Incised Stones of the Great Basin: A Contextual Archaeology

by

Randy Ottenhoff

A thesis submitted in partial fulfilment for the requirements for the degree of Doctor of Philosophy at the University of Central Lancashire

Volume 1 of 2

September 2015

STUDENT DECLARATION FORM

I declare that while registered as a candidate for the research degree, I have not been a registered candidate or enrolled student for another award of the University or other academic or professional institution.

I declare that no material contained in the thesis has been used in any other submission for an academic award and is solely my own work

Signature of Candidate ____

Type of Award ____

School ____

Abstract

This research examined the context of incised stones in the Great Basin. Incised stones are small tabular shaped stones, that are easily portable, and have designs incised on the surface. The Great Basin is located in western North America and encompasses a roximately California, Idaho, Nevada, and Utah. The landscape was used by prehistoric hunter-gatherers for over 10,000 years. The incised stones were left at caves, rock-shelters and open-air sites. This research focused on five sites that are either caves or rock shelters: Camels Back Cave, Gatecliff Shelter, Hogup Cave, Ruby Cave and Swallow Shelter. Context was used as a fundamental theoretical lens to approach incised stones. A contextual analysis was achieved by employing three analytical methods: chronology, spatial analysis, and design grammar. The chronology of incised stones was discussed in terms of how climate trends affect the number of incised stones left at sites. The spatial analysis examined the incised stones through a chronology at the unit or trench level. The design grammar classifies the imagery of the incised stones. The design grammars were contextualised into the spatial placement of the designs and analysed. The results of this doctoral thesis will highlight how incised stones were connected with specific activities. Interpretations of the incised stones are inferred from this research.

Table of Contents

VOLUME 1

Volume 2

List of Figures

List of Tables

Acknowledgments

There are so many people to thank who have made this research possible. First, I would like to thank Dr. David Robinson and Dr. Rick Peterson for being my first and second supervisor during this work. Your expertise, encouragement, and advice throughout this process has meant everything. I would like to thank the Post-Graduate Research Group (PRoGRess) for their grant award to attend conferences and to Gary Bond for the financial support he provided.

I would like to thank David Hurst Thomas, Melvin Aikens, Gardiner Dalley, David Madsen, and David Schmitt for their published monographs. I also want to extend a thank you to Martin Baumhoff who excavated Ruby Cave. I want to thank David Hurst Thomas for taking an active interest in my work and sending all three volumes of the Gatecliff Shelter monograph to me. I would also like to thank you for sending me copies of your papers and an advance copy of new radiocarbon dates for Gatecliff Shelter. I would like to thank Melvin Aikens for sitting down and discussing Hogup Cave for two hours at the Society of American Archaeology (SAA) meeting in Austin, TX. Thank you also, for looking at draft copies of the Hogup Cave excavation grid and giving me such valuable feedback. I would like to thank Gardiner Dalley for the telephone conversation we had regarding the excavation of Swallow Shelter. Finally, I would like to thank David Madsen for the emails regarding pollen records for Camels Back Cave. I would like to thank Trudy Thomas for her analysis of incised stones at Gatecliff and Ruby Cave. Janis Klimowicz for her Masters on design grammars. Both have made significant contributions to incised stone research. I would also like to thank Bonnie Pitblado for inviting me to talk at the incised stone symposium at the SAA's, in Austin, TX and to all the participants in that session, particularly Clark Wernecke.

Thank you to Robert Bettinger and Lisa Dietz at the University of California, Davis for allowing me to research the Ruby Cave collection, also Clint Cole, Areli Soriano, Alyssa Nelson, and Christyann Darwent. My thanks to those who worked with the Ruby Cave collection: Peggy Kieffer, Monica Garcia, Amanda Welcott, and Suzanne Griset.

I would also like to thank Glenna Nielsen-Grimm and Annie Sager at the Utah Museum of Natural History for orienting me with the collection and files. You were a huge help. Thank you to Danielle Peterson and your parents for the free bed. A big thank you to Francisco Arellano for going to the University of Utah State library and searching for information on incised stones. Thank you to Fred Frampton and Chimalis Kuehn for giving me access to the Ruby Cave files at the Elko Forest Service offices, Nevada. Thank you also to Chimalis Kuehn and Craig Shier for guiding us up the hill to Ruby Cave. I would like to thank Barbara Roth at the University of Las Vegas, for granting me access to the Daniel R. Shawe collection. Also in Las Vegas, Jennifer Shier, Angela Voss, and Jeff thank you for letting me stay at your house. To the unnamed graduate student who gave me assistance, thank you. Dena Sedar at the Lost City Musuem, you have my gratitude for all of the incised stone information you sent me.

In Reno, Nevada I would like to thank, for their support, the staff of the University of Nevada, Reno library for getting me a copy of Janis Klimowicz work. Your track record is unbroken. I would like to extend a thank you to Karyn de Dufour of the Nevada State Historic Office and Brian Hocket for helping me to obtain access to The Nevada Cultural Resource Information System (NVCRS). I want to thank Bob Kautz, Richard Breitling, Jason Spidell, and Barbi Malinky-Harmon of Kautz Environmental for sending me pictures of incised stones. Also, Jared Andrus you rock. I would like to thank Harold Brewer, Dayna Giambastiani and my wife, Melonie Shier, for reading chapters and giving me great feedback. I would also like to thank Dave Valentine for giving me an incised stone bibliography and inviting me along to look at the Tonopah, Nevada incised stone collection.

I would like to thank my friends who have helped in innumerable ways: Elaine Evans, Claye Evans, Robert Richman, Cole Evans, Chai Evans, Roger Kendle, Mathew Grubb, Naomi Krueger, Stefan Krueger, Steve Hall, Peter Molnar, Eniko Molnar, Ed Wilde, and Matt Newman.I would like to thank my family for all of the love, and support they have given me over the years. I would like to thank my Mom and Dad who have always believed in me. My father passed away during this research, but he always wanted to know what I was learning about incised stones. I would also like to thank my brothers John and Robert for all of the help and support they have given over the years. Thank you for inviting me to board game night with your family, going to sunsplash together, and the tours of Intel. I want to say thank you to my wife's family for all for their love and constant source of laughter, particularly Craig Shier for climbing that hill. To my darling wife, who always supported me throughout this research, I love you very much. Thank you for going on long walks together, and for talking about the archaeology. Thank you also for making me smile and laugh and not to be too stressed. My son Aiden was born during the course of this research. Thank you Aiden for the excursions down to the park and ice cream by the river together.

Finally, but not least, I want to also thank my Heavenly Father for listening to my prayers and comforting me and my family through these years.

Chapter 1: Introduction to the Research

Introduction

The aim of my project is to explore the archaeological prehistoric material culture of the Great Basin through incised stones, and uncover what role these enigmatic stones had in the lives of the hunter-gatherers who made them. Incised stones are small, portable, and mostly flat, with designs incised on the surface. These stones have a wide distribution in the Great Basin; often found in cave and rock shelter deposits which span thousands of years of short-term use by indigenous groups. There are 562 incised stones collectively for all of the sites that I have chosen for my sample: Camels Back Cave, Hogup Cave, Gatecliff Shelter, Ruby Cave, and Swallow Shelter. The first incised stones began to appear in the archaeological record about 6,500 years ago, but prehistoric people had been living in the Great Basin for more than 10,000 years. It is unknown why prehistoric people started to create incised stones in the Great Basin, yet incised stones have a worldwide (Chapter 2) presence in archaeology. Even though these stones have been found archaeologically for over a 100 years in the Great Basin, these artefacts have received little attention from scholars. This lack of attention has left incised stones as a little understood archaeological artefact without context within the Great Basin. No other research in the world will have studied incised stones the way this research intends.

This research explores the contextual placement of incised stones within the Great Basin at multiple sites. These sites were selected out of other potential sites (Chapter 3) based on their geographic distribution within the Great Basin. Small geographic areas with lots of incised stones do exist (Monitor Valley (Thomas 1983a) and Granite Mountains, Nevada (Klimowicz 1988)), but I wanted sites that would represent a large area of the Great Basin. Additionally, these sites have a number of radiocarbon dates that allow for a chronological analysis. As this research will show there are patterns in the contextual comparisons between these sites.

What is Context?

Context originates from a Latin word (*contexere*) “meaning to weave, join together, connect“ (Butzer 1980:418, Hodder 1986:122). Context in archaeology is not just concerned with the artefacts, but also the surrounding data in which the artefact derived (Hodder 1986:123). Archaeological context incorporates provenience and associated artefacts along with any surrounding features such as pits or caches, as they rest within a stratigraphic matrix to infer activities from the past (Renfrew and Bahn 2008:52, Schiffer 1972:160, Hodder 1986:129, Simek 1984:405, Lyman 2012:212). In addition to the geological setting, the surface the artefacts are deposited, associated faunal remains, and ecofacts also make up the context (Lyman 2012:212). Every dimension within an object’s space (Hodder 1986:143), or environmental setting (Butzer 1980:417) can be considered the context. Context in archaeology takes into account human decision-making which is a multidimensional expression within the environment (Butzer 1980:417, Schoenwetter 1981:371). These multidimensional areas which context is taken, has five themes which are listed below and taken from Butzer (1980:419):

1. Space- The topography, climates, biological communities, or human groups can suggest a spatial patterning that can be analysed.
2. Scale- A spatial analysis of the context must distinguish small, medium, and large-scale objects, aggregates, or patterns.
3. Complexity- Environments and communities are not homogeneous and allow for interpretation of cultural behaviour.
4. Interaction- At different scales, humans interact internally with each other, and with a non-living environments uneven distribution of resources.
5. Stability- People living in diverse communities of any environmental complex are all affected to some extent by negative feedback as a result of internal processes or external inputs. In consequence, readjustment, whether minor or major, short-term or long-term, is the rule rather the exception, and context can identify this changing spectrum.

In some cases, the context has been preferred even over radiocarbon dates to show a simultaneous event and its subsequent deposit. For example, Cave 7 in Utah, originally excavated in 1893 by Richard Wetherill, found 90 burials in the same stratigraphic relationship: all had been massacred (Geib and Hurst 2013:2754). In 1993 a re-evaluation of the artefacts and bodies confirmed Wetherill’s original assumption that a massacre had taken place and the bodies were left at the cave (Geib and Hurst 2013:2754). The later radiocarbon

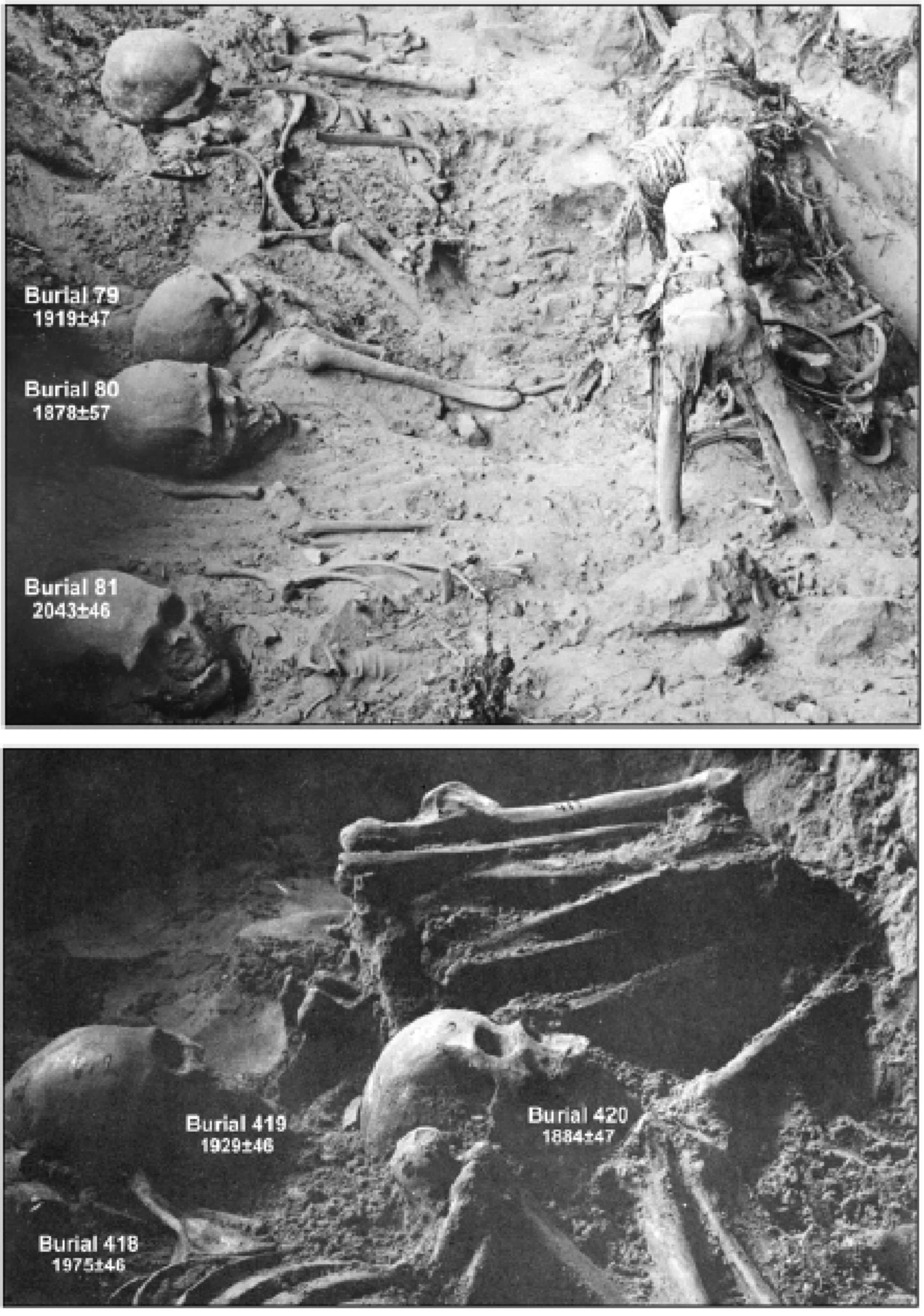


Figure 1.1: Contextual placement of bodies from Cave 7 in Utah, suggest a massacre took place (Geib and Hurst 2013:2763).

dates and it was found that the 'massacre' death were spread out over several centuries, and is suggested that instead of a massacre the deaths occurred over a period of time and then were interned at the cave (Geib and Hurst 2013:2755). The context in which the bodies were found (Figure 1.1) are so intermingled and interconnected that even though the dates returned a range of centuries, the contextual placement of the bodies is strongly suggestive that a massacre most likely did occur (Geib and Hurst 2013:2769). Thus the radiocarbon date can only provide a date range for the massacre, but cannot un-weave the contextual placement of the bodies to show an internment overtime (Geib and Hurst 2013:2769).

Context has been discussed in archaeology for nearly 200 years, but where did archaeology gain the use of context? The term context was not always used in the literature during the mid-nineteenth century, but some archaeologists developed their analysis based on provenience, and associated discussions, which together are contextual (see Chapter 2). The first incised stone mentioned in North America was analysed by demonstrating the placement of the incised stone within a burial in association with the other artefacts (Abbott 1875:331, Chapter 3). Thus the very first published incised stone was analysed using context. Pitt Rivers (1827-1900) developed a deep interest in archaeology while he was a Major-General in the British army, but after inheriting his family's estate at Cranborne Chase he retired from active service and began excavations on his estate (Bahn 1999:131). During these excavations of Roman and prehistoric sites, Pitt Rivers drew upon his military experience by developing demanding methods of excavation and detailed notes of the context. Pitt Rivers privately published the Cranborne Chase excavations, yet outside of Britain his influence was unknown for many years (Bahn 1999:131).

Context in European archaeology began to become an increasing issue as Miloje Vasič (1908 to 1912), excavated in Serbia's Neolithic tell called Vinča, near Belgrade (Bahn 1999:132). The rubbish and buildings that constituted the mound were separated into layers that allowed for a chronology to be built up for the Balkans, and impacted future excavations to record context in the region (Bahn 1999:132). Nikolai Vesselovskii in 1897 excavated a burial mound called Kurgan situated in the foothills of the northern Caucasus (Bahn 1999:133). The three-roomed tomb contained gold and silver, earrings, beads, vessels, rings, and post holding up the canopy (Bahn 1999:133). The recorded contextual information established the connection to the Bronze Age (c. 2500-2200 BC) in the Near East (Bahn 1999:133).

In the United States, archaeologists during the late nineteenth century were concerned with discovering when Native Americans arrived in North America. Evidence for a Pleistocene peopling of North America was presented in various journals during the late nineteenth century, but the authors of these papers were amateur archaeologists (Holmes 1893:29). Holmes addresses these unprofessional archaeological reports concerning the peopling of North America when he states "the evidence so far collected in support of these propositions is unsatisfactory and in such a state of utter chaos that the investigation must practically begin anew" (1893:30). Holmes, who was head archaeologist for the Smithsonian Institute began his career as a geological illustrator, creating panoramas that displayed the stratigraphy, scale, and landscape (Lyman 2012:216). From this experience Holmes most likely learned about the importance of context, and applied these principles to archaeology (Lyman 2012:216). It was Holmes frankness in his publications of dismissing poorly excavated and described archaeology sites that adjusted the field of archaeology to a more contextual approach (Lyman 2012:215). Issues that can occur with a contextual archaeology were pointed out by Holmes (1897:828) as is the case of a reported in the incised stone find in Delaware. Holmes demonstrates how the stratigraphy is mixed and therefore could not be relied upon for a contextual relationship (1897:828). This type of movement of artefacts within sediments is called primary and secondary context, although Holmes never used that terminology.

Primary context means artefacts that have not moved from their original association and provenience since the time of deposition. In secondary context are artefacts that have moved from their original context and deposited elsewhere (Mellink 1966:157, Wainwright 1971:58, Schiffer 1972:161, Moholy-Nagy 1997:293, 299, Matthews et al. 1997:287, Meltzer, Todd, and Holliday 2002:11, Tankersley et al. 2009:566, and Lyman 2012:225). The term primary and secondary context did not start to be used until the late 1960s (Lyman 2012:225).

In the 1970s Schiffer introduced a concept called systemic context which differs from archaeological context in that the systemic follows individual artefacts through its life as it is used within a culture before it become deposited. Archaeological context, as defined by Schiffer (1972:157) refers to artefacts that have been a part of a cultural life-way and then deposited. The archaeologist that finds the artefact then can investigate the attributes of the artefact to discover how it was manipulated during the time it passed through a cultural system. The cultural system is what Schiffer calls the systemic context of artefacts (Schiffer 1972). The systemic context of an artefact follows five processes: procurement, manufacture, use, maintenance and discard (Schiffer 1972:158). For items that are consumable such as food the four processes are: procurement, preparation, consumption, and discard (Figure 1.2, Schiffer 1972:158). Operationalizing a systemic context during an analysis involves taking into consideration the archaeological context or the artefacts provenance, and the cultural activity or systemic context which got the artefact to its final resting place (Schiffer 1972:161).

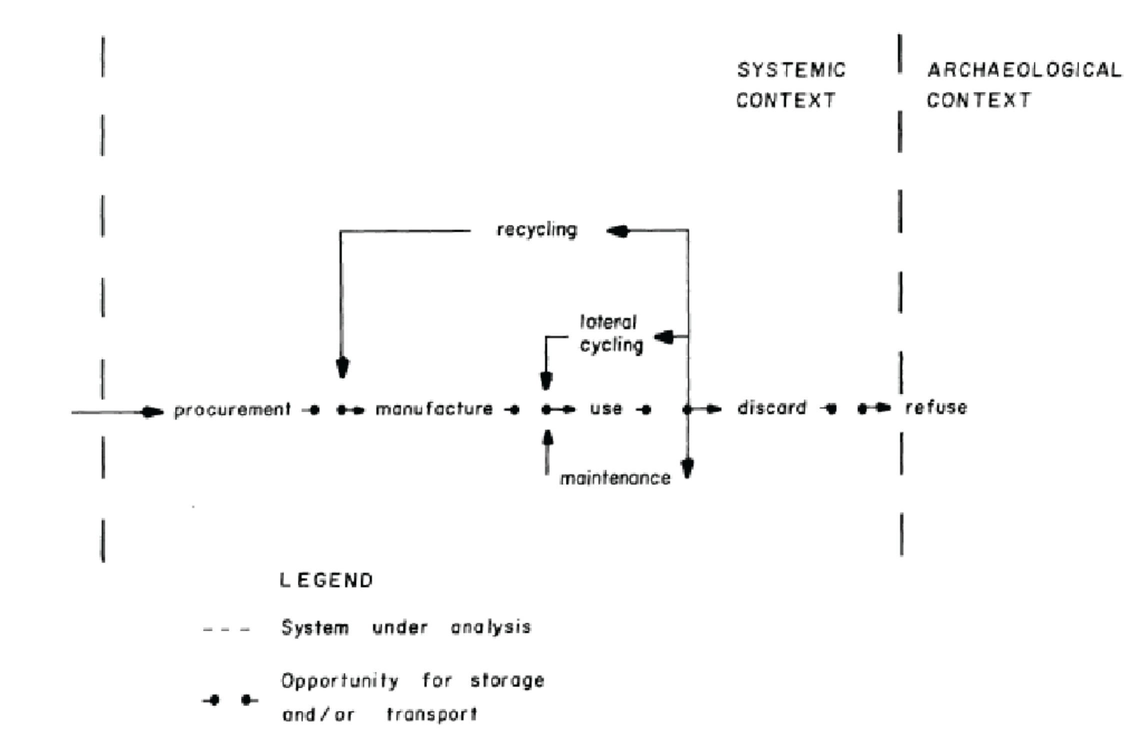


Figure 1.2: The systemic context flow chart from procurement to refuse of an artefact (Schiffer 1972:158).

An example of how to infer activities of a cultural system (systemic context) from the final resting place of an artefact (archaeological context) is given through a projectile point found in different situations (Schiffer 1972:161):

> "A projectile point found in association with an antler flaker and tiny pressure flakes of the same material in a habitation structure is a different projectile point from one found in a midden, or another found eroding from the wall of an arroyo with no other associated cultural material. In the first case, one would be dealing with the location of some manufacturing activities, the second a location of discard activities, while in the third perhaps the location of use."

Another area that systemic context explores is issues of refuse disposal into primary context versus secondary context. To answer these questions the cultural system of handling waste material is considered a logistical decision by the inhabitants of a site based on the size of a population and the length of stay at the site (Schiffer 1972:161). A systemic contextual argument would suggest that an activity that takes place at one site by one person, who inhabits a site for a short time, would leave the refuse in a primary context, removing instead the activity (such as knapping) to another place (Schiffer 1972:161). If the population was larger and stays at the site longer such as a village, then activity areas may be routinely cleaned moving some of the refuse to a secondary context (Schiffer 1972:616). This hypothetical site suggests that a systemic context approach could help interpret why artefacts are found in a primary or secondary context. Archaeological context incorporates the associated artefacts, provenience, and related features. Systemic context links these associations, provenience, and features into activities that then can then be analysed (Schiffer 1972:164).

Hodder introduced a contextual archaeology that not only accounts for the systemic context, but also the symbolic context (Hodder 1986:128). Hodder's contextual approach (Figure 1.3), relates the artefacts to the surrounding associated artefacts, in space and time by linking them into a grammar that then could be read like a text. Each artefact would act as a sentence that together would make up a full text, if one of the artefacts was taken out of context it would no longer make sense (Hodder 1986:153). Hodder's contextual archaeology relies on artefacts having a dual nature as text and as signs (Hodder 1986:153). A sign as introduced by Saussure, is the deep structured meaning in language (Greene 2002:256, Hodder 1986:37). For example, Hodder explains that a "symbol (a bead, duck, arrowhead) could be used to signify a chief" (2002:256). In a contextual archaeology, a fibulae found only in women's graves, could be read as a signifier of womanhood, when the fibulae is also found contextualised with female activity areas (Hodder 1986:129). The argument could be made even stronger if the fibulae is incised or painted with reproductive imagery allowing for the contextual approach to deliver the meaning behind the symbolism (Hodder 1986:126).

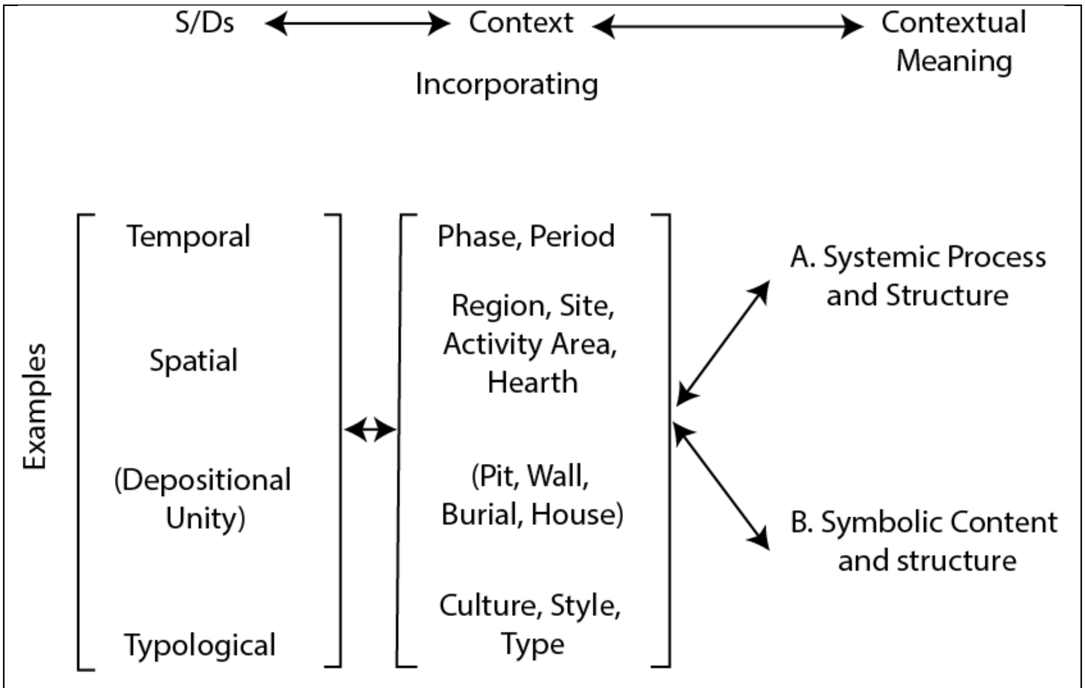


Figure 1.3: Ian Hodder's contextual archaeology flow chart. (Redrawn from Hodder 1986:129).

The contextual archaeology presented by Hodder holds that centred studies of "ceramics, or the lithic, or the seeds" had to be made broader in scope to include the contextualised surrounding (Hodder 1986:144). The contextual data is in a constant state of being questioned and re-evaluated, with different theories applied to the data to find a best fit to give a full description and explanations (Hodder 1986:147, 150). This approach like most archaeological investigations aims to understand the thinking of people in the past, to uncover how they coded their world in their artefacts and discover the representation of their symbols and signs (Hodder 1992:17, 18).

This research uses a contextual approach to uncover how incised stones were placed within the culture. A contextual approach allows for a multi-scalar method to situate artefacts into their surroundings (Butzer 1980:419, Hodder 1986). My approach uses these different scales of context which work together for analysis of incised stones. The largest scale in which this work contextualises is the climate that occurred during the deposition of incised stones (Chapter 4). The smallest scale rest at the level of design grammar on the incised stone and that designs context (Chapter 8). Incised stones emerge in the archaeological record in the Great Basin at different times and places (Chapter 5). This first occurrence of incised stones gives the opportunity to examine the contextual changes that took place before and after deposition. The overall question addressed is how does the context change at the sites, and what can be inferred from these changes? Chapter 6 examines these before and after relationships in terms of the contextualised climate and the overall total number of artefacts that are contextualised with the incised stones. The second scale used is down to the size of an excavation unit. These contextual relationships (Chapter 7) of the other artefacts works to place the incised stones within activities, and ask several questions of the data such as:

- How do incised stone associations change over time at Camels Back Cave, Hogup Cave, Swallow Shelter, Gatecliff Shelter, and Ruby Cave?
- Are incised stones associated with projectile points?
- Do incised stones have a structured deposition?
- Are incised stones found in caches?
- Were incised stones made by men or women?

The smallest scale is the context of the designs on the incised stones themselves (Chapter 8). This scale uses a design grammar to place the incised stones into grouping that then are analysed based on their contextual placement. Without a design grammar an analysis would not be possible as the data would be mute. The questions asked of the contextual relationships are:

Figure 1.4: Two incised stones from Hogup Cave. Top: 42Bo36 FS 412.297 Bottom: 42Bo36 FS 86.72 Courtesy of Natural History Museum of Utah. Photos by author.

- What is the chronology of incised stones?
- Do design grammars occur in the front, middle, or back of the site?
- What is each design grammar most often contextualized with in terms of activities?

Taken together this research will give incised stones a contextual place within the archaeology of the Great Basin. As it stands now, incised stones are seldom studied and because of this a number questions have not been addressed. This research asked these questions through a contextual approach to give suggested meaning to incised stones as an artefact class.

What are Incised Stones?

This research is focused on incised stones that are defined as tabular, to semi-rounded stones that are easily transportable[1] by one person, and range in design from a simple line to more complex imagery (Figure 1.4, Thomas 1972:86, Thomas 1983b:246, Klimowicz 1988). Incised stones can be perforated, shaped along the edges, and ground on the surfaces (Thomas 1983b:246). Further, they can be broken or fragmented with the incised image being broken or contained within the broken area (Thomas 1972:86). Incised stones fit into a general class of incised artefacts that also include incised teeth, bone, ivory, and horn. The interpretation of incised stones may or may not fit these other artefact typographies, in the same way a biface is not interpreted as scraper even though they are both chipped stone tools.

The material that incised stones have been made from can be different in geologic formation. From the Great Basin incised stones are made on sandstone, shale, volcanic tuff, slate, mudstone, siltstone, and limestone (Aikens 1970:79, Dalley 1977:46, Thomas 1983b:247, Ottenhoff 2004:5, and Schmitt, Hunt Page, Callister. 2005:202). The material selection appears to be based on soft materials that can be easily incised (Klimowicz 1988:29). The selection of an incised blank seems to have been casual as the surface quality didn't appear to be important (Thomas 1972:85, Thomas 1983b:249).

Incised stones have been given many different names (Figure 1.5) over the years as these artefacts have been poorly studied. In a worldwide perspective there are even more names assigned to these artefacts (see Chapter 2). The paucity of research, conference papers or symposiums has caused little consensus as to what to call these artefacts. However, from the 1970s onward an increasing number of monographs and reports used the name 'incised stone' to describe these artefacts (Aikens 1970:79; Dalley 1977:46; Elston 1979:155; Green

[1] In my opinion the 'easily transportable' clause excludes incised stones that are larger than 50 cm^2 as size and weight does not make them easy to move. In the Great Basin there are no known examples of incised stones that are larger than 50 cm long.

1972:89; Holliman 1969:23; James 1983:247; Jennings 1980:120; Johnson 1966:12; Klimowicz 1988; Lee 1981:41; Parkman 1981:286; Pilling 1957:6; Plew 1981:8; Powers 1969:35; Santini 1974; Schuster 1968:5; Thomas 1983b:246; Treganza and Malamud 1950:149; Tuohy 1967). I started to use the incised stone terminology as a museum intern working with the Ruby Cave collection, and have chosen to use it in this research.

Klimowicz does not include incised stones with perforations as these may have served as pendants that were suspended (Klimowicz 1988:62). In very few cases (see Chapter 2; South America) do perforated incised stones show evidence of having been worn as a pendant. Furthermore most pendants have been symmetrically shaped, honed, and polished with a smooth texture (Dart 1949:83, Aikens 1970:88, Frankel and Webb 2004:2, and Schmitt, Monson, and Shaver 2005:204). Perforated incised stones have little or no shaping of the sides, honing or polishing, and the texture is “a fine granular texture, about the same as fine sandpaper” (Thomas 1972:86). Pendants and incised stones have different based attributes such as symmetry, texture, and polish. Handling a lot of incised stones from the Great Basin has a tactile quality of having a rough texture on all sides and surfaces, with micro-topography of divots, ledges, and undulations. It is true that incised stones may have had perforations that allowed for suspension, but they lack the tactile and visual attractiveness of a pendant; therefore, perforated incised stones and pendants can remain split as two distinct artefact classes. To conclude incised stones with perforations are included in my definition of an incised stone.

The word engraved is used in many different articles concerning incised stones, but what is the difference between engraved and incised? During this research I was only able to find one account that defines engraving. Farbstien (2011) defines engraving as an incision that can have a “U” or “V” shaped bottom depending on the tool used to make the design (2011:9). A “U” or “V” shaped cut may suggest that a different tool was used, but as Carole Fritz (1999:193) found if a “burin is retouched, the quartz microfossils and lepispheres are completely modified and our analysis would conclude that a different tool has been used”. There is no clear stylistic or technical advantage to using the terminology incised or engraved, and it appears to be a personal choice. The same can be said for the word etched which synonyms include engrave, and incise.

There are two incising techniques used on the incised stones in this research. One technique is usually done by pulling a harder stone by hand across a soft stone to create a line. This technique isn’t named, but in this work is referred to as the normal method. The other technique first identified by Carl Schuster (1968:6) is called the walker method. This method

Figure 1.5: Names given to incised stones in the Great Basin. This list is adapted from Janis Klimowicz (1988) and Trudy Thomas's (1983b) work on incised stones.

involves a chipped stone flake that has a double protrusion or two points that then is pressed on the stones surface and pivoted back and forth or walked. The result is parallel lines that are evenly spaced apart from one another (Schuster 1968:6). Additional heads on a flake create designs that are increasingly complex (Schuster 1968:6). In Chapter 7 is a discussion regarding three incised stone found in a cache at Swallow Shelter "found most often in living sites, not in hunting or ceremonial sites" (Klimowicz 1988:1).

What is the Great Basin?

The Great Basin is a large geographic area (517,997 square kilometres) in the continental United States that includes Nevada, Utah, and parts of California, Oregon, and Idaho (Figure 1.6). The Great Basin has many different definitions that cause its borders to shift depending on which aspect of the Great Basin is being investigated. The hydrographic Great Basin is defined as all the rivers and streams do not have an outlet to the ocean (Grayson 2011:11). Instead the rivers empty into internal lakes that have a high absorption into the water table, and evaporation. Lake Bonneville and Lake Lahontan which were two massive lakes in the Great Basin during the Pleistocene were pluvial meaning they were kept full from rain water. Through a number of climate changes these lakes dwindled in size (see Chapter 4) until today only the dry lake bottoms exist. The Physiographic definition focuses on the topography which is characterised by an internal arrangement of north south trending mountains with the Sierra Mountains on the west (in California), the Wasatch Range and Colorado Plateau in the east (in Utah), and the Columbia Plateau in the north (in Idaho and Oregon, Grayson 2011:13). The northern boundary is defined more arbitrarily where the mountain elevations become smaller, but the north-south trending mountains extend into Mexico (Grayson 2011:13). Another way to look at the Great Basin is through its floristic taxa and elevation growth patterns (Grayson 2011:17). The valley floors are dominated by sagebrush and saltbrush while the higher elevations have pinyon and juniper forest (Grayson 2011:17). The pinyon harvest (see Chapter 6) is an important ecological harvest for Native

Americans living in the Great Basin for several thousands of years. The last definition is the ethnographic Great Basin that is based on ethnographic details. The culture area that constitutes the Great Basin is founded on language (Grayson 2011:34). The people of the Great Basin had six different languages that all come from the Uto-Aztecan branch that is called Numic (Grayson 2011:34). Since these divisions were based on language there has been no attempt to adjust the areas through the socio-political influence of the tribes, or artefact typology (Grayson 2011:34). Therefore individual tribes today have a number of names and cultural identifiers that they use for themselves that deviate from the language divisions. While such identities are important this work will refer to the language divisions as they provide a reference to areas within the Great Basin.

Figure 1.6: Three different Great Basins overlaid to show how the boundaries change (adapted from Grayson 2011:12, 15, 20).

Analytical Approach

The methods used in this work serve as the base and approach to the analysis of incised stones. Frequency distribution (Chapter 6), spatial associations (Chapter 7), and design grammar (Chapter 8), are all used as layers to analyse and understand incised stones in the archaeological record in the Great Basin. The data sets[2] chosen for this analysis are stratified caves and rock shelters that have a chronological sequence with buried cultural deposits

[2] Camels Back Cave, Hogup Cave, Gatecliff Shelter, Ruby Cave, and Swallow Shelter.

inside. At these sites, meticulous care in documenting the artefacts was taken by the excavators, making it possible to conduct detailed analysis of the site and its history. Using these previous excavations, the intent is to explore through a chronology the incised stones and how they relate to the other artefacts and wider contextualised picture of the Great Basin. This is important because to date, no one has developed a chronology for incised stones nor taken a spatial analysis beyond a single site (Thomas 1983a). Therefore, the methodology for all sites is primarily a contextual approach. Context can mean many different things (Lyman 2012), but I have defined context to apply to two specific forms of analysis. They are a frequency distribution, and spatial association, and the patterns that appear across the sites and their chronology. Finally, I will be employing the design grammars approach to compare design elements to the spatial associations. Therefore context is more than a methodological or analytical approach; it is used as a fundamental theoretical lens to approach incised stones.

Chronological Analysis

Chronology in the case of this research means to examine the changes to the archaeological record through time often by examining artefacts in stratified deposits (Lyman 2012:18). It is my intent to not only examine one particular time period in a sequence, but all of the stratigraphic sequences that have incised stones. Then I will compare these results with other sites and their stratified deposits. The chronology between all of the sites in my sample

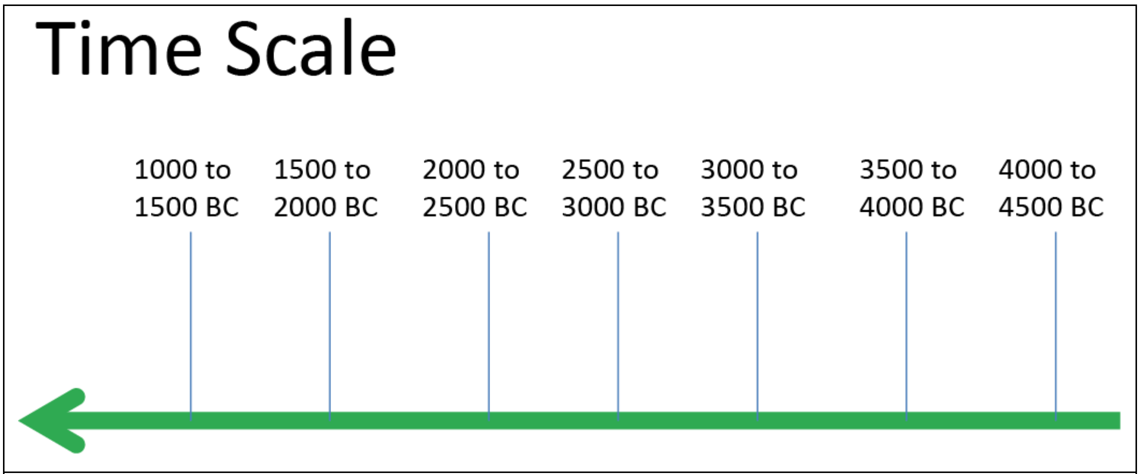


Figure 1.7: Example of the time scale used for the frequency distributions.

will be used to compare incised stone deposits between these sites through time. There are several different approaches that will utilise the chronology of the sites. Chronological comparisons include discussions of the climate, subsistence, and technology (Chapter 6) during the first appearance of incised stones at each site. Included in this discussion is an analysis through time of the pollen records at Hogup Cave, Gatecliff Shelter and Swallow Shelter. The spatial associations (Chapter 7) that incised stones have with other artefacts is discussed through a chronology between the sites. The analyses of these spatial relationships will detect the pattern within the record and emphasise the activities that are suggested by the other artefacts. Incised stones then can be contextualised to a particular activity. The designs on the incised stones (Chapter 8) are investigated by classifying all of the stones into design grammars (see Chapter 3). The time scale (Figure 1.7) that is used for all of the sites is based on 500 year increments.

Frequency Distribution

A frequency distribution is the total number of artefacts, individual artefact classes at an archaeological site and looks for lows, peaks, parallel changes, and polar opposites to uncover patterns in the record. The frequency distribution is the total number of artefacts per level. Such an analysis will assist in determining times when incised stones are made in abundance, or in scarce quantity, and when compared to other artefacts a new level of understanding may arise that will give insight into the motives for making an incised stone. To put it another way the frequency distribution will unlock the "fossilized behavioural patterns in artifacts" (Webster et al. 1993:12). A frequency distribution does not have to rest solely on the confines of an archaeological site, and can be extended to include environmental changes such as climate, availability of game animals, or technology. The prominence of a pattern can widen our understanding of the purpose of an incised stone as it relates to external influences. This method is further enhanced due to the short term habitation sequences at many cave and rock shelter sites. The events of a group visiting a site, using it for a particular purposes such as gathering or hunting, and then leaving the site to remain unused for sometimes years has created well defined cultural lenses that seal in the artefacts of the event. Thus, patterns through time are well defined and offer valuable insight into the main purpose of a visitation to a site. To obtain these frequency distributions I used the summarised tables in the monographs or the artefact catalogues in my sample sites and made a large database in excel.

Spatial Analysis

The spatial analysis examines incised stones in relation to other artefacts within a 1.5 meter area. Gatecliff Shelter is the only site that has spatial maps published in its monograph that displays incised stones. I did not make any attempt to remake these published maps and therefore Gatecliff Shelter maps are in a different style than the maps from the other sites. The spatial maps made for Gatecliff Shelter were called "Artifact distribution maps" however since I already am using a frequency distribution in my analysis I do not want the terminology to be confused and chose to call them spatial maps. At Camels Back Cave spatial maps were published in the monograph, but not the levels that contained incised stones. Using data I obtained from the original field notes I reconstructed the levels with incised stones. In fact I used the original field notes at all the sites in my sample (expect Gatecliff Shelter) to build these spatial maps. In all I made spatial maps for Camels Back Cave, Hogup Cave, Ruby Cave, and Swallow Shelter. I use the words build and reconstruct because I used over 2,000 pages of field notes to find the original hearth shapes and sizes, unit characteristics, and provenience of artefacts or in some cases wood post (see Swallow Shelter; Level 9). Wherever possible I used Illustrator to trace hearth drawings in the notes and place them directly in the maps. It is important to understand that the actual place an artefact came from within a unit is in many cases lost, but the unit size is 1.5 meters^2 which works as an analysis threshold. Before the spatial maps could be made I had to obtain the original field notes from museum archives at the University of California, Davis, the Utah Museum of Natural History, and the Elko County Forest Service field office in Elko, Nevada. I scanned the original field notes, photographs, artefact catalogues, and additional information that was essential to recreating the spatial maps used as analysis in Chapter 7.

In discussing associations I am using the definition that Worsaae used in 1843 and what Lyman (2012:6) restated in his 2012 paper that associations are:

> "artefacts [that] are found close together in (horizontal) space and in the same Stratum…the principle rests on the two-part assumption that stratigraphically associated artefacts (those in the same Stratum) were not only deposited at the same time but also that they were in use at the same time"

This assumption is the basis on which archaeologists rely upon to make inference, analysis, comparisons, and contrast within the archaeological record. A printed distribution table of artefacts per level in an archaeological monograph is held static and almost unchangeable due to the destructive nature of excavation. Making a spatial map of a cultural level doesn't change the perception or dynamic of Wosaae's statement. A level as reported by each site constitutes a living surface that is defined as the place where activities took place and material culture from behaviour become deposited (Schmitt and Madsen 2005:214, Thomas 1983a:24, Bettinger 1989:24). In an ethnographic situation that studied living surfaces Lewis Binford stayed with a group of Nunamiut Eskimo men in a hunting stand while they waited for game animals (Figure 1.8, Binford 1978:330). The ethnographer observed their behaviour for a total of 34 hours and made detailed notes on how they handled their cultural materials (Binford 1978:332). From these observations he discerned five ways that artefacts entered a depositional phase: dropping, tossing, resting, positioning, and dumping items.

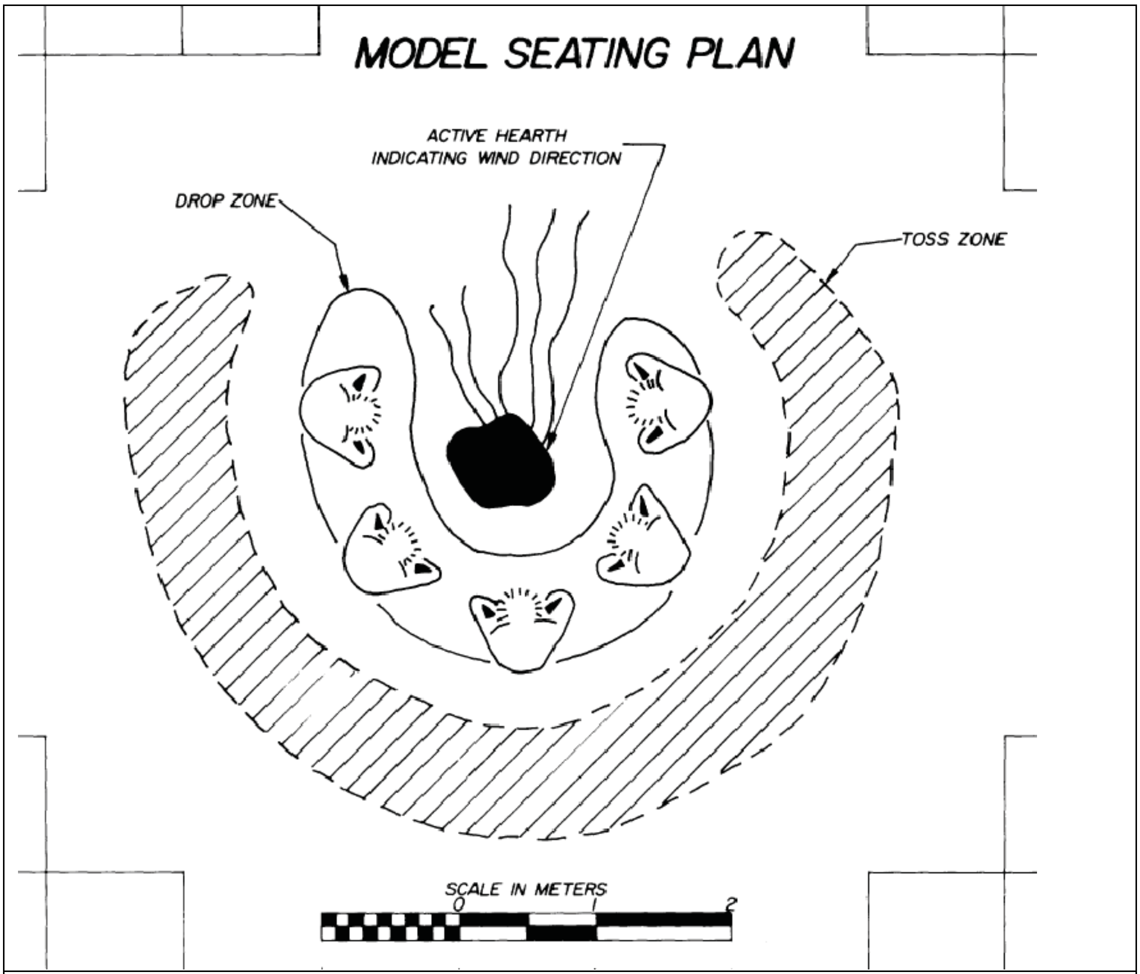


Figure 1.8: Toss Zone and Drop Zones of Nunamiut Eskimo men in a hunting stand (Binford 1978:339).

- Dropping: Bone splinters made during marrow extraction are allowed to drop to the ground or wood shaving while making a mask mould are deposited directly under the activity; in another instance but less common dropping included a “fumble” where an item accidently fell to the ground (Binford 1978:345).
- Tossing: Throwing an item out of the immediate area where the action occurred was a common occurrence. An item such as a beverage container or bone is simply tossed away (Binford 1978:345).
- Resting: Is the setting down of equipment such as a rifle leaned against a rock with the backpack beside it, or tools laid out in an array ready to be used to fabricate or repair (Binford 1978:345).
- Placed: An item is considered placed if it is put out of the way of other activities in an unobtrusive spot that would not be disturbed (Binford 1978:345). This spot is always a place where the item can be retrieved easily and could be considered a cache (Binford 1978:345).

- Dumping: A container that is full of items that are considered to be waste is deposited by turning the container upside down at the periphery of the site (Binford 1978:345).

The terminology above is used during the discussion of the spatial maps in Chapter 7. Binford used the hearths as the central point from which the people, artefacts, and activities occurred. The hearths in the study of the Nunamiut men provided a focused spot from which the site could be analysed. Instead of a hearth the incised stones provide the central point from which the surrounding artefacts are associated. The terms associated and provenience (Figure 1.9) are widely used by archaeologists and an understanding what they mean will help facilitate the discussion in Chapter 7. Provenience means “the precise location of a single artefact in three-dimensional space relative to a reference system” (Lyman 2012:5). In the case of this research the provenience of an incised stone is contained to be within a 1.5 meter area. Swallow Shelter has slightly different unit structures that will be discussed later (see Chapter 7). Associations which has already been discussed above are artefacts that are found close together on the same living floor. In Figure 1.9 are examples of how provenience and associations work together. During analysis a determination is made as to what activity the artefacts suggest. Activities such as milling food, or stone tool manufacturing is assessed, and then plotted on a bar graph in relation to the incised stones in the individual units. These activity areas within an archaeological site support an understanding of incised stones within their society.

Chapter 7 asks specific questions:

- How do incised stone associations change over time at Camels Back Cave, Hogup Cave, Swallow Shelter Gatecliff Shelter and Ruby Cave?
- Are incised stones associated with projectile points?
- Do incised stones have a structured Deposition?
- Are incised stones found in caches?

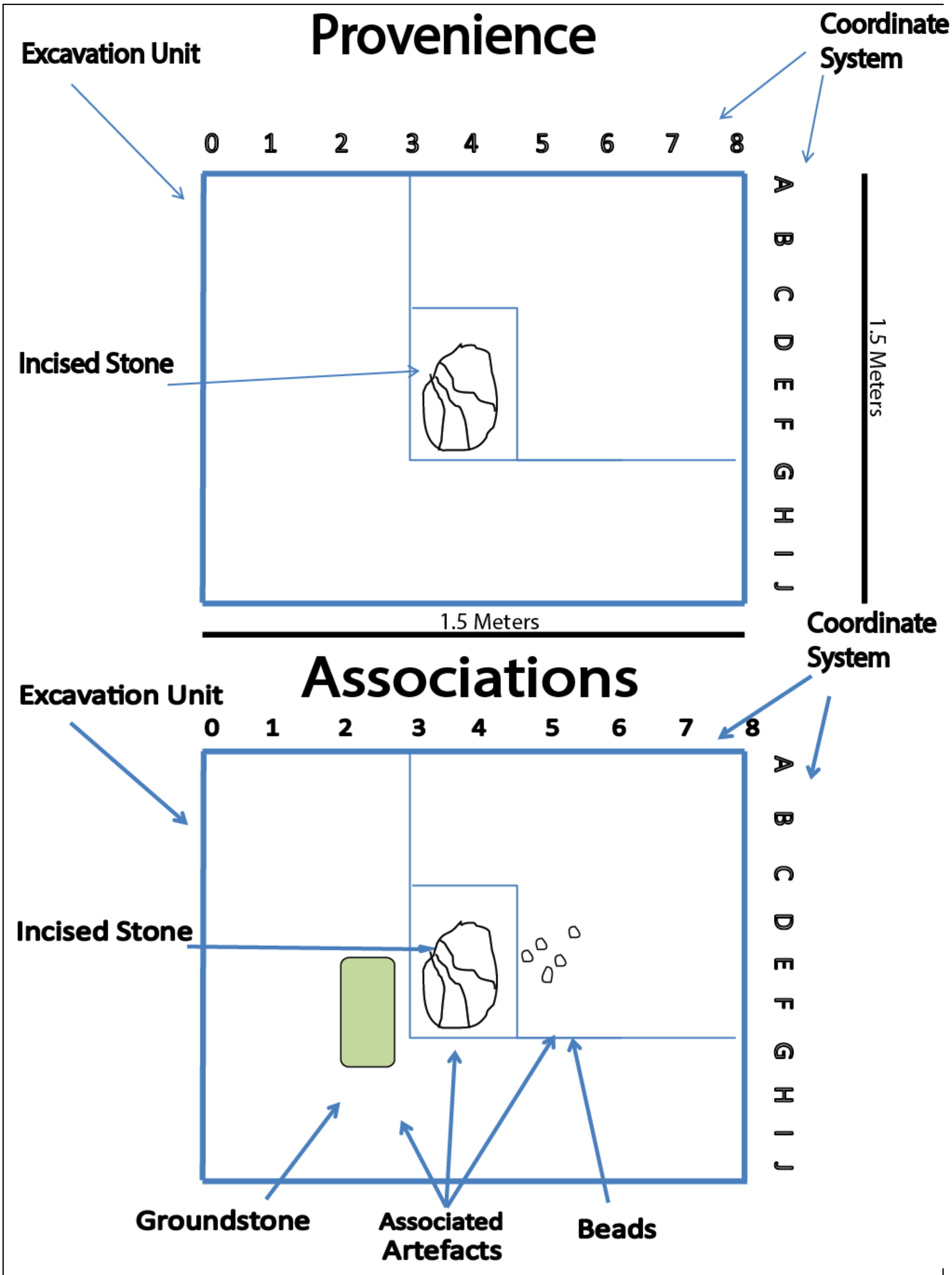


Figure 1.9: Examples of the difference between provenance and associations.

Detecting activities in relation to incised stone throughout multiple chronologies at multiple sites will improve our understanding of how incised stones were emphasised in the day to day lives of the people who made them. Extracting this information will then will lead to interpretations of why incised stones were made and how they are contextualised into the lives of the people who made them.

Structured Deposition

As a concept structured deposition works on the basis that formalized, repetitive behaviour is detectable through a depositional pattern within the archaeological record (Garrow 2012:87; Richards and Thomas 1984:191). The idea that became structured deposition was suggested by Ian Hodder in his 1982 edited volume 'Symbolic and Structured Archaeology' (Garrow 2012:86). Richards and Thomas's 1984 analysis of Durrington Walls which is a Neolithic henge in southern England created the term structured deposition (Garrow 2012:87; Richards and Thomas 1984:191). In this work they found "patterned deposition of broken pottery and animal bones within a henge ditch" at Durrington Walls (Garrow 2012:98). Since that time a number of other terms have been used in place of structured deposition such as: ceremonial, deliberate, formal, formalized, intentional, non-utilitarian, odd, peculiar, placed, ritual, selected, special, symbolic, token, and unusual deposits (Garrow 2012:93). In the case of the analysis of Durrington Walls the structured deposition used during this early work does have three critical problems. The first is the omission of time by not acknowledging different stages of use through a chronology. Secondly is the overstatement of patterns by pushing an interpretation beyond reasonable supported statistics (Garrow 2012:90-91). For instance, at Durrington Walls some post-holes had flint and little pottery while others had exactly the opposite (Garrow 2012:90-91). This was interpreted as a pattern of mutual avoidance however in reality 31 of the 52 post-holes had had comparable amounts of flint and pottery (Garrow 2012:90-91). Finally the ritual and everyday domestic use of artefacts is blurred across the site making it difficult to interpret (Garrow 2012:90-91). This blurring has become two different avenues within the concept of structured deposition. The first is the deposition of 'everyday' activities which could lead to structured deposition, and the other that is called hyperinterpretive (Garrow 2012:103). In the case of 'everyday processes' structured deposition describes "rhythms of everyday life, and about the nature of occupation at the site, rather than any symbolic meanings" (Garrow 2012:103). An example of this is found when Harding (2006:103) looked at layers of burnt flint and pottery within pits and interpreted these as representations of activities that took place on site instead of explaining it as a symbolic-ritual occurrence (Garrow 2012:103). Hyper-interpretive depositional structure refers to the preponderance of interpreting material culture as having had symbolic or ritual meaning based on an artefacts placement or surroundings. This type of interpretation has been used at monument sites such as Etton where Harris (2005:47) described “both the fox skull and the first pot were placed in the ground upside down is surely significant, stressing inversion, the breakdown of normality”, or Pollard (2008:53) pointing out that killing and deposition of animals was increasing the energy or potency of the enclosure at Etton (Garrow 2012:103). In this work structured deposition is used to describe odd or unusal deposits of incised stones.

Design Grammars

The imagery of incised stones has been classified into different categories by many different investigators over the year. Chapter 3 of this work covers in detail some of these design classifications that have been made. One of the best approaches to classifying is done by Klimowicz who fleshed out seven different design classifications on 788 incised stones in the Santini collection; these classifications are called design grammars (for example, Figure 1.10) following similar work done on pottery sherds (Santini 1974, Klimowicz 1988). Klimowicz applied her design grammars to the Gatecliff Shelter incised stones and compared both collections (Thomas 1983b, Klimowicz 1988, Santini 1974). Unfortunately the classification she used for each incised stone at Gatecliff was never published, so I reclassified the Gatecliff collection using her design grammar classification and description. Further I classified all of the incised stones that are within my sample using her design grammars, and Chapter 8 discusses the outcome of these classifications.

Conclusion

This research is unique in its theoretical approach which uses layers of analysis to discover the usage of incised stones in the past. The scope of this work is unparalleled in the Great Basin and the world making it a seminal cross examination of incised stones at stratified sites that incorporates the context of the total number of artefacts, climate, subsistence and technology (Chapter 6), spatial associations (Chapter 7), and design grammars (Chapter 8). There is no other study that examines incised stones at multiple sites through a chronology in a large or small geographic setting. The design grammars which were applied to the Santini collection I have now applied to all 562 incised stones within my sample. My methods can be applied to other incised stones anywhere in the world.

Swallow Shelter

Level 9

Sheet 1 of 3

(830 AD)

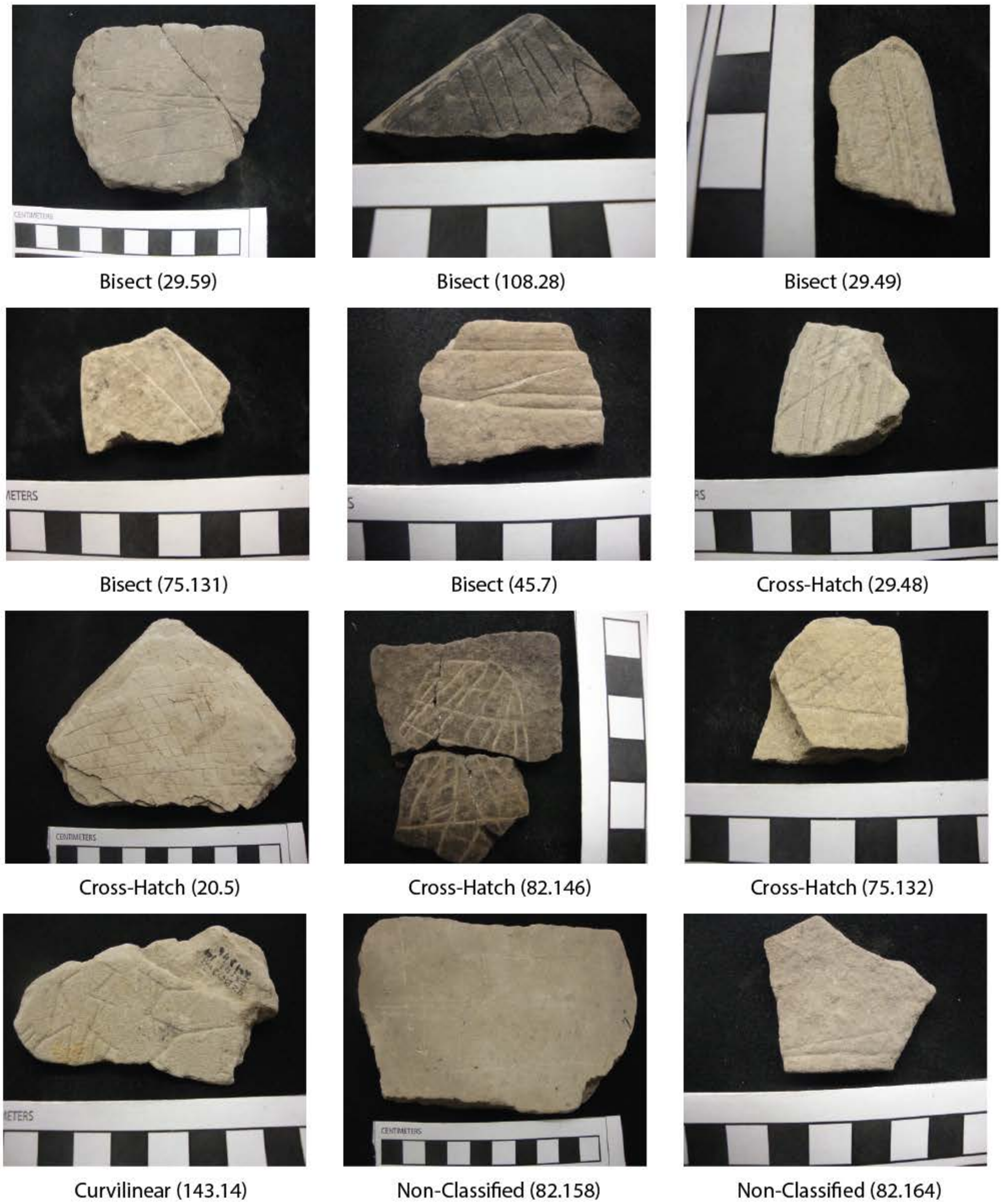


Figure 1.10: Design grammar as applied to Swallow Shelter Level 9. 42BO268 Courtesy of Natural History Museum of Utah. Photos by author.

The structure of the thesis follows four literature review chapters that create the footing needed to understand incised stones and the Great Basin. Chapter 2 brings together incised stones, bones, ivory, and horn from around the world and discusses the thematic approach of research towards these artefacts. The area of the world that are covered include, Africa, Europe, the Middle East, Asia, South America, Australia, and Polynesia. Chapter 3 is split into two parts; part one covers the United States on the east coast and California on the west coast. Part 2 focuses in on the Great Basin incised stones. Chapter 4 discusses the climate change of the Great Basin from the Pleistocene to current conditions and discusses the most current understanding of the archaeology and the life-ways of the prehistoric hunter-gatherer inhabitants. Chapter 5 introduces the sites that have been chosen as the sample sites in this research. Chapter 6 discusses the context of climate and environment in relation to incised stones. Inference is used to understand the social structure of the hunter gatherers as they react to the wane or wax of fruitful seasonal harvest, and how this affects the number of incised stones deposited. Chapter 7 examines the artefacts found in association with incised stones. In addition the topics of structured deposition, caches and hunter-gatherer gender roles is discussed. Chapter 8 discusses the designs of the incised stones as a design grammar. This chapter asks: do design grammars have a connection to specific activities? Chapter 9 concludes the entire thesis with a summary of the chapters. Interpretations of the incised stones are suggested based on the cumulative analysis. Finally, future research is suggested in the area of incised stones.

Chapter 2 begins in Africa since Blombos Cave in South Africa contains the earliest (75,000 years ago) deposits of incised stones. The dispersion of incised stones, that today we know cover the world over, seems to have started at this early site.

Chapter 2: Incised Stones: A World-Wide Literature Review

Introduction

Chapter 2 provides the results of a world-wide literature review that was undertaken to demonstrate the presence of incised stones around the globe. This world review discusses what type of research has been conducted on incised stones. These results will not only inform on previous research, but will also build the context in which incised stones exist in the world and set the background for discussions on incised stones in the Great Basin. Intentionally, this overview begins with the earliest known incised stones found in Africa followed by Europe, Middle East, Asia, Australia, Polynesia, and Mesoamerica (Figure 2.1). Within the discussions for each continent, some incised artefacts may only receive a brief sentence with the site name, material type, and imagery of the incising; in other places, one or two paragraphs are dedicated to discussing the methods applied to incised artefacts.

As an artefact category incised stones are found throughout the world originating in the distant past. To appreciate incised stones one should consider they are as old as the earliest 'anatomically modern humans' (AMH). In places where incised stones were not found or discussed, I include discussions on incised bone, teeth, or ivory artefacts because they are of the same general incised artefact category. Incised lines of bone, antler, or ivory are made the same way on stone and the methods to analyse them are comparable. In the following discussions, terminology used by other researches such as incised plaques, engraved stone, celts, or morah has been preserved depending on how specific the artefact is to the term. One example is a morah stone from Australia that is a groundstone with incised designs across the surface. An engraved plaque, however, has been changed to incised stone since there is no difference between the two terminologies (see Chapter 1). The profile of an incised stone can vary from unshaped or shaped edges that may or may not have drilled holes. The medium can also vary a great deal, from sandstone, basalt, and obsidian to steatite.

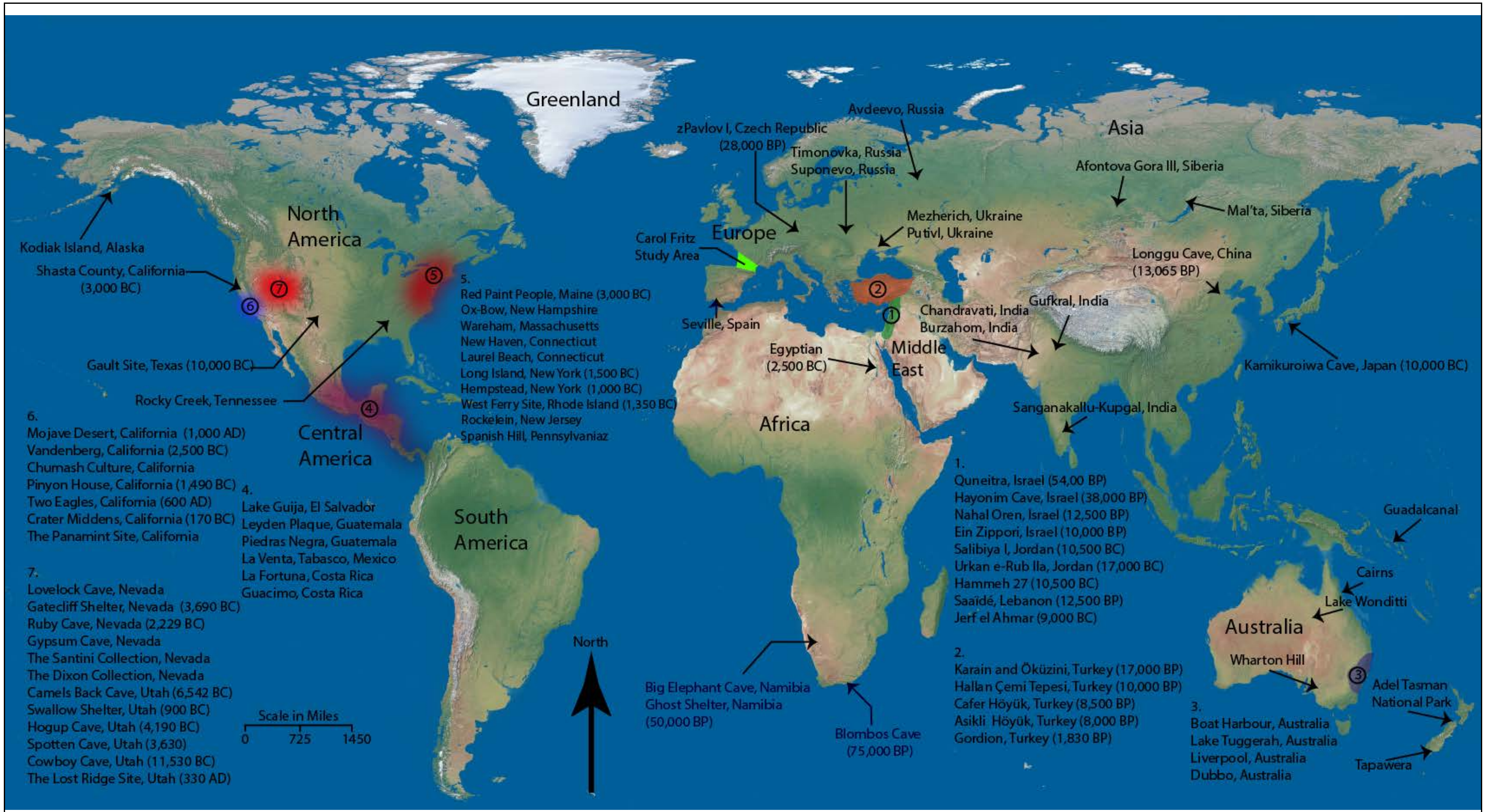


Figure 2.1: World Map of all sites discussed in Chapter 2 and 3 (After Patterson 2015).

Africa (75,000 BC to 250 AD)

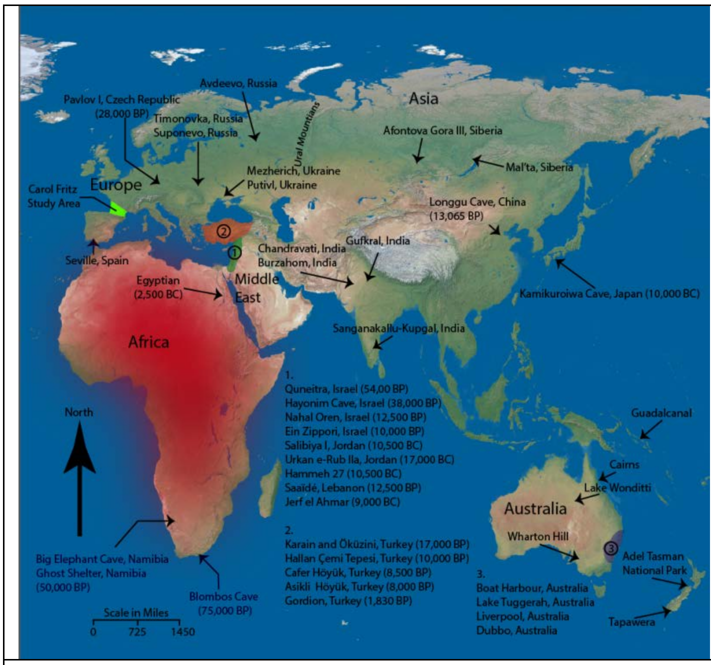


Figure 2.2: Incised Stones of Africa shaded in red (After Patterson 2015).

Blombos Cave in South Africa (Figure 2.2) has fifteen incised ochre pieces that are found within deposits dating to 75,000 to 100,000 years ago (Henshilwood et al. 2009:27). The Blombos Cave ochres (Figure 2.3) were analysed by researchers as symbolism in the archaeological record (Henshilwood et al. 2009:41). The antithesis to symbolism has been an act of doodling (Henshilwood et al. 2009:41). An example of incised stones being classified as doodling comes from the excavation in Gordion, Turkey were Rodney Young published several papers referring to the incised stones as doodles (Roller 2009:4). As a result, the incised stones at Gordion did not receive attention from scholars who accepted the doodle classification as the final analysis (Roller 2009:4). Doodling is defined as "a design or representational image made while a person's attention is otherwise occupied" (Henshilwood et al. 2009:41).

The Blombos Cave incised stones were manufactured by using two hands, a great deal of concentration, and a processes that created a focused design (Henshilwood et al. 2009:42). Surfaces of the incised stones were prepared by grinding, which indicates intentionality to incise within the prepared area (Henshilwood et al. 2009:42). Henshilwood and his team conclude the incised ochres represent the emergence of symbolic thought and of the use of tradition in early anatomically modern humans (2009:42; Kintigh et al. 2014:14). Tradition is defined as "continuity in material culture practices that last longer than a phase or the duration of a horizon" (Henshilwood et al. 2009:43). The incised objects may represent a tradition that lasted for a 25,000 year period in Blombos Cave, and Henshilwood et al. (2009:45) argue that the tradition extends outside of Blombos Cave into other areas of South Africa. Also in South Africa is a rock shelter site called Klein Kliphuis, where incised ochre was found in circa 30,000 BC deposits (Mackay and Welz 2008:1523). The purpose of the incised lines remains enigmatic, but the evidence of symbolic expression in early *Homo sapiens* is likened to the Blombos Cave ochres (Mackay and Welz 2008:1530).

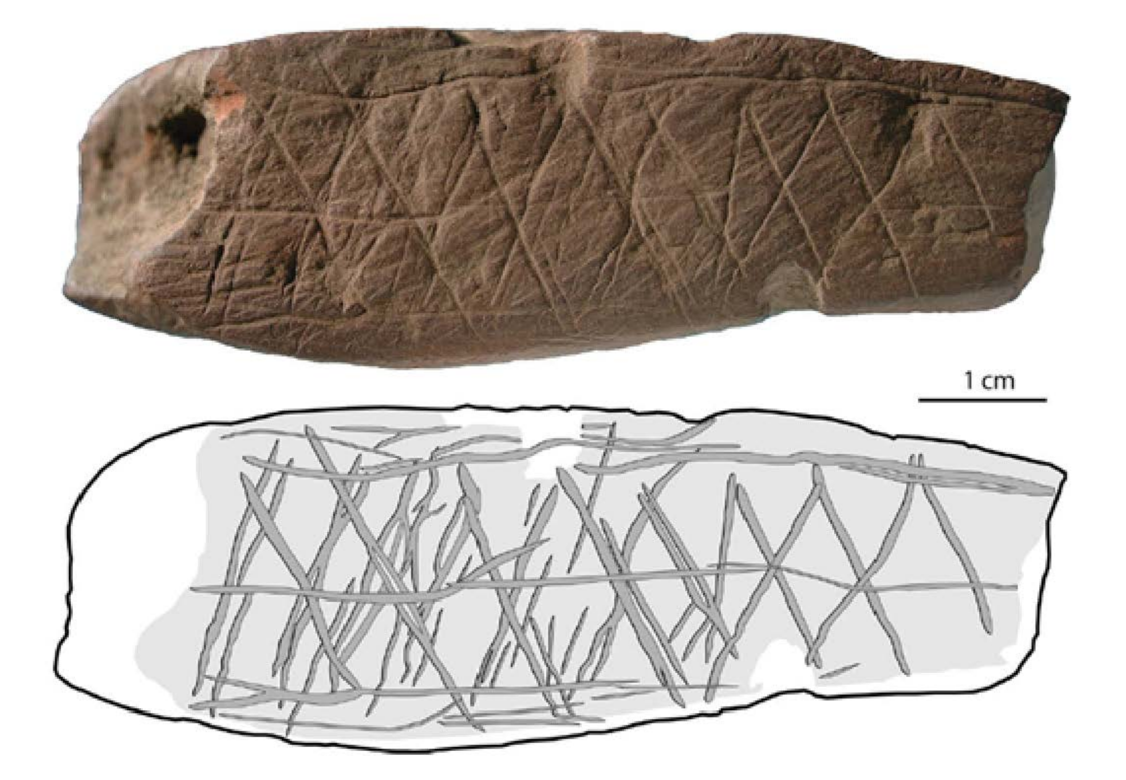


Figure 2.3: Blombos Cave incised ochre from 75,000 BP (Henshilwood et al. 2009:35).

Moving away from South Africa to the country of Namibia is the archaeological site of Big Elephant Shelter in the Erongo Mountains (Wadley 2012:101). At this site one incised stone was recovered from the excavation, but not recognised as an incised stone until laboratory work was performed on the collection (Wadley 2012:102). This artefact is made on a hard stone which characterises other incised stones in southern Africa during the middle and late stone age (Wadley 2012:105). There are other incised stones from Namibia such as the Ghost Shelter site that has crossing double lines incised on one surface (Wadley 2012:104).

The Egyptians, who had a complex agricultural society, made incised stones of Gods and glyphs from 1,500 BC to 250 AD (Petrie 1914:34). Glyphs and imagery of Gods incised on stone tablets was a common household item (Petrie 1914:34). One such example is an incised steatite with the text reading "become Horus, Osiris, Amru, and Ptah" dating to 250 BC to 250 AD (Petrie 1914:34, Bury et al. 2014:4). From 1,000 BC are four incised stones called the eye of Uzat which is associated with seven Goddesses (Petrie 1914:32, Bury et al. 2014:4). Some incised stones were made on black steatite, one example has the image of a God holding a branch on the back of a bull, the style of imagery suggest it come from Caesarea, Israel (Petrie 1914:32). Finally, there are five incised inscriptions on limestone and steatite that date to 1,500 to 1,000 BC and refer to the 30th Chapter in the 'Book of the Dead', which offers protection in life from people in elite statues who might cause harm or limit a person's potential in some way (Petrie 1914:24).

Europe (40,000 to 3,000 BC)

The geographic area of Europe includes sites as far east as the Ural Mountains in Russia (Figure 2.4). Some of the earliest incised stones are ochres from Poland that date to 40,000 years ago (Zilháo 2007:30), while incised stones from Spain and Portugal date to 3,500 to 3,000 BC (Lillios 2008:8). Zilháo (2007) and d'Errco et al. (2003) point out that Neanderthals (Table 2.1) made portable art objects in Europe that include incised stone, bone and other materials found at Neanderthal sites. In Spain and Portugal there are over 2,000 incised stones in museum collections that were recovered from tombs with the rare occurrence from settlement sites (Lillios 2008:17). During the early 19th century scholars thought these incised stones were influenced by Egyptians due to the similarities in appearance (Lillios 2008:17). Jose Vasconcelos, a 19th century Iberian researcher, wrote after seeing Egyptian incised stones "If I had found one in Portugal, I wouldn't have distinguished it from our own!" (Lillios 2008:26). Vasconcelos (Figure 2.4) was not in favour of Iberian incised stones as ornaments, but proposed that the imagery was that of some sort of religious system (Lillios 2008:26).

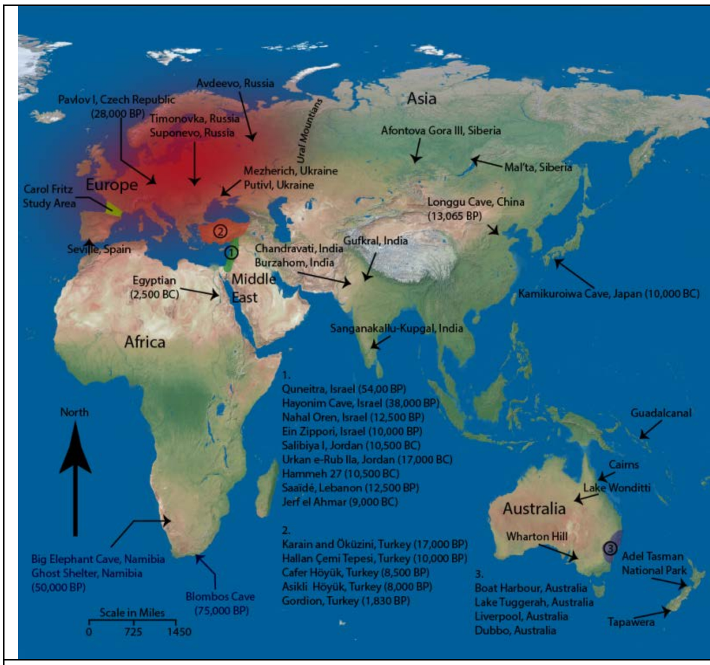


Figure 2.4: Incised stones of Europe shaded in red (After Patterson 2015).

Country and Place	Site	Date	Object	Citation
Krakow, Poland	Piekary IIa	c. 40,000 BP	Two pieces of ochre with abstract incised designs	(Zilháo 2007:24)
Bulgaria	Bachokirian Type Site	c. 39,000 BP	A spindle-shaped bone pendant, oval in cross section and grooved at the narrow end	(Zilháo 2007:24)
Italy	Fumane rock shelter	36,000 to 34,000 BP	325 perforated shells, red deer teeth incised for possible suspension around the root	(Zilháo 2007:28)
France	Aldène cave	29,700 and 32,400 BP	Incised of a bear and two felines	(Zilháo: 2007: 34)
France	Solutré	c. 21,000 BC	incised rhinoceros rib	(d'Errico et al 2003:34)
Isturitz, France	Isturitz	c. 20,000 and 35,000 BC	A bone pipe with incising	(d'Errico et al 2003:39)
France	La Marche shelter	c. 15,000 BC	Piece of antler image of a horse and above it there is are many incised dots	(d'Errico et al 2003:34)
Valencia, Spain	Tossal de la Roca	Epipaleolithic	Broken pendant carrying on both sides incised lines that are abstract	(d'Errico et al 2003:34)

Table 2.1: Several portable art objects found in Europe recovered from Neanderthals sites.

Czech Republic

Rebecca Farbstein (2011) reports on the "Pavlovian" culture in the Czech Republic that dates between 28,000 and 24,000 years BC. At a site called Pavlov I which is the type site for the Pavlovian culture is an incised bone tablet (Figure 2.5), two incised and perforated ivory fragments (Figure 2.5 #3 and #4), and a sculpted ivory mammoth figurine with incising to show the animals legs (Figure 2.5 #5; Farbstein 2011:2-4). Also there is a length of ivory that has decoration added to the convex side while the concave side has smoothing and miscellaneous tool marks (Farbstein 2011:16).

The incised objects from Pavlov I are discussed as to how carving is different from engraving (Farbstein 2011:16). Carving is defined as a method of reduction by making several passes over the surface of an object until a "wide and deep scar" is created (Farbstein 2011:9). Carving attracts a person's attention more than incising and each piece is carefully thought out by the maker as to how the object will appear (Farbstein 2011:9). Engraving creates a line with a "U" or "V" shaped bottom which can be made by many different tools (Farbstein 2011:9). To facilitate the analysis of the incised objects a three category system was created unifacial, bifacial, and multifacial. The first of these is that if incising was restricted to one surface then the object was unifacial; however, the object remained in the unifacial category even if there was evidence of minimal incising on another surface (Farbstein 2011:14). The example given is that of a mammoth rib where one side is carefully decorated while the reverse only has five incised lines at one end (Farbstein 2011:14). The second category is that of a bifacial art object where both sides are incised giving the impression of a front and back (Farbstein 2011:14). The third and last category is multi-facial if more than two sides were decorated to a similar extent (Farbstein 2011:14).

Figure 2.5: Incised ivory fragments from Pavlov I. Scale in centimetres. (Farbstein 2011:3).

To perform the analysis, Farbstein uses the chaîne opératoire and gesture methods in her analysis. Chaîne opératoire translates as operational sequence, and is an analytical tool that was first introduced by French archaeologist Leroi-Gourhan (1964). This analysis explores the chain of events that go into making a particular artefact (Farbstein 2011:14). These events when identified in sequence are capable of "identifying strategic and tactic choices at every stage of the manufacturing process…and [can]… approach cognitive problems, including intentionality" (Audouze 2002:287). This method is used to follow the chain of events that go into making a particular artefact (Farbstein 2011:15). The chaîne opératoire method is used to sequence the events or order of production by the individual or group that made art object at Pavlov I (Farbstein 2011:15). Gesture refers to the movement of the hands over the object or how the object was held during incising. It also refers to material choice where stones were most likely chosen by tactile preference. To determine the sequencing of the lines a "x10 power hand lens" is used to see the bottom of the mark where pressure was first applied as incising began, and then the end of the line where pressure and depth decreased as the hand removed the burin or graver (Farbstein 2011:7). The final outcome of Farbstein's (2011:19) chaîne opératoire examination is that there is no wide spread tradition that existed outside of Pavlov I. The method of making incised, and even the carved materials, appear to have been isolated to small-scale technical traditions that did not existed outside Pavlov I (Farbstein 2011:19).

Portugal, Spain, and France

In Portugal and Spain, late Neolithic incised stones are associated with burials (Lillios and Thomas 2010:139). Incised stone research has a long history in these countries (Figure 2.6) evidenced by the picture of Jose Vasconcelos, a 19th century researcher, with an incised stone around his cuff. Lillios and Thomas (2010) give examples of incised stones (Figure 2.7) (they refer to them as plaques) from a variety of sites throughout these areas. Stones from Portugal and Spain date between 3,500-2,500 BC (Lillios and Thomas 2010:138).

Figure 2.6: Jose Vasconcelos, a 19th century Iberian researcher. Note the incised stone hanging off his cuff (Lillios 2008:26).

Lillios and Thomas build a biographical sketch on a single incised stone called the Valencina Plaque that was found in a tomb in Seville, Spain. The biography of the incised stone included three approaches: raw material, visual imagery and deposition. The raw material selected to make this incised stone is sparse in some areas yet abundant in other places in Spain and Portugal (Lillios and Thomas 2010:141). Areas that are slate rich have the highest frequency of incised stones (Lillios and Thomas 2010:141). The source material most likely came from western Iberia which is nearly 100 miles away from its final deposition (Lillios and Thomas 2010:141). The visual imagery of the stone includes its colour, which from a distance would have attracted attention with the black finish and bright white incised lines; in contrast, other incised stones are "visually subtle pieces" (Lillios and Thomas 2010:142). The colour may be a product of the use of the stone when worn close to the skin. An archaeological experiment was carried out by Alexander Woods where he wore an incised stone (unstated material) for weeks at a time (Lillios and Thomas 2010:142). The findings showed that the stone will quickly absorbed bodily oils causing the slates to darken which obscure the incising (Lillios and Thomas 2010:142). The incised stone that was buried with the dead may hold the contents of bodily fluids thus making them "become materialized in the plaque, and the plaques viewed as receptacles for the ancestors - or, indeed, the ancestors themselves." (Lillios and Thomas 2010:142). Another aspect of visual imagery is the way the incised stone draws one's attention into the stone. Here the artefact size is discussed as the small scale of the piece encourages the viewer (Lillios and Thomas 2010:141):

> "to come close to it, but at the same time it also restricts the number of people that can effectively see or read its imagery at any given moment. It provokes a kind of intimacy; it commands our attention and draws our gaze towards it."

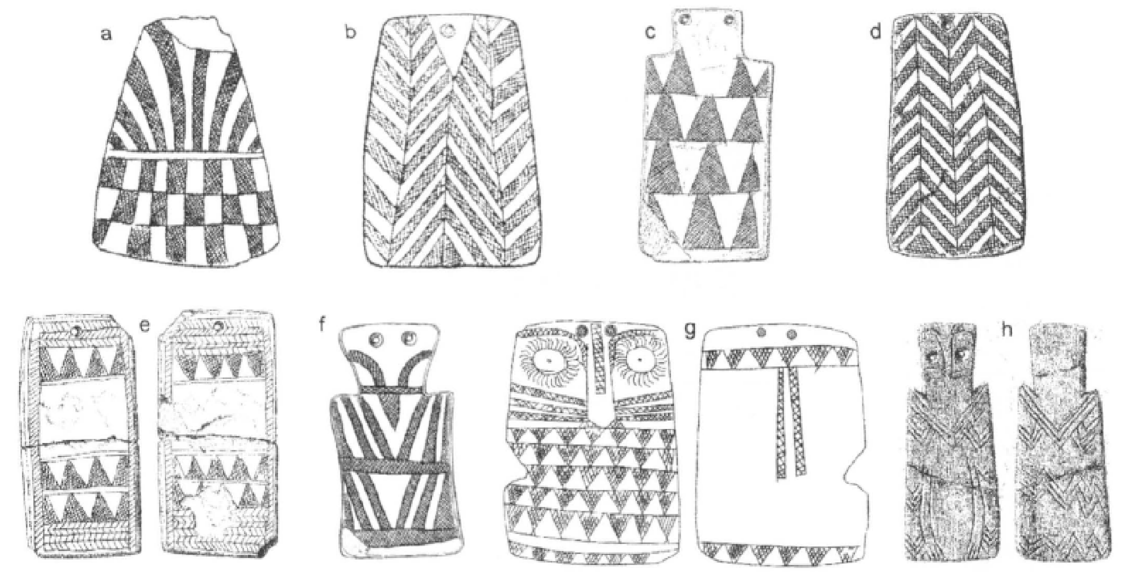


Figure 2.8: Incised stones from across Europe. A. From site Cebolinbo 1, B. From site Olival da Pega 1, and D. From site Comenda da Igreja. A, B, and D are from Evora, Portugal. C. From site Vega del Peso in Badajoz, Spain. E. From site Cueva de la Mora, G. From site Huelva. E and G are from Huelva Spain. F. From site Marquesa in Portalegre, Portugal. H. From site Idanha a Nova in Castelo Branco, Portugal (Lillios and Thomas 2010:139).

Another aspect of size is how symmetrical these incised stones appear. They observe that symmetry has been cross culturally studied by psychologists to show that people are attracted to symmetry (Lillios and Thomas 2010:143). Finally they put forward an idea that the stones could have recorded textile patterns and that these stones would hold information for future textile makers (Lillios and Thomas 2010:144).

Carole Fritz's (1999) microscopic examination of 90 incised stones from sites in southwest France resulted in sequencing the incising on the incised stones. The results showed that there is a tradition of Figures that are "conceived and produced from front to back, beginning with the shape which sketches the outline of the animal" (Fritz 1999:209). This particular sequencing of incising is found from the Pyrenees to Gironde a distance of 241 miles.

Russia

In Russia, Alexander Marshack describes several schematized fish designs on incised ivory and bones (Marshack 1979:271). The prehistoric people who made these schematized fish were hunter-gatherers living during the Pleistocene (Marshack 1979:272). An example is found on an incised mammoth tusk (Figure 2.8) from Timonovka, Russia that is south west of Moscow (Marshack 1979:272). Another site called Suponevo, which is a few miles from Timonovka, are more of the fish motifs (Marshack 1979:294). At Timonovka, the people lived in mammoth bone huts with hearths that suggest that the encampments were used during winter months when the temperatures would fall far below freezing (Marshack 1979:272-276). Marshack interpreted the schematized fish motif as magical symbolism to unfreeze rivers thus releasing the trapped fish below (Marshack 1979:276).

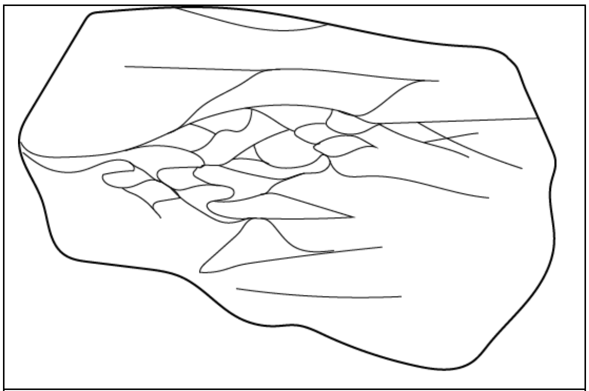


Figure 2.8: Schematized fish design incised on Mammoth tusk from Timonovka, Russia. (Redrawn from Marshack 1979:271).

Near the Ukraine boarder in Russia is an area known as Eliseyevich that has incised bones with imagery of ladders, zigzags, and double-lines (Marshack 1979:277). At another site in Avdeevo, Russia (south of Moscow) is an incised fragment of bone with zigzags (Marshack 1979:282). In Ukraine, at Mezherich, is a mammoth scapula and a mammoth bone (Figure 2.9) that has zigzag motifs, and geometric shapes (Marshack 1979:285). The mammoth bone was a part of a mammoth bone house that is located on a rise above a river (Marshack 1979:285). At a bog site in Putivl, in eastern Ukraine is an incised bovid jaw (Marshack 1979:294). When examined under microscopic scrutiny many of these incised artefacts revealed that numerous incisions were made using different tools (Marshack 1979:293). The conclusion that Marshack reached is that the incisions were made over time, each time with a different tool (Marshack 1979:293).

Figure 2.9: Incised mammoth scapula From Mezherich in Ukraine (Marshack 1979; 292).

Middle East (54,000 to 1,250 BC)

The Middle East consists of Israel, the region in Turkey known as Anatolia, and the Levant which is the area of Jordan, Lebanon, and Syria (Figure 2.10). Incised objects in this area range in date between 54,000 to 1,250 BC. The early date of 233,000 is not confirmed or else it would have outdated the Blombos Cave examples in South Africa which dates to 75,000 to 100,000 BP.

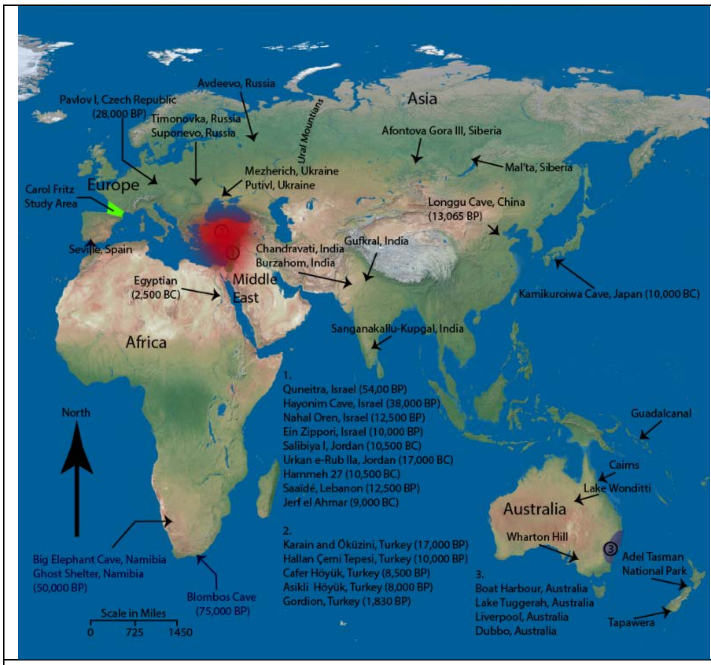


Figure 2.10: Incised stones of the Middle East shaded in red (After Patterson 2015).

Israel

The Berekhat Ram figurine from Qafzeh, Israel is suspected to date to 233,000 BP (d'Errico et al. 2003:20). This figurine is a natural occurring rock that happens to look effeminate, but then is incised to enhance its feminine features (d'Errico and Nowell 2000; Marshack 1997).

Marshack analysed a 54,000 BP incised cortex (Figure 2.11) from the Golan Heights area in Quneitra, Israel (Marshack 1996:363). He puts forward that the imagery is that of "rainbow arcs and surrounding rain" (Marshack 1996:363). To contextualise his interpretation, the climate of the area is analysed to show that current rainfall in the area of Golan Heights and seasonal rainbows probably existed prehistorically. The site in question is interpreted as a short term camp visited most likely during early summer months as the rains would be declining (Marshack 1996:363). Thus, Marshack (1996:363) describes a scenario of hunter-gatherers creating the incised stone after witnessing several rainbows from the site.

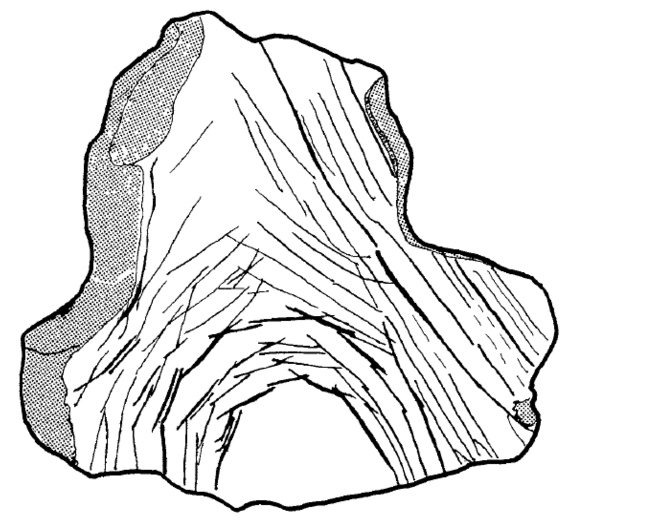


Figure 2.11: Incised cortex from Golan Heights near the town of Quneitra, Israel (Marshack 1996:363).

At Hayonim Cave from the Aurignacian period, (38,000 - 28,000 BC), are two incised stones (Brumm et al. 2006:178). One of the stones resembles an ungulate (deer or antelope) made on a limestone slab while the other is a basalt rock that is deeply incised in the centre with many parallel lines lightly incised on the surface (Brumm et al. 2006:178). During the same time range at Hayonim Cave four incised stones were found, two of which display a complex net pattern, one has a fish complete with scales incised, and another has criss-crossing incisions (Belfar-Cohen 1991:578).

At a later date within Hayonim Cave, (10,360 to 10,010 BC), limestone slabs were placed to make a pavement and some of these pavement stones were incised with long lines (Belfar-Cohen 1991:578). Belfar-Cohen (1991) analysed the limestone pavements and noted that the limestone are all manuports that had been laid adjacent to one another to resemble a pavement (Belfar-Cohen 1991:578). These incised stones are interpreted to suggest that the appearance of artistic expression may coincide with a change from seasonal rounds to a year round or partial sedentism that has defined the Natufian period (Belfar-Cohen 1991:585). Belfar-Cohen suggests that this new sedentism would have created a need for social cohesion and for a way to cope with group stress (1991:585). This view is supported in Douglas Campana's work on Hayonim Cave bone tools where the Natufian groups seemed to specialize in design types, even suggesting that if their design was not on a tool then it could not be used

(Campana 1991:465). Campana (1991:465) points out that the art was an expression of group identity and shared stresses.

From the site of Nahal Oren, which is in a drainage channel near Mt Carmel in Israel, are stones that dates to 10,500 to 8,200 BC (Noy 1991:560). The three incised limestones that were discovered vary from a basic grid pattern to a more elaborate incising of a dog and owl on the same stone (Noy 1991:361-364). The dog and owl stone is made on an odd shaped nodule of limestone and on opposite ends the animals are incised complete with eyes and fine features (Noy 1991:364). Tamer Noy (1991) suggest that differences in incised designs arise from small groups keeping specific traditions. Noy (1991:561) likens the analysis to that of differences in flint tool production.

Figure 2.12: Incised stone from Ein Zippori. Ostriches running next to one another (Israel Antiquities Authority 2012).

During a highway widening project in 2012 an incised stone (Figure 2.12) was recovered from a Wadi Rabah site called Ein Zippori in Israel (Israel Antiquities Authority 2012). The Wadi Rabah culture was first identified by Jacob Kaplan in 1958 at the Wadi Rabah site, based on pottery style changes at the end of the Neolithic period in Israel (Gibbs 1993:23). The incised stone depicts two ostriches running next to one another (Israel Antiquities Authority 2012). The incised stone along with other artefacts such as a delicately made stone bowl and beads is interpreted as objects relating to a socially stratified culture that had a group of social elites that used these traded luxury items for trade (Israel Antiquities Authority 2012).

Anatolia

In the area known as Anatolia, which includes Turkey, are the caves Karain and Öküzini that dates to 15,000 to 10,000 BC. These caves yielded incised pebbles and slabs. At Karain there is a feature of rock augmented with incised lines and 'dots' (Brumm et al. 2006:178). A site called Hallan Çemi Tepesi, which dates to the 11th millennium BC has many metamorphic incised rocks that contain a repeated hourglass design known as a notched baton (Brumm et al. 2006:178). At a site called Cafer Höyük dated to 6,500 BC there is a green stone that has incised geometric designs. Finally, the Aşikli Höyük mound, dates to the 8th millennium BC, and has a polished stone plaque with 'V' and 'O' patterns (Brumm et al. 2006:178).

In Gordion, Turkey, excavations from 1950 to 1973 by Rodney Young revealed incised stones from a building that was destroyed by fire (830 – 805 BC); this building is called Megaron 2, a name taken from the Homeric epics (The Iliad and Odysseys) (Roller 2009:1, 6). Megaron 1 and 2 were a part of the complex series of building that made up the citadel of the Phrygian city. Laying between the buildings are 105 incised stones some of which are incorporated into the walls of both Megarons (Roller 2009:3, 100). The initial interpretation of the incised stones by Rodney Young is that they were examples of doodles; this interpretation impeded further analysis of the stones while other aspects of the building were researched (Roller 2009:1). The reanalysis of the incised stones suggest the doodle interpretation was premature and that the imagery represents a Phrygian culture that was becoming increasing complex after 900 BC (Roller 2009:47). There is little expression of art in Phrygian society before 900 BC, but contact with Neo-Hittite artistic influence is believed to have been the genesis of the incised stones (Roller 2009:47). Roller proposes a scenario where rulers after seeing the Neo-Hittite statues began a city beautification programs of their own to similarly incorporate aesthetics into the city (2009:47). The analysis of the imagery suggest that the Phrygian's had started to depart from mimicking the Neo-Hittites, and were developing their own style (Roller 2009:49). The fire that occurred had the effect of locking these incised stones into a particular time that allows for a clear snap shot into this pivotal development (Roller 2009:49).

Levant

A site in the lower Jordan Valley called Salibiya I, yielded a limestone incised stone dated to 10,500 to 8,200 BC (Brumm et al. 2006:178). In the same area as Salibiya I, is another incised stone (n=1) (Figure 2.13) from the site Urkan e-Rub IIa (Hoovers 1990:317). This site dates to the Epi-Palaeolithic (17,000-I2,500 BC), and it is suggested that these objects are meant to be personal and viewed up close by a restricted audience (Hoovers 1990:321). Specifically, Hoovers states that the size of the group was probably not "larger than a nuclear family" (1990:321).

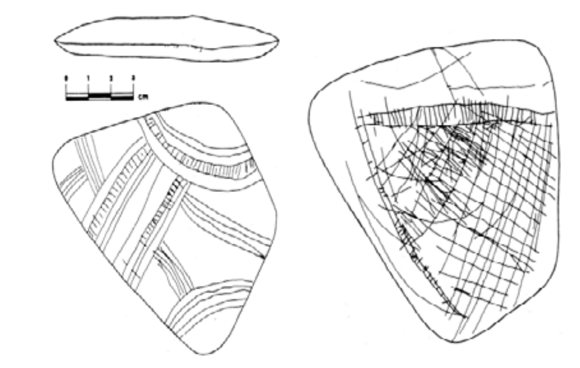


Figure 2.13: Incised stone from site Urkan e-Rub IIa in the Lower Jordan Valley. I9,000-I4,500 BP (Hoovers 1990:317).

Also in Jordan at Wadi Hammeh 27 (Figure 2.14) which dates to 10,500 to 8,200 BC are 18 incised limestone pebbles and slabs (Bar-Yosef 1998:167). Three of the incised stones were found placed end to end along one of the walls of the site with a pile of rubble creating a support; the incised stones in this way could be displayed (Edwards 1991:133).

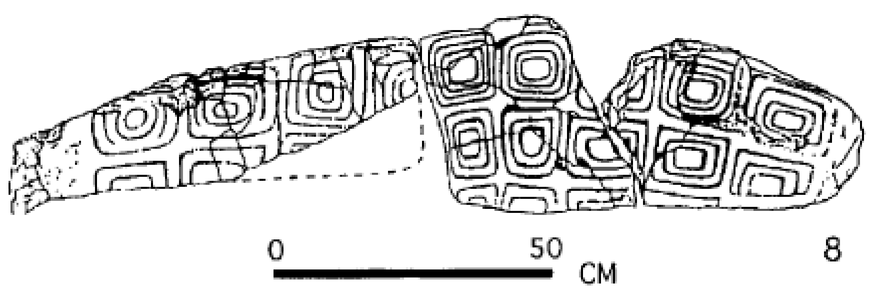


Figure 2.14: Decorated limestone slab from Wadi Hammeh 27 in Jordan. (Bar-Yosef 1998:167).

In Lebanon, at Saaïdé II, which dates to 10,500 to 8,200 BC incised pebbles with parallel lines were found (Brumm et al. 2006:178). These pebbles were discovered together with plain unmarked pebbles (Schroeder 1991:73). Other sites from the Levant include Cayönü, Mureybet, Sheikh Hassan, and Cafer that date to the Neolithic (9,000 to 5,500 BC) and contain stones that have been described as shaft straighteners with incised lines and geometric designs (Brumm et al. 2006:178). Finally, at Jerf el Ahmar in Syria, which dates to the Neolithic (9,000 to 5,500 BC) bifacially incised stones were recovered (Brumm et al. 2006:178).

Asia (No Dates)

Finding incised artefacts in Asia (Figure 2.15) proved to be a challenge. It is possible that many incised materials from Asia are greatly under reported or reported in languages I am not able to read. I was only able to find examples from Siberia, China, India, and Japan.

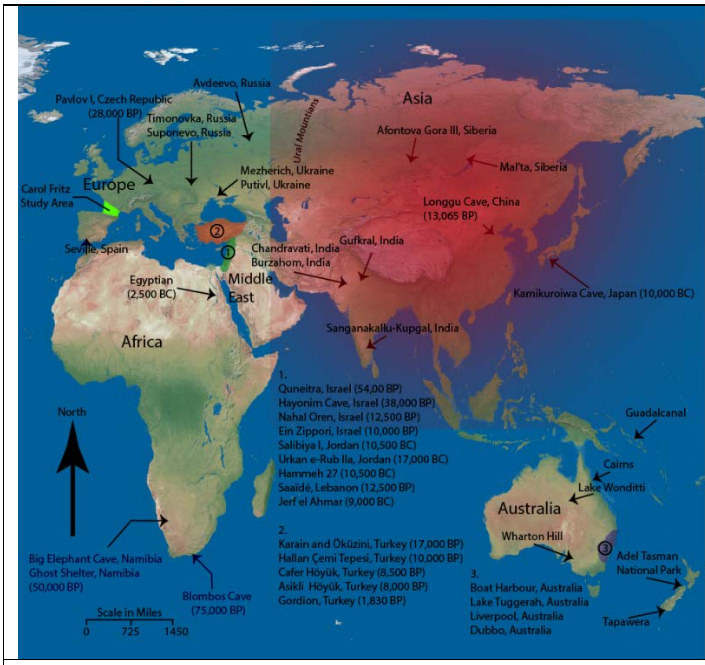


Figure 2.15: Incised stones of Asia shaded in red (After Patterson 2015).

At a site called Afontova Gora III in Siberia is an incised disk made on mammoth bone (Figure 2.16); however, no date is provided (Bednarik 2010:3). More of these disks are reported from Afontova Gora II, Irkutsk Hospital, and the Voennyi site (Bednarik 2010:3). Other incised disks are from Berelekh and Mal'ta sites. Unfortunately, there is no analysis or interpretations as these artefacts are only listed.

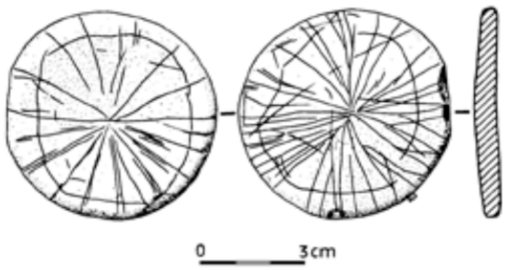


Figure 2.16: An incised disk from Afontova Gora III, Siberia (Bednarik 2010:3).

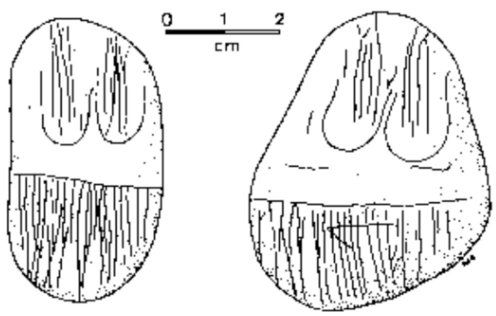


Figure 2.17: Incised stone from Kamikuroiwa rock-shelter, Japan (Bednarik 2010:6).

From Longgu Cave in Hebei Province, China is an incised bone that dates to 11,065 BC (Bednarik 2010:5). The surface of this bone was covered in a bright red colour believed by Bednarik to be hematite from Japan (Bednarik 2010:5). In Japan there are an unreported number of incised pebbles (Figure 2.17) from Kamikuroiwa rockshelter that date to circa 10,000 BC, and some have been interpreted as having breasts and skirts (Bednarik 2010:6).

Near a town called Chandravati in northwest India a Mesolithic incised chert microblade core was found (Brumm et al. 2006:173). At a site called Burzahom are flat stones incised with figurative and non-figurative images (Brumm et al. 2006:174). In Gufkral, in Kashmir are rectangular stone 'harvesters' with incised geometric motifs (Brumm et al. 2006:174).

Brumm et al. (2006:165) found 27 incised dolerite flakes in a Neolithic site called Sanganakallu-Kupgal in south India. To analyse these stones, Brumm's team used ethnography from several different indigenous cultures to investigate how rocks are regarded (Brumm et al. 2006:179). Overall, rocks have a mystical quality of being living things within the landscape, and have healing qualities similar to the power of a shaman, or that of ancestors combined with the rocks (Brumm et al. 2006:179). In other beliefs, rocks have the ability to walk around. In Indonesia stone axes can travel underground or fly through the air; in one case, flying axes can lured in by using pork fat as bait before the capture (Brumm et al. 2006:179). The interpretation of the incised stones from Sanganakallu-Kupgal suggests that these stones may have been considered a living entity, and that incising the surface allowed for a person to engage with the spirit of the stone (Brumm et al. 2006:186).

Australia (No Dates)

The research from Australia (Figure 2.18) relies heavily on ethnography in nearly every report or journal article. Ethnographic information is very important to reaching interpretations and should not be ignored as a source for archaeological interpretation. There is not an example of incised stones from the west coast or for that matter anywhere west of the Simpson Desert (which is about the middle of Australia).

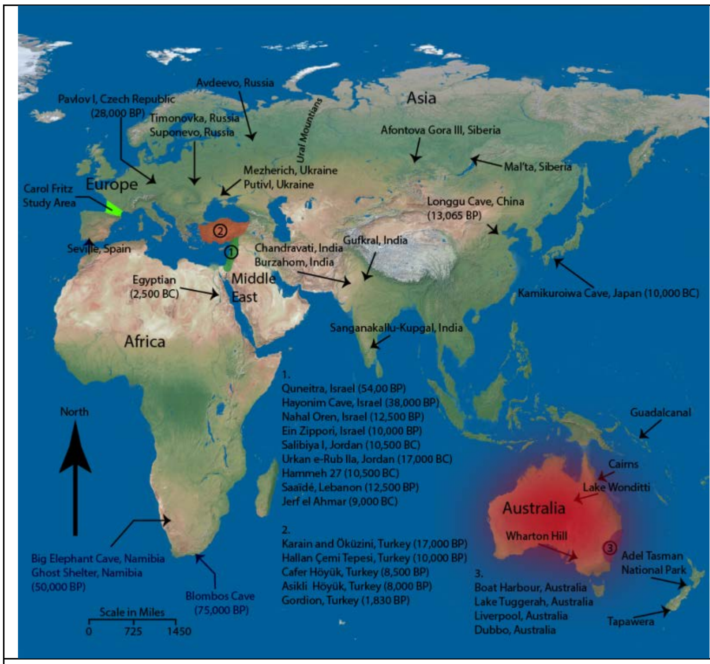


Figure 2.18: Incised stones of Australia shaded in red (After Patterson 2015).

East Coast Australia

Along the eastern Australian coast about 40 miles north of Sydney is a prehistoric midden near the town of Boat Harbour (Bramwell 1941:17). Within the midden, four incised stones were recovered that have "parallel and converging incisions" on tabular pieces of sandstone (Bramwell 1941:17). The purpose of the incisions is attributed to tool sharpening (Bramwell 1941:17). At another site southward along the coast, about 30 miles from Sydney, is another prehistoric site around the edges of Tuggerah Lake. At this site, a single incised stone was found that has grooves resembling a motif found on large rock art panels (Bramwell 1941:17). Twenty miles west of Sydney in the town of Liverpool, several incised stones have been discovered at different times by different people (Bramwell 1941:18). Many of these stones have animal Figures, for instance there is the image of a stingray incised on the surface of a water worn stone, and others have tortoises, while some have more obscure Figures that look like ovals and legs (Bramwell 1941:18). Only a few miles from Sydney in Moroubra, is an incised stone that has a circle with 20 rays coming out of it on one side and on the other side is a series of scratches (Bramwell 1941:18).

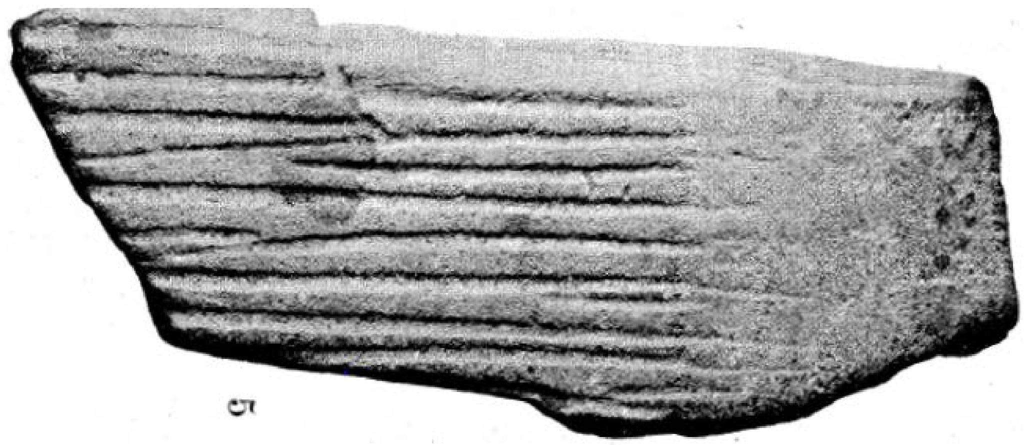


Figure 2.19: Incised stone from Dubbo, New South Wales, Australia (Bramwell 1941:18).

Dubbo

250 miles from the east coastline is a town called Dubbo. In this place an incised stone (Figure 2.19) was found that has naturally occurring geological striations on one side, but the other side has deliberate incised lines (Bramwell 1941:17). An Australian native advisor who examined the stone attributed the incised lines as the product of sharpening bone points (Bramwell 1941:17). At an undisclosed location in southern Queensland an incised stone was discovered by an amateur archaeologist (Etheridge 1897:2). The incised stone is intricately

incised with spirals and concentric circles and has “ruddling” which means red ochre rubbed over the surface of the stone (Etheridge 1897:2). In addition, the stone is fractured on one side and in its place an adhesive gum was placed that may have been an attempt to repair the damage (Etheridge 1897:2).

Lake Wonditti

Near Lake Wonditti in southwest Queensland a cache containing two incised stones was donated in 1977 to the Queensland museum after fears that the cache may be collected by local ranch hands (Morwood and Gibson 1984:561). The cache, its location, and the myth behind the cache are part of the local history of Lake Wonditti (Morwood and Gibson 1984:561). The myth of the incised stone and the other artefacts begins by assigning names to each of the stones that then are a part of the story. For example, one stone that is water-rolled and spherical, measuring 6.5 cm wide is said to be a healing stone (Morwood and Gibson 1984:562). Another incised stone that is an arc-shaped elongated fragment measuring 48 cm in length is called a boomerang in the story (Morwood and Gibson 1984:562). Incised on this stone is the vague form of a human body with a smiling face (Morwood and Gibson 1984:563). The other incised stone is a weathered fragment, which measures 23.5cm long and in the myth is call a kadaitcha shoe (Morwood and Gibson 1984:562). This stone is incised with a warrior carrying a spear and shield (Figure 2.20), and wearing a head dress (Morwood and Gibson 1984:563). On the same piece is an incised design of parallel lines and circles (Morwood and Gibson 1984:563). The final piece that is thought to have been stolen by locals is called a stone knife (Morwood and Gibson 1984:561).

The myth recounted by Morwood and Gibson (1984:561) is about a Kalkadoon man who was to be married to a women from a nearby tribe. When the man arrived at Lake Wonditti he found the place abandoned and the lake water to be milky in colour. So the man puts his boots, stone knife, boomerang, and healing stone into a cave, and stuck his spear into the ground beside the cave where today a mulga tree grows. The man then went straight up into a cloud with a “Choo” sound, and it’s up in the cloud where he still stays. This myth is believed to be centuries old as are the associated artefacts; the myth was passed down through an oral tradition within the local community (Morwood and Gibson 1984:561). The story would often be told first, and after the story was recounted, the listener is asked if they would like to see the artefacts.

Figure 2.20: Incised warrior on the kadaitcha shoe (Morwood and Gibson 1984:562).

Morah Stones

In Queensland Australia, near the city of Cairns, are groundstone slabs that have numerous incised lines (Bramwell 1941:17). These slate groundstone slabs that have incised lines crossing the grinding surface are called “morah” (McCarthy et al. 1946:62, Bramwell 1941:17). During consultations with Native advisors they interpret the grooves in the morah as the pathways that allow poisonous juices from the seeds to drain away as they are crushed with a pestle or mano (Bramwell 1941:17). Another morah was collected in the Simpson Desert which is found in the Northern Territory near the centre of the country (Bramwell 1941:18).

Cylindro-Conical Stones

Another group of incised stones that have been given a specialized name are the cylindro-conical stones (McCarthy et al. 1946:67). These stones are shaped through grinding, pecking, or “percussion-trimming” into a cylindrical, horn, or bean shape (McCarthy et al. 1946:67). Not all of these stones have incising but the ones that do display longitudinal, transverse and median circumference lines, while others have bird track and barred circle designs (McCarthy et al. 1946:67). Most of the cylindro-conical stones have flake scars removed from around the base which may be similar to an ethnographically described practice performed on an artefact called a *tjuringa* (McCarthy et al. 1946:67). A *tjuringa* is a pear shaped stone that is rubbed with ochre or charcoal and incised with geometric designs (McCarthy et al. 1946:70). In central Australia the ethnographic explanation of these stones is that they are the home of the spirit of their owner, or the totemic animal of the tribe (McCarthy et al. 1946:70). Some of these stones have a bored hole at one end to be suspended during ceremonies (McCarthy et al. 1946:70). When an elderly person becomes ill they will scrape along the edge of the *tjuringa* and mix the dust with water and drink the mixture as a potion of health (McCarthy et al. 1946:67; Spencer and Gillen 1927: 133-134). The flake scares observed on the base of the cylindro-conical stones may have had a comparable medicinal property as well as a magical embodiment of an individual or tribe (McCarthy et al. 1946:67).

Wharton Hill

In Southern Australia three incised stones were recovered from the summit of Wharton Hill (Edwards 1965:228). The incising on these stones are longitudinal straight parallel lines that transverse the entire stone. To the north by 100 miles in "Wirrealpa-Martin's Well country" a substantial number of incised stones have been found (Edwards 1965:228). Aboriginal informants suggested that incised stones were a form of communication between tribes; verbal communications would be accompanied with an incised stone (Edwards 1965:228). The stone material cannot be traced to a particular location as the material[3] is abundant even at 100 miles away, thus an interpretation of intra-tribal communication is difficult to support (Edwards 1965:230).

[3] The rock type is not identified by Edwards.

Polynesia (No Dates)

Polynesia covers a large number of islands in the Pacific Ocean. Discussed below are incised stones from New Zealand and Guadalcanal (Figure 2.21). A search of the literature for incised stones on other islands, such as Hawaii, returned no results. New Zealand is included with Polynesia because it is geographically covered by the Polynesian Archaeology Journal. The journal does not report on archaeology from Australia.

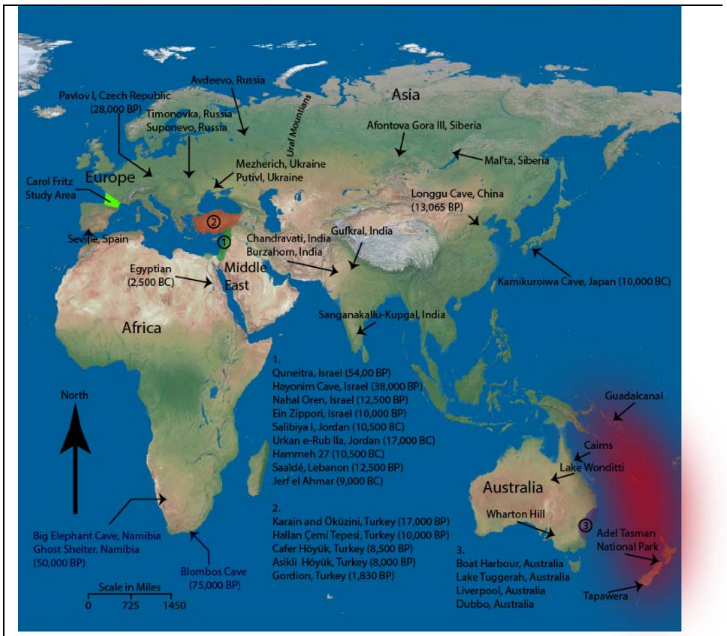


Figure 2.21: Incised stones of Polynesia shaded in red (After Patterson 2015).

New Zealand

In New Zealand incised stones, often called amulets, were made on slate and limestone disk and fragments (Skinner 1933:310). From an un-provenienced location in New Zealand are two incised stones. One is a slate disk (Figure 2.22) that has two perforated holes and depicts two stylized fish swimming away (Skinner 1933:310). The other incised stone is a slate scraper that has an outline of the body and tail of two fish (Skinner 1933:313). Near the coast of New Zealand from Adel Tasman National Park is Fisherman Island where incised serpentine was found that contains elaborate swirls and geometric shapes (Skinner and Phillipps 1953:117). A few miles inland from Fisherman Island is the town of Tapawera where a crescent-shaped piece of incised sandstone was recovered from a prehistoric settlement that also contains ovens, groundstone, and a number of flakes (Duff 1949:128). The shape of the stone suggests it represents Rongo the God of agriculture who is personified by the shape of the moon to the Maori people (Duff 1949:129). The incising is that of the head on one side and on the reverse is what appears to be an unfinished head (Duff 1949:129). The crescent shape appears to be natural and was not shaped or carved (Duff 1949:129).

Guadalcanal

2,000 miles north of New Zealand are the Solomon Islands. On the island of Guadalcanal is an incised stone that appears to be naturally shaped in the form of a shark (Davenport and Coker 1967:154). The stone was interpreted by Pelise Moro, a visionary and the creator of the “Moro Movement” that is mostly concerned with creating better living conditions for the islanders and gaining political power to protect the islands natural resources (Davenport and Coker 1967:137). Moro claims the incising represents “a shark-human changeling named

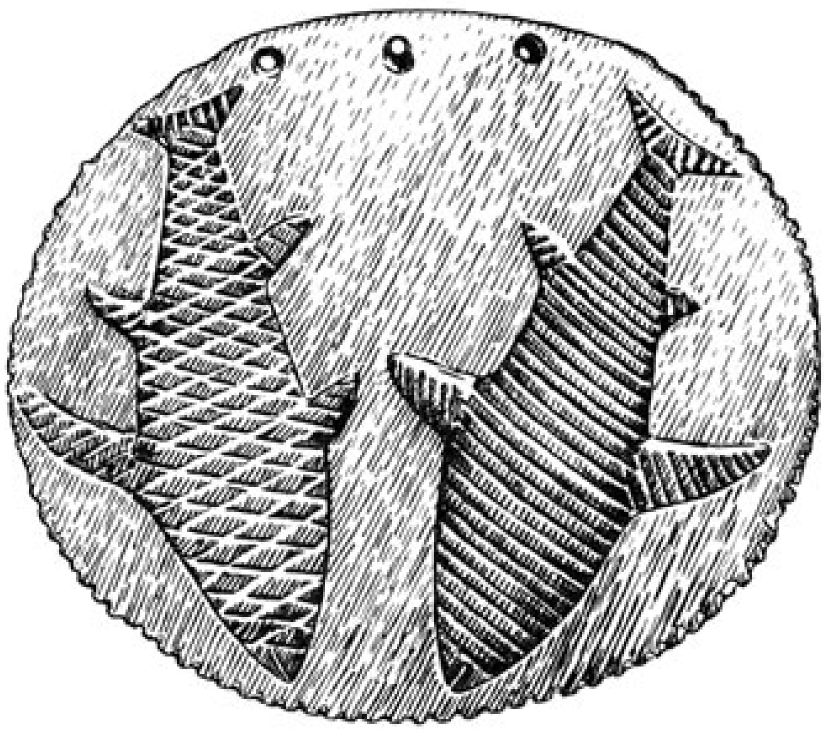


Figure 2.22: Incised fish on a slate disk. Above the fish are drilled holes possibly for suspension (Skinner 1933:310).

Halagali who is a guardian and custodian of all the resources of the sea. If anyone misappropriates these resources, Halagali can be called upon to punish the culprit” (Davenport and Coker 1967:154). The incised stone was not made for the Moro Movement, yet it is not clear if it is a prehistoric or contact period artefact (Davenport and Coker 1967:157).

Central America (Circa 1,000 BC to 800 AD)

The incised stones from Central America (Figure 2.23) often contain decipherable glyphs that usually contains information regarding the owner's ancestry or a royal blood line. In some instances bloodletting iconography is considered to have been the purpose of incising Gods on jade. Trade of incised stones may have taken place and is discussed in the following Costa Rica examples. I did not find incised stones in South America during my literature search, but this may be due to reports not in English.

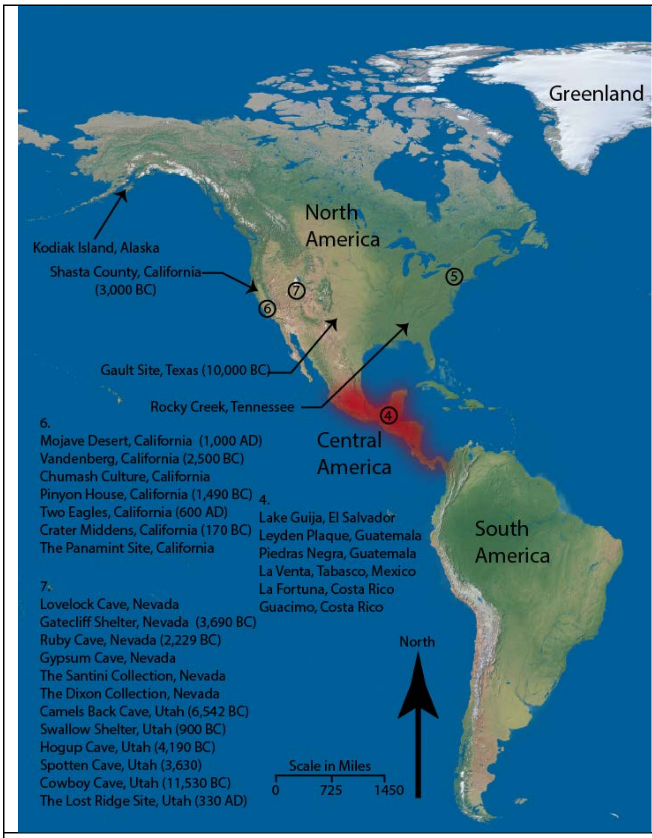


Figure 2.23: Incised stones of Central America shaded in red (After Patterson 2015).

The Guija Plaque

Lake Guija is the largest body of water within El Salvador. Located near the northern border with Guatemala, the lake formed a thousand years ago after a volcanic eruption created a lava dam (Houston and Amaroli 1988:1). In this lake off the tip of Igualtepeque Peninsula a diver found an incised stone about 3 meters under the lake surface (Houston and Amaroli 1988:1). This greenish-black hued metamorphic incised stone called the Guija plaque (Figure 2.24) has an intricately incised image of a person wearing a headdress and collar and what appears to be tattoos along the arm (Houston and Amaroli 1988:4). There is a partial text that is not legible due to a break, but it is most likely the name of the lord that is portrayed in the incising (Houston and Amaroli 1988:4). The incising ranges from minute scratches to 0.5 mm wide lines, and a partially drilled hole that may have been started after the stone broke along the top possibly for suspension (Houston and Amaroli 1988:3). Incised stones of these type are not often "trinkets for trade, but rather served as the regalia of rulers" (Houston and Amaroli 1988:4). The lake that formed a thousand years ago may have submerged a village that was the origin of the incised stone (Houston and Amaroli 1988:4). Another possibility is that this stone was produced in the region of Petén, Guatemala, which had the largest Mayan settlements (Houston and Amaroli 1988:4). The possibility of a Petén origin is further enhanced as the human Figure is similar to the Leyden Plaque from northern Guatemala (Houston and Amaroli 1988:4).

The Leyden Plaque

In 1864 during construction of a canal near the northern Guatemala coast a jadeite incised stone called the Leyden plate or plaque was found as a construction crew dug through a prehistoric mound (Morley and Morley 1938:5). Measuring 21.6 cm long by 8 cm wide and 0.5 cm thick, the stone has a column of 15 incised glyphs on one side while the reverse is a low relief of a human Figure that resembles the Guija plaque (Morley and Morley 1938:5, Houston and Amaroli 1988:4). In the case of the Leyden Plaque, the incised glyphs are words within the Mayan lexicon that consist of a genealogy and date (Morley and Morley 1938:6, Stuart 1988:7). Design elements of the incised glyphs such as the rounded corners, the placement of the feet on the relief in a unnatural position, and the Figure at the feet called 'the captive' are all indicative of murals and architectural elements in the city of Tikal in the Petén region of Guatemala; therefore, the Leyden Plaque was likely manufactured in Tikal during the earlier Mayan inscriptions (Morley and Morley 1938:8-12).

Figure 2.24: The Guija plaque has an intricately incised image of a person wearing a headdress and collar, with what appears to be tattoos along the arm (Houston and Amaroli 1988:4).

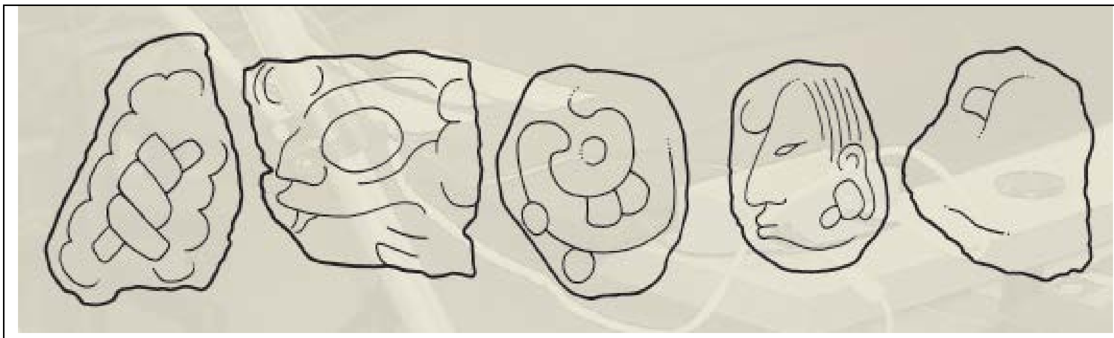


Figure 2.25: Five incised jade stones with depictions of the Gods K'awiil the God of lighting, and the Jester God. The position of the tongue and mouth may be to allow the God to drink the first blood during a bloodletting (Hruby and Ware 2009:76).

In the northwest corner of Guatemala near the border of Mexico is Piedras Negras where in the 1930s the University of Pennsylvania excavated a cache of artefacts that included incised jades (Hruby and Ware 2009:76). The Piedras Negras jades were incised and then paint added using the incised lines as a guide for the paint strokes (Hruby and Ware 2009:76). The images on the incised and painted jades are that of Mayan gods, such as K'awiil, the God of lighting, and the Jester God who is a part of a creation myth dealing with the three hearthstones (Figure 2.25, Hruby and Ware 2009:78). The interpretation of these Gods appearing on the incised jades is that they were used by priests, the royal family, and the king as divining instruments that were deposited in caches at the end of specific time phases, such as the movement of a constellation or calendric event (Hruby and Ware 2009:85). Also of note is the placement of the mouth of the God represented near the sharp point of the jade indicating a possibility the jade was used in bloodletting ceremonies where the God would get the first drink of blood (Hruby and Ware 2009:79). Outside of Piedras Negras, bloodletting iconology has been identified on the Pacific slopes of Guatemala where an incised stone with the depiction of a fish and crocodile was located (Joyce et al. 1991:5-9).

The Smithsonian Institution excavated an Olmec site at La Venta in Tabasco, Mexico in 1942 and 1943 (Drucker 1952:1). From that excavation four incised stones, or celts as they are called in Mesoamerican research, were recovered from a cache containing hundreds of shaped serpentine and jade stones, that were not incised with any design elements (Drucker 1952:165). The designs range from what looks like a jaguar-monster to a depiction of flora (Drucker 1952:165). Elsewhere in the excavation is an incised obsidian core with a raptorial bird or a bird-monster with fangs protruding from its beak (Drucker 1952:169).

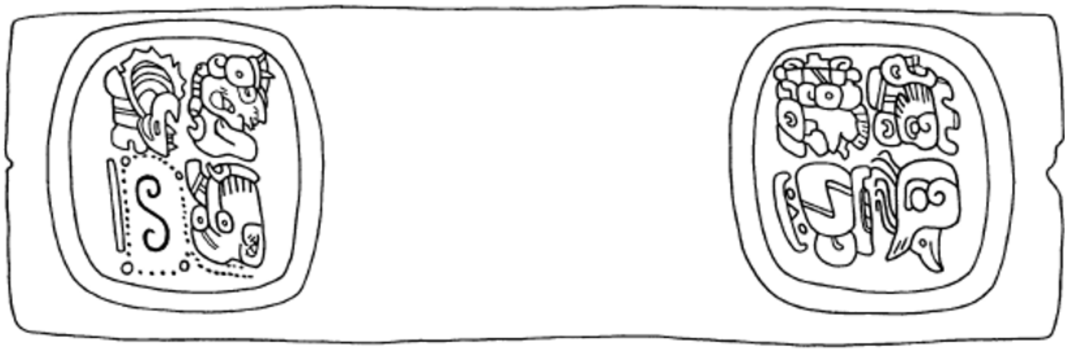


Figure 2.26: The Cleveland Plaque with glyphs that may commemorate the owner of the plaques death (Stone 1996:1).

The Cleveland Plaque

An incised stone that has no provenience, but is probably Mayan in origin was purchased by the Cleveland Museum of Art in 1950 (Stone 1996:1-2). The jade stone called the Cleveland plaque (Figure 2.26) measures 14.4cm long, by 1.4cm wide and has two main glyphs incised on one side (Stone 1996:3). The incised stone is believed to have been a part of a costume and would have been worn across a person's chest, which is evidenced by chipping at the edges where the stone would have hit against other flanked ornaments (Stone 1996:1). The glyphs represent the royal genealogy of the owner of the incised stone, and after the owners death the piece may have been incised to commemorate his life (Stone 1996:8).

Costa Rica

In northern Costa Rica six incised stones were recovered from several cemetery sites (Chenault 1994:273). Three of these incised stones are as large as 50 cm long by 30 cm wide while the other three are not sized but are said to be considerably smaller (Chenault 1994:273). The interpretation of the larger incised stones is that they may have been boundary markers for areas within a site; however, no interpretation is offered for the smaller incised stones (Chenault 1994:273).

In La Fortuna and Guacimo Costa Rica three incised slate disks were found that may have held an iron-pyrite mirror that was attached with adhesive gum (Chenault 1994:273, Stone and Balser 1965:327). One of the disks is incised with a human Figure, the other a Mayan glyph, and the last a ball player (Chenault 1994:273, Stone and Balser 1965:320). The ball player has an outstretched arm as if to throw or catch while opposite this Figure is a human with a headdress holding a paddle like object (Stone and Balser 1965:320). These incised disks most likely arrived in Costa Rica from trade and ultimately became a part of three different burials (Stone and Balser 1965:316 and 313). The glyph on one of the stones dates to

435 AD and it is likely that the style places it as having a Tikal, Guatemalan origin (Stone and Balser 1956:316). The incised disks were at one point repaired using a vegetable glue, and it is suggested that the disk were a part of an earlier burial that then was looted probably around 700-800 A.D (Stone and Balser 1965:327). During that time there was an increase in trade and a diffusion of ideas, and the attraction of finding bluish jade drove a grave robbery economy (Stone and Balser 1965:327).

Summary

This world-wide overview has looked at incised stones from Africa, Europe, the Middle East, Asia, Australia, Polynesia, and South America. The literature review does not include North America as this is the focus of the next chapter (Chapter 3). A number of research themes (Figure 2.27) were observed in this world literature review and they consist of classification systems, ethnographic approaches, artefact biographies, and interpretation. The summary of the work shows how these themes interact within geographic boundaries.

Figure 2.27: Themes of research covered from around the world. Wordle 2014.

The research from Africa and Europe is keen to associate incised stones with the development of traditions in early groups (such as Anatomically Modern Humans) (Henshilwood, d'Errico, and Watts 2009, Kintigh et al. 2014). These themes return in Europe at Neanderthal sites with incised stones, as these early hunter-gatherer peoples are thought to have carried on many different traditions that included making incised stones (d'Errico et al. 2003; Wadley 2012, Zilháo 2007). The operational sequence or Chaîne opératoire supports tradition as several studies demonstrate that the method of incising is often the same across broad landscapes and for many thousands of years (d'Errico et al. 2003; Zilháo 2007). Microscopic analysis of many incised stones has demonstrated that tradition is the only way to explain why so many incised stones are similarly constructed (Fritz 1999). In ancient Egypt, from about 1500 BC to 1500 AD the agricultural society made incised stones as good luck pieces for their homes (Petrie 1914). Many incised stones had imagery of Gods or text from the Book of the Dead that were meant to ward off danger (Petrie 1914).

An artefact biography of an incised stone in Spain shows how it may have been used as a receptacle for the ancestors (Lillios and Thomas 2010). Magic in Russia's schematized fish designs are interpreted to be a form of magic to un-freeze the rivers and bring back the fish (Marshack 1979).

Incised stone imagery is interpreted as a reproduction of the surrounding environment was applied in in the Golan Heights site in Israel; the hunter-gatherers may have been depicting seasonal rainbows (Marshack 1996). At Hayonim Cave, also in Israel, incised stones are thought to be used for group solidarity. A pavement of limestone artefacts were laid down shortly after life-ways shifted to a more sedentism (Belfar-Cohen 1991). Incised stones as a trade good is discussed in Israel and South America (Houston and Amaroli 1988, Israel Antiquities Authority 2012).

Ethnographic informants are consulted in nearly every published report on incised stones from Australia. The interpretation of incised stones as communication devices between tribes is derived from tribal informants (Edwards 1965) as is the morah stones (incised groundstone) where the incised lines are explained as channels to drain off poisons (Bramwell 1941, McCarthy, Bramwell, and Noone 1946). Some informants have said that the incised lines on some of the stones where made by sharpening bone points. In New Zealand the crescent shape of stone suggests it represents Rongo the God of agriculture which is based on ethnographic accounts (Duff 1949:129). In Guadalcanal, interpretations are made by Pelise Moro on an incised stone that is naturally shaped like a shark (Davenport and Coker 1967:154). Ethnography is also used in South America where iconography of Gods is interpreted (Hruby and Ware 2009). Five incised jade stones from Piedras Negras with depictions of the gods K'awiil are thought to be bloodletting knifes based on the position of the tongue and mouth; the God would get the first blood during the ceremony (Hruby and Ware 2009:76).

Imagery interpretation and sourcing of stylistic imagery have been themes of research in both Japan and South America. In Japan's Kamikuroiwa rock shelter the incised stone imagery is thought to be gendered as it is interpreted to be that of breast and skirts (Bednarik 2010). Stylistic sourcing has been performed on the Leyden Plaque in Guatemala where the design elements of the incised glyphs place its origin of manufacture in the city of Tikal in the Petén region of Guatemala (Morley and Morley 1938:9-12).

Glyphs in South America such as the Guija plaque, Leyden plaque and the Cleveland plaque contain ancestry and dating information (Houston and Amaroli 1988, Morley and Morley 1938:6, Stone 1996, Stuart 1988:7). The Guija plaque has a broken glyph that probably was the name of a lord portrayed (Houston and Amaroli 1988:4). The Leyden Plaque glyphs consist of the genealogy of the owner, which establishes their importance (Morley and Morley 1938:6, Stuart 1988:7). The Cleveland plaque, which does not have a provenience, does bear glyphs with a royal lineage (Stone 1996:8).

Conclusion

This summary of a world-wide literature review has shown that context has not been widely considered in incised stone research across the world. There are several themes of research (Figure 2.25), which are concerned with tradition, or a description of the incised material, but not with context. In Europe, a contextual approach is not strongly applied to incised stone interpretation. The work by Lillios and Thomas (2010) is a notable exception; an object biography was created for the incised stone called the Valencia Plaque—this biography gives the plaque a context. They contextualised the location of the source material for the plaque and the final deposition of the Valencia Plaque in Spain. In general, Neolithic incised stones are deposited in areas that do not have the slates naturally occurring (Lillios and Thomas 2010:142). In the case of the Valencia Plaque, the source area is 100 miles away. The context of final deposition for the Valencia Plaque is inside a tomb. Given this contextual placement Lillios and Thomas (2010:142) suggest the plaque may become a receptacle of the dead by absorbing body fluids. Furthermore, "the engraved slate plaques were most likely created at the time of a person's death and used strictly in mortuary contexts" (Lillios 2008:109).

Context in the Middle East is discussed at the site of Golan Heights, Israel. Marshack (1996) contextualises the surrounding environment at Golan Heights, and interprets the design to be a reproduction of rainbows that occur in the area during early summer months. Marshack's view, which is not explicitly about context, may be closer to what we now term 'interpretative archaeology', which follows closely from Hodder's (1986) contextual archaeology.

The context of the incised stone at Ein Zippori, Israel, is considered with associated artefacts such a stone bowl and beads (Israel Antiquities Authority 2012). The stone ball and beads are probably trade items belonging to a stratified elite during the Wadi Rabah culture period (Gibbs 1993:23, Israel Antiquities Authority 2012). The Israel Antiquities Authority suggests the incised stone was traded as a luxury item.

In Australia, I consider the two part relationship at Lake Wonditti, where the myth and the cache have an integral relationship as a contextual approach (Morwood and Gibson 1984). In this case, the myth is told of a man leaving his equipment in a cache and then at the conclusion of the story, the listener is taken to see the artefacts in the cache. Thus the listener becomes the participant which together validate the importance of the story.

In sum, while acknowledging that some approaches can be thought of as contextual, in reality there is a real lack of explicit, or even implicit, contextual approaches in worldwide studies of incised stones. The next chapter asks similar questions of the incised stones of North America.

Chapter 3: Incised Stones: A Literature Review of North America and the Great Basin

Introduction

In the previous chapter incised stones were discussed from all over the world. That chapter showed that context has not been a major analytical approach. This overview of North American incised stones is split into two sections. Section one covers incised stones outside of the Great Basin within the United States, and section two focuses on the incised stones in the Great Basin. In both sections the general background and contextualisation of the incised stones is given, such as the type of site, associated artefacts or structures, and the interpretation of the incised stones if any. Similar to the world wide literature search in the previous chapter certain incised objects are not included. Artefacts such as incised bowls, or incised arrow shaft smoothers are omitted as these objects have a clear function and are not incised stones. In addition, pottery sherds with incised lines are not included as these are assumed to have been completed vessels (McGuire 1989). Incised stones from Canada were not found during the literature search.

A constant theme of the incised stones from California and the Great Basin is their recovery from sites that had long term or extended stays while work was performed such as the pine nut or grass seed harvesting. All of the incised stones in my sample (Hogup Cave, Swallow Shelter, Camels Back Cave, Ruby Cave, and Gatecliff Shelter) are places where extended stays and habitation occurred. Thus this review of the sites and the incised stones in these sites are important to the later contextualisation of this work. All of the Native American cultures in this literature review are hunter-gatherers unless otherwise noted.

Incised Stones of the Eastern United States

This section will discuss incised stones found on the east coast of the United States (Figure 3.1). The first mention of an incised stone in the literature for North America was by Charles Conrad Abbott in 1875 (1875:330). Abbott was an archaeologist and museum curator at the Peabody Museum in Cambridge, Massachusetts. In this position he had access to an array of artefacts that had been collected from many parts of North America. In this capacity, he wrote about an incised stone found in a burial at an undisclosed location in New Jersey (Figure 3.2). The placement of the stone was on the chest of an inhumation with various other artefacts placed around the skeletal remains. In many of the graves that were excavated weapons were placed on the right, pipes were put on the left side and pottery was located at the feet (Abbott 1875:331). The incising was done on jasper that was split in half along the long axis; a hole was drilled through the jasper that appears to have been done post-split because of the tool marks for the hole on the split side (Abbott 1875:331). The interpretation of the incised stone is made through the observation of its spatial context as it was found on the chest (Abbott 1875:331).

Figure 3.1: Incised stones of the eastern United States shaded in red (After Patterson 2015).

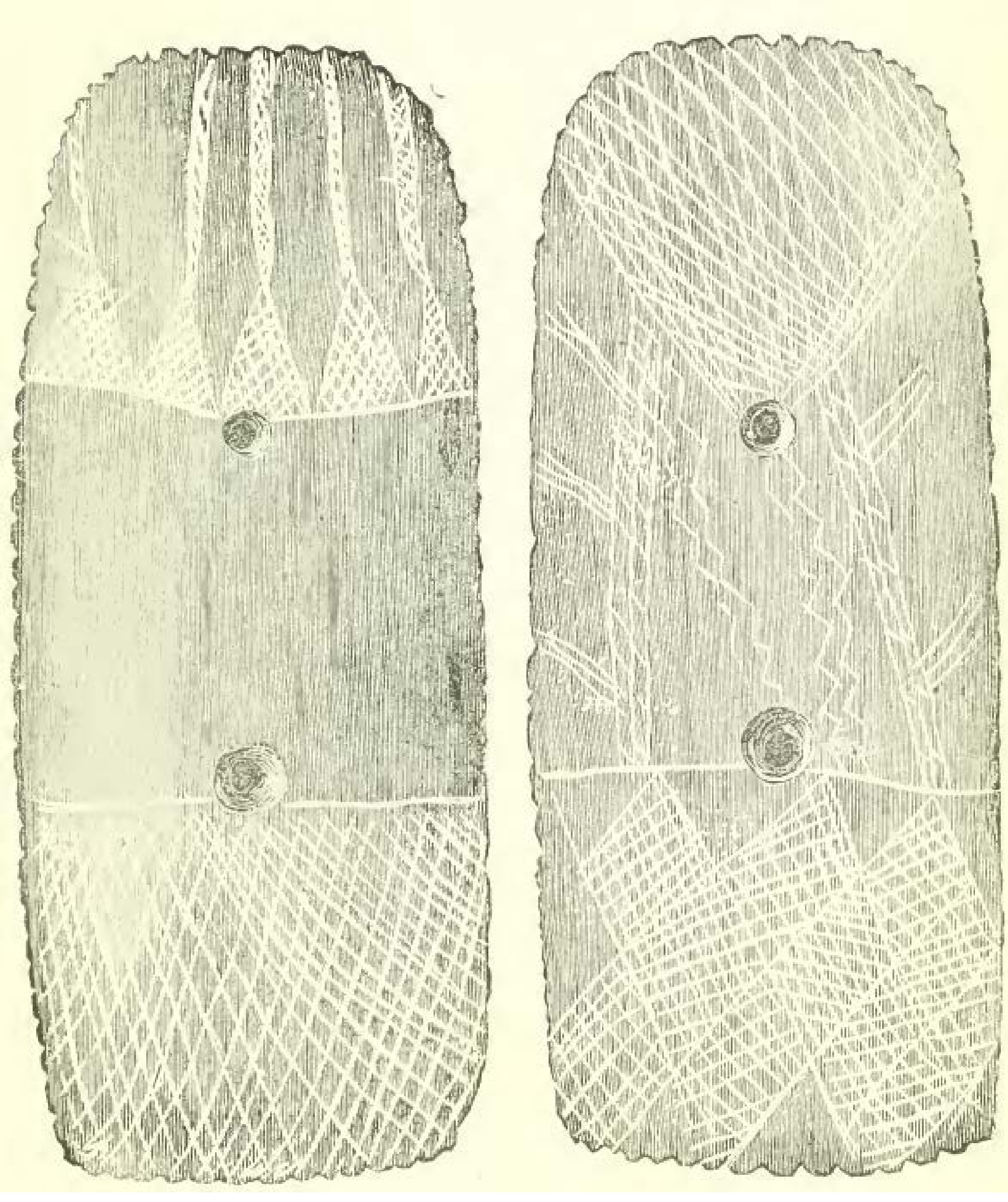


Figure 3.2: An incised stone found in a burial in New Jersey (Abbott 1875:467).

Abbott (1875:331) reasons that if the incised stone had a utilitarian purpose such as a "bow string-twister" then under the circumstances of the multiple burials and locality of artefacts the incised stone should have been placed elsewhere on the body with utilitarian artefacts. Abbott concluded that the incised stone was made for decoration, and possibly for the purpose of wearing or displaying (Abbott 1875:331). For this reason Abbott called the very first incised stone recorded in North America a "breast-plate" (Abbott 1875:331).

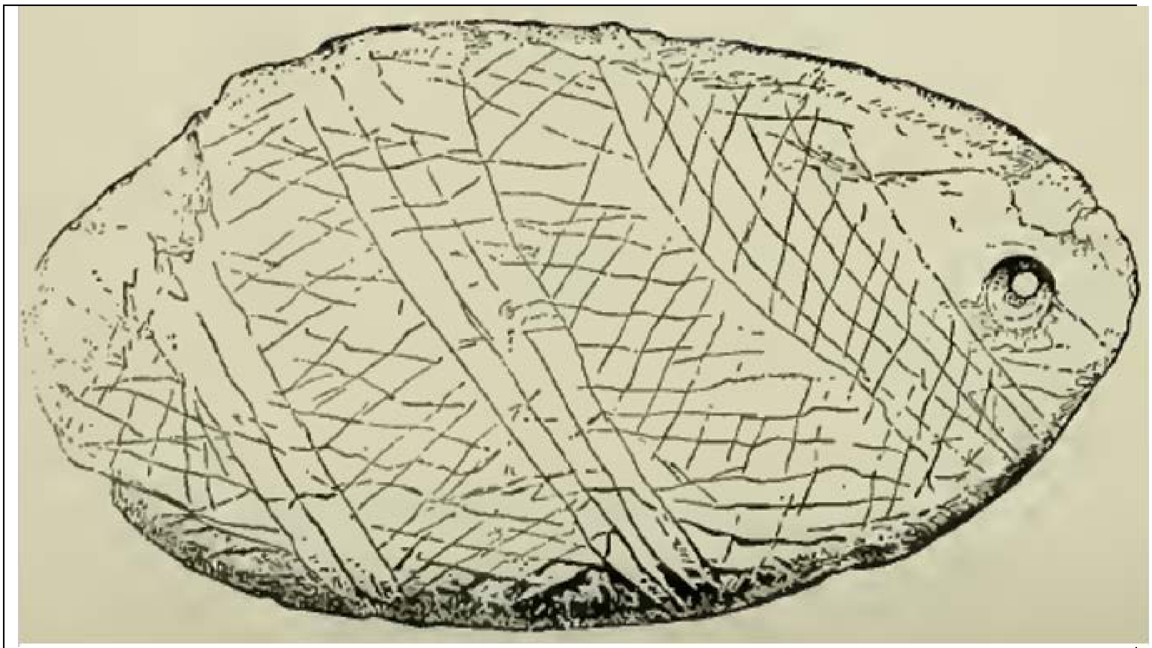


Figure 3.3: Incised stone from New Jersey (Abbott 1879:208).

In a different report published only a few year later by Abbott, a steatite incised stone with a perforated hole was reported from New Jersey (Figure 3.3, Abbott 1879:208). The interpretation reflects the incised stone mentioned above as decoration with the assumption that the perforation meant suspension (Abbott 1879:208). Another incised stone from New Jersey was excavated in the 1970s at a site called Rockelein on Mashipicong Island (Lenik 2009:152). This incised stone was spatially surrounded by grinding equipment and several small pits filled with carbonized nutshells (Lenik 2009:152).

Rhode Island

Rhode Island's West Ferry site, located on Conanicut Island, has a cremation burial that may be the remains of one adult and one child placed in a bowl-shaped pit (Lenik 2009:150). In the pit are stone tools, two steatite bowls, red ochre pigment, and (Figure 3.4) one incised stone (Lenik 2009:150). The date of the remains and associated artefact is determined by radiocarbon data to be 1,350 BC (Lenik 2009:150). The incised stone is marked with hundreds of short lines that do not make any specific geometric design.

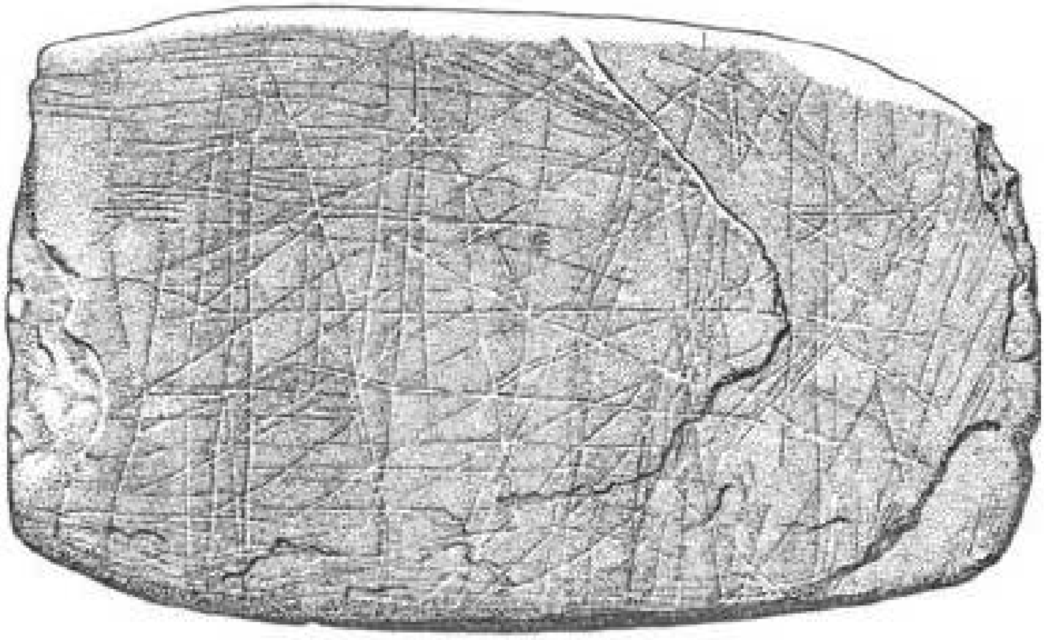


Figure 3.4: Incised stone from the West Ferry site that is located on Conanicut Island, Rhode Island (Lenik 2009:151).

Other incised stones from the same area typically have geometric motifs which makes the incising on this stone unique to the area (Lenik 2009:151). Lenik's interpretation for the stone is that a circular pit on the stone may have been the start of a hole, and if completed, the incised stone may have functioned as a pendant (Lenik 2009:152).

Maine

In Maine (3,000 to 2,500 BC) is a cultural group called the "Red Paint People" that received their name from an archaeological site where 197 burials were excavated and all of them had red ochre placed inside (Lenik 2009:152). In each burial were placed artefacts such as scrapers, knives, debitage, and in one was (Figure 3.5) an incised stone (Lenik 2009:154). When the incised stone was first described it was called a possible slate knife that had cutting edge broken off (Lenik 2009:154, Willoughby 1898:11-12). Upon further inspection by Lenik (2009:154) the slate does not appear to have ever functioned as a knife and was an incised stone from its inception. Lenik's interpretation of the incised stone is that it is a ceremonial object meant to be placed in burials, in the same way adzes, gouges, and other artefacts were placed in the ochre covered grave (2009:154).

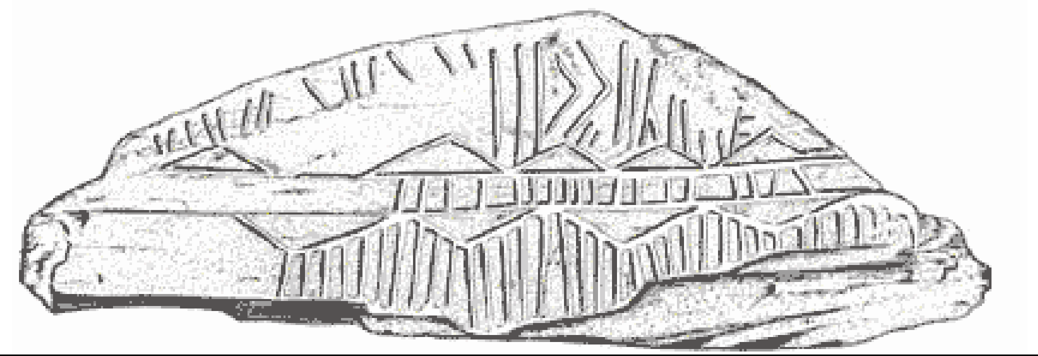


Figure 3.5: Incised stone from Ellsworth, Maine. This stone was found associated with a Red Paint People cremation burial (Lenik 2009:154).

Massachusetts

At Indian Hill in Wareham, Massachusetts one incised stone was excavated that originally was called a thunderbird (Lenik 2009:155). This incised stone was analysed by Lenik (2009) and found that the Figure is bird-like, but that it lacks a head; thunderbird imagery is important spiritually to the Algonquian culture and is typified as having a head that is turned to the side with a protruding beak, the legs apart, and the wings spread open (Lenik 2009:155). Although the thunderbird from the incised stone is missing a head the Figure is still bird-like and Lenik offers the interpretation they are personal guardian spirits for an individual to carry with them (2009:155).

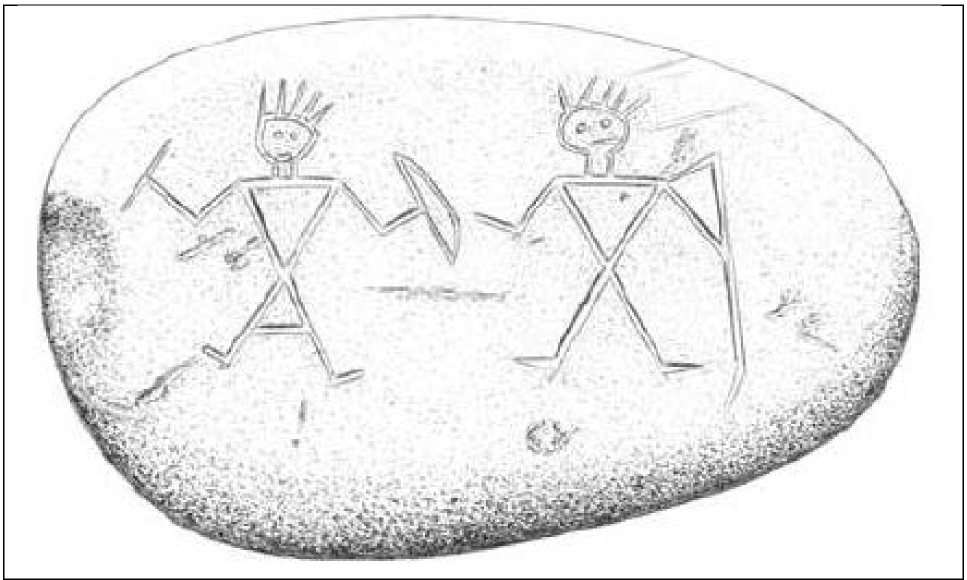


Figure 3.6: Incised stone from New Haven, Connecticut (Lenik 2009:158).

Connecticut

An incised cobble (n=1, Figure 3.6) that depicts two people beside each other holding different objects came from New Haven, Connecticut (Lenik 2009:157). The incised images appear to be stick Figure in construction, both with vertical lines rising a short distance from off the top of their head that may be a representation of a headdress (Lenik 2009:157). The Figure on the left is interpreted by Lenik to be holding a bow in the left hand and an arrow in the other. Between the legs of this Figure is a horizontal line that connects with both legs about the height of the knee. Lenik interpreters this horizontal line as being the hem line of a dress and may represent the image of a women (Lenik 2009:157). The Figure on the right does not have this horizontal line connecting the knees, but is holding in the right hand a staff (Lenik 2009:157). Lenik offers the interpretation that this incised stone was used as a good-luck charm that would have been carried with an individual.

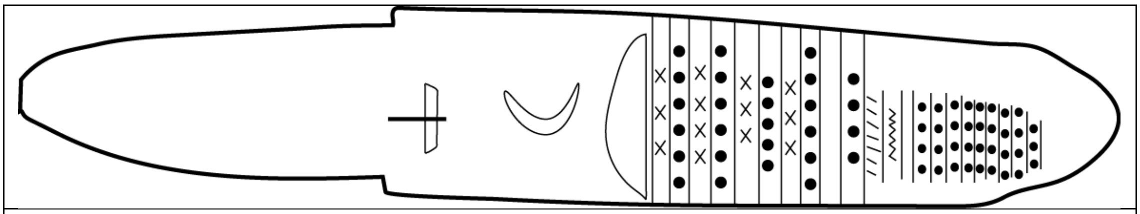


Figure 3.7: Elongated incised slate from Milford, Connecticut (Drawn from Lenik 2009:163).

Laurel Beach Shell Heap in Milford, Connecticut is a prehistoric midden from which one incised stone (Figure 3.7) was collected (Lenik 2009:163). This elongated black stone was shaped before incising by pecking, scraping, and polishing the surface until the stone measured 40 cm long by 7 cm wide. Approximately 13 cm from the left side is narrower than the rest of the object, creating what may be a handle or a socket meant to be fitted into a wood handle (Lenik 2009:163). The incisions above the narrower portion have a bow and arrow Figure and crescent shape. Followed by this further along the stone is a pattern of three incised 'X' marks following a row of dots that are separated into 23 sections by incised lines (Lenik 2009:163-164). The interpretation of this stone has changed through the years. The original hypothesis in 1885 held the stone was a ceremonial mace, but by 1977 the consensus favoured the stone used as a highly decorated pestle (Lenik 2009:163). Lenik inspected that stone and determined the stone does not exhibit any evidence for it to have been a used as a pestle, and the incisions are most likely a calendar or tally (2009:164). Lenik also suggests the Figure of a bow and arrow probably dates the stone after the arrival of the bow and arrow in Connecticut after 1 AD (Lenik 2009:164).

New York

A Long Island, New York site yielded a muscovite incised stone that dates to 500 BC to 1500 AD (Lenik 2009:158). The large piece of mica has an incised sea serpent (Figure 3.8) with three horns or antlers, a tail, and claws. Surrounding the serpent are three fish that look to be swimming away as only their tails are visible with the rest of the body disappearing off the mica edge, which indicates the depiction is taking place under the water (Lenik 2009:158). To the Algonquin people the horned serpent is a dangerous and powerful spirit that could create large waves, thunderstorms, or stop rivers from flowing (Lenik 2009:158-159). The Lenape tribe of New Jersey called this serpent Màxaxkuk who was killed by a thunder being and the body of the serpent was split up between many tribes to keep as charms to heal the sick and make it rain (Lenik 2009:159).

In Hempstead, New York is an incised stone called a 'birdstone' that was found in 1864 by a collector of Native American artefacts named Edward Rogers. The birdstone is a class of incised stone known in the Northeast states that is mostly association with burials (Lenik 2009:217). Birdstones (1000 to 1 BC) have been interpreted to be atlatl weights, personal amulets, clan or tribe symbolism, or mounted on staffs during ceremonies (Lenik 2009:217). Lenik suggests the incising to be either sacred otters, thunderbird, or people in ceremonial regalia representing a conjurer (Lenik 2009:217, Townsend 1959:55).

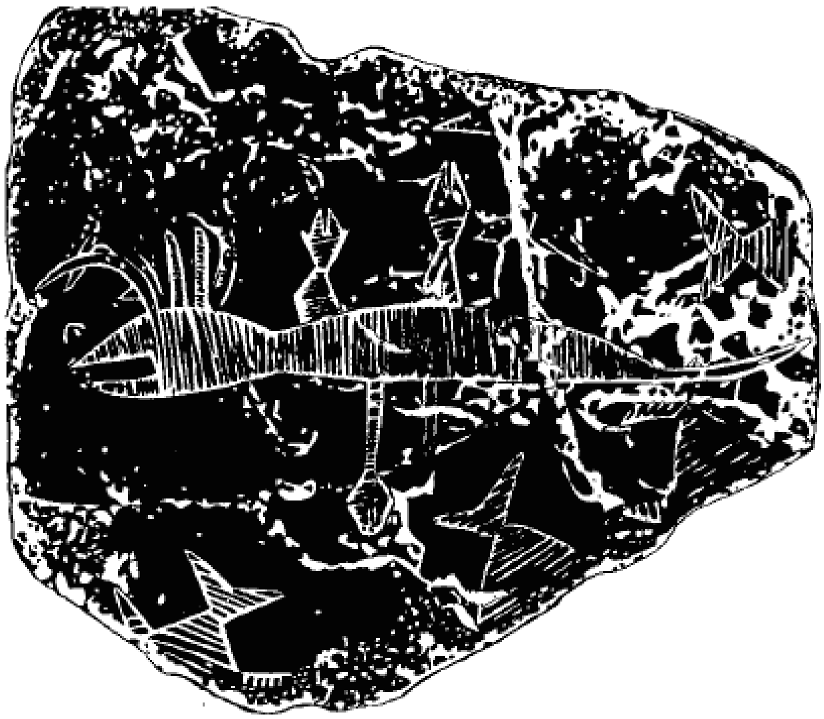


Figure 3.8: Incised Mica from Southampton, New York depicting a horned sea serpent with the tails of fish swimming out of the way (Lenik 2009:159).

New Hampshire

At a place called Oxbow along the Winnipesaukee River in Franklin, New Hampshire 32 incised stones were found by amateur archaeologist during the construction of Odell Park in 1886 (Lenik 2009:160 and 229). The artefacts that were collected and kept by the Proctor family may be the only items that remain of the site as a dam was constructed on the adjacent river that removed much of the soils that constituted the site (Lenik 2009:161). The depiction on the stones are interpreted by Moorehead, to be maps of the original Oxbow area, as they have imagery of housing units called wigwams (Moorehead 1931:49).

Pennsylvania

An incised stone (n=1) that has a grid on one surface was found on top of Spanish Hill, South Waverly, Pennsylvania which is thought to be the location of a 1615 Native American village called *Carantouan* (Lenik 2009:161). The grid is comprised of three incised groves running parallel across the length of the stone with three parallel lines crossing the length lines perpendicularly (Lenik 2009:162). Lenik (2009) who examined the stone first hand reported that it may represent a map of the top of Spanish Hill.

Tennessee

The Thruston Tablet is so named after General Gates P. Thruston who found the limestone (n=1, Figure 3.9) incised stone in Sumner County along Rocky Creek, Tennessee (Holmes 1891:161). The imagery has four prominent Figures in the foreground that is thought to suggest they are engaged in a mock combat or a dance (Holmes 1891:162). Above the two Figures on the left, is a row of people, which seems to be a fresher looking incising than the rest of the tablet. (Holmes 1891:163).

Figure 3.9: The Thurston Tablet found in Rock Creek, Tennessee (Holmes 1891: Plate I).

To the right of the row of people, is a stylistic sun, which may represent a totemic of one of the people in the image or sunset or sunrise (Holmes 1891:163). Below the Figures in the foreground, one of the personages is smoking a pipe of the type that has been found archaeologically in Tennessee (Holmes 1891:163). On the reverse of the stone is similar depictions of personages (no drawing of the reverse were published) (Holmes 1891:165). The interpretation implied from the reading is that a social scene is depicted (Holmes 1891:161).

Texas

The Gault site is a 15 hectare Clovis period (circa 10,000 BC; see Chapter 4) site in central Texas (Wernecke and Collins 2010:2). From 1929 to 2007 104 incised stones have been found both associated with Clovis culture to late prehistoric periods (1,200 AD, Wernecke and Collins 2010:2). The imagery ranges from only a few lines to complex cross-hatching (Figure 3.10), and the material is either limestone or chert. The collection appears to be very fragmentary, and Wernecke and Collins (2010:4) suspect that after incising, the stones were purposefully broken into many pieces. The eight incised stones have a strong associations with Clovis artefacts are extremely rare as is reflected in much of the literature regarding Clovis as an 'artless' society (Wernecke and Collins 2010:4, 11). The imagery made on the incised stones suggest patterns found in basketry and fabric, but the Cross-Hatch or Banded styles can be found on a number of other artefacts (Wernecke and Collins 2010:11).

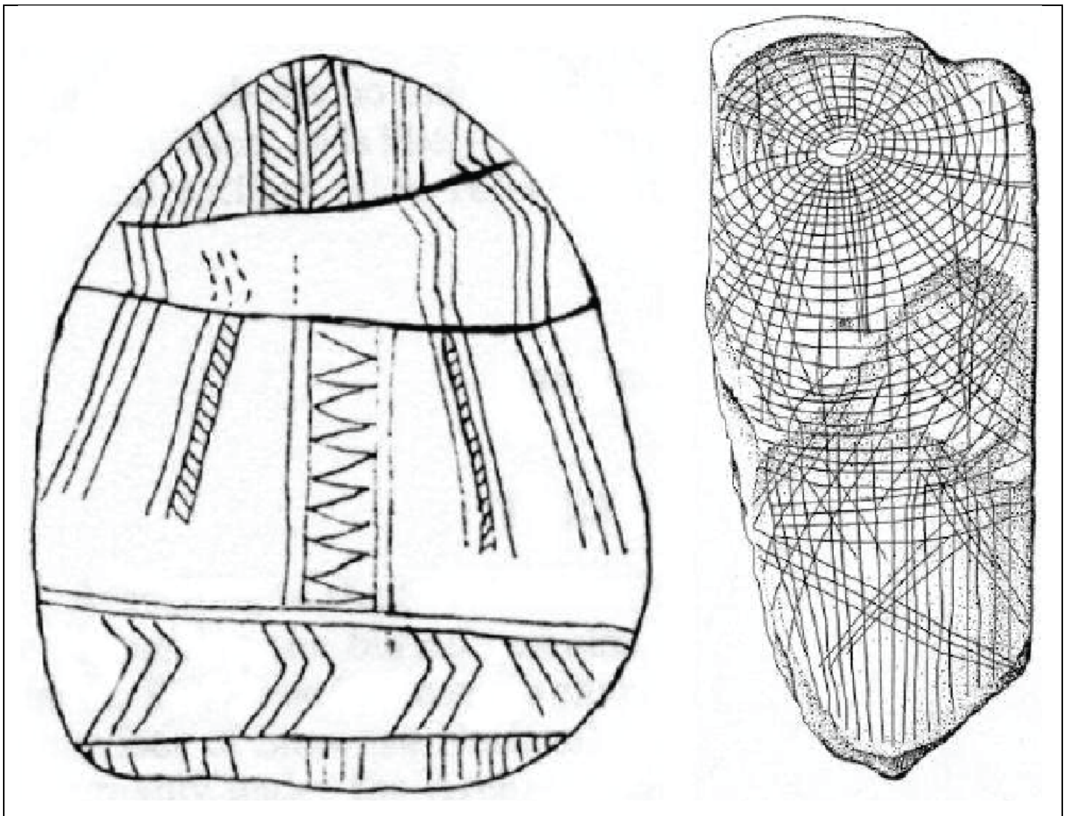


Figure 3.10: Incised stone from the Gault Site, Texas (Wernecke and Collins 2010).

Incised stones from the Western United States

The incised stones from eastern United States are considered above. This section examines incised stones from west of the Rocky Mountains (Figure 3.11) in the United States. A search for incised stones in Canada returned no results. As was discussed in the introduction the Great Basin is included in its own section. California is a major focus because of the large number of incised stones that require a thorough discussion. There are few reports of incised stones from Washington and Oregon and they are not included. The context and interpretations of the incised stones in California are important themes that are discussed and synthesised into the incised stones of the Great Basin.

Figure 3.11: Incised stones of the western United States shaded in red (After Patterson 2015).

Alaska

On Kodiak Island, Alaska 27 incised stones were found, two of which were excavated at the Uyak Bay site and the remaining are from an undisclosed location (Heizer 1947:288, Heizer 1952:266). The imagery of these incised stones is very similar to the petroglyphs on the island (Heizer 1947:288). The imagery of the incised stones and the petroglyphs is interpreted to be copied from mainland Alaska north of the island (Heizer 1947:292, Heizer 1952:266).

Shasta County, California

In northern California, 30 miles north of Lake Shasta along interstate 5, are four sites with a combined yield of 1,560 incised stones (McGuire 1989:D.1). The names[4] of the four sites are: CA-Sha-1169 (n=1,169 incised stones), CA-Sha-1175 (n=217 incised stones), CA-Sha-476 (n=62 incised stones), and CA-Sha-1176 (n=3 incised stones, McGuire 1989:D1). The sites were located during field walking in advance of a proposed expansion of the interstate (Basgall and

[4] The sites, are named using a trinomial system that is adopted by California archaeology standards. The CA= California, Sha= Shasta county, and the number refers to the sequential order of sites found within Shasta county.

Hildebrandt 1989:2). The date for the incised stones is 3,000 BC to 1,500 BC between all four sites; this date can be used as a time signature for the creation of incised stones not only at these four sites, but at sites within the vicinity (McGuire 1989:D.1). The overall condition of the incised stones is that they appear fragmentary, but as will be discussed later it is difficult to determine the completeness of an incised stone (McGuire 1989:D.5-D.6). The incised stones were analysed using four main approaches: design classification (Figure 3.12), technical and morphological attributes, and context (McGuire 1989:D1-D43).

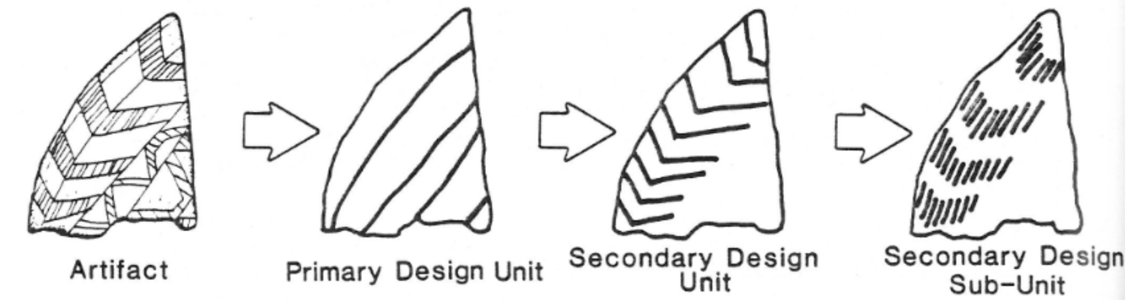


Figure 3.12: Design classification used for the Shasta incised stones collection (McGuire 1989:D.16).

Design classification uses methods borrowed from pottery imagery analysis in the southwest of North America (McGuire 1989:D.6, Plog 1980). Using these methods comes with a caveat that incised stones are not pottery sherds in one important way. Incised stones are created in an "additive process" that could be continual without any indication of what a completed incised stone looks like (McGuire 1989:D.5-D.6). Many incised stones may have been abandoned, lost, or broken before being considered completed by the maker (McGuire 1989:D.6). Imagery on pottery is assumed to be an example of a completed design on a vessel; therefore, pottery fragments are representations of imagery that is complete (McGuire 1989:D.6). Incised stones that may be considered to be complete by archaeologist may have actually been in the process of being made (McGuire 1989:D.6).

With this caveat, the design classification for incised stones from Shasta County follows the example of Plog's (1980) research on stylistic variations of prehistoric ceramics in the American Southwest (McGuire 1989:D.6). First, is the 'primary design unit' which is the hierarchical incised lines that separate the space on the stone from the smaller lines and shapes (McGuire 1989:D.14). Next, the 'secondary design unit' that uses the primary design unit to create elements, such as crosshatching or chevrons (McGuire 1989:D.15). Finally, there is the 'secondary design sub-unit' that is infill for the secondary design units (McGuire 1989:D.15). The secondary design sub-unit only occurs twice in the entire collection and is an example of the difficulty of determining completeness of incised stone (McGuire 1989:D.15).

Of the incised stones in the Shasta collection 462 underwent shaping on the sides either through grinding or flaking (McGuire 1989:D.22). The stones are mostly slate or siltstones which is a soft materials that could be easily ground by granitic cobbles or pumice (McGuire 1989:D.20). The stones that have flaking on the edges appear to have been modified to accentuate the stones natural shape (McGuire 1989:D.20). The shape that most of the stones have is an oval or "leaf-shaped" (McGuire 1989:D.23). Other modification attributes of the stones is that in total five of the incised stones have drilled holes that are subsequently broken and one example has indications of being notched (McGuire 1989:D.20-22).

A total of 188 stones were recovered that are described as being 'incised stone blanks'; these stones have edge modification, but are not incised (McGuire 1989:D.28). The oval shape that is characteristic of many of the incised stones is the shape obtained by edge grinding and flaking on the incised stone blanks (McGuire 1989:D.28). The size and weight of the incised blanks is 2-10 times greater than the incised stones (McGuire 1989:D.29). This difference appears to be reflective of the fragmentary condition of the incised stones (Figure 3.13, McGuire 1989:D.28).

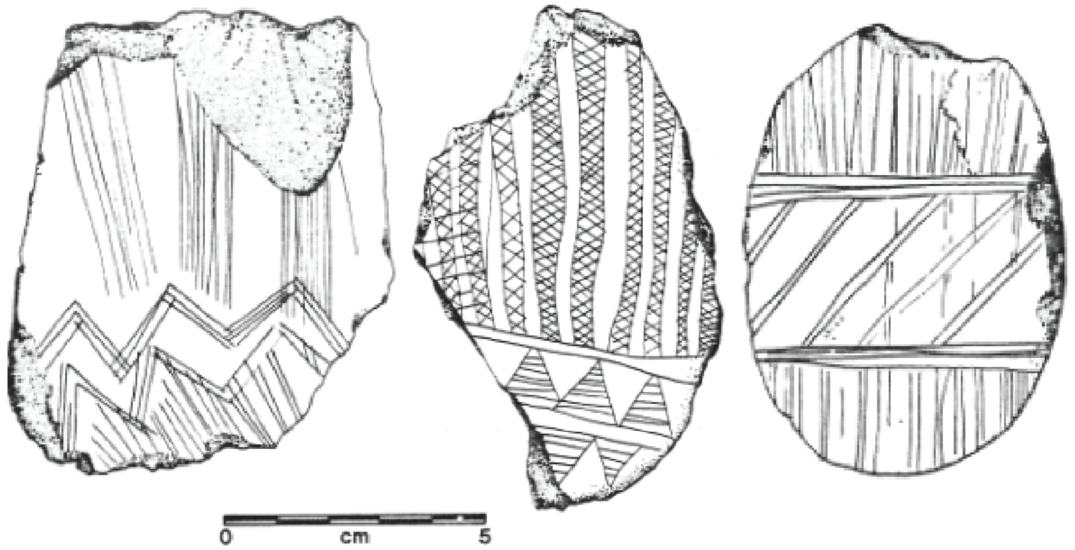


Figure 3.13: Incised stones from the Shasta Collection (McGuire 1989:D.4).

Before summarising the spatial associations, a consideration of the field method should be addressed. The excavation units were 1 by 2 meters in size (some were 0.5 X 1 m^2) and used 10 centimetre levels to reach depths from 0.6 to 1.4 meters below the surface in some places (Basgall et al. 1989:97, Basgall and Hildebrandt 1989:341). Wet screening was used through a 6mm metal grid, a method that proved vital as many of the incised stones would have not been identified without being washed (Basgall et al. 1989:97, Basgall and

Hildebrandt 1989:456, McGuire 1989:D.1). The subsurface densities of incised stones and utilitarian artefacts at CA-Sha-1169 (n= 1,278 incised stones) indicate that the incised stones are not randomly distributed with the deposits (McGuire 1989:D.34). The context the incised stones have with other artefacts are: obsidian flaked tools, bifaces, spalls, and cores (McGuire 1989:D.36). The result is that incised stones were being deposited at the same time as the utilitarian tools (McGuire 1989:D.36).

The outcome of the design classification and the technical and morphological attributes between three[5] of the sites shows homogeneity suggesting that the sites and the area were conterminously inhabited by the same cultural group from 3,000 BC to 1,500 BC (McGuire 1989:D.1 and 40). The incised stone blanks were prepared through edge modification either through grinding or flaking into oval shapes; the size thereof appears to be larger than the fragmentary incised stones. Finally, the contextual associations show that the incised stones are left with utilitarian artefacts which suggests they were included in habitation activities (McGuire 1989:D.36). McGuire's (1989:D.36) interpretation of these association is that the incised stones were worn as amulets or carried by a large number of prehistoric persons, and after the stone broke it was left behind (McGuire 1989:D.36). In contrast, the incised stones may have been a part of ritual destruction, but McGuire is in more support of the amulet hypothesis (McGuire 1989:D.36).

The synthesis of the evidence above is contextualized with the wider archaeological picture for the area. The time phase that the incised stones were made is called the Pollard Flat which ended after 1,500 BC (McGuire 1989:D.42). The Pollard Flat people are characterized as a foraging group, and the replacing group called Vollmers are a logistical hunter-gatherer people that moved more frequently than the Pollard Flat (McGuire 1989:D.42, Basgall and Hildebrandt 1989:447). The chronological data supports a hypothesis that the two groups overlapped for 500 years, and it was during this overlap that the majority of incised stones were made (McGuire 1989:D.42). The interpretation of the incised stones is that they represented cultural affiliation for the Pollard Flat people and were worn or carried as unambiguous symbols as competition over resources increased with the Vollmers (McGuire 1989:D.43). The general attributes of the incised stones as oval shaped, and the overwhelming choice of material as slate or siltstone, may be a part of this affiliation and group identity (McGuire 1989:D.43). The incised stone production stopped after the Pollard Flat people either died out or migrated away from the area (McGuire 1989:D.44).

[5] There is no explanation why CA-Sha-1176 (n=3 incised stones) was not included into the final conclusion of the design classification and the technical and morphological attributes analysis.

Mojave Desert Region, California

Incised stone artefacts are observed at several sites within the Mojave Desert region of Southern California. The sites include: Guapiabit, Denning Springs, CA-KER-2210, CA-KER-2211, and CA-KER-2215 (Figure 3.14). At Guapiabit 27 green incised stones were found (Sutton and Schneider 1996:22). These incised stones (Figure 3.15) are described as being situated on benches which flank the sides of a river. All but two of the incised stones appeared to come from a possible cache; however, the true provenance of the stones is unknown as a backhoe was used to excavate a trench through the site. Two incised stones were found outside of the trench on the surface (Sutton and Schneider 1996:38). Sutton and Schneider interpret the site as a “small, relatively independent, village occupied primarily in the late fall/or winter… [and] occupied by a discrete social unit such as a lineage” (1996:38).

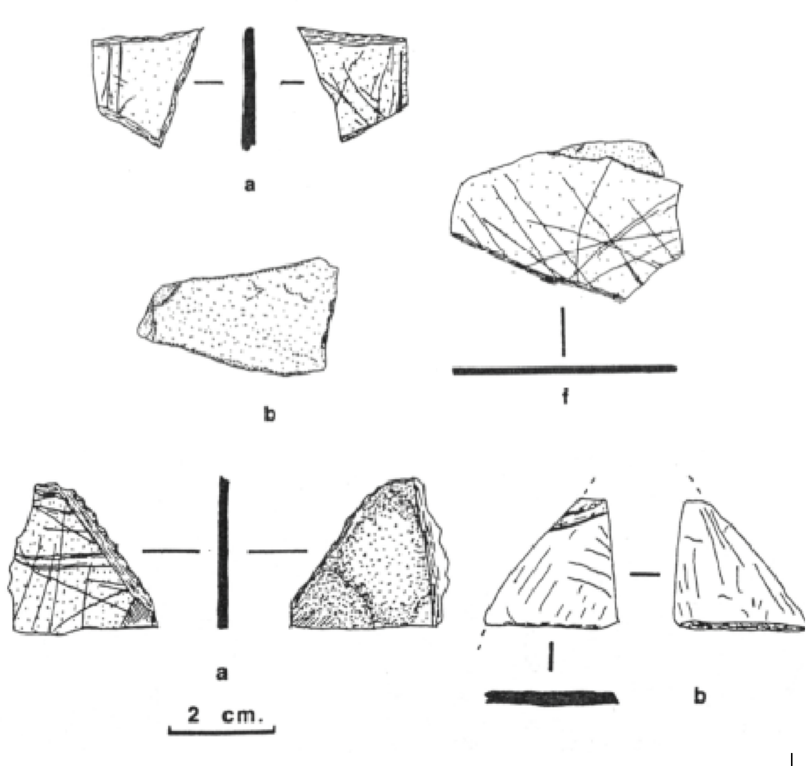


Figure 3.14: Incised Stones from CA-KER-2210, CA-KER-2211, and CA-KER-2215 (Sutton and Schneider 1996:22).

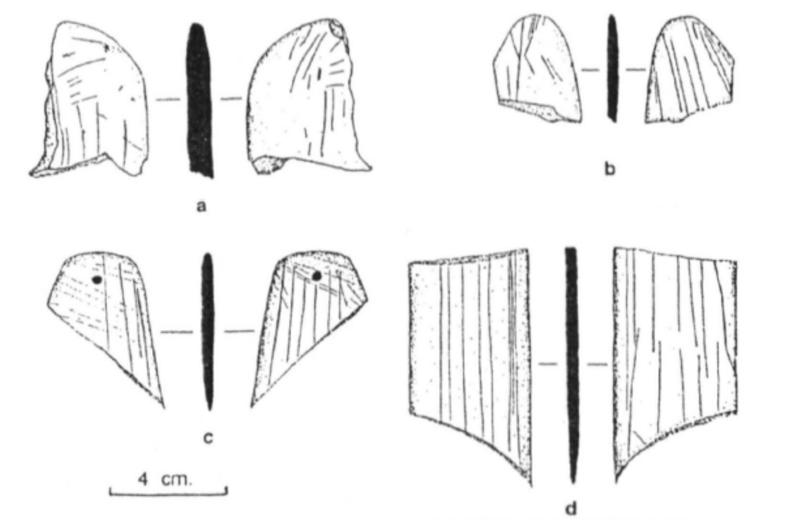


Figure 3.15: Green incised slate from the Guapiabit site in the California Mojave Desert (Sutton and Schneider 1996:26).

The next site within the Mojave Desert is called Denning Springs. Sutton describes this site as a rock shelter where two incised stone slates where found (Sutton 1987:115). The site description and analysis report the first stone was found 92 cm below the surface, while the second was found on the surface in front of the shelter on a talus slope (Sutton 1987:125). Sutton goes on to say that the site was a “small multi-purpose campsite” that was used before 1,000 to 1,750 AD, with later use as a lithic workshop (Sutton 1987:138). At site CA-KER-2210 are two incised stones, one green slate and one schist, recovered from the surface (Sutton 1991: 37). The site is in a plough zone where the plough depth reached 40 to 45 cm below the surface. From his analysis both pieces are fragments of two different larger ornaments (Sutton 1991: 37). Sutton’s (1991: 46) interpretation of the site, is that it was used for camping possibly at two different times.

At a site called CA-KER-2215 Sutton examines two green incised slates that were found on the surface inside a 40-45cm plough zone (Sutton 1991: 61). The site interpretation is a short term camping locality in which “milling and stone working” activities were conducted (Sutton 1991: 68). The site is undated, but Sutton infers a date as “incised slate seems to occur throughout the mid- to late Holocene but are more common in Rose Springs times” (Sutton 1991: 68). At site CA-KER-2211 which has been disrupted by plough activities to a depth of 45cm are two loci. These loci represent artefact concentrations that were found on the surface during survey. Locus 1 contained three green incised slates which were found within various contexts. Sutton reports one was found on the surface while the other two were found at 45-55 and 55-65 centimetres below the surface (cmbs). The one buried at 45-55 (centimeters below datum) has a perforation (Sutton 1991:113). Locus 2 contained three incised green slates which were polished and are interpreted as ornament fragments (Sutton

1991: 158). One of the incised stones was found on the surface while the other two were found during surface scrapes. Sutton's interpretation of the site is that the people living there were experiencing a cool wet environment that facilitated the hunting of hares, and did not have a strategy of procurement that called for milling stone processing until a much later time (Sutton 1991: 143).

Chumash Incised Stones, California

Georgia Lee examined 127 incised stones within the Chumash territory that is defined as along the southern California coast line from San Louis Obispo to Malibu, including the Channel Islands and into the interior of California to the inland desert (Lee 1981:41). Lee began her study by reviewing and comparing the design elements on the stones to the designs of rock art panels. The conclusion of this comparison is that there are repeated motifs, but the incised stones do not display the superimposed designs found on rock art (Lee 1981:20). Although shared motifs exist, they may not necessarily have the same symbolic meaning when placed on an incised stone (Lee 1981:57). Lee makes the case that a motif made on a utilitarian object probably has a different meaning than the rock art panel, because in one it is a tool that is used by the hand and the other it is a stationary rock art panel (Lee 1981:57). Why would a motif exist on incised stones? To explain this phenomena Lee uses cosmography and crisis art as two concepts that may have kept a motif active within the culture.

The images incised on the stones may be a cosmography, which Lee explains is more than a world view, but incorporates social significance that limits and brings order to the expression that people can have within their culture (Lee 1981:57). This order and social significance of the cosmography could explain the repeated designs and imagery that appears on many of the stones, and why motifs may be continuous within the culture (Lee 1981:57). Five possible cultural reasons are listed in her book for motif continuity:

1. There is an emotional attachment to the acceptance of traditional forms.
2. Fear of the unknown or untried within the culture.
3. The conservative nature of religion and ceremony.
4. The power of tradition to discourage change.
5. Cultural rules prescribing the proper way to use supernatural power.

Working off the cosmography is the idea of crisis art which is an attempt to "manipulate events by the creation of sacred designs" (Lee 1981:58). An example of a crisis would be an earthquake, a comet, an eclipse, a rite of passage, or an omen of bad luck such as a flock of ravens, or an owl seen during the day (Lee 1981:58). Any one of these may have been a trigger for a group or individual crisis, and spurred the creation of an incised stone to control the situation and restore order (Lee 1981:58). Motifs through time may have stayed within the scope of the Chumash culture through the five cosmography forces, and from the frequent crisis that would inevitably arise.

Continuing within the Chumash territory is a report that covers the Vandenberg incised stones located along the California coast approximately 40 miles south of San Louis Obispo, and 40 miles north of Santa Barbara.

Vandenberg Incised Stone, California

From 2001 to 2004 a rock art survey was conducted on the property of Vandenberg Air Force Base (AFB) to find and identify previously undiscovered rock art sites (Table 3.1, Bury et al. 2004:1-1). The survey located six new rock art sites that were recorded using California standardised methods (Bury et al. 2004:4-1). The results of this work was compiled into a report that was submitted to the United States Department of Defence, but was not made public. The report includes a chapter that discusses and analyses the incised stones within the property of Vandenberg AFB (Bury et al. 2004:7-1). The 36 incised stones were excavated during the 1970s by Glassow, and is discussed in detail below.

Site	**Incised Stones**	**Period**
CA-SBA-205	1	Early
CA-SBA-205	4	Middle
CA-SBA-205	20	Late
CA-SBA-210	1	Early
CA-SBA-210	1	Middle
CA-SBA-210	4	Late
CA-SBA-552	1	Unknown
CA-SBA-552	1	Late
CA-SBA-609 (Rattlesnake Shelter)	2	Middle
CA-SBA-552	1	Late
Total	36	

Table 3.1: Summarisation of sites with incised stones on Vandenberg. Associated with period of use. For an example from these sites see Figure 3.16. Early (2,500 to 1,000 BC), Middle (1,000 BC to 800 AD) or Late (800 to 1,800 AD) (Derived from Bury et al. 2004:7-27, 29, and 53; Glassow 1996:134).

There is a higher occurrence of incised stones during later periods (800 to 1,180 AD) than any period before. One explanation may be a larger population of Native American existed compared to the middle (1,000 BC to 800 AD) or early periods (2,500 to 1,000 BC) of the Chumash (Bury et al. 2004:7-27, 29, and 53; Glassow 1996:134). While a larger population could explain more incised stones Bury et al. (2004) suggest that the dramatic increase during the late period is reflective of an “actual increase of production” (2004:7-53).

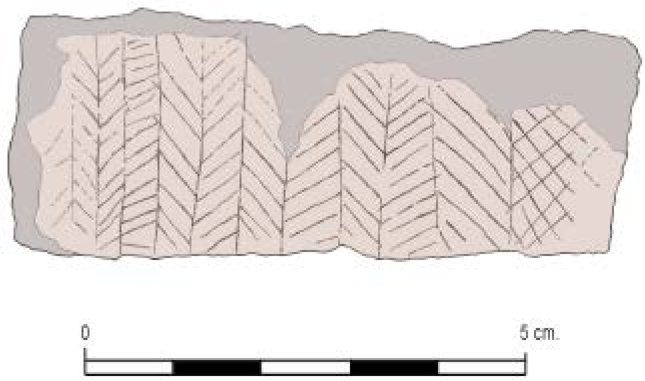


Figure 3.16: Incised stone from CA-SBA-210, in the Vandenberg Air Force Base (Bury et al. 2004:7-33).

Most of the incised stones do not show evidence of being worn as a personal adornment (Bury et al. 2004:7-53). The incised stones were probably not used as gaming pieces where they were thrown or handled extensively, as this activity would leave divots and wear over the incised lines; for the same reason they this may exclude a use as divination (Bury et al. 2004:7-54). The incised stones appear to be in a fragmentary state, and given a lack of evidence that they were thrown one possibility is that they were initially broken possibly even made for the purpose of being fragmented (Bury et al. 2004:7-54).

The types of sites where the incised stones have been found are all residential in functions that were used for "weeks or months at a time" (Bury et al. 2004:7-54; Glassow 1996:166). Of these residential sites all of them have middens from which all of the incised stones were recovered along with as Glassow states "artifacts associated with manufacturing and maintenance… such as tarring basketry water containers" (Bury et al. 2004:7-54; Glassow 1996:116).

Glassow defines a principle residential base site as having a larger number of artefact classes than other subsidiary residential sites (Bury et al. 2004:7-54; Glassow 1996:117). Of the 36 incised stones 34 are found in principal residential bases, and 26 of the 34 are associated with house structures (Bury et al. 2004:7-55). This relationship give the impression that the incised stones were a part of the "social dynamics or activities occurring within or in association with households at principle residential bases", and although portable seem to have stayed within the dwelling sites (Bury et al. 2004:7-55).

Introduction to Incised Stone Research in the Great Basin

The Great Basin (Figure 3.17) has four different definitions (see Chapter 1) that cause the boundary to shift depending on which aspect is being studied. Even with these shifting borders the Great Basin still extends into California on the West including the Mohave Desert and Owens Valley. To the north the lower south east quarter of Oregon and nearly half of Idaho to the Colombia Plateau, and on the East side it covers nearly half Utah to the Wasatch Front and Colorado Plateau. All of the incised stones from the Owens Valley and Panamint mountains are within the Great Basin.

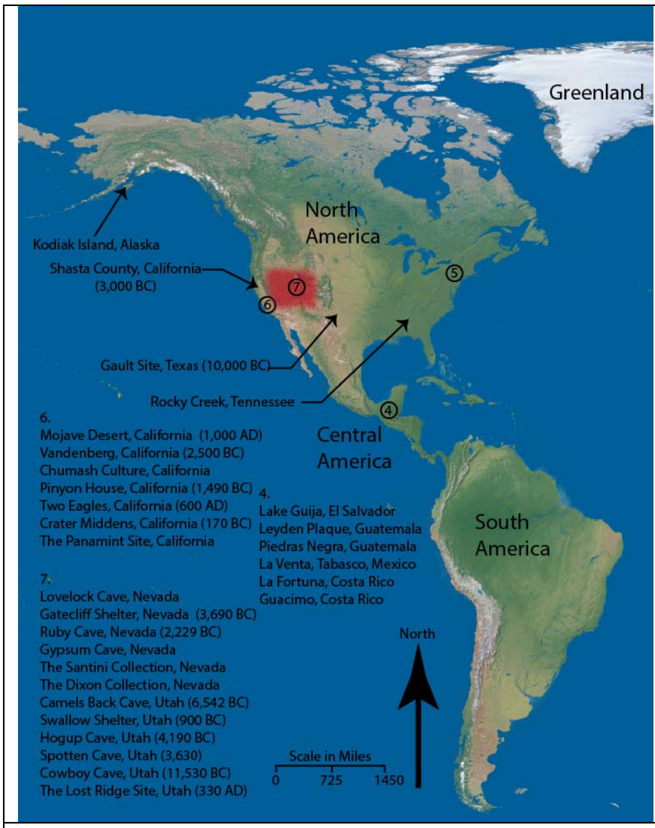


Figure 3.17: Incised stones of the Great Basin shaded in red (After Patterson 2015).

Lovelock Cave

Llewellyn Loud who was a museum preparer at the Phoebe Hearst Museum at the University of California Berkeley was sent to Lovelock Cave in 1912 after reports reached their ears of an archaeological cave in Lovelock, Nevada. Lovelock Cave as it became later known was originally mined for bat Guano that was used as fertilizer. Even though this mining occurred, Loud was able to excavate over 10,000 artefacts from April to August of 1912 (Loud and Harrington 1929:4). Although there was more excavation that could have been carried out it was not until 1924 that the Museum of the American Indian, and the Heye Foundation, funded the project and brought on board Mark Harrington the principle investigator (Loud and Harrington 2005:4). Harrington collaborated with Loud producing the 1929 report called Lovelock Cave (Loud and Harrington 1929:4). This report became the first major site to be excavated in Nevada and the first to mention two incised stones within the Great Basin (Loud and Harrington 1929:58 Plates 55 h and J). Two incised stones were found in the cave, but were only described not interpreted.

Gatecliff Shelter

Trudy Thomas (1983b) analysed the 428 incised stones from Gatecliff Shelter, in Nye County, Nevada (see Chapter 5). Trudy introduces the incised stones, and makes observations about the source material, the markings on the stones, and characteristics of the stones themselves (Figure 3.18, Thomas 1983b). The imagery is analysed into a wider synthesis which includes analogy to Great Basin rock art (Thomas 1983b). A number of observations are made concerning different contexts of the incised stones.

The designs on these incised stones seem to correspond to rock art patterns seen elsewhere in the Great Basin and therefore have been called "portable rock art" (Thomas 1983a:521). Indeed, the rock art in Gatecliff shelter and the incised stones have striking similarities not only in appearance, but in the sequence of marking (Thomas 1983a:521). In both the incised stone and rock art the order of making an image is the same (Thomas 1983a:521).

Trudy Thomas suggests that incised stones were a marking device during pinyon harvesting (1983d:351). This conclusion is reached after an extensive comparative survey of imagery on rock art and the imagery on incised stones. On both the incised stones and rock art some motifs appear to be the same. The motifs that appear on the Gatecliff collection correspond most directly to motifs that appear on rock art sites that have been described archaeological as staging areas for hunting groups (Thomas 1983d:346). These staging areas have permanent boulders or rock out crops that are notable on the landscape and therefore act as beacons to hunting groups who wish to gather annually (Thomas 1983d:346). Using ethnology she explains that for much of the year the people would be aggregated into smaller family units that would meet up with other family units to participate in larger group activities such as hunting, animal drives, or pinion harvesting (Thomas 1983d:351). These meetings had to be pre-planned at specific places in the landscape otherwise people would not be able to find one another in the larger geography (Thomas 1983d:351). According to Thomas, rock art sites were used as fixed reference points in the landscape that served as meeting places for annual group hunting activities (Thomas 1983d:351). It was these points in the landscape that captured the people's attention to produce a dramatization of hunting events in the rock art (Thomas 1983d:351). The incised stones at Gatecliff are 48 km from these staging areas, yet share some of the motifs found in both places (Thomas 1983d:346). This is explained through examining the activity of congregating from otherwise aggregated family units (Thomas 1983d:346). The communal activity of pinyon harvesting causes people to come together in much the same way as communal hunts (Thomas 1983d:350). However, pinyon groves are scattered throughout the landscape, and do not necessarily have boulders or rock outcrops available for producing rock art motifs to signify a congregated pinyon party (Thomas 1983d:350). Thus, incised stones substituted for the absence of available permanent rocks on the landscape (Thomas 1983d:350). Thomas (1983d:351) sums the experience of the prehistoric population using incised stones as

> "The portable incised stones and the non-portable rock art of Monitor Valley would have functioned, then, as symbolic correlates in the dramatization of concepts relevant to a cultural system which coordinated plant food gathering and cooperative hunting into a complementary spatial and temporal scheme".

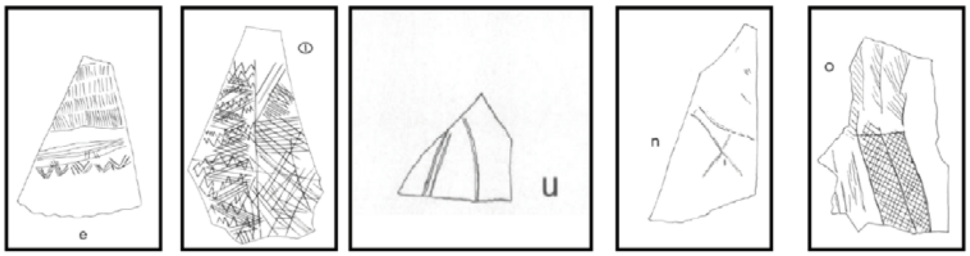


Figure 3.18: Sample of incised stones from Gatecliff Shelter with design grammar classification. (Thomas 1983d:275, and 276).

Ruby Cave

The two largest contributions to the interpretation of the incised stones (n=53) from Ruby Cave (see Chapter 5) have been made by Trudy Thomas in 1981, and the author in 2004. In Thomas's work a typology was made for the incised stones by breaking the incised lines into different categories (Table 3.2). This work suggested that the designs could be related to ceremony or the designs were made while sharpening bone or other stones into tools (Thomas 1981:2). During the process of sharpening Thomas suggests that a person may have "worked out a pattern instead of making a series of aimless scratches while they were sharpening their tools" (Thomas 1981:2). However, Thomas points out the weakness of this interpretation as incised stones are a soft material, and would have made a poor sharpening stone (Thomas 1981:2).

Type 1 elements	Cross-hatching, straight heavy lines that form triangles, and V shaped lines.
Type 2 elements	Heavy fairly straight lines, four different shapes appear on these stones. They could look like trees or fish.
Type 3 elements	Straight parallel lines, lines are vertical, horizontal, or angled to the edge of the stone.
Type 4a elements	Triangles and V's with lines within these designs.
Type 4b elements	Triangles or V's with no lines within the V's. The V's form a continuous arrow.
Type 5a elements	Horizontal lines that run across the stone with smaller vertical short lines that come off the lines.
Type 5b elements	Arcing lines with other horizontal and vertical line going around it.
Type 6 elements	Unrelated scratches.

Table 3.2: Trudy Thomas's typologies for the Ruby Cave incised stones (1981:4-6).

The author's (2004) work interpreted the stone's imagery as a view into the creative forces of the person. The author developed a concept called the "One third Rule" (Ottenhoff 2004:24). This concept is a hypothetical way of breaking down the complex thoughts or thinking that formed the images. The three main tenets of this hypothesis are: aesthetics, technological innovation, and the spiritual base (Ottenhoff 2004:24). The aesthetics represented the pleasing form of the environment in which the individual lived (Ottenhoff 2004:24). The technological innovation is defined as "sub-consciously or consciously using tools to expand their material culture" by leaving incisions on stones (Ottenhoff 2004:25). Finally, the spiritual base was defined as the assumed experiences of the person with an immaterial other world. Therefore, anytime a prehistoric person made a design all three of these 'rules' were in operation confining and expanding the final product (Ottenhoff 2004:25). Thus each tenet could have a 33% equal part in the complete design, but more likely one or two parts would have a larger percentage in forming the completed incised product (Ottenhoff 2004:25).

Gypsum Cave

Gypsum Cave which is located 20 miles northwest of Hoover Dam and just 20 miles east of Las Vegas, was excavated by Mark Harrington in 1930 (Harrington 1933:13). The cave consists of five chambers or what are referred to as rooms in the monograph; the cave from the opening to the back of room 5 is over 300 ft. long (Harrington 1933:29). In room 1 on the

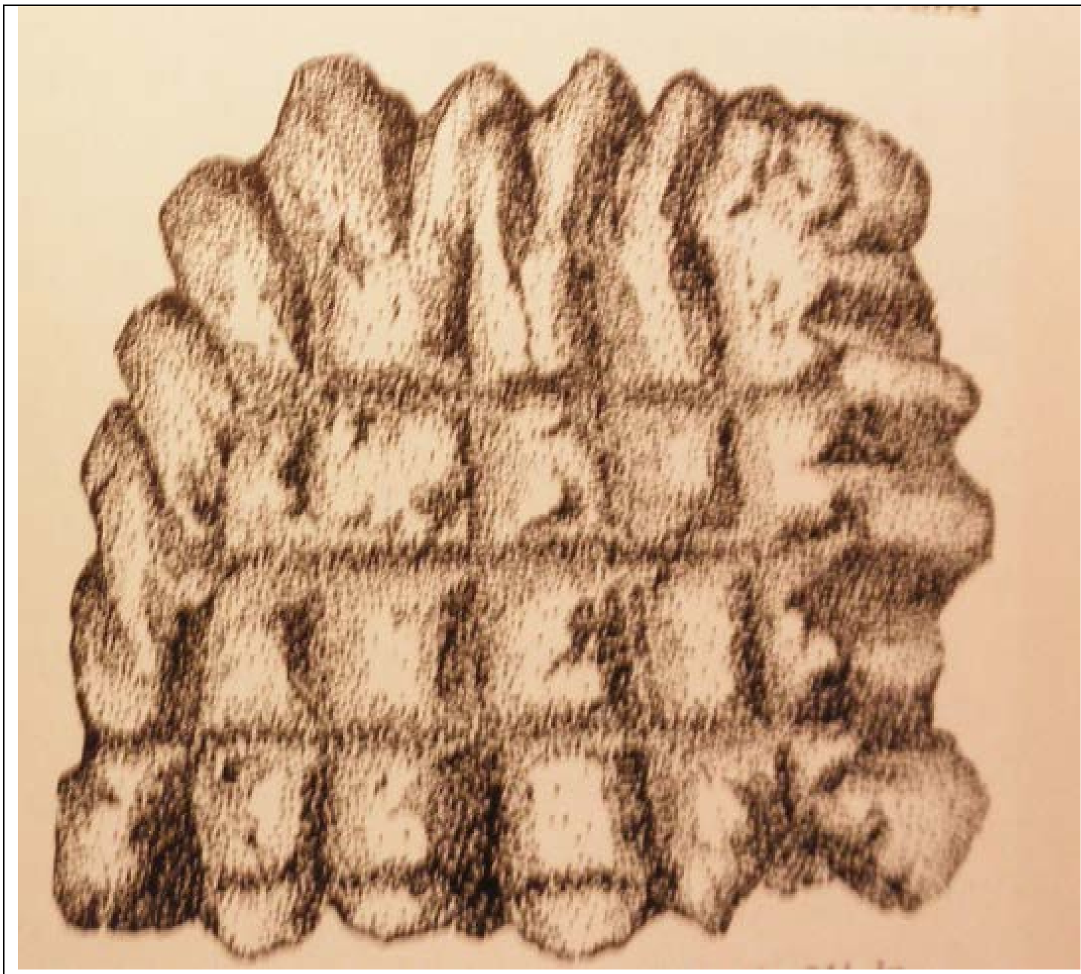


Figure 3.19: Incised stone from Gypsum Cave, identified by Harrington as an unknown artefact of sandstone (Harrington 1933:139).

lower level, is an incised stone (n=1, Figure 3.19) that measures 13 cm long by 2 cm wide and is 3 cm thick and is made on a volcanic tuff (Harrington 1933:29). The deep incised lines make a grid pattern on one side, and on the other are lines radiating out in a fan shape from one of the corners. The sides are also incised with lines that transverse the length of three sides, but one side has shorter lines (Harrington 1933:139). The incising and the look of the stone as a whole suggest that it was not used to sharpen or straighten bone implements, but was incised to create a particular form and then left that way (Harrington 1933:139).

Camels Back Cave

There are eight (Figure 3.20) incised stones found at Camels Back Cave (see Chapter 5), and they consist of either a "flat tabular or pebble sized" stone (Schmitt, Monson, and Shaver 2005:202). One of these pieces is described as being used for sharpening wood or bone as "the depth and random orientation of the grooves suggest" that this stone was not meant for decoration (Schmitt, Monson, and Shaver 2005:203). In contrast, one of the stones seems to have been shaped into a slender, elongated, pendant (Schmitt, Monson, and Shaver 2005:202). The authors point out that this shaping was performed by “grinding

Figure 3.20: Incised stones from Camels Back Cave with their design grammar classifications. 42To392 Courtesy of Natural History Museum of Utah. Photo by author.

and scraping” until a blunt nose with tapered sides was created (Schmitt et al. 2005:202). After this initial shaping, incising appears to have started at the blunt nose by making a grooved line that circumnavigates the stone (Schmitt et al. 2005:202). This groove may have served as an attachment point for cordage or rope (Schmitt et al. 2005:202). Then the entire stone obtained a black patina, suggesting either handling of the object was extensive or some other weathering process occurred on the surface (Schmitt et al. 2005:203). After this black patina occurred on the Camels Back example additional incising took place from the opposite end of the blunt nose (Schmitt et al. 2005:202). This new incising is lighter in colour as the cortex of the stone was penetrated (Schmitt et al. 2005:202). The walker method was also applied to the stones surface. The walker method was first identified by Shuster (1968, see Chapter 1) who describes as method of using one flake with two points that allows consistent parallelism at a constant equal distance, and allows for the user to pivot the tool; this tool is thought to be responsible not only for some of the incising after blackening of the stone but also for making the dots that appear on the surface of not only this stone but other stones in the collection (Schmitt et al. 2005:202). The authors note that it appears all the incised lines were made from left to right on the stone (Schmitt et al. 2005:202).

Swallow Shelter

There are 63 incised stones (Figure 1.10) from Swallow Shelter (see Chapter 5) all of which are a volcanic tuff material (Dalley 1977:46). Three of the incised stones are from the east area (EA) trench which was undated and not fully excavated (Dalley 1977:11). The incised stones were described by Dalley by placing the designs into four different typological classifications (Dalley 1977:46). The classification of Class I contain random lines with no attempt to make a geometric shape. In Class II geometric shapes are formed and there is some attention to design layout, and in class III the incised stone appears to be shaped possibly to resemble an anthropomorphic form (Dalley 1977:46). Of particular note is class IV where the designs are intricate and extensive combining together small drilled pits and incised lines (Dalley 1977:46). There is not an interpretation as to why the incised stones were created.

Hogup Cave

Hogup Cave is located in northern Utah around the west edge of the Great Salt Lake and is one of the case studies in this research (see Chapter 5). There are 30 incised stones from Hogup Cave made on slate, sandstone, shale, and limestone (Aikens 1970:81). The designs were divided into 13 different types and then described based on the appearance of the incised lines (Aikens 1970:80). There is no interpretation of why the incised stones were made.

Spotten Cave

This site is located on the south side of Utah Lake in Santaquin County, Utah nearly 80 miles southeast from Hogup Cave. From this site 23 incised stones were collected during excavation (Mock 1971:134). The earliest date for the site (3,630 to 2,225 BC) has two incised stones that are interpretation to be evidence that life at the time was not always a “battle for survival” (Mock 1971:61, 134 and 154). The greatest amount of incised stones (n=9) was

Date	Incised Stone
3,630 to 2,225 BC	2
1,710 to 160 BC	9
640 to 1,220 AD	8
Unknown Provenience	4
Total	23

Table 3.3: The radiocarbon dates and number of incised stones excavated from Spotten Cave (Mock 1971:61-84, and 134).

deposited between 1,710 to 160 BC (Mock 1971:66, and 134). Table 3.3 is provided to summarise the temporal placement of the rest of the incised stones.

Cowboy Cave

Cowboy Cave is located in east central Utah just north of the Colorado River and west of the Green River. The site was originally reported to the University of Utah in 1973 as a cave with the high potential of sub-surface archaeological deposits (Jennings 1980:3). Subsequent trench testing of the site proved that this assessment was accurate and full excavation of the site began in 1975 (Jennings 1980:3). From this site 22 incised stones were recovered from six stratigraphic deposits, radiocarbon dated to be as early as 11,530 BC to 9,070 BC. The only suggested interpretation for the incised stones is based off a 1976 rock art analysis that proposes pictographs may have had something to do with “menstrual taboos, or cult activities” (Hull and White 1980:122, Newcomb 1976).

The Lost Ridge Site

The Lost Ridge site (330-430 AD) is located southeast of Utah Lake in a saddle along the Long Ridge range of mountains (Nauta and Janetski 2006:63 and 68). One (n=1) incised stone was recovered from this site that is described as a green limestone chunk with zigzags and a grid (Nauta and Janetski 2006:70). The incised stone is not interpreted directly, but the site interpretation gives context to the incised stones creation. The paucity of the pollen data and a deer skull with "freshly shed antler scars" suggest the site was occupied during late winter (Nauta and Janetski 2006:84). The sites most important activity was the making of beads (n=47), as is noted from the large number of cut mule deer bone (n=39) that is the raw material for the beads (Nauta and Janetski 2006:72). In addition the site contained a semi-circle of stones that is thought to have been the foundation of a brush windbreak (Nauta and Janetski 2006:84). Synthesised together the artefacts suggest it was used as a gathering-hunting base, and a new material production locality (Nauta and Janetski 2006:83).

<table>
<tr><td>Design Grammar</td><td>Percentage of Total</td><td>Count</td></tr>
<tr><td>Curvilinear</td><td>32.1%</td><td>n=320</td></tr>
<tr><td colspan="3">Noted by the oval curve shapes on the stone that often have radiating lines coming off the top of the curve. The edge is where most Curvilinear designs begin. The lines often curve or sometimes "V" at the apex before returning to a different position along the same edge it originated (Figure 3.21).</td></tr>
<tr><td>Bisect</td><td>6.2%</td><td>n=62</td></tr>
<tr><td colspan="3">Line or lines that are straight (non-zigzag) and have the effect of dividing the stone into two halves (Figure 3.21).</td></tr>
<tr><td>Banded</td><td>7.4%</td><td>n=74</td></tr>
<tr><td colspan="3">Zigzags or sets of lines that are closely parallel that run all the way across the stone (Figure 3.22).</td></tr>
<tr><td>Circle</td><td>1.0%</td><td>n=9</td></tr>
<tr><td colspan="3">Complete circles or circle like Figures (Figure 3.23).</td></tr>
<tr><td>Cross-Hatch</td><td>3.4%</td><td>n=34</td></tr>
<tr><td colspan="3">Grid that is laid out over the entire surface of the stone, sometimes there is a zigzag that accompanies the grid along the side (Figure 3.23).</td></tr>
<tr><td>Dendritic</td><td>5.1%</td><td>n=51</td></tr>
<tr><td colspan="3">Appear to have an image of an organic plant growing up out of an incised surface (Figure 3.23).</td></tr>
<tr><td>Anthropomorphic</td><td>0.1%</td><td>n=1</td></tr>
<tr><td colspan="3">Human like Figure (Figure 3.24).</td></tr>
<tr><td colspan="3">Table 3.4: Klimowicz (1988:68, 84) design grammar classifications for Gatecliff Shelter and Santini Collection, including percentage of occurrence and count of total.</td></tr>
</table>

The Santini Collection

The James Santini collection of 788 incised stones were found and collected from over a hundred sites in southern Nevada in and around the Las Vegas area (Santini 1974:4, Klimowicz 1988:58). No excavation was performed at any of the sites where the incised stones were found thus the entire collection is constituted as surface finds. Nearly 400 of the Santini incised stones came from the Spring Mountain range which is the largest sandstone mountain range in Nevada (Santini 1974:5).

Of the Santini collection only two are slate and the rest (786) are sandstone, yet only four of the stones[6] show evidence of surface preparation and shaping of the sides (Santini 1974:5, Klimowicz 1988:60). Janis Klimowicz analysed the Santini collection for her master's degree from the University of Nevada Reno. In this work the designs were classified using the concept of design grammar to place the incised geometric shapes into different categories, she then compared the collection to incised stones from Gatecliff shelter (Table 3.4, Klimowicz 1988:52, 62, 100). One of the results of Klimowicz (1988:82) analysis showed that incising would nearly always follow the shape of the stone thus the selection process for the hunter-gatherers was based on two possibilities:

- The designer of the incised stone had an image in mind and would look for specific stone shapes to fit the image or
- The stone was selected first and then the image that would fit best was incised on the surface.

Klimowicz used design grammars to create the classifications of the imagery of the incised stones. What follows are examples of the seven grammars that Klimowicz's classified and the frequency of all 788 incised stones in each grammar category. In addition to these grammars there were 140 (14.0%) that had no discernible design meaning the layout of the incising is random, and there was (30.6% n=305) that were fragments deemed to be too incomplete to represent the entire incised image (Klimowicz 1988:78).

The Santini Collection Compared to Gatecliff Shelter

The same classification categories for the Santini Collection are employed for the Gatecliff Shelter incised stones (Klimowicz 1988:96). The results of this comparison showed that although both collections had the same design classifications they occurred in different proportions (Klimowicz 1988:100). This interpretation of these differences is that there was a "different symbol system" in use in the two areas (Klimowicz 1988:100).

[6] It is not stated if the surface preparation and shaping of the sides was done on slate or sandstone.

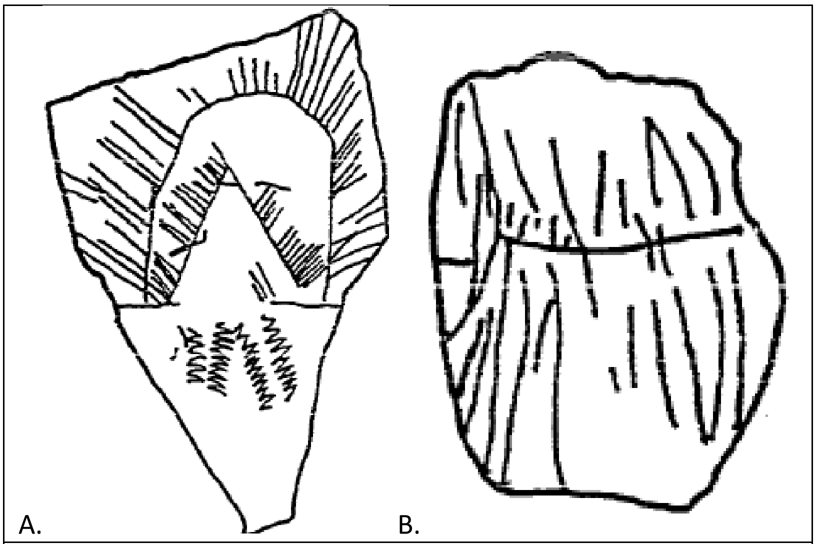


Figure 3.21: A. Curvilinear design, B. the Bisect design. Design grammar from the Santini Collection (Klimowicz 1988:67).

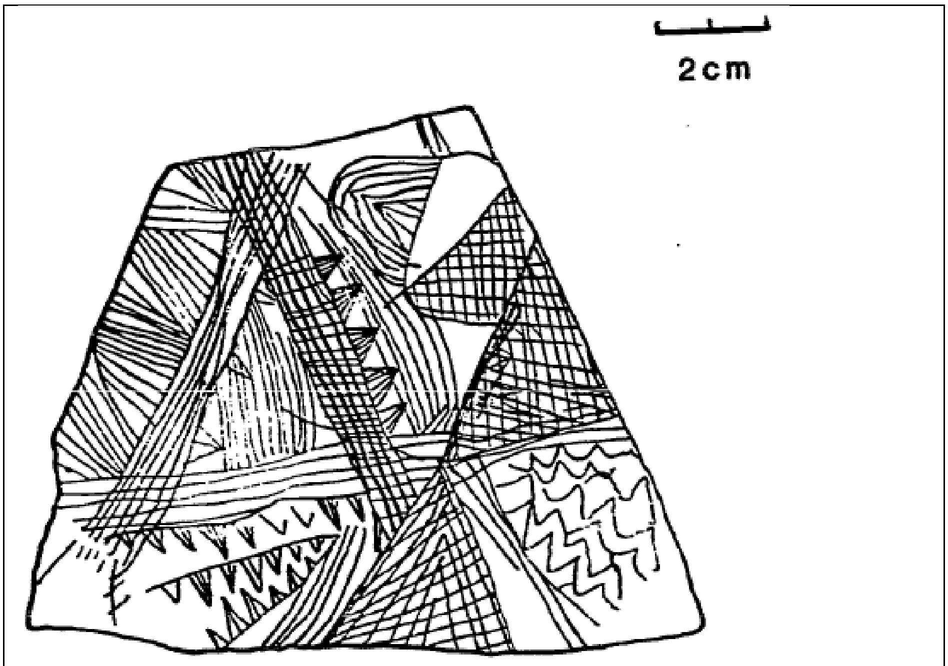


Figure 3.22: Banded design grammar (Klimowicz 1988:71).

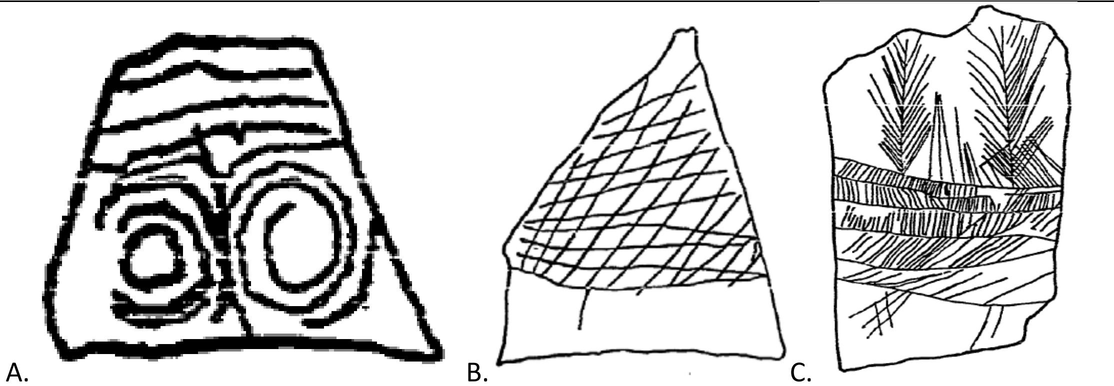


Figure 3.23: A. The circle design, B. the Cross-Hatch design, C. the Dendritic design. Incised stones from the Santini collection and there classifications (Klimowicz 1988:73-77).

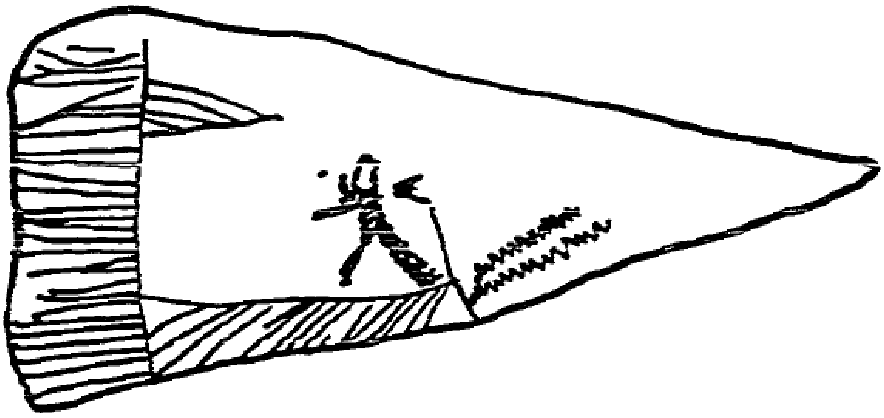


Figure 3.24: Anthropomorphic design grammar (Klimowicz 1988:79).

The incised stones were further interpreted to indicate a reflection of the order hunter-gatherers experienced in their lives (Klimowicz 1988:103). The repeated design categories represent a planned placement on stones that may have been pre-selected or selected for specific designs (Klimowicz 1988:103). The incising of these repeated designs suggests that the day to day life of the people who made them was not simple, but flourished with expression and symbolism (Klimowicz 1988:103).

The Dixon Collection

The Dixon collection is similar to the Santini collection in that the 203 incised stones were surface collected from many sites in southern Nevada near Las Vegas (Santini 1974:4). These incised stones share many of the same 'design grammar'[7] classifications as the Santini Collection that were analysed by Klimowicz (Santini 1974, Klimowicz 1988). At an undisclosed site John Dixon describes the spatial context (Figure 3.25) in which five incised stones were "apparently inserted on end into the ground" around a hearth (Santini 1974:13 and 14). Dixon further explains that incised stones placed on end didn't just occur at this site, but was a

[7] Please see the section on the Santini Collection in this chapter for a discussion about Design Grammar.

common placement under and around pine nut trees (Santini 1974:13). Santini on the other hand reports that the incised stones that he found never had this arrangement; instead the incised stones were often in small concentrations at the sites he visited, but not standing on end (Santini 1974:13). With the caveat that the Dixon collection constitutes surface finds that may have had post-depositional tampering, the interpretation of these findings is that the incised stones were left as an "expression of gratitude or request for future help" in food gathering (Santini 1974:13).

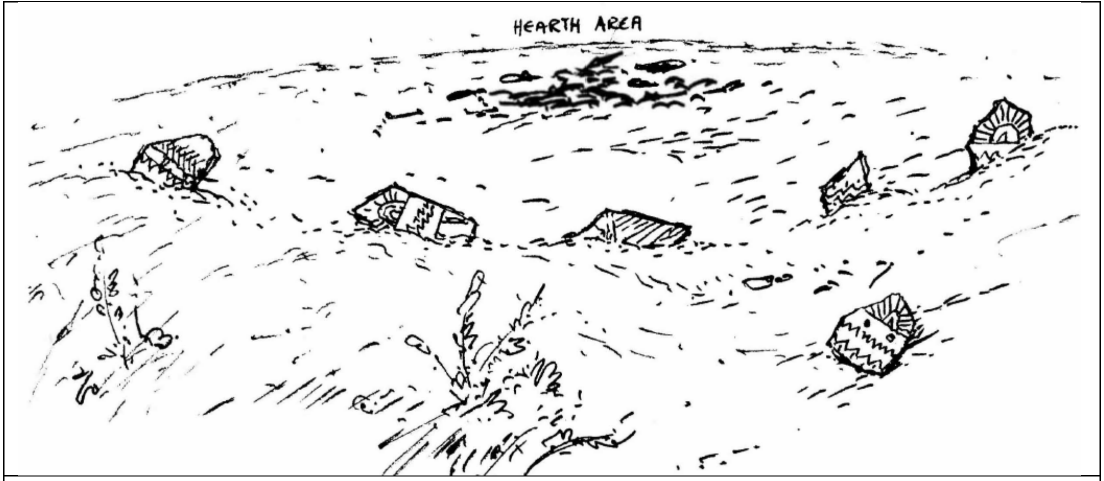
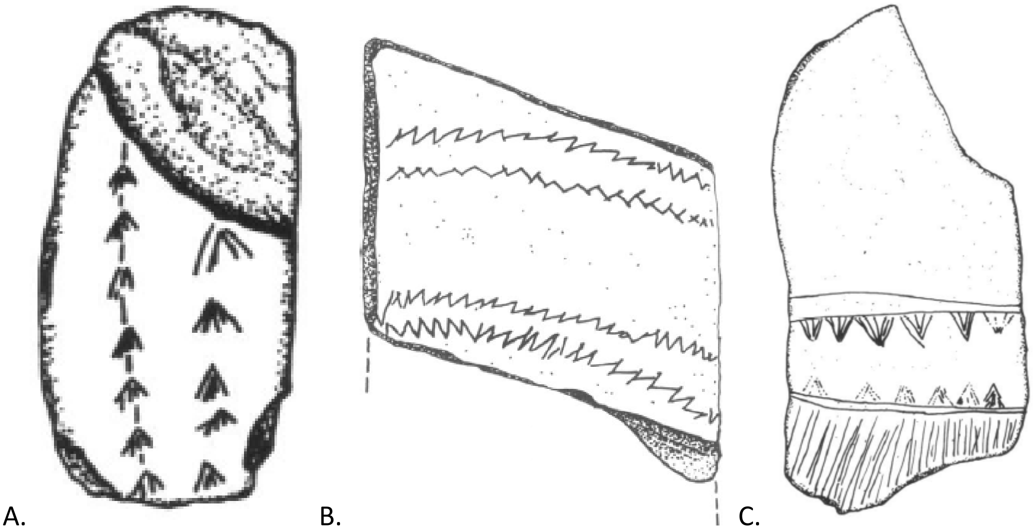


Figure 3.25: Sketch of the placement of incised stones that was reported by John Dixon (Santini 1974:14).

Three Owens Valley, California Sites: Pinyon House, Two Eagles, and Crater Middens

The Owens Valley is located on the eastern flank of the Sierra-Nevada Mountain range near the Nevada border. The valley starts from Mono Lake in the north and continues for 75 miles south. This part of California is considered to be a part of the Great Basin as it has no rivers that drain into the ocean instead the water empties into Owens Lake (Grayson 2011:12). The work conducted in the Owens Valley that lead to the subsequent excavation of Pinyon House, Two Eagles, and Crater Middens was started in 1971 as the "Owens Valley Project" that was meant to test the Desert Culture model that was first introduced by Jesse Jennings (Bettinger 1989:13). The desert culture was a term used to describe Native American life in the Great Basin from 8,000 BC all the way to contact with Europeans. The tenants held that subsistence gathering was intense, but unspecialised, that people practiced a "transhumant settlement pattern," and had small family units as opposed to large multi-family groups (Bettinger 1989:13). These excavations lead to the discovery of 10 (Figure 3.26) incised stones from Pinyon house (n=4), Two Eagles (n=3), and Midden Craters (n=3) (Bettinger 1989:77, 149, and 261).


A. B. C.
Figure 3.26: Incised stones from A. Pinyon House, B. Two Eagles, and C. Crater Middens (Bettinger 1989:77, 150).

Pinyon House

This site is located 20 miles east of the town of Big Pine resting between the White Mountain's and Inyo Mountain ranges, and had four (n=4) incised stones all with ground edges (Bettinger 1989:21). The site contained 14 structures that were classed as either standing structures (n=2), rock rings (n=5), or structural depressions (n=7), three of the incised stone were associated with structure 3, which is a structural depression (Bettinger 1989:28 and 77). An example of what the structures may have looked like is found in Figure 3.27. The structural depressions are considered to be house remains with a hearth that contained pinyon charcoal, and red-brown floors, that may be from the "ash, charcoal, decayed grass bedding, and other debris [embedded] into the underlying soil during occupation" (Bettinger 1989:32). Structure 3 (4.4 Meters N/S, 3.1 Meters E/W) probably had a gabled roof, evidence of the roof was found under the 7cm thick surface debris, and around the perimeter of the house is "21 pinyon stubs set 5 to 7 cm into the ground, all but one oriented to the east; apparently these are the remnants of burned beams" (Bettinger 1989:37).

Figure 3.27: A domed house with a rock foundation near to the Crater Middens Site. (Photo taken by E.S. Curtis in 1924 in Bettinger 1989:167).

The date of the site (1,490 to 1,581 AD) is obtained from the charred wall beams, and obsidian hydration rim measurements on flakes (Bettinger 1989:38). The date is consistent with the cottonwood triangular and Desert Side Notch projectiles points that were found in the fill above the house pit (Bettinger 1989:39). Three of the incised stones were found in this house structure (Bettinger 1989:78). Another incised stone was not associated with any structure and was recovered from the surface of the site, but all of the incised stones were edge ground, some more extensively than others (Bettinger 1989:78). These incised stones differ from incised stones from central Nevada in that the Pinyon House incised stones (and in fact Two Eagles and Midden Craters) have edge grinding where the central Nevada ones do not (Bettinger 1989:78). Finally, at the site is an incised ground stone that has a zigzag pattern (Figure 3.28) on the surface, part of the pattern has been ground out presumably while milling seeds[8] (Bettinger 1989:50). Bettinger suggest that the incised lines may have been a “decorative way to rejuvenate the grinding surface” (1989:50). Bettinger interprets the incised stones as being tied to “magicoreligious beliefs”, and that the edge grinding suggests that they were meant to be personal charmstones (Bettinger 1989:78). The site’s interpretation during

[8] The description of this incised stone is very similar to Morah Stones found in Australia (See Chapter 2).

the time the incised stones were deposited is as a pine nut harvesting camp, and pine nut processing and storage locale (Bettinger 1989:107).

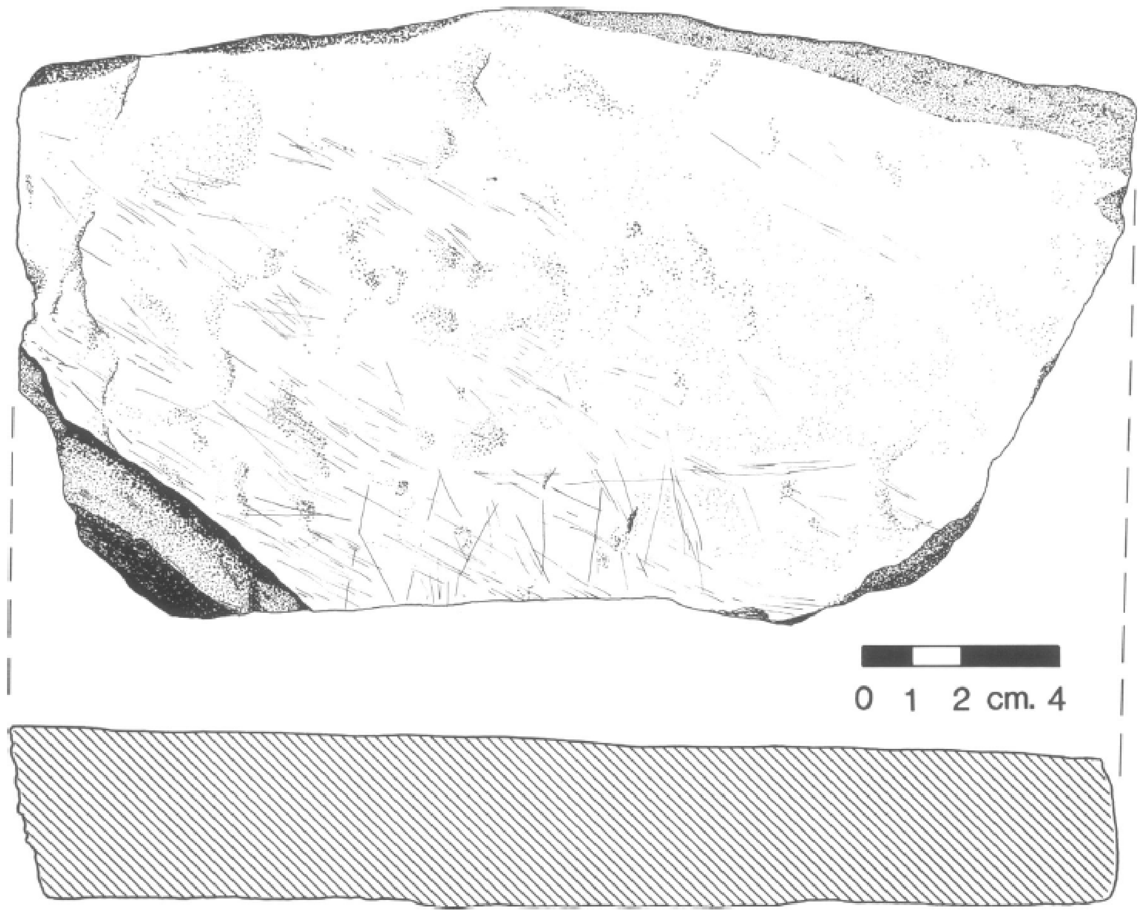


Figure 3.28: A milling stone with an incised surface of zigzags. Incising the stone may have been a way to rejuvenate the surface of the ground stone (Bettinger 1989:50).

Two Eagles

Two Eagles is an 8,400m^2 open air site that rests on a gentle hill slope that is in the rain-shadow of a nearby mountain range (Bettinger 1989:112). This site has very little depth and constituted nearly all surface collections within and around the 28 rock rings (Bettinger 1989:112). There are three incised stones found on site (Bettinger 1989:149). One incised stone[9] is associated with Structure 7 which may have been a lean-to "used as a work place or temporary shelter" (Bettinger 1989:149). The second incised stone is associated outside of Structure 10 which is one of the largest dwelling rock rings on the site (Bettinger 1989:100, 121, and 150). This incised stone was prepared by percussion and grinding along some of the edges and on both faces (Bettinger 1989:150). The last incised stone is not associated with any structures, and is questionable if the light scratches are natural or intentional (Bettinger

[9] There is no indicating as to how closely associated the incised stone is with structure 7, but it is clear that it was recovered from outside the rock ring.

1989:150). The remaining structures are pine nut caches, or snow basins meant to be used as drinking water (Bettinger 1989:149). There is not a direct interpretation for the incised stones at Two Eagles, but Bettinger (1989:78, 150, and 156) infers that like Pinyon House these incised stones are also a part of “magicoreligious beliefs” that were made between 600 AD and European contact (Bettinger 1989:78,150, and 156). Like the Pinyon house habitation two Eagles was also a habitation site that was meant to gatherer and process seeds from local plants that would take an extended amount of time (Bettinger 1989:163).

Craters Middens

Located between the towns of Big Pine and Independence, California is Crater Mountain that has many stream channels that go around its base. On the north side of the mountain along a stream channel is the site of Crater Midden (170 BC to 1,655 AD) that follows the banks of a stream channel for 500 meters (Bettinger 1989:165, 304). This stream channel is dry in contemporary times, but the area is prone to large earthquakes, and it is speculated that water flowed through the channel until an earthquake disrupted the flow of water (Bettinger 1989:165). The site is broken down into five separate midden areas, but the original recording of the site was done as if it was one large site (Bettinger 1989:166). Midden II (777m^2) is the largest midden in the site with ten stone rings, several bedrock mortars, and a pitted petroglyph boulder. Excavation in the midden uncovered one (n=1) incised stone 10-20 cm below the surface (Bettinger 1989:167, 260). Midden III (230 m^2) is smaller than Midden II, but contains a lot of surface artefacts including milling stone, and one rock ring (Bettinger 1989:168). One incised stone came from the surface of this location and is ground on the sides with light incised lines (Bettinger 1989:262). Finally, Midden IV is artefact sparse on the surface, but there are three bed rock milling stations with many milling surfaces on each boulder, and a rock wall alignment that is interpreted to be a sunshade foundation (Bettinger 1989:174). The one incised stone that was found on the surface has many random incised lines (Bettinger 1989:262). Like Pinyon House and Two Eagles the interpretation of the incised stones remained the same (Bettinger 1989:78,150, and 156). From this site 23 blank slates were found in context with post 1 BC deposits (Bettinger 1989:272). They may have been debris from the manufacture of incised stones or pendants, or were meant to be incised stones that were never made (Bettinger 1989:272). The site interpretation is that Crater Middens represents a change from a hunting locality, to a very intensive seed processing and long term settlement from 600 to 1,655 AD (Bettinger 1989:15, 325).

This discussion is included to highlight the use of Pinyon House, Two Eagles, and Crater Middens. The incised stones are interpreted to be a form of magic that is connected to some sort of religious belief (Bettinger 1989:78,150, and 156). There is an incised milling stone from

Pinyon House that is thought to have been a functional way to refresh the milling surface. There is a similarity to the description of the 'morah stones' in Australia (see Chapter 2). The three sites are 16 kilometres apart, and it is possible, ignoring topography, that there was some sort of functional relationship that existed at the time of their use (Bettinger 1989:328). While it is impossible to know if the hunter-gatherer groups knew each other, and used each site, it is clear that there is an intensive gathering of seeds for processing principally in the late prehistoric occupations (600 AD to historic times) (Bettinger 1989: 15, 328, 330, and 345). During this time these sites were used as settlements or extended stay locales during the gathering and processing (Bettinger 1989: 30, 162). Bettinger suggests that with longer settlements, a large group probably meant there was more resources, and that a more intensive and directly concentrated area of craft work took place somewhere on the site; inversely a smaller group, would have left a smaller footprint behind of craft working (Bettinger 1989:162). In both cases the craft area would take place outside of the home. With small groups the craft area may have been closer to the house and could account for a smaller scatter of chipped flakes, and the larger groups would have made the crafting area further from the home, and left a much larger debris field (Bettinger 1989:162).

The Panamint Mountain Site

The Panamint Mountain site is located in Inyo County, California within the Panamint Range in the Pleasant Canyon basin (Figure 3.29, Ritter 1980:97). The site consists of a conical structure of 80 pinyon logs placed at an incline onto two forked centre post, with an 8 to 45 meter artefact scatter around the structure (Ritter 1980:98, 109). The artefacts in association include milling stones, a chalcedony flake, modified tin cans, metal buckets, and various wire and nails which dates the site to the early 1900s (Ritter 1980:103). On the surface of the site are four incised stones made on green slate (Ritter 1980:105). One of the incised stones with zigzag designs was found in the doorway of the structure and appears to have been the most recent incised stone made on the site (Ritter 1980:103). Another incised stone that is associated with groundstone, metal strapping, and a cairn is broken into three pieces and placed close together northeast of the structure (Ritter 1980:102, 103). The third and fourth incised stones are located southwest of the door and are associated with a 5 gallon modified can that is a possible stove, and a lard bucket. The incising on one is cross hatching, and the other is two lines crossing each other (Ritter 1980:102,103, 107). The incised stones are interpreted to be magicoreligious, with no further interpretation offered (Ritter 1980:109). The site is interpreted to be a camp meant for extended stays possibly for the collection of pine nuts, but possible as a camp for workers at a nearby mine that was last opened in 1908 (Ritter 1980:110).

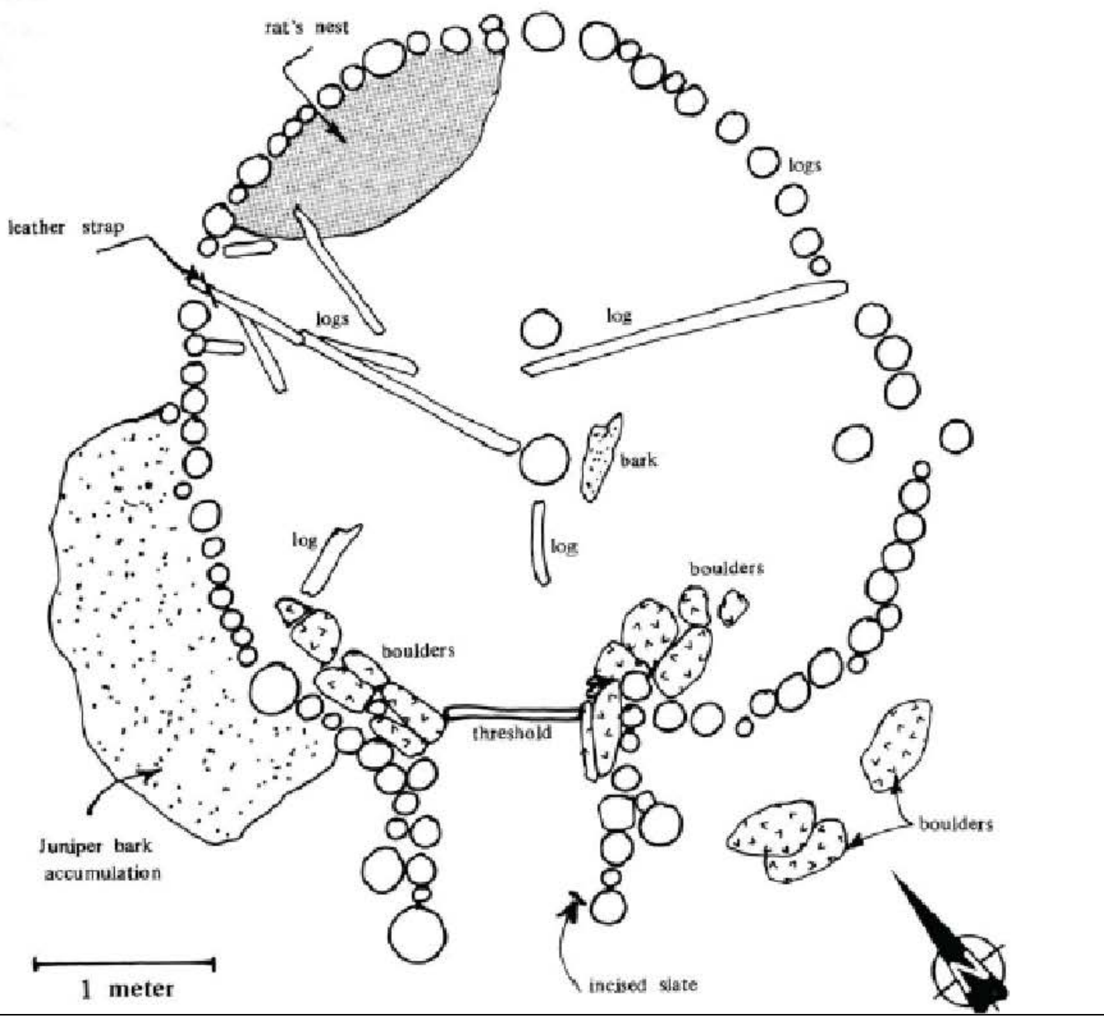


Figure 3.29: The Panamint Mountain site. Top: Photo of structure. Below: Plan map of structure (Ritter 1980:98 and 99).

Conclusion

The earliest publication that discusses incised stones in North America occurred in 1875 in a Smithsonian Institute publication by Charles Conrad Abbott (1875:330). Since that time there has been a slow but steady increase in the reporting of incised stones across North America. Throughout this literature review there have been many interpretations (Table 3.5) of incised stones, each one having a sometime subtle meaning.

Incised Stone Interpretation	Citation
Possible Pendent	(Abbott 1879:208, Lenik 2009:152)
Possible Breast Plate	(Abbott 1875:331)
Ceremonial incised stone meant for burials	(Lenik 2009:154)
Personal Guardian Spirit	(Lenik 2009:155)
Good Luck Charm	(Lenik 2009:157)
Ceremonial Mace	(Lenik 2009:163)
Decorated Pestle	(Lenik 2009:163)
Calendar or Tally	(Lenik 2009:164)
Depictions of mythological spirits	(Lenik 2009:159)
Depictions of ceremonial regalia	(Lenik 2009:217, Townsend 1959:55)
Maps	(Moorehead 1931:49, Lenik 2009:162)
Cultural affiliation symbols	(McGuire 1989:D.43)
Rock Art substitutes	(Thomas 1983d:350)
Sharpening Platforms	(Thomas 1981:2, Harrington 1933:139)
Aesthetics	(Mock 1971:61, 134 and 154)
Menstrual taboos, or cult activities	(Hull and White 1980:122, Newcomb 1976)
Design Grammar	(Klimowicz 1988:103)
Expressions of gratitude or request for future help	(Santini 1974:13)
Magicoreligious beliefs	(Bettinger 1989), (Ritter 1980:109)
Crisis Art	(Lee 1981:58)

Table 3.5: Interpretations of incised stones throughout the North American literature review.

Rarely are the incised stones discussed with their contextual relationships to associated artefacts or features. The sites that do mention context (Table 3.6) are linked to residential sites, food processing or tool fabrication, and an instance of burial. The themes of research from the world (Chapter 2) included: classification systems, ethnographic approaches, artefact biographies, and interpretation. In the North American literature review there are some differences; such as, none of the sites have been interpreted using artefact biographies. The east coast of North America uses ethnography, such as the sites of Indian Hill, Massachusetts or Ox-Bow, New Hampshire (Lenik 2009), California and the Great Basin do not (with the possible exception of the Chumash). Work that has aimed to classify incised stones has looked at aesthetics (Mock 1981), design grammar (Klimowicz 1988), and crisis art (Lee

1981). The most common theme in North America and the Great Basin is interpretative. Overall, there may be more contextual approaches used in the Great Basin than anywhere in the world, although contextual approaches are found globally, most often in desert regions. The type of site (Table 3.7) in which the incised stone rest is also described in some, but not all, of the reports on incised stones.

Contextual Associations	**Citation**
Grinding equipment and burnt nutshells.	(Lenik 2009:152)
Obsidian flaked tools, bifaces, spalls, and cores	(McGuire 1989:D.36)
Activities occurring inside or outside of households	(Bury et al. 2004:7-55)
Inside or adjacent to the home	(Bettinger 1989)
Burial	(Lenik 2009:154)
Metal can modified into a stove, and a lard bucket	(Ritter 1980:102,103, 107).
Groundstone, metal strapping, and a cairn	(Ritter 1980:102, 103).
Entrance to structure	(Ritter 1980:103)

Table 3.6: Contextual associations that incised stones have with other artefacts.

Type of Site	**Citation**
Village Occupation	(Sutton and Schneider 1996:38)
Settlement	(McGuire 1989)
Small multi-purpose campsite	(Sutton 1987:138)
Camping Site	(Sutton 1991: 46)
Short term camping locality	(Sutton 1991: 68)
Principle residential base	(Bury et al. 2004:7-54; Glassow 1996:117)
Gathering-hunting base	(Nauta and Janetski 2006:83)
Extended stays and settlement	(Bettinger 1989)
Large Midden	(Lenik 2009:163)
Campsite	(Ritter 1980:110)

Table 3.7: Types of sites that incised stones were discovered.

This is not an exhaustive literature review of North America. Incised stones from Canada were not found, although the Artic region is represented by incised stones from Alaska. Mexico is included in Chapter 2. Additional incised stones from the Great Basin not mentioned in the text are listed in Table 3.8, including surface finds. These other sources were not included because of the brevity of discussion or the complete lack of information which is the case in many of the private collections mentioned. Incised stones recovered from prehistoric settlements or extended stays are a reoccurring theme in the Great Basin, and is discussed by Bury, et al. (2004) in the Vandenberg sites.

dditional Incised Stones in the Great Basin		
Red Rock Canyon Rockshelter (n=3)	Mojave Desert, California	(Sutton, Bury et al. 2004, Gardner 2009:63)
Danger Cave (n=1)	North West Utah	(James 1983)
Douglas County (n=1)	Douglas County, Nevada	(Tuohy 1967:7)
Lockout Shelter (n=1)	Near Mormon Peak, southern Nevada.	(Green 1983)
K.K. Miller Collection (Unknown Number)	From Various Sites in Clark County, Nevada.	(Tuohy 1967:7)
Kay Johnson Collection (Unknown Number)	From Various Sites around Pyramid Lake	(Tuohy 1967:7)
Etna Cave (n=1) incised stone	Southern Nevada	(Wheeler 1973:37)
Bootstrap (n=31)	North Central, Nevada	(Stroh 1996a:101)
Rodeo Overlook (n=8)	North Central, Nevada	(Stroh 1996a:171)
Round Mountain Camp (n=9)	North Central, Nevada	(Stroh 1996a:235)
26-EK-5278 (n=1)	North Central, Nevada	(Stroh 1997:17)
26-EK-5271 (n=24)	North Central, Nevada	(Stroh 1996b:A1)
26-EK5270 (n=1)	North Central, Nevada	(Stroh 1996b:A1)
26-EK-1530 (n=2)	North Central, Nevada	(Stroh 1996c:454)
26-EU-1734 (n=2)	North Central, Nevada	(Stroh 1995:333)
26-EU-1320 (n=4)	North Central, Nevada	(Stroh 1995:442)
The Yaha Site (n=9)	North Central, Nevada	(Fond and Jones 1995:64)
26-CK-2457 (n=3)	Southern Nevada	(Richens and Billat 1989)
Bee Cave (n=1)	Southern Nevada near Mormon Peak.	(Harrington 1930:2)
Big Springs Ranch (n=1)	North Central, Nevada	(Stoner, Mehls, and Rusco 1997)

Table 3.8: Incised stones from the Great Basin not discussed in Chapter 3.

Some of the sites discussed in this review will be reconsidered in later chapters as the results of my detailed contextual approach are discussed. The sites that I am studying are Camels Back Cave, Hogup Cave, Swallow Shelter, Gatecliff Shelter, and Ruby Cave. The monographs consist of discussions restricted to designs on the stones, with the exception of Trudy Thomas (1983b), none have interpreted the incised stones. However, Klimowicz methodology utilizing a design grammar is very well organized and could be applicable to a large number of incised stones from different areas in the Great Basin and the world. I will return to the issue of design grammars in Chapter 8; however, in the next chapter, the Great

Basin's climatic history from the end of the Pleistocene to contact with the Europeans will be addressed. This chapter will also have a synopsis of what is known of the prehistory of the Great Basin from current research of theory and models.

Chapter 4: Environment and Archaeology of the Great Basin

Introduction

In order to understand the context of incised stones in the Great Basin, it is necessary to understand the archaeology and long term changes in this vast region. This chapter sets out to familiarize the reader with the environmental changes and archaeological material culture differences through more than 10,000 years of hunter-gatherers. The archaeological record begins during the Pleistocene with some of the earliest known sites on the shore lines of now extinct lakes. The environmental and climate change from the Pleistocene to the late Holocene happened in a series of transitions. The climate history is dramatic with evidence that suggests major hydrological changes across landscapes, from massive Pleistocene lakes to dry sandy valley floors. Through the early, middle and late Holocene there is a measurable difference in the material culture. The different archaeological periods are visible through projectile point typographies.

The Great Basin landscape (Figure 4.1) is predominantly a high desert punctuated with north-south trending mountain ranges that rise above a series of valleys. There are 32 mountains that are above 10,000 ft. and many that are nearly that tall (Grayson 2011:13). The average valley floor elevation from all across the Great Basin (n=34 valleys) is 4,534 ft. (Grayson 2011:18). The plant communities are indicative of a high desert and range from the sagebrush communities (Figure 4.2) to the juniper / pinion forests.

Figure 4.1: The Great Basin boundary and topography (After Flashearth 2015).

A.

B.

C.

Figure 4.2: Landscape and environment of the Great Basin – Sagebrush communities. A: A field of California poppy, a native species, near Lancaster California (the furthest southwest manifestation of the Great Basin). B: Northern Nevada near Winnemucca, Nevada. C: Unnamed stream in Northern Nevada near Elko, Nevada (Photo Credit: Melonie Shier).

Pleistocene/ Early Holocene Transition (8,000 to 5,500 BC)

The end of the Pleistocene and the start of the Holocene is an arbitrary date of 8,000 BC or 10,000 years ago, that was settled upon by the Holocene Commission of the International Quaternary Association in 1975 (Hopkins 1975:10). During the Pleistocene, the Great Basin looked very different from what it does in modern times. Lake Bonneville (Figure 4.3) and Lake Lahontan filled much of the Great Basin; today, much of the valley floor is dry and filled with vegetation and sand (Rhode 2008:19). These lakes were pluvial meaning they were created by rainfall (Flint 1963:124), but at the end of the Pleistocene less rain meant that the lakes began to evaporate (Rhode 2008:20). Throughout this period lake levels rose and fell (Rhode 2008:20).

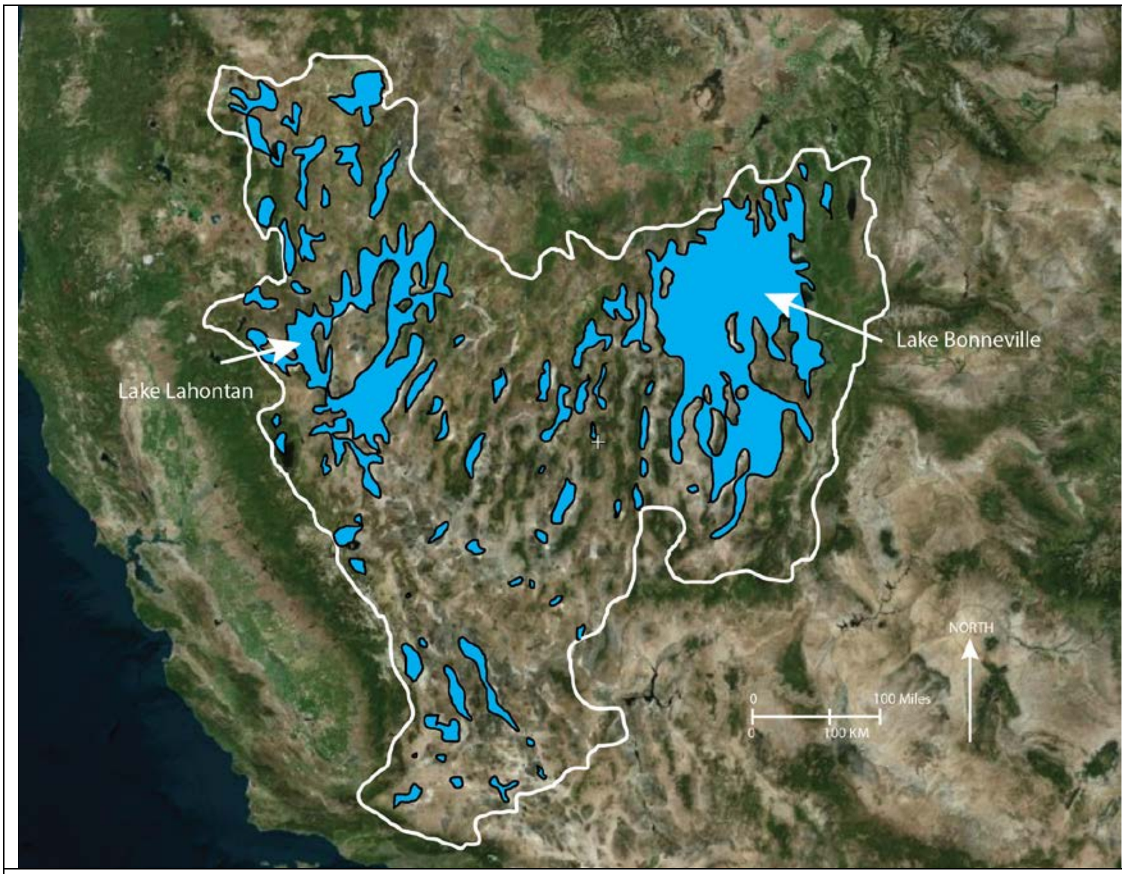


Figure 4.3: Hydrology of the Great Basin during the Pleistocene with Lake Bonneville and Lake Lahontan highlighted as the two largest lakes (After Flashearh 2015, Morrison 1991).

As the early Holocene came into existence at 8,000 BC, the environment was warmer and drier than the Pleistocene, which caused the extinction of not only lakes, but also flora and fauna (Rhode 2008:20). Work done by Haynes and Quade in the Las Vegas area show that the dry valley of today was a very different place at the transition in epochs (Grayson 2011:218). At the time of transition the once high water table that fed many small ponds and marshes fell leaving only some of the marshes surviving, yet even they were not to last and were

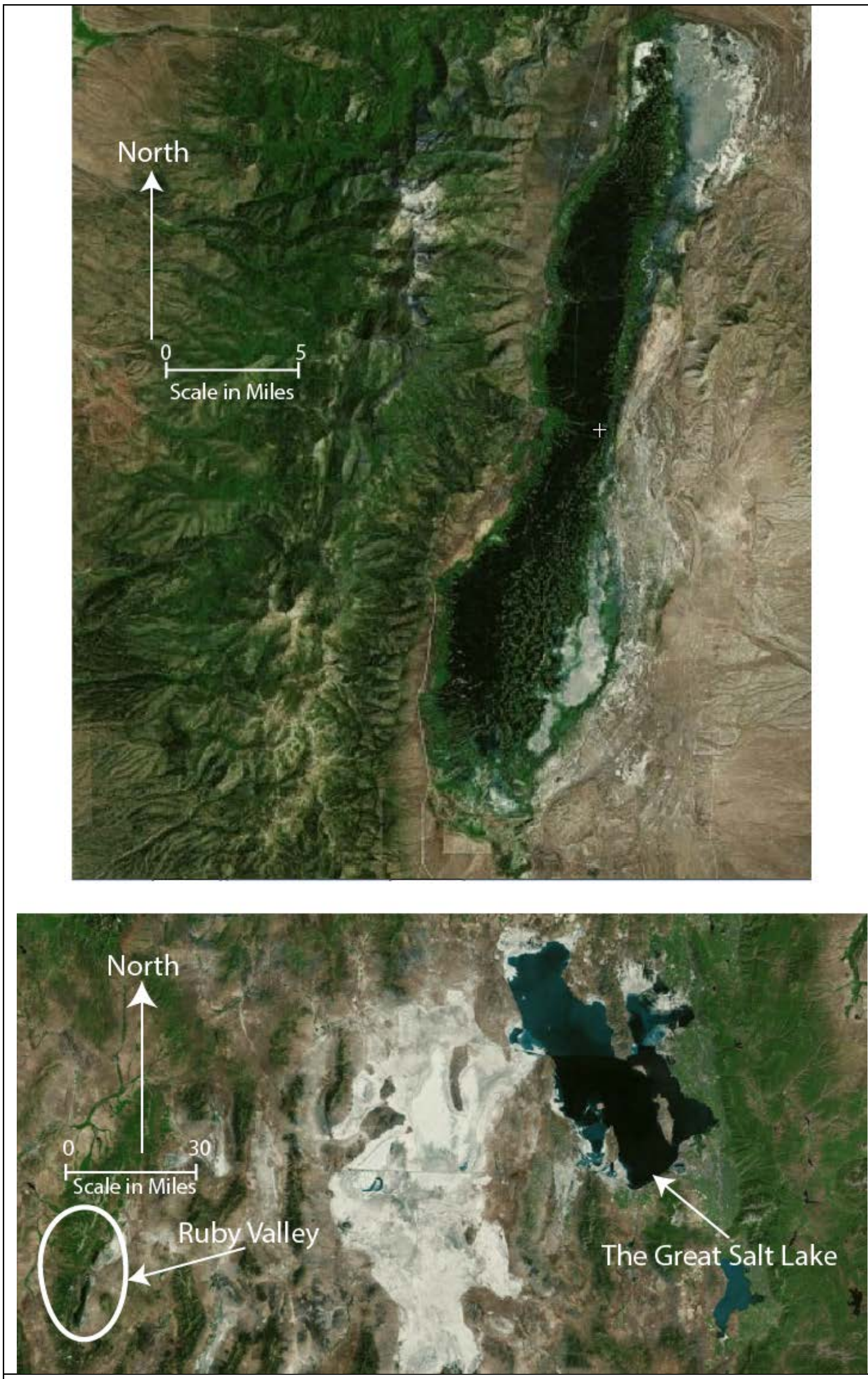


Figure 4.4: The Ruby Valley. Above: A close-up of the Ruby Valley where Ruby Cave is located. Below: Ruby Valley shown in relation to the Great Salt Lake (After Flashearth 2015).

completely gone by 5,200 BC (Grayson 2011:218). In the Owens Valley, California, the Lake levels that were overflowing at 8,750 BC fell and rose many times during the transition only to finally settle at 6,300 BC to what is now a dry or nearly dry lake bottom (Grayson 2011:219,Orme and Orme 2008). At Camels Back Cave, the conditions are very dry and hot, but at 8,000 BC, Lake Bonneville filled this area with so much water that Camels Back Cave was underwater (Schmitt and Madsen 2005:5). About 6,500 BC the area had dried out a great deal leaving behind numerous stream channels that fed massive wetlands that were used by the prehistoric peoples (Oviatt, Madsen and Schmitt 2003:208). In Northern Nevada, Lake Lahontan was another massive pluvial Pleistocene lake that covered a large percentage of the land between separate basins (Grayson 2011:220). In this area the lake level rose and fell many times during the transition between epochs, and at times many separate lakes formed between basins (Huckleberry et al. 2001:310, Madsen and Berry 1975:398). In the Ruby Valley (Figure 4.4) the lake rose and fell only to become a marsh by 6,700 BC, but by 4,730 BC the Ruby Valley had dried up (Thompson et al. 1990, Thompson et al. 1992). To conclude, the Great Basin went from a wet and cool environment to become a dry and warm environment during the Pleistocene to Holocene transition. The population was very sparse during this time as there is little evidence of archaeological sites throughout the Great Basin (Thomas 2014:136)

Middle Holocene / Altithermal (5,500 to 2,500 BC)

The Altithermal is the name given to the time period of 5,500 to 2,500 BC by Ernst Antevs in 1948 (Beck and Jones 2007:48). Antevs used lake varves to determine the warmer climate of the Great Basin during this time. A varve is lake sediment of alternating course gravels and fine grain sand, which deposits during ice melt. The thickness of the varve is measured to determine a climate chronology (Mehringer 1986:31, Delany 2007:154). Using this Antevs estimated that this period of time was hot and dry and essentially 3,000 years of drought (Beck and Jones 2007:48). The term Altithermal is still in popular use in the Great Basin; however, the 3,000 years of severe drought with high temperatures as Antevs understood is not the same picture that we have today. There were higher temperatures overall with repeated drought and brief periods of wetness (Simms 2008:94, Hemphill and Larsen 1999:221).

A lot of the massive Pleistocene lakes and mashes dried up during this time including the disappearance of the Ruby Mashes in north east Nevada at about 4,800 to 2,500 BC (Grayson 2011:245). The Humboldt river, that flows year round today and is normally fed by ice melt and natural springs dried up and Lake Tahoe which is more than a mile deep dropped nearly 13ft. allowing trees to grow on the ancient shore line (Simms 2008:77, 95, Grayson 2011:220, 245, 248). Water became scarce and consistently hot temperatures meant the populations of artiodactyls (hooved land mammals) in particular shrunk along with vegetation zones (Byers and Broughton 2004:238). At different points during the Altithermal the artiodactyl populations grew and shrunk as is evidenced from scat droppings found inside Homestead Cave (Byers and Broughton 2004:241). It is during this time that logistical hunting flourished as a system of male hunting away from a base camp (Thomas 2014:136). As well

Figure 4.5: Landscape and environment of the Great Basin – Ruby Marshes. Note the cattail growing along the water's edge (Photo Credit: Melonie Shier).

bristlecone pine trees, a source of prehistoric food, was available in higher elevations (Byers and Broughton 2004:238).

Late Holocene (2,500 to Present)

At about 2,500 to 1 BC temperatures started to cool down into what is often referred to as the Neo-Glacial Period (Simms 2008:91, Hemphill and Larsen 1999:221). This cooler period, with its increase in rain fall and decrease of evaporation rates, is responsible for refilling most of the Pleistocene lakes in the Great Basin, and proliferating the size of wetlands (Simms 2008:91, Hemphill and Larsen 1999:221). The Ruby Marsh in Ruby Valley that is associated with Ruby Cave began to refill (Figure 4.5) and support an animal population (Kieffer 1961:6). During this time artiodactyls such as mule deer, bighorn sheep, and pronghorn became more abundant (Byers and Broughton 2004:238). One species of note is that of bison.

Bison are a grass dependent species and could not withstand a long period of dryness with increased heat (Grayson 2008:16). Bison remains are found in the Late Holocene that indicates there must have been a substantial amount of wetness in order to sustain this land animal (Dalley 1977:66, Thomas 1983a:127, Durrant 1970:242). Within this time frame are particular periods of notable climate change such as the Neo-Glacial Drought and the Medieval Climatic Anomaly. It is also during this time period after the Neo-Glacial drought that logistical hunting stopped, instead of having base camps that hunters left from, the whole family unit traveled together to the caves and rock shelters or high altitude site (Thomas 2014:138, see gender this chapter).

Neo-Glacial Drought (500 BC to 100 AD)

This drought is thought to be responsible for the depopulating of the central Great Basin as the water levels at all of the lakes receded and spring water flow decreased (Thomas 2014:138). The salinity of the lakes probably became too high “for human consumption”, and as shown in pack-rat middens vegetation diversity was very low (Thomas 2014:138). The dry hot conditions most likely caused huge wildfires, that after their abatement, allowed more drought resistant species of plants to grow (Thomas 2014:138).

Medieval Climatic Anomaly (350 to 1,350 AD)

This period of time was first pieced together by British climatologist Hubert Lamb who spotted a time when the planet became warmer. He called it initially the Medieval Warm Epoch and is known today as the Medieval Climatic Anomaly (Lamb 1965:13). In the Great Basin this period is noted by a drop in lake levels, less snow pack, yet an increase of summer time rainfall (Thomas 2014:140). Summer rains is evidenced from owl pellet remains with increased fish, and bristlecone pine tree rings that suggest that the tree propagation at high altitudes were higher than historically recorded (Simms 2008:88). The summer rainfall probably supported a large plant population that made it possible for increased populations of Bison, and other artiodactyls to thrive (Thomas 2014:140).

Little Ice Age (1,400 to 1,900 AD)

The Little Ice Age was coined by the geologist François Matthes in 1939 after studying the return of glaciers during the later Holocene (Grayson 2011:264). This period contrasts with the Medieval Climatic Anomaly in that it is cooler and wetter. Yet, the tree ring data for the Great Basin indicates that within the Little Ice Age there was fluctuations in the temperatures, the amount of precipitation, and that more water fell during the winter and was locked in as snow pack until spring run-off (Simms 2008:85). Across the board, lakes rose and many wetlands were swallowed by the waters moving to high stands (Simms 2008:85). Pinion-Juniper woodlands started to grow in more places.

The Archaeological Record through Time

The climate changes that have taken place in the Great Basin (Figure 4.6) from the Pleistocene to the end of the prehistoric period are discussed above, and contextualised in relation to incised stones in Chapter 6. Just as important as it is to understand the substantial changes over time in climate, so too is the material culture of the Great Basin hunter-gatherers. From the early Clovis culture to contact with the Europeans, the morphology of projectile points, the use of atlatls, and introduction of the bow and arrow are some of the technological changes that are represented in nearly 10,000 years of Great Basin archaeology. The discussion to follow introduces six different time period where the archaeology is measurably different from one another. This will provide a material culture context for the Great Basin for later analysis.

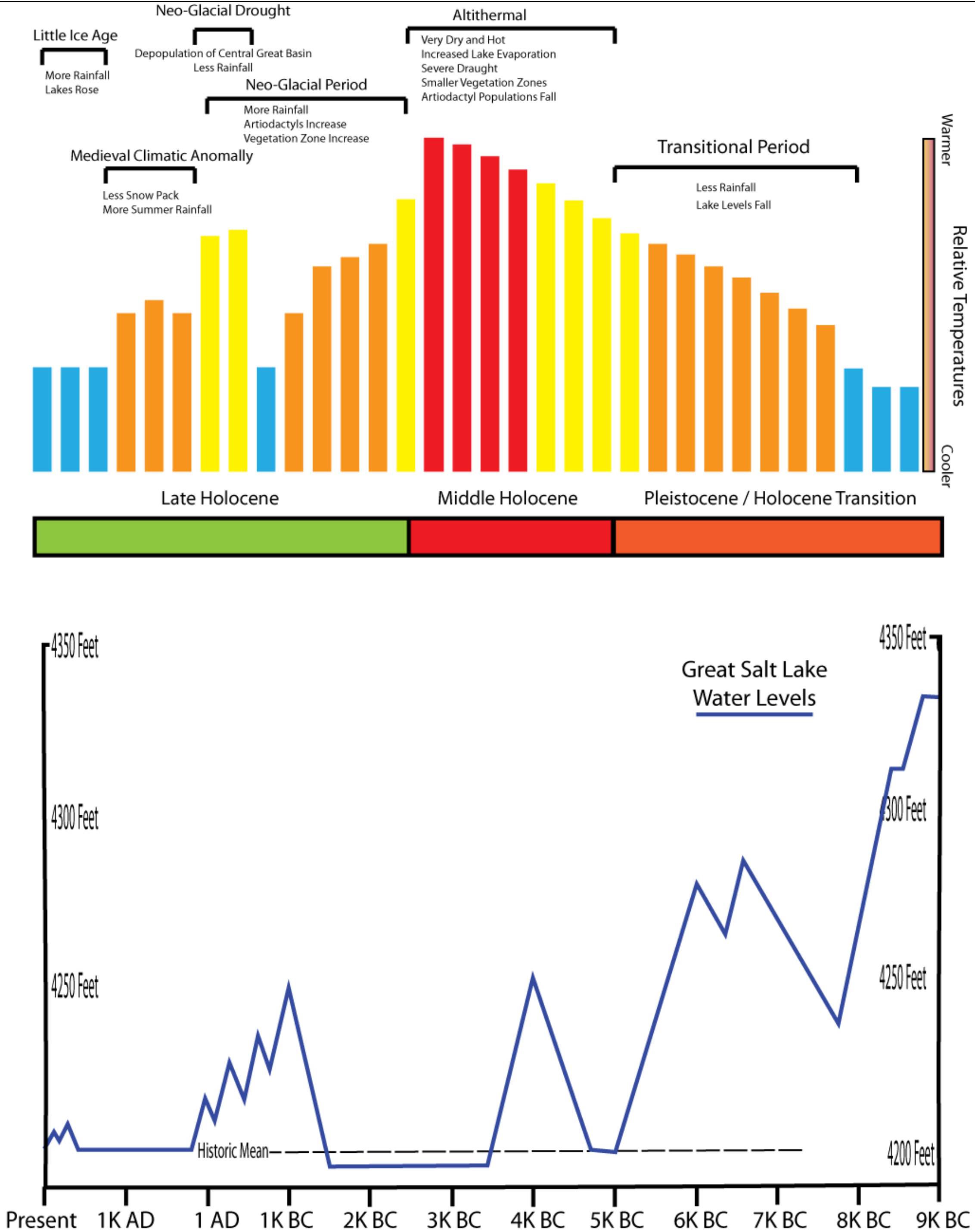


Figure 4.6: Great Basin temperatures, lake levels and trends through time (After Madsen and Berry 1975:398). The temperature chronology and climate history is as mentioned in the text.

Pre-Clovis (12,000 BC and Earlier)

Pre-Clovis sites are sites dated older than 12,000 BC (Justice 2002:70). Pre-Clovis is a time in North American that predates the Clovis culture, defined mainly from a projectile point type explained in more detail below. The best example of a pre-Clovis site in the Great Basin is at Paisley Caves in Oregon. Paisley Caves is described as several caves along the bottom of a basalt rock outcrop (Grayson 2011:62). Originally excavated in 1932 by Luther Cressman, Paisley Caves bore artefacts that are associated with extinct Pleistocene horse and camel (Aikens 2008:30, 31, Hockett et al. 2008:37). These finds came below a layer of ash that was deposited from the eruption of Mount Mazama at 5,677 BC (Zdanowicz et al. 1999:1). At the time of discovery, radiocarbon dates were not available and Mount Mazama's eruption was only suspected to have been between 2,000 and 8,000 BC, thus the claim of a an early arrival of humans in North America and for that matter the Great Basin, was highly suspect and often rejected by scholars (Aikens 2008:31). In 2002, 10 years after Cressman's death, excavation continued by Dennis Jenkins from the University of Oregon (Grayson 2011:62). These excavations clearly established the archaeology with coprolites that dated between 10,260 to 10,400 BC (Grayson 2011:63).

Additional sites within the Great Basin that may have has Pre-Clovis occupations include Fishbone Cave, Fort Rock Cave, and Smith Creek Cave (Hockett et al. 2008:37). Outside of the Great Basin there are two sites that have pre-Clovis dates Monte Verde in Chile and Meadowcroft Rock Shelter in Pennsylvania. The Monte Verde site has radiocarbon dates that place it within 10,800 to 9,800 BC (Simms 2008:106). Meadowcroft Rock Shelter is located along the Ohio River and has similar dates to Monte Verde (Simms 2008:106). Still there are other sites such as Paige-Ladsen in Florida and Catus Hills in Virginia that are probably pre-Clovis (Beck and Jones 2012:23).

Clovis Culture (12,000 to 9,000 BC)

Clovis refers to a projectile point type in North America, so called because of the original finding of fluted projectile points in Blackwater Draw near Clovis, New Mexico (Justice 2002:67). The Clovis point was found lodged in the leg bone of an extinct mammoth (Justice 2002:67). These projectile points are distinct in shape. They are fluted points (Figure 4.7) that can be between one and four inches tall with concave bases (Justice 2002:67). The sides of the points just above the concave base are almost always ground as to make them dull, most likely to prevent the sinew or other wrapping from cutting through (Justice 2002:67).

The Clovis culture is associated with the hunting of large mammals that are now extinct, such as mammoth (Grayson 2011:78). Other artefacts that are associated with the

Clovis are long narrow blades and flakes that were struck off cores, with bone and wooden tools common (Simms 2008:111). There is groundstone present during the Clovis times, but it is found rarely (Simms 2008:111). This may be because seeds that took a lot of processing time were not needed as a major food staple (Simms 2008:111). Food storage does not appear to have been a major survival technique during Clovis times, suggesting that the Clovis people were not tethered to landscape and could rely on multiple resources throughout the year (Simms 2008:111). One noted behavioural activity is that of making caches of non-food items. These caches may have been “resupply depots” (Meltzer 2009:252) that served as reassurance since Clovis people may have been new to the landscape and did not know the distance to the next resource (Beck and Jones 2007:47).

One good example of a Clovis site in the Great Basin is the Lime Ridge Site near Bluff, Utah (Simms 2008:124). This site was a camp with associated blades, spears, scrapers, debitage, and stacked rocks interpreted to be hiding places while hunting (Simms 2008:124). There are still more sites in the Great Basin that are Clovis such as the Montgomery site near Green River Utah, Wilson Butte Cave near Twin Falls, Idaho, Danger Cave near Wendover, Nevada, and the Sunshine Locality near Ely, Nevada.

Folsom Culture (8,800 to 8,200 BC)

Jesse D Figgins was the director of the museum of Natural History in Colorado, and was the first to name the Folsom Culture after excavating at the Folsom Station site in Folsom, New Mexico (Wormington 1946:75, 76). This site was excavated in 1926, however Figgins was not an archaeologist himself, so he called in the help of Dr. Barnum Brown, Dr. Frank Roberts, Jr, and Dr. A. V. Kidder, who were prominent archaeologist at the time (Wormington 1946:76). Through their combined efforts they announced the finding of a fluted point lodged in an extinct bison (Wormington 1946:76). The Folsom culture is characterized by a change in how the projectile points are made and how they are associated with bison which is a shift away from mammoth kills that have been so often applied to the Clovis subsistence (Grayson 2011:79).

In the Great Basin Folsom points are confused with Clovis points all the time, because they are both fluted (Grayson 2011:289). This is further complicated by a lack of datable sites that have fluted points. To combat this problem Beck and Jones took detailed measurements on several projectile points in the Great Basin, and compared them to classic Clovis points (Beck and Jones 2007). The results showed that Great Basin Folsom fluted points are “shorter, thinner, and have a wider and deeper base” (Grayson 2011:289). There is another problem within the Great Basin concerning fluted points, there is not a single buried Folsom site to produce datable materials to date the fluted points (Grayson 2011:292). Therefore there is no way to confidently say if fluted points in the Great Basin date to the Folsom period. On the other hand there have been dated Clovis sites, as mentioned before. What is available to date fluted points is numerous surface finds of fluted points along extinct lake shores, namely Lake Bonneville and Lake Lahotan (Aikens and Madsen 1986:155).

Early Holocene Archaeology (9,200 to 5,500 BC)

During the 1930s Elizabeth and William Campbell began surveying the ancient shorelines of Lake Mojave (Grayson 2011:292). Their theory was that if they surveyed ancient shorelines then they would find ancient artefacts (Grayson 2011:293). During these surveys they found some stemmed projectile points. Radiocarbon dating was not available in the 1930s, but after consulting with Ernst Antevs, who was famous for identifying the Altithermal phase during the middle Holocene, Elizabeth and Campbell concluded in 1937 that the points may date to as long ago as 13,000 BC (Warren and Crabtree 1986:184, Grayson 2011:293). With the expert advice of Antevs, the Campbell's named their sites and the points they found in them, as belonging to the Lake Mojave Culture (Warren and Crabtree 1986:184). Later radiocarbon dating dates the Lake Mojave Culture between 9,200 and 5,500 BC in the Great Basin, but in the range of 8,100 to 6,400 BC in the Mojave Desert (Warren and Crabtree 1986:184). The Great Basin Stemmed Points that were found, were classed into two different types: Lake Mojave and Silver Lake (Justice 2002:85). The Mojave Lake points are longer than the Silver Lake ones, with the stem often making up half or all of the entire body (Justice 2002:86, 98). The crescents, or what was originally called "crescentic stones," are usually one or two inches long and have the front and back edges in the mid-section dulled (Grayson 2011:293). Humboldt series projectile points have a long distribution that start 6,000 BC to 600 AD (Justice 2002:156). The Triple T Concave Base is thought to be a variation of the Humboldt (Justice 2002:83, 157).

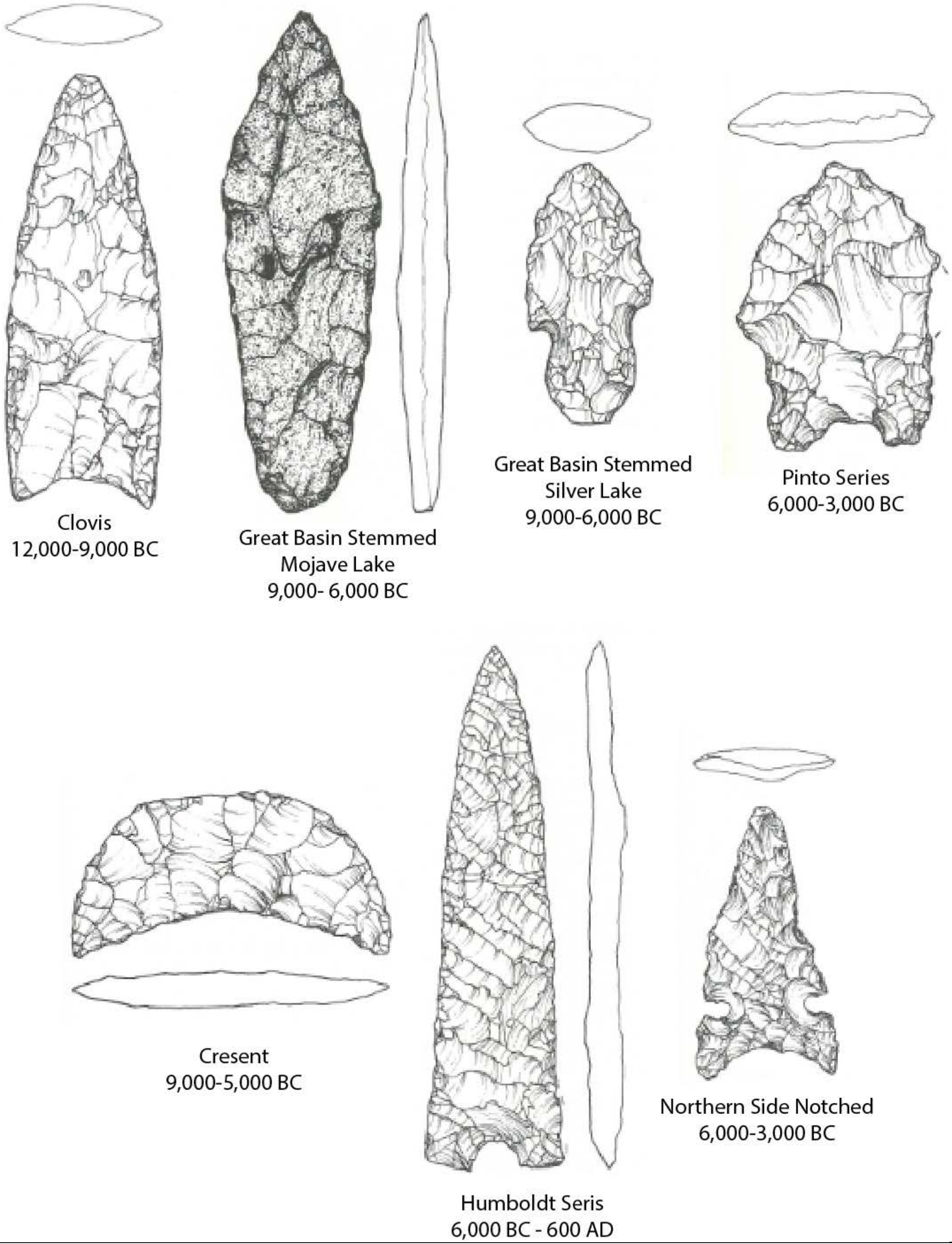


Figure 4.7: Great Basin projectile points (12,000 to 3,000 BC) mentioned in the text (Images and dates from Justice 2002:67, 69, 87, 88, 117, 127,151, 171).

Middle Holocene Archaeology (6,300 to 2,500 BC)

Robert F Heizer developed a naming system for projectile point types (Grayson 2011:307). The two part naming system first uses the name of the site where it is first recognized and dated, and the second name of the point represents some sort of manifestation or attribute of the morphology of the point (Grayson 2011:307). An example would be Elko Eared projectile points, so named because these point were originally typed in Elko County and eared because the tangs are long and rounded which resembles rabbit ears (Heizer and Baumhoff 1961:128, Justice 2002:298). The only two points that were in use during the whole of the middle Holocene were the Northern Side Notch and the Pinto (Justice 2002:134, 173, Jennings 1986:117). The Northern Side Notch point is dated to 5,300 to 2,500 BC, and is primarily found around the Columbia Plateau which is the northern most extent of the Great Basin in Oregon (Justice 2002:134, 173). These points are about one and half inches long with notches on either side of the point just above the base (Justice 2002:168). The Northern Side Notch has been found as far south as Camels Back Cave in Utah (Elston 2005:112). Pinto points were first identified at the Pinto Basin Site in Joshua Tree National Forest in the 1930s and date to 3,000 to 2,000 BC (Justice 2002:135). These points are found mostly in southern Great Basin, either to the west or east, but are known to appear in Hogup Cave (Justice 2002:137, 139). Unlike the other projectile points that have been used with atlatls, the Pinto points are thought to have been attached to spears (Grayson 2011:312). The projectile points during the middle Holocene are characterized as having been used with atlatls (Grayson 2011:312). A good example of direct evidence of this is from Hidden Cave where Elko points were found in situ still hafted to atlatl darts (Grayson 2011:309).

The projectile point chronologies and morphology are not the only markers of the middle Holocene. To begin with, most of the sites during the middle Holocene are located near current or now extinct dependable sources of water or open marshes (Aikens 1970:1, Dalley 1977:7, Janetski 2007:1). The sites are also marked by the increase use of ground stones (Cressman 1986:120, Elston 1986:141, Aikens and Madsen 1986:155). The increase of ground stone use is thought to be a response to the higher temperatures in the Great Basin that left many resources that were available during the early Holocene, deficient during the middle Holocene (Grayson 2011:302). Thus, there was a great dependence on seed processing to obtain subsistence.

It is also during this time that the first houses appear in the archaeological record. Danny King who was visiting a site in Surprise Valley, which is located in the north western Great Basin, had his dog with him when it jumped into the natural hot spring and died instantly from the high temperatures, the site thereafter was named the King's Dog site (Grayson

2011:303). The King's Dog site was excavated by Jim O'Connell in the 1960s and a series of five house floors were discovered with the second deepest house floor dating to 3,640 BC (James 1983:158 Grayson 2011:303). The dimension of this house was about 25 ft. across and 2.5 ft. deep with a central hearth (Grayson 2011:303). Around the hearth were posts holes which would have supported a roof with the entrance, which was a sloping ramp, facing to the east (Grayson 2011:303). It is thought that these sturdy robust houses were made for winter encampment (Grayson 2011:314).

Late Holocene Archeology (2,500 BC to present)

The archaeology of the late Holocene is characterized as the time period when population seemed to grow fast, and many previously unoccupied caves and rock shelters were used for the first time (Cressman 1986:120, Elston 1986:145, 146, Aikens and Madsen 1986:157, Marwitt 1986:161). Not only are caves and rock shelters inhabited more, but a wide variety of landscape settings were used including high altitude settings (Thomas 2014:130, Bettinger 2008:87). The houses from the King's Dog site and Menlo Baths, both in Surprise Valley, became smaller in the late Holocene, a shift from the larger houses found for the middle Holocene (James 1983:158). This change in size has been interpreted as a change from winter encampments in the middle Holocene to summer use during the late Holocene (James 1983:169). An important food staple and activity during a summertime encampment at these sites became pinyon pine, as the nuts were processed and stored for wintertime use (James 1983:156). The increased hydrology of the late Holocene seems to correspond to an increase of more sites, more people, and more use of the landscape; inferring that there was simply more water available (Grayson 2011:314). The arid conditions of the middle Holocene had finally come to an end, and more rain fall and cooler conditions were felt everywhere in the Great Basin.

In the central Great Basin, Gatecliff points were in use from 3,000 to 1,500 BC, and Elko points 1,500 BC to 700 AD (Justice 2002:144, 304). The problem is that these dates work really well for the central Great Basin, but away from the centre these points have earlier and earlier dates (Justice 2002:144). For instance, Elko points may date to the late Holocene in the central Great Basin, but away from there these points could date to the middle or the late Holocene (Grayson 2011:312).

At about 1,800 or 1,300 BC the bow and arrow arrived in the Great Basin (Beck and Jones 2007:50). The advantage of a bow over an atlatl or thrown spear is that one can shoot further, reload faster and kill with better precision (Kelly 1997:28). The speed, distance, and preciseness of the bow and arrow may have made it possible for smaller hunting parties or

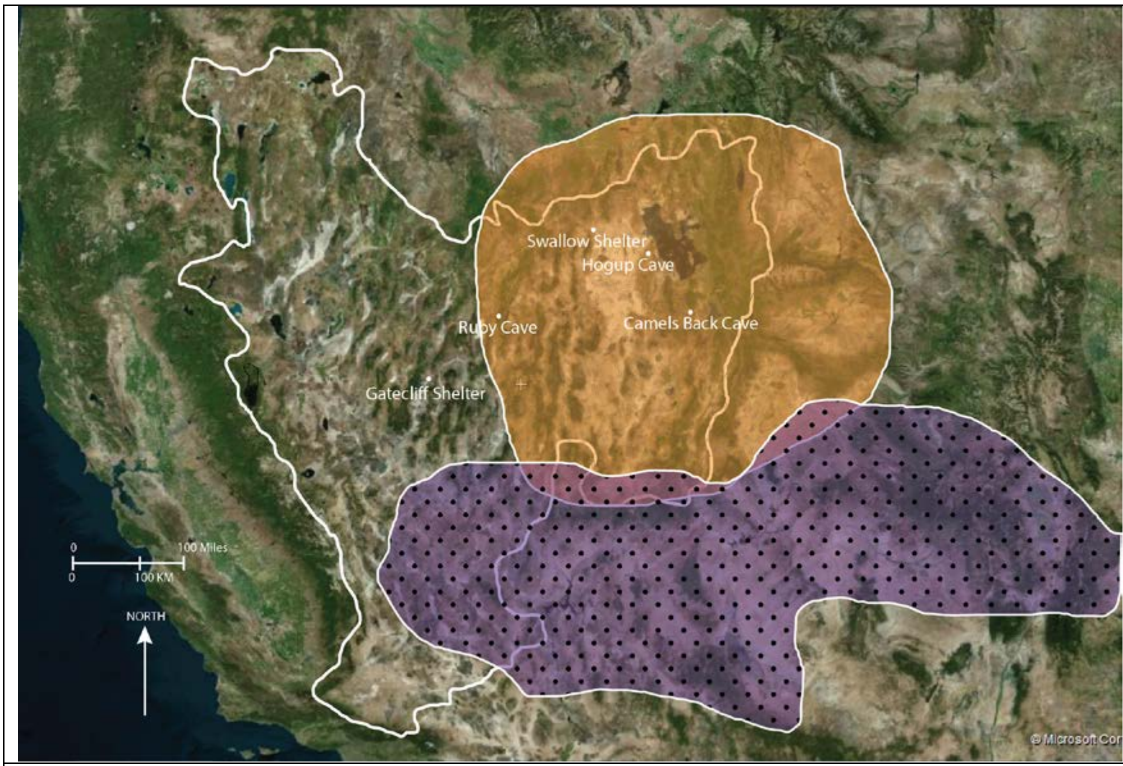


Figure 4.8: The distribution of Fremont pottery in orange and Peublo pottery in purple within the Great Basin (After Flashearth 2015, Madsen 1986:206).

even individual hunting to occur (Kelly 1997:28). Bettinger (1999b:47) explored the implications of this change in Hunting from a communal activity, and suggested a theory of what he called the “Me Generation.” The Me Generation theory, which was the last two words in the publication, suggests change in the very social structure of hunter-gatherers. Before the bow and arrow, there were larger groups that moved together hunting and gathering, but because of the effectiveness of the bow to kill smaller game quickly, these large groups broke into smaller nuclear family groups (Grayson 2011:324). Thus the food became more private, which is seen ethnographically in the pinyon nut harvest, where pine grove trees were claimed by a particular family group and not shared with other family units (Bettinger 1999b:47 Grayson 2011:325). There is evidence to support this shift to the nuclear family, one is through the use of pottery.

There are several different ceramic types found regionally in the Great Basin: Shoshone Ware, Southern Paiute Utility Ware, Owens Valley Ware, and Death Valley Brown Ware (Figure 4.8) (Grayson 2011:324). The ceramics are so similar it is nearly impossible to regionalize when compared to one another. For this reason Lonnie Pippins has suggested using the name “Intermountain Brown Wares” as a way to take away regional names and simplify referencing (Grayson 2011:325). The way the pots have been used was researched by Jelmer Eerkins who ran chemical analyses and determined that seeds were boiled inside the pots (Grayson 2011:325). These pots are found inside house structures instead of outside, and are plain with no decorations (Grayson 2011:325). Since there is no decoration and that they are associated inside houses, these pots probably served as private individual use and were not meant for outward display (Grayson 2011:325). This adds evidence to Bettinger's Me Generation theory that the nuclear family became dominate and self-supporting. More evidence of the Me Generation is from the collecting of Pinyon Pine harvest which can be done twice a year. In the fall the cones are open and allow the seeds to be dislodged simply by shaking the cone (Grayson 2011:325). However, earlier in the year the green cones can be collected and then heated which will release the seeds. The advantage to collecting the cones when they are still green is that there is less competition from other animals who eat or store them (Grayson 2011:325). These seeds then were stored in rock-ring features across the Great Basin, and is supporting evidence of Bettinger's Me Generation. Just as predicted in the theory, the family units stored (rock rings), cooked (Intermountain Brown Ware), and hunted (bow and arrow) for themselves making them highly adaptive to the landscape.

Along with the bow and arrow is a new line of projectile points (Figure 4.9) that came into being. The late Holocene is best noted for the Rosegate points which replaced Elko points from 1,300 to 600 AD and finally Desert Side Notch points that replaced the Rosespring points (Grayson 2011:310). Both the Rosegate and Desert Side Notch points tipped the shafts of arrows and were lighter and smaller than their atlatl and spear point predecessors (Grayson 2011:309). The Great Basin has undergone many changes through time (Figure 4.10) both climatic and cultural.

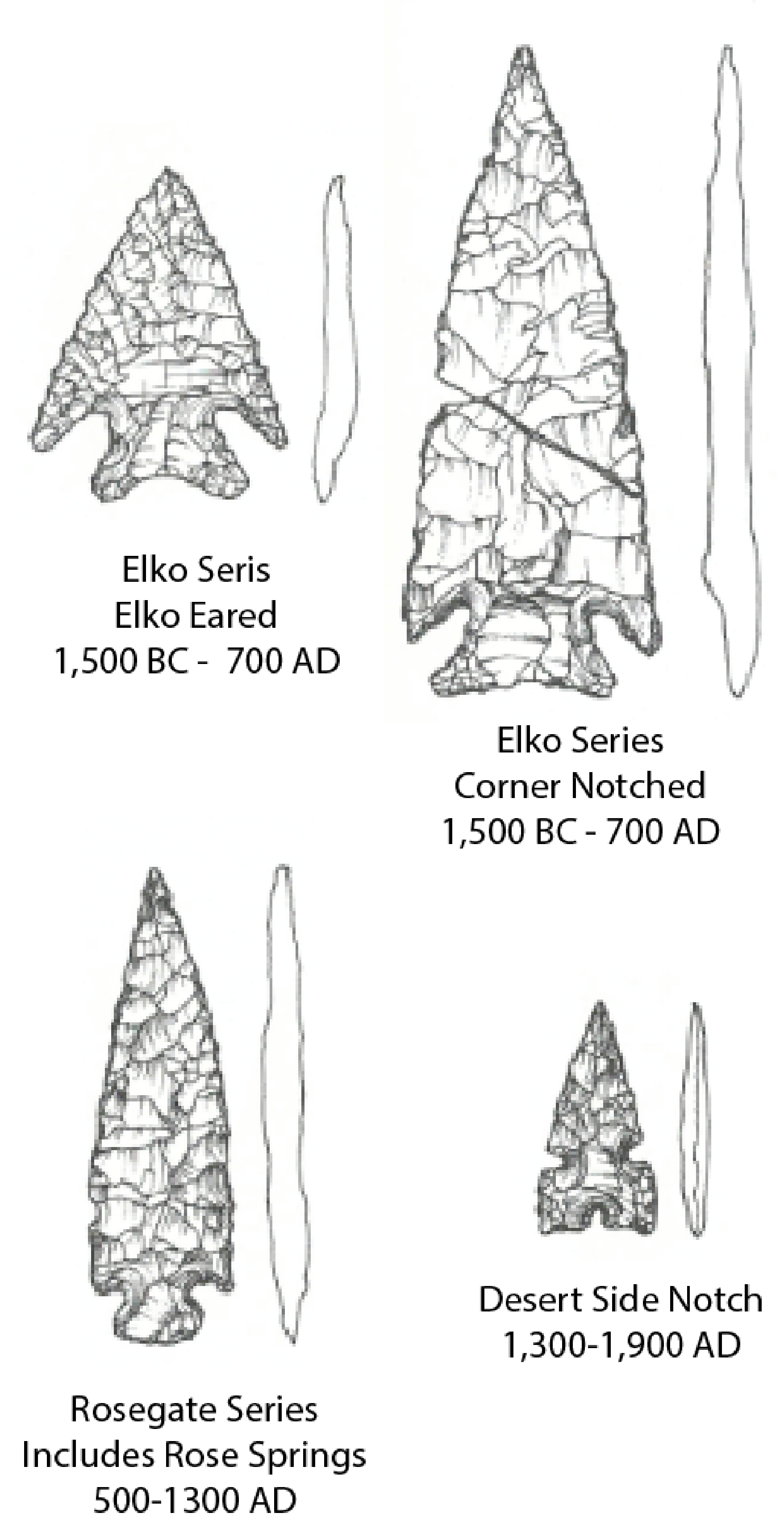


Figure 4.9: Great Basin projectile points (15,000 BC to 1,900 AD) mentioned in the text (Images and dates from Justice 2002:301, 323,and 381).

Thematic Topics in Great Basin Research

This section focuses on particular areas of research within the Great Basin. Not everything in this section is pertinent to incised stones, but are included to develop the associative context of the Great Basin material culture. Specifically, the Fremont, is an important component of the Great Basin after 400 AD, yet the creation of incised stones predates the Fremont and the people who made incised stones were most likely full time hunter-gatherers. Similarly, the Numic expansion is a theory that now has been mostly abandoned, yet was central to the Great Basin archaeology for nearly 60 years. The Numic expansion history, components, and downfall are included to explain why this theory is not discussed in this research. What is directly pertinent and will be revisited in subsequent chapters, are the discussions of gender and rock art. Gender archaeology comes into the discussion of incised stones in Chapter 7 and rock art is an important contextual component in the Great Basin.

Fremont Complex (400 to 1,350 AD)

The Fremont culture is so called because of sites found along the Fremont River in Utah (Grayson 2011 328, Marwitt 1986:162). This group of people are set apart because of their adoption of horticulture. Corn, beans, and squash were all grown by the Fremont within large villages that are placed along courses of flowing water (Janetski and Talbot 2014:118, Grayson 2011:328, Marwitt 1986:161, Madsen 1986:206). The geographic range (Figure 4.11) of these people inhabited an area that occupies nearly all of Utah, and about one third of eastern Nevada (Janetski and Talbot 2014:118, Grayson 2011: 328). The landscape in which they lived was often altered by irrigation channels to feed their crops, by building pit houses and "above ground adobe dwellings and storage facilities of either adobe or stone, and carefully made storage pits" (Janetski and Talbot 2014:118, Grayson 2011:328, Janetski 2008:108, Madsen 1989, Madsen and Simms 1998, Talbot 2000a, 2000b Janetski 1998, 2008, Simms 2008, Talbot, Baker, and Janetski 2005, Metcalfe and Larrabee 1985, Hockett 1998, Wilde and Soper 1999).

The artefacts of the Fremont are as distinctive as their signature on the landscape. Grey pottery that is thin walled was made as were unfired clay figurines (Janetski 2008:109, Grayson 2011:328). Fremont pottery is not the same as Intermountain Brown Ware. Also distinct is a particular construction of moccasin called the Fremont moccasin, imported Pacific

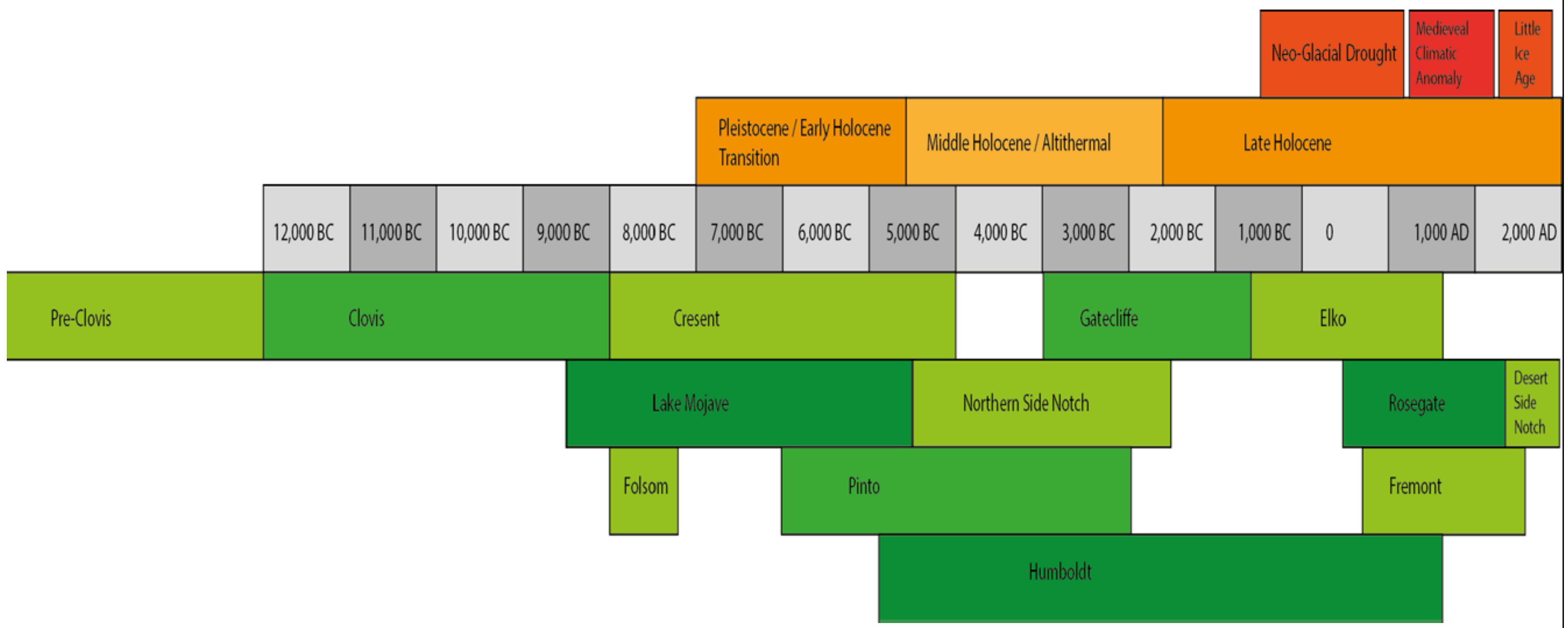


Figure 4.10: Time scale with climatic periods in orange and archaeological traditions in green as mentioned in the text.

Coast shell, turquoise often was used as ornaments, and rock art that is distinct on the rock but also reflected on the pottery and unfired clay figurines (Janetski 2008:110, Grayson 2011:328). The Fremont fringe, as called by David Madsen and Dave Schmitt, is the boundary where the Fremont stop and the hunter and gatherers begin (Madsen and Schmitt 2005:18) This border often has hunter and gatherers who started to make their own grey pottery styles (Grayson 2011:328, Madsen and Schmitt 2005:18).

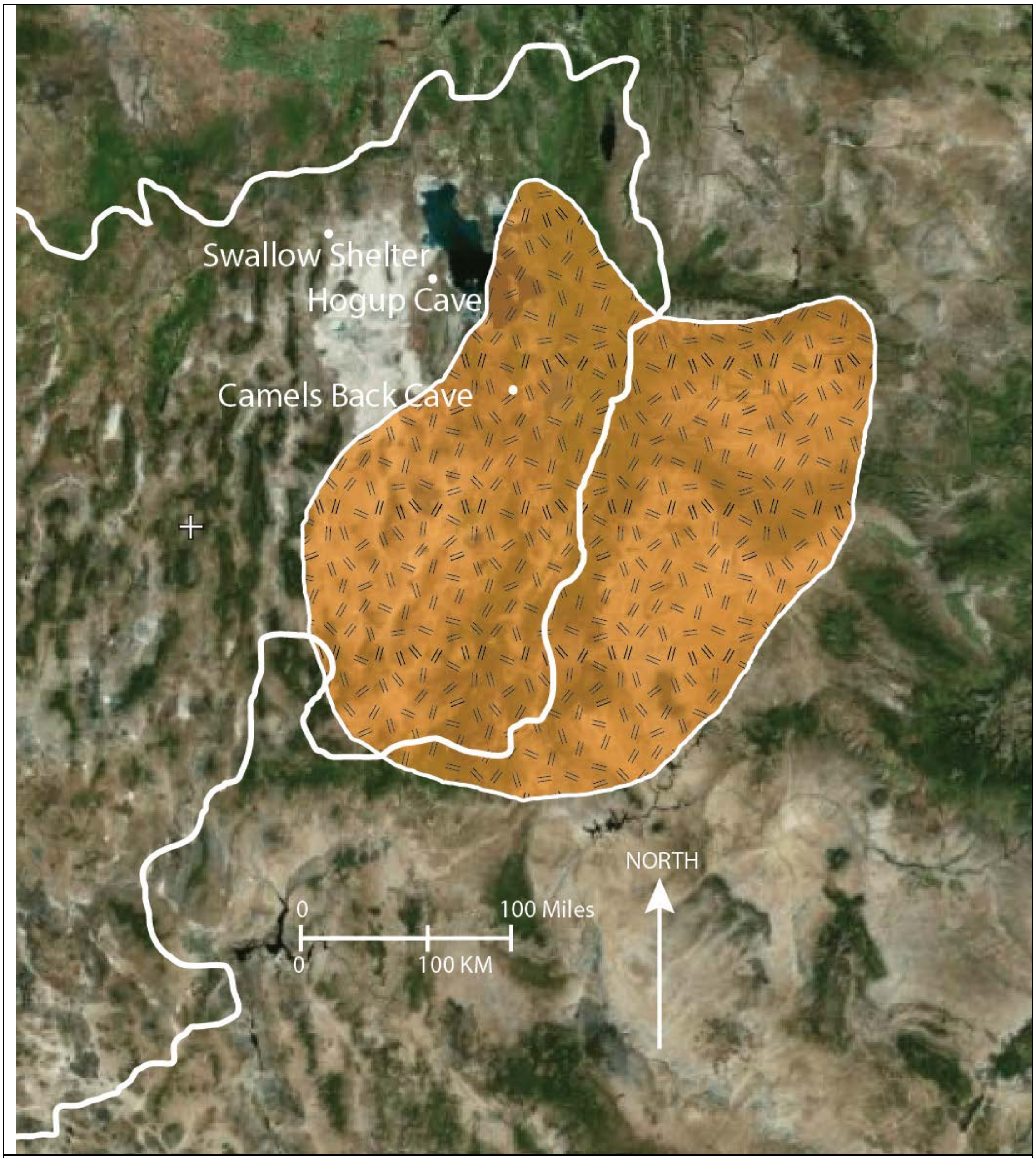


Figure 4.11: The Fremont area of influence within the orange hashed area. Camels Back Cave is within the area, but no incised stones were made at this site during the Fremont time period (After Flashearth 2015, Janetski and Talbot 2014:123).

There are commonalities to sites that have been called Fremont and Joel Janetski and others have said that these commonalities mean that the Fremont is a specific cultural complex, but as David Madsen and Steve Simms pointed out many sites are "differentially distributed…across time and space" (Lekson 2014:109, Grayson 2011:329, Marwitt 1986:163 Janetski 1998, 2004 Janetski et al. 2005, Madsen and Simms 1998). Whatever the case, it is widely held that the distinction of the Fremont was not a result of population replacement, but of diffusion most likely from the American southwest (Marwitt 1986:163). Evidence of this diffusion is found at the Steinaker Gap site in northern Utah. At this site it appears that corn was grown at 250 AD, but missing were the distinctive ceramics, the pit houses, and ornaments that have been associated with the Fremont standard (Grayson 2011:329). From the record however, there is still a lot of variation of Fremont site use across the landscape suggesting that some of the Fremonts were full time horticulturists, others were part time horticulturists and hunter gatherers, and still others were full time hunter gatherers (Madsen 1989:63, Madsen and Simms 1998:323, Grayson 2011:329). Madsen and Simms has pointed out the Fremont "could have been all of these things at one time or another in their lives" (Madsen and Simms 1998:323).

The Fremont were not to last as they were absent from the area at time of contact (Grayson 2011:331). The only groups that were found, were hunter gatherers that made baskets, pottery, and moccasins differently from the Fremont culture and were Numic speakers (Grayson 2011:331).

Evidence for the Fremont only occurs within the Medieval Climatic Anomaly (Simms 2008:232). Monsoon summer storms and increased summer temperatures made perfect weather to grow crops (Grayson 2011: 331). This weather phenomenon also made it possible for bison to live in the area, because bison need a substantial amount of grasses to survive (Grayson 2008:16). As this weather turned to a drier and more drought like condition about 1350 AD the bison started to disappear from the landscape and the Fremont horticultural way of life came to an end (Simms 2008:233, Janetski 2008:115, Grayson 2011:331). However Simms points out that it may not have been changing weather patterns, but a number of decisions made by people in the culture that lead to the end of Fremont (Simms 2008:233).

Numic Expansion

Many who have studied the Great Basin, have most likely heard of a theory called the 'Numic Expansion'. This theory is based on a linguistic model called glottochronology that is no longer used by linguists as the model has been shown to not be reliable (Miller 1986:100). However, many archaeologist still refer to the Numic Expansion, and it deserves an explanation of its tenets.

At the time of contact the Native Americans that lived in the Great Basin spoke a language that is derived from Uto-Aztecan (Figure 4.1, Miller 1986:98). The derived family of languages is called Numic and is spoken not only in the Great Basin, but in southern California, and parts of the Great Plains (Miller 1986:98). It was at one time widely believed that Numic speakers populated the Great Basin about 1,000 AD, and originated from Death Valley, California (Grayson 2011:317, Lamb 1958:98). This theory was put forth by Sydney Lamb in 1958 and was built around a paper published by the linguist Morris Swadesh in 1955. Swadesh used a method that he developed called glottochronology (Grayson 2011:317, Beck and Jones 2008:51, Miller 1986:100). This method took words that were thought to be universal to all cultures such as woman, hand, tongue, and hair, and then use them to compare two different languages. After comparing vocabularies, Swadesh claimed that one could determine how much time had passed since one language separated from another in the same language family (Grayson 2011:317). Lamb took this method of glottochronology and compared the Tübatulabal speakers in southern California with the Numic speakers of the Great Basin. From the results of divergence he came up with the Numic Expansion theory (Lamb 1958:98).

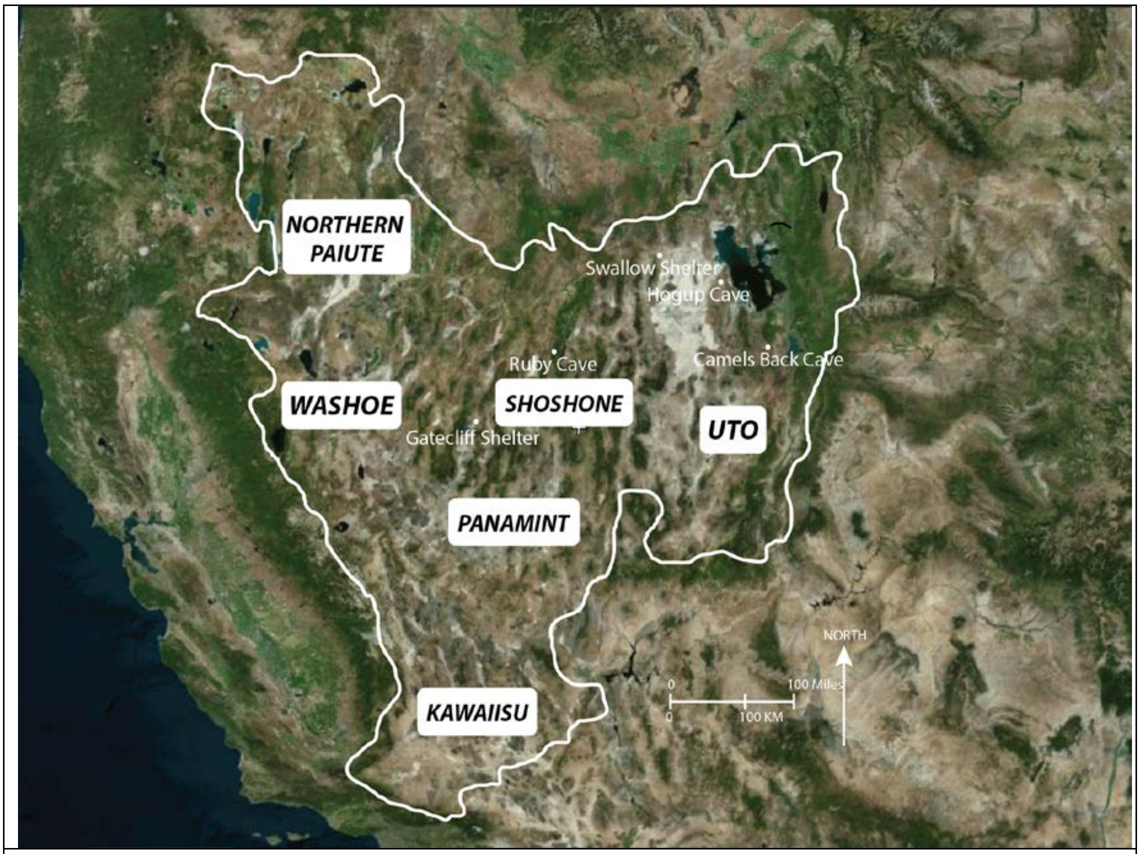


Figure 4.12: Map with the location of the Uto-Aztecan speakers in the Great Basin at time of contact (After Flashearth 2015, Miller 1986).

In the following decades other linguists wrote influential papers that used glottochronology to determine when Numic languages in the Great Basin separated. Kenneth

Hale's dates that fell just under 1,000 AD for the separation of Northern Paiute, Shoshone, and Ute gave support to the original out of Death Valley theory (Hale 1958, Grayson 2011:317). James Goss calculated that Kawaiisu-Ute separated about 900 AD, and Wick Miller claimed the Panamint and Shoshone diverged about 700 AD (Grayson 2011:317). All of these dates agreed with Lambs 1000 AD Numic Expansion theory and gave archaeologist the foundation they needed to add more evidence from the archaeological record.

The idea was quickly adopted by many archaeologists, and perhaps the most influential supporter of the Numic Expansion is Robert Bettinger. Bettinger has taken his Me Generation theory nuclear family, wider use of the landscape, and individual hunting, and enclosed it around the Numic expansion in order to augment the claim (Bettinger 1999b:47). Bettinger and Baumhoff (1982:487) described the practices of pre-Numic people as travellers, because the pre-Numic groups would travel great distances to obtain high quality resources across the landscape. Bettinger and Baumhoff (1982:487) describe the practices of Numic people as processors, who would use lower quality resources and adapt to the environment quicker. Bettinger and Baumhoff even claim that the house structures in high altitude sites such as the White Mountains is a result of Numic people making a wider use of the landscape. The artefactual evidence is difficult to tie to a specific language and for the Numic expansion it is not clear if it really belongs to Numic speakers exclusively (Grayson: 2011:327). However, the most salient and agreed upon artefact that changed dramatically after 1,000 AD was baskets (Adovasio 1986b:204) yet it is still not clear if it was Numic speakers made the baskets. For instance, at Gatecliff shelter a basket that was at one time thought to be Numic speaker made, later after direct dating, the basket turned out to be 2,500 years earlier than the proposed 1,000 AD Numic model (Grayson 2011:327).

The Numic Expansion theory has many problems associated with it, starting with its base in glottochronology. With this method it assumes there are words that are universal to all people and therefore can be measured in terms of how different it is from a supposed ancestral language (Grayson 2011:316). This assumption however, is flawed since there is no evidence to support the idea of a universal word. In addition to this, Swadesh used written languages, which regulates and standardizes a language, to make calculations of divergence, but the Numic and the Tübatulabal language is not written and therefore the calculations may never have been correct in the first place (Grayson 2011:316). Moreover, glottochronology does not even work when determining the separation dates for Italian and French. John Rea's work in this area has demonstrated that glottochronology places the divergence at 1,586 AD, but it is known that French started to be written at 842 AD and Italian at 960 AD (Grayson

2011:316). With this evidence against glottochronology it is completely dead as a theory, and therefore the way that Lamb used it in his work with the Numic must be rejected.

Still at some point Numic speakers did arrive in the Great Basin and newer theories for how this happened have arisen. Jane Hill, who is a linguist, has put forth an idea that Numic speakers moved north from Mesoamerica (Hill 2002:459). Hill arrived at this conclusion by comparing words for corn in the Great Basin to its linguistic affiliation with Ute-Aztecan and the origins of corn which is found in Mesoamerica (Hill 2002:466). Hill has also placed an arrival of 2,000 BC for Numic speakers based off of radiocarbon dates from corn at archaeological sites in the southwest (Hill 2002:459). Hill calls this model the "Numic Ethnogenesis in situ" but it may have some of the same problems that Lamb's theory has as it uses glottochronology (Grayson 2011:318).

Another theory is that proto Ute- Aztecan speakers originated in the Great Basin, about the centre of Nevada about 8,000 BC and that the population grew out southward (Grayson 2011:319, Merrill et al. 2009:21022). Evidence of corn then was diffused into the American southwest and into the Great Basin about 2,000 BC instead of population replacement after this group of people reached Mesoamerica (Merrill et al. 2009:21024). In this model Numic speakers were present in the Great Basin from the start of the middle Holocene. Criticism of Merrill and his team's findings is offered by Grayson, as their linguistic assumptions are based off the work of Kay Fowler (Grayson 2011:319). Fowler's work shows that in the Numic language there are words for turkey and agave both of which only occur south of the Great Basin (Grayson 2011:319). Therefore, the ancestral Ute-Aztecan language most have been positioned outside the Great Basin (Grayson 2011:319). Another problem with Merrill's conclusions is that the archaeology in central Nevada during 8,000 BC is very sparse and does not seem to have had a great deal of use until later (Grayson 2011:319). Therefore, the jury is still out in terms of how the Numic speakers came to reside in the Great Basin at the time of contact.

Gender

At one time during the 1980s and before papers that attempted to be published concerning anything to do with gender in archaeology were considered "unpublishable (or even laughable) by those who controlled archaeological publications" (Nelson 2006:1). Since then a plethora of gender research has been published that cover topics in historical archaeology, mortuary analysis, landscape archaeology, farming societies, and gender in pastoral societies (Nelson 2006). This research makes inference to the presence of women and their activities in relation to incised stones based on the contextual associations. Chapter

7 addresses the question: Did men or women make incised stones? This section acknowledges the presence of gender archaeology in the Great Basin, and sets up a later discussion of incised stones and who made them.

Gender archaeology is defined as a system that includes males and females (Whitehouse 2007:27). Gender should not be confused with sex, which is based on anatomy. Gender is a social construct. While it is possible to have multiple genders within a culture, beyond man and women there are only two sexes, male and female (not including children) (Whitehouse 2007:27, Conkey and Specter 1998). There has yet to be performed archaeological work that seeks to identify gender beyond the man / woman dichotomy. The Maidu people of the Sacramento Valley in central California ethnographically included a gender called two-spirited, who are transgendered men who preferred to perform women's activities, and are treated differently than men or women. There is more than one method and theory that has been applied to gender archaeology.

Some gender archaeology studies have researched "categories of social organization, such as age, statues, and ethnicity" (Whitehouse 2007:27). Another avenue taken has been to study the facets of gender such as "roles, relations, ideologies, and identities" (Whitehouse 2007:28). For the purposes of analysing incised stones this research will use gender archaeology as it has been used to research categories of social organization.

In the Great Basin, rock art, and more specifically who made rock art, has been studied as an activity performed by men, although more and more rock art studies are covering both genders (Cannon and Woody 2007:37). A counter to this male dominance is Cannon and Woody's (2007:37) review of groundstone found in the presence of rock art. Groundstone can have rock art elements and be found in a contextual association with rock art panels (Cannon and Ricks 2007:123, Pendegraft 2007:59, Shock 2007:82, 90, Cannon and Woody 2007:37). Groundstone usage, along with cooking, is mostly associated with activities that women did for the benefit of the others in the group of hunters and gatherers (Bettinger 1991:101, Cannon and Woody 2007:37). Even though this may be generally true, McGuire and Hildebrandt point out that looking into the deep archaeological past should be treated with caution as there is no reason to think that the same sexual division of labour existed for all times and people (Conkey and Gero 1991:17, McGuire and Hildebrandt 1994, Cannon and Woody 2007:38). Nevertheless, the associations of groundstone and rock art continue to appear, and for the most part rock art is found in places that are described as residential (Cannon and Ricks 2007:123, Cannon and Woody 2007:38).

In a case study of the Tired Dam site in southern Oregon there is a case for both men and women making rock art (Cannon and Woody 2007:46). In this site are "stone house rings, and rock rings that may have been used as hunting blinds" which rest beside or near rock art (Cannon and Woody 2007:46). In the house rings are groundstone, worked stone, hearths, and beads; and in the hunting blinds are broken projectile points, cores, and choppers (Cannon and Woody 2007:46). In this type of site both men and women may have been making the rock art, and what is more the rock art is closer and more tightly associated with the groundstone and habitation (Cannon and Woody 2007:46). This is just one case study that could easily link women close to the proximity of rock art and therefore make a case that women were making the rock art (Cannon and Woody 2007:46). Even with the research above, rock art continues to be associated with men making rock art for communal hunting and shamanism (Cannon and Woody 2007:38).

The movement of people across the Great Basin has come under a great amount of scrutiny, especially after the downfall of the Numic Expansion model. To rethink the structure of lifeways in the Great Basin David Hurst Thomas investigated how gender logistics changed in the Great Basin after the Neo-Glacial Drought. Thomas concludes that before 800 BC there was a spike in the amount of precipitation that the Great Basin received and that this spurred a great deal of hunting even in highland sites above 11,000 ft. in the central and western Great Basin (Thomas 2014:143). In the Monitor Valley the earliest highland sites are dated at 4,350–4,100 BC and contain discarded projectile points and "thousands of traps, blinds, and rock walls to increase their hunting" (Thomas 2014:143). These sites were above the Pinyon range and in the winter deep snow covers the surface at these altitudes (Steward 1938:58, Thomas 2014:130). Julian Stewart was the first to point out that because of the snow these sites were probably not winter encampments (Steward 1938:58, Thomas 2014:130). Between 4,350 and 4,100 BC the summer had wet climatic conditions, that likely fostered dramatic increases in artiodactyl densities (Thomas 2014:136). The artefacts before 800 BC were mostly hunting related and therefore Thomas introduces the idea that these sites were 'Man Caves', visited exclusively by long range hunting men to kill mountain sheep and other artiodactyls (Thomas 2014:137). The 'Man Caves' last for nearly 3,550 years and abruptly came to an end between 800 and 650 BC when there was severe drought in the Great Basin, and for the most part the central Great Basin became scarcely populated (Thomas 2014:138). This time period is called the post-Neo-Glacial drought and it started to come to an end about 200 BC (Thomas 2014:138). After this time the camps, previously used as logistic long range hunting camps, started to be used as family spaces that included both men and women working together in the procurement of food instead of being separated by great distances (Thomas 2014:138). At high range sites after the drought, summertime camps were set up, only this time they too were occupied by family groups (Thomas 2014:143). It is not completely known why after the drought there was such a shift in the way the people stayed together (Thomas 2014:143).

Rock Art

As a whole, the study of rock art has been neglected by archaeologists in that “only a handful of doctoral dissertations are written each year” within academia (Quinlan 2007:1). This neglect may stem from the way that rock art is thought of in the archaeological record. A ‘rock art site’ is made on natural rock surfaces that in turn is set within a landscape, and as such, does not serve a utilitarian purpose (Quinlan 2007:2). In general artefacts or spaces that are deemed non-utilitarian are thrust into the category of ritual, object or space, based on an assumption that there must be an unknown symbolic meaning attached to them (Renfrew 1985:24, Quinlan 2007:2). Therefore, it is not surprising that rock art has been placed within the realm of ritual, or even spiritual expression (Quinlan 2007:2). An example of Great Basin Rock is in Figure 4.13, from Grimes Point near Fallon, Nevada, about a hundred miles west of Gatecliff Shelter.

Taçon and Chippindale (1998:6) suggest rock art studies fall within two methods from which it can be studied: informed and formal. Informed studies are “those that depend on some source of insight passed on directly or indirectly from those who made or used the rock art” (Taçon and Chippindale 1998:6). In some cases, there are current rock art makers who explain what their paintings mean, such as in Arnhem Land, Australia where it is explained that a giant crocodile chews through mountains to see what is on the other side (Taçon and Chippindale 1998:6, Dryer 1994:54). Another, example is the case of the San bushman of South Africa, whom have given a wealth of ethnographic explanation for the rock art imagery, yet they do not currently make the rock art themselves (Taçon and Chippindale 1998:6). The formal method for approaching rock art is defined as a study that has no ethnographic information available in which to draw from, thus there is no enlightenment from the makers or the makers’ descendants to say what rock arts means (Taçon and Chippindale 1998:7). In this case the rock art must be approached with a broad tool chest of theory and method in order to analysis the rock art (Taçon and Chippindale 1998:7).

Figure 4.13: Example of open-air rock art panel found at Grimes Point near Fallon, Nevada (Photo by author).

Within the Great Basin assigning rock art to ritual significance has been done many times since 1903, and later in the 1990s rock art was attributed to the acts of shamans (Reinach 1903, Breuil 1952, Heizer and Baumhoff 1959, 1962, Clottes and Lewis-Williams 1998, Lewis-Williams 2002, Quinlan 2007:2). Rock art however, does not stand alone, and it has been tied to other types of archaeologies. Rock art is often associated with “lithic scatters, house rings, [and] hunting blinds” which fall under the realm of settlement archaeology (Quinlan 2007:3). These ties between rock art panels and the surface archaeology are often obvious to an observer, but in the past these connections had been downplayed or the significance gently teased out in order to support a particular view point of the researcher (Quinlan 2007:3). A good example of this is in Heizer and Baumhoff’s hunting magic scenario where the rock art is placed at hunting blinds, and near game trails in order to increase the success of the hunt (Heizer and Baumhoff 1962, Quinlan 2007:3). Contrast this with David S Whitley’s theorization of rock art as places of shamanistic pilgrimage sites that were supposed to be away from all other settlements (Whitley 1994a, 1994c, 1998, Quinlan 2007:3). The point to take away from both of these cases is that they argue for opposites: one author claims most of the rock art is near settlement places, and the other says that most of the rock art is not near settlement places (Quinlan 2007:4). Rock art studies nevertheless are changing, and constantly are brought closer to a more mainstream integration with the archaeological picture as a whole (Quinlan 2007:5).

Most recently there have been two ways in which rock art has been studied in the Great Basin: ethnographic perspective and social context (Quinlan 2007). In the ethnographic perspective rock art sites near Walker Lake in western Nevada were examined with the interpretations contextualized by taking into account local oral tradition (Brown and Woody 2007:11). In this approach a story is collected from the local Paiute that the images are of a sea serpent that lives in the Lake (Brown and Woody 2007:11). Then this story is traced back in time to the earliest known occurrence of it, which as it turns out appeared in a 1883 edition of the Walker Lake Bulletin with the last printed recording happening in 1956 (Brown and Woody 2007:15). The analysis of how this story was started is thought to be the result of flooding events that happen not only in contemporary times, but as long ago as 3,500 BC or older (Brown and Woody 2007:13,18). During these flooding events gully erosion exposes rock that often contains fossils including that of ichthyosaurs (Brown and Woody 2007:12). Therefore, the conclusion is that the local Paiute story of a sea serpent may have been started as long ago as 3,500 BC was perpetuated by possible repeated findings of ichthyosaurs fossils that could have been exposed after flooding events (Brown and Woody 2007:19).

The social context in which rock art has been studied in the Great Basin is an attempt to integrate landscape and other archaeology that lies near the rock art into a single analysis (Quinlan 2007:6). Of more than a thousand rock art sites that are officially recognized in the Great Basin, 244 have clearly stated positive or negative associations with material culture (Pendegraft 2007:52, Woody 2000a:138-43). Set within the Pah Rah range of north western Nevada just north of Reno, Nevada is the Spanish Springs Valley where recent research has closely studied the rock art with the associated material culture (Pendegraft 2007:58). Within this area the rock art is contextually associated with groundstone, rock rings, debitage, and stone chipped tools (Pendegraft 2007:59). The portable groundstone and bed rock mortars in some cases has a petroglyph engraved somewhere on its surface (Pendegraft 2007:59). This valley has been in use since 5,000 BC, with the majority of the area being intensively used during the late Holocene (600 to 1,350 AD, Pendegraft 2007:61, Delacorte 1997:13). The debris left behind in this area is suggestive of seasonal field camps that is rich in not only food plants, but also ample amounts of stone, that could have been used as groundstone (Pendegraft 2007:66). The seasonal camps which probably had the presence of both men and women would have been the scene of parenting, “hunting… singing, dancing, myth telling, and rock art use” (Pendegraft 2007:66). Men and women may have processed food using groundstones, such has been shown in California during the Milling Stone Horizon (Fitzgerald and Jones 1999, Jones 1996, Pendegraft 2007:66). Although it is unclear to what extent men had in the procuring of plant food, Pendegraft (2007:66) suggests that the Spanish Spring Valley was mostly used by women, while the men hunted in other places. With the landscape, material culture, rock art, and the activities firmly set, Pendegraft introduces ethnographic accounts of painted body design that were gender specific or could be used to designate the sex of a baby (Pendegraft 2007:66). Pendegraft says that since the rock art, which was set within such a women's activity area, may have "been used to explore and negotiate themes relating to sexual identities and economic reproduction", and that women indeed made rock art (Pendegraft 2007:67-68).

Conclusion

To conclude, the archaeology of the Great Basin has had measurable changes over the past 12,000 years (see Figure 4.7). This chapter set out to discuss the environmental changes from the end of the Pleistocene to modern times, and to give an overview of the archaeological changes from pre-Clovis to the late Holocene. The cultural changes are typified by morphological changes in the projectile point chronologies, from the pre-Clovis to the Desert Side Notched. Throughout, the analysis of incised stones the information of climate change and the archaeology will give context to the larger picture of the Great Basin. In the next chapter the sites that have been selected for analysis will be introduced.

The chapter also introduced four thematic topics that are common in Great Basin archaeology. The themes are: the Fremont complex, Numic Expansion, gender, and rock art research. The main points of the research on the Fremont complex are included in the previous summary. Because the theory of Numic Expansion has basically been debunked, it is not featured in the above summary.

Gender studies in the Great Basin are few, but cover rock art and family logistical patterns. The rock art studies point out that rock art is placed in the area of ground stone, and therefore women were probably involved with the making of the designs. Thomas makes a case for families moving together after the Neo-Glacial Drought as opposed to the logistical hunting that took place for nearly 3,000 years before. The change in logistics came after the dry hot conditions nearly emptied the central Great Basin, then at the end of the drought repopulation occurred, but their way of life had changed.

Rock art studies started with a minimal amount of research probably because of their supposed non utilitarian quality that thrust it into a ritual or ceremonial context. This generalisation meant that rock art received less attention from researchers who studied utilitarian artefacts. Taçon and Chippindale (1998:6) hypothesised two categories of rock art interpretation: informed and formal. The informed uses ethnographic studies while the formal method uses inference from the landscape, and associated archaeological sites to draw interpretations. The Great Basin uses both the informed and formal methods to approach rock art. A contextual archaeology, as I am using for incised stones, could benefit traditional formal interpretations of rock art when ethnography is unavailable. Thus showing how contextual archaeology could benefit other forms of material culture research.

Summary

During the Pleistocene there is evidence for pre-Clovis occupations (pre-12,000 BC) is found in Paisley Caves, southern Oregon. At this locale the main characteristic that sets it apart as being pre-Clovis is its association with extinct animals: camel and horse. In the Clovis times (9,200 to 8,800 BC) the type of projectile point, with its fluted base, denotes this culture. Like the pre-Clovis people there are extinct mammoths that have been associated with the unique points of the Clovis. Other assemblages include long narrow blades and flakes that were struck off cores, bone and wooden tools, and catchments that held hordes of stone tools (Simms 2008:111). The Folsom culture (8,800 to 8,200 BC) is like the Clovis culture in that they too had fluted projectile points, but only Folsom points had fluting that went from the base to near the tip. Folsom points are found mostly with Bison kills, which is a difference in that Bison are still found in some parts of Nevada and not extinct as with its predecessors. The Lake Mojave Culture (9,200 to 5,500 BC) is denoted by two types of stone artefacts that of stemmed points and crescents. The stemmed points are grouped into two different types that of the Lake Mojave, and Silver Lake (Grayson 2011:293). The crescents, are not fully understood as to how they operated, one idea is that the tips were used to puncture and kill fish or other game.

The environmental changes from the Pleistocene to the late Holocene took several stages of development. The massive pluvial lakes from the Pleistocene (Lake Lahontan and Lake Bonneville) began to evaporate as the decrease of rains and a raise in temperature dried up many of the marshes. These changes singled the end of the Pleistocene and the start of the early Holocene (8,000 to 5,500 BC). These dryer conditions continued with some flux until the middle Holocene (5,500 to 2,500 BC) where a high temperate drought regime began. During this time the the disappearance of the Ruby Mashes, populations of artiodactyls in particular shrunk, and water became more scarce in the Great Basin. In the late Holocene the temperature started to ameliorate and more water fell throughout the Great Basin.

During the middle Holocene (6,300 to 2,500 BC) regional variation in projectile point morphology is seen more explicitly than at any time before. The type sites for projectile points, such as Gatecliff shelter, that is located in central Nevada has a tight morphology for the immediate area. However, further away from the centre of Nevada and the types become more questionable. Northern Side Notch, and the Pinto are the only two points that are in use during the middle Holocene. Other types such as Gatecliff points (3,000 to 1,500 BC) and Elko points' (1,500 BC to 1,300 AD) spill into the late Holocene. The middle Holocene also saw the first houses built at the King Dogs site in northwest Nevada.

The late Holocene is characterized as climate conditions that are most like today's weather and the population of the hunter - gatherers grew larger as these conditions allowed for favourable food getting procurement. The bow and arrow was introduced (1,800 or 1,300 BC) and allowed for smaller hunting parties and for nuclear family to be able to forage on their own. Pottery is made in greater quantity within the late Holocene and there is a lot of variation to be found across the Great Basin. Even with this variety it has been mostly accepted to call the pottery as Intermountain Brown Wares as opposed to regional names that may only be slightly different from one another. Basketry is also made in more abundance in the late Holocene. After 1,000 AD the basketry patterns change dramatically and one time was thought to support the Numic spread hypothesis where Numic speakers spread across the Great Basin from southern California. This idea has been set aside as not being true since the original determination of Numic speakers' divergence from the southern California speakers was never accurate.

During the late Holocene two periods of climate change occurred. The first is the Neo-Glacial Drought (500 BC to 100 AD). During this time the temperatures increased, and rain was so scarce that many springs most likely became dried. The lake levels went very low and the salinity probably increased to a point as to make it undrinkable. As the Neo-Glacial Drought ended so did the logistical hunting, which was replaced with men and women working and travelling together all across the landscape.

The Medieval Climatic Anomaly (350 to 1350 AD) is noted as an increase of temperatures, but also summertime rains and warmer winters that made it possible for bison and other ungulates to propagate. This period is also noted as the time period when the Fremont agriculturalist moved into the Great Basin, but were mostly concentrated in Utah.

The Fremont people who lived in Utah and parts of eastern Nevada were horticulturalist who began growing corn, squash and beans about 400 to 1350 AD. These people lived in permanent settlements, however, it is possible that within a person's lifetime they were horticulturist, half and half horticulturist / hunter gatherer, or full time hunter gatherer. The growing of crops was made possible by summer monsoon rains, in combination with the diffusion of seeds, and knowledge from Mesoamerica that spurred the lifeway of the Fremont. The Fremont horticulture disappeared at the same time drought arose in the Great Basin which is not only eminent in the archaeological record, but also due to the observes that bison which rely on large amounts of grasses in the summer time disappeared from the Great Basin landscape.

The Little Ice Age (1,400 to 1,900 AD) contrasts with the Medieval Climatic Anomaly in that the rains moved from the summer to the winter, and a high snow pack allowed the run-off of more springtime water. The overall temperatures were cooler, but unfortunately the agricultural Fremont suffered due to the change in rain patterns. The summer rain was perfect for watering crops, and without it the Fremont way of life soon ended.

Chapter 5: An Introduction to the Sites Chosen for this Contextual Analysis

Introduction

This chapter introduces three caves and two rock shelters (Figure 5.1) that have incised stones and excellent preservation of the artefacts. The aim of this chapter is to provide an introduction and context to the sites, without analysis of the incised stones. The topics that will be covered in this section will give a site description, a history of research, discuss the chronology, and give a synopsis of the site's interpretation. The context of incised stones will continue to be discussed in Chapter 6, 7, and 8 as the scale of context is refocused and tracked through time

The sites that will be introduced are Camels Back Cave, Hogup Cave, Gatecliff Shelter, Ruby Cave, and Swallow Shelter. The dry environment of these sites allowed for a variety of vegetable and leather artefacts to escape decay and disintegration. The advantage of this preservation is that a more complete contextual analysis can be performed.

A cave in this research, is defined as a recessed landform in which part of the geological structure does not receive sunlight (IMACS 2001:420). A rock shelter is a landform with a natural overhang that gets direct or indirect sunlight. A rock shelter "differs from a cave in that the width of the mouth at the opening is larger than the depth of the cavity" (IMACS 2001:420).

Figure 5.1: Map showing the sites that are used in this work.

Camels Back Cave

Camels Back Cave is located within the boundary of the Dugway Proving Grounds, a military base in the state of Utah (Schmitt and Madsen 2005:1). Its location is at the southern tip of the Great Salt Desert that is located within the northwest area of the state (Schmitt and Madsen 2005). The cave mouth faces towards the north (Figure 5.2) as it sits on the southern extension of Camels Back Ridge at 1,380 m. (4,527 ft) above mean sea level (Schmitt and Madsen 2005:1). The authors never describe the view from the cave's entrance, but they do mention that there is a dry river bed about 6 km to the northeast (Schmitt and Madsen 2005:1). This dry river bed was a Pleistocene river that once fed Lake Bonneville at about 12,500 to 9,000 years ago (Schmitt and Madsen 2005:1).

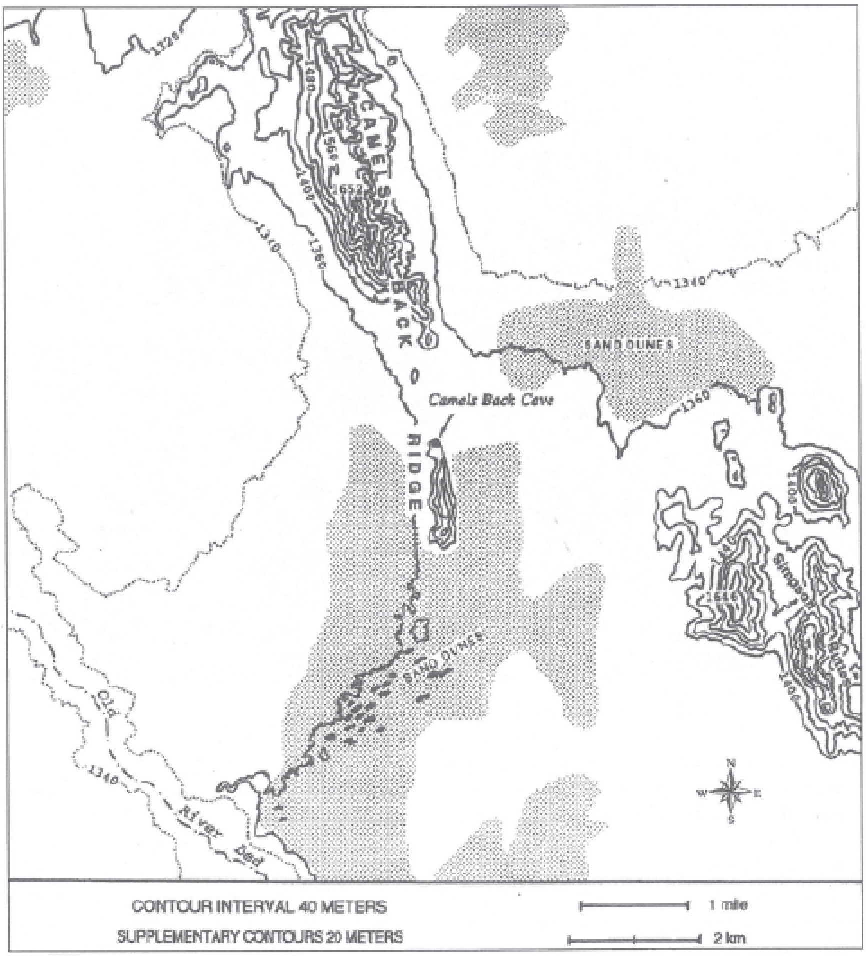


Figure 5.2: Camels Back Cave. Top: Camels Back Cave surface level. Unknown photographer. (Camels Back Cave CD-Rom 1). Courtesy of Natural History Museum of Utah. Bottom: Camels Back Cave location in relation to Camels Back Ridge (Schmitt and Madsen 2005:3).

The area of Dugway Proving Grounds has a rich geology. The cave itself is made of lower Paleozoic age limestone, as is most of the Camels Back ridge (Schmitt and Madsen 2005:4). In the immediate vicinity are obsidian deposits from a number of extinct volcanoes that dotted the landscape (Schmitt and Madsen 2005:5). During the Pleistocene (15,300 to 14,200 BP) the entire Camels Back Mountain Range was almost entirely submerged in what was Lake Bonneville (Schmitt and Madsen 2005:5). Camels Back Cave would have been 98 meters below the water surface during this time and exposure above the surface for human use is believed to have occurred about 10,000 BC (Schmitt and Madsen 2005:5). The formation of the cave is attributed to wave cut action that left tufa deposits on the walls and ceiling (Schmitt, Monson, and Shaver 2005:46).

History of Research

The cave was identified as containing archaeological deposits in 1984 while a cultural survey of the area was taking place. Designated in the field as 42To392, it has since been referred to as Camels Back Cave as that is the name of the ridge upon which (Schmitt and Madsen 2005:1). The research design was laid out by Dave Schmitt from the Desert Research Institute and the Washington State University department of anthropology, and David Madsen who is with the Texas Archaeological Research Laboratory at the University of Texas and the Desert Research Institute (Schmitt and Madsen 2005:281). The first assessment related to Camels Back Cave actually came from below the cave where a large lithic scatter of the Great Basin Stemmed Tradition was found (Schmitt and Madsen 2005:1). The Great Basin Stemmed Tradition is dated to occur between 10,000 to 8,000 years ago. Because of this antiquity further research into obtaining cultural and paleoenvironmental data from Camels Back Cave became the first research question (Schmitt and Madsen 2005:1). Testing took place in 1993, which shows "intact living surfaces extending almost to the base of the deposit" (Schmitt and Madsen 2005:1) giving incentive for a major excavation project (Schmitt and Madsen 2005: Xiii). Major excavation seasons took place between 1996-1998 with a number of participants in the excavation and artefact analysis (Schmitt and Madsen 2005:46).

Chronology

There are 27 radiocarbon dates (Table 5.1) from 18 strata at Camels Back Cave (Schmitt, Monson, and Shaver 2005:57). The earliest deposits date from 9,110 BC and the most recent deposits date to 1,670 AD. On the surface of the cave, there contained evidence of a historic European hunting camp (Schmitt, Monson, and Shaver 2005:57). The radiocarbon samples come from hearths (n=20), a smeared lens, a filled animal burrow, coyote scat, artiodactyl scat (n=2), and from a reed grass arrow shaft that was recovered from a packrat midden (Schmitt and Shaver 2005:46). The depth of the deposits (Figure 5.3) reached almost four meters below the contemporary surface (Schmitt and Shaver 2005:58).

Cultural Stratigraphy	Radiocarbon Dates BC/AD
I	9,110 - 8,719 BC
IIa	8,155 - 7,603 BC
IIb	5,930 - 5,679 BC
III	6,404 - 6,197 BC
IV	6,587 - 5,735 BC
V	6,353 - 5,164 BC
VI	5,429 - 5, 259 BC
VIII	5,232 - 4,753 BC
IX	4,542 - 4,295 BC
XIa	4,181 - 3,491 BC
XIc	4,726 - 3,055 BC
XIIb	3,565 - 3,303 BC
XIIIa	2,809 - 2,288 BC
XIIIc	2,572 - 1,836 BC
XIVa	2,090 - 1,784 BC
XIVc	1,545 - 1,214 BC
XVb	764 BC - 645 AD
XVIIa	450 - 817 AD
XVIIc	1,124 - 1,347 AD
XVIII	1,375 - 1,670 AD

Table 5.1: Radiocarbon years of stratigraphy from Camels Back Cave (Schmitt and Shaver 2005:49).

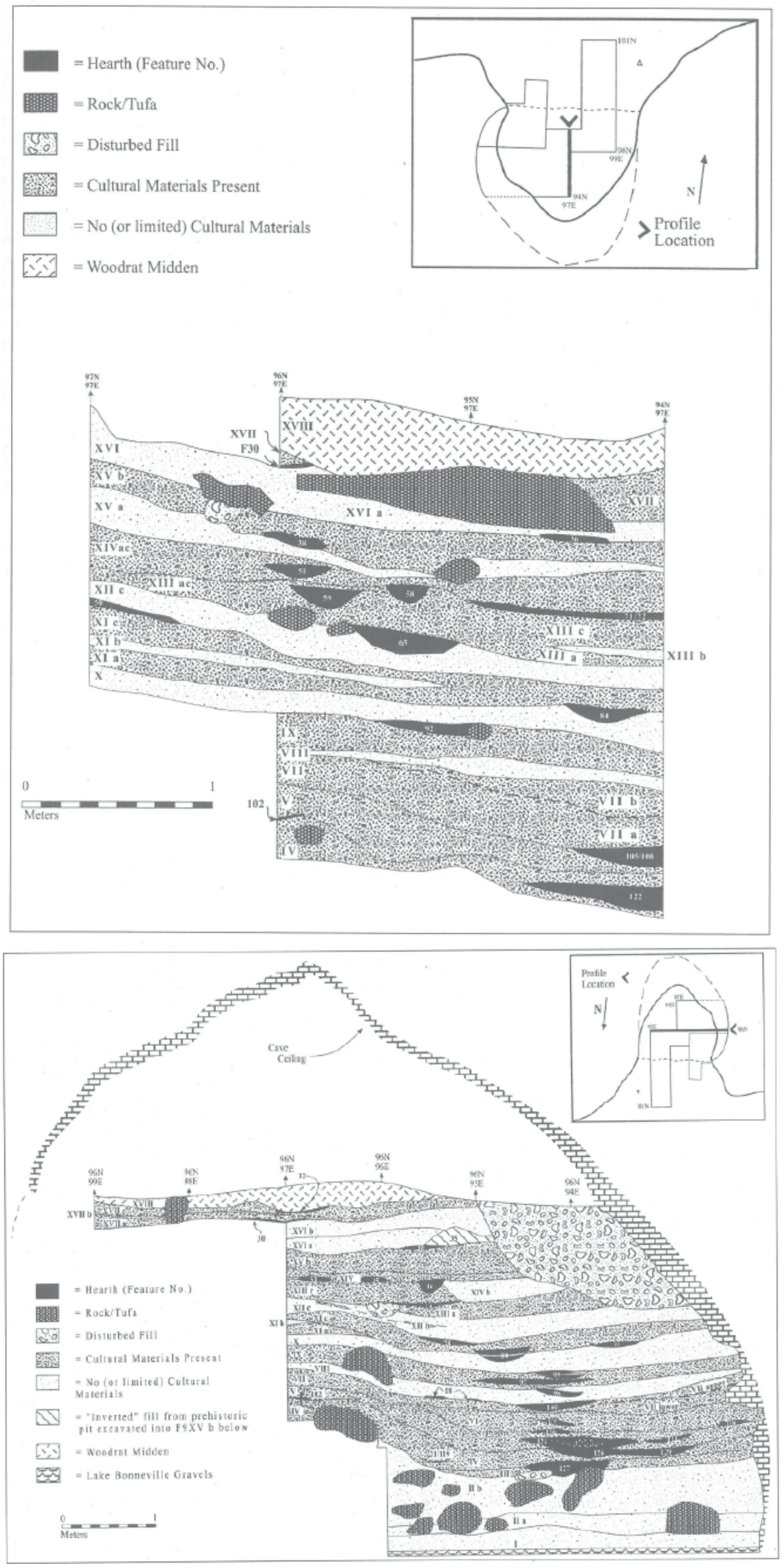


Figure 5.3: Camels Back Cave section maps (Schmitt, Monson, and Shaver 2005:50, 53).

Synopsis of Site Interpretation

The 7,500 year history of Camels Back Cave is thought to denote one of “short-term visits” (Schmitt and Madsen 2005:230). Throughout this period are living surfaces (n=8) and hearths (n=99) which represent occupations lasting from overnight to a few days (Schmitt and Madsen 2005:230). The brevity of the occupations is attributed to the supposed complete lack of water in the cave’s vicinity (Schmitt and Madsen 2005:230). In general, the cave is thought to have been used as either the focus of a foraging trip or the stop over for a foraging party between two geographic regions (Schmitt and Madsen 2005:230).

Hogup Cave

Hogup Cave is located on Hogup Mountains which is located in northwest Utah. The cave is at 4,700 ft. above mean sea level (Figure 5.4) with the peak of Hogup Mountain at 6,847 ft. above mean sea level (Aikens 1970:1). The mouth of the cave opens south with a view of the Great Salt Lake 10 miles to the east (Figure 5.5, Aikens 1970:1). The geology of the cave is mostly limestone as it is part of a large fault block that makes up most of the range (Aikens 1970:1).

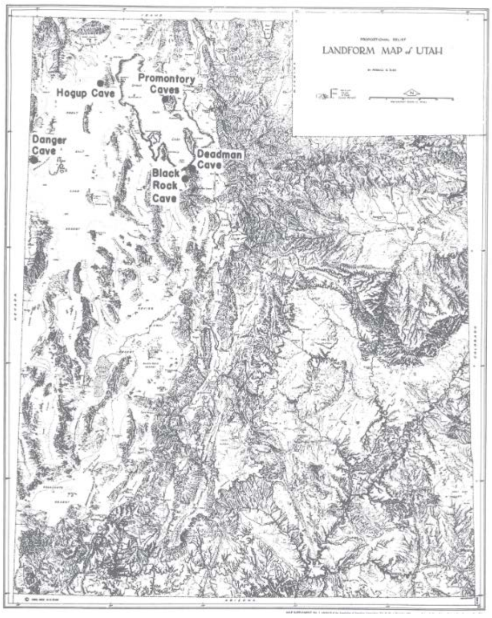


Figure 5.4: Hogup Cave map and topography (Aikens 1970: ix).

There are three vegetation zones in the area of Hogup Cave, the pickleweed-salt grass, the sagebrush-shadescale, and a juniper zone (Aikens 1970:1). The pickleweed zone, an important food item for the inhabitants of Hogup Cave, occurs at the base of the Hogup Mountains where the alluvial fans drop into the Great Salt Lake Basin (Aikens 1970:1). There is a major ephemeral stream channel and a seep within close proximity of Hogup Cave. The seep was active during the 1970 excavation (Aikens 1970:1). The seep is used by local residents as a clean source of water, and Aikens suggested that because of the depth of the spring, and the half an acre of water dependent-vegetation which it supports, the spring was available during prehistoric times (1970:1), suggesting pickleweed grew near the seep. Above this vegetation zone is the sagebrush-shadescale zone which includes the area immediately around Hogup Cave and above as a dominate covering for Hogup Mountain (Aikens 1970:1). On the highest areas of the mountain the juniper zone occurs with sporadic cover, and at the time of excavation there was no juniper or pinyon growing within 5 miles of the cave (Aikens 1970:1).

The cave's dimensions are 6 m. (20 ft.) tall, by 10 (30 ft.) wide, with a 16 m. (50 ft.) recess from the entrance to the back of the cave (Aikens 1970:2). In the rear of the cave is a second chamber that has a low entrance height but is another 50 ft. long by 30 ft. wide once inside (Aikens 1970:2). At surface level this second chamber was only accessible via crawling, as Aikens stated, the entrance to the second chamber is narrower compared to either chamber. These two areas are designated as the outer chamber (with an outside outlet) and the inner chamber (no outside outlet) by Aikens, and for the purposes of this report I will keep this labelling (1970:1).

History of Research

The Hogup Cave excavation was part of larger plan of research into the prehistory of the Great Basin (Figure 5.6), a program that was created by Dr Jessie D. Jennings, and directed by him for over 20 years (Aikens 1970:v). The funding for the project came from generous grants from the National Science Foundation, and the Wenner-Gren Foundation for Anthropological Research (Aikens 1970: v). Excavation began in the summers of 1967 and 1968 with Carl Melvin Aikens as the lead crew chief (Aikens 1970: v). Many of the researchers who wrote papers for the appendix to the Hogup Cave monograph were either at the site during excavation or performed significant work during the post-excavation processing (Aikens 1970: v).

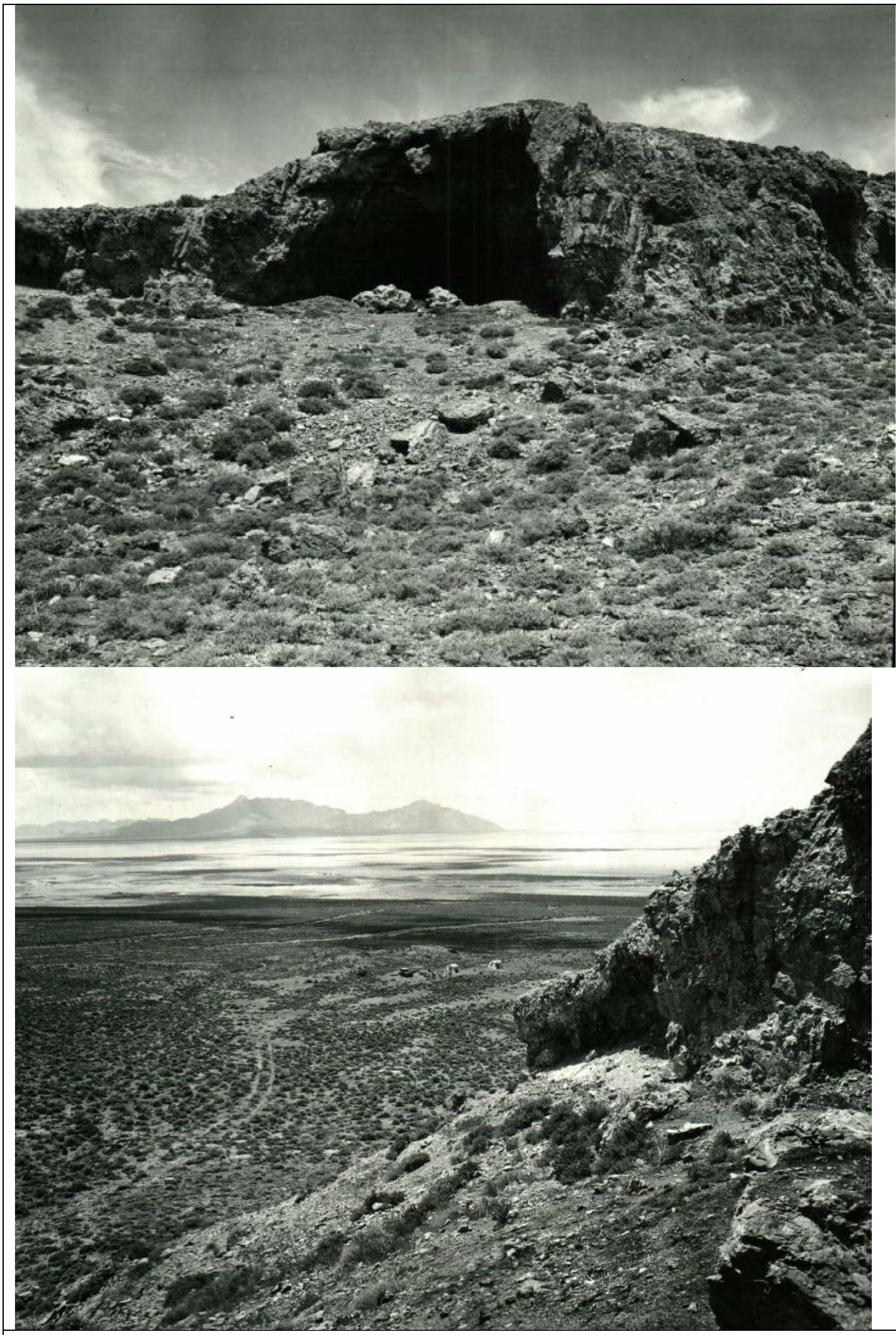


Figure 5.5: Hogup Cave opening. Top: South facing cave mouth. Bottom: View toward the Great Salt Lake (Aikens, M. 1967h) Courtesy of Natural History Museum of Utah.

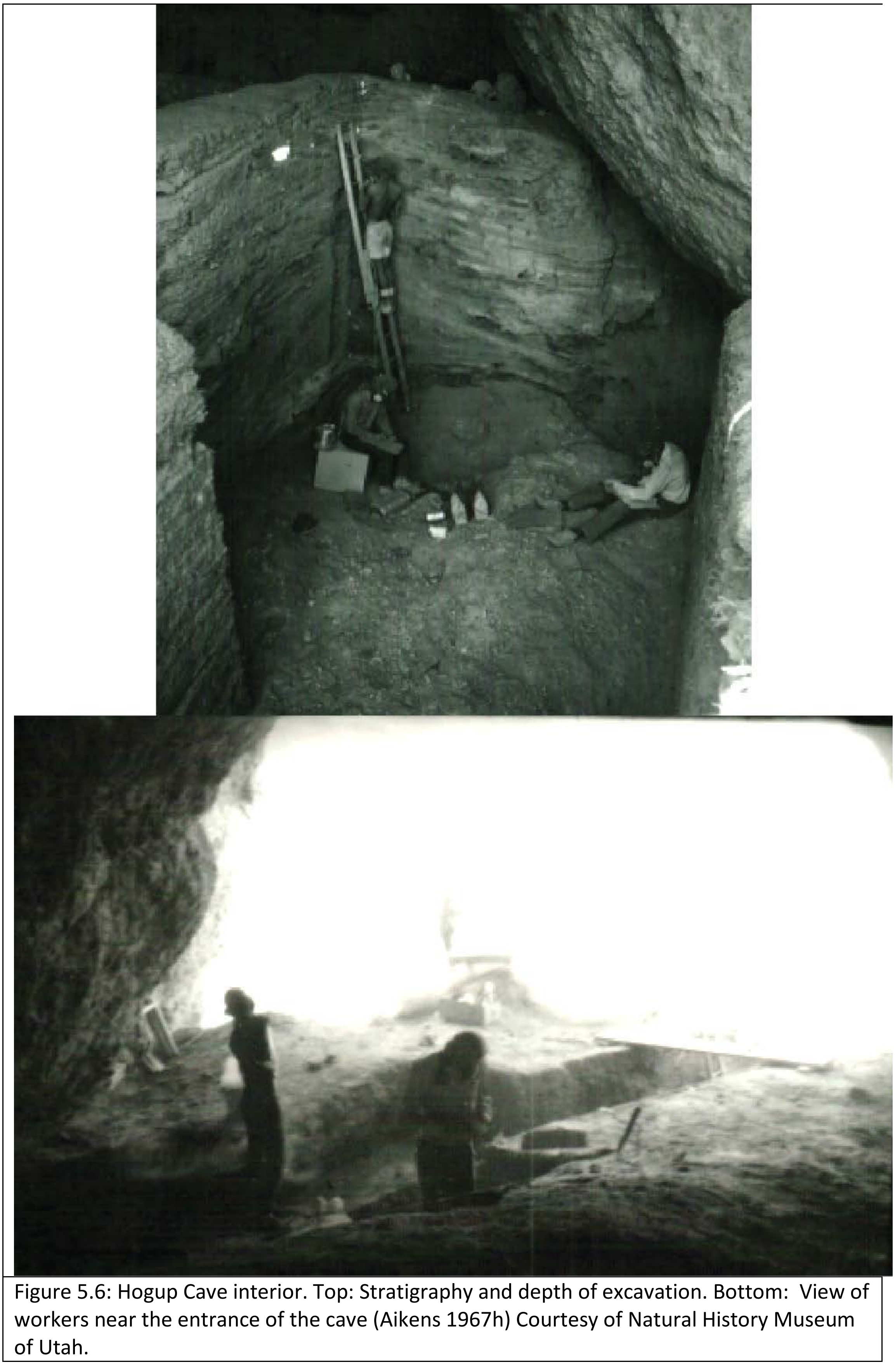


Figure 5.6: Hogup Cave interior. Top: Stratigraphy and depth of excavation. Bottom: View of workers near the entrance of the cave (Aikens 1967h) Courtesy of Natural History Museum of Utah.

Chronology

There are 23 radiocarbon dates (Table 5.2) in 16 strata for Hogup Cave. The earliest radiocarbon date is Stratum 1 (6,350 - 5,860 BC) the youngest radiocarbon date is in Stratum 16 (200 BC – 1,520 AD, Aikens 1970:28). The section drawings (Figure 5.7) show that there were intrusions into the subsurface. These areas of intrusion are not included in the overall contextual analysis.

Cultural Stratigraphy	BC
Stratum 1	6350 - 5860 BC
Stratum 3	6800 - 4020 BC
Stratum 4	5815 - 5250BC
Stratum 5	5250 - 3795 BC
Stratum 6	4400 - 3960 BC
Stratum 7	4190 - 2610 BC
Stratum 8	2610 - 1200 BC
Stratum 10	2490 - 600 BC
Stratum 12	920 - 550 BC and 470 AD
Stratum 14	620 - 790 AD
Stratum 16	200 BC - 1520 AD

Table 5.2: Radiocarbon dates by level for Hogup Cave. (Aikens 1970:28)

Synopsis of Site Interpretation

Hogup Cave was linked to four different cultural units. Unit I is the earliest unit encompassing Strata 1-8 (6,350 - 1,200 BC). During this time the cave was used extensively, as it was "probably occupied seasonally as a base camp for a wide range of activities" (Aikens 1970:188). Unit II occurs in Strata 9, 10, and 11 (1,200 - 920 BC, Aikens 1970:190). Unit II has a slew of new artefacts, the open marshlands were swallowed by rising water levels of the Great Salt Lake, and a heavy emphasis was placed on hunting big game animals (Aikens 1970:192). Unit III occurs (950 BC to 1,480 AD) in Strata 12, 13, and 14 (Aikens 1970:192). Aikens classifies Unit III as "a hunting outpost of the horticulturally based Fremont culture that is known from a number of different sites along the eastern shore of the Great Salt Lake" (Aikens 1970:194). Unit IV encompasses 1350 to 1850 AD and includes strata 15 and 16 (Aikens 1970:194). During Unit IV, the Fremont culture disappears, and the cave is "once again as one of the seasonal stations of a group of hunter-gatherers, as in the pattern of Unit II" (Aikens 1970:195).

Finally, Aikens interprets Hogup Cave as not a typical site within the Great Salt Lake area of the Great Basin (Aikens 1970:206). This means that the location of Hogup Cave within the landscape creates a specialized economic opportunity for hunter-gatherers, and therefore is used differently from any other location in the landscape (Aikens 1970:206).

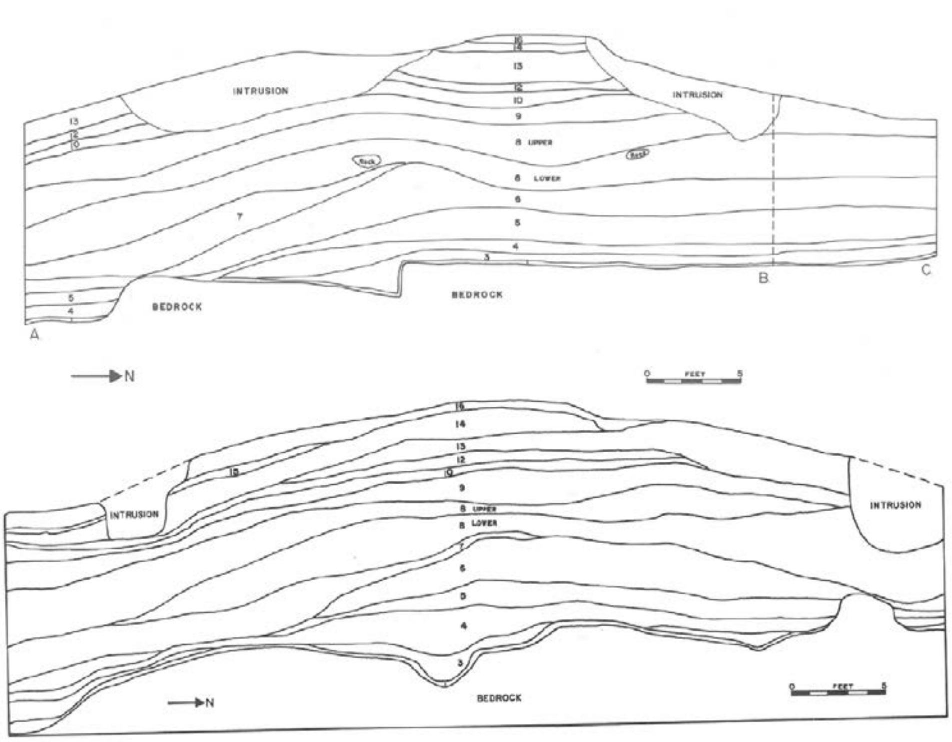


Figure 5.7: Section drawing for Hogup Cave (Aikens 1970:15, 16).

Gatecliff Shelter

Gatecliff Shelter is located near the centre of the state of Nevada. As part of the Toquima mountain range (Figure 5.8), the shelter is situated on the Gatecliff formation after which the site is named (Melhorn and Trexler 1983:29). This formation and the shelter sits in Mill Canyon, which has a seasonal stream fed by springs (Melhorn and Trexler 1983:29). These streams at the time of excavation had low output and water did not flow late into summer (Melhorn and Trexler 1983:29). The shelter is an overhang of dolomite and chert that faces south towards the canyon (Thomas 1983a:16). Thomas reports this shelter to be at an elevation of 2,319 m. or 7,607 ft. above mean sea level (Thomas 1983a:16). The dimensions of Gatecliff shelter is approximated by this author as the actual dimensions are never printed. The opening before excavation is 4

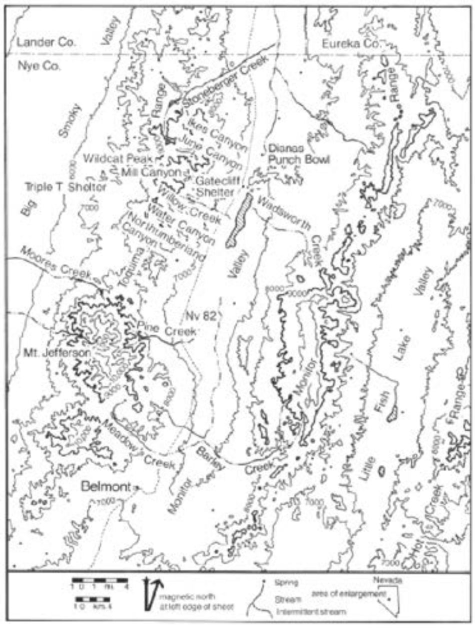


Figure 5.8: Gatecliff Shelter locational map (Thomas 1983:17).

meters vertical by 5 meters in width and at least 5 meters from the drip line to the to the rear (Thomas 1983a:19).

History of Research

Dr David Hurst Thomas is the head of the anthropology department at the American Museum of Natural History in New York City, New York. Just before 1970, excavation performed by Thomas in the Reese River Valley was nearing conclusion, yet there were no stratified sites in the area that yielded the ability to reconstruct paleoenvironmental and prehistoric changes (Thomas 1983a:16). In June 1970, Gatecliff Shelter was found after a chance meeting with a mining geologist, named Mr. Peer, who remembered seeing a rock shelter with rock art along the rear wall (Thomas 1983a:16). An initial 50 by 50 cm excavation unit was dug by Thomas to a depth of 30 cm, and an incised stone with butchered and burnt artiodactyls bones were recovered (Thomas 1983a:16). In the following years more intensive excavation was conducted which included over 300 archaeologist, 5,000 work days, and 600 cubic meters of dirt being dug and sifted (Thomas 1983a:11, 18). The maximum depth of Gatecliff was over 10 meters, and a stair case was installed for health and safety, taken from the remains of a historic mine (Figure 5.9 (Thomas 1983a:24). In 1978, excavations concluded at Gatecliff, but not all of Gatecliff was excavated, leaving the possibility of later data recovery possible (Thomas 1983a:25). It was not until 1980 that the site was backfilled (Thomas 1983a:25). This backfilling was done via a conveyor belt to preserve the side walls which were protected with plastic and sheet wood; the staircase was never removed from the site and is to this day buried in the fill (Thomas 1983a:28).

The excavation resulted in a three part monograph on Gatecliff Shelter and the wider archaeology of the Monitor Valley, in Nevada. Some chapters and appendices are either authored or co-authored by people who excavated or performed laboratory analysis. Trudy Thomas (1983b, c, d) analysed the incised stones and rock art from Gatecliff Shelter.

Figure 5.9: Gatecliff Shelter interior. Top: View from the rear of the shelter using a fish lens. Bottom: Stairs and bucket relay (American Museum of Natural History: 2015).

Chronology

There are 47 radiocarbon dates (Table 5.3) for Gatecliff Shelter. These dates have been used to organize the occupation spans between each cultural Horizon. The earliest radiocarbon dates for the use of Gatecliff Shelter is 4,220 BC with the latest use happening at 1,400 AD (Kennett et al. 2014). The total depth of deposits reached 10 meters (Figure 5.10 and Figure 5.11); however, due to safety concerns some portions remain unexcavated (Thomas 1983a:25).

Cultural Horizon	**Cal AD / BC (Thomas 1983a)**	**Cal AD / BC (Kennett et al. 2014)**
Horizon 16	3550 to 3400 BC	4220 to 4110 BC
Horizon 15	3400 BC to 3300 BC	3920 to 3845 BC
Horizon 14	3300 and 3150 BC	3690 to 3600 BC
Horizon 13	3150 to 3050 BC	3560 to 3485 BC
Horizon 12	3050 to 2300 BC	3310 to 3155 BC
Horizon 11	2300 to 2150 BC	2875 to 2775 BC
Horizon 10	2100 to 1450 BC	2530 to 2395 BC
Horizon 9	1450 to 1350 BC	1910 to 1710 BC
Horizon 8	1350 to 1300 BC	1640 to 1615 BC
Horizon 7	1300 to 1250 BC	1625 to 1535 BC
Horizon 6	1250 BC to 700 AD	195 BC to 50 AD (Late) 1550 to 1365 BC (Early)
Horizon 5		265 to 495 AD
Horizon 4		
Horizon 3	700 to 1300 AD	925 to 1105 AD (Horizon 2/3)
Horizon 2	1300 AD (SIC)	
Horizon 1	Post 1300 AD	1240 to 1400 AD (Horizon 1/2)

Table 5.3: Gatecliff Shelter radiocarbon dates by horizon. The research used the most up to date ranges as seen in Kennett, et al. (2014, Thomas 2012). For Horizon 6, the late date was used in the analysis.

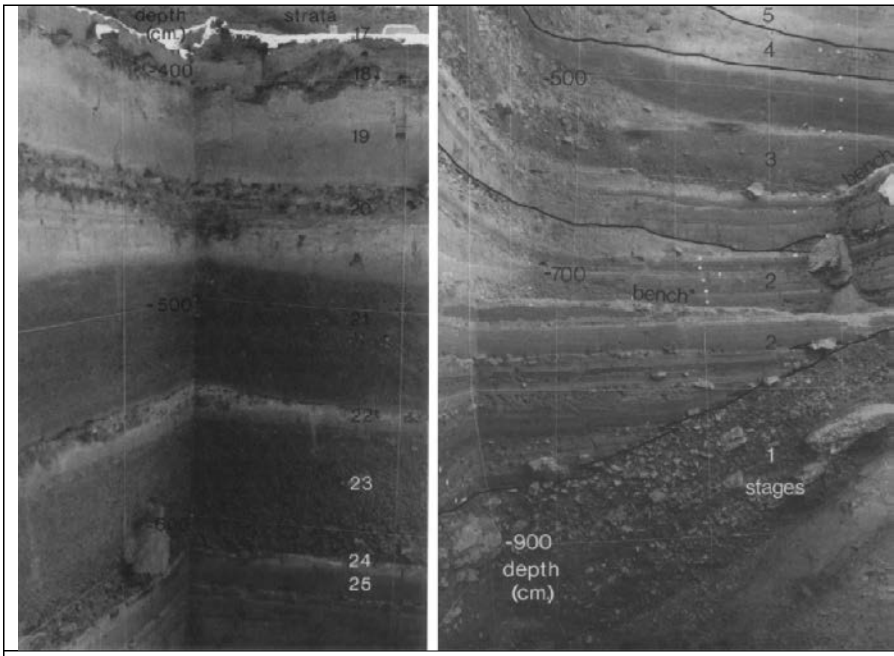


Figure 5.10: Gatecliff Shelter stratigraphy (Thomas 1983:54, 77).

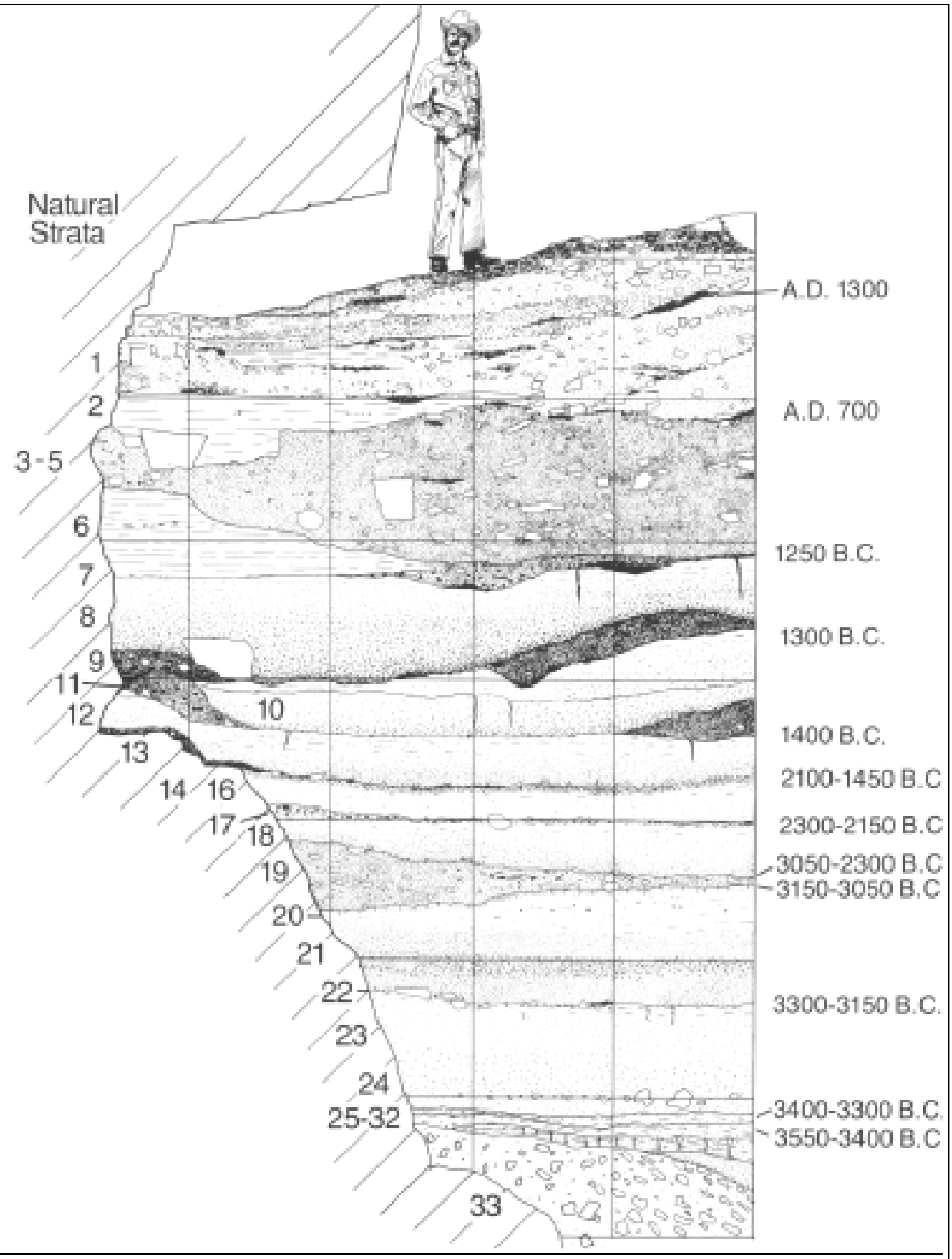


Figure 5.11: Gatecliff Shelter section drawing. Man on top of section for scale (Thomas 1983:41).

Synopsis of Site Interpretation

David Hurst Thomas (1983a) makes several interpretations of Gatecliff through time. These interpretations are presented on different aspects of use of the shelter and can be thought of as scales. These scales start as a micro analysis of artefacts and end up as an overall analysis of the cave. The scale is then analogous to going from a zoom to a wide angle view on a camera. The first scale is interpreting men and women extraction and fabrication activities, the second is the context of features, and toss/drop zones. Finally, the interpretation of the use of the shelter overall through time is discussed.

Extraction and fabrication activities are the first scale at Gatecliff. Extraction activities are defined as the collection of subsistence, or the raw materials, to produce new artefacts (Thomas 1983a:516). At Gatecliff, during a number of Horizons, the processing of artiodactyls, and gathering raw materials for projectile point manufacturing were of primary importance (Thomas 1983a:517). These activities are attributed to men who were in the process of butchering kills, collecting raw materials for new tools, and preparing them for transport to other places where they would be consumed or used (Thomas 1983a:517). Evidence of women at the site is limited to only Horizon 1 where Apocynum fibres were located (Thomas 1983a:517). These fibres were used in the production of cordage (Thomas 1983a:517). Fabrication activities are defined as the process of making new artefacts through altering raw materials (Thomas 1983a:517). Fabricated artefacts such as flaked stone tools, ground stone, and traps and snares is attributed to male activities (Thomas 1983a:517). The fabrication of bone awls, drills, gravers, and perforating tools are attributed to women's activities (Thomas 1983a:520).

The second interpretive scale is the context of hearths and toss/drop zones within the shelter. The hearths (n=34) at Gatecliff were mostly placed four meters from the rear wall of the shelter, yet just inside of the drip line to prevent rain and wind from disturbing the fire (Thomas 1983a:525). When plotted, these hearths form a line referred to as a "hearthline" (Thomas 1983a:524). This arrangement is true for every Horizon with a hearth, and as Thomas (1983a:525) explains would have provided

> "A relatively warm and smoke free "rear room," a heated work and sleep area of nearly constant size between 15 and 20 sq. m. The rear wall effectively served as a heat sink, warming the inner part of the shelter with a relatively small fire."

Toss/Drop zones are essentially debris that is either tossed away or dropped. These methods appear to be how artefacts are sorted at Gatecliff (Thomas 1983a:524). A toss zone is an area where tossed large heavy items have collected over time (Thomas 1983a:524). A drop zone is an area where small light items have collected over time (Thomas 1983:523). At

Gatecliff (except Horizon 2) artefacts, ecofacts, and debitage at the rear of the shelter are significantly smaller than those found at the drip line (Thomas 1983a:523). In fact, artefacts are so well sorted through tossing or dropping that "regardless of material, stage of manufacture, potential use life, edge attrition, typological or functional category, the internal positioning of debris is best predicted by one variable-weight" (Thomas 1983a:524). It seems that if it was heavy it was tossed out of the shelter, and if it was light it was dropped inside the shelter (Thomas 1983a:524).

The final interpretation of Gatecliff is the use of the shelter overall through time, achieved by three groupings of time that roughly corresponds to climate change. The first of these is during the Middle Holocene circa (3,400 BC) when people first visited the shelter (Thomas 1983a:524). This period lasted until 3,000 BC and is described as a time when "small groups of people stayed no more than a few days. Those stopping at Gatecliff were travelling light, often making new ad hoc tools during their absence from the base camp" (Thomas 1983a:524). The second period of time is from 3,000 BC to just before 1,300 AD and at the shelter, the number of artefacts increased (Thomas 1983a:528). Also, women appear to have frequented the shelter more often, as is considered through the increase of ground stone, basketry, and hide textiles (Thomas 1983a:527). However, the premise of Gatecliff remained the same as Thomas (1983a:528) explains it as

> "a field camp serving as a convenient stopover for people moving through Mill Canyon. Sometimes hunters spent the night there, and women probably ducked -inside Gatecliff to escape the heat of the day, or to avoid a sudden thunderstorm while collecting the native seeds of the Mill Canyon area."

In the final period change occurs just before the site's last use at circa 1,300 AD (Thomas 1983a:521). In this instance the shelter seems to be used strictly as an all-male hunting camp, and the toss/drop zones change with the large heavy items in the inside the shelter (Thomas 1983a:528). This change left no room for a life space on the inside of the shelter (Thomas 1983a:528).

Ruby Cave

Ruby Cave is located on the east facing side of Sherman Mountain, in north east Nevada, with the largest city of Elko approximately 60 miles away to the northwest (Welcott 2001:1). Sherman Mountain is part of a series of mountains that together are called the Ruby Mountains, whose highest point is at 11,387 ft. and rest on a narrow fault block which trends north and south for 100 miles (Welcott 2001:1). The Ruby Marshes spread out below this mountain chain to which the cave (Figure 4.5) has an opening view (Welcott 2001:1). The cave is at 6,700 ft. and is surrounded by pine nut and juniper trees (Welcott 2001:2). The cave itself is reached by a steep 45 degree incline for about 500 ft. (Welcott 2001:1). Due to concerns of uninvited visitations to the site, a map of its exact location is not provided (Figure 5.12). Welcott explains that the major hazard in obtaining access to the cave is the “loose dirt and shale [which] make up a majority of the hillside, making it extremely difficult to gain any sure footing” (2001:1). The cave’s opening is 12 ft. high by 30 ft. wide and it is 35 ft. (Figure 5.13) from the opening of the cave to the back wall (Welcott 2001:2).

Figure 5.12: Ruby Cave vicinity (Google 2015).

History of Research

Martin Alexander Baumhoff, the cave’s original excavator, was professor of archaeology at the University of California, Davis. He planned and executed the excavation in 1959 however, he left very little in terms of excavation notes, acknowledgements, or further explanation (Welcott 2001:3). Baumhoff passed away in 1983, but what does survive is the original excavation plan including the grid that was used for the units, the provenance for the artefacts, stratigraphic drawings, and some notes on projectile points (Welcott 2001:3). One of the mysteries of the cave’s provenance notes is the appearance of some artefacts which do not fit into the coordinates of the cave grid. Welcott points out, after a visitation to the site, that there is a smaller cave beside Ruby Cave (2001:1). She then notes that units A-1 and E-1 that do not correspond to the grid designations, may have been placed inside this smaller cave (Welcott 2001:1).

Figure 5.13: Ruby Cave. Top: Looking towards Ruby Cave's natural column. Bottom: From inside the site looking outwards through the same column (Photographs by author).

Since the excavation of the cave five unpublished reports have been produced. The first is by Peggy Kieffer (1961) and explains the fauna remains in Ruby Cave, with discussion on climate change, and subsistence changes through time. Trudy Thomas (1981) examined the incised stones of Ruby Cave. In this report she made a typology for the incised stones, discussed how the incising may have been made, and likened the appearance of the incised stones at Ruby Cave to others found in the Great Basin by Julian Stewart. In Amanda Welcott (2001) wrote for her undergraduate dissertation at the University of California, Davis. She examines all of the artefacts from Ruby Cave and grouped them into categories, making the collection easily accessible to the reader. Welcott also noted that the cave was most likely used by men during hunting excursions (2001:27). Ottenhoff (2004) reported on the incised stones of Ruby Cave for a museum internship project. In this report he examined each stone by recording measurements and detailed descriptions of each stones' incised lines. Ottenhoff also discussed possible reasons the incised stones were made and left (see Chapter 3). Finally, Monica Garcia (2006) wrote a report which focused on the projectile points. In all five cases the authors offer interpretations of Ruby Cave, and suggest further research.

Chronology

Level	Calibrated Date
0-6" Level 1	890-1280 AD
6-12" Level 2	620 BC-890 AD
12-18" Level 3	2470-620 BC
18-24" Level 4	2470-620 BC
24-30" Level 5	2290-1900 BC
30-36" Level 6	Undated

Table 5.4: Radiocarbon dates by Level for Ruby Cave (Garcia 2006:8).

The first radiocarbon dates for Ruby Cave were submitted for measurement by Welcott in 2001 and are reported by Garcia in her 2006 unpublished paper (Figure 5. 17). These dates were then converted to "BC / AD" (Garcia 2006:8). The results place the earliest occupation at 2,290 BC with the latest date at 1,280 AD (Garcia 2006:8). The stratigraphy of Ruby cave appears to have only two strata. Ruby Cave was excavated in six inch arbitrary levels. There are six arbitrary levels that reached 36 inches below the surface, terminating at the course grained ceiling debris (Figure 5.14). The first Stratum, which is from the surface down, is described as an ashy midden. The second Stratum which continues from Stratum one to the bedrock is described as "decomposed Angular Roof Debris" (Welcott 2001:37). This decomposed roof debris layer (Strata 2) that is under the ashy midden is sterile of cultural artefacts (Welcott 2001:37), therefore, all the artefacts are in an ashy deposit (Strata 1). This suggests, that until used by people, the natural deposition of the cave was one of gradual infill of course-grained rocks mostly from roof fall (Welcott 2001:37). I suggest that there may be deeper unexcavated cultural remains below 36 inches, under a thick layer of roof fall. Similar roof fall deposition is noted at Gatecliff Shelter (Thomas 1983a).

Synopsis of Site Interpretation

The general interpretation of Ruby Cave is that it was used prehistorically as a "logistical hunting camp" (Garcia 2006:15, Welcott 2001:27, Kieffer 1961:4). The basis of this determination was made by two criteria, the first was the cave's location in the landscape, and second the artefacts left in the cave through time. The first argument was that the cave is simply too far from the Ruby Mashes, and "is not ideal for exploiting the resources of the marsh below" (Welcott 2001:27). Therefore, the gathering of flora was not the main objective for the occupants at the cave. Second, the most abundant artefact was projectile points and faunal remains, which were accompanied with an overall small collection of other artefacts (Garcia 2006:15, Welcott 2001:27, Kieffer 1961:9). Kieffer notes that the entire kill (mountain sheep or deer) was carried back to the cave for butchering, and then the meat, still on the bone, was most likely taken away to share with a larger congregation (1961:9).

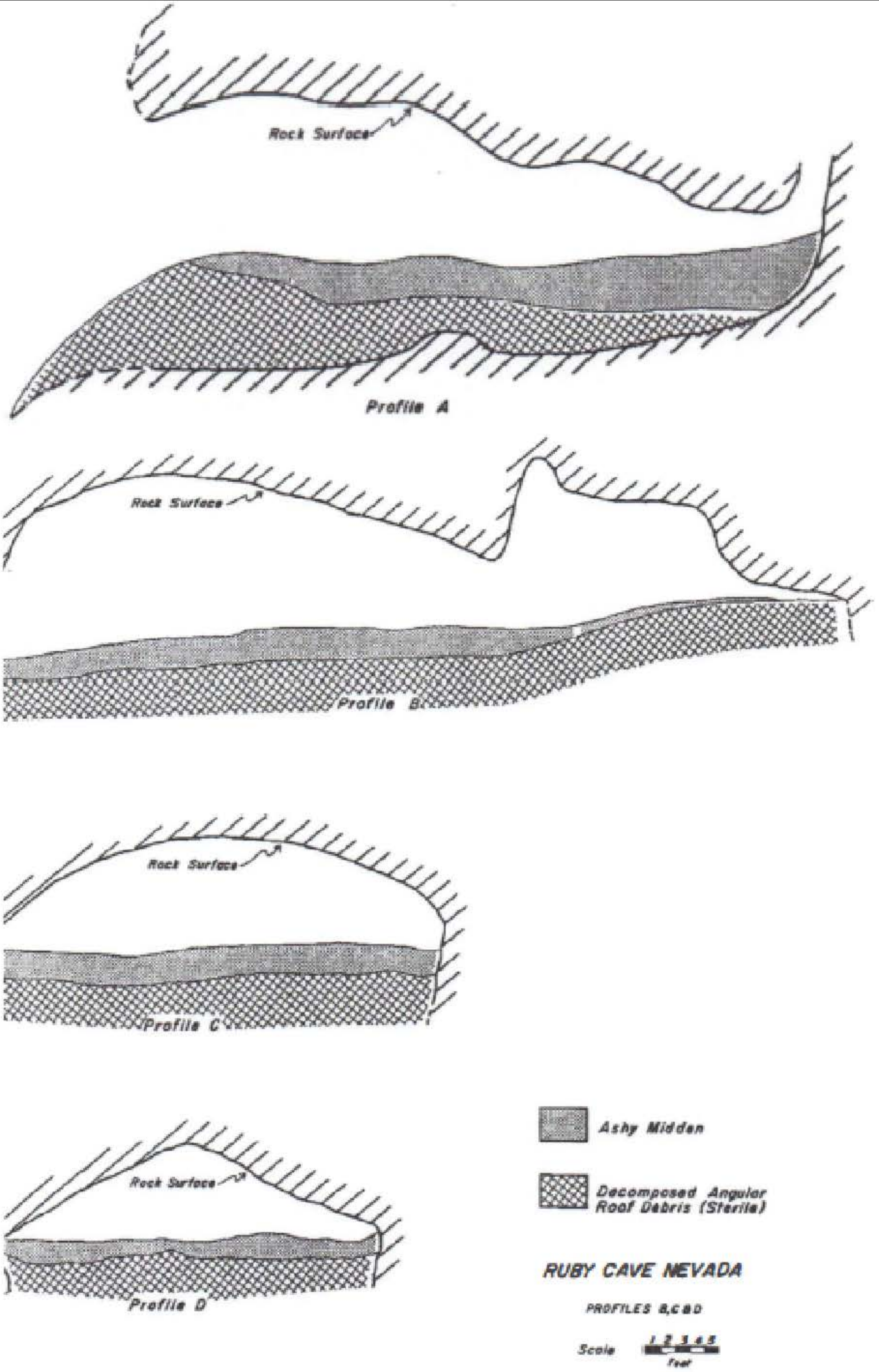


Figure 5.14: Ruby Cave section drawing (Garcia 2006:19).

Swallow Shelter

Swallow Shelter is located on the east side of Goose Creek Mountain which is in the northwest part of the state of Utah (Dalley 1977:7). Only a half mile away from the Nevada border, Swallow Shelter rests at 5,800 ft. above sea level and rises 100ft above a valley called South-Fork Valley (Figure 5.15) (Dalley 1977:7). Within a 3 mile radius around Swallow Shelter there are 24 natural springs which feed many different creeks throughout the area (Dalley 1977:7) The shelter itself is composed mostly of a white volcanic tuff that has exfoliated away to create a protected area from the sun and rain (Dalley 1977:7). The entrance of the shelter is 150 ft. across by 15 to 20 ft. tall and recesses from 28 to 47 ft. from drip line to the rear wall which is 4 to 8 ft. tall (Dalley 1977:7). Finally, Swallow Shelter receives its name from the *Petrochelidon pyrrhonota* or Cliff Swallow that nest along the volcanic tuff face (Dalley 1977:7).

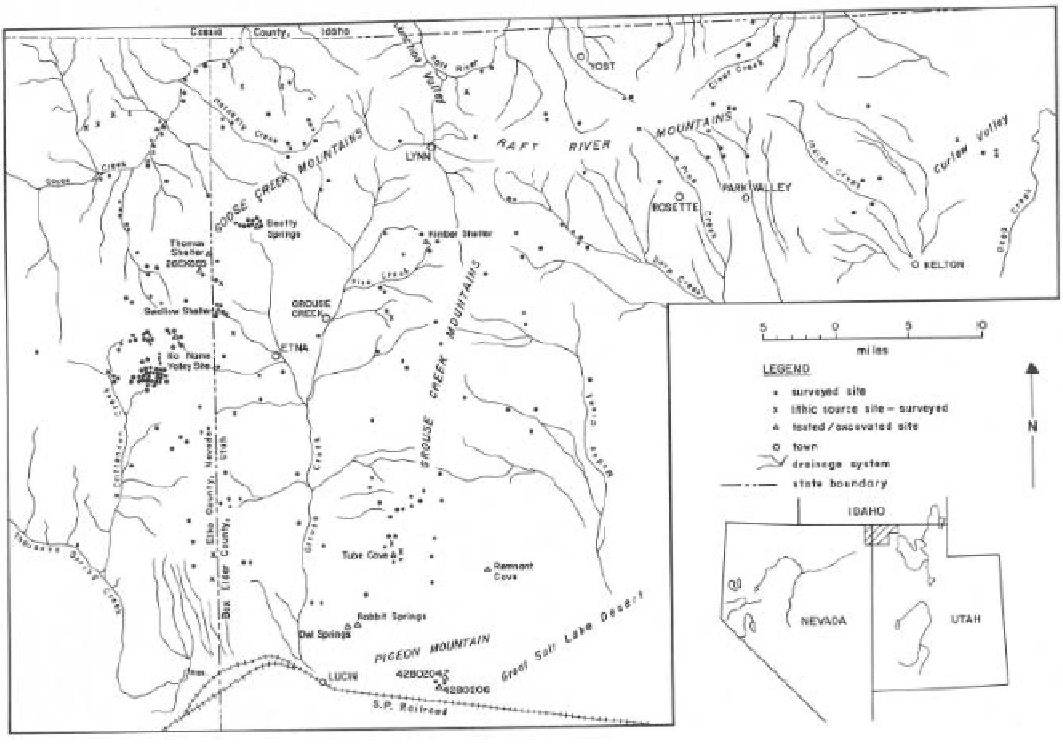


Figure 5.15: Swallow Shelter locational map (Dalley 1976:2).

History of Research

The University of Utah, department of anthropology, carried out survey and excavation in the northwest area of Utah starting in 1969 (Figure 5.16, Dalley 1977:1). This work which includes the excavation of swallow Shelter set out to follow two research designs (Dalley 1977:1). The first was to expand the knowledge of the prehistory of Utah, and the second was to further understanding of the Fremont (Dalley 1977:1). Swallow Shelter was first located and tested by excavation in 1970 with a concluding excavation in 1972 (Dalley 1977:1). Funding for the survey and excavation was generously given by the National Science Foundation (Dalley 1977: v). In 1971, Gardiner F Dalley took over responsibility for all survey and excavation, yet the entire project was overseen by Dr Jesse D Jennings who brought rigorous standards, and advice throughout all activities (Dalley 1977: v-vi). The final investigation report for Swallow Shelter was written by Dalley in 1977. Further investigations in the site have included both a masters on the faunal assemblage (Swanson 2011) and doctoral work on the archaeobotany (Coulam 1988).

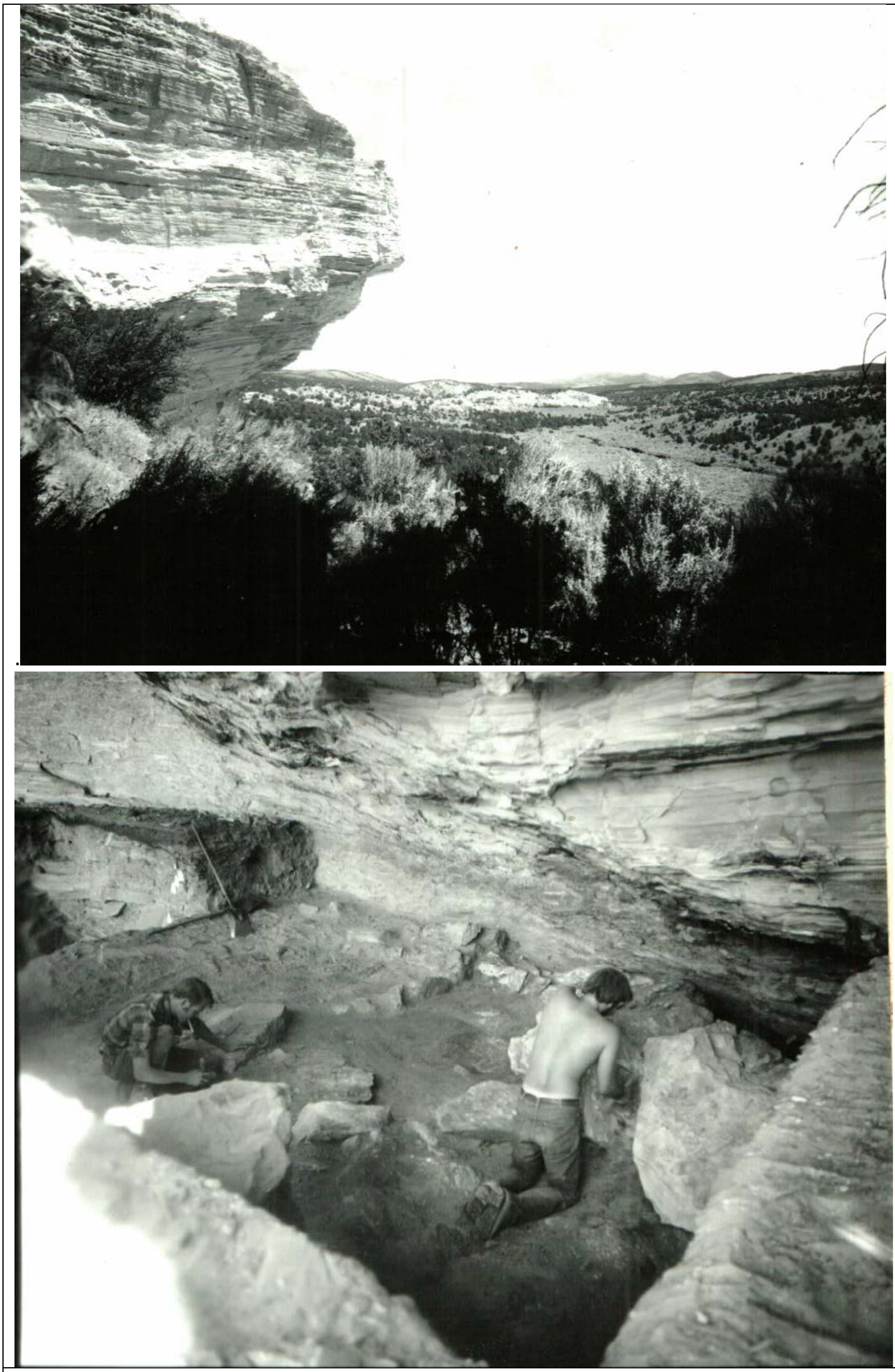


Figure 5.16: Swallow Shelter. Top: View from opening of Swallow Shelter. Bottom: Crew during excavation of Swallow Shelter (Dalley 1972) Courtesy of Natural History Museum of Utah.

Chronology

There are 11 stratified levels (Figure 5.17) in Swallow Shelter, of which five are radiocarbon dated (Table 5.5) showing a cultural deposition spanning over 5,500 years (Dalley 1977: 12). The oldest strata is Stratum 1 (circa 3,460 BC), the youngest dated strata is Stratum 9 (830 AD) however there are two strata younger than Stratum 9. Reaching a depth of 20 ft. or nearly 7 meters Dalley contributes the fill to be from natural and cultural forces (Dalley 1977:11). The business of excavating was carried out in two different areas of the shelter which are noted as the west area and the east area (Dalley 1977:11). The stratified layers during excavation were separated into 17 distinct layers, but during post excavation many of these layers were combined (Dalley 1977:13). Some of the artefacts are reported as coming from the east area, this denotes a trench that was opened at the east end of the shelter, but was not fully excavated due to the lack of stratigraphic distinction and low quantity of artefacts (Dalley 1977:11).

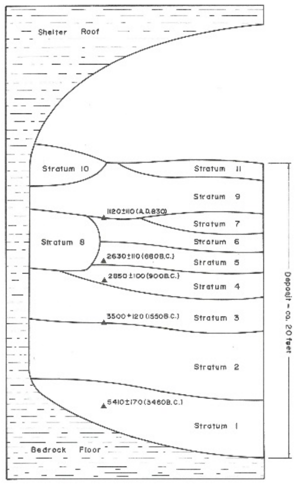


Figure 5.17: Swallow Shelter section drawing (Dalley 1976:12).

Stratum	Calendar Dates
11	
10	
9	720 – 830 AD
8	
7	
6	
5	680 BC – 830 AD
4	900 – 680 BC
3	1550 – 900 BC
1	3460 – 1500 BC
E2	Undated
Unknown Stratum	

Table 5.5 Swallow Shelter radiocarbon dates by strata (Dalley 1977:20, 43).

Synopsis of Site Interpretation

Based on all available artefacts from the shelter the interpretation of the site was that it severed primarily as a hunting base (Dalley 1977:72). The site would have been a part of a hunter and gatherer seasonal round and was used not only for hunting, but also the production and repair of artefacts, and lastly the processing of “wild edible plants” was of minor importance (Figure 5.18) (Dalley 1977:72). The production of new or refurbished items such as projectile points, wooden hunting equipment, and incised stones were the main items that are suspected to have been made at the shelter (Dalley 1977:72). Visits to the site by the prehistoric inhabitants are suspected to have been of short duration mostly taking place during late summer or early fall as is noted by the mature grass remains that are in full seed (Dalley 1977:73). An assumption for the periodicity of visits to the shelter was made based on the amount of individual mammals and the weight in meat for those mammals, and how much a group of six adults would eat (Dalley 1977:73). The outcome of this meat weight to a party of six meant that the site would have not been visited more than once every ten years (Dalley 1977:73).


Figure 5.18: Interior of Swallow Shelter before excavations (Dalley 1976:9).

Conclusion

This chapter has discussed the sites from which incised stones were excavated. The interpretations and the history of the research is meant to help the reader understand the previous research done at theses site. For each site a site description, history of research, chronology, and synopsis of the site interpretation is given. Hereafter the terms site, rock shelter, and cave, are used interchangeably to represent the sites in this research.

In all of the interpretations the sites are thought to be used mostly, if not exclusively, by men for hunting. This type of interpretation has dominated research in the Great Basin from the outset of logistical hunting models (Binford 1980, Kelly 1983). Logistical hunting is synonymous with all male hunting parties and David Hurst Thomas brought this stereotype to a forefront referring to it as ‘Man Caves’ (Thomas 2014). The evidence in the coming chapters will explain why ‘Man Caves’ may not have been as apparent in the archaeological record. The context of incised stones, as will be demonstrated, is much more closely associated to male / female extraction activities. The interpretations offered by many of the excavators was tentative as the main purpose of the monograph was to report the archaeology (artefacts and ecofacts), not to go to great length on how the site fit into the greater scheme of the Great Basin.

Rather than discuss these sites in further detail here, I now move to the analyses derived from the excellent contextual data available—the following three chapters will focus upon the context of incised stones from these five sites.

Chapter 6: Context and Chronology: Temporal Trends and Incised Stones

Introduction

The previous chapter introduced the sites used in this research by included a history of the research, discussion of the chronology, and a synopsis of each site's interpretation. This chapter will examine the context of these sites in far more detail. The scale of the context in this chapter is the widest and broadest, in subsequent chapters the scale will narrow. The chapter aims to undertake two tasks: to contextualize the initial appearance of incised stones at the sites, and to perform a frequency distribution analysis of the long term trends at each site. The hope is to contextualise incised stones (Table 6.1) with the total number of artefacts, the climate, the subsistence, and the technology at the time the first incised stones appear at each of the sites. This chapter will conclude with a summation of the climatic context as represented by the frequency distributions peaks and troughs, for the Altithermal, Late Holocene, Neo-Glacial Drought, and Medieval Climatic Anomaly.

	AD 1000 to 1500	AD 500 to 1000	AD 0 to 500	BC 500 to 0	BC 1000 to 500	BC 1500 to 1000	BC 2000 to 1500	BC 2500 to 2000	BC 3000 to 2500	BC 3500 to 3000	BC 4000 to 3500	BC 4500 to 4000	BC 5500 to 5000	BC 6000 to 5500	BC 6500 to 6000	BC 8000 to 7500	BC 9000 to 8500
Camels Back Cave							4				1		1		1		
Gatecliff	43	137		68		151	8	1	2		1						
Hogup Cave	2	3		2	8	2	3					6					
Ruby Cave		31	15				5	3									
Swallow Shelter	7	36		18	3												

Table 6.1: Chronology of incised stone sorted by site. The number for each time period and site is the total number of incised stones.

A frequency distribution, or total number of artefacts per level, will build a context around the incised stones by exploring changes in the climate, subsistence, and technology. Such an analysis will assist in contextualising when incised stones are made in abundance, or in scarce quantity. When compared to other artefacts, an additional level of context will aid insight into the setting for the making of incised stones. To put it another way the frequency distribution will unlock the "fossilized behavioural patterns in artifacts" (Webster 1993:12). A frequency distribution does not have to rest solely on the confines of an archaeological site, and in this case the frequency distribution discussion will also rely on the climatic data (Chapter 4). This method is further enhanced by looking at the short term habitation sequences at many cave and rock shelter sites. The events of a group visiting a site, using it for a particular purposes such as gathering or hunting, and then leaving the site, sometimes to remain unused for a number years has created well defined cultural lenses that seal in the artefacts of the event. Patterns through time are therefore well defined and offer valuable insight into the main purpose of a visitation to a site.

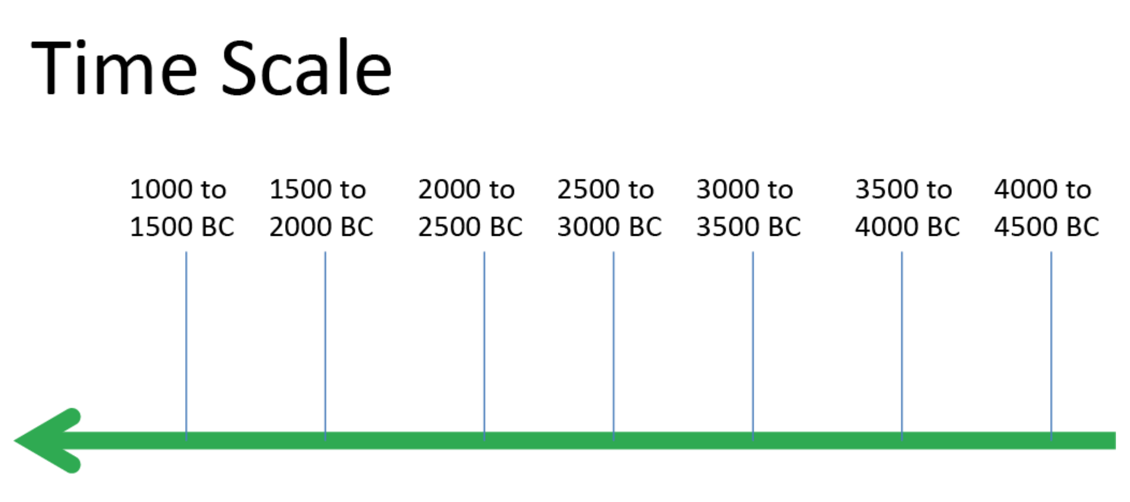


Figure 6.1: Example of chronological 500 year timeline.

Methodology of Making Graphs

My methods for comparing incised stones across five sites started with placing all of the data from four different monographs and several unpublished manuscripts (such as those from Ruby Cave) into an Excel spread sheet (see Appendix A for spreadsheets, Schmitt and Madsen 2005, Aikens 1970, Thomas 1983a, Welcott 2001, Garcia 2006, Baumhoff 1959a, Baumhoff 1959b, Dalley 1977). This spread sheet had column titles and no blank rows or columns therefore Excel treated my data as if it was a database. The database included several artefact and ecofact types that appeared throughout the chronology of all five sites.

The radiocarbon dates between sites do not overlap evenly. To overcome discontinues dates the time scale was devised by using 500 year increments (Figure 6.1). A thousand year increment was deemed too wide and a 250 year increment to narrow. Madsen and Berry (1975) found the thousand year date range problematic when analysing pollen and radiocarbon dates. The dates were correlated by finding the average of the date range per radiocarbon date. This method allowed for a chronological analysis of the context of incised stones and associated artefacts.

During the data entering of artefacts and ecofacts, I had to make some decisions on how to homogenise my data as each monograph differed slightly. An example of this is when I entered the minimum number of individuals (MNI) of animals in Ruby Cave. The MNI of mountain sheep in Ruby Cave was reported by combining levels together, thus Level 1 and 2 shared the same number of mountain sheep. I had no way of separating the true number of mountain sheep by level. I decided to take the average number of total mountain sheep per level. In this way I reported 50% in one level and the other 50% in the other level, or in the case of three levels I divided by 3 and so on. I decided to round down any decimal numbers; rounding down instead of up was done to avoid over reporting more than necessary.

Another challenge was inputting the data for rabbits and hares from Gatecliff Shelter. At Gatecliff Shelter there are two types of levels: horizon and stratum. A horizon is a level that was occupied by people, and a stratum is defined as a level that may or may not, have had human occupation (Davis et al. 1983:46). The rabbit and hares at Gatecliff Shelter appear in levels that are culturally sterile, the spreadsheets only include animals reported by horizon. In the spreadsheets, the headers 'small mammal' and 'large mammal' constitute a total sum of all faunal remains for that category. Small mammals includes rabbit, hares, skunk, and marmots and large mammals include bison, deer, pronghorn antelope, and bighorn mountain sheep. Avian remains are their own category and are represented as MNI.

Context of First Incised Stones

From the sites chosen for this study, (Figure 5.1) the earliest incised stones are from Camels Back Cave. The earliest instance of an incised stone was recovered in Stratum 4 and dates between 6,587 to 5,735 BC. Hogup Cave's first incised stone occurs in Stratum 7 circa 4,190 BC. At Gatecliff Shelter from 3,700 and 3,530 BC (Horizon 14) incised stones are deposited for the first time. At Ruby Cave, the first incised stone is found in the undated Level 6. At 900 BC incised stones finally make an appearance at Swallow Shelter. The sites are discussed in order of first occurrence (Camels Back Cave, Hogup Cave, Gatecliff Shelter, Ruby Cave, and Swalllow Shelter).

The following section will discuss the context relationships at the time incised stones emerge in the archaeological record for each site. This is done through a discussion of the climate, subsistence, and technology at each site. With the discussion of Ruby Cave it should be noted the earliest incised stones is from an undated level. It is possible that the excavation was not taken to bedrock, so there could be incised stone under the debris field (see Chapter 5). The debris field of decomposing roof material did yield artefacts to 84 inches (110 cm) below surface, but past Level 6 no radiocarbon dates are available (no incised stones were found at this depth).

Camels Back Cave

At this site several patterns arise as the first incised stone (n=1: 6,587-5,735 BC) appears in the deposition. Incised stones at Camels Back cave were introduced during changes in climate, subsistence and technology.

Climate

The climate in the area of Camels Back Cave started to become warmer at 6,350 to 5,300 BC (Madsen, Oviatt, and Schmitt 2005:25). This warming trend corresponds to the beginning of the Altithermal (see Chapter 4), as temperatures increased quickly causing an end to an entire glacier in Little Cottonwood Canyon, about a hundred miles northeast of Camels Back Cave (Madsen, Oviatt, and Schmitt 2005:25). Rivers, wetlands, and plants (as noted from pollen samples) dried up and disappeared from the landscape with the rapid increase of temperature in the area of Camels Back Cave (Madsen, Oviatt, and Schmitt 2005:25). Artiodactyls populations (such as deer and pronghorn) shrunk, while small mammals became increasingly diverse in the landscape (Madsen, Oviatt, and Schmitt 2005:26). This diversity in small mammals may have been at its greatest during the early parts of the Holocene (Madsen, Oviatt, and Schmitt 2005:26). Interestingly, during this time pinyon pine starts to appear in the area of Camels Back Cave (Madsen, Oviatt, and Schmitt 2005:25). Pinyon pine growth continued to expand during this time even into its current environmental setting (Madsen, Oviatt, and Schmitt 2005:26).

Subsistence

The oldest strata with an incised stone is Stratum IV. The total number of mammal bones (n=1,789) increases from the previous Stratum III (n=954) which is an 820 increase in total count (Schmitt and Lupo 2005:137). Out of this number the largest intact small mammals are hares and rabbits (Table 6.1, Schmitt and Lupo 2005:138). Also, appearing for the first time is bison and bighorn mountain sheep in the record (Schmitt and Lupo 2005:138). At about 5,350 BC several other sites in the Great Basin have a marked increase of seed processing (Madsen, Oviatt, and Schmitt 2005:39). At Camels Back Cave however, the preservation was poor for vegetal and seed matter, but is noteworthy that in hearths in Stratum IV pepper weed seeds are more abundant than in any hearth in any Stratum (Madsen, Oviatt, and Schmitt 2005:85).

Technology

Hearths in Stratum IV are also the earliest occurrence of fire cracked rocks, in a dug pit (Hunt et al. 2005:60, 88). Other new technologies in the Stratum include an awl (between Stratum III and V), a metate, and six unusual groundstone fragments (Schmitt, Monson, and Shaver 2005). These unusual pieces appear to be to be groundstone, but were altered by flaking, and grinding so that they are rounded and semi-rounded objects (Schmitt, Monson, and Shaver 2005:199). Missing from the Stratum IV deposit are projectile points (Schmitt, Monson, and Shaver 2005:112).

Hogup Cave

The oldest strata with six incised stone is Stratum 7 (circa 4,190 BC). The changes in climate around Hogup Cave are substantial over the last 8,000 years. These changes have been classed into different periods called the Altithermal, Neo-Glacial, and the Medieval Climatic Anomaly or the Medieval Warm Period.

Climate

The Altithermal is seen in Stratums 4 through 8 (5,865 to 2,610 BC, Durrant 1970:245). During this time mammal bones of artiodactyls are relatively small compared to the much larger intake of lagomorphs, shorebirds, and rodents (Durrant 1970:243). This suggested to Durrant that perhaps deer and bighorn sheep were less available because of hot and dry conditions, and hunters sought after rabbits, birds, and squirrels (1970:244). An indicator of the drier environment is the presence of the pallid bat (*Antrozoas pallidus*), which prefers dry conditions with warm temperatures; pallid bat remains were found in strata temporally linked to the Altithermal (Durrant 1970:244). Today, the pallid bat is known to be located outside of the Great Basin, and the appearance of it at Hogup Cave, suggest temperatures would have to have been at least 1° Celsius warmer for it to have hibernation success (Harper and Alder 1970:235). As Lake Bonneville succumbed to the hot and dry, conditions there is evidence to suggest that a marsh formed in the wake of the retreating shore line (Harper and Alder 1970:228).

This marsh would have been fueled by a high water table and supported a range of flora and fauna (Harper and Alder 1970:228). The best evidence of this is the avian remains, which indicate that during this time waterfowl and shorebirds were a common menu item (Harper and Alder 1970:228, Parmalee 1970:243). This is also the time when pickleweed would have grown in abundance around these marshes, and was harvested and processed in Hogup Cave (Kelso 1970:252). Indeed, so much pickleweed was harvested that Aikens comments the deposition of the stratigraphy as “literally tons and tons of vegetal matter”

(Aikens 1970:11). The Altithermal had periods of wetness (see Chapter 4, Figure 6.3) which was sufficient enough to raise the Great Salt Lake shoreline. The marsh environment about 4,000 BC would have disappeared under the waves and the once high water table is believed to have dropped making an end to the marsh. This is supported by the almost entire disappearance of shoreline birds from Hogup Cave (Harper and Alder 1970:228). Due to this change, hunter-gatherer groups most likely intensified their use of upland sites to obtain food (Madsen and Berry 1975:404). Although pickleweed never disappears from Hogup Cave, the occurrence decreases, which is another possible sign that the marshes disappeared at this time (Harper and Alder 1970:228). With the close of the Altithermal, temperatures had actually started to ameliorate or cool down, and possibly increased rain occurred that spurred the growth of new plant communities such as sagebrush and shadescale, yet this was not enough to replace the loss of the marshes and wetlands (Harper and Alder 1970:229). The hunter-gatherers most likely used Hogup Cave as their primary residential base.

Subsistence

The change in subsistence after 4,190 BC is another factor in the suite of changes that led to the creation of incised stones. Mule deer and pronghorn had been a common kill for the Hogup Cave inhabitants, but after 4,190 BC bighorn sheep were killed along with increasing numbers of deer, bison, and pronghorn (Durrant 1970:242). At the same time lagomorphs such as rabbits were still captured, but in decreasing amounts (Durrant 1970:242). Shorebirds were still being taken, but in fewer numbers. Once again pickelweed was an important food source, but from pollen and coprolite studies, it appears it was harvested less as it was most likely less available (Kelso 1970:252). Fresh water mussels, that would have been available during the open marsh lands, start to disappear from the record after 4,190 BC (Harper and Alder 1970:228).

Hogup Cave (Stratum 7)	
Artefact	**Citation**
Atlatl	(Aikens 1970:156).
Painted Bones	(Aikens 1970:86).
A Pestle	(Aikens 1970:68).
A Stone Ball	(Aikens 1970:72).
Sagebrush Bark and Grass Pads	(Aikens 1970:120).
A Wooden Awl	(Aikens 1970:156).
Wrapped and Lashed Sticks	(Aikens 1970:173).

Table 6.1: Artefacts that appear in the record at Hogup Cave at the same time as the oldest incised stones at Hogup Cave.

Technology

A piece of an atlatl is found in Stratum 7 (Aikens 1970:156). This suggests a significant new technological change for the people at Hogup Cave. The atlatl is not the only new arrival in Stratum 7 as (Table 6.2) demonstrates. The single stone ball is described as "ovoid, shaped by pecking and grinding… with battered ends" (Aikens 1970:72). Stone balls such as these may have served as hide-processing stones (Adams 2002:96).

An artefact called "wrapped and lashed sticks" are sticks wrapped in sinew that may have been used in the construction of moccasins (Aikens 1970:86). The sagebrush bark and grass pad "fibers are stuck together and matted rather tightly, as they might be if they had been impregnated with blood" (Aikens 1970:119). This residue was not tested, but Aikens (1970:119) suggests the bundles may have been used to catch menstrual blood. Twenty-two bone beads were recovered, where only three beads had been found in previous levels (Aikens 1970:86). I propose that during this time, people possibly traveled further and established new trade networks which in turn spurred the rapid change in technology, and introduced incised stones to Hogup Cave. The increase of bone beads may support trade either as an import or export.

Gatecliff Shelter

An incised stone (n=1) first appear in the record of Gatecliff Shelter in Horizon 14 which dates to 3,700 and 3,530 BC (Thomas 2012). Horizon 14 is a thin cultural layer (15-50 cm thick), that is between two culturally sterile levels (Davis et al. 1983: 56, Thomas 1983a: 172). An analysis of the climate and archaeology of the site will provide the contextual background to the incised stone. Climate, subsistence, and technology are the three factors examined during the Horizon 14 deposition. Horizon 15 (3,940 – 3,800 BC), which is the preceding occupational level, is used to compare and contrast the climate and archaeology of Gatecliff Shelter (Thomas 1983a:448, Thomas 2012).

Climate

Before 3,300 BC, climatic changes took place around Gatecliff Shelter before the introduction of incised stones. Sagebrush *(Artemisia tridentate*), pinion pine *(Pinus monophylla*), and Juniper *(Juniperus osteosperma*) woodlands appear on the landscape following flooding that occurred between 3,500 and 3,100 B.C (Davis et al. 1983:57, Thomas 1983a:505). Coinciding with the new plant growth during this time, the annual rainfall became less frequent during the summer months with higher amounts of precipitation during winter storms (Thomas 1983a:506). Pinion pine and juniper pollen increased (Thompson and Kautz

1989:142, 143). In Horizon 14, and radiocarbon dated to 3,400 BC, a segment of carbonized pinyon pine is found in the shelter, suggesting this tree was readily available as firewood (Thompson and Kautz 1983: 143, Thomas 1983a:505).

Subsistence

Subsistence changes took place at Gatecliff Shelter at the same time as the incised stone is deposited. The amount of individual rabbits and squirrels decline in the Horizon (14) incised stones appear (Grayson 1983:104, 105). The number of bighorn sheep (n=3) is slightly increased from previous level Horizon 15 (n=2) (Grayson 1983:127). A soil sample taken beneath a milling stone yielded the ecofact of pinyon pine scales (Kramer and Thomas 1983:231, Thomas 1983a: 451). Thomas points out that this association may not indicate the processing of pine nuts. However, I argue the association is strong enough to suggest at least onsite pine nut processing. The carbonized pinyon pine and the pinion pollen increase of Horizon 14 suggest there was an availability of pine nuts, in conjunction with the equipment (groundstone) to process pine nuts makes the association and activity very possible.

Technology

Technological (Table 6.2) changes took place at Gatecliff. There is a small increase in the number of projectile points in Horizon 14 compared to Horizon 15 (Thomas and Bierwirth 1983a:178). The Triple T Concave Base (n=4; Horizon 14) has a more defined concaved base than the previous Triple T Concave Base (n=2; Horizon 15) examples (Thomas and Bierwirth 1983a:189). Triple T Concave Base Points are only found at Gatecliff Shelter and are thought to be a form of Humboldt projectile points (Justice 2002:83, 157).

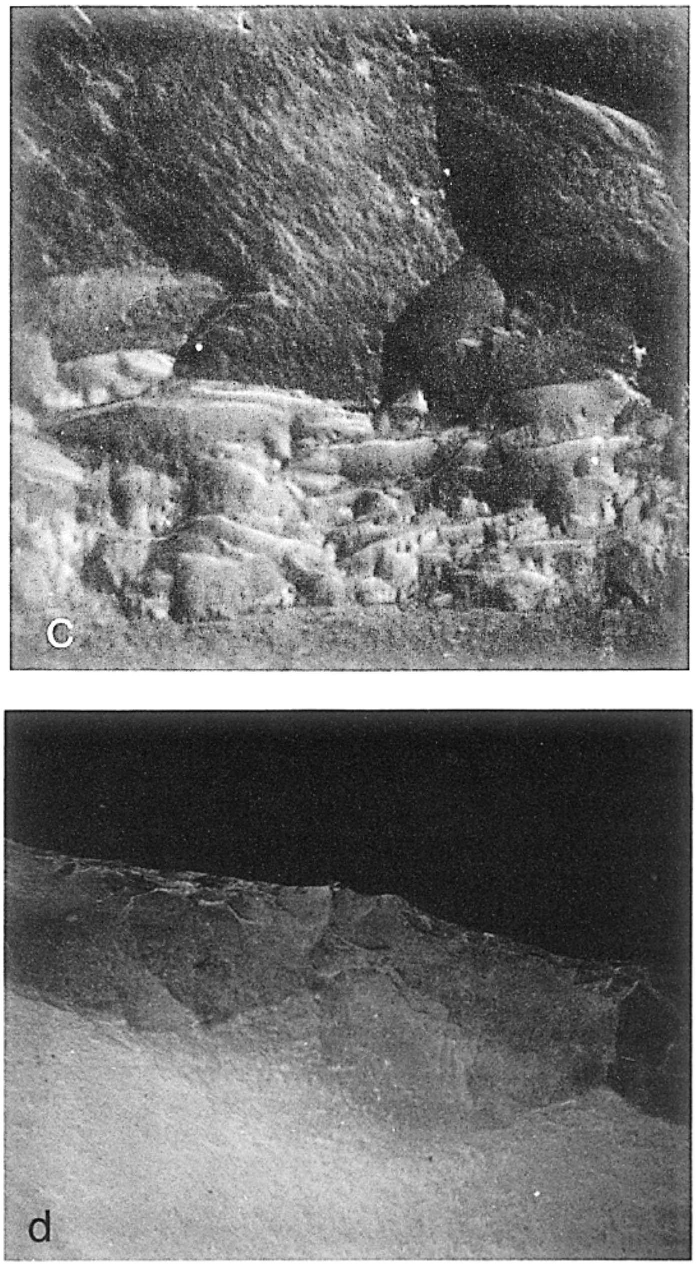


Figure 6.2: Electron photomicrograph of scrapers showing signs of wear. C: unifacial edge showing “small step scars which are indicative of hard wear” (Rowan and Thomas 1983:324). D: unifacial edge with scars indicating only minor wear (Rowan and Thomas 1983:324)

Other new technologies that occur in this stratum include finished knife blades (n=2), scrapers (n=2), and a ground stone slab (with caked on red ochre, Thomas 1983a). A microscopic level analysis revealed the scrapers appear to have been used for scraping (Figure 6.2), proving that they were used for their intended purpose (Thomas 1983a:451). Scraping may have taken place on bighorn sheep hides, which is an activity not previously detected at Gatecliff Shelter (Thomas 1983a:451). Chipped stone flake counts are 46 times more prevalent in Horizon 14 (n=1,950) than in Horizon 15 (n=42) or Horizon 16 (n=32) (Thomas 1983a:309). The knife, scraper, and Triple T Concave Base were probably not made in the cave, but the lithic analysis shows that the repair of chipped stone tools was a dominate activity (Thomas 1983a:451). The ground stone is well used as seen through striations and a well ground surface (Kramer and Thomas 1983:243). The caked on red ochre under x-ray diffraction examination matches the x-ray diffraction results for the rock art in the shelter (Thomas 1983a:452). The results seem to indicate a one to one from the ochre preparation to the making of the rock art, but Thomas (1983a:454) cautions, that the ochre prepared on this metate may have been used as body paint and was never applied to the cave walls. Nevertheless the designs on the incised stones represent 1/4th of the designs that appear on the rock art (Thomas 1983c:318).

Ruby Cave

Unlike the other sites in the sample, Ruby Cave incised stones first occurrence is an undated strata (n=2: level 6). However, Level 5 immediately above Level 6 is dated to 2,240-1,900 BC (Garcia 2006:8). Level 5 has one incised stone and will be used to discuss the climate, subsistence, and technology adaptations at Ruby Cave. Pollen data is unavailable at this site.

All of the radiocarbon dates for Ruby Cave fall within four of the 500 year increments, which does not provide enough data for a good discussion on the frequency distribution of the cave. Also, the cave extends much deeper than the level the oldest radiocarbon date was taken. Thus for this section, the first occurrence of an incised stone is discussed in relation to the long term trends of the cave post Level 6.

Climate

The climate of the Ruby Valley with its accompanying marsh was recovering (2,240-1,900 BC) from the dry and warmer trend of the Altithermal (see Chapter 5). Evidence of this is in the form of faunal remains found during the Ruby Cave excavation. The overall amount of mountain sheep in Levels 6 and 5 is small (n=13) relative to the abundance found in later Levels 1 – 2 (n=51, Kieffer 1961:4). Kieffer suggest that the reason for this is the effect the Altithermal had on animal populations which limited artiodactyls, especially deer and antelope in Level 5 (1961:4). As the temperatures would have declined in the Ruby Valley the rebound of grasses and lakes would have taken many years and so would have the return of large numbers of artiodactyls (Kieffer 1961:6). Evidence of cooler wetter conditions, particularly the increase of summer rains after the Altithermal, is evidenced in the appearance of marmots (n=7, Kieffer 1961:7, 18). These animals rely on green vegetation which would have been available after the Altithermal (Kieffer 1961:11). Overall, the state of the climate was shifting from the hot dry Altithermal to ameliorated lower temperatures that had increased summer precipitation (Kieffer 1961, Welcott 2001:4).

Subsistence

Excavation revealed a total of 2,450 mammal bones that were identifiable to 21 different species of animal (Kieffer 1961:1, 11). Mountain sheep were the main large ungulates that were taken as food items in all levels of excavation at Ruby Cave (Kieffer 1961:18). Bighorn mountain sheep are a draught resistant species and would have been available at higher elevations, thus possibly spurring the initial habitation to Ruby Cave during Levels 5 and 6 (Kieffer 1961:5). The butchery of the whole animal took place within the cave, as is evidenced by the types of bones present, and the meat was most likely stripped off the bone and taken away (Kieffer 1961:15).

The subsistence of Level 5 (2,240-1,900 BC) suggest that the site was originally used as a hunting camp for bighorn sheep. In other subsistence sections in this chapter the changes have been addressed as compared to the past. The small game animals such as rabbits, hares, and skunks were hunted in increasing numbers through time when compared to the initial occupation of the cave (Kieffer 1961:18). This may indicate not only more availability of small animals, but a larger population of people using the cave for a longer period of time. Another animal that is present in late levels (Level 2: 620-890 BC; Level 1: 1,280-890 AD) are the skunks are a water dependent animal that is currently found near and along the edges of the marshes (Kieffer 1961:6). The appearance of skunks (n=13) suggests that trips from the marshes may have been a regular activity in later levels, and Kieffer notes that this probably represents a change in the behavior for the people utilizing the cave from a hunting camp (Kieffer 1961:7).

The most compelling evidence of resources being collected from the marshes and carried back to the cave is the presence of a cattail (Baumhoff 1959a). Cattails grow in the Ruby Marshes today and it is a very water dependent species (see Figure 4.2, Welcott 2001:24). Pine nuts and pine scales (Level 1: 1,280-890 AD) were being collected and taken back to the cave during the late levels (Baumhoff 1959a). While these resources were being gathered it appears that mountain sheep (n=51) were hunted in increasing numbers (620-890 BC; 1,280-890 AD) especially in Level 1 – 2 (n=30 incised stones). In short, it appears by the end of the younger occupation levels the cave was supporting a sizable group of people who were doing a wide range of hunting and gathering activities. Perhaps the most salient change is the gathering of vegetation and plant resources. This may suggest that not only were men hunters working at the site, women were involved more than the earlier occupations

Technology

In level 6 (1,900 – 2,290 BC) in comparison to the previous undated level there is a modified flake not present before, and more chipped stone flakes (n=59), than level 5 (n=19). There is also a chipped stone knife that is also new (Baumhoff 1959a). In later levels there is a rise in the amount of incised stones in Level 2 (620 BC – 890 AD) where there are (n=16) incised stones. The only artefact that is new to Ruby Cave in Level 2 is groundstone. The ground stone consist of a milling slab (metate) and a hand grinder (mano); the mano has been heavily used (Welcott 2001:4). Perhaps a better way to track the changes over time is to combine some of the levels (Table 6.3), and examine the additions over time. This table list new technologies that appeared:

Level	**Incised Stones**	**Technology**
Surface - 12 inches Levels 1 and 2. 620-1,280 AD.	47	Groundstone, Pestle, Bow and Arrow Fragments, Juniper Bark Rope, Polished Bone, Incised Bone, Cut Sticks,
13 - 24 inches Levels 3 and 4. 2,470-620 BC.	3	Basketry Fragments, Leather Fragments, Cordage Fragments, Promontory Peg, Ochre, Pottery, Modified Flakes, Drill
24 - 36 in Levels 5 and 6. 2,290-1,900 BC.	3	Bone Awl, Blade, Scraper, Bone Bead

Table 6.3: Technology that appears at Ruby Cave. All depths are below surface.

Swallow Shelter

Stratum 4 (n=2, incised stones) is radiocarbon dated (from a hearth) to 900 BC (Dalley 1977:20). There were incised stones (n=3) excavated from the east area but because of the low number of artefacts and lack of radiocarbon dates, the east area will not be included in this discussion.

Climate

Stratum 4 corresponds to an increase of snowfall and decreased precipitation and evaporation along the Great Salt Lake, filling the lake nearly 4 meters above current averages (Coulam 1988:181, McKenzie and Eberli 1985:32). This refilling of the lake would have meant that marshes and their plant communities would have disappeared therefore an intensified use of upland sites such as Swallow Shelter would have increased to supplement hunter-gatherer subsistence namely gathering (Coulam1988:9).

Subsistence

The identification of individual plant species from Stratum 4 seems to indicate that along with hunting, the "gathering of a few select riparian plants seems to have been the dominant subsistence during…deposition" (Coulam1988:201). However, because soil samples were not collected below Stratum 4, comparisons between Stratum 4 and 3 plant diversity is not possible (Coulam 1988:155). Bighorn sheep and bison are present in Stratum 4 (n=8) deposit in slightly higher quantity than Stratum 3 (n=7, Dalley 1977:68). Also increasing are yellow-tailed marmots (n=26 Stratum 4; n=24 Stratum 3), along with an increase in other small mammals (Dalley 1977:66). "The marmots have significantly more burned specimens (12.4% of total burned) in comparison to cottontails (1.7% of total burned) and jack rabbits (2.5% of total burned)" (Swanson 2011:79). In addition to traces of burn marks, it appears that cut marks appear on bones in Stratum 4 (Swanson 2011:73). Cut marks on bone are "associated with the separation of muscle tissue (meat) from the bone" (Swanson 2011:73). Also, throughout all Stratums "there is no indication of resource depression at Swallow Shelter" (Swanson 2011:92). Many of the species discussed are hunted during communal hunting parties that can include a large number of people (Swanson 2011:79).

Technology

The incised stones that are deposited in Stratum 4 occur with technologies not seen in previous strata. In addition to these new technologies other items such as ochre stained bones (n=4) appear in higher quantity than Stratum 3 (n=1) (Dalley 1977:50). Preforms (n=27) and bifaces (n=18) increase in number as do scrapers (n=46), and blades (n=12, Dalley 1977:33). Also increasing in abundance are Elko (n=27), Pinto (n=16), and debitage (n=1,482, which is seven times more prevalent from the previous level, Dalley 1977:23).

Summary: Context of the First Incised Stones

From this section an important question of context can be asked: What does the context of the first incised stones deposits suggest? The climate (Figure 6.3) played an important part in spurring new growth and attractions to the sites. At all of the caves, climate change was occurring just before the first incised stones were left at each individual site. At Camels Back Cave, the climate had turned hot and dry at the start of the Altithermal, yet there was harvesting of seeds (pepperweed), and the hunting of large game such as bison and mountain sheep. At Hogup Cave, Gatecliff, Ruby Cave, and Swallow Shelter the situation is slightly different as the Altithermal was ending. More water was available everywhere on the landscape; pinion trees grew in the vicinity of Gatecliff Shelter, the Ruby Marshes were on the rebound, and the extra rain and raising water levels in the Great Salt Lake assimilated some marshy areas.

There was new vegetation in the surrounding area, giving new animal subsistence choices, such as marmots, to the people who live in the Great Basin. Many of these new subsistence choices required group involvement to obtain the resource. There were new attractions at each of the sites that were not previously available before incised stone deposition. At Camels Back Cave, pepperweed seeds were found in higher concentrations and the new growth of pinion pine may have brought people to the site as they utilized these resources. At Swallow Shelter the marmot intake was higher, along with new plant communities in greater abundance which offered attractions to the site that was not previously available. At Hogup Cave, the upland resources of pickleweed around seeps or at the base of Hogup Mountain, may have attracted hunter-gatherers to the site given that the marsh near the lake shore may have been disappearing. The increase in new technology in the record at each one of these sites can be explained by a large section of the population in attendance at the site during these harvesting activities. Incised stones were deposited for the first time as group composition changed. It may be suggestive that the hunter-gatherer groups used reconnaissance to report back to larger groups the most abundant resource areas, and that the family group moved together at least part of to the year. This is a break from logistical hunting where men would visit 'Man Caves' (see Chapter 4) and women would stay at base camps.

It appears that incised stones are made in greater abundance at sites when there is plenty of nearby food resources available. The availability of food, either flora or fauna, probably made it possible for hunter-gatherers to stay at a location for longer durations of time. As shown above, incised stones appear with a number of other artefacts that had not previously been deposited. It appears that longer stays and a large food supply allowed for more activities to take place such as the fabrication of new artefacts or fabrication tools. Incised stones were probably made during these longer periods of stay. These data also suggests that the caves and rock shelters during plentiful food availability periods were more than just logistical hunting localities, but that the entire family unit would most likely stay at the site. The presence of ground stones, awls, and the large number of newly fabricated objects suggests female extraction and manufacturing activities. Therefore, the cave or rock shelters that have incised stones probably did not serve as a 'Man Cave'. This suggests that the presence of incised stones are a marker of extended stays, extensive nearby food supplies, and fabrication activities.

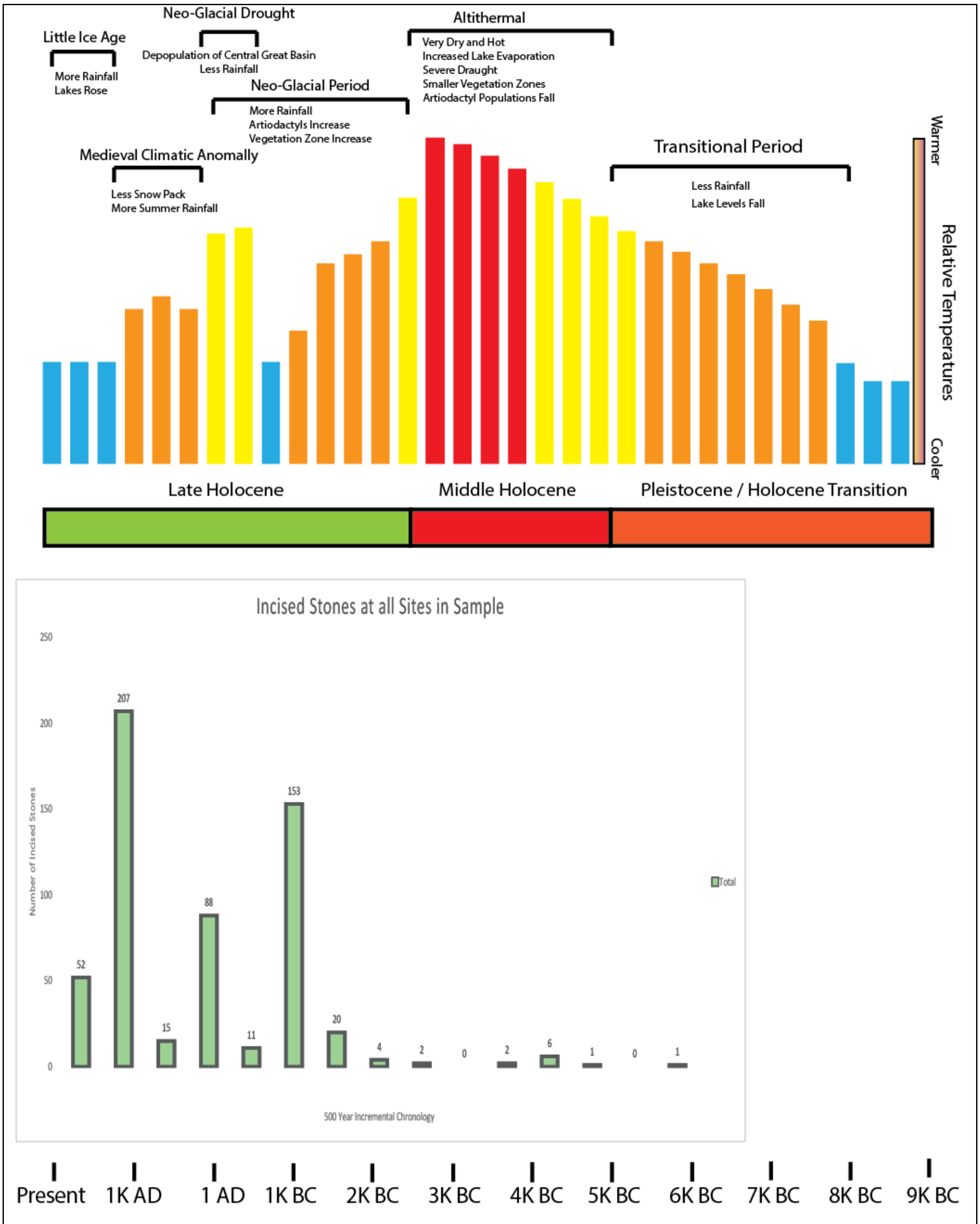


Figure 6.3: The number of incised stones at the sites in relation to the relative temperatures and climatic conditions.

Long Term Trends

The section above addresses the climate, subsistence, and technology in relation to the first occurrence of incised stones at the sites. This section will discuss the long term trends after incised stones are deposited. Discussed in the methodology in the chapter introduction this work uses 500 year increments to homogenize the data. The long term trends will cover the time period when incised stones are most common at the sites 2,000 BC – 1,500 AD. The

Altithermal begins 5,500 to 5,000 BC. The Neo-Glacial Drought is represented by the time frame of 500 BC to 0. Of the climatic periods, these two will be discussed most often.

Incised stones will be compared to the frequency distribution of several artefact classifications (awls, projectile points, ground stones, scrapers), faunal remains and pollen showing subsistence and climate). The artefact classifications were chosen because of their link to gender activity, and subsistence. The most common pollen that is found in the sites that have pollen data are *Cheno-AMS, Ambrosia, Pinus, Artemisia,* and *Juniperus*. Faunal remains give an idea of the subsistence in lieu of pollen. The faunal assemblage is divided into three classifications small mammal (rabbits, hares, skunks, and marmots), large mammal (bighorn mountain sheep, deer, pronghorn, and bison), and avian. This section will first briefly introduce the pollen deposition. Then the section will give the background ethnographic usage from the Great Basin, of the five pollen producing families (*Cheno-AMS, Ambrosia, Pinus, Artemisia,* and *Juniperus*), creating a context into why these particular families were used, when a variety of pollen data was available.

There are only three sites where pollen diagrams were included in the monographs: Gatecliff Shelter, Hogup Cave, and Swallow Shelter. The other two sites, Ruby Cave and Camels Back Cave do not currently have pollen records available. Only the general taxa of species are reported (Thompson and Kautz 1983:138) due to the difficulty in differentiating pollen between two species. For example, "the single-needle pinon (*Pinus monophylla*) of the lower mountain slopes and the limber pine (*Pinus flexilis*) of generally higher elevations" (Thompson and Kautz 1983:138) have very similar pollen characteristics and were not separated out at the time of counting at Gatecliff Shelter.

Pollen can enter the archaeological level in two ways, either windblown, or via contact disbursal. Windblown pollen is carried several miles and is easily deposited into caves and rock shelters. Pollen deposits can also be influenced by the activities of people. At all of the sites prehistoric people brought plants from outside into the cave or rock shelter.

Once deposited, pollen can come under attack from micro-organisms or oxidation (Thompson and Kautz 1983:141). Micro-organisms can eat pollen which destroys the grains. If the soil has a high amount of oxygen then the pollen grains would be more susceptible to decay (Thompson and Kautz 1983:141). In general, if the excavated stratigraphic level contained preserved organic matter then chances are there was a low oxidation environment (Thompson and Kautz 1983:141), best seen in cave deposits.

Thompson and Kautz believed that the occupation times at Gatecliff Shelter are short-termed thus minimizing the amount of pollen that was deposited in comparison with the entire chronology of the site (1983:141). In likewise manner the same suggestion can be applied at all of the sites within my sample.

Ethnographic Plant Use

This section addresses how the plants that are discussed in this chapter may have been used by the prehistoric people of the Great Basin. This ethnographic data gives a background and contextualises the possible uses of these plants during habitation at the sites. Throughout this research the use of different plant species is discussed. I have made inferencea in the text to suggest different activities and decisions made by the hunter-gatherers about how they used the flora in their environment. This inference is based on a history of ethnographic plant use and is included here to familiarise the reader with this ethnography. Although the focus of the ethnography is on the hunter-gatherers of the Great Basin, occasionally ethnography from outside of the Great Basin is utilized to suggest other possible uses of the plants.

Pinus

Pine nuts were an important staple of hunter-gatherer life. In addition to being used for food, pine wood was commonly utilized in many different applications; such as bows, spears, shelters, firewood, and medicine (Lowie 1924). Pinion pine in the Great Basin is typically the single-needle pinon (*Pinus monophylla*) of the lower mountain slopes and the limber pine (*Pinus flexilis*) of generally higher elevations (Thompson and Kuatz 1983:138).

Both men and women collaborated on a pine nut harvest, usually spending as much as a month or more collecting pine nuts. Men would climb the trees and throw down the nuts to baskets below, which were cared for by women (Lowie 1924:203). If the tree was not very high then a long pole could be used to knock the nuts free from the tree (Lowie 1924:203). These collecting times usually brought large numbers of people together to work cooperatively. For example, "practically all the Moapa [Northern Nevada Tribe] left for a pine-nutting expedition in the middle of September, 1915, and did not expect to return before sometime in October" (Lowie 1924:201). Ethnographic information concerning treatment of pinon pines includes ceremonial activity (Fowler 1986:65). Dances were held at the time of harvest and prayers that evoked supernatural help to ensure a healthy harvest were offered (Fowler 1986:65). Various groups in the Great Basin practices fire ecology to keep the undergrowth to a minimum to encourage a healthier harvest (Gassaway 2009). Pine cones respond to heat by opening up their scales and releasing the seeds as an automatic response to fires in nature as a form of seed propagation (Muir and Lotan 1985:1658).

The pine nuts would undergo several steps that included parching and grinding into a mush (Fowler 1986:65). Some of this mush could be left outside in freezing temperatures that would produce an ice cream type of treat for children (Fowler 1986:65). Pinion resources were often claimed by family units as their exclusive area of harvest (Fowler 1986:65). There are mythological stories that includes tales of pine nuts being stolen by people who are accompanied by animal friends (Lowie 1909). Some of these stories tell of pine nut genesis or how pine nuts came to be in the Great Basin (Lowie 1909). Pine nuts can be "cracked, meat eaten raw; or roasted and stored, then ground for cakes and gruel, sometimes mixed with sunflower seeds… with bumper harvests every few years" (Callaway et al. 1986:337).

It is also interesting to note that the Gosuite Indians (North-Western Utah) would boil pine gum and drink the water as a medicinal aid (Chamberline 1911:349, Kelso 1970:259). Fry (1976) suggests that boiled pinion gum may have been able to kill some internal parasites commonly found in Great Basin human coprolite samples.

Juniperus

Juniper (*Juniperus*) is an evergreen that may appear as a shrub or a tree. The wood from juniper trees may have been used in the construction of bows as well for firewood (Lowie 1924:245, Thompson and Kautz 1983:141). The berries can be eaten straight from the tree without any processing such as the Utes of Utah and Colorado would do, or cooked and dried into cakes (Callaway et al. 1986:337). The Utes made and wore necklaces of juniper seeds (Stewart 1942:277). The young shoots and leaves were sometimes used in teas (Callaway et al. 1986:337). Women made cordage from the bark, which was often used by Ute men to make nets (Smith 1974:56). Bedding could also be made out of juniper bark (as was cattails) (Smith 1974:37). Other uses by the Utes were spiritually based. They believed healing power was attainable by "inhaling juniper smoke from a specially prepared fire" or placing the ashes of the fire on the body, would infuse the shaman with power (Jorgensen 1934:342). Mothers were encouraged after delivery, to rub juniper and sage on their abdomen (Jorgensen 1934:365).

Artemisia

In the Great Basin this species is almost entirely attributed to sage brush (*Artemisia tridentata)*. The most common use of sage brush is for firewood as is noted at Gatecliff (Thomas 1983a:447). With the Ute, after the birth of a child the father may bathe and be rubbed with sage and juniper boughs, and "then run strenuously to ensure the child's industriousness" (Callaway et al. 1986:351).

Ambrosia

This species of plants include ragweed. The Goisute, that live along the Nevada Utah border, would use ragweed as a cure for sore eyes by making a tea then placing the spent leaves over the eyes as a bandage (Chamberlain 1911:361). The Tohono O'odham from southwest Arizona claim diarrhoea could be treated with the vapour of canyon ragweed. An infant would be placed on a bed of the leaves, which had a hot cloth laid over them, and the vapour would remedy the diarrhoea (Castetter and Underhill 1939:158). The Seminal Indians who were originally from Florida, but then were forcibly moved to reservations in Oklahoma, used giant ragweed (*Ambrosia trifida),* in the treatment of nose bleeds. The process would involve boiling the roots; while cooling, the patient inhales the vapour (Howard 1984:45).

Cheno-AMS

Cheno-AMS is a group of plants that contains goosefoot (*Chenopodiaceae), pigweed* (*Amaranthus*), saltbush (*Atriplex canescens*), pickleweed *(Allenrolfea occidental)* and seepweed (*Suaeda*) (Williams 1983:417). These plants are drought resistant and have a green leaf and seed that could be eaten off the bush at almost any time of the year (Williams 1983:417). Branches of saltbush are used for seasoning, either in cooking or in pit-baking (Castetter and Underhill 1935:15). The seeds can also be ground into a mush after parching and made into cakes (Puseman et al. 2000:90). The Burns Paiute of the northwest Great Basin, continue to utilize *cheno-AMS* plant families today (Couture, Ricks, and Housley 1986:152).

Camels Back Cave

The incised stones at Camels Back Cave, have a dispersed distribution from 6,500 to 1,500 BC. The peak of incised stones is 2,000 to 1,500 BC with four, no incised stones were found a thousand years before or after this peak. There is no pollen data for this site. Although Madsen et al. (2005) observe a general trend of more *Pinus* in the area of Camels Back Cave. Incised stones were compared to awls, beads, groundstone, scrapers, modified flakes, bifaces, and projectile points. Because of their irregularity, no artefacts classification has a similar distribution to the incised stones. At Camels Back Cave there only a couple of preforms observed, thus modified flakes were examined instead. The modified flakes and bifaces have a similar distribution over time. Scrapers in general, when not including the peak of 5,500 to 5,000 BC, have a gradual decline throughout the entire occupation of Camels Back Cave. Groundstone is prevalent at the site, with the exception of 3,500 to 3,000 BC and the recovery period in the 500 year increment that follows. The small animal remains have a gradual rise to their peak in 5,500 to 5,000 BC, with two gradual decreasing plateaus from 4,500 to 3,500 BC and 2,000 BC to 1,500 AD.

Between 5,500 and 5,000 BC, one incised stone is deposited. All artefacts classifications are on the rise, particularly for groundstone, scrapers, and small mammals all at their highest peak during the 10,000 year occupation (Figure 6.4). This period is a continuation of the Altithermal from a thousand years previous.

The Altithermal was generally warmer than other climate epochs (not including the Neo-Glacial Drought), which may have resulted in larger small mammal populations. Scraper numbers are three times as many as the previous 500 year increment. Thus, scrapers probably are being used for small mammal hide preparations not for large mammal, as large mammals have a minimal presence during this time. The peak of groundstone and scrapers may have been indicative of communal small mammal hunting practices.

In the Middle Holocene, represented as 4,000 to 3,500 BC, an incised stone is deposited. During this time modified flakes and bifaces are a peaking trend, while groundstone and scrapers are in lower amounts then the previous 500 year increment. The groundstone is on the lower end of a thousand year increase after the Altithermal. During this time, as compared to the Altithermal, there was more rain, as is indicated by rising lake levels at the Great Salt Lake at 4,000 BC (Madsen and Berry 1975:398). No projectile points were observed at this time. The lack of projectile points suggests other hunting methodologies. When this is compared to the generally even plateau of small mammals, it may suggest the use of group hunting strategies where both men and women were present (as also indicated by strong presence of groundstone).

Between 3,500 and 3,000 BC there is a complete lack of awls, lithic technologies, beads, and groundstone, but scrapers have a slightly elevated presence. The number of small mammals is near the end of the thousand year high plateau. There is a peak of avian remains during this time that is not represented in the previous date range. The small mammal and scraper connection may indicates there was hide processing at the site, but not other activities.

During the last occurrence (2,000 to 1,500 BC) of incised stones (n=4) at Camels Back Cave was the beginning of a lower plateau for small mammal remains. There is an increase in groundstones (to peak 500 years later) and beads, while the lithic technology is in a trough (with the exception of modified flakes). No projectile points were observed in this period.

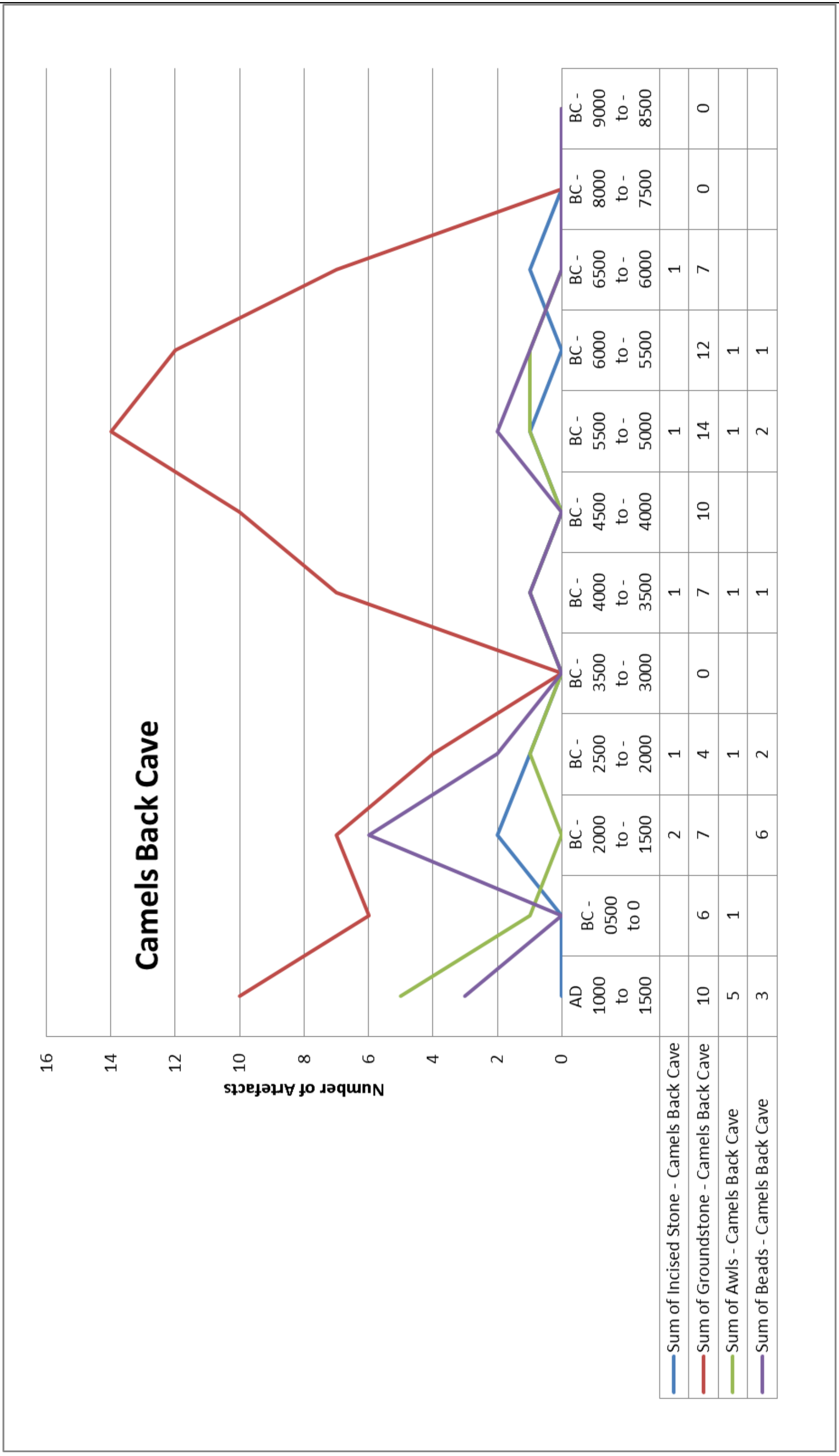


Figure 6.4: Frequency distribution of incised stones, groundstone, awls, drills, and beads found at Camels Back Cave.

Gatecliff Shelter

After the first appearance of incised stones, the main presence of incised stones at Gatecliff Shelter occurs from 4,000 BC to 1,500 AD. Within this time the highest number of incised stones (n=151, Horizon 6) peaks at 1,500 BC to 1,000 BC. The incised stones frequency, then troughs at 500 BC – 0, but raises back up from 500 – 1,000 AD, to nearly the same amount seen a thousand years previously.

The artefacts that were compared to the incised stones consist of groundstone, awls, beads drills, projectile points, scrapers, bifaces, and preforms. The beads have the most similar artefact distribution to incised stones, but on a much smaller scale. Scrapers, bifaces, preforms, projectile points, and groundstone have a similar frequency distribution with each other, but not with the incised stones post 2,500 BC.

When looking at the pollen distribution frequencies, a more varied picture of the subsistence and climatic changes through time are visible. *Juniperus* and *Artemisia* are the most common pollen species. *Ambrosia*, is the least common and although found in Gatecliff, is very uncommon throughout its entire history.

Something very interesting happens to the pollen data in the five hundred years before the major peak of incised stones. During this time (2,000 to 1,500 BC), *Artemisia, Pinus, Junpierus,* and *Cheno AMS,* all are heavily represented, and have their highest peak of occurrence within Gatecliff Shelter. When compared to the artefact distributions, groundstone, preforms, projectile points, and bifaces all have their highest peak during this period as well. In the faunal record large mammals are represented in large quantities for the first time, and also represents the beginning of a general trend of increased large mammal procurement. Small mammal bones increase 7 times more frequently than the past 500 year increment. There is not only hunting events (as indicated by the raised lithic technology and faunal remains), but there are also plant processing activities occurring at the same time, as indicated by the high number of groundstone. During this period eight incised stones were deposited.

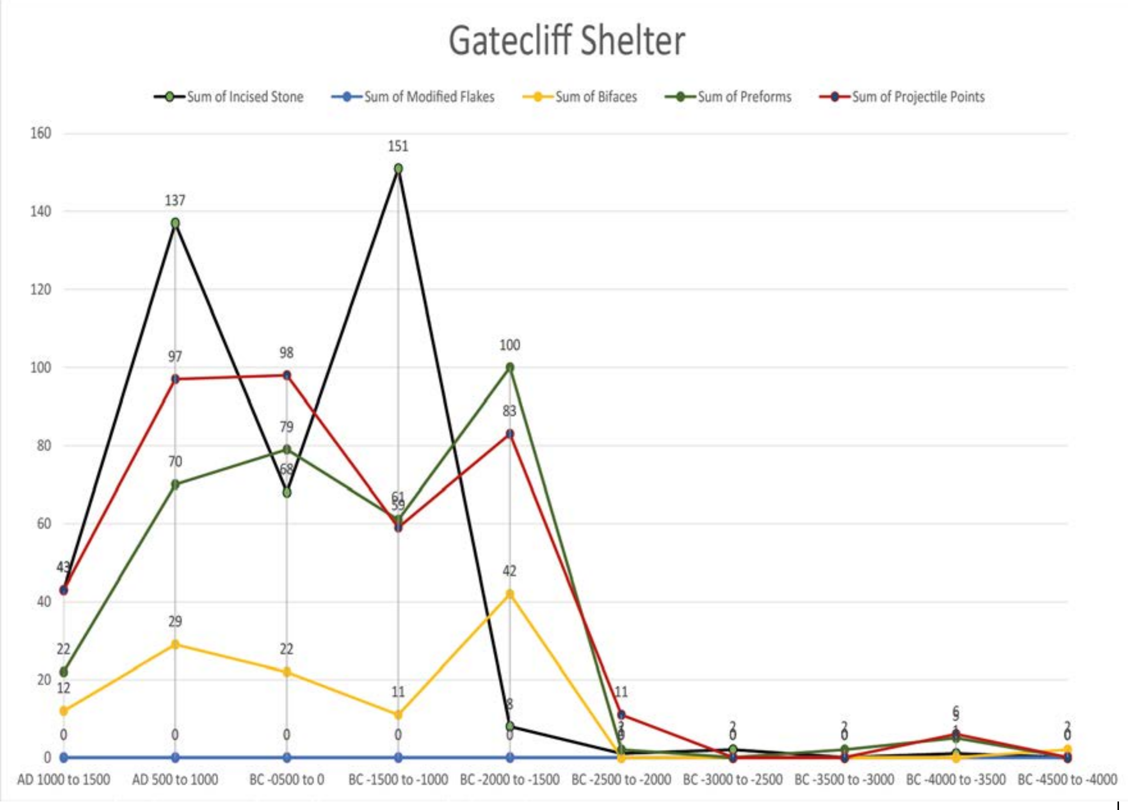


Figure 6.5: Frequency distribution of incised stoned, modified flakes, bifaces, preforms, and projectile points at Gatecliff Shelter.

Between 1,500 and 1,000 BC all pollen families have a marked decrease, just as incised stones are having a major peak of occurrence. For example, *Juniperus* is only 15% of the previous 500 year increment, and *pinus* pollen troughs, indicating the climatic conditions may have been dry. A dramatic decrease of groundstone occurs in this period, trending lower in frequency, is roughly the same for the rest of the occupation, even in the Neo-Glacial Drought recovery period. All flaked lithic tools are on the decline during this time. This period of time also has a decline of large and small mammal bones. The only artefact class that is on the rise with incised stones is beads. Apart from the large deposit of incised stones, the decline of artefacts, suggest the site was probably visited less often than the previous 500 year increment. The Neo-Glacial Drought is represented in the date range of 500 BC to 1. The incised stones have a very dramatic drop at the time of the Neo-Glacial Drought (Figure 6.5). Projectile points and preforms (500 – 1 BC) increase, which may suggest that hunters used the site as a logistical hunting camp more often than complete family groups. Large mammal bones are on the increase during this time supporting the suggestion that hunters utilized the site more often. The small mammals dramatically decrease, but are still significant in numbers. In the pollen data, all plant families decrease during the Neo-Glacial Drought, except *Juniperus,* but the increase from the previous five hundred year increment is minor, and is a part of the overall trough of *Juniperus* that last for a thousand years. After the Neo-Glacial Drought all artefact classes except ground stone increase in number (500 – 1,000 AD).

From 1,000 – 1,500 AD it appears incised stones were on the decline at Gatecliff Shelter just before the end of the radiocarbon sequence. This five hundred year date range is problematic because this could be the closing of the Medieval Climatic Anomaly. As mentioned above 1,500 to 1,000 BC is the highest frequency of incised stones, even though artefacts (except beads) and pollen counts were lower.

Hogup Cave

There are 30 incised stones at Hogup Cave that occured from 4,500 BC to 1,500 AD. The highest occurrence of incised stones is 14 from 1,000 to 500 BC. The incised stones are compared with awls, beads, drills, groundstone, bifaces, scrapers, projectile points, and modified flakes. The distribution of beads and drills looks the most similar to the distribution of incised stones. Bifaces and scrapers have a very similar frequency distribution. Projectile points and modified flakes has a similar distribution, with projectile points occurring slightly more frequently. All of the lithic material follows the same pattern of peaks and troughs, with the main peak at 4,500 to 4,000 BC, which coincides with the first occurrence of incised stones at the site. Groundstone has a unique distribution frequency. Groundstone dramatically increases every five hundred year to a peak at 4,500 to 4,000 BC, with significantly less deposited post 1,500 BC.

Artemisia and *Cheno-AMS* are the most common pollen family throughout the entire site occupation. The two families have very similar distribution frequency, except between 500 and 1,000 AD, in which the *Artemsia* has a significant peak, and the *Cheno-AMS* has a shallow trough. *Pinus, Ambrosia,* and *Juniperus* have a similar frequency distribution as well but to a much lesser extent, except between 4,500 and 4,000 BC where *Juniperus* does not have a significant trough or peak.

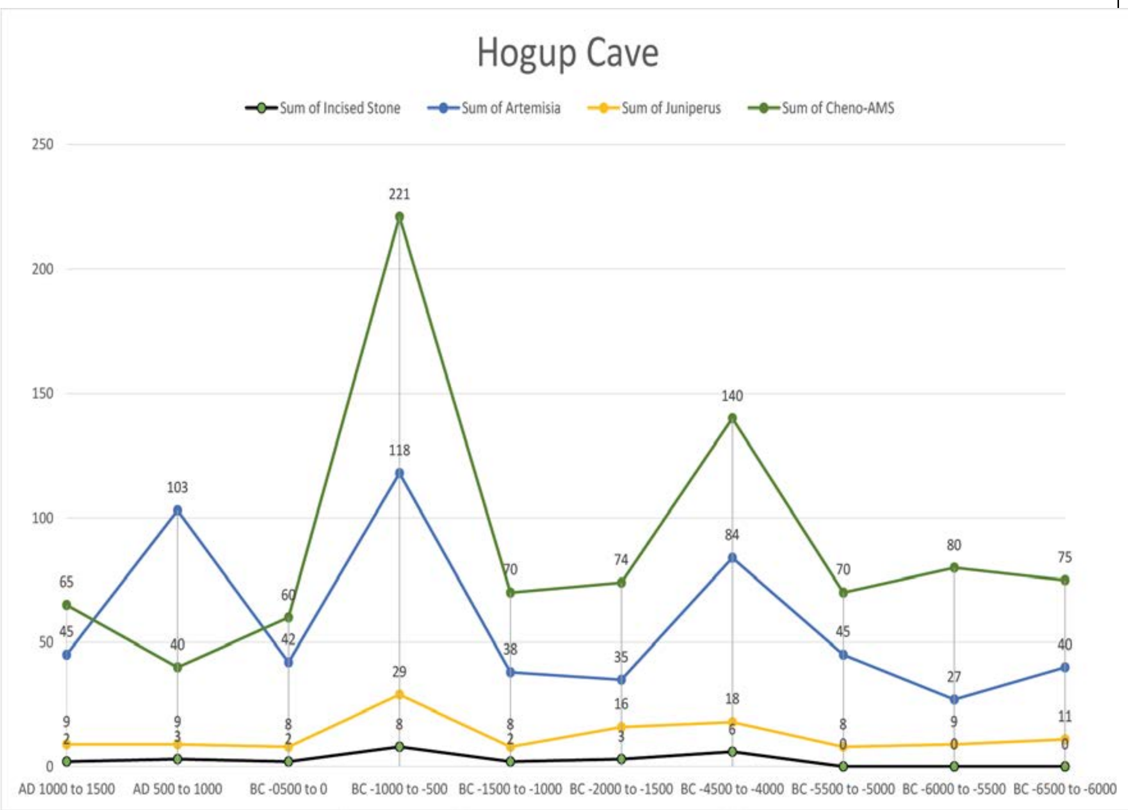


Figure 6.6: Frequency distribution of incised stones, *Artemisia, Juniperus,* and *Cheno-AMS* at Hogup Cave.

After the peak of first occurrence (4,500 to 4,000), incised stones peak again at 1,000 to 500 BC. All artefacts classes and pollen families show a peak during this period. For the pollen families, this peak is the highest occurrence of *Cheno-AMS, Pinus, Artemesia,* and *Juniperus*. *Ambrosia* has its highest peak during the oldest instance of incised stones, and peaks during 1,000 to 500 BC as well (Figure 6.6). During this time period there is a rise of small mammal bones (n=220) and large mammal bones (n=31). Because all artefacts classifications have a peak at the same time, no particular activity can be noted, however it is indicative of significant use of Hogup Cave. The Great Salt Lake, which may or may not have had a direct impact on the inhabitants of the other sites, had a significant impact on the inhabitants of Hogup Cave due to its direct association with the lake (Aikens 1970). The consideration of shoreline changes in this case, offers an additional level of contextual analysis. The Great Salt Lake peaks in lake level elevations between 1,000 and 500 BC (Madsen and Berry 1975), giving the impression that the climate was much wetter and more favorable for a range of activities at Hogup Cave.

During the Neo-Glacial Drought, represented as 500 BC to 0, all artefact categories and pollen families decline, with Neo-Glacial recovery accounting for lower artefact frequencies in the subsequent 500 years. However during post Neo-Glacial Drought recovery *Artemisia* returns to pre drought levels. The Great Salt Lake levels were lowering with punctuated periods of wetness within the Neo-Glacial Drought.

Swallow Shelter

All of the incised stones at Swallow Shelter occur from 1,000 BC to 1,500 AD. The greatest number of incised stones are deposited 500 to 1,000 AD. Leading up to this date range, incised stones are deposited in a gradual increase in numbers.

The incised stones at this site are compared to awls, projectile points, ground stone, and scrapers. The frequency distribution of these artefacts does not mirror the frequency distributions of incised stone from Swallow Shelter. The awls have a frequency distribution that shows they are present at a steady rate post 1,500 to 1,000 BC. The pollen for Swallow Shelter suggest that the most generally prevalent species is *Artemisia*, with *Juniperus* as a close second (post 1,500 BC). *Ambrosia* is the most prevalent pollen pre-2,500 BC, with a major peak between 3,000 and 2,500 BC.

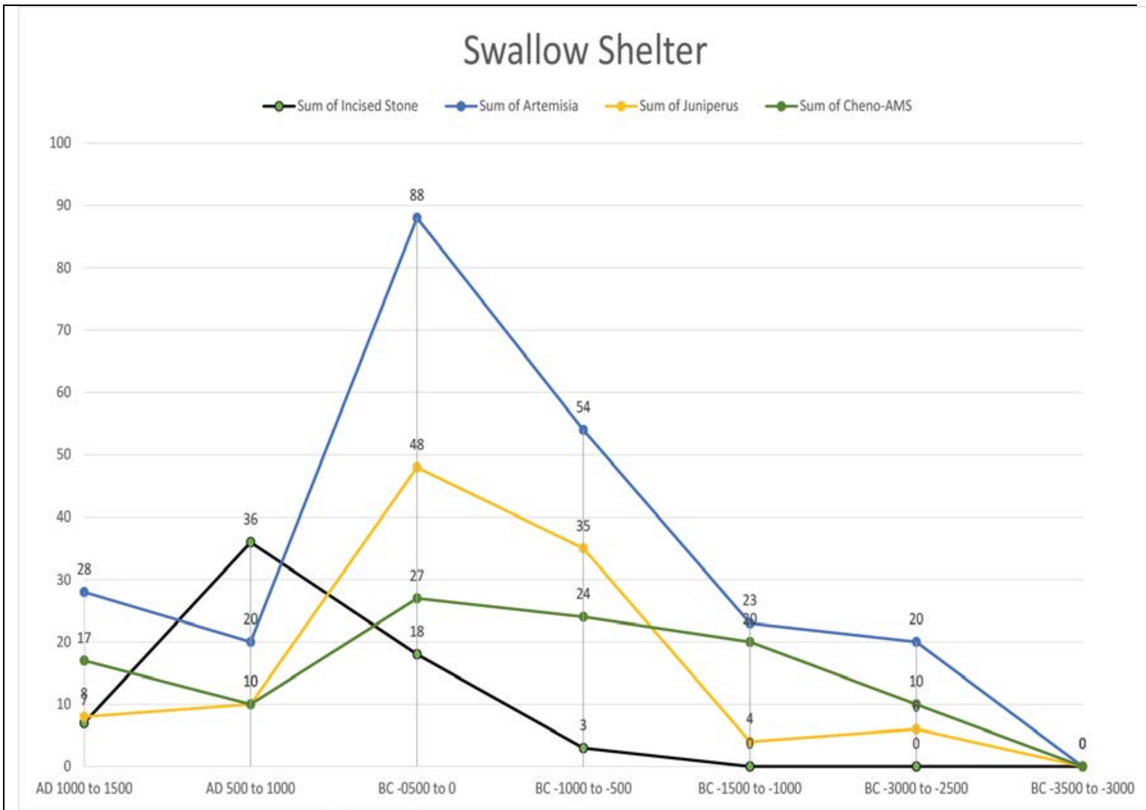


Figure 6.7: Frequency distribution of incised stones, *Artemisia, Juniperus,* and *Cheno-AMS* at Swallow Shelter.

In the five hundred year period (1,000 – 500 BC) before the Neo-Glacial Drought, all artefacts classes, faunal assemblages, and pollen families show a rising trend. The distribution frequencies indicate more projectile points, bifaces, large mammals (all of which have a peak in this period), and small mammals on a rising trend. In comparison to the previous 500 year increment the number of small and large mammals increase.

Artemisia and *Cheno-AMS* have their highest peak at 500 BC to 0 during the time of the Neo-Glacial drought (Figure 6.7). This suggests that Swallow Shelter may have been an attractive harvesting point on the landscape during the Neo-Glacial Drought, thus making the shelter a unique habitation for this time frame (most other sites are not visited during this period). The Neo-Glacial Drought occurs through three stratums (Stratum 6, 7, and 8). The small mammals are on the increase during this period and forms part of a 1,500 year peak that last past the Neo-Glacial Drought. The occurrence of large mammals decrease in the Neo-Glacial Drought.

At 500 to 1,000 AD all but *Ambrosia* has a very dramatic decrease in pollen counts. The decrease is represented as being only one fourth of the Neo-Glacial Drought counts. At the same time incised stones are peaking in the record. This period occurs during the Medieval Climatic Anomaly. This may indicate the shelter was used less for plant harvesting and processing and more for hunting, as is indicated by the increase in scrapers. Small mammal and bighorn mountain sheep faunal remains are more prevalent during this period.

Summary of Long Term Trends: A Trans-Holocene Chronology of Incised Stones

After collating the dating information on the incised stones, a picture of the chronology for all the sites can now be put forward, this has never been done before. As shown in Figure 6.8, a total of 562 incised stones cover a time period from 6,500 BC to 1,500 AD. The initial occurrence of incised stone is minimal, with only 16 examples from a time period representing 4,000 years. These are occurring in the Altithermal. However, at about 1,500 to 2,000 BC, a significant increase is seen with 20 incised stones appearing. This number is eclipsed in the following 500 year period with an exponential rise to 153 incised stones. Between 1,000 BC and 500 AD there is a trough and peak period coinciding with the Neo-Glacial Drought (0 to 500 AD). Although the date range for the Neo-Glacial Drought appears to peak, the majority of the stones in this peak are from Gatecliff Shelter, which generally has more incised stones then the other caves. The highest peak of incised stone is between 500 to 1,000 AD, with 207 stones represented. This period is the Medieval Climatic Anomaly. Finally, the last 500 years (Little Ice Age) show another significant drop even though there still are 52 examples recorded.

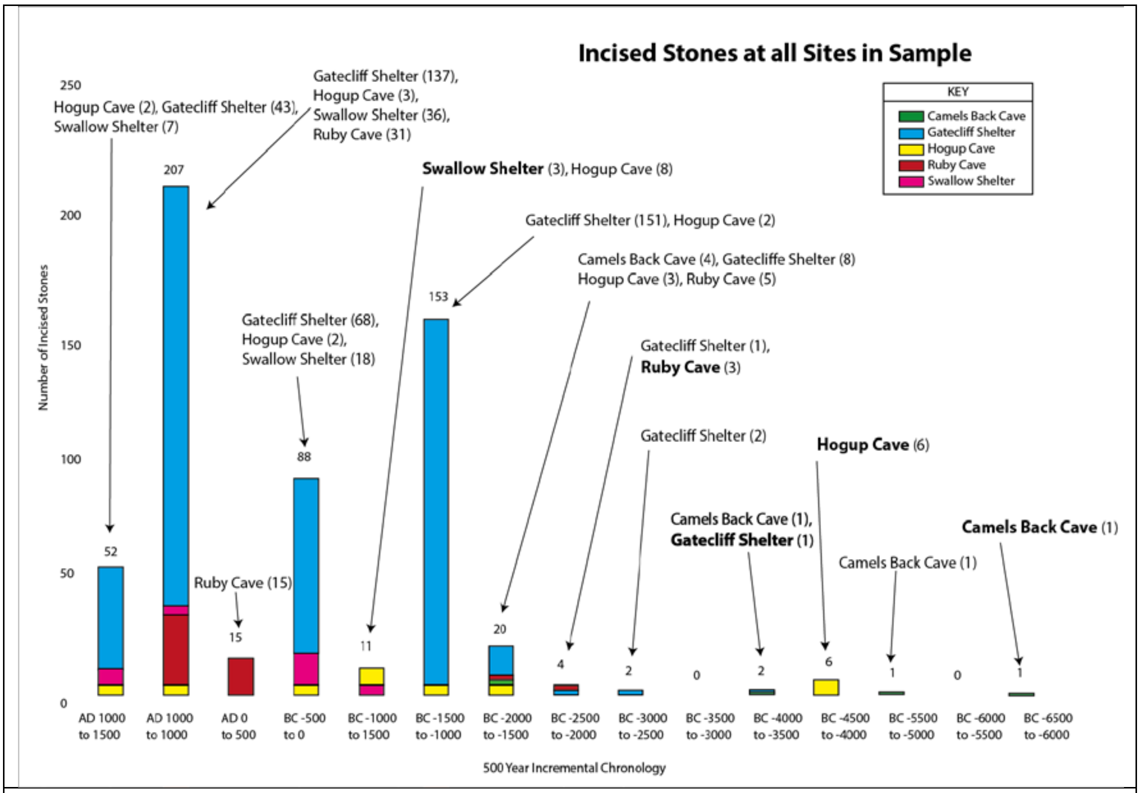


Figure 6.8: Incised stone Chronology for all of the sites within my sample. The numbers in parenthesis are the number of incised stones. The bold site names indicate the first appearance of incised stones. Figure by Author.

When the overall trends of incised stones within the Great Basin are compared to site specific frequency distributions, the context of the climate is seen more clearly, as well as highlights site specific unique characteristics. The climatic time frames of the Althithermal (or Middle Holocene), the Late Holocene, the Neo-Glacial Drought, and the Medieval Climatic Anomoly are hereafter discussed in summary.

Most of the incised stones have their period of first occurrence during the Altithermal. *Ambrosia* is more prevalent than in later periods, which may account for the lack of ethnographic information on this food source. Within the Altithermal at Camels Back Cave there are peaks at 5,500 to 5,000 BC and 4,000 to 3,500 BC. At these peaks all artefact classes are generally on a rising trend. There is a trough 3,500 to 3,000 BC, whereas most artefact classes show a severe decline, scrapers and small mammals are more prevalent. The peaks coincides with high shoreline levels of the Great Salt Lake, and the trough coincides with below historic mean lake levels (Figure 6.9).

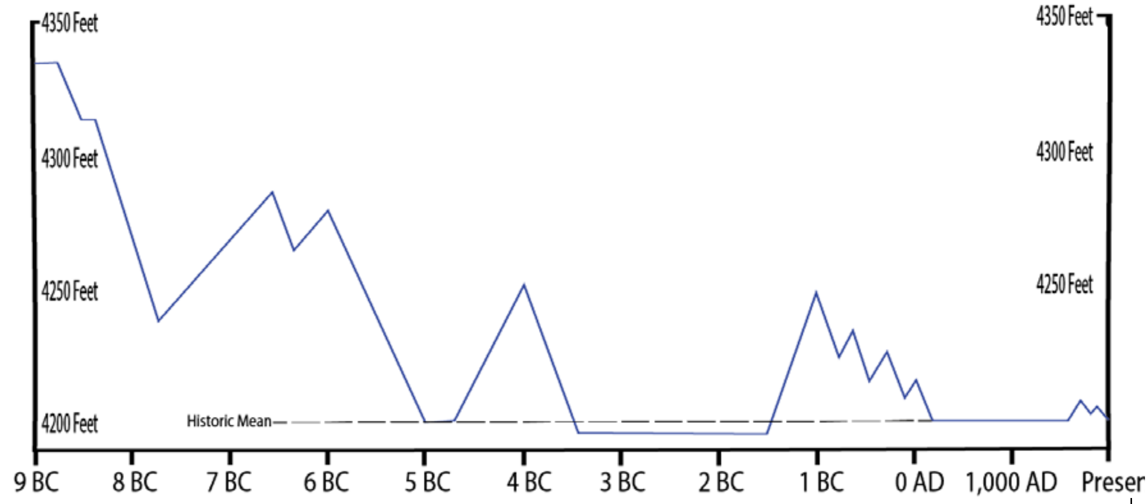


Figure 6.9: The water level of the Great Salt Lakes from 9,000 BC to present (adapted from: Madsen and Berry 1975:398).

In the Late Holocene, at Camels Back Cave between 2,000 and 1,500 BC lithic technology is in a trough while modified flakes, scrapers, and small mammals are on rising trends. This is different than what is occurring at Gatecliff Shelter for the same period. At Gatecliff, all artefact classes are peaking, including pollen counts, with small mammal counts 7 times more frequent than the previous 500 years. The Great Salt Lake, which Camels Back Cave is closer to than Gatecliff, was still experiencing below historic mean shoreline levels. At Gatecliff between 1,500 and 1,000 BC incised stones peak, although pollen, groundstone and faunal remains are on the decline. At Swallow Shelter and Hogup Cave, artefact classes increase, with projectile points, bifaces, and large mammals at their highest peak in Swallow Shelter.

The Neo-Glacial Drought occurred in the chronology at 500 BC to 0. At Gatecliff and Hogup Cave this is seen as a major decrease in all artefact categories with the exception of projectile points and large mammals at Gatecliff, and *Artemisia* in Hogup Cave. At Camels Back Cave and Swallow Shelter the artefact frequencies do not show much of a decrease. At Swallow Shelter no artefact class takes a major dip and all pollen families (except *Ambrosia*) have their highest peak during this period, which is part of a general increasing trend.

Between 500 and 1,000 AD, the Medieval Climatic Anomaly is represented. Incised stones have their most common occurrence at Ruby Cave (n=31). At Gatecliff Shelter all artefact classes, including pollen, peak again with 137 incised stones. At Hogup Cave *Cheno-AMS* continues to be in a decline while the other pollen categories are elevated, there is also a decline of lithic and faunal remains. Swallow Shelter's pollen classifications are generally lower, however *Ambrosia* is on the rise. The other artefact categories at this shelter are all in a peaking trend, with preforms (n=77) at their highest peak.

The variability of the topography in the Great Basin, caused by the various north south trending mountain ranges, could have created micro-climatic events resulting in dissimilar usage of the caves during the same period. Aikens observes "to a greater or lesser degree, every site occurs within a unique environment. Hence, there can be no single sites that are typical of the Great Basin" (Aikens 1970:120). For example, between 2,000 and 1,500 BC Camels Back Cave and Gatecliff have greatly different artefact assemblages (Camels Back Cave was in a trough, Gatecliff at a significant peak). As well during the Neo-Glacial Drought, characterized by a general decrease in population Great Basin wide, Gatecliff Shelter and Hogup Cave are affected and show dramatic decreases, but Camels Back Cave and Swallow Shelter, show a marked increase in use. Within a three mile radius of Swallow Shelter there are 24 natural springs (Dalley 1977:7), and at Hogup Cave the Great Salt Lake is fairly close, allowing for family group occupation. This period may have seen an increase again in logistical hunting and decline in family groups, at Gatecliff and Hogup Cave, as is seen in increased preforms and projectile points in the deposition.

Obviously, this chronology immediate calls into question a number of aspects concerning incised stones through time. The first concerns the initial appearance of incised stones: what can be gleaned from a contextual approach to further understand their emergence? Secondly, how do the peaks and troughs in the later sequences relate to the archaeological record? These questions are addressed here, as well as in the subsequent chapters.

Conclusion

The chapter was divided into two parts. In part one, the first time occurrence of incised stones were discussed for all of the sites. In part two, the frequency distributions were compared across the sites revealing trends which are summarized in a trans-Holocene chronology. The chronology highlighted climatic events as a platform to discuss trends in the Great Basin, as well as site specific unique characteristics. The chronology gives strong evidence of changes in logistical hunting to family group procurement strategies.

Logistical hunting occurred as part of the hunters-gatherer organisation in the Great Basin (see Chapter 4); however, when incised stones are present the data indicates that hunting and many other uses of the site occurred. The data supports a model where logistical hunters typically did not make incised stones, and that the context of an incised stone is based on whole not aggregate family groups staying together in upland sites while gathering resources such as pickle weed, or pine nuts. The pull to the site for a family unit may have been the attraction of harvesting or large numbers of small mammals, but while they stayed they created incised stones.

Subsistence and technological changes are reflected in the frequency distribution charts which parallels the creation of incised stones. Incised stones then are tied very closely to the climate as dry periods meant decreased seed crops, and therefore shortened stays and harvesting. The hunter-gatherers during dry periods probably spent their time elsewhere in the landscape collecting whatever resources they could or staying close to more subsistence stable areas. During dry times the sites were in use but probably by logistical hunters working away from the core family group. There are fewer numbers and in some instances an absence of incised stones during dry periods at individual caves and rock shelters. This suggests that logistical hunters probably did not regularly make incised stones, and the creation of incised stones is probably based more on whole family groups staying together in upland sites while gathering resources. Evidence of this occurs at Gatecliff Shelter, which has a large incised stone collection. During the Neo-Glacial Drought, where there is a marked decrease in incised stones and harvesting related artefacts (with a decrease in small mammals) but a marked increase in hunting technologies such as projectile points and preforms during this period (as well as a large mammals increase). The 500 year increment does not allow for yearly variation to be seen. Yearly variation may have allowed for sporadic use by family groups, at times of improved condition for pine nut harvesting or small mammal drives. The data suggests that during these favourable seasons incised stones were created by whole family groups.

The most salient interpretation based on these results alone suggests harvesting had a large influence on the context of incised stones. However, the analysis is not complete and now that this contextual background has been set for incised stones the next chapter will look more deeply into the associations that incised stones have with other artefacts. The synthesis between Chapter 6 and 7 will include more specifics of where in the site and with what artefacts incised stones are made.

Chapter 7: The Context of Spatial Associations of Incised Stones

Introduction

A systemic context of artefacts found in association with incised stones is the theme of this chapter. The contextual scale is closer than the previous chapter. This chapter discusses incised stone context more thoroughly in the sites with particular emphasis within individual units. The scale consists of excavation units (1.5 m^2) at most of the sites. The exception is Swallow Shelter where the unit sizes change a great deal from a 1.5 m^2 unit to the size of a trench (0.5 m wide by 2 m long).

Throughout this chapter there are specific terms that are used to describe the function of artefacts. Table 7.1 defines terminology that may be unfamiliar to the reader:

Processing Tools	Artefacts used to work a raw material *Examples: groundstone such as metate, mano, pestle, or mortar.*
Manufacturing Tools	Any artefact that is used to manipulate and direct other materials during fabrication. *Examples: Bone awls, antler flaker.*
Hunting Equipment	Any artefact that is used during hunting. *Examples: projectile points, arrow shafts, bow or bow string, atlatls, arrow bunts, and promontory pegs.*
Component Materials	A component is a part of a larger artefact. *Example: cordage*
Animal Butchery	Hunted animal that has been separated into components. *Examples: hide and meat*.
Activity Areas	An activity area is defined by the artefacts that are left. If an awl and basket fragment is left in a 1.5 meter unit then in that area was the activity of manufacturing.

Table 7.1: Definition of activities with examples, as used in the text.

Incised stones have not previously been contextualised into the archaeology of the Great Basin and have been inadequately researched in the past by scholars (see Chapter 2 and 3). This paucity of research has failed to ask basic questions of incised stones and for this reason incised stones are usually considered as a miscellaneous artefact class. This research seeks to give incised stones a context within the Great Basin and place it, not as a miscellaneous artefact, but instead as an artefact that is on par with the more commonly researched artefacts such as baskets, ceramics, and projectiles points. The questions that are asked in this chapter have been chosen to explore in depth different dimensions of incised stones. The questions are: How do incised stone associations change over time at Camels Back Cave, Hogup Cave, Swallow Shelter, Gatecliff Shelter and Ruby Cave? Are incised stones associated with projectile points? Do incised stones have a structured deposition? Are incised stones found in caches? Were incised stones made by men or women? The answers to these questions help to facilitate an interpretative synthesis that incorporates Chapter 6 and 8.

This work defines cache and structured deposition as two separate and specific terminologies. A cache is defined as a deposit that is meant for later retrieval (Thomas 1985). The contents of a cache are artefacts that have attributes of being nearly complete or newly finished. In this work the caches have more than one type of artefact (awls, flakes, pendants) present. The placement of a cache is placed away from foot traffic often at the base of walls where the contents cannot be trampled. The caches are not structured in any ceramonic manner, and there appears to be no specific arrangment or formal placement of the artefacts. The caches have the impression of being placed together based on their quality (new or nearly finished) and left in a pile at the base of a cave or rock shelter wall. Finally, it is inferred in this work that the placement of the cache and the quality of the artefacts suggest that the cache was always meant for later retrieval.

I define the act of structured deposition through identifying an artefact or artefacts that are not typical of a cache and were probably not meant for later retrieval. Artefacts in a structured deposition are structured by arranging or placing them to meet a specific intentionality such as the limestone pavements from Hayonim Cave (see Chapter 2) or Gatecliff Shelter Horizon 6 (Chapter 7). Unlike the caches in this work, structured deposition does not seem to be dependent on concerns of foot traffic, or restricted to the walls of a site. The artefacts within a structured deposition could be of any quality such as broken pottery sherds or newly constructed artefacts.

Methodology

Analysis of incised stone context at this scale is impossible without knowing the spatial placement of artefacts. The sites were excavated by using controlled measurable units. The contents of these units have a provenance as to the stratigraphy they were found. In addition, at each site a map was made during the excavation that shows the layout of the excavation grid and the name of each unit. Using this information, I made spatial maps that placed the artefacts back into the units they were found by stratigraphic level. The only site that I did not create a map set was Gatecliff Shelter, as these maps are published as a part of the Gatecliff Shelter monograph (Thomas 1983a). The associations are detectable through the creation of the maps and this chapter demonstrates patterns in the record associated with incised stones.

Windblown dust, sand, and in some cases roof fall, covered the living floors between visitations. Over time stratigraphy formed that locked the artefacts into a temporal context. The only site that was not dug stratigraphically was Ruby Cave, which was excavated using six inch arbitrary levels until bedrock was reached. These levels are correlated to radiocarbon dates (Chapter 5) and therefore each level is taken to be a representation of changes through time.

To make the association maps for incised stones at Swallow Shelter, Hogup Cave, and Camels Back Cave I had to first travel to the Museum of Natural History in Salt Lake City, Utah. During this week long research trip, I scanned over 2,000 pages of original field notes, photographs, and annotated copies of the published monographs. Ruby Cave does not have a published monograph. The Ruby Cave materials are housed at the University of California, Davis and the Forest Service office in Elko, Nevada. I travelled to both places and made copies of the field notes, catalogues, and site descriptions. Some research materials, such as the photographs were collected in 2004 while I worked as a museum intern at the anthropology museum at the University of California, at Davis.

In order to put the information together I needed to understand the recording system used during the excavations in Utah. Glenna Nielsen-Grimm (2012) of the Museum of Natural History explained how Jesse D. Jennings in the 1960s had created a method of naming all excavation units, stratigraphic layers, and cultural features (hearth or pit) with an F number. To uncover the artefactual remains association with a particular feature a bit of sleuthing had to be done. The F stood for 'Feature' as Jennings considered almost everything at the site a feature. For example, if the feature was a hearth with the name F45, then I could go to the field note page titled F45, and from those notes find that hearth is in Unit F67. Then I would go to page for F67 and read the unit notes until I found the stratigraphic number, for the example is F33. Once I had that, I could go to the F33 stratigraphic notes and read about that particular stratigraphic layer. All artefacts under the Jennings system were given a Field Sample Number or FS#. In the daily logs the artefacts were bagged and recorded as a lot with the Field Sample Number along with the feature number the artefacts came from. I used annotated copies of the monographs from the museum that contained not only the photo of the artefact but the FS#, such as FS 78.65. This number meant that that artefact was the 65th artefact in Lot 78. Using FS 78.65 I was finally able to look at the artefact catalogue to find the provenience. In this way I knew where the artefact originated and in an Excel spread sheet I data entered its provenance. Often times I ran into problems correlating the excavated stratigraphic level to the published stratigraphic level, because in many cases stratigraphy was combined. However, these problems were solved either by finding a key in the field notes, or by using a correlation sheet that was made by the excavators that placed the F numbers with the FS numbers. Preference was always given to the field notes.

Once I had made my spreadsheets I would double check my work by looking at the frequency tables that are published in the monographs. With all of this I was able to recreate the spatial association maps that are used for this chapter.

How do incised stone associations change over time?

This question will be answered in three different timelines for incised stones. These timelines have been chosen to capture multiple sites that have slightly different radiocarbon dates, and to demonstrate associative change through time on a millennial scale. The date ranges are: 4,500 – 3,000 BC, 3,000 – 500 BC, 500 BC – 1,500 AD.

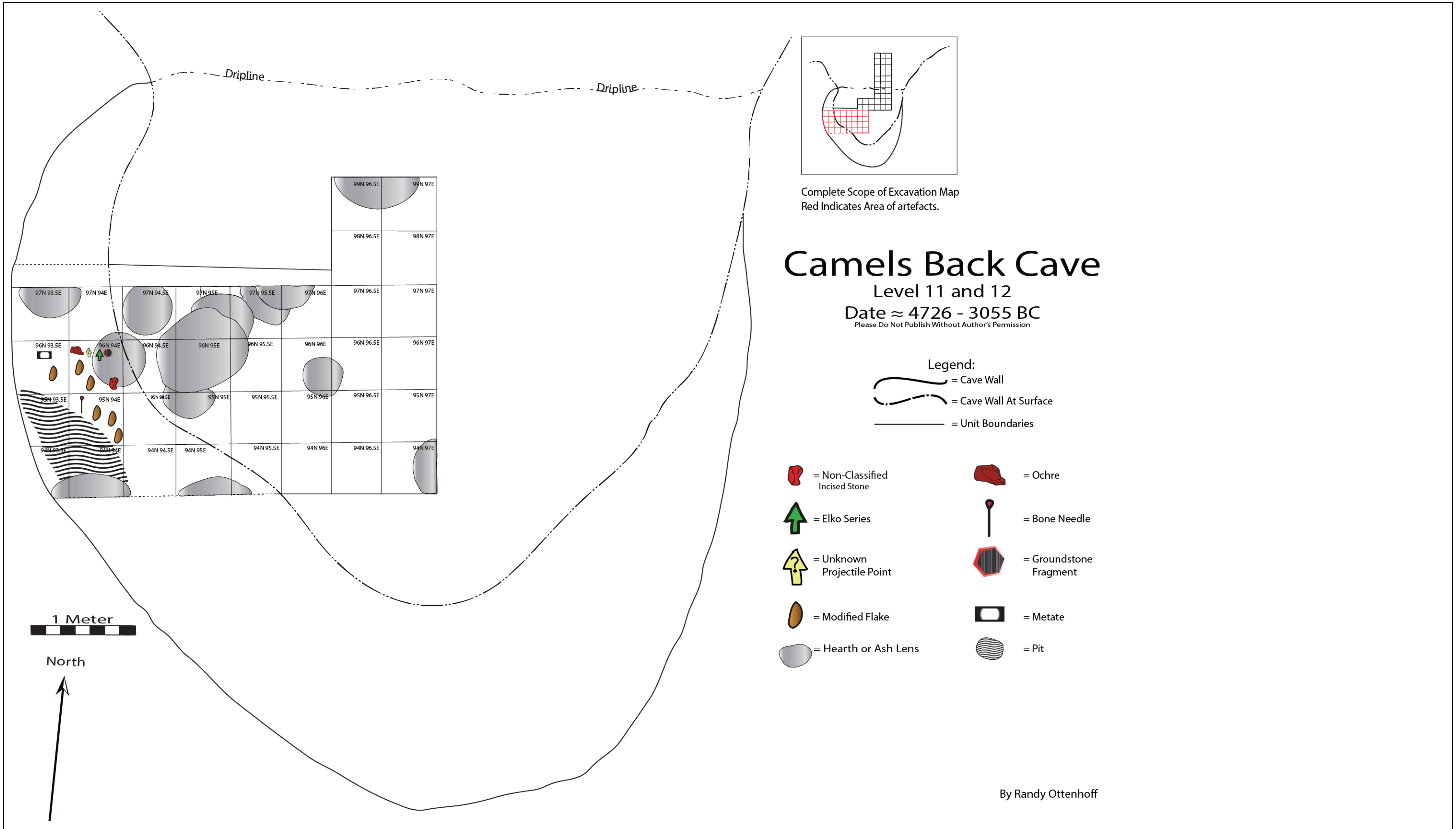


Figure 7.1: Spatial context of oldest incised stones from study, deposited Camels Back Cave Level 11/12 (4,726 -3,055 BC). Map by Author.

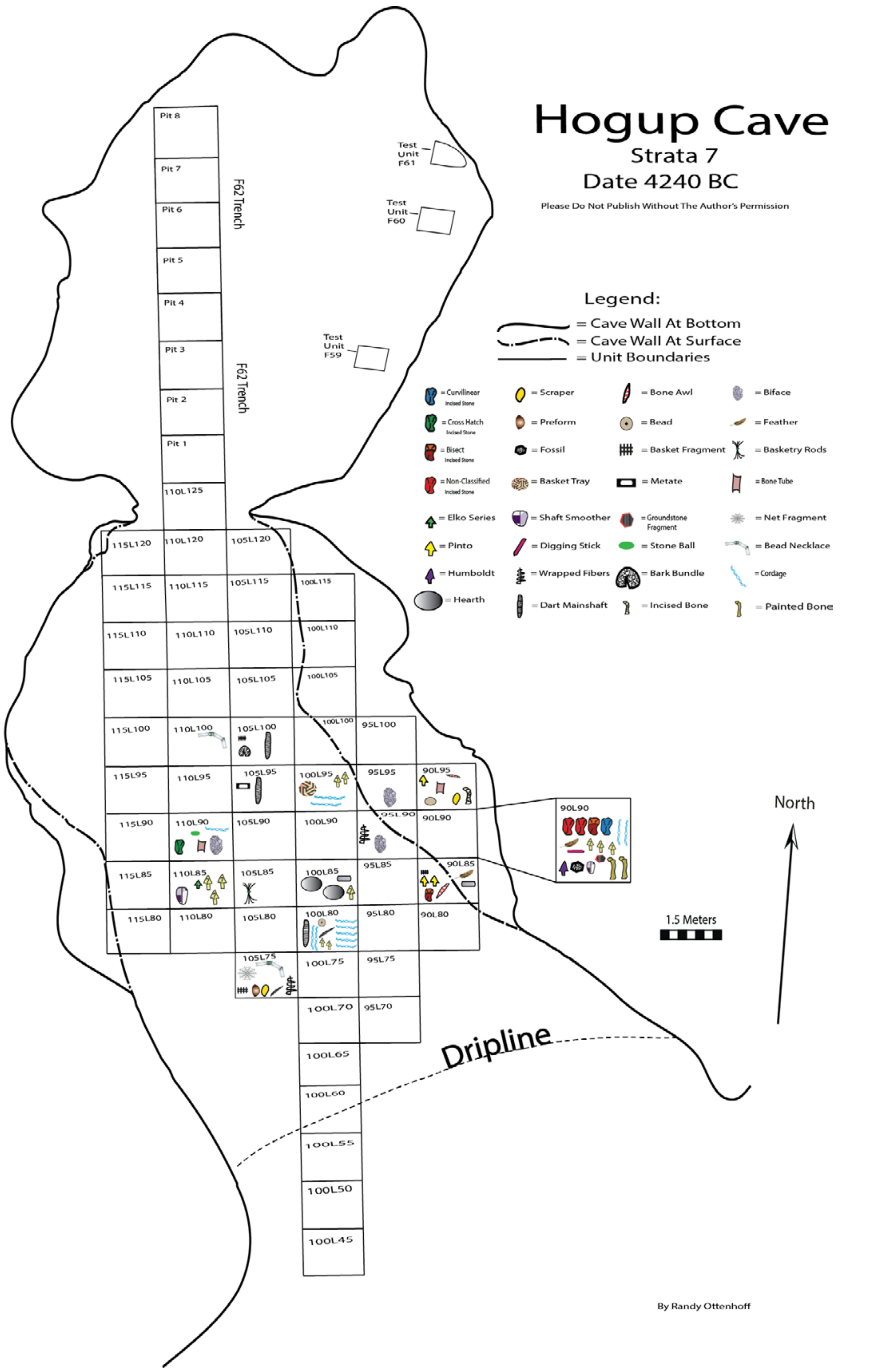


Figure 7.2: Spatial context of incised stones from Level 7 (4,240 BC) at Hogup Cave. Map by Author.

4,500 – 3,000 BC (Camels Back Cave, Hogup Cave, Gatecliff Shelter, and Ruby Cave)

The context of Camels Back Cave's (4,726-3,055 BC; Level 11 and 12) incised stone (n=1), is within a meter of modified flakes (n=4), projectile points (n=2), a ground stone fragment, a bone eyed needle and a piece of ochre (Figure 7.1). The placement of the items is two meters away from the west cave wall. The bone eyed needle and modified flakes suggesting that in this locality sewing, and possibly cutting using the bifaces was performed in the cave at this time. The ochre is a component material that is usually used for its ability to be processed into paint. Contextualized with the incised stone outside of a meter, but still nearby is evidence of food processing with the presence of a metate. The conclusion is that the incised stone is set amongst a close contextual relationship with the preparation of component materials, and possibly clothing manufacturing.

At Hogup Cave (4,240 BC; Level 7) during this interval are a total of seven incised stones. Five of the incised stones are set al.ong the front east wall of the cave (Figure 7.2) and are contextualised with painted bones (n=2), groundstone, a fossil, a shaft smoother, feathers (n=2), a digging stick, a bone awl, a Humboldt projectile point, and Pinto projectile points (n=2). Towards the centre of the cave is one more incised stone that is associated with a stone ball, a bone bead, a biface, and leather strap. Stone balls such as this one is associated with hide-processing (Chapter 6).

In both areas of the cave the incised stones are associated with artefacts that are used to create new items. Artefacts such as the leather strap, and feathers, are used as pieces in the fabrication of new artefacts and are called component materials. The shaft smoother for instance is used for smoothing and straightening the shaft of an arrow or atlatl dart (Adams 2002:84). The bone awl is used in a variety of manufacturing processes, such as the sewing of leather (Shimkin 1986:321). The leather strap is component material for building any number of artefacts, from binding, to adding fringe. The feathers serve as another component material that in this case is kept with the manufacturing tools. Contextualized together the incised stones are associated with component materials for the production of new or repairing artefacts.

Gatecliff Shelter's incised stone (n=1, 3,080 BC Horizon 14) is found alone with no other artefacts within a meter. Gatecliff during this time has broken projectile points, groundstone, and stone blades. Although the incised stone is set al.one, it is within a contextual setting with hunting implements. The presence of broken projectile points suggests that these points were fired and subsequently broken after lodging in the animal. In Hearth A, one chert blade was found directly associated with artiodactyl long bones (Thomas 1983a:450). In addition, "on-site hide processing is indicated by resharpened soft-use of scrapers" (Thomas 1983a:455). The incised stone is set within a mode of processing meat, and probably skins for later consumption and use.

At Ruby Cave there is not an accurate date for the oldest strata with an incised stone (Level 6, 30 – 36 inches below surface). The level above is dated to have started at 2,290 BC. The incised stones are found along the rear wall of the cave of Ruby Cave (n=2) and are directly associated with a burned area, an Elko point and three pieces of debitage. The associated Elko point is broken from an impact fracture probably after being fired from a weapon (Dockall 1997:328). This burn area is the only recorded hearth for this level.

The other activities in this level take place near the entrance of the cave where there are four pieces of burned bone. The artefacts in the unit beside the bones were excavated in a test unit that used different depth procedures than the rest of the level. Therefore, the provenance of these artefacts may not belong to this level. These artefacts include a bone awl, a fossil, and a Rose Springs projectile point. Throughout the entire site there is a small amount of chipped flaked stone.

The activities that took place inside the cave can be understood by analysing the artefacts and their placement. The burned bones are 9 meters away from the only burned area. The bones are within a 1.5 meter excavation unit indicating they were probably carried, not thrown from the fire to the front of the cave. Before the bones were burned in the fire there was a hide removal and butchery process that followed the hunting event that killed the animal. The bone awl, if associated, represents the presence of a manufacturing tool. Tools like awls were used to preserve the hides of killed animals for future textile products. Therefore the incised stones are contextualized with the processing and cooking of meat for consumption, and if the awl is associated, the preservation of the hide.

In summary from 4,500-3,000 BC incised stones are associated with component materials, manufacturing (sewing, arrow shafts making), and animal butchery. The process of scraping hides, saving feathers, cutting strips of leather or collecting ochre are all things that one needs during manufacturing. Combined with the evidence of the manufacturing tools, such as awls, bone eyed needles, modified flakes, and shaft smoothers, the activities involved were that of the production of new or repair of equipment. The incised stones are associated with these activities within 1.5 meters and therefore are likely involved in the process of production.

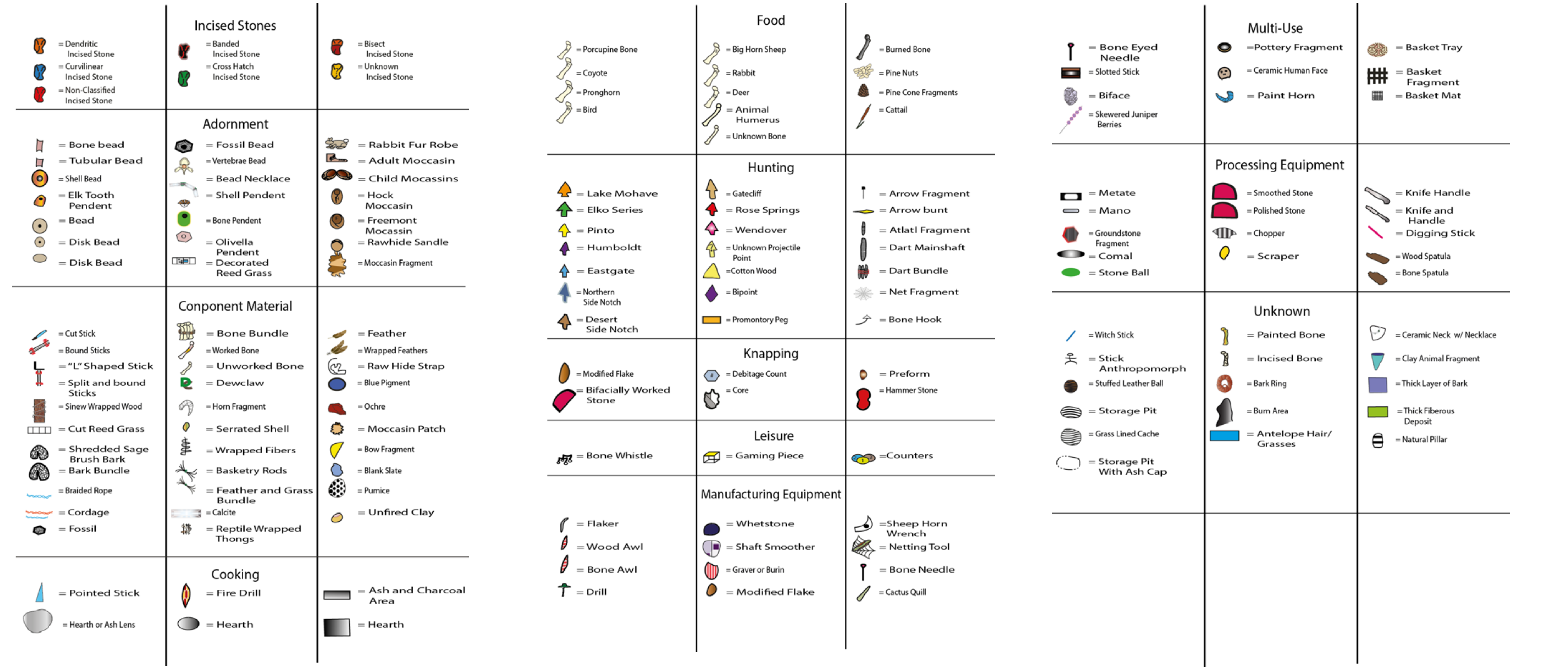


Figure 7.3: Key for all contextual maps grouped by activity.

At Gatecliff Shelter the incised stone is found two meters away from the nearest artefact which is a finished knife. The contextualised activities in Gatecliff are that of scraping hides, and animal butchery. At Ruby Cave there is not a radiocarbon date to tie the earliest level into the overall picture. However, the activities of animal butchery and the possibility of the awl being a part of the level suggests that hide preservation took place there as well. The incised stones at Ruby Cave are directly associated with an Elko projectile point that had been broken after being fired. The contextual relationship with the projectile point suggests that the incised stones were a part of the activities that took place after the hunt; the skinning, butchering, and cooking.

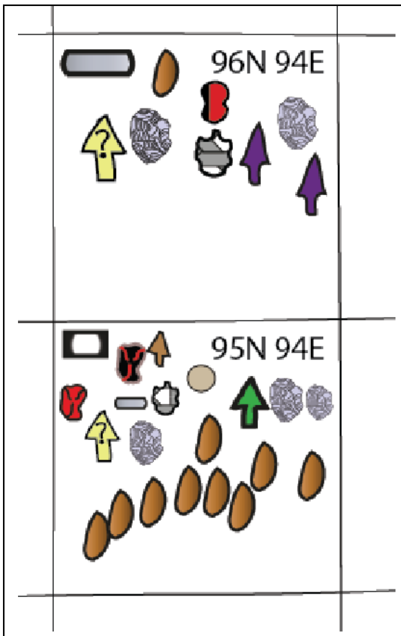


Figure 7.4: Spatial context of incised stones from mixed Level 13 and 14 at Camels Back Cave (2,813 to 1,784 BC). See Figure 7.3 for symbol key.

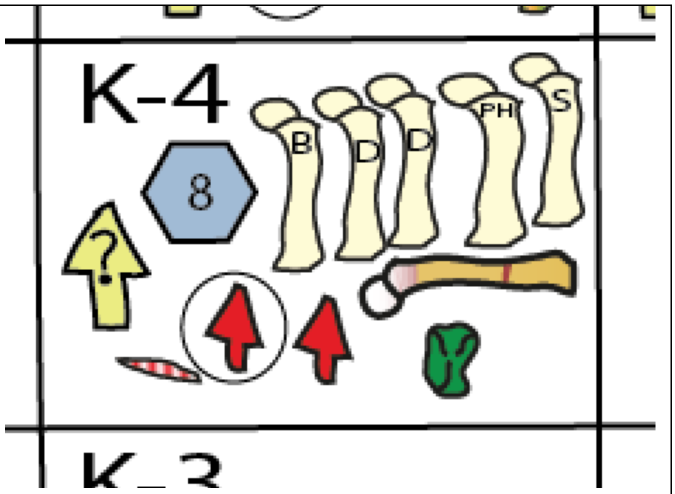


Figure 7.5: Spatial context of incised stone from Level 3 (12-18 inches) at Ruby Cave (620 – 2,470 BC). See Figure 7.3 for symbol key.

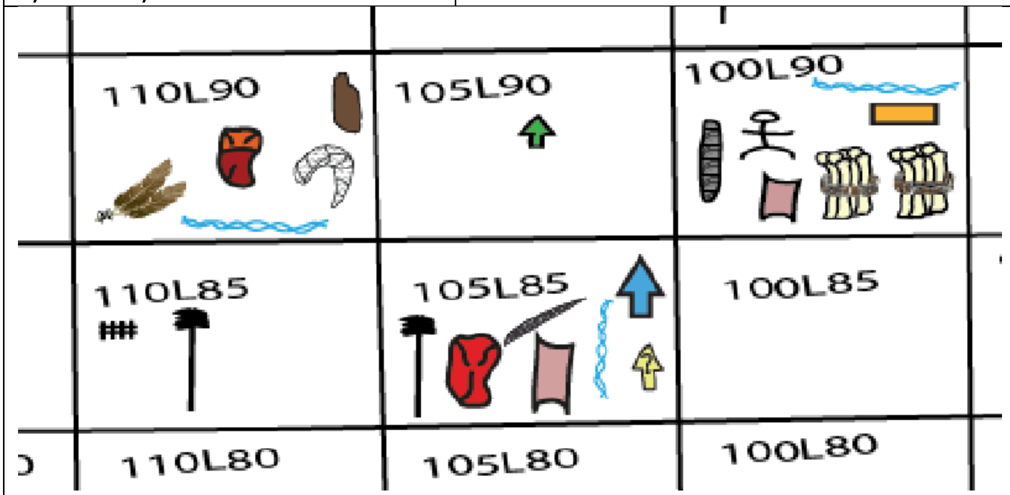


Figure 7.6: Spatial context of incised stones from Level 10 (2,540 to 650 BC) at Hogup Cave. See Figure 7.3 for symbol key.

3,000 – 500 BC (Camels Back Cave, Hogup Cave, Gatecliff Shelter, and Ruby Cave)

At Camels Back Cave (2,813-1,784 BC), Level 13 and Level 14 are combined for analysis, because they share the same date range, and there is a unit that is a mix of Level 13 and 14 (96N 94E and 95N 94E). It is within this combined strata incised stones (n=3) are deposited for the last time (Figure 7.4). Within a meter the three incised stones are associations with groundstone (metate and mano), modified flakes, a lithic core, broken projectile points (n=2), a bead, and bifaces (n=10). The processing equipment which is a mano and metate and a lithic core are new associates to incised stones within a meter. All of the projectile points are broken (Elston 1997), probably after having been fired which is indication of a hunt having taken place. The nine modified flakes show clear evidence of use wear on two, with the rest having evidence of possible use wear (Elston 1997). The modified flakes, may suggest activities related to manufacturing, and the processing equipment probably was used for grinding seeds or food processing.

During this time interval the incised stones (n=2) at Hogup Cave (2540-650 BC; Level 10) are contextualised (within 1.5 m) with arrow fragments, a bone spatula, projectile points, a feather, and groundstone (Figure 7.6). The feather is a short flight feather that has the barbs removed on one side and a thin wrap of sinew going around the rachis or main shaft (Aikens 1970:118). The Eastgate projectile point is complete with no breakage (Aikens 1970:35). The arrow shaft is described as a simple solid shaft with a sinew wrapping that still holds a small piece of feather in place, and sinew wrapping just below the nock (Aikens 1970:165). There is also a bone spatula that is not pictured, but there is an example of one at Promontory Caves that is described as a hide working tool (Ives 2014:157). The incised stones are most closely associated to hunting equipment, or component materials such as the wrapped feather and cordage.

In the wider context of the level (outside 1.5 m) there are component materials, manufacturing tools, and completed clothing. Stored in the rear of the cave is a bone awl, several meters in front of the awl is a grouping of two rabbit fur robes, a pair of child moccasins, and an adult moccasin (Figure 7.7). The moccasins and the rabbit fur robes are stored together with no other manufacturing tools or component materials. Near the front of the cave are component material (two jackrabbit bone bundles and twisted cordage), a bead, and an anthropomorphic figurine in a setting that would allow lighting during manufacturing. The faunal record for this level has a minimum number of individuals of 16 pronghorn and 41 jackrabbits (Durrant 1970:242). Therefore, there was an ample amount of animal skins that would have been made available as component materials. The surmised and suggested activity inside of the cave is the making of new clothing in the light then subsequent storage further back in the cave. The incised stones are directly associated with hunting equipment, component materials, and in the case of the bone spatula hide processing. Contextualized with the rest of the site the incised stones were probably a part of an animal butchery and clothing manufacturing event.

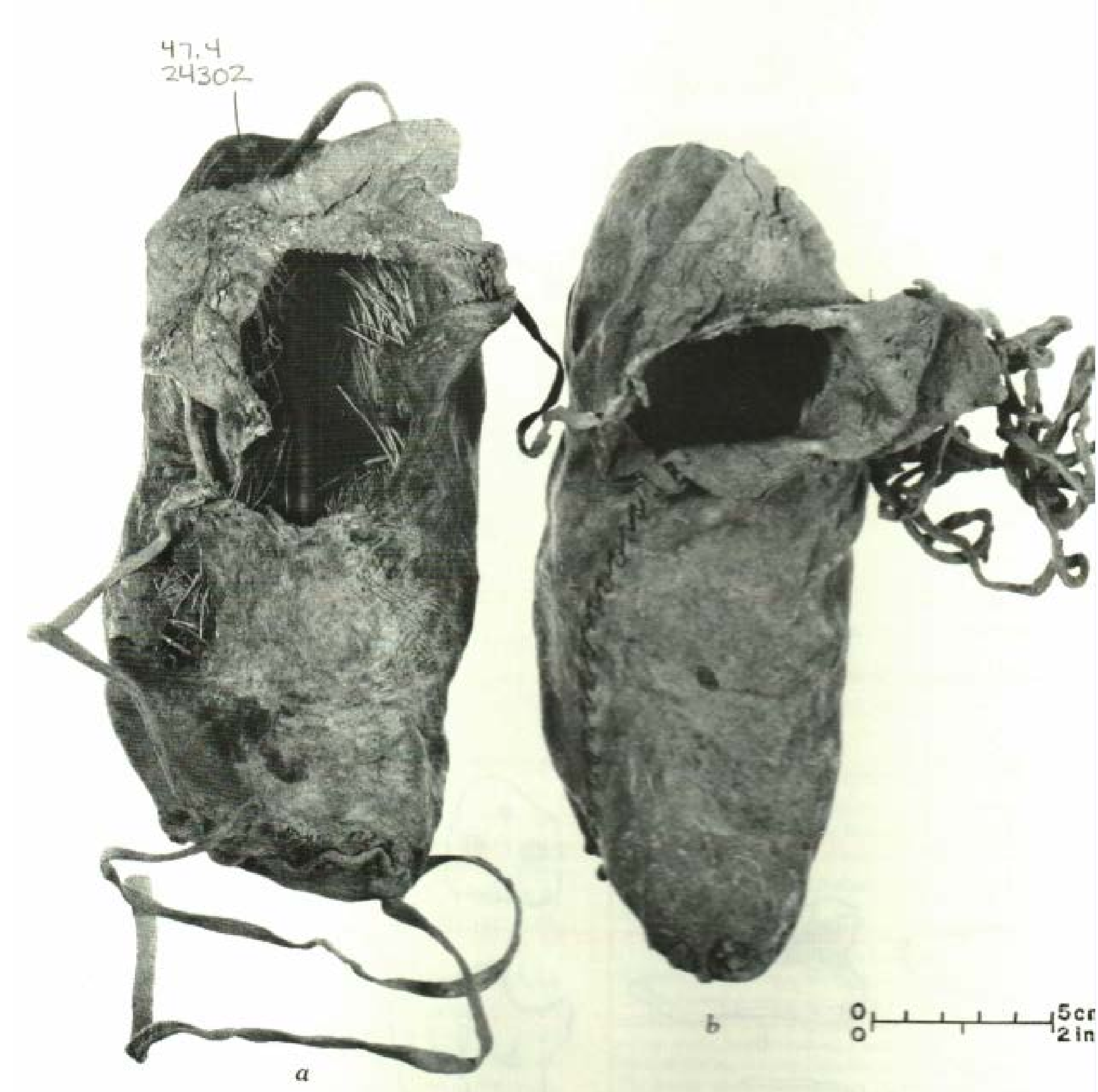


FIG. 66. One-piece or "hock" moccasins. Note side seam on specimen b.

Figure 7.7: Hock moccasin example from Hogup Cave (Aiken 1970)

At Ruby Cave (2,470-620 BC; Level 3 (12-18in), Figure 7.5), during this interval the incised stones (n=4) are generally associated with a stone blade, modified flakes, cordage, broken projectile points, scrapers, worked bone, large mammal bones (bighorn sheep bones, deer, and pronghorn), and a bone awl.

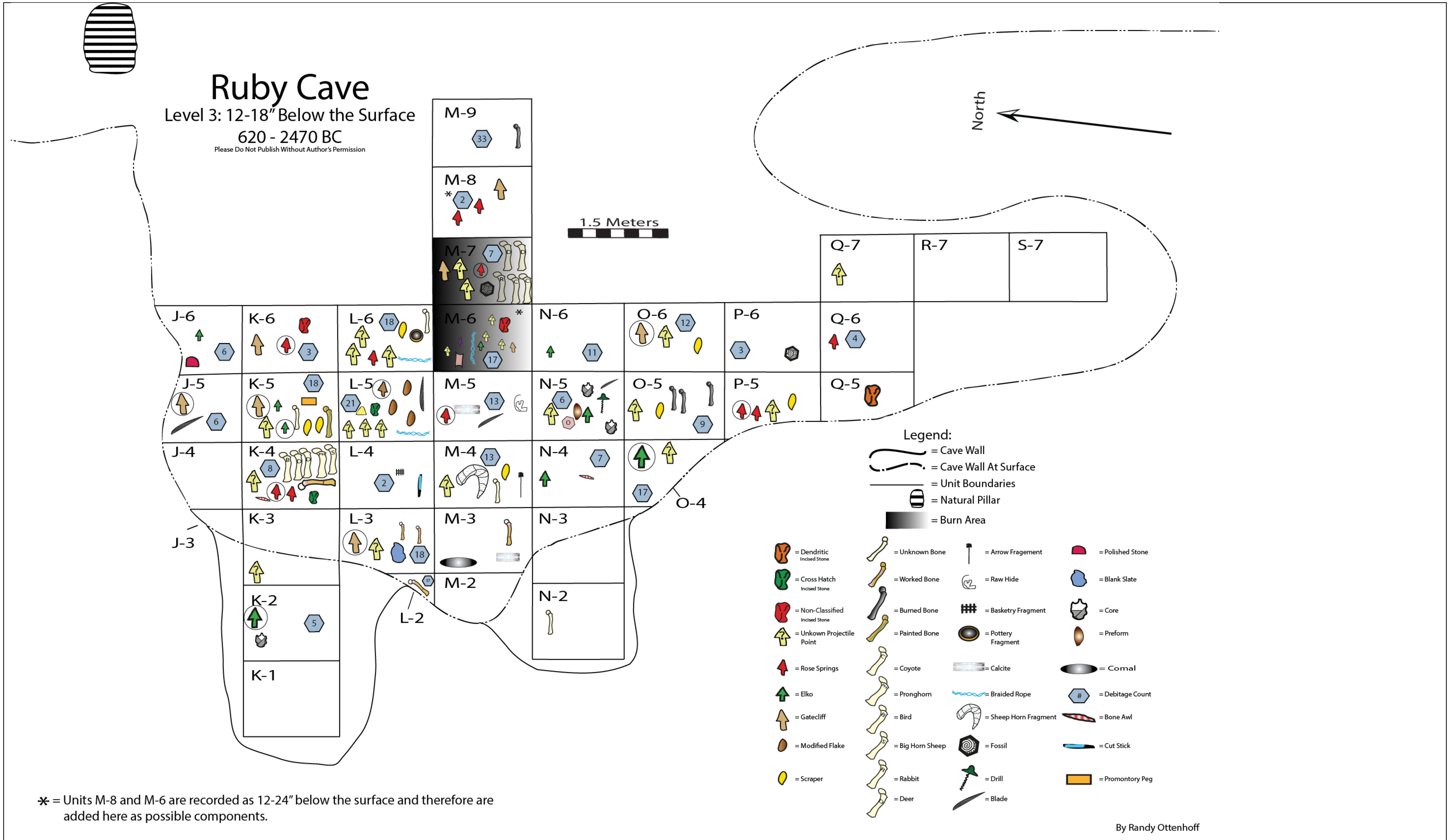


Figure 7.8: Ruby Cave Level 3; 12-18 inches below the surface. Map by author.

In the excavation unit named K-4 (Figure 7.8) the incised stone is found with the bones of four different species of animal (bird, deer, pronghorn, and bighorn mountain sheep). In this contextual setting the activity was probably butchering of several species. The scrapers are useful tools for scraping hides and butchering animals (Rowan and Thomas 1983a:327). The projectiles are broken from an impact fracture which indicates they were fired. The most likely explanation for their presence is that they were lodged in the kill and discarded during the skinning and butchering.

Some of the bones of the animal are modified either by adding paint or polishing the bone (Welcott 2001:25). Also in association is a complete bone awl which indicates that sewing or puncturing was a part of the events that took place (Welcott 2001:13). Taken together the incised stones are contextualized with the activity of butchering, polishing, painting, and manufacturing as evidenced through the painted bone and modified bone.

At Gatecliff Shelter (Horizon 8 and 9, 1,700 -1,550 BC) the incised stones (n=3) are associated with groundstone (n=4), beads, projectile points, bifaces, and a hammer stone. In Horizon 8 and 9 there was an emphasis on the production of new equipment (Thomas 1983a:477). In particular is the fabrication of groundstone with associated manufacturing tools such as a hammer stone and edge-battered cobble (Thomas 1983a:476). Other activities included the making of new projectile points, or modified flakes (Thomas 1983a:477). In these levels there is also a context with beads which may have been fabricated at the same time as the other equipment. At Gatecliff the overall mode of the associative relationships is the activities of fabrication with the manufacturing tools such as the hammerstone. Lithic equipment was being made with incised stones associated, but there is a greater of associations with groundstone.

At Swallow Shelter (900 BC, Level 4) the first incised stones (n=2) are associated with Elko projectile points (n=2), unknown projectile point (n=7), modified bone (n=3), a mano, bifaces (n=2), a scraper, a shaft smoother, and one smoothed stone (Figure 7.9). With so few artefacts it is difficult to analyse the activities. The Elko projectile points both have damage, one is missing a tang and the other missing the tip (Dalley 1977:27), and is probably an indication that hunting occurred and the animal butchered at the site as is also reflected in the modified bones. The smoothed stone could be evidence of food processing or even rubbing of hides but nothing is conclusive (Dalley 1977:48). The mode of activities that the incised stone is associated is hunting and possible processing.

In summary, incised stones enter into new associations during this interval. The major relationship both directly and indirectly through contextualization is that of the activity of manufacturing. The manufacturing as the result of hunting events includes hide processing, the making of lithic projectile points or modified flakes, or the making of cordage.

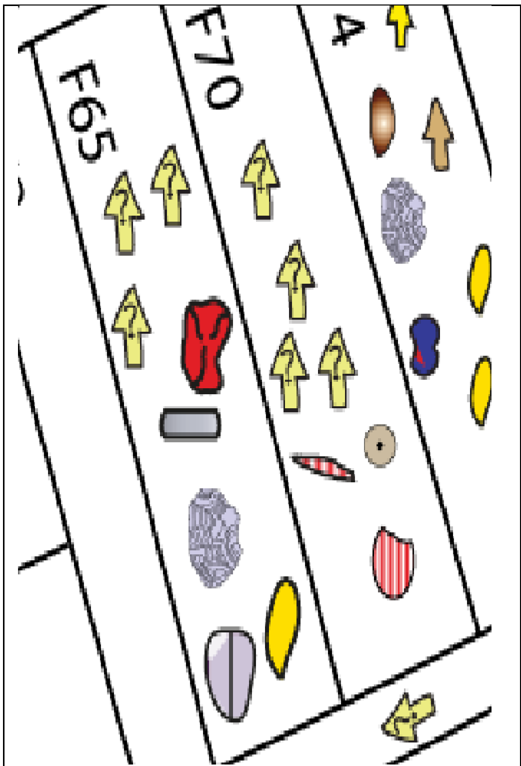


Figure 7.9: Spatial context of the incised stones from Level 4 (900 BC) at Swallow Shelter. See Figure 7.3 for symbol key.

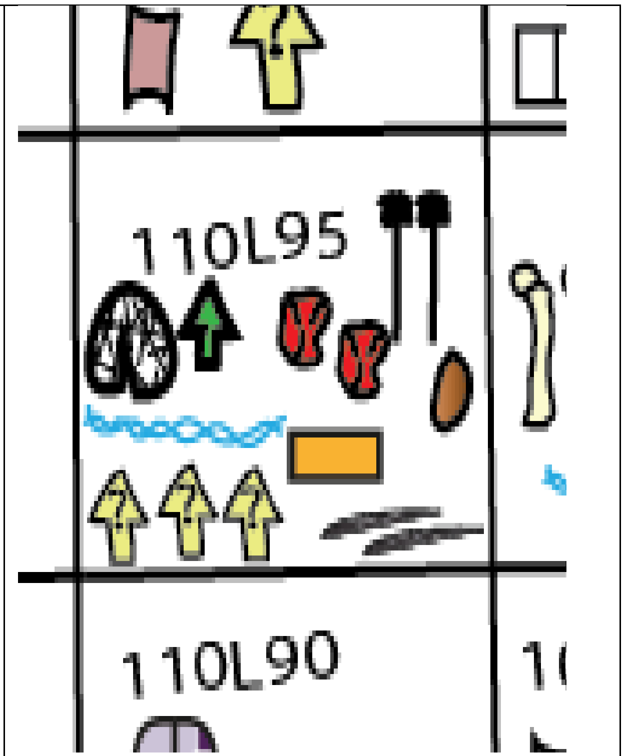


Figure 7.10: Spatial context of the incised stones from Strata 14 at Hogup Cave. See Figure 7.3 for symbol key.

500 BC – 1,500 AD (Hogup Cave, Gatecliff Shelter, Ruby Cave, and Swallow Shelter)

Gatecliff Shelter (1,250 AD; Horizon 2) has 27 incised stones that are deposited with a variety of activities across the level. The incised stones are associated to within a meter with projectile points both broken and unbroken (n=10), bifaces (n=11), bone beads (n=10), grounstone (n=2), a mano, a promontory peg, a bone awl, and a drill.

The incised stones are also associated with an animal butchery feature. In association to the bone bed are several incised stones, groundstone, projectile points, and bifaces (Thomas 1983a:493). This feature is referred to as the ‘bone bed’, or a large area that contains about two dozen bighorn sheep kills (Thomas and Mayer 1983:355, see Figure 7.10 for example of sheep horn wrenches). While it is impossible to know if the kills are episodic or accretional the impression of the deposit is that it represents a “single behavioural event” (Thomas and Mayer 1983:355). For one, all of the bones lay on the same micro-topographic surface in the middle of the site with a scattering towards the dripline (Thomas and Mayer 1983:355). The horn cores, skulls, mandibles, the atlas vertebrae, pelvis, sacrum, sternum, scapula, and femur all have evidence of butchery marks (Thomas and Mayer 1983:358-360). The carcasses were stacked up near the middle of the site and then

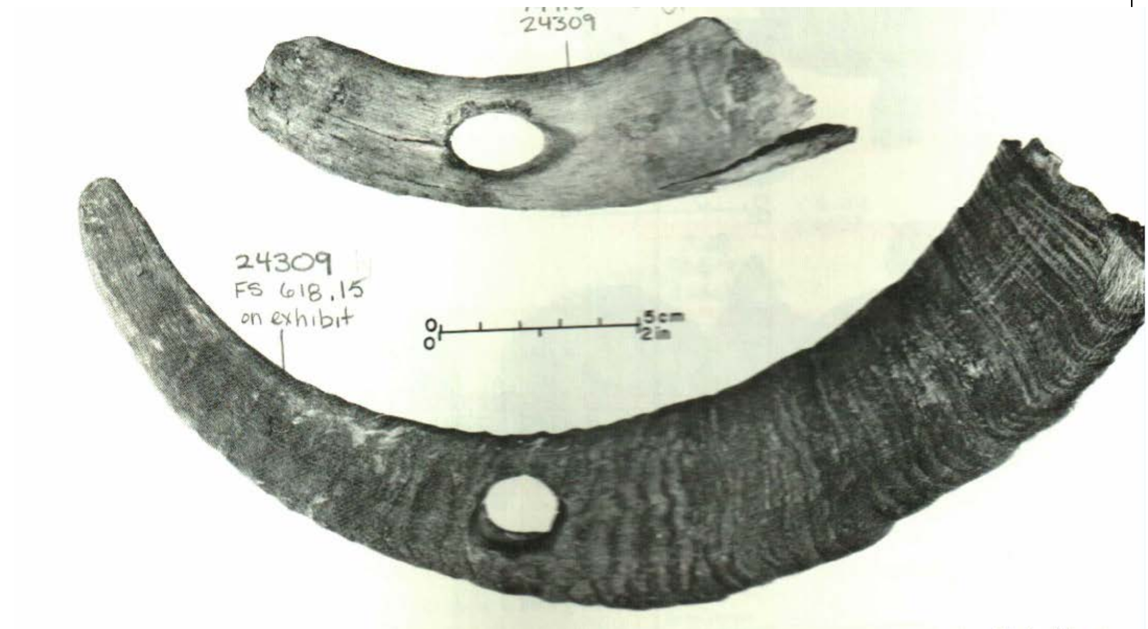


Figure 7.11: Examples of bighorn mountain sheep usage as 'horn wrench' (Aikens 197).

"disarticulated in place" with three distinct artefact clusters around the edge of the bone bed (Thomas 1983a:496). In each of these artefact clusters are lithic flakes and bifaces from the activity of knapping, hide processing, and bone bead fabrication. After "matching discarded artifacts and debitage, it seems clear that primary tool manufacturing occurred around the edge of the bighorn concentration" (Thomas 1983a:496). The primary tool manufacturing in this case is represented by knapping. The incised stones are associated with these clusters and the manufacturing of tools and beads.

In a cluster towards the rear of the site and associated to within a meter are finished artefacts in conjunction with the bone bed (Thomas 1983a:493). This particular area of the cave not only has the activity of knapping taking place, but also drilling. A drill is found closely associated with the incised stones as is the bone beads suggesting that the manufacturing of the beads took place in this locality.

On the west side of the site an incised stone is associated with a mano. This particular mano does not have a use-wear pattern that indicates a hard surface rubbing as the crystals are not truncated (Thomas 1983a:496). Instead it was most likely used as a rubbing tool for hide processing (Thomas 1983a:496). Also on the west side of the site an incised stone is closely associated with a metate. Therefore the incised stones are directly associated with and contextualized with the manufacturing of new or the repair of lithic artefacts, the creation of bone beads and the preparation of hides clothing fabrication.

At Swallow Shelter (830 AD Level 9, Figure 7.12) the incised stones (n=28) are found associated with the activities of manufacturing, hunting, and cooking. The manufacturing activities are notable from bone awls (n=5), drills (n=3), an antler flaker, gravers or burins (n=4), and scrapers (n=5). The other evidence of manufacturing is found with the component materials that go into fabricating new or repairing artefacts. Namely the wrapped fibres, the fur strips, and the knotted juniper bark. In addition are the artefacts that were left in various stages of construction. The net fragment for instance is "knotted together at regular intervals in such a way as to indicate net elements, although none are complete" (Dalley 1977:65). There are three bone awls in the same unit as the net fragment with wrapped fibres, juniper bark bundles, and fur strips that are knotted together. The evidence suggests that manufacturing took place of a net that was left unfinished, and as a part of this activity an incised stone was left.

Elsewhere in the shelter are two bifaces, one in an intermediary stage of production and the other is complete (Dalley 1977:30-32). One of the bifaces is found in unit F70 where there is also an antler flaker, suggesting that this biface was in the process of manufacture. Another activity happening in Unit F70, is the manufacturing of a tubular bead with the drill associated.

The evidence of hunting equipment comes in many forms. The Corner-Notched projectile point in Unit F112, associated with three incised stones, cannot be classed into any projectile point typology (Dalley 1977:30). I suggest that this projectile point was left unfinished and is evidence of the manufacturing of chipped lithic tools. In support of this an antler flaker is found in the same unit as the corner-notched projectile. Incised stones are not just associated with hunting equipment in this unit, but also in several units with Rosesprings projectile points, Cottonwood point, and a bunt arrow foreshaft. Finally, there is limited evidence of cooking with an incised stone association. In Unit F112 is the presence of juniper berries skewered on a stick in the fashion that they were meant to be eaten. In conclusion the incised stones for Swallow Shelter in this interval are associated with several instances of manufacturing, hunting, and to a limited extent, cooking.

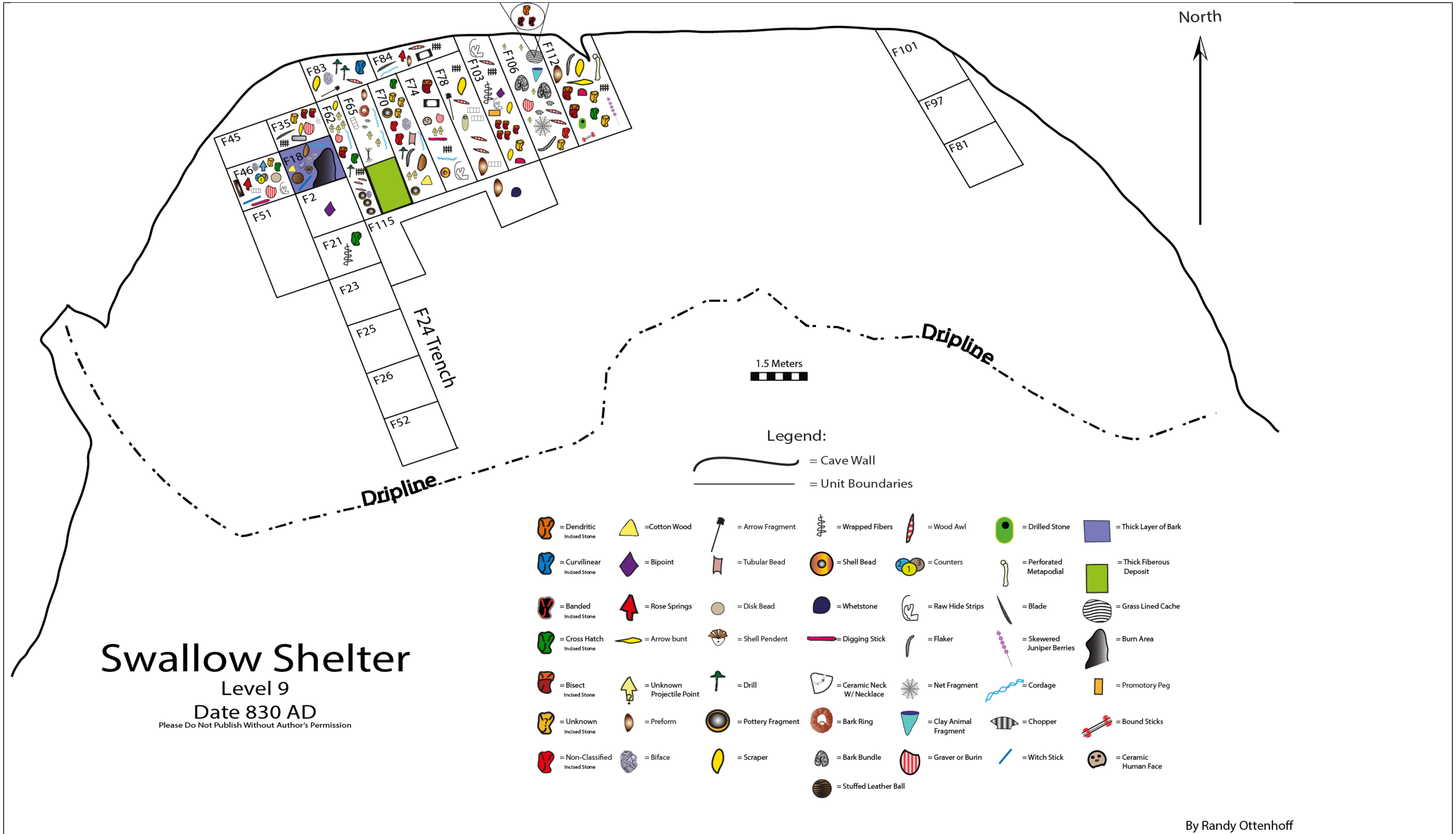


Figure 7.12: Spatial context of the incised stones from Swallow Shelter Level 9 (830AD). F83 has a possible cache. F106 may represent a structural depostions. Map by Author.

At Hogup Cave (740 – 1,330 AD, Level 14, Figure 7.10) there are three incised stones that are located near the middle of the cave. A shredded bark bundle associated with two incised stones probably served as padding for moccasins or other clothing as is evidenced in a hock moccasin in Level 12 (Figure 7.7, Aikens 1970:102-104). There are also two arrow body fragments in this unit, one is a splinter of the main body of an arrow and has "three black painted lines running parallel to each other (Aikens 1970:165). The other is a short distal section that appears to have been cut off from the longer body (Aikens 1970:160). Their fragmentary condition suggests that they were fired and broken during a hunting event. However they were not just discarded, but saved and in the case of the painted lines altered or carefully cut as if to be preserved for some other purpose. Also associated is cordage, which in this level is nearly all two-ply with one example of a braided three-ply cord (Aikens 1970:126). Making cordage is a manufacturing activity, but is also a component material. One complete net and over 138 net fragments were recovered from the site (Aikens 1970:125). These nets were made from a light two-ply to a heavier two-ply cordage (Aikens 1970:125). From this level there are two net fragments that do not have a provenance to a particular unit (Aikens 1970:125-127).

In addition to manufacturing activities, there is also hunting equipment associated with the incised stones. I have already classified the arrow fragments that were modified by being cut or circled with black lines as manufacturing. However in this instance they can also serve as hunting equipment since that was their initial purpose. There are also five projectile points associated, and three promontory pegs. The promontory pegs are named after their first identification at Promontory Caves in 1937 by Julian Stewart. They are thought to be components in snare traps (Aikens 1970:170, Elsasser and Prince 1961:143, Ruby 1953:157, Thomas 1983a:297, Wheeler 1973:25). The promontory pegs are used for capturing animals and hence fall into the category of hunting equipment.

Outside of the 1.5 meter excavation units the incised stones are contextualised with the activity of animal butchery. The blue squares (Figure 7.12) near the front of the cave represent antelope hair and grasses mixed together (Aikens 1967f, Aikens 1970:25). The antelope hair mixed with the grass indicates that there must have been a hide scraping event taking place in that spot. The mammal index for Level 14 does not have any antelope bones meaning that only the hides were brought into the cave for processing (Durrant 1970:242). Below the hide processing area is a moccasins patch that is most likely a component material from the prepared skin(s). Manufacturing tools such as a shaft smoother, which is in an adjacent unit to the incised stone may have been used to make or repair arrow shafts. There are arrow shaft fragments (n=9) found throughout the level. In summary, the incised stones at Hogup Cave are associated with items that suggest manufacturing and hunting equipment. In a wider scheme they are contextualized with the activities of hide scraping, and other manufacturing taking place from within the cave.

At Ruby Cave (890-1,280 AD) during this interval there are 29 incised stones. In comparison to the previous levels, the incised stones are found with an increased number of artefact classes. These artefacts suggest a variety of different activities that range from manufacturing, food processing, cooking equipment, lithic knapping, and hunting equipment. The manufacturing evidence is found in a bead in Unit 0-4. All of the beads from Ruby Cave are tubular and in this particular bead, the outside was scored around the circumference, as if

Figure 7.13. Circumference scoring, possible in advance of breaking into separate beads. (Photo Credit: Elizabeth Guerra; Courtesy of the University of California, Davis).

it was to be broken into two beads (Welcott 2001:14). Scoring of beads (Figure 7.13) is also noted from Hogup Cave where six specimens have circumference scoring (Aikens 1970:90). One of these beads, broke apart along the scored line to form two beads (Aikens 1970:90).

In addition to this at Ruby Cave are two other beads one in Unit N-6 which is described as having been broken apart during construction and the other as a complete bead (Welcott 2001:14). The complete bead is found in Unit K-6 with a drill suggesting that drilling of the bead took place in that unit. In the same unit with this complete bead are six incised stones. There are also three bone pendants that show evidence of having been worked. In Unit N-6 the bone pendent is burned most likely in one of the five burned areas in the level. One of the pendants (Unit O-4) is in an uncompleted condition, and finally the last pendant (Unit P-5) was incised (Welcott 2001:15). Food processing and cooking is present with incised stones in several units. Four metates appear in as many units and one pestle is associated with an incised stone and metate. Evidence for an association to cooking and food stuff is observed in a proximity to pine nuts, cattail, a pine cone, and burned bone. The pine cone fragment is also associated with a burned area. Pine cones respond to heat by opening up their scales and releasing the seeds as an automatic response to fires in nature as a form of seed propagation (Muir and Lotan 1985:1658). The context to the burn area may indicate the extraction of seeds. There is also a burned bone in Unit M-6 that also had evidence of a burn area. The inference with the burned bone is that it was burned during cooking.

The incised stones are contextualised with the activity of lithic knapping as is evidenced on the north side of the cave where there are higher totals of flakes than elsewhere in the cave. Through the activity of knapping, a flake can be made and used, as a quick cutting tool or further refined into a complete biface, scraper, blade, or projectile point. To further support incised stones association with knapping, Unit P-5 has one incised stone with two lithic cores. In this unit there are no flakes which suggest that the context was important enough to be kept together. The most frequent activity that the incised stones are associated with is hunting equipment, followed by cooking equipment, and finally manufacturing.

Incised stones from 4,500 – 3,000 BC are contextualised with manufacturing and animal butchery, new clothing, or the production of component material. This trend continues through 3,000 – 500 BC only to become more strongly tied to the production of new artefacts that comes from the activity of animal butchering. Finally, 500 BC – 1,500 AD incised stones appear to be tied to many different activities, and associated with a wider range of artefacts across all of the sites.

Are incised stones associated with projectile points?

Incised stones are associated with projectile points, but with the exception of the earliest level of Ruby Cave there are always other artefact classes associated within 1.5 meters. This section will not address every occurrence of incised stones with projectile points, as the frequency distribution of projectile points and incised stones is discussed in Chapter 6. This section will draw attention to some specific contextual variations. Throughout all of the sites and levels the projectile points that are associated with incised stones are Elko series, Rosesprings series, Eastgate, Pinto, Humboldt, Gatecliff, and Cotton Wood Triangulars. The only projectile point that has any amount of consistency is the Elko Projectile point, and for that reason this question will focus on that particular point. Elko series projectile points are prevalent 1,500 BC to 700 AD, and is dominate lithic technology in the Late Holocene (see Chapter 4).

The previous chapter when looking at the frequency distributions would suggest there was not a strong correlation between incised stones and projectile points. However, when you start to look at the depositionally associated artefacts the context of incised stones and projectile points changes slightly. In the previous section it was observed that projectile points (at Ruby Cave) are more commonly broken than would be found in a strictly knapping episode. The association is instead to hunting, but because they are also found in association with manufacturing equipment, the association between incised stones and projectile points is a secondary context. Hunting occurred before the animal is butchered and the hides prepared. The projectile point is embedded in the animal, this is the primary context; after the animal is taken to a site and butchered the projectile point is in a secondary context.

The first incised stones (n=2) at Swallow Shelter are found with an Elko Projectile point at 900 BC. The incised stone and Elko association continues until 680 BC. After this time the incised stones are not associated with Elko projectile points again. However, between 680 BC to 830 AD the Elko projectile point is found with a painted stone. The incised stones in this level become associated with processing equipment, and manufacturing tools. I suggest the painted stone associated with the Elko has taken the place of the incised stone. Therefore, the Elko point remains associated with an object that has been marked or decorated. My interpretation is that incised stones were being used in such a different way that they could no longer be associated with Elko projectile points. Instead a painted stone was used for the Elko projectile point. Unfortunately, this associative choice is only observed at Swallow Shelter.

Do incised stones have a structured deposition?

There are at several instances of structural deposition within the sample. The examples discussed here are found at Swallow Shelter (830 AD) Gatecliff Shelter (1,500 BC to 700 AD).

Swallow Shelter

At Swallow Shelter (Level 9, 830 AD) a 'basin' was dug then lined with grass (Dalley 1977:21). Laid inside of the basin are three incised stones that had been carefully made with intricate geometric and floral designs (Figure 7.14). Each stone is incised on one surface and is broken. The breakage was done at the mid-point and in each case a triangular piece was removed from the left side of each incised stone. The triangular pieces were never recovered during the excavation. The type of material used for the incised stones is very smooth and white and the stones show signs of having been shaped. These three stones are set apart from the rest of the level in many different ways. Throughout the rest of the level the incised stones are associated with many different activities: manufacturing tools (such as awls, antler flakers, drills, gravers or burins, and scrapers), hunting equipment (such as projectile points, netting, promontory pegs, and arrow fragments), and component materials (such as wrapped fibres, bound sticks, and bark bundles). The incised stones that were placed in the dug basin are only found with a bed of unmodified grass and therefore do not share any of the associations from the rest of the site. In addition, the incised stones have been placed below the living floor of the site, meaning that it has been taken out of the main body of activities happening above. Their placement in a comfortable pit suggests that these incised stones were not meant to be disturbed.

Figure 7.14. Swallow Shelter incised stones found in a grass lined cache (Photo by author).

The incised stones from inside the dug basin, are white, very flat, and of a smooth material that is placed in a grass lined cache. The other incised stones are angular, rough, brown to off white, and unshaped. The incising is crude in comparison to the carefully made rows of incised lines on the cached stones. Not only were these incised stones carefully made, but because of their bright white appearance they must have been specifically collected. In addition, before grass could be lined in the basin the grass must have been harvested. Therefore, the intricate incising, breaking, removal of the triangular pieces, and deposit into the grass lined basin was all planned and executed with some sort of specific intention.

However, it cannot be classified as ritual since this type of structured deposition does not occur anywhere else in my sample nor in any case that I have been able to find in the Great Basin in regards to incised stone deposition. While these three incised stones have a structured deposition they are also formal in that they were selected specially for their colour and texture. Additionally, they were intricately designed and then all broken in a specific method. However, they do not pass the ritual definition in regards to being repetitive. While there are prehistoric dug pits elsewhere in the Great Basin that contain a variety of artefacts, such as Level 12 at Hogup Cave there are none that contain just incised stones. I propose that these incised stones at Swallow Shelter were deposited to commemorate some event, person, or thing.

Gatecliff Shelter

At Gatecliff Shelter (1,500 BC to 700 AD) is a total of 146 incised stones, with 96 of them deposited along the rear of the site within a two meter area (Thomas 1983b:256). Thomas only identified the area as a concentration (1983a:488). This clustering (Figure 7.15) is mapped in the Gatecliff monograph, but the associated artefacts are not included on the map. Horizon 6, in which this structured deposition of incised stone occurs is difficult to separate from Horizon 4-6 due to the course grain size, and the overall mixing of the levels (Thomas 1983a:488). Statistically Gatecliff Shelter is size sorted from the back of the shelter to the front. The incised stones near the wall of the site "cannot be accounted for by mere size sorting… [reflecting] some behavioural significance" (Thomas 1983a:489). This type of activity is defined by Binford (1978) as Drop and Toss Zones sorting and at Gatecliff Shelter large heavy items were normally removed from the shelter, while lighter artefacts were near the rear wall of the shelter (see Chapter 5).

The incised stones outside of the clustering are not mapped with the associated artefacts, however they are contextualized with activities in Horizon 4-6. There are bone awls (n=29), drills (n=4), yellow and red ochre, scrapers (n=32), bone beads (n=52), a shaft straightener, hammerstones (n=53), and a bone flaker (Thomas 1983a:489-490). All of these items point towards the activities of manufacturing: of hide clothing, projectiles, ground stone, bifaces and basketry (Thomas 1983a:491). On site processing of plant materials took place, the scraping of animal hides, and field butchery were other activities that occurred (Thomas 1983a:491). Although there is not an associative map, the incised stones outside of the cluster are contextualised within the everyday rhythm of life at the site.

The 96 incised stones that are concentrated break the overall pattern of associative relationships, not only in this level, but all levels. In fact, the large quantity of incised stones found together is not found in any chronology at any of the other sites in my sample. Therefore, the clustering is archaeologically significant, and demonstrates specific goals in which the creators and depositors had in mind for its deposition. Intentionality of the clustering must have been a part of something other than the everyday activities.

To support intentionality, the incised stones in the cluster also exhibit a Curvilinear design, which until Level 6, did not occur at the site (Thomas 1983b:256). The use of the 'walker method' (see Chapter 1) to incised the surface of the stone is also new.

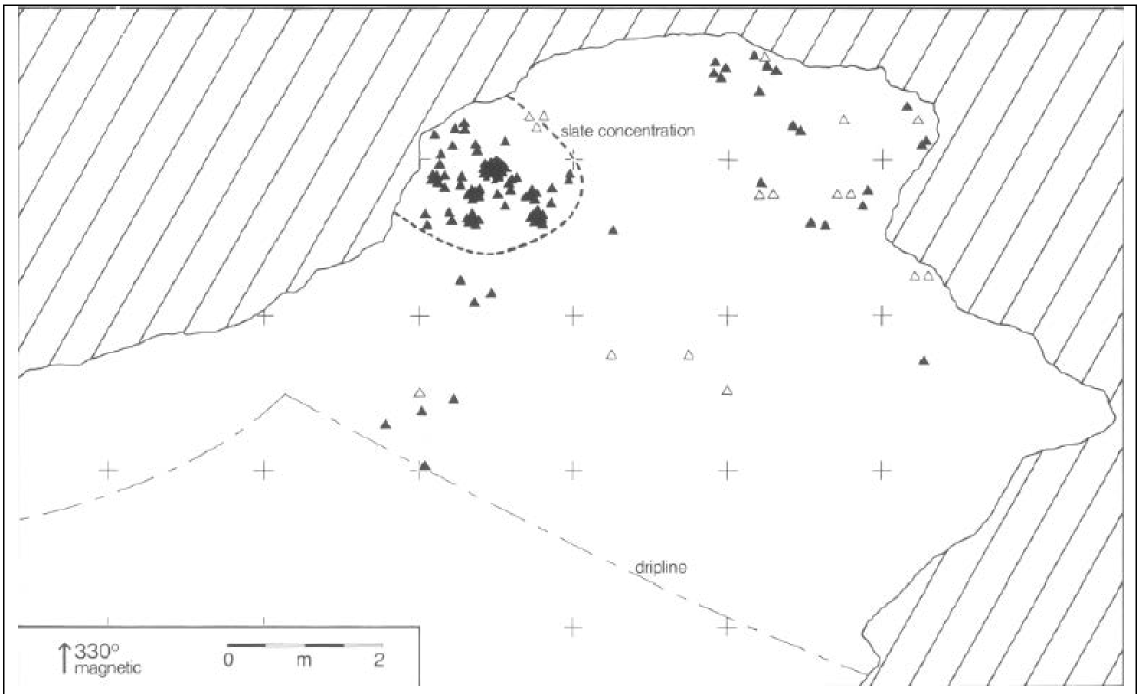


Figure 7.15: Gatecliff Shelter Horizon 6 (Thomas 1983a:488). Clustering of 96 incised stones is suggested to be structured deposition.

Due to the nature of the sites deposition being very mixed, it is impossible to know if the stones represent a single event or were deposited over a course of years. If they were deposited over a course of years, then the ritual category may apply since it would demonstrate structure, formality, and repetitiveness. However, if it was a single event, which I suspect it is, then they may have been left as a structure to commemorate an event, person, or place.

Taking into account the contextualised climate of the Neo-Glacial drought and the lower amount of *Pinus* pollen then it may be that a harvest was poor during this time period. The social aspect of pinion harvesting (see Chapter 6), that brings together family units for harvesting may have been confronted with a disappointing harvest. Ethnographically (see Chapter 6), family units claimed certain groves of trees as theirs, so the commemoration could be to the harvest. Given the evidence displayed in this chapter, incised stones are closely associated with activities and perhaps due to the climate the incised stones were made as a form of crisis art (see Chapter 4). Conceivably, the prehistoric inhabitants may have felt if they make incised stones and leave them in a pavement or pile then it may secure hope of a better yield in the future.

Are incised stones found in caches?

Incised stones are found in caches. Caching is notable at several sites such as Hidden Cave, where the entire deposit is thought to have been attributed to an accumulation of cached material over thousands of years (Thomas 1985). Unlike Hidden Cave, the sites in my sample are mainly used for a variety of activities not just caching, yet incised stones are found in a cache context. To spot a cache in the maps I looked for clusters of artefacts along the walls of the cave and rock shelters. From there I looked to see if there were any incised stones associated with the clustering. If there was an incised stone, I started to look up information on the condition or stage of manufacturing of the artefacts. In doing this search there may have been other caches, but because there was no incised stones they were not synthesised into this analysis.

Figure 7.16: Incised stone found in possible cache in Swallow Shelter (42Bo268 FS 143.14). Courtesy of Natural History Museum of Utah. Photo by author.

Swallow Shelter

At Swallow Shelter (830 AD, Level 9), there is evidence to suggest that an incised stone (Figure 7.12) was cached along the rear wall of the shelter with other artefacts. This cache is in Unit F83, where a biface is found along with two drills, a bone scraper, and an arrow shaft section. The arrow shaft section has been carefully constructed with a drilled hole at one end and a dark stained area around the outside where sinew may have once wrapped around (Dalley 1977:60). The scraper is made of bone, and is the most developed bone scraper out of the entire Swallow Shelter collection (Dalley 1977:54). The two drills are not only in excellent complete condition, but one is extensively flake and shaped while the other is nearly the same quality as the first (Dalley 1977:37). The biface is described as being lunate or crescent shaped and in a near finished condition (Dalley 1977:35). Given the quality of manufacturing that

Figure 7.17: Possible cache in Unit F83 in Level 9 of Swallow Shelter. See Figure 7.3 for symbol key.

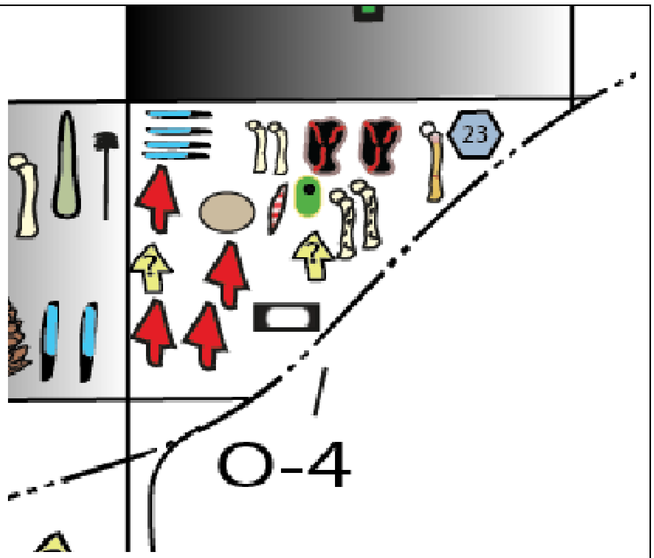


Figure 7.18: Possible cache in Unit O-4 in Level 1 (0-6 inch) in Ruby Cave. See Figure 7.3 for symbol key.

went into making these artefacts and their placement along the back wall of the shelter suggest, that this was a cache meant for later retrieval.

The cache is placed out of the main flow of traffic in the cave, and thus served keeping them safe from being broken or trampled. If a cache is meant to be something someone returns to, then the incised stone must have also been thought of as something to be returned too and retrieved. This particular cache is never discussed by Dalley the author and excavator of Swallow Shelter, but he does state that there was a cache in the east excavation area of the shelter were there was “two partially developed welded tuff blade cores…found on a small ledge covered by Stratum E3 materials” (Dalley 1977:21). In summary, an incised stone is found in the rear of the shelter with other complete and well-made artefacts. The placement of the artefacts is out of the way of the traffic areas of the site and the quality of the items make the deposit look very much like a cache.

Ruby Cave

In Ruby Cave (890-1,280 AD, 0-6 in), is a possible cache in Unit O-4 which is in the back of the cave along the wall. Including the two incised stones there are 44 artefacts in this unit. These artefacts include cut sticks (n=4), Rosespring projectile point (n=4), unknown projectile points (n=2), a metate, a bead, a bone awl, a bone pendant, incised stones (n=2), a worked bone, unidentified and unworked bone (n=2), incised bone (n=2), and flake debitage (n=23,

Figure 7.19). The bone pendent and scored bone bead are in varies stages of manufacture. The bone pendent is in incomplete condition, and in comparison to the other bone pendants from this level, which were either burned or broken, it seems likely that it is placed in this unit for later retrieval and completion.

Figure 7.19. Flakes from Level 1 (0-6 in). Above: Flakes found in cache in Unit O-4. Below: Flakes from the rest of Level 1 (0-6 in) Unit M-8 (Coutesy of the University of California, Davis) Image by author.

The bone bead is scored around the circumference (Figure 7.13), for possible preparation to be broken. Similar beads are present at Hogup Cave, Gatecliff Shelter, and Etna Cave (Aikens 1970:90, Wheeler 1973:33, Thomas 1983a:302, Welcott 2001:14). David Hurst Thomas calls this type of circumference preparation as a bead blank (1983a:303). Out of the four Rose Springs projectile points for this unit, I have only data for one, which is in complete and unbroken condition (Baumhoff 1959b). Of the four cut sticks only one is burnt with the other three apparently unused (Welcott 2001:18). The metate is in fragmentary condition, however it is not basined showing that is was not extensively used (Welcott 2001:4). This metate fragment may have been saved as a future recycled item (Adams 2002:23). Recycled items are artefacts that were “designed and used in one activity, but ultimately employed in a completely different context that may or may not have physically altered the item” (Adams 2002:23). Finally, there are 23 lithic flakes (Figure 7.19) in this unit which is the largest amount of concentrated flakes out of any of the units for this level. Given the large size of the flakes they may have been saved for later knapping.

In conclusion, this data culminates in calling this occurrence a cache: the position of these artefacts are along the back wall of the cave, the artefacts are complete or nearly complete, there are saved flakes, and the possible planned recycling of a groundstone fragment. The manufacturing mode of nearly all of the artefacts in the cache is that they are still in the process of being made. As a part of this cache are two incised stones. If all of the other artefacts were meant to be later retrieved then these incised stones also must have been retrieved. Further, if many of the artefacts still needed to be worked then it is quite possibly that the incised stones would have received more incising.

Hogup Cave

At Hogup Cave (circa 4,240 BC; Strata 7) are four incised stones cluster of 18 artefacts along the east wall near the entrance to the cave which is possibly a cache, with four incised stones (Figure 7.2). The artefacts consist of incised stones (n=4), cordage (n=2), a Humboldt projectile point, a fossil, an arrowshaft straightener, a feather, a digging stick, a groundstone fragment, painted bone (n=2), and unidentified projectile points (n=3). The condition of the arrowshaft straightener is complete where four other examples are broken. There are three grooves on the stone that are all shallow, suggesting it was used but not extensively (Aikens 1970:69). Grooved stones like these could have been used for removing material from contact surfaces, such as the spines of grasses, or shaping awls, and arrow shafts (Adams 2002:84). If the stone is really hard then the grooves were most likely manufactured where if the stone is soft the grooves are probably worn in from use (Adams 2002:84). The grooved stone in this unit is pumice which is naturally abrasive and hard indicating the grooves may have been

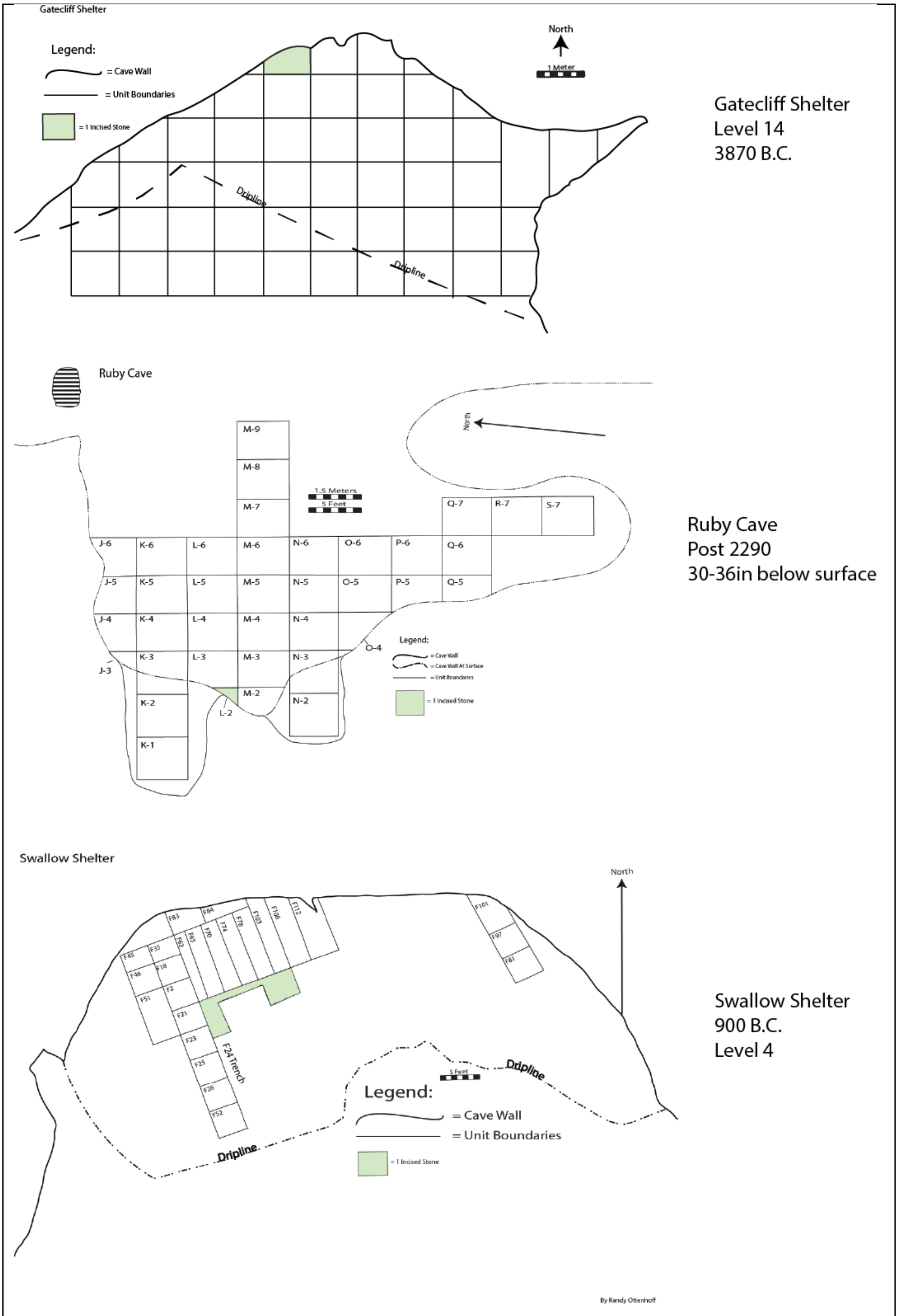


Figure 7.20. Incised stones distribution during the early period.

manufactured (Rapp 2009:223, Aikens 1970:69). There is also a feather that is unmodified, yet its placement with the other objects suggest that it was saved for future use. There is a total of 245 feathers from the Hogup Cave excavation which are in "remarkable shape considering their age" (Baldwin 1970:267). There are 13 feathers from other levels that were modified by wrapping thin sinew around the mainshaft of the feather (Aikens 1970:119). The modified feathers support a suggestion that the feather in this cache could have been saved as a component material. There are five projectile points in this unit, but there is data on only one which is a Humboldt concave projectile in complete and unbroken condition (Aikens 1970:43, Figure23c). The majority of the objects in the possible cache are ready to be used during a later retrieval. The four incised stones that are together with these items do not have a great deal of incising, and therefore could be saved in this cache for later marking.

A spatial placement analysis: Were incised stones made by men or women?

Incised stones, were probably made, by both men and women because incised stones are found in men and women activity areas. This question will also display maps, with coloured areas over the units that incised stones were found, to demonstrate their spatial distribution through time at multiple sites.

Incised stones were demonstrated in Question One of this chapter as having increasing associations with other artefacts through time. From 500 BC to 1,300 AD these associations become the most varied at Gatecliff Shelter, Swallow Shelter, Hogup Cave and Ruby Cave. The associative pattern grew through time as did the spatial patterning. Before 500 BC the incised stones at all of the sites are widely spatially distributed (Figure 7.21) although elsewhere in the site activities were taking place. After 500 BC the incised stones are more widely distributed. Yet as shown in Question One and Three, the incised stones are not left randomly, but are left with activities such as manufacturing, processing, hunting equipment, or caching. To understand why the spatial patterning of incised stones changed we need to understand how the demography of the Great Basin changed as a whole after 2,000 BC.

The conclusion of Chapter 6 shows that there was a marked change in the organization structure of how people exploited resources in the Late Holocene. The data suggests a move away from logistical hunting to family and group subsistence strategies, particularly the pine nut harvest and small mammal drives. During the Neo-Glacial Drought (500 BC to 100 AD, see Chapter 4), there was a general trend of using some of the caves for logistical hunting (Gatecliff Shelter and Hogup Cave), although the other caves were still used by family groups. During this time there was not enough precipitation to support the vegetation communities and or wetland environments that had previously been thriving areas for foragers to gather

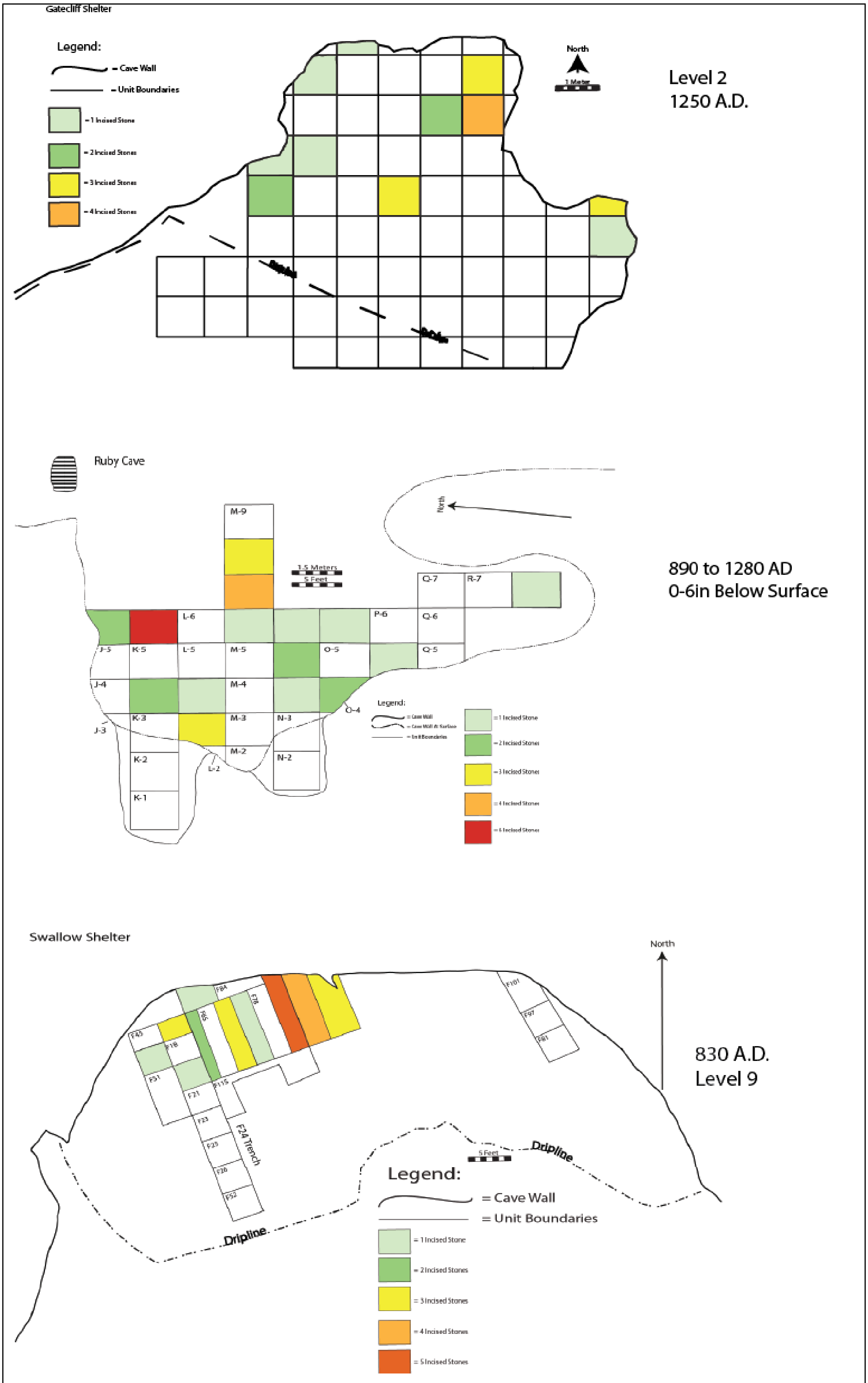


Figure 7.21. Incised stones distribution during the late period.

food (Thomas 2014:13) Many of the springs stopped flowing or had decreased in output of fresh drinking water, and the salinity of the lakes made the water undrinkable (Thomas 2014:138). The drought was not to last and as people started to return to the Great Basin they no longer adopted the previous 4,000 year tradition of logistical hunting camps (Gatecliff Shelter and Hogup Cave), although the other caves were still used by family groups. During this time there was not enough precipitation to support the vegetation communities and or wetland environments that had previously been thriving areas for foragers to gather food (Thomas 2014:13) Many of the springs stopped flowing or had decreased in output of fresh drinking water, and the salinity of the lakes made the water undrinkable (Thomas 2014:138). The drought was not to last and as people started to return to the Great Basin they no longer adopted the previous 4,000 year tradition of logistical hunting camps where only men hunted while women stayed at a residence base (Thomas 2014:134 and 140 also see Chapter 4). Instead men and women moved together as smaller family groups occupying many of the same sites that in millennium past had been considered long distance logistical 'Man Caves' (Thomas 2014:138). Supporting these families was the bow and arrow, which Bettinger suggest started a change in the social organization of the Great Basin hunter-gatherers, into smaller nuclear families (see Chapter 4). This time period was the start of the Me Generation where these nuclear families sustained themselves without the need to share meat in large hunting parties.

Feeding directly into the new settlement pattern at the end of the post Neo-Glacial Drought helps explain why incised stones become much more spatially distributed within the sites in my sample. More people doing more activities requires more space to do those activities (Figure 7.21). Men, women, and children would have been a part of the contextual seen at the sites after the Post-Neo-Glacial Drought. In order to do work, people must have been using most of the site for their daily routine. The fact that incised stones are found across the sites means that people must have been moving all around them, either seated next to incised stones, crawling over them, reaching over them, walking around them, and integrating them somehow into whatever they were doing. The incised stones are nearly never found alone; they are almost always found with other artefacts. These artefacts suggest activities taking place in the spot that they were left. These activity spots then were happening spatially all across the sites. Since the settlement pattern calls for men and women to be working together then we can assume that males and females worked in the same cave or rock shelter. Therefore, it is most likely that males and females were making incised stones since incised stones are found with nearly every activity inside the site especially after 500 BC.

The counter to this argument could be that the incised stones were made outside of the cave or rock shelter and then carried into the site and deposited with the activities. In such a case it would be difficult or impossible to know if men and women made incised stones. At Ruby Cave there are nine blank slates from five different levels that resemble what an incised stone would look like if not incised (Welcott 2001:13). In three different level at Ruby Cave the blank slates are found in the same unit as an incised stone. The simplest explanation is that the incised stones were made inside the cave. If it was easier to manufacture something outside of the cave or rock shelter then no one would take the time to transport so much raw materials to the rock shelter, to be butchered, sewn, scraped, twined, drilled, shaped, knapped, cut, burned, cooked, milled, or incised. Further, the cave offers shelter, from the sun and rain, a defendable space from wild animals and other people, and a place to act as a heat sink from a hearth. Therefore, the cave or rock shelter must have been the simplest place to carry out manufacturing including making incised stones.

Conclusion

To conclude, this chapter addressed five different questions about incised stones that had not been answered for the Great Basin. The chapter started off by asking if incised associations change over time. The answer to that question is yes, incised stone become increasingly associated with a variety of artefacts through time at multiple sites. The next question address if incised stones are associated with projectile points. Although incised stones are associated with projectile points it probably most likely this association is a secondary context. The most interesting projectile point association is of an Elko from Swallow Shelter between 680 BC and 830 AD. In this case the Elko projectile becomes associated with a painted stone, where in previous levels it had been associated with incised stones. My interpretation of this is that the incised stones were being used in such a way that made it inappropriate to be associated with Elko Series projectile points.

Question Three covered structured deposition. Structured deposition usually does not cover commemoration as an interpretive outcome. However, I am stretching structured deposition as a concept to cover commemoration because it provides a good launching point into how to think of these incised stones. At Swallow Shelter are three highly decorated incised stones placed in a grass lined basin. The nature of the stones was such that they did not match the texture, or colour, of the other incised stones at the site in the same level. Also the incised stones had been incised much more delicately than the other incised stones. While this deposit is structured, and formal, it is not repetitive which means it does not meet the criteria for a ritual deposit. Therefore, I suggest that the stones were deposited to commemorate an event, person, or thing. Also covered in this question is the 96 incised stones that were deposited within a 2 meter area at Gatecliff Shelter. This area in relation to the activities going on around it seems to be set apart from the rest of the site. I suggest that like Swallow Shelter, this incised stone clustering is commemorative.

Question Four ask if incised stones are cached. They are cached and three different examples are provided with in depth discussions of the other artefacts to argue that these caches were meant for later retrieval. If the cache was meant to be returned to then the incised stones must have be thought of something to be returned too. In addition to this many of the incised stones that are cached still have room to be incised on.

Question Five discusses if men and women made incised stones, which they most likely do both produce incised stones post 2,000 BC. After 2,000 BC there was a shift in the settlement pattern following the Post Neo-Glacial Drought. Men and women started to moved together and cooperate in foraging and possibly hunting activities. This is a major shift from the old habitation pattern where females would stay at residential bases while males went to logistical hunting camps to procure meat. If it is after 500 BC, men and women started to work and move together, then it helps to explain why the incised stone spatial distribution widens at my sample sites. More people means that more space must be taken up in the site for more activities. Since incised stones are associated with activities then it makes sense that incised stones would have a wider spatial distribution. If men and women are working together and incised stones are found across many different activities in a single level, then both males and females were probably making incised stones.

Chapter 8: Design Grammar Analysis

Introduction

A contextual foundation of artefact associations in relation to incised stones was laid in the previous chapter. This chapter uses a specific analytical method called design grammar (see Chapter 1 and 3) to classify all 562 incised stones. This chapter will analysis the contextual setting of the spatial associations of the design grammar and the frequency distribution through time in comparison of other artefacts. The questions addressed are directed to contextualise design grammar into the archaeological record.

- Where are design grammars found at the sites: front, middle, or back?
- Is there a design grammar chronology?
- Do all of the design grammars appear at all of the sites?
- Contextual archaeology: are design grammars associated with specific activities?

The context of the design grammar is meant to examine patterns of spatial deposition through a chronology, and not to establish different cultures through time. This chapter is not interested in creating a culture history. By classifying each incised stone into a design grammar an analysis can be presented on a spatial plane and on a chronological basis. The design grammars for incised stones in the Great Basin were developed by Klimowicz (1988) which are applied to the incised stones in my work.

What is a design grammar?

Design grammar is not a ranking of the incised stones nor are the meaning or symbolism of the patterns understood (Hodder 1982:210). What is understood is that a design grammar is repeated through a chronology, and found across the Great Basin. Design grammar is expressed on incised stones across a multitude of contexts as shown in the Santini collection in southern Nevada (see Chapter 3), and the stratified caves and rock shelters sites sampled in this work.

Grammar in this case does not refer to spoken language or sign language (Hassan 1988:283). It also does not refer to trying to read the incised designs as if they are a book in much the same way Christopher Tilley organized the Nämforsen rock art (Tilley 1991:29). What grammar does mean is the “recurrent, structured combinations of” designs incised on the surface (Hassan 1988:283). The designs are recurrent on the incised stones and have an unknown meaning which this chapter is attempting to understand. It is this recurrence that gives the designs a grammar in much the same way Tilley's Nämforsen recurrent rock art designs have a grammar. Tilley's grammar exploration compared the rock art designs in association to other designs on the same rock, or other rock art locales within the same area (Tilley 1991:30). The grammar in this work does not seek to compare designs with designs, but designs associated with artefacts.

A structure as used with the definition of grammar is "the way a whole is put together out of different parts" (Leborg 2006:94). The 'whole' would be the design and how it looks viewed all together, as opposed to a small area of the design. Most of the design grammars have an 'informal structure' which is defined as a non-regular organisation of the design (Leborg 2006:5) on the incised stone surface, yet between individual incised stones the classification can be discerned. The Curvilinear design grammar is an exception as the line or lines of this design often begin on one of the planes edges, curves and terminates along the same edge at a different position (Klimowicz 1988:63 and 84). The Curvilinear could be described as concentric as the curves often share the same axis. This type of repeated positioning of Curvilinear on a number of incised stones is called a 'concrete structure' (Leborg 2006:34). A concrete structure has more predictability of positioning than an informal structure. A concrete structure and an informal structure, influences how all of the designs on the object will appear (Leborg 2006:34).

The forerunner to design grammar was first introduced in 1942 by George Brainerd, who suggested that comparing designs that are symmetrical or similar in appearance was an acceptable way to have categories of classification (Brainerd 1942:164). It was not until the 1980s that Brainerd's idea was used on ceramic classification, textile design, projectile point analysis, and rock art sites in Europe and the United States (Klimowicz 1988:52). In rock art sites, design grammar has been used to analyse the interactions, size, crowdedness, and orientation of images to find the stages of application and how they work together (Chippindale 1986, Klimowicz 1988:53, 56, Tilley 1991).

Design Grammar	Structure	Count	Definition
Curvilinear	Concrete	n=49	A curving line that begins and terminates along the same edge.
Bisect	Informal	n=154	A line that divides the surface of the stone into two halves.
Banded	Informal	n=154	Zigzags or parallel lines with connecting perpendicular lines between them.
Cross-Hatch	Informal	n=61	Grids or manifold incised lines crossing each other.
Dendritic	Informal	n=11	Plant like Figures.
Anthropomorphic	Informal	n=1	Animal or human Figures.
Circle	Informal	n=9	Circular incising.
Non-Classified	-	n=20	These are incised stones that are minimally incised or to fragmentary for a design grammar to be assigned.

Table 8.1: Design Grammar classification with structure typography, counts, and definition. Anthropomorphic and Circle are only found at Gatecliff Shelter.

In practice, the design grammars for the incised stones that Klimowicz analysed was based on similarities between motifs, where grammar is defined as incised shapes that then can be grouped into one of seven classifications (Table 8.1). What sets my work apart from Klimowicz design grammar study is my use of context of the incised stones.

The Gatecliff Shelter incised stones were classified by Klimowicz for her masters thesis. Unfortunately, her design grammar for each Gatecliff Shelter incised stone is not available. I have had to reassign the design grammars to the Gatecliff Shelter incised stones, which may differ slightly from Klimowicz's (Figure 8.2, see appendix D). Gatecliff Shelter will be discussed as it pertains to the frequency distribution, and not the spatial associations. Spatial maps were made and published for Gatecliff Shelter, but each incised stone cannot be correlated to its specific location on the map. The data for such correlation exist in the original field notes, but during the course of this study I was not able to obtain those notes. Anthropomorphic and circle design grammars only appear at Gatecliff Shelter and the Santini collection in southern Nevada.

Figure 8.1: Artist Elaine Weinreb's illustration of a roundabout and roundabout sign (McKinleyville Press Blog: 2011).

Hodder (1982:206) critiqued design grammar as a concept by observing that designs repeated on pottery or rock art lacks a link and synthesis to the overall archaeology and life-way of an indigenous group. Because my work is contextual and involves design grammar there is a link between the artefact and the overall archaeology and lifeways of the peoples who lived in the Great Basin.

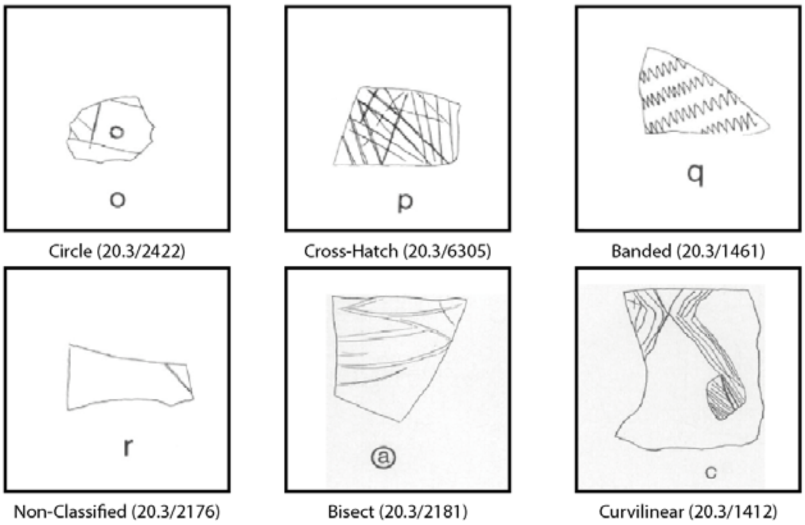
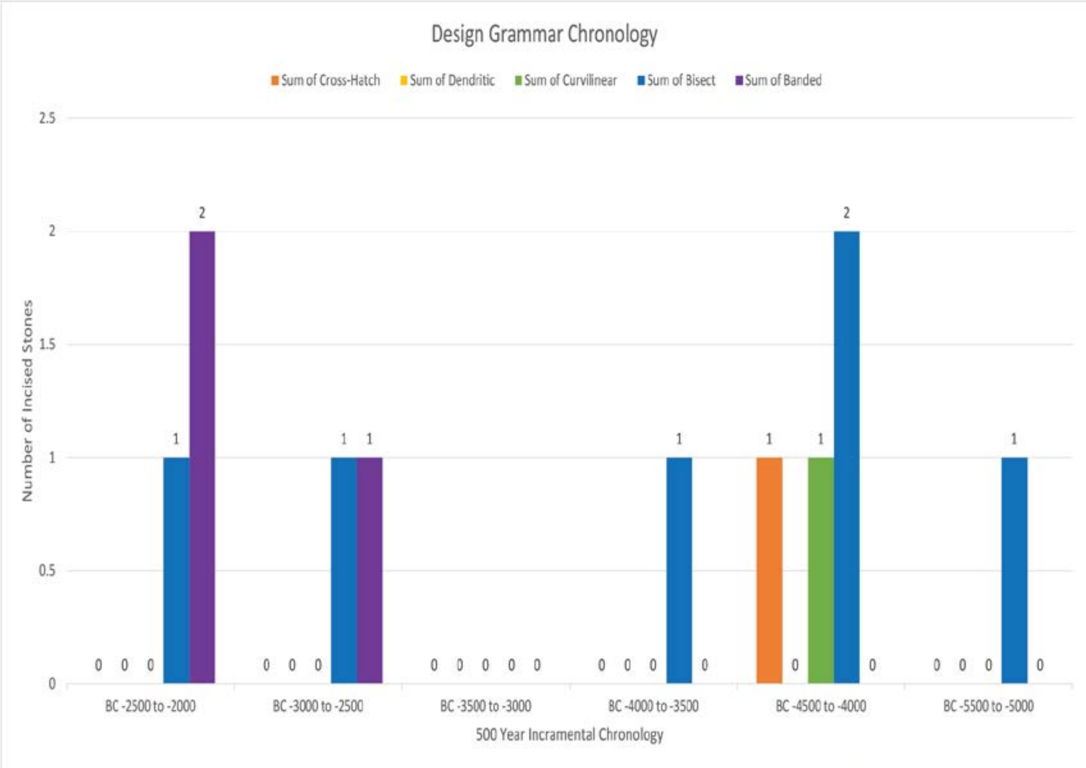


Figure 8.2: An example of design grammars from Gatecliff Shelter Level 6 (1,500 BC). (Images: Thomas 1983b).

A contextual archaeology (Hodder 1986) approach will be applied to the incised stones. In a contextual archaeology the artefacts form a text that can be understood after considering the context. Drawing connections between the contextual artefacts can lead to an understanding of the artefacts symbolism (see Chapter 1). This research takes this idea and applies it to the design grammar and the activities that are associated with that design grammar. I assume that a design grammar has a meaning and because it is associated with an activity that meaning may be understood. Hodder's (1982) critique of design grammar as not having a link to the archaeology is addressed in this research by using context to establish a link.

This contextual archaeological approach postulates that the context of the activity and the designs are related to one another in such a way to suggest a logical connection between the act of doing (activity) and the image incised (design grammar). For instance, a contemporary example would be a roundabout sign on the road and the roundabout itself (Figure 8.1). The sign is in a contextual relationship to the roundabout. The sign shows the direction of travel in the roundabout, and the activity that will take place. The roundabout is where the activity actually occurs, in this case driving in the roundabout in a counter clockwise direction as the sign suggest. Since the sign is contextual with the direction of travel in the roundabout then the logical connection between the sign and the roundabout is the sign is a symbol of the activity. Similar to the roundabout sign having a connection to the activity, so does the design. Finding the context between the design and the activity can lead to a logical connection to what the design symbolises. The approach is addressed as the last question in this chapter.



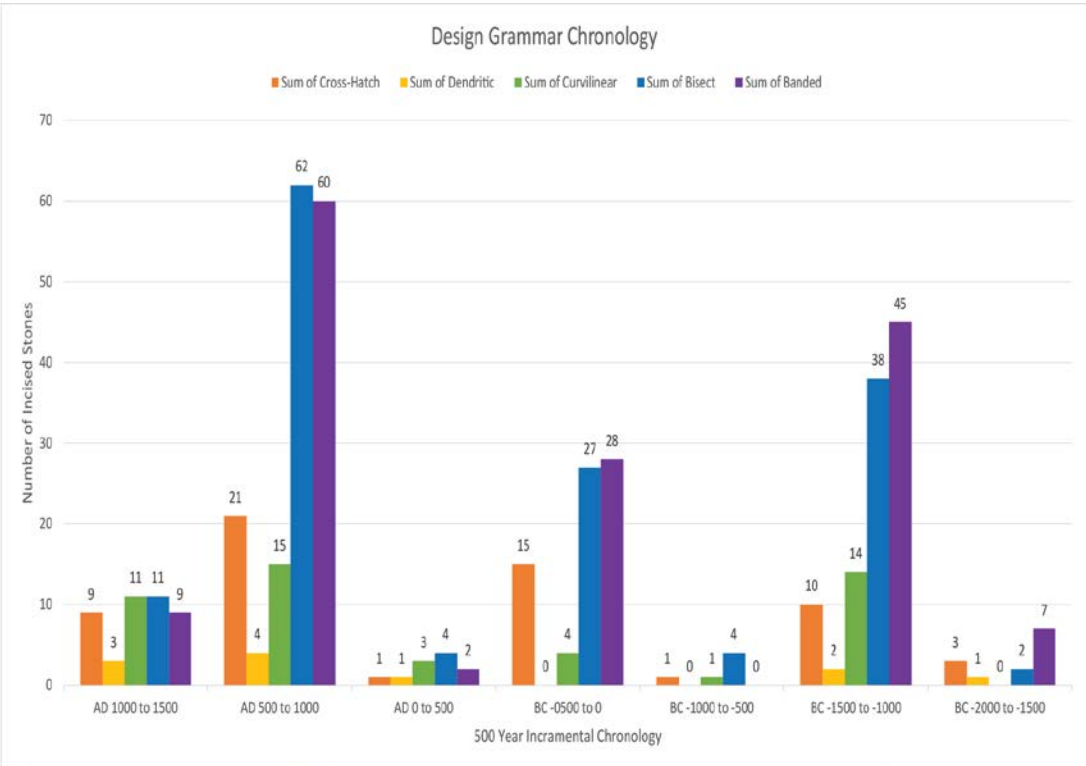


Figure 8.3: Design grammar chronology. Above: Incised stones during the Altithermal and includes most of the first time occurance stones (except Swallow Shelter). Bottom: Age of the incised stone, 2,000 BC to 1,500 AD.

What is the chronology of incised stones design?

From Figure 8.3 it appears that the Bisect design is the earliest (Camels Back Cave 5,500 – 5,000 BC). At Hogup Cave three design grammars (Curvilinear, Banded, and Cross-Hatch) appear in the record 4,500 – 4,000 BC. Curvilinear and Cross-Hatch designs do not occur at the other sites until much later. For example, at Gatecliff Shelter Curvilinear and Cross-Hatch do not appear until 1,500 – 1,000 BC. Dendritic does not occur until 2,000 – 1,500 BC at Ruby Cave. Of all of the design grammars, the Dendritic (n=11) is the least made. The Circle (1,500 – 1,000 BC) and Anthropomorphic (500 – 0 BC) only appear at Gatecliff Shelter (see appendix D).

Where are design grammars found at the sites: front, middle, or back?

In determining what constituted front middle and back, I followed several assumptions. The back of the cave is defined by any unit that is in contact with the wall. The front of the site are the units nearest the drip line. At Hogup Cave, the first 5 units from the drip line are considered the front. The middle of the site are the units that are in not in contact with the wall, but not at the front of the site near the drip line. At Swallow Shelter, the units behind F115, but not touching the wall, are considered the middle.

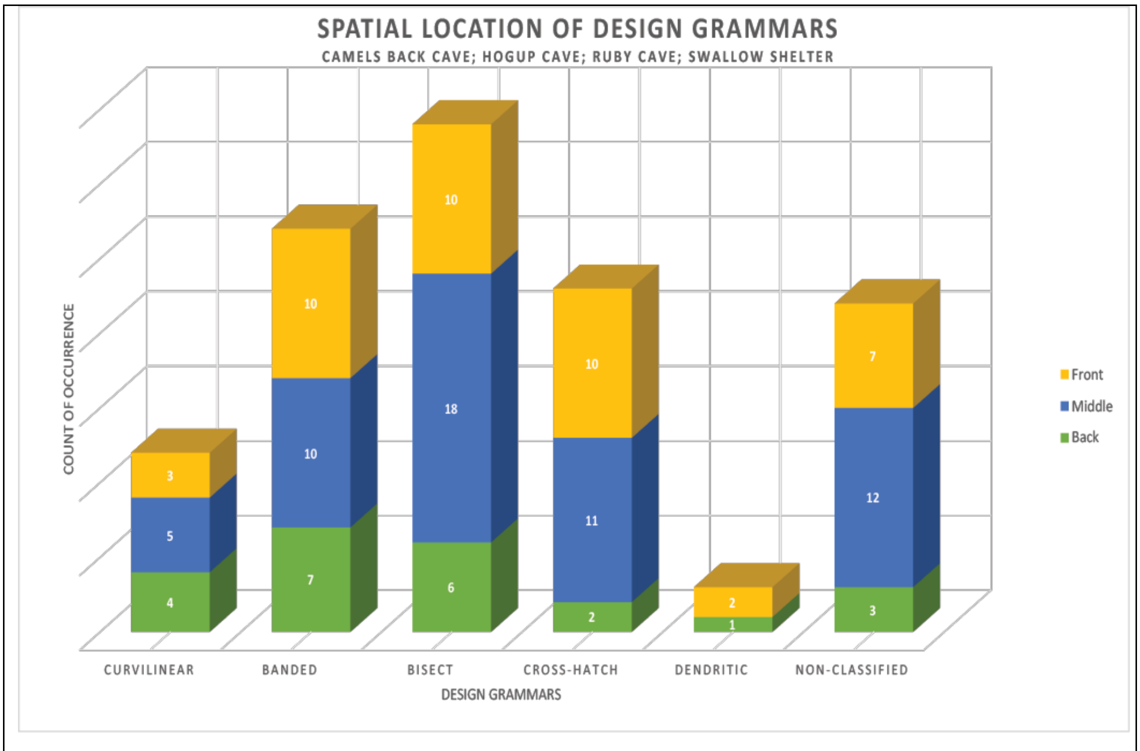


Figure 8.4: Design grammars based on the location they were found inside the cave or rock shelter. Front: The area towards the opening of the cave. Middle: The area between the front and contact with the wall of the site. Back: Any unit that comes into contact with the wall.

Before this research began the placement of incised stones within many of the sites was not known, and until this research was performed incised stones could have had any contextual relationship. Depending on where the incised stones were located in the cave could indicate a variety of meaning. For instance, if incised stones were placed only along the back wall, outside of routine traffic flows, then analysis may be made that the incised stones were set apart, for example all in caching or structure deposition (such as in Chapter 7). However, the incised stones do not show a large number of occurrences along the back wall. They are more often placed along the front and middle of the site (Figure 8.4), which is contiguous with the results of the incised stones assoction (Chapter 7).

Design grammars mostly occur in the front and middle of the sites, as these are the places where the aforementioned (Chapter 7) activities took place. The back of the cave has a notable drop off of incised stones. Cross-Hatch, Dendritic, and Non-Classified have the least occurrence in the back of the sites. The Non-Classified incised stones are included and show there placement to occur mostly in the front or middle of the site. These stones are too minimally incised to have a design grammar assigned to them.

	Camels Back Cave	Gatecliff	Hogup Cave	Ruby Cave	Swallow Shelter
Sum of Incised Stone	7	411	26	54	64
Sum of Cross-Hatch	0	42	2	5	12
Sum of Dendritic	0	7	0	3	1
Sum of Unknown	1	0	2	5	14
Sum of Non-Classified	3	55	8	8	8
Sum of Circle	0	9	0	0	0
Sum of Anthropomorphic	0	1	0	0	0
Sum of Curvilinear	0	38	2	8	1
Sum of Bisect	1	116	6	10	21
Sum of Banded	2	128	5	15	4

Table 8.2: Design grammar distribution across the sites, with total number of incised stones at the top.

Do all of the design grammars appear at all of the sites?

Not all of the sites have all of the design grammars (see Table 8.2). The only site to have all of the design grammars is Gatecliff Shelter because the Circle and Anthropomorphic are found only at this site in the sample. If you do not include Circle and Anthropomorphic, Ruby Cave and Swallow Shelter have all of the other design grammars. The Dendritic design grammar is not found at Hogup Cave. At Camels Back Cave the incised stone have either Bisect or Banded grammar. Due to their ambiguity the above statement does not include random, and non-classified incised stones. Both of these design grammars may be indicative of incomplete design elements.

Contextual archaeology: Are design grammars associated with specific activities?

The design grammar and the associated artefacts in each unit were tallied from the sites and then entered into an Excel spreadsheet. Then each artefact was assigned an activity based on its purpose (see Chapter 7 and Appendix E). For instance a component material is cordage, and feathers and hunting equipment is projectile points or promontory pegs.

There are often many artefacts that are associated with incised stones and for this reason each activity in Figure 8.5 adds to 100%. The design grammars that have the highest percentage in specific activities are discussed as to their contextual logical connection. The associated consist of leisure, food, cooking, knapping, adornment, processing equipment, manufacturing equipment, multi-use, component material and hunting equipment.

Upon looking at the graph it may be first assumed Bisect are related to food material culture, but this is a skewed result. The food category is problematic. Many foods could also be parts of other categories. For example, Juniper berries (Chapter 6) are a food stuff, but they were also used to make beads.

All of the design grammars are associated with hunting equipment. Most of the hunting equipment incorporates projectile points (n=162). Many of the projectile points are broken as is seen in Ruby Cave. This probably reflects projectile points that have been removed from the carcass of an animal after being hunted and are in a secondary context (Chapter 7). For this reason the hunting equipment category is considered background to the site and is not used as analysis.

Bisect

Out of these associated items component materials are most associated at (44.62%). The associated component materials consist of blank slate, cordage, drilled stone, feathers, modified bone, ochre, rawhide, and reeds. Component materials are used during the fabricating of objects. For example the cordage at Hogup Cave is shown to have been used to make nets (Aikens 1999:125). The design of Bisect (Figure 8.6) separates the space of the incised stone into two halves with typically different designs on either side. Artefacts such as cordage, and reeds were most likely cut as they were needed to fit the purpose of a particular project. The Bisect design may have a connection and consistency with the operation of cutting.

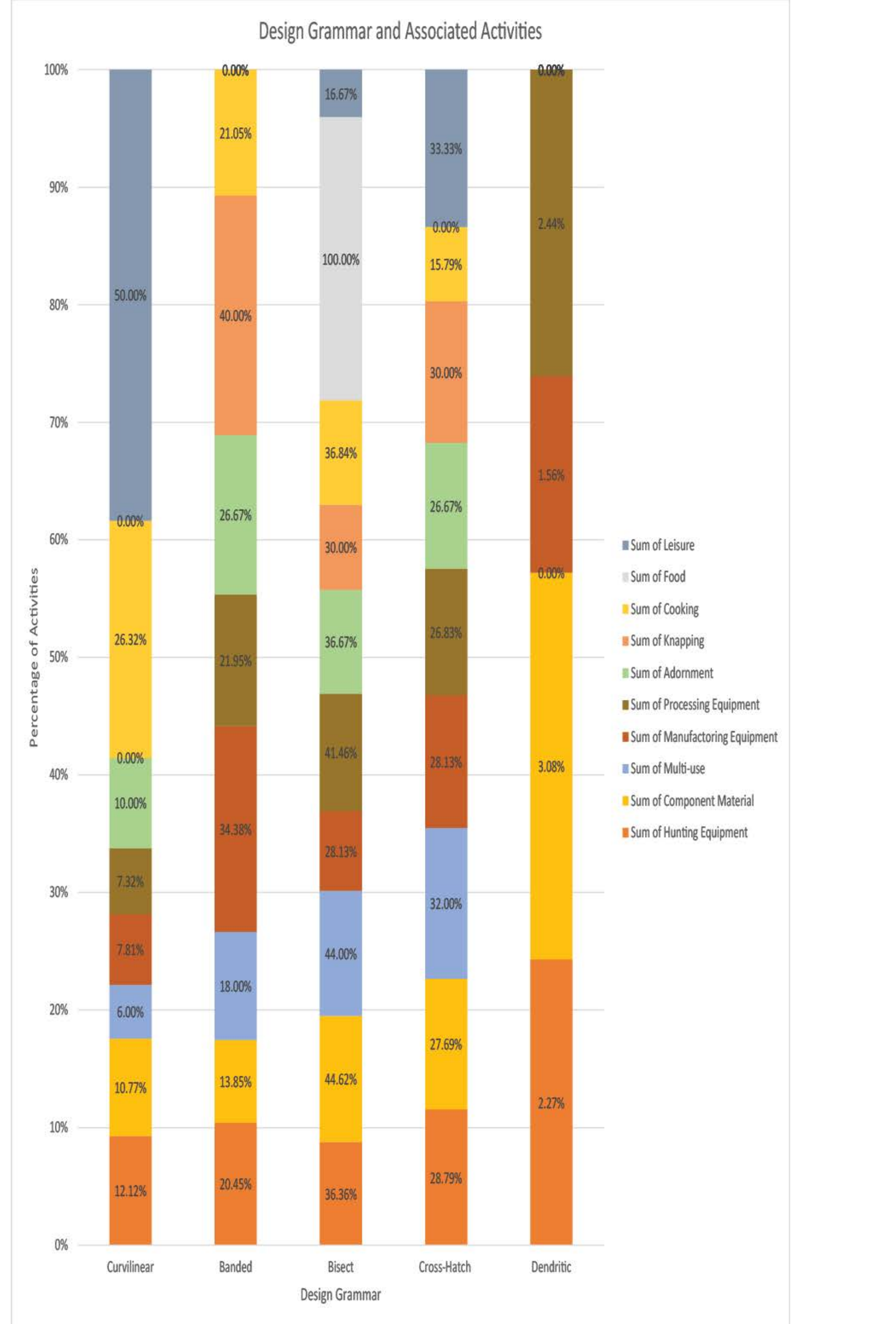


Figure 8.5: Design Grammar with associated activities within 1.5 meters.

Design Grammar	Projectile Point	Modified Bone	Biface	Smoothed Stone	Scraper
Bisect	41	4	10	3	7
Banded	23	2	9	2	3
Curvilinear	13	0	1	0	1
Cross-Hatch	35	5	8	3	4
Dendritic	3	1	0	0	1
Non-Classified	47	1	9	3	5
Total	**162**	**13**	**37**	**11**	**21**

Design Grammar	Blade	Awl	Bead	Core	Fire Drill	Cordage	Arrow Shaft	Flaker	Preform
Bisect	2	7	11	1	1	15	4	3	2
Banded	4	7	8	4	2	3	1	0	0
Curvilinear	0	1	3	0	0	3	2	0	0
Cross-Hatch	0	10	8	1	1	6	1	2	2
Dendritic	0	0	0	0	0	0	0	1	0
Non-Classified	1	4	9	2	2	8	10	3	0
Total	**7**	**29**	**39**	**8**	**6**	**35**	**18**	**9**	**4**

Design Grammar	Basketry Fragment	Promontory Peg	Bipoint	Bunt Point	Drilled Stone	Mano
Bisect	7	1	1	1	1	2
Banded	0	3	0	0	0	2
Curvilinear	2	1	0	0	0	0
Cross-Hatch	1	1	0	1	0	0
Dendritic	0	0	0	0	0	0
Non-Classified	3	1	0	0	0	3
Total	**13**	**7**	**1**	**2**	**1**	**7**

Design Grammar	Pottery	Graver	Metate	Raw Hide	Drill	Cut Stick	Crystal	Blank Slate	Food
Bisect	5	4	4	4	1	6	3	1	2
Banded	0	0	2	2	1	2	2	0	0
Curvilinear	0	0	1	2	3	5	0	0	0
Cross-Hatch	7	1	2	4	4	0	2	0	0
Dendritic	0	0	0	0	0	0	1	1	0
Non-Classified	3	0	4	3	1	1	1	1	0
Total	**15**	**5**	**13**	**15**	**10**	**14**	**9**	**3**	**2**

Design Grammar	Feather	Shaft Smoother	Painted Bone	Digging Stick	Gaming Piece	Reed	ochre
Bisect	2	1	2	1	1	1	1
Banded	1	0	0	0	0	0	0
Curvilinear	1	1	2	1	2	1	0
Cross-Hatch	1	1	0	1	2	2	0
Dendritic	0	0	0	0	0	0	0
Non-Classified	1	3	2	1	1	1	1
Total	**6**	**6**	**6**	**4**	**6**	**5**	**2**

Design Grammar	Incised Bone	Bow String	Modified Flake	Phalus	Pointed Stick	Stone Ball
Bisect	0	0	0	1	0	0
Banded	2	1	10	0	0	0
Curvilinear	0	0	0	1	0	0
Cross-Hatch	0	0	0	0	2	1
Dendritic	0	0	0	0	0	0
Non-Classified	0	0	11	1	0	0
Total	**2**	**1**	**21**	**3**	**2**	**1**

Design Grammar	Anthropormorph Stick	Chopper	Bark Bundle	Net Fragment	Counter
Bisect	0	0	0	0	1
Banded	0	0	0	0	0
Curvilinear	0	0	0	0	1
Cross-Hatch	1	0	0	0	0
Dendritic	0	0	0	0	0
Non-Classified	0	2	2	1	0
Total	**1**	**2**	**2**	**1**	

Table 8.3: The counts of individual artefacts found within 1.5 meters of each design grammar. This data is used in Figure 8.5. (See Appendix E for artefact to activity).

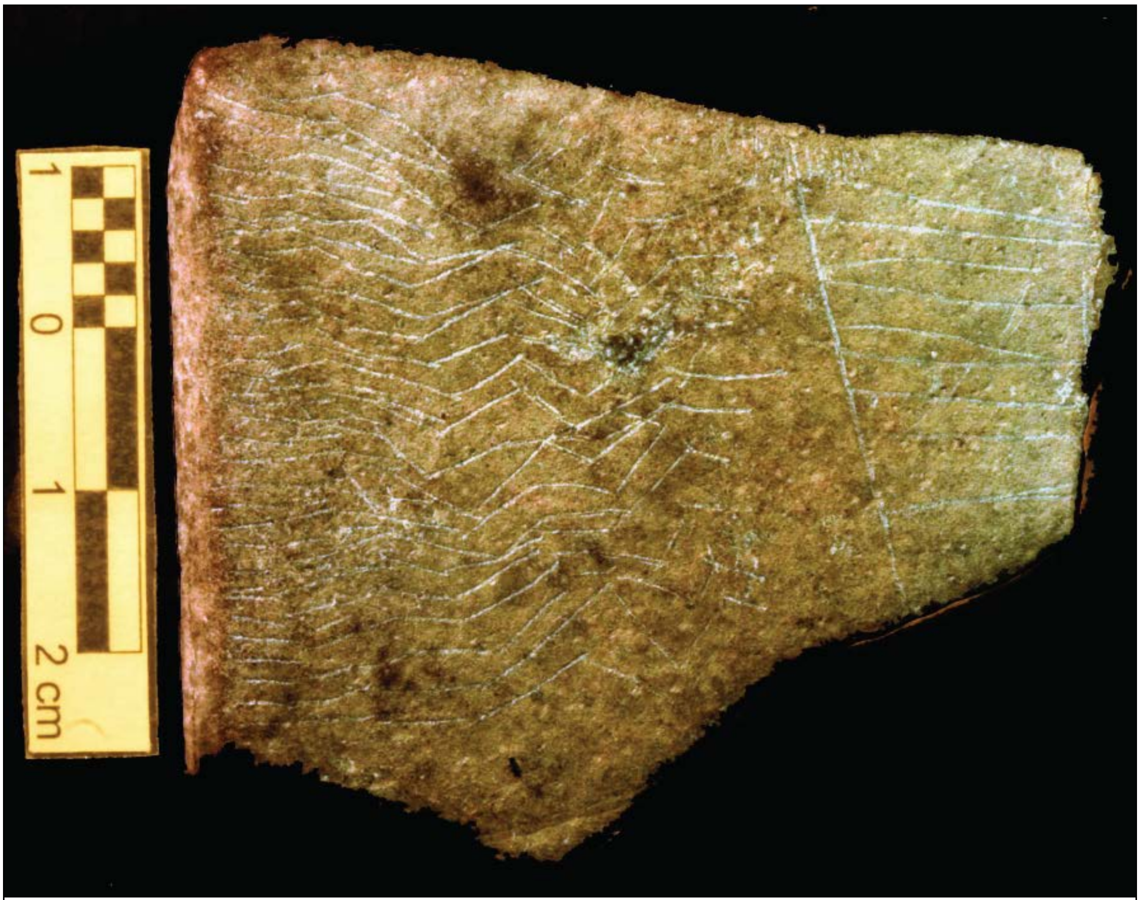


Figure 8.6: Bisect incised stone from Ruby Cave, Nevada. (Field Sample 255-222, Courtesy of the University of California, Davis, Photo by Author).

cordage would become two, so would the surface of the stone be bisected in two. The two pieces of cordage could have been used in different projects. The different designs on either side of a Bisect line may have possibly been a depiction of this duality of the component materials or for that matter all of the activities strongly associated with Bisect. The becoming something very different from the same whole may have been a theme within the culture and inspired the Bisect design.

Curvilinear

Compared to the other design grammars, curvilinear design has a higher percentage of associations to leisure activities (50%). The leisure activities include the artefacts of gaming dice (n=2) and counters (n=2). The counters and dice are suggested to be used in some sort of game (Aikens 1999:88, 171). The counters, are bone shaped artefacts that are rectangular, circular, or bipointed (Aikens 1999:88). The dice is either made of reed or wood, and is incised with transverse lines and dots (Aikens 1999:170, 171). These types of gaming objects may have been used in an ethnographically described game called the hand game (Kelly and Fowler 1986:381). The hand game was played by two teams seated across from one another. One team would hide two bone objects, one is marked and the other is not. The other team had to guess where the bone pieces are hid in order to win a counter that is placed on the ground between the two teams (Kelly and Fowler 1986:381). These gaming pieces associated with Curvilinear may have had used in a very similar game. The interpretation of this design suggest that it is possibly a symbol related to a game.

No Curvilinear (Figure 8.7) was found in association with artefacts that suggest knapping activities. Banded, Bisect, and Cross-Hatch are all found with the activities of knapping.

Figure 8.7: Curvilinear incised stone from Ruby Cave, Nevada. (Field Sample 255-222, Courtesy of the University of California, Davis, Photo by Author).

Banded

The Banded design (Figure 8.8) has the highest contextual relationship with the activity of knapping (40%). The artefacts for the activity are cores and antler flakers. The flakers are usually deer antler with a thick blunt end (Aikens 1970:85). A flaker is used to remove flakes from a lithic source to make a sharp edge or a desired shape. Removing flakes from a lithic material leaves a flake scar that has a complex micro-topography. This micro-topography includes concentric ripples that connect between the flake scars. The Banded design has parallel lines connecting perpendicular lines between them in a similar fashion to the micro-topography surface of a projectile point or biface. The logical connection between the two suggest the banding is a symbol of the process of knapping.

Figure 8.8: Banded incised stone from Hogup Cave, Utah (42Bo36 Field Sample number 452.228, Courtesy of Natural History Museum of Utah. Photos by author.).

Cross-Hatch

The Cross-Hatch design does not have a higher percentage of activities compared to the other design grammars. However, I found that Cross-Hatch does have a higher sum of pottery fragments (n=7) than any other incised stone. The connection between the Cross-Hatch design and the pottery from the data in this work is unknown. Cross-Hatch has the second highest association to leisure activities.

Dendritic

This design grammar (n=3) has a very low occurrence to any activity. In only one instance (Ruby Cave, level 1) is it found associated other artefacts. One of the Dendritic designs are found in the structured deposition of (Swallow Shelter, level 9; Chapter 7). Finally, the third stone, (Ruby Cave Level 2) is found in a unit with no other associated artefacts within 1.5 meters. It is possible that this design had a special use. Given the organic designs and the general activities of harvesting (Chapter 6) that was happing at the time of site occupation, the logical connection may suggest the symbolism is related to harvesting and gathering.

Conclusion

The placement of the design grammars are mostly in the middle and front of the sites. This location is not surprising given that incised stone are contextual with different activities within the sites. Performing these activities probably required different light levels and the association with incised stones may suggest that the incised stones were made at the same time the activity was occurring.

The chronology of the incised stones shows that Bisect is the earliest followed by Banded, Curvilinear, and Cross-Hatch. The Dendritic design occurs much later in the chronology. Circle and Anthropomorphic are only represented at Gatecliff Shelter. Not all of the design grammars appear at all of the sites. Gatecliff Shelter has all of the design grammars and Camels Back Cave only has Bisect and Banded. Ruby Cave, Swallow Shelter, and Hogup Cave do not have circle and Anthropomorphic, with Hogup Cave also not having the Dendritic.

The contextual archaeology approach looked at the design grammar and compared it to the activities. Then a contextual logical connection between design and activity was suggested to show what the design may have symbolised. The designs of Bisect, Curvilinear, Banded, and Dendritic have suggestive logical connections to their context. Cross-Hatch is possibly connected to pottery, but it is unclear what the symbol of Cross-Hatch may represent.

Chapter 9: Conclusion

A contextual analysis takes into account the associated artefacts, provenience, features, associated faunal remains, ecofacts, geological background, and every dimension of an objects space (Hodder 1986:143), or environmental setting (Butzer 1980:417). Context investigates attributes of artefacts to uncover its life history. This work has looked at the context of incised stones by focusing on the environment of the sites, the close associations incised stones had through the site's chronology, and an analysis of the design grammar on the incised stones in comparison to the associated artefacts. The sites that were used as samples were: Camels Back Cave, Gatecliff Shelter, Hogup Cave, Ruby Cave, and Swallow Shelter. The most salient points from this research suggests six different interpretations of incised stones (Figure 9.1). These interpretations are dependent on how they are found in the archaeological record. They may also be dependent on how they are contextualized into the localized climate conditions during their deposition. Before a discussion of these interpretations can be considered, the results of the contextual data in Chapter 6 and 7 needs to be considered. The incised stones are a polysemous artefact (see Shanks and Hodder 1995:9-10) that has a contextual interaction with their associated artefacts. These interpretations are based on the position in which incised stones were found.

Figure 9.1 is a suggestion as to how hunter-gatherers made decisions on where to make their residential habitations based on the data from this work. Following the flow of this processes is meant to clarify the development leading up to the creation of incised stones with possible interpretations. The following sections explain in more detail what the diagram only outlines.

Demographic Context

The hunter-gatherers of the Great Basin made decisions on habitation sites on a yearly seasonal basis (Bettinger 1989, 1991, Grayson 2011, Thomas 2014). These decisions were based on a dynamic relationship with the environment (Bettinger 1989). If the site had a rich source of edible flora, large and small fauna, and water then the site was probably a good candidate as a principle habitation site. A principle habitation site is a place from which an extended period of stay is possible due to the abundance of nearby food and water (Bury et al. 2004:7-54; Glassow 1996:166). From the archaeological evidence presented a number of activities take place at these principle habitation sites.

While there is a general environmental climate record for the Great Basin, from my sample it appears that each site had unique microclimates. These localized changing climate conditions probably were an integral factor hunter-gatherers used to decide how best to spend their seasonal rounds. The data suggests hunter-gatherers most likely performed reconnaissance in the early spring to survey the landscape and make an informed plan of how to use their environment to the fullest each year. In my sample, the sites that have concurrent pollen spikes also have a spiking increase in artefacts indicating a diversity of activities (Chapter 6). I interpret this relationship to be evidence that the site was used as a residential habitation during these times.

If the cave or rock shelters did not offer the best choice in resources then the site was probably not used as a principle habitation site. This is evidenced by a decline or trough in the pollen record which correlates with fewer artefacts as shown in Chapter 6. Even so, if the site still offered some nearby sources, such as water and edible floras, then the site may have been used as a logistical hunting site. If the site did not offer any prospects for hunting or had an unreliable source of water, then this suggests the site was simply left unused. This means that the sites in the sample were most likely used for different purposes based upon localized environmental contexts; such as logistical hunting sites, residential habitations, or as vacant sites depending on the climatic conditions throughout their chronologies.

Logistical hunting sites usually do not have a large breath of artefacts types which is indicative of fewer activities being carried out at the sites. The data in Chapter 6 concerning the first appearance of incised stones, suggests that the sites had been used as logistical hunting locations or short term camps before the introduction of incised stones (however, data is imprecise in the case of Ruby Cave as discussed previously). Importantly, there appears to have been a switch to a form of residential habitation as the first appearance of incised stones occurs. Logistical hunting camps have very few or no incised stones. I suggest that this is strong evidence for logistical hunters not typically making incised stones.

Concurrent with a switch from logistical hunting/short term camps the climate conditions changed at each of the sites. At Camels Back Cave the Altithermal was just beginning when an early occupation is shown to have contained the first incised stone deposit. Even at this time the local environment offered resources, such as pepperweed seeds and hunting. Throughout the Altithermal no site in this sample other than Camels Back Cave, had any incised stones in their inventory. However, the environmental history of Hogup Cave (shown in Chapter 6) suggests the Altithermal ended sooner there than the other sites. Based on the analysis of pollen and artefact records in Chapter 6, the Altithermal was not a uniform environmental event, but ended sooner in some places than others. Even so, the change into cooler temperatures with more rain probably caused the sites to have what I term a new ‘pull’. The attraction at Hogup Cave was spurred on by the rising water level of the Great Salt Lake that had the effect of destroying the natural marshes along the shore lines (Harper and Alder 1970:228). Hunter-gatherers who were probably looking for a principle habitation site with natural protection from the elements turned to Hogup Cave (Madsen and Berry 1975:404). Hogup Cave offered an abundance of pickleweed, bighorn sheep, deer, bison, pronghorn, and a nearby source of water (Durrant 1970:242). Each site’s story is different but the thread throughout is when the microenvironment is favourable for habitation there is more artefacts, when not there is marked decrease in artefacts.

It is important at this point to outline a sketch of what the archaeology of these sites suggests regarding the behaviour of the Great Basin people who visited them. The rich material culture at the five sites attest to a plethora of activities (see Chapter 7). Principle residential sites contained not just men or just women, but entire family groups including children and probably the elderly. At Hogup Cave a pair of child moccasins were recovered suggesting children were present. Once a family group settled into a residential site they would exploit the natural surroundings, and undertake the activities that supported the core of their hunting and gathering existence. This included hunting, harvesting, trapping, food processing, manufacturing, and leisure activities such as gaming.

Hunting could include both local and logistical hunting. Trapping of skunks at Ruby Cave or yellow tailed marmots as at Swallow Shelter are examples of this activity. Harvesting would take place of the nearby food sources. The gathering of nuts, berries, seeds, roots, and other flora would be the main objective. Hunted and harvested food would be taken back to the residential site (as is evidence at Hogup Cave and Swallow Shelter) and processed on site. Food processing would be accomplished on a metate using a mano to turn the materials into a food mush, such as noted by the processing of pine nuts (Chapter 6). With the intake of the trapped animals, hunted animals, and harvesting there was plenty of raw materials available from which to manufacture new materials. Thus, manufacturing was a big component of life at a residential habitation site. Either it be creating new arrow shafts from local plants, making baskets (as is evidenced by the basket rods found in Hogup Cave) or the scraping of animal hides (as in Gatecliff Shelter). Finally, gaming was a part of life in these residential sites as there are gaming pieces such as counters and dice present.

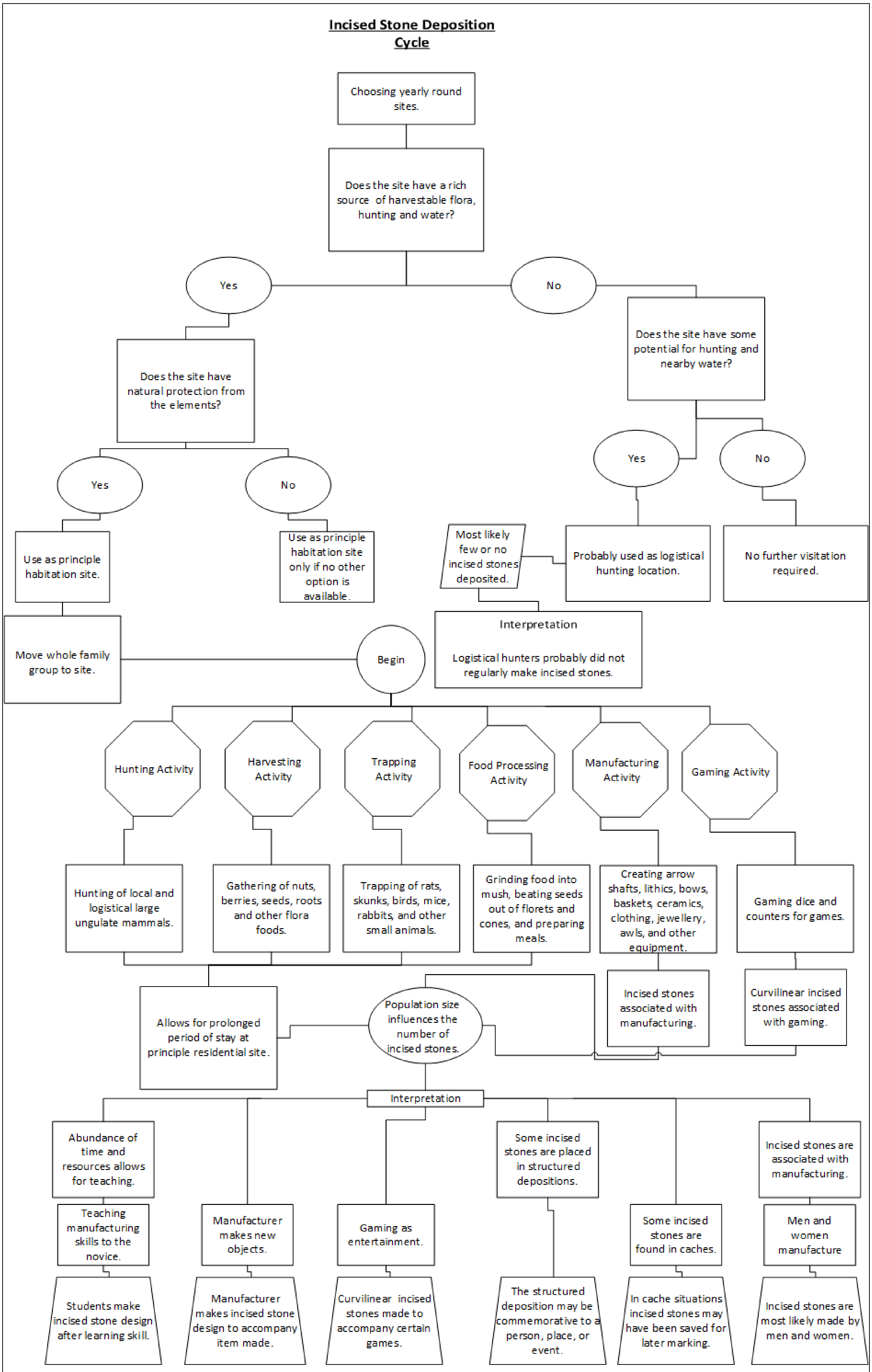


Figure:9.1: Diagram covers incised stone interpretations and flow of the results.

As discussed above, there are distinct periods of greater incised stone deposition relative to other time periods. How can this be explained? The overall population may increase and decrease over time representing fewer people visiting and utilizing the sites. During the Great Basin's environmental history there has been evidence to suggest that the population declined during periods of drought (Grayson 2012, Thomas 2014). Another possibility is that localized fluctuations, rather than large scale climatic trends, in the climate caused unfavourable conditions at the sites. The archaeology of the late Holocene is characterized as the time period when population seemed to grow fast and many previously unoccupied caves and rock shelters were used for the first time (Cressman 1986:120, Elston 1986:145, 146, Aikens and Madsen 1986:157, Marwitt 1986:161). As discussed in Chapter 6 the pollen records for each site indicates localized climate changes which are independent from the overall environmental conditions of the Great Basin. These fluctuations manifest itself not only in pollen records, but in artefact quantities as hunter-gatherers decide how to make their seasonal rounds. For instance at Swallow Shelter the *Artemisia* and *Cheno-AMS pollen* have a peak at 500 BC to 1 BC during the time of the Neo-Glacial drought. This suggest that Swallow Shelter may have been an attractive harvesting point on the landscape during the Neo-Glacial Drought. The pull to the site during this microclimate made the shelter a unique habitation for this time frame as most other sites were not visited like Swallow Shelter. The Neo-Glacial Drought occurs through three stratums (Stratum 6, 7, and 8). The small mammals are on the increase during this period and forms part of a 1,500 year peak that lasts past the Neo-Glacial Drought.

At each of these sites there are most likely population increases and decreases. The number of incised stones is probably an effect of the number of people present at a site (although instances of special deposition may confuse these statistics – see structured deposition discussion below). Therefore if there are more people at a site then one could expect to find more incised stones when compared to a site with fewer people.

Incised stones made by novices

Residential habitation means long term stays at one site without having to pack up and move around the landscape constantly. This means in addition to simple demographic and population flux, that there would have been time to teach others how to make the material goods that the hunter-gatherers used in their day to day life. We know this is the case as there have been important studies of learning behaviours and the transmission of knowledge especially pertaining to learning networks and perishable technologies in the American West (Shennan 2008, 2009; Stark et al. 2008; Steele et al. 2011, Eerkins et al 2014:1138). From the analysis in Chapter 7, the association that incised stones have at these sites is with manufacturing materials. Examples of materials could be manufacturing tools (such as shaft straighteners, awls, abraders, and scrapers), component materials (such as cordage, basket rods, animal hides, shredded bark or grass bundles), or with completed artefacts.

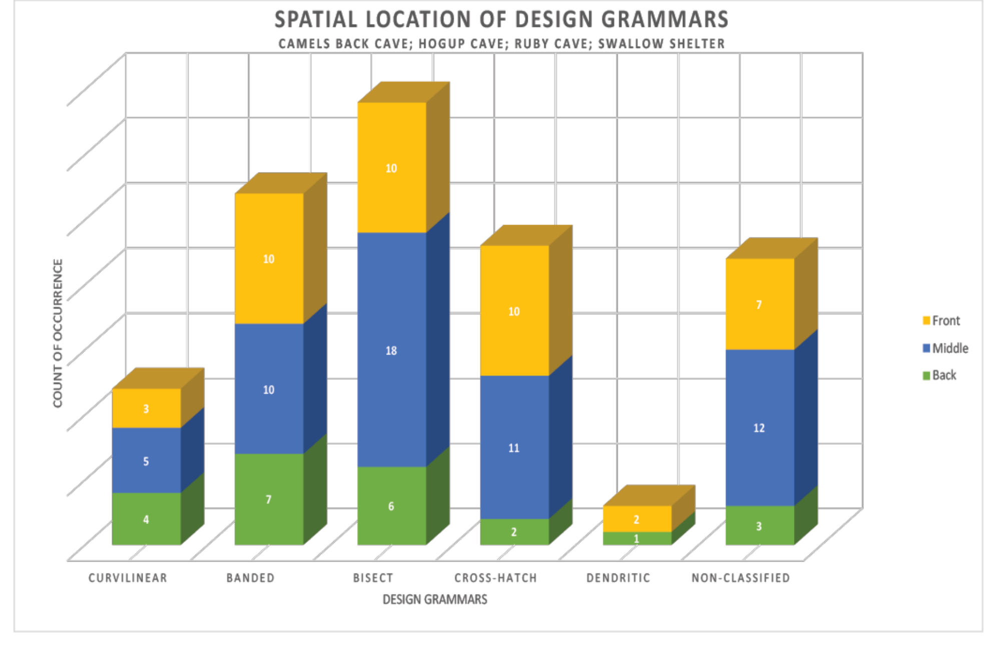


Figure 9.2: The location of incised stones inside the cave or rock shelter. Front: The area towards the opening of the cave. Middle: The area between the front and contact with the wall of the site. Back: Any unit that comes into contact with the wall.

These manufacturing events take place near the front or middle of the site (see Appendix D) which is probably reflective on how much light was available in these zones. The placement of most of the incised stones falls within these zones (Figure 9.2). The practice of manufacturing is crucial in this context. The making of such a wide range of materials, much of it perishable, entailed not only a suite of technical skills, but must have been learned from those already having those skills. Clearly some form of learning practice must have taken place in these situations where large groups aggregated for extended periods of time. Learning how to make a technology "demands a detailed understanding of the principles facilitating their creation, which in turn necessitates some form of educational system" (VanPool 2008:195). Training can take days, weeks, years, or lifetimes to complete (VanPool 2008:195). Jolie (2014) has shown how learning practices can be analysed from perishable assemblages in the American West such as those found in cave sites. Learning practices must have been an integral aspect of the inter-social relations occurring within the contexts of manufacturing and incised stone use. Within this context, the findings of the analyses are suggestive that at least some of the incised stones may have been made by the novices that were present on site.

While it is impossible to say whether the stones were directly part of a learning activity or part of an initiation following that activity (although either or both is possible), they are in some way connected to learning processes.

Incised stones and leisure

Another part of this story concerns the design grammars. While the designs are known their underlying meaning is not known. As shown in Chapter 8, seven design classifications are recurrent in the Great Basin (Klimowicz 1988). Because the incised stones in this sample fall within the same classifications as Klimowicz's work it seems clear that these classifications are wide spread in the Great Basin and as such the classification system is valid for use in analysis.

The design grammars are contextualised with many different types of artefacts, but some designs are more associated with some activities than others (see Figure 8.5 and Table 8.3). This suggests that certain designs may be contextualized with certain activities. One such example is the curvilinear design. This design has the highest association with leisure activities than any of the other design grammars. Even though this sample is small, it may be a significant example of the polysemous nature of these artefacts.

There are several examples of incised stones being used as gaming boards found outside of the Great Basin. The Zuni people who live in New Mexico and Arizona have a game called *Kolowis Awithlaknannai* or Fighting Serpents. The game board (Figure 9.3) is traditionally made on stone slabs that are often also used as roofing tiles (Murray, 1978, Parlett 1999, and Bell 1979).

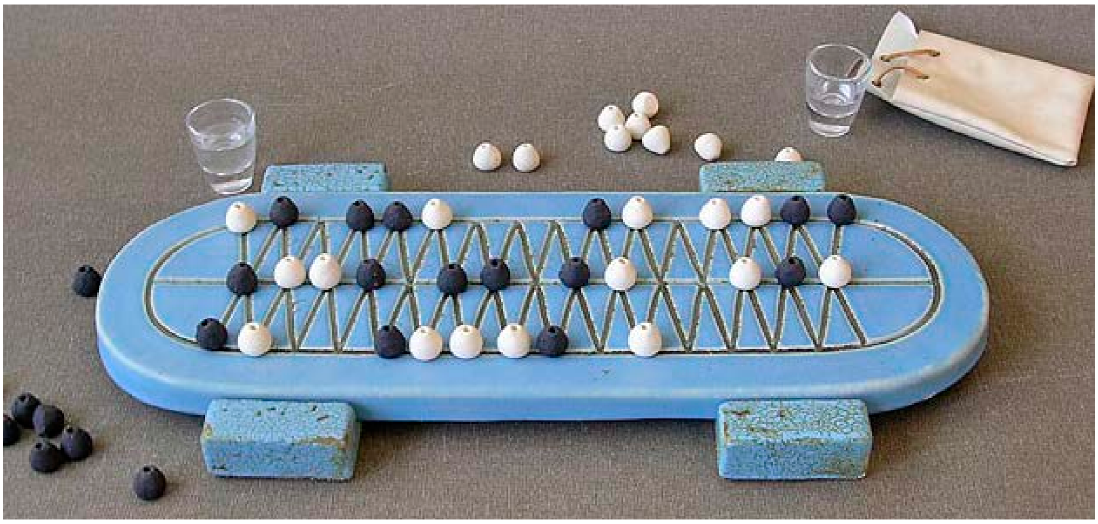


Figure: 9.3 A modern *Kolowis Awithlaknannai* board (Tetraktis 2015).

During excavations at a Neolithic site in Ain Ghazal, Jordan a stone slab was uncovered with parallel divots on the surface (Rollefson 1992). The stone was interpreted as a game board although the nature of the game was not known (Rollefson 1992:1). The Ain Ghazal gaming

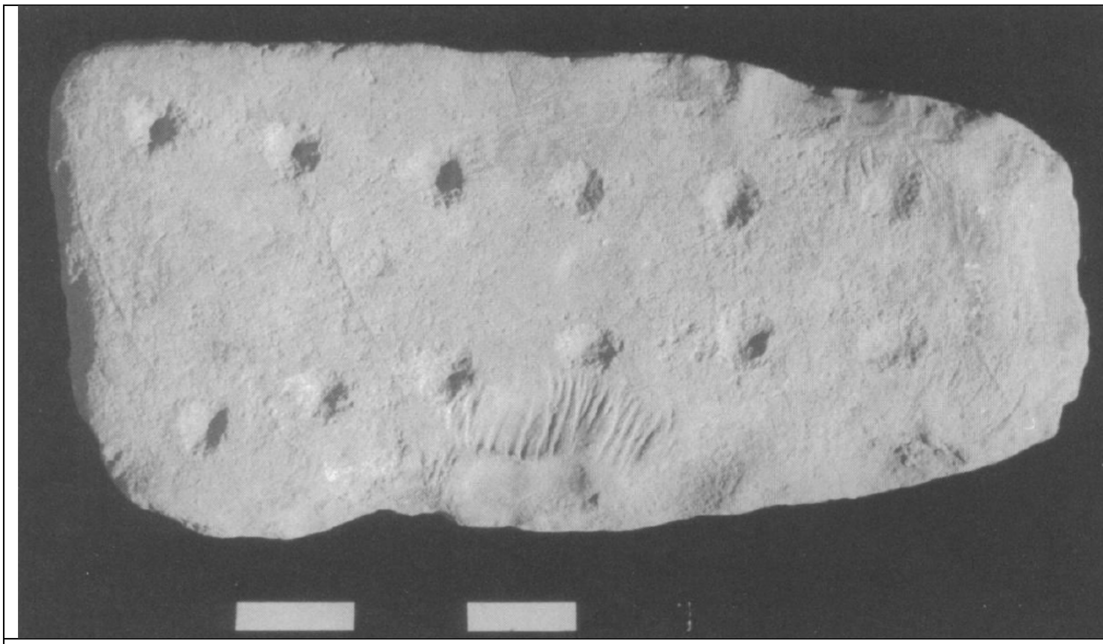


Figure: 9.4. Gaming stone recovered from Ain Ghazal, Jordan Neolithic site (Rollefson 1992:1).

stone resembles other games such as Mancala a game played in Arab regions or Wari a game played in many parts of Africa. Both of these games can be played with seed pieces and take an extensive time to play (Rollefson 1992:2).

One game played in the Great Basin is called the Hand Game, involved two teams trying to guess where a gaming piece was hidden in the hands of the opposing team (Kelly and Fowler 1986:381, see Chapter 8). Two such gaming pieces are from Hogup Cave (Figure 9.5),

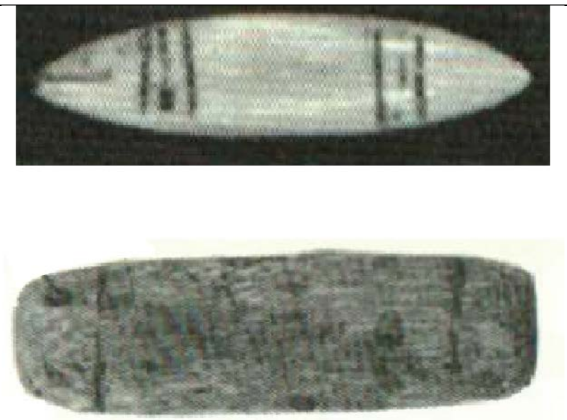


Figure 9.5: Gaming pieces from Hogup Cave. Actual size of artefact is about 5 cm (Aikens 1970:89, 169).

used in some form of gaming such as the Hand Game. Although not incorporating a playing board this game shows the people of the Great Basin were avid game players. Using stone slabs as game boards is a strong possibility as shown in the above examples, a game that was not recorded in emergency ethnographic work and played by people in the more distant past. The association with the curvilinear design and leisure activities may have meant that incising the stone was a part of a game.

Caching and Structured Deposition

First, it is useful to differentiate between a deposit that may have been meant for caching versus what is termed a structured deposition. A deposit which may be termed 'structured' in this work is a deposit that is odd or atypical, as viewed by the excavator during excavation, compared to other deposits in the Great Basin. The use of the term structured deposition has "a wide variety of equivalent terms…ceremonial, deliberate, formal, formalized, intentional, non-utilitarian, odd, peculiar, placed, ritual, selected, special, symbolic, token and unusual deposits" (Garrow 2012). A cache, on the other hand, is defined as a deposit that is meant for later retrieval (Thomas 1985). Caches can be identified in their placement: usually out of the foot traffic and along the walls of the site for safe retrieval at a later visit. The artefacts of a Great Basin cache have attributes of being nearly complete or newly finished (see Chapter 7). Often a cache has more than one type of artefact (awls, flakes, pendants). Structured deposition is different in that the placement could be anywhere and not restricted to the walls of a site. The artefacts could also be of a different quality or quantity than those found in caches. For instance, the Swallow Shelter examples are not near the wall and are clearly set apart from any other incised stones found. Equally, the assemblage of incised stones at Gatecliff which appears to have been 'structured' entailed 96 stones near the wall but confined to a 2 meter area (again, see Chapter 7). Therefore the structured deposition at Gatecliff and Swallow Shelter are distinguished specifically for their peculiar placement in relation to all of the other everyday deposits. This section will cover a cache found in Hogup Cave and then include structured deposition.

Swallow Shelter and Gatecliff Shelter do not have the only instances which may be defined as structured deposition. To illustrate, I would like to discuss structured deposition events at Hogup Cave which were not covered previously but include an incised stone and non-incised stones in discrete depositions. Before the Hogup Cave excavation began, it was evident that there were backfilled pits as seen on the surface. These dug areas were assumed to be created by looters in search of artefacts (Figure 9.8, Aikens 1970:2). During excavation most of the artefacts in these dug pits were excluded from the record in order to maintain provenience control of unaffected areas (Aikens 1970:2). However some exceptional artefacts were kept even though they were in the bottom of these disturbed context. A re-examination of the artefacts from these supposed looter pits has raised questions of the intentionality of these ‘contemporary’ dug pits.

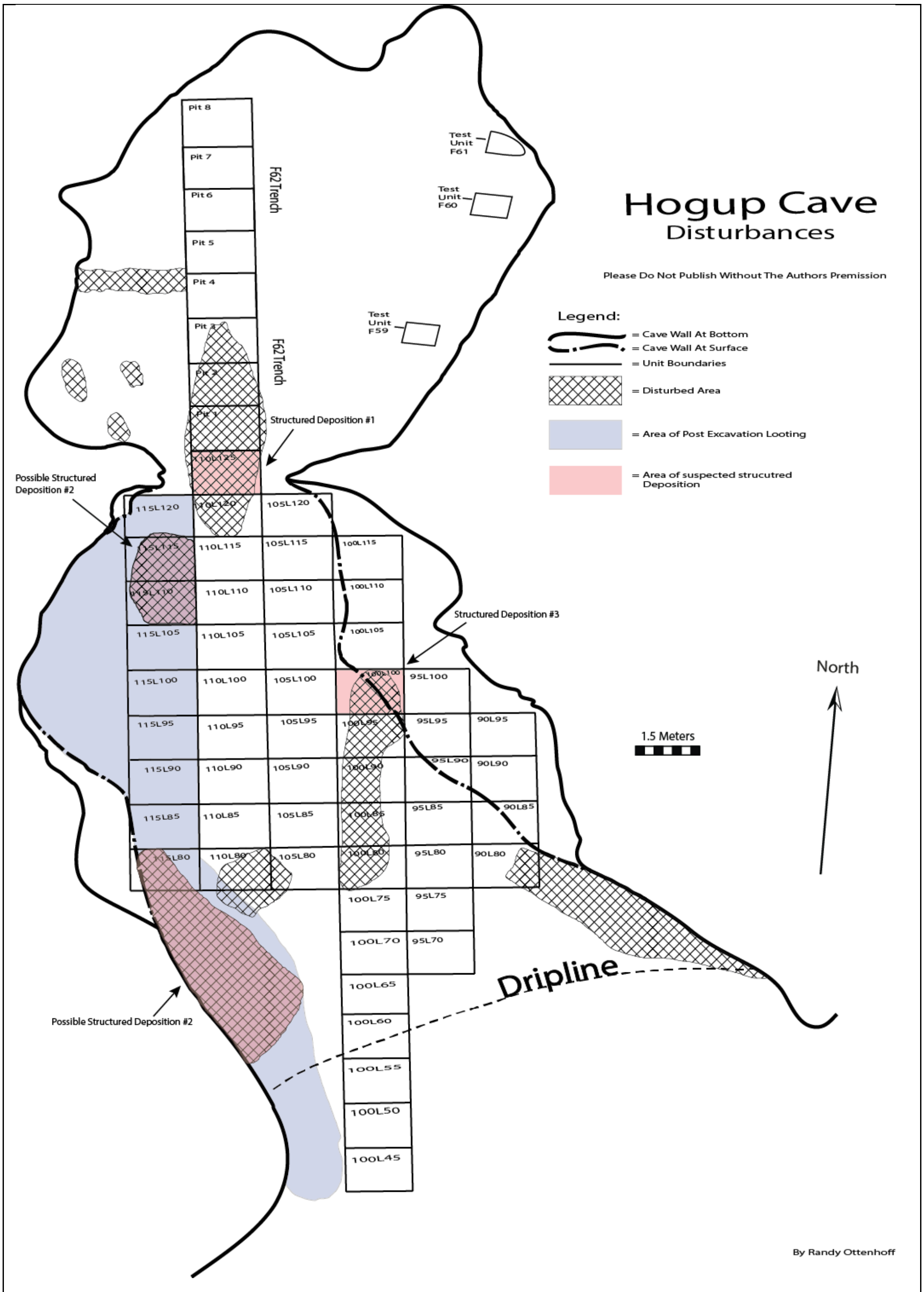


Figure 9.6: The disturbed areas before the site was excavated are show with the post excavation looting overlaid. The suggested structured deposition positions are shown (Aikens 1970:6-7, Aikens 2015).

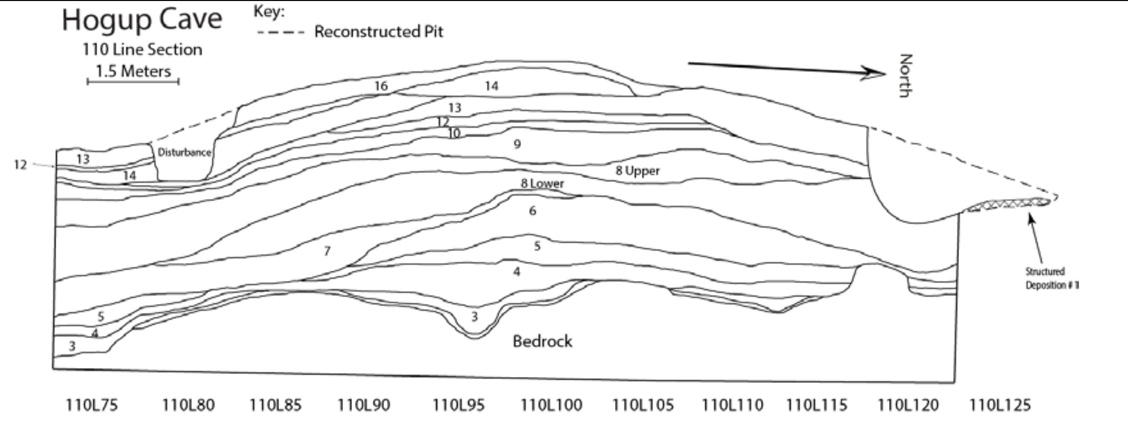


Figure 9.7: Hogup Cave section drawing displaying the position of Structured Deposition #1. (Aikens 1968 notes) (42Bo36 Courtesy of Natural History Museum of Utah)

Cached incised stones

There are three caches discussed in Chapter 7, the cache from Swallow Shelter has one incised stone, Ruby Cave has two, and Hogup Cave has four. The Hogup Cave cache was recognized as a cache based on the quality of the artefacts. Out of the four incised stones

Figure 9.8: Four incised stones from a cache in Hogup Cave. (42Bo36 Top left: FS. 488.89. Top right: FS 488.34. Bottom left: 488.101. Bottom right: FS 488.83). Courtesy of Natural History Museum of Utah. Photo by author.

(Figure 9.8) three of them are very superficially incised while the fourth has lots of incised lines present. Since caches are meant for later retrieval, the incised stones that have minimal incising may have been stored for later marking.

Structured Deposition #1

This pit (110L125) is located near the back of the cave (Figure 9.6) at the portal entrance to a chamber in the rear of Hogup Cave. When Aikens (2014) first entered the cave it was assumed this point was the back of the cave. Before excavation began a large contemporary disturbance was found that spanned nearly 7.5 meters and included 110L125. Aikens attempted to mitigate the impact of the 'disturbance' by excavating and discarding the 'fill' from the record (Aikens 1968: F9). In the process of removing the 'fill' the back chamber to the cave was discovered and the artefacts that make up Structured Deposition #1 were found at the base of the fill.

The artefacts that were found consists of a tobacco sack, twenty-two cordage fragments, six projectile points, one basket tray (Figure 9.9), five basketry fragments, three manos, two pendants, one bundle of sticks, and one gaming stick. The paper tag off the Bull Durham sack reads (UMNH Catalogue)

> Blackwell's Bull Durham Smoking Tobacco, under no… circumstance… ever be packaged any other way than in white muslim bags, like this package, put up in such… as are authorized by law. Any offer of this standard brand… any other shape…

This tobacco was manufactured from 1874 to 1957 in Durham County, North Carolina (UMNH 2012).

If the disturbance in this area was made by looters it is highly improbable they would leave such an array of artefacts at the bottom of the pit. The collection of artefacts left at the base of this pit does not suggests looting. The nature of this deposit appear to be attributable to a particular structure in which the intentionality was different from caching and different from looting as leaving the best artefacts behind would not fulfil the wants of a looter. Given the tobacco and the artefacts the situation suggests that this pit represents some sort of offering.

Figure 9.9: Basket tray found in Structured Deposition #1 (Aikens 1970:149.

As was previously noted upon excavation it was assumed this locale was the back of the cave and was not until further excavation that the backroom was discovered. Upon entry into the backroom further areas of disturbance were noted but not interpreted (Aikens 2014), and ultimately very little excavation occurred within this areas (Figure 9.6). These disturbances would have predated the closure of the portal into the chamber. Perhaps this structured deposition occurred at the same time as the closure of the portal and if so the artefacts would have been placed highly deliberately as part of this event.

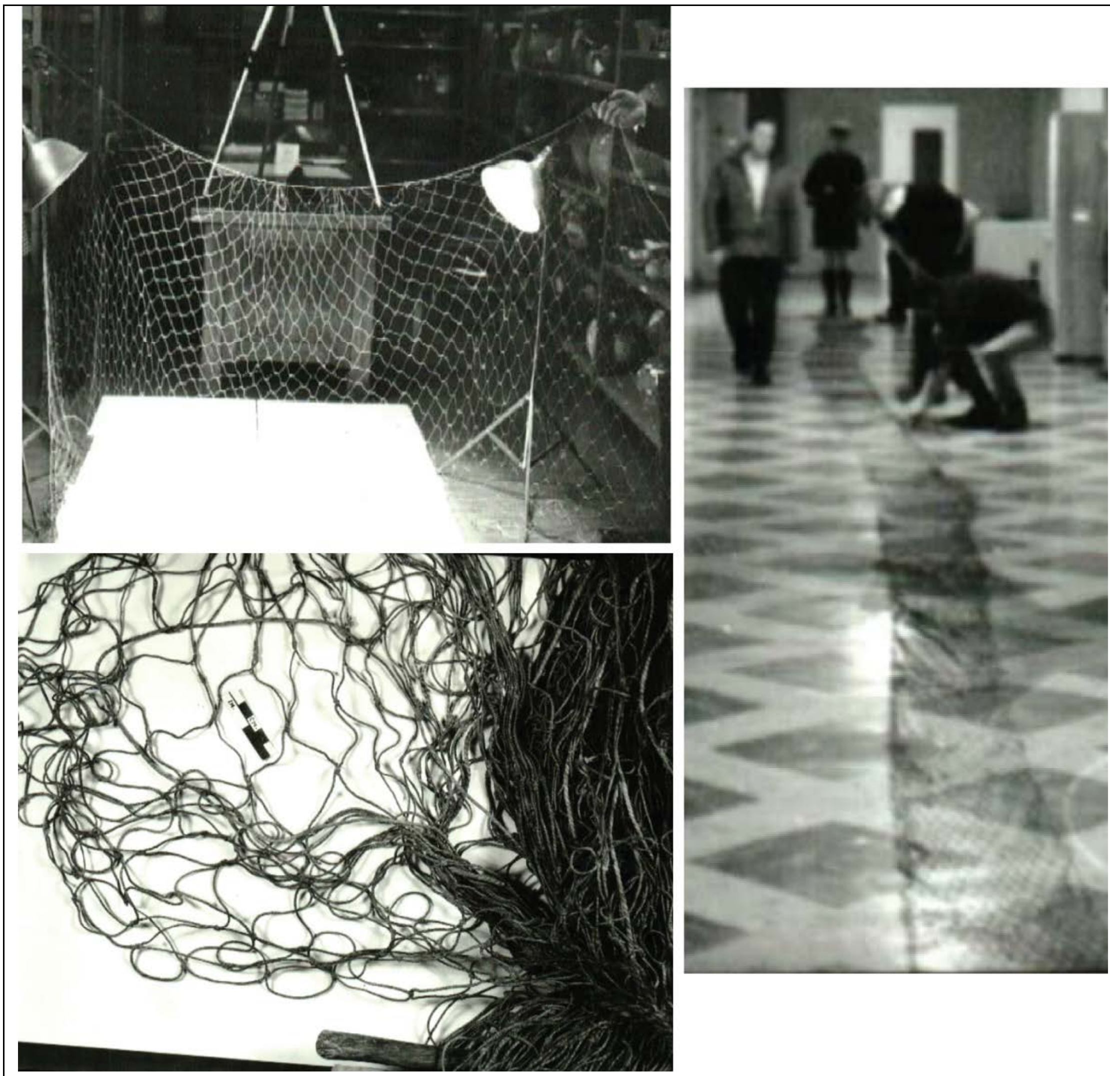


Figure 9.10: Net found in possible Structured Deposition #2. Left Top: Net extended to its width. Left Bottom: Net opening up from wood sticks. Right: Net extended down hallway (Aikens 1968) (42Bo36 Field Sample number 431.00, Courtesy of Natural History Museum of Utah).

Structured Deposition #2

During the original excavation Aikens (2014) made a decision to not excavate a row of units (115L) as a way to leave data and research in-situ for future research. After the excavation of Hogup Cave concluded a group of people wanting to collect artefacts for their own personal collections excavated along the west wall of the site (Figure 9.10, Aikens 2015). These looters found a complete atlatl and a complete net (Figure 9.10). These artefacts were in very good condition showing little to no deterioration. The net was over 41 meters in length and 1.7 meters wide, and could have been used during rabbit drives (Aikens 1970:125). The provenience of the net and atlatl may be gone forever, but given the findings from the other disturbed areas perhaps these artefacts were contemporarily made and deposited within the disturbed areas. If this is true, then this suggests that the looters found two artefacts that may have been made during the same time as the Bull Durham tobacco deposit (Structural Deposition #1) was left. If these item were made in a contemporary time period then it could explain the pristine condition of these artefacts. This is especially true when considering that other nets and atlatls found in Hogup Cave were fragmentary at best (Aikens 1970). Unfortunately, without more data from the looters themselves this suspected structured deposition will always remain a mere possibility.

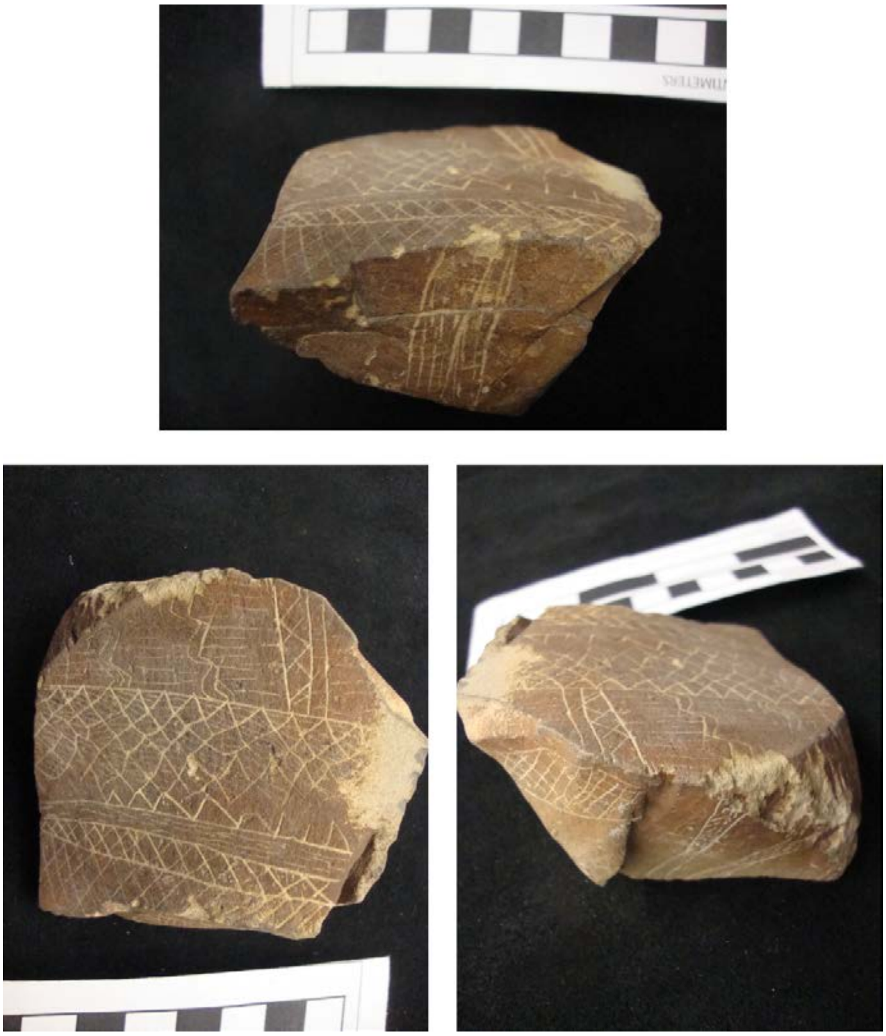


Figure 9.11: Incised stone found within the contemporary disturbed context. (42Bo36 Field Sample number 452.228, Courtesy of Natural History Museum of Utah).

Structured Deposition #3

This pit was located on the east side of Hogup Cave (100L100), in a surface disturbance spanning nearly 7.5 meters. At the base of the pit was found an incised stone along with two painted bones, a phallic looking stone, a paint horn, two stone balls, a knife handle, a disk bead, and a cane artefact (Aikens 1970). This particular incised stone is unique among the incised stones within Hogup Cave. For one, all sides of the stone have been used for marking (Figure 9.11), which is not a common trait of the other incised stones (See Appendices D). The incised stone is also very angular and not tabular shaped like the other examples. Similar to Structured Deposition #1 this pit has a number of artefacts that one would expect to be taken away by looters. Among the artefacts is a paint horn and painted bones (Figure 9.12).

Figure 9.12: A. Paint horn (Aikens 1970:94). B. Painted Bone (Aikens 1970:89).

The paint horn comes from a bison and has a leather thong attached by several overhand knots (Aikens 1970:91). The interior has been drilled at the tip and a red hematite powder caked the inside (Aikens 1970:91). The painted bones are probably ungulate bone splinters that have been marked using red hematite (Aikens 1970:89).

Similar to Structured Deposition #1, this disturbance area may be contemporaneous to the Bull Durham tobacco (1874 to 1957). The uniqueness of the one incised stone among all of the other examples at Hogup Cave suggest it may have been be a contemporary construct. The attributes of this incised stone as being angular and multiple surface incising may suggests it is an attempt to mimic other incised stones.

The contemporary disturbances are odd in that they contain artefacts that would normally have been collected by looters. The placement of the tobacco pouch and incised stone suggests that they are a type of offering. In addition, if the net and atlatl are contemporary then this may suggests the people involved were participating in rabbit drives. It is plausible that the ones responsible for the digging and placement of the artefacts cared a great deal for the people of the past. It is possible to speculate that the responsible parties were Native American decedents who in an act of homage, respect, and possible revival performed these structured depositions. In this framework the incised stone may be an attempt to recreate the incised stone traditions of the past.

The incised stones in the structured deposition discussed in Chapter 7 and 9 have recurrent themes of being used in commemoration type of situations. While the exact purpose of the commemoration is unknown the quality of the artefacts and their uniqueness attest to the probably of their high importance to the people who emplaced them.

Conclusion: practices in Great Basin incised stones deposition

Incised stones are polysemous artefacts since their interpretations change depending on their contextual and associative surroundings such as for teaching, manufacturing, gaming, or commemorating. Not every site in the Great Basin had incised stones, but their presence suggests a particular set of assumptions regarding the conditions under which they were deposited. Concurrent with incised stones, the environmental conditions at an individual site was most likely laden with a variety of edible sources of food (See Chapter 6). The artefact concentrations appear to have the nature of a long term stay probably as a habitation site. At these sites there is an increase of artefacts and activities. Men, women, children, and elderly were most likely present during these longer stays (see Chapter 7). Overall, a hypothesis of incised stones would be that their presence, regardless of their polysemous interpretation, are a marker of a set of assumptions that can be applied to that particular strata, horizon, or level in which they are found. These assumptions are of course testable, which is key, given that this work has not explored the context of incised stones at open air sites.

All of the residential occupation periods were associated with manufacturing. The vast majority of the incised stones came from discard activities where there does not seem to be any special placement of the stones. While within this context, it is a likely time for learning practices and transmission to occur.

Identifying caching as a possible activity at sites is important because, as discussed above, if incised stones are present the owners may have wished to recover incised stones for later marking. This suggests that individual ownership is of importance. This may explain why some complete incised stones found in caches may be markers of ownership or identity for that incised stone and its cache.

Because incised stones are portable, they could have possibly been made anywhere. However, given their associative context as being an integrated piece of the deposit it is most likely that the incised stones were made at the site. Further to this, blank incised stones were carried to the cave and left behind never having been used. Within Ruby Cave there were seven incised stone blanks (Ottenhoff 2004). If incised stones were made off-site then it would not explain why blank incised stones would be carried to the site. In addition, if a family group is out harvesting and trapping then they most likely would be too busy to create an incised stone.

All of the other evidence in this work (i.e. manufacturing, caching, structured deposition, and design grammars) suggests that making an incised stone was a cultural event (i.e. novices, gaming, commemorating) and possibly a rite of passage among the youth. Furthermore, incised stones do not appear to be made by just one gender, instead the contextual associations (which is with a wide variety of artefacts) suggests that men and women were making incised stones. Nothing suggests that incised stone creation was a casual affair and was performed just anywhere. A majority of the sites in the Great Basin do not have any incised stones present. Therefore, incised stones were most likely created in the caves and rock shelters during residential habitations and probably during or following after some sort of event (i.e. teaching, gaming, or rites of passage).

Future research

What this work has not focused on is why incised stones begin to appear in the archaeological record (6,500 BC in Camels Back Cave). Camels Back Cave is the furthest site to the east in my sample and is the earliest. It is tempting to want to attribute the incised stones as appearing in the Great Basin from an eastern source. For example, the Gault site over 1000 miles to the southeast in Texas, has Clovis aged incised stones (13,000-9,000 BP) (Lemke et al 2015:114). This early date predates all incised stones in the sample discussed here and future research could aim to flesh out where and when incised stones entered the Great Basin by examining securely dated instances on the Colorado Plateau. For instance, Cowboy Cave which is on the boundary between the Great Basin and the Colorado Plateau contains 36 incised stones with many dating to the early Archaic (12,000 to 9,000 BC) component of the site (Hull and White 1980: 104). Alternatively, a putative incised stone from Danger Cave in the northwest Great Basin also have very early dates (James 1983). Only further research could tease out this possibility, as the sample size of this work was too small to firmly support either for or against.

Of particular note the design grammar of circle and anthropomorphic styles do not appear any further east than Gatecliff Shelter in the sample. Why this would be the case is unclear, but since incised stones in this work have been closely tied to manufacturing and the designs on the incised stones have been tied to what was manufactured, then the answer may lie in production. Was there something made at Gatecliff Shelter that that was not made at the other sample sites? Without further research into Gatecliff Shelter's provenience records this question cannot currently be addressed.

Because of their temporal association between 400 and 1,350 AD, a research question could seek to understand any possible connection between incised stones and the Fremont. There is evidence of the Fremont material culture appearing at Swallow Shelter and Hogup Cave, such as anthropomorphic stick figures, but the coprolites from Hogup Cave have only one instance of corn during the Fremont period (Fry 1976) suggesting that the inhabitants of Hogup Cave were always full time hunter-gatherers. However, the incised stones during this time could be contextually studied with incised stone in the interior of the contemporary Fremont boundary (See Figure 4.11).

Finally, the ethnographic connection to incised stones and female rites of passage is advanced. The ethnographic informants Sarah Winnemucca and Sarah Hopkins discuss the Festival of Flowers in the north western Great Basin in which all girls within their society are named after flowers or rocks (Louie 1924:306). Once the festival is announced the girls have five days to collect what they are named after. The girls with flower names collect the flower she is named after and weaves them into "wreaths and crowns with scarfs, and dress up in them" (Louie 1924:307). Sarah Winnemucca explains that "some girls are named for rocks and are called rock-girls, and they find some pretty rocks which they carry; each one such a rock as she is named for" (Louie 1924:307). The dance floor is then prepared and the girls going through the rite of passage form a circle, each girl with their respected flower, rock, or sometimes with their branch of sagebrush (Louie 1924:307). The girls then march along each one singing of themselves, as Sarah Winnemucca recaptures in song (Louie 1924:307)

> I, Sarah Winnemucca, am a shell-flower, such as I wear on my dress. My name is Thocmetony. I am so beautiful! Who will come and dance with me while I am so beautiful? Oh, come and be happy with me I shall be beautiful while the earth lasts. Somebody will always admire me; and who will come and be happy with me in the Spirit-land? I shall be beautiful forever there. Yes, I shall be more beautiful than my

> shell-flower, my Thocmetony! Then, come, oh come, and dance and be happy with me!

During this circular marching movement young men dance beside the girls as they continue to take turns singing their own song, including the rock-girls (Louie 1924:307). At the conclusion of the dance the girls are have transformed into a “singing flower” and are not considered girls any longer (Louie 1924:307). The girls praise each other on the beauty of the flower clothes or rocks chosen for the dance often giving away the ritual garments and items to other girls (Louie 1924:307). What is not explicit in this account is what specifically the rock-girls do for the stones they are named after. Some, but not all, incised stones have evidence of having been suspended as if from around a persons’ neck (see Chapters 1 to 3). Perhaps, the rock-girls were using incised stones in this fashion. Did they make incised stones for this and possibly other rites of passage events? A reading between the lines in the ethnographic record and stringing together how rites of passages, naming ceremonies, and mentions of rocks may interconnect to the archaeological record of incised stones and could be an avenue of research.

No longer should incised stones be regarded as a miscellaneous artefact. In the Great Basin, they are a highly important source of cultural meaning, no longer to be ignored. Understanding incised stones is important for our future understanding of the past in the Great Basin and perhaps the world.

Bibliography

A

Abbott, C. 1879. Miscellaneous Objects Made Of Stone. In: G. Wheeler, ed. *Report upon United States Geographical Surveys: West of the One Hundredth Meridian*. Washington DC: Government Printing Press.

Abbott, C. 1875. The Stone Age in New Jersey. In: J. Henry, ed. *Annual Report of the Board of Regents of the Smithsonian Institution, Showing the Operations, Expenditures, and Condition of the Institution for the Year 1875.* Washington DC: Government Printing Office. PP 246-380.

Adams, J. 2002. *Ground Stone Analysis*. Salt Lake City: The University of Utah Press.

Adovasio, J. M. 1975. Fremont basketry. *Tebiwa*. 17(2):67–76.

Adovasio, J. M. 1979. Comment by Adovasio. *American Antiquity*. 44:723–731.

Adovasio, J. M. 1980. Fremont: An Artifactual Perspective. In: D. Madsen, ed. *Fremont Perspectives.* Salt Lake City, Utah: Utah State Historical Society. Antiquities Section Selected Papers. 7(16): 35–40.

Adovasio, J. M. 1986a. Artifacts and Ethnicity: Basketry as an Indicator of Territoriality and Population Movements in the Prehistoric Great Basin. In: C. J. Condie and D. D. Fowler, eds. *Anthropology of the Desert West: Essays in Honor of Jesse D. Jennings.* Salt Lake City, Utah: University of Utah Press, Anthropological Papers 110. PP 43–88.

Adovasio, J. M. 1986b. Prehistoric basketry. In: W. L. d'Azevedo, ed. *Handbook of North American Indians: Great Basin*. 11. Washington, DC: Smithsonian Institution Press.

Aikens, M. 1967a. *Box 9-6.* [Unpublished documents] Hogup Cave. Salt Lake City, Utah: Utah Museum of Natural History Archives.

Aikens, M. 1967b. *Box 9-8.* [Unpublished documents] Hogup Cave. Salt Lake City, Utah: Utah Museum of Natural History Archives.

Aikens, M. 1967c. *Box 9-9.* [Unpublished documents] Hogup Cave. Salt Lake City, Utah: Utah Museum of Natural History Archives.

Aikens, M. 1967d. *Hogup Cave Site Notes 42Bo36: "FS – Feature – Strata Correlation Tables".* [Unpublished document] Hogup Cave. Salt Lake City, Utah: Utah Museum of Natural History.

Aikens, M. 1967e. *Hogup Cave Site Notes 42Bo36: "Miscellaneous tabulations, Identifications, and Analysis Notes".* [Unpublished document] Hogup Cave. Salt Lake City, Utah: Utah Museum of Natural History.

Aikens, M. 1967f. *Hogup Cave Site Notes 42Bo36: F2-F42.* [Unpublished document] Hogup Cave. Salt Lake City, Utah: Utah Museum of Natural History.

Aikens, M. 1967g. *Hogup Cave Site Notes 42Bo36: F43-F56, Weekly Reports, Permit, Analysis, Moccasins, C14.* [Unpublished document] Hogup Cave. Salt Lake City, Utah: Utah Museum of Natural History.

Aikens, M. 1967h. Hogup Cave Photos 42Bo36. [Unpublished document] Hogup Cave. Hogup Cave. Salt Lake City, Utah: Utah Museum of Natural History.

Aikens, M. 1967. *Hogup Cave Site Notes 42Bo36: FS Sheets, Obsidian Hydration, and Point Type.* [Unpublished document] Hogup Cave. Salt Lake City, Utah: Utah Museum of Natural History.

Aikens, M. 1967. *Hogup Cave Site Notes: F1 Feature Key.* [Unpublished document] Hogup Cave. Salt Lake City, Utah: Utah Museum of Natural History.

Aikens, M. 1970. *Hogup Cave*. Anthropological Papers, Number 93. Salt Lake City: The University of Utah Press.

Aikens, M. 2008. Great Basin Cave Archaeology and Archaeologist. In: D. Fowler and C. Fowler, eds. *The Great Basin: People and Place in Ancient Times*. Santa Fe, New Mexico: School for Advanced Research Press Publishing.

Aikens, M., and Madsen, D. 1986. Prehistory of the Eastern Area. In: W. L. d'Azevedo, ed. *Handbook of North American Indians: Great Basin*. 11. Washington, DC: Smithsonian Institution Press.

Allchin, F. 1995. The Mauryan State and Empire. In: F. Allchin, ed. *The Archaeology of Early Historic South Asia.* Cambridge: Cambridge University Press.

American Museum of Natural History, 2015. Gatecliff Nevada. [Online] http://research.amnh.org/anthropology/research/naa/gatecliff. Accessed February 23, 2015.

Amirkhanov, H, and Lev, S. 2008. New Finds of Art Objects from the Upper Palaeolithic Site of Zaraysk, Russia. *Antiquity*. 82(318): 862-870.

Antevs, E. 1948. Climatic Changes and Pre-white Man. In: E. Blackwelder, C. Hubbs, and E. Antevs, eds. *The Great Basin, with Emphasis on Postglacial Times*. University of Utah Bulletin V. 38(20). IN GRAYSON 2011

Audouze, F. 2002. Leroi-Gourhan, a Philosopher of Technique and Evolution. Journal of Archaeological Research. 10(4): 277-306

B

Bahn, P. 1999. *The Cambridge Illustrated History of Archaeology*. Cambridge: Cambridge University Press.

Baldwin, D. 1968. *Hogup Cave Analysis 42Bo36*: Cordage and Feathers. [Unpublished document] Hogup Cave. Salt Lake City, Utah: Utah Museum of Natural History.

Baldwin, D. 1970. Bird Feathers from Hogup Cave. In: C, Aikens, ed. *Hogup Cave.* Anthropological Papers, Number 93. Salt Lake City: The University of Utah Press. Appendix VI.

Banning, E.B. 2002. *Archaeological Survey*. New York: Klumer Academic / Plenus Publishing.

Barrett, J. 2001. Agency: The Duality of Structure and the Problem of the Archaeological Record. In: I. Hodder, ed. *Archaeological Theory Today.* Cambridge: Polity. PP 141—164.

Bar-Yosef, O. 1998. The Natufian Culture in the Levant, Threshold to the Origins of Agriculture. *Evolutionary Anthropology*. 6(5): 159-177.

Basgall, M. and Hilderbranst, W. 1989. *Prehistory of the Sacramento River Canyon Shasta County, California.* Publication Number 9. Davis, California: Center for Archaeological Research at Davis.

Basgall, M., Hilderbranst, W., and White, G. 1989. Field Methods. In: M. Basgall and W. Hilderbranst, eds. *Prehistory of the Sacramento River Canyon Shasta County, California.* Publication Number 9. Davis, California: Center for Archaeological Research at Davis. CH 5.

Baumhoff, M. 1959a. *Ruby Cave Artefact Catalogue*. [Unpublished artefact catalogue] Ruby Cave. Davis, California: University California, Davis Department of Anthropology Museum.

Baumhoff, M. 1959b. *Draft Preliminary Report on Ruby Cave*. [Unpublished document] Ruby Cave. Davis, California: University California, Davis Department of Anthropology Museum.

Beck, C. and Jones, T. 2007. Early Paleoarchaic Point Morphology and Chronology. In: K. Graf and D. Schmitt, eds. *Paleoindian or Paleoarchaic: Great Basin Human Ecology at the Pleistocene-Holocene Transition*. Salt Lake City: University of Utah Press.

Beck, C., and Jones, G. 2012. The Clovis-Last Hypothesis. In: D. Rhode, ed. *Meetings at the Margins: Prehistory Cultural Interactions in the Intermountain West*. Salt Lake City: The University of Utah Press.

Bednarik, R. 2010. *An overview of Asian Palaeoart of the Pleistocene*. IFRAO Congress, September 2010- Symposium: Pleistocene Art of Asia.

Bednarik, R. 2013. Pleistocene Paleoart of Africa. *Arts.* 2(1): 6-34.

Belfar-Cohen, A. 1991. Art Items From Layer B, Hayonim Cave: a Case Study of Art in a Natufian Context. In: O. Bar-Yosef, and F. Valla, eds. *The Natufian Culture in the Levant*. Ann Arbor, Michigan: International Monographs in Prehistory. PP 569-588.

Bell, R. C. (1979). *Board and Table Games from Many Civilisations. Revised Edition.* New York: Dover Publications.

Benson, L., Berry, M., Jolie, E., Spangler, J., Stahle, D., and Hattori, E. 2007. Possible impacts of early-11th-, middle- 12th-, and late-13th-century droughts on western Native Americans and the Mississippian Cahokians. *Quaternary Science Reviews.* 26(3-4):336–350.

Benson, L., Kashgarian, M., Rye, R., Lund, S., Paillet, F., Smoot, J., Kester, C., Mensing, S., Meko, D., and Lindström, S. 2002. Holocene Multidecadal and Multicentennial Droughts Affecting Northern California and Nevada. *Quaternary Science Reviews.* 21(4-6): 659– 682.

Bettinger, R. 1989. *The Archaeology of Pinyon House, Two Eagles, and Crater Middens: Three Residential Sites in Owens Valley, Eastern California*. No 67. New York: Anthropological Papers of the American Museum of Natural History,

Bettinger, R. 1991. *Hunters and Gatherers: Archaeological and Evolutionary Theory*. New York: Springer Publishing.

Bettinger, R. 1999a. From Traveller to Processor: Regional Trajectories of Hunter-Gatherer Sedentism in the Inyo-Mono Region, California. In: B. Billman and G. Feinman, eds. S*ettlement Pattern Studies in the Americas: Fifty Years since Virú*. Washington, DC: Smithsonian Institution Press.

Bettinger, R. 1999b. What Happened in the Medithermal. In: C. Beck, ed. *Models for the Millennium: Great Basin Anthropology Today*. Salt Lake City: University of Utah Press.

Bettinger, R. 2008. High Altitude Sites in the Great Basin. In: D. Fowler and C. Fowler, eds. 2008. *The Great Basin: People and Place in Ancient Times*. Santa Fe, New Mexico: School for Advanced Research Press Publishing.

Bettinger, R. and Baumhoff, M. 1982. The Numic spread: Great Basin cultures in competition. *American Antiquity.* 47(3): 485–503.

Binford, L. 1978. Dimensional Analysis of Behaviour and Site Structure: Learning from an Eskimo Hunting Stand. *American Antiquity*. 43 (3): 330-361.

Bouzouggar, A., Barton, R., Blockley, S. Bronk-Ramsey, C., Collcutt, S., Gatle, R., Higham, T., Humphrey, L., Parfitt, S., Turner, E., and Ward, S. 2008. Reevaluating the Age of the Iberomaurusian in Morocco. *African Archaeology Review*. 25 (1-2): 3-19.

Brainerd, G. 1942. Symmetry in Primitive Conventional Design. *American Antiquity*. 8 (2): 164-166.

Bramwell, E. 1941. Some Australian Incised Stones. *Records of the Australian Museum*. 21(1): 17-18.

Bright, J., Simms, S., and Ugan, A. 2005. Ceramics from Camels Back Cave and Mobility in Farmer-Forager System in the Eastern Great Basin. In: D, Schmitt, and D, Madsen, eds. *Camels Back Cave*. Salt Lake City, Utah: The University of Utah Press. CH 8.

Breuil, H. 1952. Quarte cents Siècles d'art Pariètal. Montignac. France: Center d'Études et de Documentation Préhistoriques.

Brown, M. and Woody, A. 2007. Stories as Old as the Rocks: Rock Art and Myth. In: A. Quinlan, ed. *Great Basin Rock Art*. Reno, Nevada: University of Nevada Press.

Brück, J. 1999. Ritual and Rationality: Some Problems of Interpretation in European Archaeology. *European Journal of Archaeology*. 2(3): 313-344.

Brumm, A., Boivin, N., and Fullagar, R. 2006. Signs of Life: Engraved Stone Artefacts from Neolithic South India. *Cambridge Archaeological Journal*. 16(02): 165-190.

Bryan, A. 1988. The Relationship of the Stemmed Point and the Fluted Point Traditions in the Great Basin. In: J. Willig, C. Aikens, and J. Fagan, eds. *Early Human Occupations in the Far Western North America: The Clovis-Archaic Interface*. Nevada State Museum Anthropological Papers 21.

Bury, R., Padgett, A., Reeves, D., and Robinson, D. 2004. *Vandenberg Air Force Base Rock Art Survey and Inventory*. [Unpublished Report] Submitted to: Vandenberg United States Air Force Base. Care of Author.

Butzer, K. 1980. Context in Archaeology: An Alternative Perspective. *Journal of Field Archaeology*. 7 (4): 417-422.

Byers, D. and Broughton, J. 2004. Holocene Environmental Change, Artiodactyl Abundances, and Hunting Strategies in the Great Basin. *Society for American Archaeology*. 69(2): 235-255.

C

Callaway, D., Janetski, J., and Stewart, O. 1986. Ute. In: W. L D'Azevedo, ed. *Handbook of North American Indians*. Washington D.C.: U.S. Government Printing Office.

Camels Back Cave CD-Rom 1. Camels Back Cave File Folder. CD-Rom was found inside file box for Camels Back Cave (42TO392). October, 2012.

Campana, D. 1991. Bone Implements from Hayonim Cave: Some Relevant Issues. In: O Bar-Yosef, and François Valla eds. The Natufian Culture in the Levant. Ann Arbor: International Monographs in Prehistory. PP 459-465.

Cannon, W. and Ricks, M. 2007. Contexts in the Analysis of Rock Art: Settlement and Rock Art in the Warner Valley Area, Oregon. In: A. Quinlan, ed. *Great Basin Rock Art*. Reno, Nevada: University of Nevada Press.

Cannon, W. and Woody, A. 2007. Toward a Gender-Inclusive View of Rock Art in the Northern Great Basin. In: A. Quinlan, ed. *Great Basin Rock Art*. Reno, Nevada: University of Nevada Press.

Chenault, M. 1994. Precolumbian Ground Polished and Incised Stone Artifacts from the Cordillera de Tilaran. In: D. Payson and B..McKee, eds. *Archaeology, Volcanism, and Remote Sensing in the Arenal Regional, Costa Rica*. Austin, Texas: University of Texas Press.

Chippindale, C. 1986. Composition and Order in Mont Bego Rock-Art. Paper Presented at the 51st Annual Meeting of the Society for American Archaeology, New Orleans.

Clark, A. 1999. Late Pleistocene Technology at Rose Cottage Cave: A Search for Modern Behaviour in an MSA Context. *African Archaeology Review.* 16(2): 93-119.

Clottes, J. and Lewis-Williams, D. 1998. *The Shamans of Prehistory: Trance and Magic in the Painted Caves*. New York: Abrams.

Condie, K. and Blaxland, A. 1970. Sources of Obsidian in Hogup and Danger Cave. In: C, Aikens, ed. *Hogup Cave.* Anthropological Papers, Number 93. Salt Lake City: The University of Utah Press. Appendix IX.

Conkey, M. and Gero, J. 1991. Tensions, Pluralities, and Engendering Archaeology: An Introduction to Women in Prehistory. In: J. Gero and M. Conkey, eds. *Engendering Archaeology*. Cambridge: Basil Blackwell Inc.

Conkey, M. and Spector, J. 1998. Archaeology and the Study of Gender. In: K. Hays-Gilpin, and D. Whitley, eds. *Reader in Gender Archaeology*. London: Routledge.

Coningham, R. and Allchin, F. 1995. The Rise of Cities in Sri Lanka. In: F, Allchin ed. *The Archaeology of Early Historic South Asia.* Cambridge: Cambridge University Press. PP 152-183.

Coulam, N. 1988. *Intermountain Archaic Subsistence and an Archaeobotanical Analysis of Swallow Shelter.* Ph.D., Arizona State University.

Couture, M., Ricks, M., and Housley, L. 1986. Foraging Behaviour of a Contemporary Northern Great Basin Population. *Journal of California and Great Basin Anthropology.* 8(2):150-160.

Cressman, L. 1986. Prehistory of the Northern Area. In: W. L. d'Azevedo, ed. *Handbook of North American Indians: Great Basin*. 11. Washington, DC: Smithsonian Institution Press.

Cutler, H. 1970. Corn from Hogup Cave, a Freemont Site. In: C, Aikens, ed. *Hogup Cave.* Anthropological Papers, Number 93. Salt Lake City: The University of Utah Press. Appendix VII.

D

Dalley, G. 1977. Swallow Shelter and Associated Sites. Salt Lake City: University of Utah, Press.

Dalley, G. 1972. *Swallow Shelter, 42Bo268: Site Notes and FS Sheets, Photo Data Album and Photo Data Sheets.* [Unpublished document] Swallow Shelter. Salt Lake City, Utah: Utah Museum of Natural History.

Dalley, G. and Peterson, K. 1970. Additional Artifacts from Hogup Cave. In: C, Aikens, ed. *Hogup Cave.* Anthropological Papers, Number 93. Salt Lake City: The University of Utah Press. Appendix X.

Dart, R. 1949. A Polished Stone Pendant from Makapansgat Valley. *The South African Archaeological Bulletin*. 4 (15): 83-86.

Davenport, W. and Coker, G. 1967. The Moro Movement of the Guadalcanal, British Solomon Islands Protectorate. *The Journal of the Polynesian Society.* 76(2): 123-176.

Davis, J., Melhorn, W., Trexler, D., and Thomas, D. Geology of Gatecliff Shelter: Physical Stratigraphy. In: D. Thomas, ed. 1983. The Archaeology of Monitor Valley 2: Gatecliff shelter. New York: Anthropological Papers of the American Museum of Natural History. CH.3

Delacorte, M. 1997. *Culture Change Along the Eastern Sierra Nevada/Cascade Front: Volume 7-Pah Rah Uplands*. Far Western Anthropological Research Group. Report Submitted to the Bureau of Land Management, Carson District, Nevada.

Delany, C. 2007. Seasonal Controls on Deposition of Late Devensian Glaciolacustrine Sediments, Central Ireland. In: M. Hambrey, P. Christofferson, N. Glasser, and B. Hubbard, eds. *Glacial Sedimentary Processes and Products: Special Publication 39 of the ISA.* Malden: Blackwell Publishing.

d'Errico, F., Henshilwood, C., Lawson, G., Vanhaeren, M., Tillier, A., Soressi, M., Bresson, F., Maureille, B., Nowell, A., Lakara, J., Backwell, L., and Julien, M., 2003. Archaeological Evidence for the Emergence of Language, Symbolism, and Music: An Alternative Multidisciplinary Perspective. *Journal of World Prehistory.* 17(1): 1-70.

d'Errico, F. and Nowell, A. 2000. A New Look at the Berekhat Ram Figurine: Implications for the Origins of Symbolism. *Cambridge Archaeological Journal*. 10(1): 1-70.

Dietler, M, and Ingrid H. 1998. *Habitus*, Techniques, Style: An Integrated Approach to the Social Understanding of Material Culture and Boundaries. In *The Archaeology of Social Boundaries*, edited by Miriam T. Stark, pp. 232-263. Smithsonian Institution, Washington, D.C.

Dockall, J. 1997. Traces and Projectile Impact: A Review of the Experimental and Archaeological Evidence. Journal of Field Archaeology. 24 (3): 321-331.

Dobres, M. and Robb, J. 2000. Agency in Archaeology: Paradigm or Platitude? In: M. Dobres and J. Robb, eds. *Agency in Archaeology.* London: Routledge. PP 3-17.

Drucker, P. 1952. *La Venta, Tabasco: A Study of Olmec Ceramics and Art*. Smithsonian Institution Bureau of American Ethnology Bulletin 153. Washington DC: United States Government Printing Office.

Dryer, C. 1994. Kunwinjku Art from Injalak. The John W. Kluge Commission. North Adelaide: Museum Art International.

Duff, R. 1949. An Incised Stone from Tapawera, Nelson. *The Journal of the Polynesian Society*. 58(3): 128-130.

Durrant, S. 1970. Faunal Remains as Indicators of Neothermal Climates at Hogup Cave. In: C, Aikens, ed. *Hogup Cave.* Anthropological Papers, Number 93. Salt Lake City: The University of Utah Press. Appendix II.

E

Edwards, A. 1965. Rock Engravings and Incised Stones: Tiverton Station, North-east South Australia. *Mankind*. 6 (5): 223-231.

Edwards, P. 1991. Wadi Hammeh 27: An Early Natufian Site at Pella, Jordan. In: O. Bar-Yosef, and F. Valla, eds. *The Natufian Culture in the Levant*. Ann Arbor, Michigan: International Monographs in Prehistory. PP 123-148.

Eekens, J, Bettinger, R, Richerson, P. Cultural Transmission Theory and Hunter-Gatherer Archaeology. In Vicki Cummings, Peter Jordan, and Marek Zvelebil eds. The Oxford Handbook of the archaeology and anthropology of hunter-gatherers. Oxford University Press: Oxford. 1127-1142.

Elsasser, A. 1957. A decorated Stone Implement from Mono County, California. Journal of California Anthropology. 5 (1): 73-78.

Elsasser, A. and Prince, E. 1961. The Archaeology of Two Sites at Eastgate, Churchill County, Nevada. Berkeley: University of California Press.

Elston, R. 1986. Prehistory of the Western Area. In: W. L. d'Azevedo, ed. *Handbook of North American Indians: Great Basin*. 11. Washington, DC: Smithsonian Institution Press.

Elston, R. 1997. *Lithic Analysis Catalogue*. [Unpublished document on CD] Camel's Back Cave. Salt Lake City, Utah. Utah Museum of Natural History.

Elston. R. 2004. Lithic Assemblage Variability. In: D, Schmitt, and D, Madsen, eds. *Camels Back Cave*. Salt Lake City, Utah: The University of Utah Press. CH 5.

Elston, R. 2005. Flaked and Battered Stone Artifacts. In: D. Schmitt and D. Madsen, eds. *Camels Back Cave*. Salt Lake City, Utah: The University of Utah Press. CH 5.

Etheridge, R., 1897. On circular and spiral incised ornament on Australian Aboriginal implements and weapons. *Records of the Australian Museum* 3(1): 1–6.

F

Farbstein, R. 2011. The Significance of Social Gestures and Technologies of Embellishment in Paleolithic Portable Art. *Journal of Archaeological Method and Theory.* 18(2): 125-146.

Farbstein, R. and Svoboda, J. 2007. New Finds of Upper Palaeolithic Decorative Objects from Předmostí, Czech Republic. *Antiquity*. 81(314): 856-864.

Fitzgerald, R. and Jones, T. 1999. The Milling Stone Horizon Revisited: New Perspectives from Northern and Central California. *Journal of California and Great Basin Anthropology*. 5(21): 67-93.

Flint, R. 1963. Pleistocene Climates in Low Latitudes. *Geographical Review*. 53 (1): 123-129.

Fond, A. and Jones, J. 1995. *Data Recovery Excavations at the Yaha Site: An Open Prehistoric Camp Site Along Rodeo Creek, Northern Eureka County, Nevada.* Cultural Resource Report 5010-01-9301, Little Boulder Basin Series Number 2. Salt Lake City, Utah: P-III Associates, Inc. Submitted to: Elko, Nevada: Barrick Goldstrick Mines, Inc.

Fowler, C. 1986. Subsistence. In: W. L. d'Azevedo, ed. *Handbook of North American Indians: Great Basin*. 11. Washington, DC: Smithsonian Institution Press.

Fowler, D. and Fowler, C. eds. 2008. *The Great Basin: People and Place in Ancient Times*. Santa Fe, New Mexico: School for Advanced Research Press Publishing.

Fritz, C. 1999. Towards the Reconstruction of Magdalenian Artistic Techniques: The Contribution of Microscopic Analysis of Mobiliary Art. *Cambridge Archaeological Journal*. 9(02): 189-208.

Fry, G. 1970. Preliminary Analysis of the Hogup Cave Coprolites. In: C, Aikens, ed. *Hogup Cave.* Anthropological Papers, Number 93. Salt Lake City: The University of Utah Press. Appendix III.

Fry, G. 1976. *Analysis of Prehistoric Coprolites from Utah.* Anthropological Papers. Salt Lake City: University of Utah Press.

G

Garcia, M. 2006. *Ruby Cave Assemblage*. Undergraduate Thesis. University of California, Davis.

Garrow, D. 2012. Odd Deposits and Average Practice. A Critical History of the Concept of Structured Deposition. *Archaeology Dialogues*. 19(2): 85-115.

Gary, M., Robert, M., and Wolf, C. eds. 1974. *Glossary of Geology.* Washington, DC: American Geological Institute.

Gassaway, L. 2009. Native American Fire Ecology in Yosemite Valley: Archeology, Dendrochronology, Subsitence, and Culture Change in the Sierra Nevada. *Proceedings of the Society for California Archaeology*. Papers Presented at 42nd Annual Meeting of the Society of California Archaeology. 22.

Geib, P. and Hurst, W. 2013. Should Dates Trump Context? Evaluation of the Cave 7 Skeletal Assemblage Radiocarbon Dates. *Journal of Archaeological Science*. 40: 2754-2770.

Gero, J. and Margaret, W. 1991. *Engendering Archaeology: Women and Prehistory*. Oxford: Blackwell.

Gibbs, T. 1993. *Understanding Community: A Comparison of Three Late Neolithic Pottery Assemblages from Wadi Ziqlab, Jordan*. PhD. University of Toronto.

Goss, J. H. 1968. Culture-historical inference from Utaztecan linguistic evidence. In: E. Swanson, ed. *Utaztecan Prehistory*. Occasional Papers of the Idaho State University Museum 22. PP 1–42.

Gosselain, O. 2000. Materializing Identities: An African Perspective. *Journal of Archaeological Method and Theory* 7. 187–217.

Glassow, M. 1996. *Purisimeño Chumash Prehistory: Maritime Adaptations along the Southern California Coast.* Fort Worth: Harcourt Brace.

Google. 2015. Ruby Cave Vicinity. Available through: https://maps.google.co.uk/maps?ll=40.1618841,115.4468657&z=11&cid=14935910583306589619&q=Nevada,+USA&output=classic&dg=opt. Accessed February 27, 2015.

Grayson, D. 1983. The Paleontology of Gatecliff Shelter. In: D. Thomas, ed. *The Archaeology of Monitor Valley 2: Gatecliff Shelter.* New York: Anthropological Papers of the American Museum of Natural History. CH 6.

Grayson, D. 2008. Great Basin Natural History. In: D. Fowler and C. Fowler, eds. *The Great Basin: People and Place in Ancient Times*. Santa Fe: School for Advanced Research Press Publishing.

Grayson, D. 2011. *The Great Basin: A Natural Prehistory*. Berkeley: University of California Press.

Green, J. 1972. *Archaeology of the Rock Creek Site, 10-CA-33, Sawtooth National Forest, Cassia County, Idaho.* Masters. Idaho State University, Pocatello.

Green. 1983. Lookout Shelter (26LN2508). [Unpublished documents] Lookout Shelter. Department of Anthropology. Las Vegas, Nevada: University of Nevada, Las Vegas.

Greene, K. 2002. *Archaeology: An Introduction*. Suffolk: St. Edmundsbury Press.

H

Haag, W. 1970. Dog Remains from Hogup Cave. In: C. Aikens, ed. *Hogup Cave.* Anthropological Papers, Number 93. Salt Lake City: The University of Utah Press. Appendix

Hale, K. 1958. Internal diversity in Uto-Aztecan. *International Journal of American Linguistics*. 24(2): 101–107.

Harding, J. 2006. Pit Digging, Occupation and Structured Deposition on Rudston Wold, Eastern Yorkshire. *Oxford journal of Archaeology*. 29(2): 109-126.

Harding, S. 1965. *Recent Variations in the Water Supply of the Western Great Basin*. Water Resources Center Archives Series 16. Berkeley, California: University of California, Berkeley.

Harrington, M. 1930. Bee Cave. [Unpublished Manuscript] T143 Box 2. Las Vegas, Nevada: University of Nevada, Las Vegas.

Harris, O. 2005. Agents of Identity: Performative practice at the Etton Causewayed Enclosure. In: D. Hoffman, J. Mills, and A.Cochrane, eds. *Elements of Being: Identities, Mentalities, and Movements*. British Archaeological Reports International Series Book 1437. Oxford: ArchaeoPress.

Harrington, M. 1933. *Gypsum Cave, Nevada*. Los Angeles: Southwest Museum.

Harper, K. and Alder, G. 1970. The Macroscopic Plant Remains of the Deposits of Hogup Cave, Utah and Their Paleoclimatic Implications. In: C. Aikens, ed. *Hogup Cave.* Anthropological Papers, Number 93. Salt Lake City: The University of Utah Press. Appendix I.

Hassin, F. 1988. Prolegmena to a Grammatical Theory of Lithic Artefacts. *World Archaeology.* 19(3): 281-296

Heizer, R. 1947. Petroglyphs from Southwestern Kodiak Island, Alaska. Proceedings of the American Philosophical Society. 91(3): 284-293.

Heizer, R. 1952. Incised Slate Figurines from Kodiak Island, Alaska. American Antiquity. 17(3): 266.

Heizer, R. and Baumhoff, M. 1959. Great Basin Petroglyphs and Prehistoric Game Trails. *Science*. 5(129): 905.

Heizer, R., and Baumhoff, M. 1961. *The Wagon Jack Shelter: The Archaeology of Two Sites at Eastgate, Churchill County, Nevada*. University of California Anthropological Records. 20(4). Berkeley: University of California Press.

Heizer, R. and Baumhoff, M. 1962. *Prehistoric Rock Art of Nevada and Eastern California*. Berkeley: University of California Press.

Hemphill, B. and Larsen, C. 1999. Prehistoric Lifeways in the Great Basin: Bioarchaeological Reconstruction and Interpretation. Salt Lake City: University of Utah Press.

Henshilwood, C., d'Errico, F., and Watts, I. 2009. Engraved Ochres from the Middle Stone Age Levels at Blombos Cave, South Africa. *Journal of Human Evolution*. 57(1): 27-47.

Haynes, C. 1967. Quaternary Geology of the Tule Springs Area, Clark County, Nevada. In: H. Wormington and D. Ellis, eds. *Pleistocene Studies in Southern Nevada*. Nevada State Museum Anthropological Papers (13). Las Vegas, Nevada: Nevada State Museum.

Henshilwood, C, d'Errico, F, and Watts, I. 2009. Engraved Ochres from the Middle Stone Age Levels at Blombos Cave, South Africa. *Journal of Human Evolution*. 57(1): 27-47.

Hill, J. 2002. Proto-Uto-Aztecan Cultivation and the Northern Devolution. In: P. Bellwood and C. Renfrew, eds. *Examining the Farming / Language Dispersal Hypothesis.* McDonald Institute Monographs. Cambridge: McDonald Institute for Archaeological Research, University of Cambridge. PP 331-340.

Hill, J. 2002. Toward a Linguistic Prehistory of the Southwest: “Aztec-Tanoan” and the Arrival of the Maize Cultivation. *Journal of Anthropological Research.* 58:457-475.

Hockett, B. 1998. Sociopolitical Meaning of Faunal Remains from Baker Village. *American Antiquity.* 63: 289-302.

Hockett, B. and Morgenstein, M. 2003. Ceramic Production, Fremont Foragers, and the Late Archaic Prehistory of the North-Central Great Basin. *Utah Archaeology.* 16: 1-36.

Hockett, B., Goebel, T., and Graf, K. 2008. The Early Peopling of the Great Basin. In: D. Fowler and C. Fowler, eds. *The Great Basin: People and Place in Ancient Times*. Santa Fe, New Mexico: School for Advanced Research Press Publishing.

Hodder, I. 1982. *Symbols in Action: Ethnoarchaeological Studies of Material Culture*. Cambridge: Cambridge University Press.

Hodder, I. 1986. *Reading the Past*. Cambridge: Cambridge University Press.

Hodder, I. 1992. *Theory and Practice in Archaeology*. London: Routledge.

Hodder, I. 2002. Ethics and Archaeology: The Attempt at Çatalhöyük. *Near Eastern Archaeology.* 65 (3): 174-181.

Holliman, R. 1969. Further Studies on Incised Stones from the Great Salt Lake Desert, Utah. *Southwestern Lore.* 35(2): 23-25.

Holmes, W. 1891. The Thruston Tablet. American Anthropologist. 4(2): 161-166.

Holmes, W. 1893. A Question of Evidence. *Science*. 21: 135-136.

Holmes, W. 1897. Primitive Man in the Delaware Valley. *Science*. 6: 824-829.

Hopkins, D. 1975. Time-Stratigraphic Nomenclature for the Holocene Epoch. *Geology*. 3: 10.

Houston, S. and Amaroli, P. 1988. *The Lake Guija Plaque.* Research Reports on Ancient Maya Writing 15. Washington, DC: Center for Maya Research.

Hoovers, E. 1990. Art in the Levantine Epi-Palaeolithic: An Engraved Pebble from a Kebaran Site in the Lower Jordan Valley. *Current Anthropology*. 31(3): 317-322.

Hoovers, E., Vandermeersch, B., and Bar-Yosef, O. 1997. A Middle Paleolithic Engraved Artefact from Qafzeh Cave, Israel. *Rock Art Research.* 14(2): 79–87.

Hruby, Z. and Ware, G. 2009. Painted lithic artifacts from Piedras Negras, Guatemula. In: C. Golden, S. Houston, and J. Skidmore, eds. *Maya Archaeology 1*. San Francisco: Precolumbia Mesoweb Press. PP 76-85.

Huckleberry, G., Beck, C., Jones, G., Holmes, A., Cannon, M., Livingston, S., and Broughton, J. 2001. Terminal Pleistocene/Early Holocene Environmental Change at the Sunshine Locality, North Central Nevada, U.S.A. *Quaternary Research*. 55: 303-312.

Hudson, T. 1979. A Charmstone from the Sea off Point Conception, California. *Journal of California and Great Basin Anthropology.* 1(2): 363-367.

Hughes, R. 2005. Determination of the Geologic Sources for obsidian Artefacts from Camels Back Cave and Trace Element Analysis of Some Western Utah and South-eastern Nevada Volcanic Glass. In: D. Schmitt, and D. Madsen, eds. *Camels Back Cave*. Salt Lake City, Utah: The University of Utah Press.

Hull, F. and White, N. 1980. Spindle Whorls, Incised and Painted Stone and Unfired Clay Objects. In: J. Jennings, ed. *Cowboy Cave*. Salt Lake City: University of Utah Press.

Hunt, A. 1960. Archaeology of the Death Valley Salt Pan, California. University of Utah Anthropological Papers 47.

Hunt, J., Rhode, D., Schmitt, D., and Madsen, D. 2005. Hearth Morphology, Distribution, and Content. In: D. Schmitt, and D. Madsen, eds. *Camels Back Cave*. Salt Lake City, Utah: The University of Utah Press. CH 4.

Huntley, J. and Nance, W. 1979. More Incised Cobbles. *Idaho Archaeologist*. 3(2): 8-9.

I

IMACS. 2001. *Intermountain Antiquities Computer System Users's Guide.* University of Utah, Bureau of Land Management, United States Forest Service. Available at: <http://www.anthro.utah.edu/labs/imacs.html> [Accessed June 2014].

Israel Antiquities Authority. 2012. *A String of Colored Beads in a Bowl, Images of Ostriches Carved on a Stone Plaque and Animal Figurines – All from the Stone Age, were Exposed at Ein Zippori in the North*. [Online] Available at: <http://www.antiquities.org.il/article_Item_eng.asp?module_ id=&sec_id=25&subj_ id=240&id=1961> [Accessed June 04 2014].

J

James, S. 1983. An Early Incised Stone from Danger Cave, Utah. *Journal of California and Great Basin Anthropology*. 5(2): 247-252.

Janetski, J. 1998. *Archaeology of Clear Creek Canyon.* Provo, Utah: Museum of Peoples and Cultures, Brigham Young University.

Janetski, J. 2004. *2003 Test Excavations at Mosquito Willie (42TO137).* Technical Series 04-12. Provo, Utah: Museum of Peoples and Cultures, Brigham Young University.

Janetski, J. 2007. Utah Valley: A Natural and Archaeological Overview. In: J. Janetski and G. Smith, eds. *Hunter-Gatherer Archaeology in Utah Valley.* Occasional Paper No. 12. Provo: Museum of People and Culture, Brigham Young University.

Janetski, J. 2008. The Enigmatic Fremont. In: C. Fowler and D. Fowler, eds. *The Great Basin: People and Place in Ancient Times.* Santa Fe, New Mexico: School for Advanced Research Press. PP 105-115.

Jennings, J. 1980. *Cowboy Cave*. Salt Lake City: University of Utah Press.

Jennings, J. 1986. Prehistory: Introduction. In: W. L. d'Azevedo, ed. *Handbook of North American Indians: Great Basin*. 11. Washington, DC: Smithsonian Institution Press.

Johnson, L. 1966. *Site LAN-2: A Late Manifestation of the Topanga Complex in Southern California Prehistory*. University of California Anthropological Records. 23:1-36.

Jolie, E. 2014. Technology, Learning, and Innovation in Textile Arts: Integrating Archaeological and Ethnographic Perspectives. *North American Archaeologist* 35: 303-329.

Jones, T. 1996. Mortars, Pestles, and Division of Labour in Prehistoric California: A View from Big Sur. *American Antiquity*. V(61): 234-264.

Jordan, P. 2004. Examining the Role of Agency in Hunter Cultural Transmission. In: A. Gardner, ed. *Agency Uncovered: Archaeological Perspectives on Social Agency, Power and Being Human*. London: UCL Press.

Joyce, R., Edging, R., Lorenz, K., and Gillespie, S. 1991. Olmec Bloodletting: An iconographic study. In: V. Fields, ed. *Sixth Palenque Round Table*. Norman: University of Oklahoma Press.

Justice, N. 2002. *Stone Age Spear and Arrow Points of California and the Great Basin*. Indianapolis: Indiana University Press.

K

Kadereit, G., Borsch, T., Weising, K., and Freitag, H. 2003. Phylogeny of Amaranthaceae and Chenopodiaceae and the Evolution of C4 Photosynthesis. *International Journal of Plant Science*. 164(6): 959-986.

Kelso, G. 1970. Hogup Cave, Utah: Comparative Pollen Analysis of Human Coprolite and Cave Fill. In: C. Aikens, ed. *Hogup Cave.* Anthropological Papers, Number 93. Salt Lake City: The University of Utah Press. Appendix IV.

Kennett, D., Culleton, B., Dexter, J., Mensing, S., and Thomas, D. 2014 (In press). High-precision AMS C14 Chronology for Gatecliff Shelter, Nevada. *Journal of Archaeological Science*.

Kelly, I. and Fowler, C. 1986. Southern Paiute. In: W. L D'Azevedo, ed. *Handbook of North American Indians*. Washington D.C.: U.S. Government Printing Office.

Kieffer, P. 1961. *Term Paper-Anthro. 196: Non-artifact Remains—Bone.* Undergraduate Thesis. University of California, Davis.

Kintigh, K., Altschul, J., Beaudry, M., Drennan R., Kinzig., A, Kohler, T., Limp, W., Maschner, H., Michener, W., Pauketat, T., Peregrine, P., Sabloff, J., Wilkinson, T., Wright, H., and Zeder, M. 2014. Grand Challenges for Archaeology. *American Antiquity*. 79(1): 5-24.

Kiryushin, Y. and Grushin, S. 2009. Early and Middle Bronze Age Portable Art Pieces From the Forest-Steppe Zone of the Ob-Irtysh Region. *Archaeology, Ethnology & Anthropology of Eurasia (Elsevier Science)*. 37(4): 67-75.

Klimowicz, J. 1988. *A Structural Analysis of Prehistoric Incised Stones from Southern Nevada*. Masters. University of Nevada, Reno.

Kleepe, J. 2005. A Study of Ancient Trees Rooted 36.5 m (120') Below the Surface Level of Fallen Leaf Lake, California. *Journal of the Nevada Water Resources Association.* 2:29-40.

Kramer, K. and Thomas, D. 1983. Ground Stones. In: D. Thomas, ed. 1983. The Archaeology of Monitor Valley 2: Gatecliff shelter. New York: Anthropological Papers of the American Museum of Natural History.

L

Lamb, S. 1958. Linguistic prehistory in the Great Basin. *International Journal of American Linguistics.* 29(2): 95–100.

Lamb, H. 1965. The Early Medieval Warm Epoch and its Sequel. Paleogeography, Paleoclimatology, Paleoecology. 1:13–37.

Leborg, C. 2006. *Visual Grammar*. New York: Princeton Architectural Press.

Lee, G. 1981. *The Portable Cosmos: Effigies, ornaments, and incised stone from the Chumash Area. Anthropological Papers No. 21*. Socorro: Ballena Press.

Lenik, E. 2009. *Making Pictures in Stone: American Indian Rock Art of the Northeast*. Tuscaloosa: The University of Alabama Press.

Lemke, A, Wernecke, D, Collins, M. 2015. Early Art in North American: Clovis and later paleoindian incised artifacts from the Gault Site, Texas (41BL323). American Antiquities 80 (1). 113-133.

Leroi-Gourhan, A. 1964. Gesture and Speech. Translated from French by Anna Bostock Berger. London: The MIT Press.

Lewis-Williams, D. 2002. *The Mind in the Cave: Consciousness and the Origins of Art*. London: Thames and Hudson.

Lillios, K. 2008. Heraldry for the dead: memory, identity, and the engraved stone plaques of neolithic Iberia. Austin: The University of Texas Press.

Lillios, K. and Thomas, J. 2010. Speaking of Stone, Speaking through Stone: an exegesis of an engraved slate plaque from Late Neolithic Iberia. In: B. O'Connor, G. Cooney, and J. Chapman, eds. *Materialitas: Working Stone, Carving Identity*. Oxford: Oxford Books. PP 138-146

Livingston, S. 2005. The Birds of Camels Back Cave. In: D. Schmitt, and D. Madsen, eds. *Camels Back Cave*. Salt Lake City, Utah: The University of Utah Press. Appendix I.

Loud, L. and Harrington, M. 1929. *Lovelock Cave.* Berkeley: University Of California Press.

Louderback, L. and Rhode, D. 2009. 15,000 Years of vegetation change in the Bonneville basin: the Blue Lake pollen record. *Quaternary Science Reviews*, 28 (3-4): 308-326.

Lowie, R. 1909. *The Northern Shoshone*. Anthropological Papers of the American Museum of Natural History 2 (2). New York: Order of the Trustee.

Lyman, L. 2012. A Historical Sketch on the Concepts of Archaeological Association, Context and Provenience. *Journal of Archaeological Method and Theory*. 19: 207-240.

M

Mackay, A. and Welz, A. 2008. Engraved Ochre from a Middle Stone Age Context at Klein Kliphuis in the Western Cape of South Africa. *Journal of Archaeological Science*. 35(6): 1521-1532.

Madsen, D. 1986. Prehistoric Ceramics. In: W. L. d'Azevedo, ed. *Handbook of North American Indians: Great Basin*. 11. Washington, DC: Smithsonian Institution Press.

Madsen, D. 1989. *Exploring the Fremont*. University of Utah Occasional Publication 8. Salt Lake City, Utah: University of Utah Press.

Madsen, D. and Berry, M. 1975. A Reassessment of Northeastern Great Basin Prehistory. *American Antiquity*. 40

Madsen, D. and Schmitt, D. 2005. Buzz-Cut Dune and Fremont Foraging at the Margin of Agriculture. Salt Lake City: University of Utah Press.

Madsen, D. and Simms, S. 1998. The Freemont Complex: A Behavioral Perspective. *Journal of World Prehistory.* 12(3): 255-336.

Madsen, D., Oviatt, C., and Schmitt, D. 2005. Geomorphic, Environmental, and Cultural History of the Camels Back Cave Region. In: D. Schmitt, and D. Madsen, eds. *Camels Back Cave*. Salt Lake City, Utah: The University of Utah Press. CH 2.

Madsen, D., Oviatt, C., and Young, D. 2009. Old River Bed Geomorphology and Chronology. In: D. Madsen, D. Schmitt, and D. Page, eds. *The Paleoarchaic Occupation of the Old River Bed*.

Magee, P., Barber, D., Sobur, M., and Jasim, S. 2005. Sourcing Iron Age Softstone Artefacts in Southeastern Arabia: Results from a Programme of Analysis Using Inductively Coupled Plasma-Mass Spectrometry/Optical Emission Spectrometry (ICP-MS/OES). *African archaeology Review.* 16(2): 129-143.

Marshack, A. 1979. Upper Paleolithic Symbol Systems of the Russian Plain: Cognitive and Comparative Analysis. *Current Anthropology*. 20(2): 271-311.

Marshack, A. 1996. A Middle Paleolithic Symbolic Composition from the Golan Heights: The Earliest Known Depictive Image. *Current Anthropology*. 37(2): 357-365.

Marshack, A. 1997. The Berekhat Ram Figurine: A Late Acheulian Carving from the Middle East. *Antiquity*. 71(272): 327.

Marwitt, J. 1986. Fremont Cultures. In: W. L. d'Azevedo, ed. *Handbook of North American Indians: Great Basin*. 11. Washington, DC: Smithsonian Institution Press.

Matthes, F. 1939. *Report of Committee on Glaciers*. American Geophysical Union Transactions 1939: 518-523.

Mathes, F. 1941. Rebirth of the Glaciers of the Sierra Nevada During the Late Post-Pleistocene Times. *Geological Society of America Bulletin.* 52: 2030.

Matthews, W, French, C, Lawrence, T, Cutler, D, and Jones, M. 1997. Microstratigraphic Traces of Sites Formation Processed and Human Activities. *World Archaeology*. 29 (2): 281-308.

McCarthy, F., Bramwell, E., and Noone, H. 1946. *The Stone Implements of Australia*. Australian Museum Memoir 9. Sydney: Australian Museum Press.

McGuire, K. 1989. Incised Stones. In: M. Basgall and W. Hildebrandt, eds. *Prehistory of the Sacramento River Canyon, Shasta County, California: Excavation at CA-Sha-1176, Sha-1175, Sha-1169, Sha-476*. Publication Number 9Davis, California: Center for Archaeological Research at Davis. Appendix D.

McGuire, K. and Hildebrandt, W. 1994. The Possibilities of Women and Men: Gender and the California Milling Stone Horizon. *Journal of California and Great Basin Anthropology.* 16(1): 41-59.

McKee, E, and Thomas D. 1972. Petroglyph Slabs from Central. Nevada. *Plateau* . 44(3): 84-104.

Mehringer, P. 1986. Prehistoric Environments. In: W. L. d'Azevedo, ed. *Handbook of North American Indians: Great Basin*. 11. Washington, DC: Smithsonian Institution Press.

Melhorn, W. and Trexler, D. 1983. Geology and Geomorphology of Mill Canyon. In: D. Thomas. ed. *The Archaeology of Monitor Valley 2: Gatecliff shelter*. New York: Anthropological Papers of the American Museum of Natural History. Ch.2.

Mellink, M. 1966. Archaeology in Asia Minor. *American Journal of Archaeology*. 70 (2): 139-159.

Meltzer, D. 2009. *First Peoples in a New World: Colonizing Ice Age America.* Berkeley: University of California Press.

Meltzer, D., Todd, L., and Holliday, V. 2002. The Folsom (Paleoindian) Type Site: Past Investigations, Current Studies. American Antiquity. 67 (1): 5-36.

Mensing, S., Benson, L., Kashgarian, M., and Lund, S. 2004. A Holocene Pollen Record of Persistent Droughts from Pyramid Lake, Nevada, USA. *Quaternary Research*. 62: 29-38.

Merrill, W., Hard, R., Mabry, J., Fritz, G., Adams, K., Roney, J., and MacWilliams, A. 2009. The Diffusion of Maize to the Southwestern United States and its Impact. *Proceedings of the National Academy of Science.* 106:21019-21026.

Metcalfe, D. and Larrabee, L. 1985. Fremont Irrigation: Evidence from Gooseberry Valley, Central Utah. *Journal of California and Great Basin Anthropology.* 7(2):244-254.

Miller, W. 1986. Numic Languages. In: W. L. d'Azevedo, ed. *Handbook of North American Indians: Great Basin*. 11. Washington, DC: Smithsonian Institution Press.

Miller, W., Tanner, J., and Foley, L. 1971. A Lexicostatistic Study of Shoshoni Dialects. *Anthropological Linguistics*. 13:142-164.

Miller, J., Germanoski, D., Waltman, K., Tausch, R., and Chambers, J. 2001. Influence of Late Holocene Hillslope Processes and Landforms on Modern Channel Dynamics in Upland Watersheds of Central Nevada. *Geomorphology* V(38).

Miller, J., House, K., Germanoski, D. Tausch, R., and Chambers, J. 2004. Fluvial Geomorphic Responses to Holocene Climate Change. In: J. Chambers and J. Miller, eds. *Great Basin Riparian Ecosystems: Ecology, Management, and Restoration.* Washington DC: Island Press. PP 49-87.

Milliken, R., Hughes, R., and Madsen, D. 2005. Shell Artifacts. In: D. Schmitt, and D. Madsen, eds. *Camels Back Cave*. Salt Lake City, Utah: The University of Utah Press. CH 9.

Mock, J. 1971. *The Archaeology of Spotten Cave, Utah County, Central Utah*. M.A. thesis, Department of Anthropology and Archaeology, Brigham Young University, Provo.

Moholy-Nagy, H. 1997. Middens, Construction Fill, and Offerings: Evidence for the Organization of Classic Period Craft Production at Tikal, Guatemala. *American Antiquity.* 24 (3): 293-313.

Morley, F. and Morley, S. 1938. *The Age and Provenance of the Leyden Plate. Contributions to American Anthropology and History 5(24).* Publication 509. Washington, DC: Carnegie Institution of Washington. PP 1-17.

Morrison, R.B. 1991. Quaternary Stratigraphic, Hydrologic, and Climate History of the Great Basin, with Empahsis on Lakes Lahontoan, Bonneville, and Tecopa. In: R.B. Morrison, ed. *Quarternary Nonglacial Geology.* Conterminous, US: Gelogical Society of America. PP 283-320.

Moorehead, W. 1931. *The Merrimac Archaeological Survey: A Preliminary Paper*. Massachusetts: Peabody Museum.

Morwood, M. and Gibson, M. 1984. Incised Stones from Glenormiston Station, S.W. Queensland. *Memoirs of the Queensland Museum*. 21(2): 561-565.

Muir, P. and Lotan, J. 1985. Disturbance History and Serotiny of Pinus contorta in Western Montana. *Ecology*. 66(5): 1658-1668.

Murray, H. (1978). *A History of Board Games Other Than Chess.* New York: Hacker Art Books Inc.

N

Nauta, L., and Janetski, J. 2007. Lost Ridge Site (42UT6235): A Late Archaic Deer hunting Camp on Long Ridge. In: J. Janetski and G. Smith, eds. *Hunter-Gatherer Archaeology in Utah Valley.* Occasional Paper No. 12. Provo: Museum of People and Culture, Brigham Young University.

Nelson, S. 2006. Introduction: Archaeological Perspectives on Gender. In: S Nelson, ed. *Handbook of Gender in Archaeology*. New York: Alta Mira Press.

Newcomb, W. 1976. Pecos River Pictographs. In: C. Cleland, ed. *Cultural Change and Continuity: Essays in Honor of James Bennett Griffin*. New York: Academic Press.

Nielsen-Grimm, G. (2012). *Jesse D Jennings.* [Conversation] Museum of Natural History, Utah. Personal Communication, October 2012.

Noy, T. 1991. Art and Decoration of the Natufian at Nahal Oren. In: O. Bar-Yosef, and F. Valla, eds. *The Natufian Culture in the Levant*. Ann Arbor, Michigan: International Monographs in Prehistory. PP 557-568.

O

Orme, A. and Orme, A. 2008. Late Pleistocene Shorelines of Owens Lake, California, and their Hydroclimatic and Tectonic Implications. In: M. Reheis, R. Hershler, and D. Miller, eds. *Late Cenozoic Drainage History of the Southwestern Great Basin and Lower Colorado River Region: Geologic and Biotic Perspectives*. Geological Society of American Special Paper (429).

Ottenhoff, R. 2004. Incised Stones From Ruby Cave, Nevada. [Unpublished manuscript] Davis California: Anthropology Museum at the University of California, Davis.

Oviatt, C., Madsen, D., and Schmitt, D. 2003. Late Pleistocene and Early Holocene Rivers and Wetlands in the Bonneville Basin of Western North America. *Quaternary Research*. 60: 200-210.

P

Parlett, D. (1999). *The Oxford History of Board Games.* Oxford: Oxford University Press.

Parkman, B. 1981. An Incised Tablet from Northern California. *Journal of California and Great Basin Anthropology*. 3(2): 286-290.

Parmalee, P. 1970. Birds from Hogup Cave. In: C. Aikens, ed. *Hogup Cave.* Anthropological Papers, Number 93. Salt Lake City: The University of Utah Press. Appendix V.

Pendegraft, S. 2007. Grinding Stone and Pecking Rock: Rock Art of the high Basins, Spanish Springs, Nevada. In: A. Quinlan, ed. *Great Basin Rock Art*. Reno, Nevada: University of Nevada Press.

Pendleton, L. 1985. Material Culture: Artifacts of Stone. In: D. Thomas, ed. *The Archaeology of Hidden Cave, Nevada.* Vol. 61: Part 1. New York: Anthropological Papers of the American Museum of Natural History. CH 14.

Petrie, F. 1914. *Amulets*. London: Constable & Company Ltd.

Pilling, A. 1957. An Incised Pebble from Lassen County. *University of California Archaeological Survey Reports*. 38(51): 6.

Plog, S. 1980. *Stylistic Variation in Prehistoric Ceramics: Design Analysis in the American Southwest*. Cambridge: Cambridge University Press.

Pollard, J. 2008. Deposition and Material Agency in the Early Neolithic of Southern Britain. In: B. Mills, and W. Walker, eds. *Memory Work*. Santa Fe, New Mexico: Archaeologies of Material Practices.

Powers, R. 1969. *Archaeological Investigations in Willow Creek Canyon, South Eastern Idaho*, 1966. Occasional Papers of the Idaho State University Museum 25.

Puseman, K., Cummings, L., Ruggiero, L., and Moutoux, T. 2000. Pollen and Macofloral Analysis. In: R. Ahlstrom, ed. *Pithouse Excavations at the Park Wash Site (42KA4280), Grand Staircase-Escalante National Monument, south central Utah*. Las Vegas, Nevada: HRA, Inc. Conservation Archaeology.

Q

Quade, J. 1986. Late Quaternary Environmental Changes in the Upper Las Vegas Valley, Nevada. *Quaternary Research.* 26: 340–357.

Quinlan, A. 2007. Integrated Rock Art with Archaeology: Symbolic Culture as Archaeology. In: A. Quinlan, ed. *Great Basin Rock Art*. Reno, Nevada: University of Nevada Press.

R

Rapp, G. 2009. *Archaeomineralogy*. Berlin: Springer.

Rea, J. 1973. The Romance Data of the Pilot Studies for Glottochronology. *Current Trends in Linguistics.* 11:355–367.

Reinach, S. 1903. L'art et la Magie à Propos des Peintures et des Gravures de l'Âge de Rennes. L'Anthropologie. V (14): 257-266.

Renfrew, C. 1985. *The Archaeology of Cult: The Sanctuary of Phylakopi*. London: Thames and Hudson.

Renfrew, C. and Bahn, P. 2008. *Archaeology: Theories, Methods and Practice*. London: Thames and Hudson.

Rhode, D. 2008. Building an Environmental History of the Great Basin. In: D. Fowler and C. Fowler, eds. 2008. *The Great Basin: People and Place in Ancient Times*. Santa Fe, New Mexico: School for Advanced Research Press Publishing.

Richens, L. and Billat, S. 1989. Site 26-CK-4440. [Unpublished Document] Project 2003 Kern River Expansion, in Clark County, Nevada. Las Vegas, Nevada: Harry Reid Center for Environmental Studies, the University of Nevada, Las Vegas.

Richards, C. and Thomas, J. 1984. Ritual Activities and Structured Deposition in Later Neolithic Wessex. In: R. Bradley and J. Gardiner, eds. *Neolithic Studies: A View of Current Research*. Oxford: Oxford.

Ritter, E. 1980. A Historic Aboriginal Structure and Its Associations, Panamint Mountains, California. *Journal of California and Great Basin Anthropology*. 2(1): 97-113.

Robinson, P. 2014. Time Line. *Ancient Egypt Magazine*. 1(14): 4.

Rollefson, G. 1992. A Neolithic board game from Ain Ghazal, Jordan. The American Schools of Oriental Research 286. 1-5.

Roller, L. 2009. *The Incised Drawings from Early Phrygian Gordion*. Philadelphia: University of Pennsylvania Press.

Ruby, J. 1953. *Archaeological Survey of Western Utah No. 12*. Salt Lake City: University of Utah Press.

S

Santini, J. 1974. A Preliminary Report on the Analysis of Incised Stones from Southern Nevada. *Nevada Archaeologist*. 2(1): 4-14.

Schiffer, M. 1972. Archaeological Context and Systemic Context. *American Antiquity*. 37 (2): 156-165.

Schmitt, D. and Madsen, D. 2004. *Camels Back Cave.* [Unpublished document on CD] Camel's Back Cave. Salt Lake City, Utah. Utah Museum of Natural History.

Schmitt, D. and Madsen, D. 2005. Camels Back Cave. University of Utah Anthropology Papers 125. Salt Lake City: University of Utah Press.

Schmitt, D. and Lupo, K. 2005. The Camels Back Cave Mammalian Fauna. In: D. Schmitt, and D. Madsen, eds. *Camels Back Cave*. Salt Lake City, Utah: The University of Utah Press. CH 7.

Schmitt, D. and Shaver, M. 2005. *Site Stratigraphy and Chronology*. In: D. Schmitt, and D. Madsen, eds. *Camels Back Cave*. Salt Lake City, Utah: The University of Utah Press. Ch 3.

Schmitt, D., Hunt, J., Page, D., and Callister, K. 2005. Miscellaneous Artifacts: Historic Materials, Ground Stone, and Modified Wood, Bone, and Shell. In: D. Schmitt, and D. Madsen, eds. *Camels Back Cave*. Salt Lake City, Utah: The University of Utah Press. Ch 9.

Schmitt, D., Monson, W., and Shaver, W. 2005. Site Stratigraphy and Chronology. In: D. Schmitt, and D. Madsen, eds. *Camels Back Cave*. Salt Lake City, Utah: The University of Utah Press. CH 3.

Schmitt, D., Shaver, M., and Hunt, J. 1994. From Here to Antiquity: Holocene Human Occupation on Camels Back Ridge, Tooele County, Utah. *Utah Archaeology*. 7(1): 35-50.

Schoenwetter, J. 1981. Prologue to a Contextual Archaeology. *Journal of Archaeological Science*. 8: 367-379.

Schroeder, B. 1991. Natufian in Central Béqaa Valley, Lebanon. In: O. Bar-Yosef, and F. Valla, eds. *The Natufian Culture in the Levant*. Ann Arbor, Michigan: International Monographs in Prehistory. PP 43-80.

Schroedl, A., ed. 1995. *Open Site Archaeology in Little Boulder Basin: 1992 Data Recovery Excavation in the North Block Heap Leach Facility Area, North-Central Nevada.* Cultural Resources Report 492-02-9317, Little Boulder Basin Series Number 3. Salt Lake City, Utah: P-III Associates, Inc. Submitted to: Elko, Nevada: Bureau of Land Management, Elko District.

Schroedl, A. ed. 1996. *Open Site Archaeology in Little Boulder Basin: 1993 – 1994 Data Recovery Excavations in the North Block Tailing Impoundment Area, North-Central Nevada.* Vol 1. Cultural Resources Report 5039-01-9601, Little Boulder Basin Series Number 7. Salt Lake City, Utah: P-III Associates, Inc. Submitted to: Elko, Nevada: Bureau of Land Management, Elko District Office. BLM Report 1-1614(P).

Schroedl, A., ed. 1998. *Open Site Archaeology: 1996 Bootstrap Data Recovery Excavations, North-Central Nevada.* Cultural Resources Report 5082-01-9804, Little Boulder Basin Series Number 12. Salt Lake City, Utah: P-III Associates, Inc. Submitted to: Elko, Nevada: Bureau of Land Management, Elko District Office. BLM Report 1-1897(P).

Schroedl, A. and Tallman, D. 1997. *Surface Collection, Mapping, and Testing of 26EK5278, Eureka County, Nevada.* Cultural Resource Report 5063-02-9716, Little Boulder Basin Series Number 10. Salt Lake City, Utah: P-III Associates, Inc. Submitted to: Carlin, Nevada: Newmont Gold Company.

Schuster, C. 1968. Incised stones from Nevada and elsewhere. *Nevada Archaeology Survey Reporter* 2(5): 4-23.

Shimkin, D. 1986. Eastern Shoshone. In: W. L. d'Azevedo, ed. *Handbook of North American Indians: Great Basin*. 11. Washington, DC: Smithsonian Institution Press.

Shanks, M, and I. Hodder. 1995. *Interpreting Archaeology: Finding Meaning in the Past*. New York: Routledge.

Shock, M. 2007. A Regional Settlement System Approach to Petroglyphs: Application to the Owyhee Uplands, Southeastern Oregon. In: A. Quinlan, ed. *Great Basin Rock Art*. Reno, Nevada: University of Nevada Press.

Simms. S. 2008. Ancient Peoples of the Great Basin & Colorado Plateau. Walnut Creek: Left Coast Press.

Simona, P. 2005. Decorated Stones from the Open-Air Site of Zemono, Slovenia. *World Archaeology*. 37(4): 637-640.

Skinner, H. 1933. Maori Amulets in Stone, Bone, and Shell. *The Journal of the Polynesian Society*. 42(168): 310-320.

Skinner, H. and Phillipps, W. 1953. *The Journal of the Polynesian Society*. 62(2): 169-195.

Spencer, B. and Gillen, F. 1927. *The Arunta: A Study of a Stone Age People Vol. II*. London: Macmillan.

Spector, J. 1998. What This Awl Means: Towards a Feminist Archaeology. In: R. Preucel and I. Hodder, ed. *Contemporary Archaeology In Theory: A Reader*. Singapore: Blackwell Publishing. PP 485-500.

Stevenson, R. 1955. Pictish Art. In: F Wainwright, ed. *The Problem of the Picts*. Edinburgh: Thomas Nelson and Sons. PP 97-128.

Steward, J. 1938. *Basin-Plateau Aboriginal Sociopolitical Groups*. Bureau of American Ethnology Bulletin No. 120. Washington DC: Smithsonian Institution.

Stine, S. 1998. Medieval Climatic Anomaly in the Americas. In: A. Issar and N. Brown, eds. *Water, Environment and Society in Times of Climatic Change*. Dordrecht: Kluwer Academic Publishers. PP 43-67.

Stone, A. 1996. The Cleveland Plaque: Cloudy Places of the Maya Realm. In: M. Macri and J. McHargue, eds. *Eighth Palenque Round Table, 1993*. San Francisco: Pre-Columbian Art Research Institute. Available through: <Mesoweb.com> [Accessed June 2014].

Stone, B. and Balser, C. 1965. Incised Slate Disk from Atlantic Watershed of Costa Rica. *American Antiquity*. 30(3): 310-329.

Stoner, E., Mehls, S., and Rusco, M. 1997. *A Cultural Resource Inventory of BLM Parcels for the Proposed Big Springs Ranch Land Exchange Elko County, Nevada. Volume I*. Cultural Resource Report: CRR-1-1577. Sparks, Nevada: Western Cultural Resource Management, Inc. Submitted to: Elko, Nevada, Bureau of Land Management Elko District.

Stuart, G. 1988. *A Guide to the Style and Content of the Series Research Reports on Ancient Maya Writing.* Contributions to American Anthropology and History 5(24). Publication 509. Washington, DC: Carnegie Institution of Washington. PP 1-17.

Stroh, K. 1995. Incised Stone Analysis. In: A. Schroedl, ed. *Open Site Archaeology in Little Boulder Basin: 1992 Data Recovery Excavation in the North Block Heap Leach Facility Area, North-Central Nevada.* Cultural Resources Report 492-02-9317, Little Boulder Basin Series Number 3. Salt Lake City, Utah: P-III Associates, Inc. Submitted to: Elko, Nevada: Bureau of Land Management, Elko District.

Stroh, K. 1996a. Incised Stone. In: A. Schroedl, ed. *Open Site Archaeology in Little Boulder Basin: 1993 – 1994 Data Recovery Excavations in the North Block Tailing Impoundment Area, North-Central Nevada.* Vol 1. Cultural Resources Report 5039-01-9601, Little Boulder Basin Series Number 7. Salt Lake City, Utah: P-III Associates, Inc. Submitted to: Elko, Nevada: Bureau of Land Management, Elko District Office. BLM Report 1-1614(P).

Stroh, K. 1996b. Site 26EK5271 Incised Stone Descriptions. In: B. Tipps Ed. *Open Site Archaeology Near Upper Boulder Creek: Data Recovery Excavation at Sites 26EK5270, 26EK5271, and 26EK5274 in the East Basin Development Area, Elko County, Nevada.* Cultural Resource Report 5032-01-9609, Little Boulder Basin Series Number 8. Salt Lake City, Utah: P-III Associates, Inc. Submitted to: Elko, Nevada: Bureau of Land Management, Elko District. BLM Report 1-1753(P).

Stroh, K. 1997. Incised Stone Artifacts. In: A. Schroedl and D. Tallman, eds. *Surface Collection, Mapping, and Testing of 26EK5278, Eureka County, Nevada.* Cultural Resource Report 5063-02-9716, Little Boulder Basin Series Number 10. Salt Lake City, Utah: P-III Associates, Inc. Submitted to: Carlin, Nevada: Newmont Gold Company.

Stroh, K. 1998. Incised Stones. In: A. Schroedl, ed. *Open Site Archaeology: 1996 Bootstrap Data Recovery Excavations, North-Central Nevada.* Cultural Resources Report 5082-01-9804, Little Boulder Basin Series Number 12. Salt Lake City, Utah: P-III Associates, Inc. Submitted to: Elko, Nevada: Bureau of Land Management, Elko District Office. BLM Report 1-1897(P).

Sutton, M. 1991. *Archaeological Investigations at Cantil Fremont Valley, Western Mojave Desert, California*. Occasional papers in Anthropology. Bakersfield, California: California State University, Bakersfield Museum of Anthropology.

Sutton, M. 1987. Excavation at CA-SBR-3829, The Denning Springs Rockshelter, Avawatz Mountains, San Bernardino County, California. In: M. Sutton, ed. *Papers on the Archaeology of the Mojave Desert*. Salinas: Coyote Press Archives of California Prehistory. 10.: 115-139.

Sutton, M., Robinson, R., and Gardner, J. 2009. Excavations at the Red Rock Canyon Rockshelter (CA-KER-147), Western Mojave Desert, California. *Pacific Coast Archaeological Quarterly*. 42(2 & 3): 17-90.

Sutton, M. and Schneider, J. 1996. Archaeological Investigations at Guapiabit: CA-SBR-1913. *Quarterly*. 43(4): 22-26.

Swanson, R. 2011. *A Comprehensive Analysis of the Swallow Shelter (42bo268) Faunal Assemblage and Remnant Cave*. Masters. Washington state university.

T

Taçon, P. and Chippindale, C. 1998. An Archaeology of Rock-art Through Informed Methods and Formal methods. In: C. Chippindale and P. Taçon, eds. *The Archaeology of Rock-Art*. Cambridge: Cambridge University Press.

Talbot, R. 2000a. Fremont Architecture. In: J. Janetski, R. Talbot, D. Newman, L. Richens, and J. Wilde. *Clear Creek Canyon Archaeological Project: Results and Synthesis.* Occasional Papers 7.Salt Lake City, Utah: Brigham Young University Museum of Peoples and Cultures. PP 131-184.

Talbot, R. 2000b. Fremont Settlement Patterns and Demography. In: J. Janetski, R. Talbot, D. Newman, L. Richens, and J. Wilde. *Clear Creek Canyon Archaeological Project: Results and Synthesis.* Occasional Papers 7.Salt Lake City, Utah: Brigham Young University Museum of Peoples and Cultures. PP 201-230.

Talbot. R., and Richens, L. 1996. Steinaker Gap: An Early Fremont Homestead. Salt Lake City, Utah: Brigham Young University Museum of Peoples and Cultures. Occasional Paper 4.

Talbot, R. and Richens, L. 2004. Fremont Farming and Mobility on the Far Northern Colorado Plateau. Salt Lake City, Utah: Brigham Young University Museum of Peoples and Cultures. Occasional Paper 10.

Talbot, R., Baker, S., and Janetski, J. 2005. Project Synthesis: Archaeology in Capitol Reef National Park. In: J. Janetski, L. Kruetzer, R. Tablot, L. Richens, and S. Baker. *Life on the Edge: Archaeology in Capital Reef National Park.* Salt Lake City, Utah: Brigham Young University Museum of Peoples and Cultures. Occasional Paper 11. PP 351-407.

Tankersley, K., Waters, M., Stafford, T. 2009. Clovis and the American Mastodon at Big Bone Lick, Kentucky. *American Antiquity*. 74 (3): 558-567.

Tetraktis Studio. http://www.tetraktis-studio.gr/gamepress_en.php?vid=9&img=1. Accessed 14/08/15.

Tilley, C. 2004. *The Materiality of Stone: Explorations in Landscape Phenomenology*. Oxford: Berg.

Tipps, B, ed. 1996. *Open Site Archaeology Near Upper Boulder Creek: Data Recovery Excavation at Sites 26EK5270, 26EK5271, and 26EK5274 in the East Basin Development Area, Elko County, Nevada.* Cultural Resource Report 5032-01-9609, Little Boulder Basin Series Number 8. Salt Lake City, Utah: P-III Associates, Inc. Submitted to: Elko, Nevada: Bureau of Land Management, Elko District. BLM Report 1-1753.

Thomas, D. 1983a. The Archaeology of Monitor Valley 2: Gatecliff Shelter. New York: Anthropological Papers of the American Museum of Natural History.

Thomas, D. 1985. *The Archaeology of Hidden Cave, Nevada*. 61(1). New York: Anthropological Papers of the American Museum of Natural History.

Thomas, D. 1988. The Archaeology of Monitor Valley: 3 Survey and Additional Excavations. New York: Anthropological Papers of the American Museum of Natural History.

Thomas, D. and Mayer, D. 1983. Behavioral Faunal Analysis of Selected Horizons. In: D. Thomas, ed. *The Archaeology of Monitor Valley 2: Gatecliff Shelter*. New York: Anthropological Papers of the American Museum of Natural History. Ch 18.

Thomas, D. 2012. *New Radiocarbon Dates for Gatecliff Shelter*. [Email] Personal Communication, December 13, 2012.

Thomas, D. 2014. Why did Foraging Families Spend Summers at 11,000 Feet? In: N. Parezo and J. Janetski, eds. *Archaeology in the Great Basin and Southwest*. Salt Lake City: University of Utah Press.

Thomas, D. and Bierwirth, S. 1983a. Material Culture of Gatecliff Shelter: Projectile Points. In: D. Thomas, ed. 1983. The Archaeology of Monitor Valley 2: Gatecliff shelter. New York: Anthropological Papers of the American Museum of Natural History. CH 9.

Thomas, D. and Bierwirth, S. 1983b. Material Culture of Gatecliff Shelter: Additional Stone Tools. In: D. Thomas, ed. 1983. The Archaeology of Monitor Valley 2: Gatecliff shelter. New York: Anthropological Papers of the American Museum of Natural History. CH 10.

Thomas, T. 1981. Incised Stones Classifications, Ruby Cave. [Unpublished manuscript] Davis, California: Anthropology Museum at the University of California, Davis.

Thomas, T. 1983b. Material Culture of Gatecliff Shelter: Incised Stones. In: D. Thomas, ed. The Archaeology of Monitor Valley 2: Gatecliff Shelter. New York: Anthropological Papers of the American Museum of Natural History. Ch 11.

Thomas, T. 1983c. Rock Art of Gatecliff Shelter. In: D. Thomas, ed. 1983. The Archaeology of Monitor Valley 2: Gatecliff shelter. New York: Anthropological Papers of the American Museum of Natural History. CH 15.

Thomas, T. 1983d. The Visual Symbolism of Gatecliff Shelter. In: D. Thomas, ed. 1983. The Archaeology of Monitor Valley 2: Gatecliff shelter. New York: Anthropological Papers of the American Museum of Natural History. CH 17.

Thompson, R. 1984. Late Pleistocene and Holocene Environments in the Great Basin. Ph.D. University of Arizona, Tucson.

Thompson, R. 1990. Late Quaternary vegetation and climate in the Great Basin. In: J. Betancourt, T. R. Van Devender, and P. Martin, eds. *Packrat Middens: The Last 40,000 Years of Biotic Change*. Tucson: University of Arizona Press.

Thompson, R. and Hattori, E. 1983. Paleobotany of Gatecliff Shelter: Packrat (Neotoma) Middens from Gatecliff Shelter and Holocene Migrations of Woodland Plants. In: D. Thomas, ed. The Archaeology of Monitor Valley 2: Gatecliff Shelter. New York: Anthropological Papers of the American Museum of Natural History.

Thompson, R. and Kautz, R. 1983. Pollen Analysis. In: D. Thomas, ed. 1983. The Archaeology of Monitor Valley 2: Gatecliff shelter. New York: Anthropological Papers of the American Museum of Natural History.

Thompson, R., Toolin, L., Forester, R., and Spencer, R. 1990. Accelerator-Mass Spectrometer (AMS) Radiocarbon Dating of Pleistocene Lake Sediments: In the Great Basin. *Palaeogeography, Palaeoclimatology, Palaeoecology*. (78): 301–313.

Thompson, R., Whitlock, C., Bartlein, P., Harrison, S., and Spaulding, W. 1992. Climatic Changes in the Western United States since 18,000 yr B.P. In: H. Wright, J. Kutzbach, T. Webb III, W. Ruddiman, F. Street-Perrott, and P. J. Bartlein, eds. *Global Climate since the Last Glacial Maximum*. Minneapolis: University of Minnesota Press.

Townsend, E. 1959. *Birdstones of the North American Indian*. Indianapolis: Privately Printed.

Treganza, A. and Malamud, C. 1950. The Topanga Culture First Season's Excavation of the Tank Site, 1947. *University of California Press, Anthropological Records*. 12(4):129-169.

Troitskaya, T., Savin, A., and Solodovskaya, O. 2007. Hollow Animal Figurines of the Verkhneobskaya Culture, The Novosibirsk Region. *Archaeology, Ethnology & Anthropology of Eurasia*. 32(4): 67-76.

Tuohy, D. 1967. An Incised Stone Tablet from Douglas, County, Nevada. *Nevada Archaeological Survey Reporter*. 1(7): 7-10.

W

Wadley, L. 2012. Revisiting Later Stone Age Collections from Big Elephant Shelter, Namibia. *South African Archaeological Bulletin*. 67(195): 101-107.

Wainwright, G. 1971. The Excavation of a Fortified Settlement at Walesland Rath, Pembrokeshire. *Britannia*. 2: 48-108.

Warren. C. and Crabtree. R. 1986. Prehistory of the Southwestern Area. In: W. L. d'Azevedo, ed. *Handbook of North American Indians: Great Basin*. 11. Washington, DC: Smithsonian Institution Press.

Webster, D., Evans, T., and Sanders, W. 1993. *Out of the Past: An Introduction to Archaeology.* Mountain View: Mayfield.

Weinreb, E. 2011. Illustration of Roumdabout*.* In: J. Durham, au. McKinleyville Press Blog. 14 Feb 2011. Available at: < http://mckinleyvillepress.wordpress.com/2011/02/14/coming-soon-to-school-road-in-mckinleyville/> [Accessed 26 Sept 2014].

Welcott, A. 2001. The Archaeology of Ruby Cave, Elko County, Nevada. [Unpublished Document] Ruby Cave. Davis, California: University California, Davis Department of Anthropology Museum.

Wernecke, C. and Collins, B. 2010. Patterns and Process: Some Thoughts on the Incised Stones from the Gault Site, Central Texas, United States. Symposium at the IFRAO Congress.

Werner, R. 1980. A Ship Incised on Slate Found Near Bodega, Sonoma County, California. *Journal of California and Great Basin Anthropology*. 2(2).

Whitehouse, R. 2007. Gender Archaeology and Archaeology of Women: Do We Need Both? In: S. Hamilton, R. Whitehouse, K. Wright, eds. *Archaeology and Women: Ancient and Modern Issues.* Walnut Creek: Left Coast Press.

Wheeler, S. 1942. The Archaeology of Etna Cave, Lincoln County, Nevada. In: D.. Fowler, D. Madsen, and E. Hattori, eds. 1972. *Prehistory of Southeastern Nevada No 6*. Reno, Nevada: Desert Research Institute in Social Sciences.

Wheeler, S. 1973. *The Archaeology of Etna Cave, Lincoln County, Nevada*. Reno, Nevada: Desert Research Institute Publications in the Social Sciences.

Whitley, D. 1994a. By the hunter, for the Gatherer: Art Social Relations and Subsistence Change in the Prehistoric Great Basin. *World Archaeology*. V(25): 357-373.

Whitley, D. 1994b. Ethnography and Rock Art in the Far West: Some Archaeological Implications. In: D. Whitley and L. Loendorf, eds. *New Light on Old Art*. Los Angeles: Institute of Archaeology, University of Archaeology.

Whitley, D. 1998c. Shamanism, Natural Modeling, and the Rock Art of the Far Western North American Hunter Gatherers. In: A. Turpin, ed. *Shamanism and Rock Art in North America*. Special Publication I. San Antonio, Texas: Rock Art Foundation.

Wigand, P. 2002. Prehistoric Dynamics of Piñon Woodland in the Northern Owens Valley Region and Beyond as Revealed in macrofossils from Ancient Woodrat Middens. In: J. Eerkens and J. King, eds. *Phase II Archaeological Investigations for the Sherwin Summit Rehabilitation Project, U.S. Highway 395, Inyo and Mono Counties, California*. Davis, California: Far Western Anthropological Research Group, Inc. Appendix I.

Wigand, P. and Rhode. D. 2002. Great Basin Vegetational History and Aquatic Systems. In: R. Hershler, D. Madsen, and D. Currey, eds. *Great Basin Aquatic Systems History*. Smithsonian Contributions to the Earth Sciences 33.

Wigand, P. and Nowak, C. 1992. Dynamics of Northwest Nevada Plant Communities During the last 30,000 Years. In: C. Hall, Jr, V. Doyle-Jones, and B. Widawski, eds. *The History of Water: Eastern Sierra Nevada, Owens Valley, White Inyo Mountains*. White Mountain Research Station Symposium Volume 4.

Wilde, J. and Newman, D. 1989. Late Archaic Corn in the Eastern Great Basin. *American Anthropologist.* 91:712-720.

Wilde, J. and Soper, R. 1999. *Baker Village: Report of Excavations, 1990-1994*. Salt Lake City, Utah: Brigham Young University, Museum of Peoples and Cultures. Brigham Young University Technical Series 99-12.

Wilde, J. and Tasa, G. 1991. A Woman at the Edge of Agriculture: Skeletal Remains from the Elsinore Burial Site, Sevier Valley, Utah. *Journal of California and Great Basin Anthropology.* 13:60-76.

Wilde, J., Newman, D., and Godfrey, A., 1986. *The Late Archaic / Early Formative Transition in Central Utah: Pre-Fremont Corn from the Elsinore Burial, Site 42SV2111, Sevier County, Utah*. Salt Lake City, Utah: Brigham Young University, Museum of Peoples and Cultures. Brigham Young University Technical Series 86-20.

Willoughby, C. 1898. *Prehistoric Burial Places in Maine.* Archaeological and Ethnological Papers of the Peabody Museum, Harvard University. 1(6). Cambridge, Massachusetts: Peabody Museum of American Archaeology and Ethnology.

Wormington, H. 1946. Jesse Dade Figgins, 1867-1944. *American Anthropologist*. V48(1): 75-77

Woody, A. 2000. How to do things with Petroglyphs: The Power of Place in Nevada, USA. Ph.D. University of Southampton, Southampton.

Y

Yuan, F., Linsley, B., Lund, S., and McGeehin, J. 2004. A 1200 Year Record of Hydrologic Activity in the Sierra Nevada from Sediments in Walker Lake, Nevada. Geochemistry Geophysics Geosystems. 5(3):1–13.

Z

Zdanowicz C., Zielinski G., and Germani M. 1999. Mount Mazama eruption: Calendrical age verified and atmospheric impact assessed. *Geology. V 27(7): 621-624.*

Zilháo, J. 2007. The Emergence of Ornaments and Art: An Archaeological Perspective on the Origins of “Behavioural Modernity”. *Journal of Archaeological Research*. 15(1): 1-54.