G.
1991 *The Origins of Southwestern Agriculture*. University of Arizona Press, Tucson.

- 1994 Anomalous Basketmaker II Sites on Cedar Mesa: Not So Anomalous After All. *Kiva* 60(2):219–237.
- 2006 Basketmaker II and Cedar Mesa. In *Tracking Ancient Footsteps; William D. Lipe's Contributions to Southwestern Prehistory and Public Archaeology*, edited by R. G. Matson and Timothy Kohler, pp. 45–63. Washington State University Press, Pullman.
- Matson, R. G., and Brian Chisholm
- 1991 Basketmaker II Subsistence: Carbon Isotopes and Other Dietary Indicators from Cedar Mesa, Utah. *American Antiquity* 56(3):444–459.
- 2007 Basketmaker II Subsistence. Poster presented at the Annual Meeting of the Society for American Archaeology, Austin, TX. http://www.anth.ubc.ca/fileadmin/user_upload/anso/LOA_PDFs/Chisholm_and_Matson_2007/Chisholm_and_Matson_2007.pdf (accessed January 16, 2010).
- Matson, R. G., William D. Lipe, and W. R. Haase
- 1988 Adaptational Continuities and Occupational Discontinuities: The Cedar Mesa Anasazi. *Journal of Field Archaeology* 15(3):245–264.
- 1990 *Human Adaptation on Cedar Mesa, SE Utah*. Laboratory of Archaeology, University of British Columbia, Vancouver. <http://www.anth.ubc.ca/research/research-facilities/laboratory-of-archaeology-loa/pdf-library/matson-lipe-and-haase-1990.html> (accessed January 16, 2010).
- Matson, R. G., and Jesse Morin
- 2010 Differentiating Archaic and Basketmaker II Projectile Point Manufacturing Techniques. Paper presented at the Annual Meeting of the Society for American Archaeology, St. Louis, Missouri.
- McNitt, Frank
- 1957 *Richard Wetherill—Anasazi: Pioneer Explorer of Southwestern Ruins*. University of New Mexico Press, Albuquerque.
- Morin, Jesse, and R. G. Matson
- 2009 Differentiating Archaic and Basketmaker II Projectile Point Manufacturing Techniques on the Colorado Plateau. Unpublished manuscript, Laboratory of Archaeology, University of British Columbia, Vancouver.
- Nott, BreAnne
- 2010 *Documenting Domestication: Molecular and Palynological Analysis of Ancient Turkey Coprolites from the American Southwest*. Master's thesis, School of Biological Sciences, Washington State University, Pullman.
- Nott, BreAnne, John Jones, William D. Lipe, and Brian M. Kemp
- 2009 Palynological Analysis of Ancient Domestic Turkey Droppings from the American Southwest. Paper presented at the Annual Meeting of the Society for American Archaeology, Atlanta, Georgia.
- Petersen, David
- 2002 *Cedar Mesa: A Place Where Spirits Dwell*. University of Arizona Press, Tucson.
- Powers, Margaret A.
- 1984 *The Salvage of Archaeological Data from Turkey Pen Ruin, Grand Gulch Primitive Area, San Juan County, Utah*. Division of Conservation Archaeology, Contributions to Anthropology Series, No. 808. San Juan County Museum Association, Farmington, New Mexico.
- Radomski, Elizabeth
- 1999 Continuing Analysis of Bulk Midden Samples from Turkey Pen Ruin, Cedar Mesa, Utah. Report on file, Laboratory of Archaeology, University of British Columbia, Vancouver.
- Reinhard, Karl J.
- 1992 Patterns of Diet, Parasitism, and Anemia in Prehistoric West North America. In *Diet, Demography and Disease: Changing Perspectives on Anemia*, edited by P. Stuart-MacAdam and S. Kent, pp. 219–258. Aldine de Gruyter, New York.
- Roberts, David
- 1996 *In Search of the Old Ones: Exploring the Anasazi World of the Southwest*. Simon and Schuster, Inc., Touchstone Books, New York.
- Spangler, Jerry, Andrew T. Yentsch, and Rachelle Green
- 2010 *Farming and Foraging on the Southwestern Frontier: An Overview of Previous Research of the Archaeological and Historical Resources of the Greater Cedar Mesa Area*. Antiquities Section Selected Papers, Volume IX, No. 18. Utah Division of State History, Salt Lake City. Available at Washington State University Library Research Exchange. <https://research.wsulibs.wsu.edu:8443/jspui/handle/2376/2643> (accessed January 11, 2011).
- Speller, Camilla M., Brian M. Kemp, Scott D. Wyatt, Cara Monroe, William D. Lipe, Ursula M. Arndt, and Dongya Yang
- 2010 Ancient Mitochondrial DNA Analysis Reveals Complexity of Indigenous North American Turkey Domestication. *Proceedings of the National Academy of Sciences* 107(7):2807–2812.
- Tassoni, Peter Francis
- 2001 *A Hiking Guide to Cedar Mesa*. University of Utah Press, Salt Lake City.
- Wyatt, Scott, Brian M. Kemp, Cara Monroe, and William D. Lipe
- 2009 Domestic Turkeys in the American Southwest: Imported Birds or an Independent Domestication. Poster presented at the Annual Meeting of the Society for American Archaeology, Atlanta, Georgia.
- Zeder, M. A., E. Emshwiller, B. D. Smith, and D. G. Bradley
- 2006 Documenting Domestication: the Intersection of Genetics and Archaeology. *Trends in Genetics* 22(3):139–55.
- Zwinger, Ann
- 1978 *Wind in the Rock: The Canyonlands of Southeastern Utah*. Harper and Row Publishers, New York.