

THESIS

UNBELIEVABLY DEEP: A CHRONOLOGICAL ASSESSMENT OF THE
HELLS MIDDEN SITE (5MF16), CASTLE PARK, COLORADO

Submitted by

Spencer T. Little

Department of Anthropology and Geography

In partial fulfillment of the requirements

For the Degree of Master of Arts

Colorado State University

Fort Collins, Colorado

Spring 2024

Master's Committee:

Advisor: Jason M. LaBelle

Mary Van Buren
Matthew Cooperman

Copyright by Spencer T. Little 2024

All Rights Reserved

ABSTRACT

UNBELIEVABLY DEEP: CHRONOLOGICAL ASSESMENT OF THE HELLS MIDDEN SITE (5MF16), CASTLE PARK, COLORADO

During the 1940s, the University of Colorado Museum of Natural History conducted archaeological investigations of sites in the Castle Park region of the Yampa River. One of these sites, Hells Midden, was recognized early in this work as a significant site for the depth of deposits and their ability to provide a sequence of occupation within this region of the Yampa Canyon where many Fremont sites had been recently described. The cultural stratigraphy at this site, exceeding four meters in depth, was expected to provide a chronological sequence which could be used for relative dating of other sites in the region. Intensive excavation of the site in 1948 and '49, and smaller excavations in 1940 and '47, revealed an intact stratigraphic sequence at the site with relatively high densities of material deposits. Despite recognition of the site's potential, little work has been done with the assemblage since the initial curation and reporting.

This thesis summarizes the results of a reanalysis of the Hells Midden assemblage. Research goals for this project were derived from questions the initial archaeologists had about these deposits: how old are they?, and how did settlement strategy expressed at the site change through time? The results of thirteen radiocarbon dates of the assemblage show a deep sequence of occupation, beginning intensively in the early Middle Archaic era (from a depth of 350 cmbs) and continuing through the Fremont occupations; an absence of dates was noted for the Late Archaic era despite contiguity of the stratigraphy. Fremont occupations were shown to agree with the sequence secured through previous radiometric work at nearby sites. For the second

question, a comparison of the assemblage collected from each excavated context in 1948 and '49 was conducted by ranking multiple quantifiable metrics derived from artifactual analysis. These data, when compared with notes of the excavators and description of features through much of the site's vertical extent, suggest a relatively intensive use of this site throughout the period represented by the radiocarbon sequence, with a marked increase in the sedentism expressed by inhabitants during the Formative era Fremont occupations. The sum of these results offers insight into the Hells Midden site which makes it ripe for comparison to the regional archaeological record.

ACKNOWLEDGEMENTS

The greatest thanks are owed to the ancestors and all those who came before. Thanks to the countless generations of humans whose being allowed this work. I thank my ancestors for their being which allowed me to be, too.

Thanks also to the land which has offered a dwelling place for the tracks of the past. Following these trails back into time affords us opportunities to be in deeper relation with these places, and I am ever grateful for the way the land receives me.

My father, Jim Little, taught me to think ancestrally—showing me a temporal depth to the world through traditions, material culture, and stories of those who came before. It was this influence that I imagine led me down this dusty trail. My mother, Constance Baucum Little, taught me how to hold a fire for life firmly in my belly. I thank her for always encouraging me to be bold in the world. My sister, Blair, and brother, Griffin, have always remained loyal and loving, and I am grateful for them and their families. My niblings, Daisy and Marley, are gifts to the world! I'd also like to thank Molly Merry for always making time to chat about her days on the Mantle Ranch. You all bring me so much joy.

Tess, Tim, and Tom Carpenter all deserve thanks for sustaining me in these times, each in their own way. Tom has helped me be a better (looking) field scientist, equipping me with a boot-neck holster for my field journal, and a stylish Brunton compass labeled “Property of Denver Water Works.” Thanks to you, Tom, my field fit is fun and functional. Tess taught me to dream and offered me a place to stay dozens of nights over the course of my lab research for this

project. Tim offered me employment raking, mowing, and interior decorating. In a weird way, that too was a workaholic's cure. Love all of you.

Liam Hodgson offered much support in the early idealizing phases of this project. Thanks for always having an ear for me to blurt out archaeological *Eureka!*s. Trap lots and mush more.

Kris Rahner has filled my days with brightness and my nights with lightness. Thanks for dancing, playing, laughing. Thanks for being. And thanks for asking me to be with you. Though I have mostly dreamt in the past, I look forward to our future together.

I thank all the field archaeologists that I've been able to work with during the past three summers. The call of the field rises in me when my indoor, book-learning, and word-writing brain becomes desperate to reset in the sunshine. I've been exceptionally blessed with the opportunity to work with excellent crews during this time. Special thanks here are due to the 2021 and 2022 field school students and the "Oawsh" crew that proved their abilities as archaeologists, mountain scalers, and really good friends following the field school sessions. Thanks to Dr. LaBelle for gathering such wonderful crews together and affording us the opportunities to conduct research in some fantastic locales. Thanks, too, to other folks I've gotten a chance to work with in the field while finishing the program—particularly Madeline Jennings, Lindsay Deaver, Brady Nelson, Mark Cervantes, Nick Simpson, Bailey Kirsten, Delaney Bohn, Paul Burnett, Jody Clauter, Cody Anderson, Daan Means, Dale Pate, Julio RuizDiaz, and Kimberly Truendle.

I'd also like to mention the wonderful folks who offered companionship and some mean bowling during this experience. Will Kane, you are a finer knight than I. Kelton Meyer, you are exceptional in your talents, and it's a wonderful feeling to work with you. Erika Brooks, thanks

for orbiting the same pocket of the Yampa Canyon for a while. It was good to have company in this research—you are the Chili Scoggin to my Edison Lohr! Kim Biela, thanks for tenacious friendship, positive affirmations, and conversations on the weird. I don't know how I would have made it without your ears! To all of you, thank you! I look forward to the day we reunite and grad school seems like a distant memory.

The Creative Writing Department at CSU has also provided hours of entertainment and inspiration, and special thanks are due to Nicholas Wesely and Patrick Carey, who occasionally blessed my apartment with their presence; time spent with y'all reading poetry and making cut ups has been a Godsend and will be majorly missed in my next chapter of life. Thanks to Matthew Cooperman for arranging my meeting with many of these folks and for agreeing to serve on my committee. His suggestion to sit with *The Shoshoneans: The People of the Basin-Plateau* offered me insights into the living peoples of the intermountain west from an outsider perspective. John Kneisely, my connection to this world of incredible artists, has been a major blessing in my life. Thank you for ever drawing new and exciting threads between my heart and the world-mind. Your presence has made everything calmer. Thanks for being.

Thanks to the University of Colorado archaeologists and museum staff of the past and present who made research into this topic possible. Chili Scoggin and Ed Lohr have inspired me as an archaeologist during all my hardest days in the field. Reading their writings and hearing stories of this pair in Castle Park and elsewhere provides stories far more fantastic than fiction. In addition, they were diligent scientists, laying an archaeological foundation for us today. Robert Lister, Robert Burgh, and Herb Dick should also be recognized for their field leadership and subsequent research and publications on their work. Thanks to all the crew members and

students who conducted this work, and for those who came later, like Elaine Anderson, to conduct further analysis into this site's assemblage. May this work live up to y'all's work.

Thanks to Jason LaBelle for his Precontact Colorado and Archaeological Methods courses. The assignments there gave me good opportunities to test drive certain archaeological ideas which I trust will bud in a future spring. Thanks to Andrew Du for selfless assistance on some statistical questions for this project. He was also a great professor while I TA'd, as was Carrie Chenault. Thanks to Ed Henry for his archaeological dating and space-place courses—each of which continue to provide me interesting thoughts from time to time. Thanks Mary Van Buren for the Archaeology of Complexity course and all the fine cheeses we shared; Mary also served on my committee, so thanks for that. The courses at CSU really shook and rebuilt my thinking on many aspects of the archaeological past. Thanks to others in the program, including Mike Orizaga, Hope Radford, Riley Lynch, Alex Pelissero, Ross Campbell, and many others. Thanks, finally, to the collective We at the Grad Worker's Organizing Co-Operative and all those supporters of GWOC within the Anthropology Department.

Thanks to the staff at the Colorado University Museum of Natural History. Christina Cain was a joy to work with, and this entire research hinged on her support and willingness. Thanks for allowing me access and making me feel like a member of the CUMNH team. Thanks to Will Gregg for helping me digitize photos and field records and for giving me near-endless answers to my questions. I see the labor you put into this project, and I hope you see it paid off. Will Taylor and Chance Ward also proved very useful in zooarchaeological questionings and supporting my C14 sampling efforts. Thanks, too, Elena, Katie, and Sam for logistical, technical, and communal inputs to this work. I will remember fondly my several months as a near-*Buff*.

Finally, I'd like to thank a long list of sideline supporters—many folks watching me on this venture offered constant streams of encouragement, and these words served as fuel. I'd especially like to thank the folks at the Pueblo Heritage Museum. You all set me on, and have kept me on, a steady course forward. Thanks to others in Pueblo, particularly folks with the Pueblo Archaeological and Historical Society, Pueblo County Historical Society, and all in the Pueblo arts scene. I especially recognize the currents in me which are fed by Karen Wallace, Bryan Humphreys, Doug Baxter, Cynthia Ramus, and Joel Scherzer. Y'all inspire me every day, and you are never far from my heart.

Thanks to professors who first turned me on to this wild business. Sandy Jackson at Colorado Mountain College gave me my first archaeological experiences in the spring of 2015. Bruce Lutz, my friend and former professor from CSU-Pueblo, deserves the most credit of anyone for pushing me (sometimes with force!) into this field. I am so grateful that he did. Bruce, my life is immeasurably better thanks to you.

A final thanks is due to Anne Whitfield. Anne, you are among my favorite people, and I've failed to let you know. But you are an absolute wonder to watch in the field, at the coffee shop, and in life. Thanks for your tireless patience and encouragement for me.

Funding for this project was secured through financial support from community organizations and the Center for Mountain and Plains Archaeology (CMPA). Thanks to the CMPA, Colorado Archaeological Society's Alice Hamilton award, the Loveland Archaeological Society's Eugene Eisenbarth award, the Colorado Council of Professional Archaeologist's Ward Weakly award, and Colorado State University Department of Anthropology's Karen Greiner fund for supporting my radiocarbon analyses. Thanks to the University of Georgia AMS lab staff for conducting these analyses and answering my questions as needed.

Many friends, family members, spiritual allies, mentors, and comrades remain unnamed. Trust that my love for you all resonates throughout my entire being. I hope you feel your mark on this work and know the impact you have made in my life. The world is so, so big, but you all have made it cozier. Thanks to everyone and everything that has supported me in this effort.

The lines are fallen unto me in pleasant places; yea, I have a goodly heritage.

TABLE OF CONTENTS

ABSTRACT.....	ii
ACKNOWLEDGEMENTS.....	iv
LIST OF TABLES.....	xiv
LIST OF FIGURES.....	xv
Chapter 1: Introduction to Hells Midden.....	1
Description of site.....	1
Research Goals of this Project.....	4
Organization of thesis.....	7
Chapter 2: History of Investigation on the Yampa.....	9
Where CUMNH meets Northwestern Colorado.....	18
1940s Castle Park Research.....	18
Summary of CUMNH Field Work, Spatial Relationship of Excavations, and Site Description.....	48
Subsequent CUMNH work in Dinosaur National Monument.....	51
Conclusions.....	53
Chapter 3: Hells Midden in a Regional Context.....	55
Where is Hells Midden? A discussion of place designations.....	55
Hells Midden Environment Context.....	61

Regional Archaeology.....	68
Paleoindian Era – pre-6000 BC.....	70
Archaic Era – 6000 BC – AD 500.....	73
Late Precontact Era – 500-1500 AD.....	79
Conclusions.....	84
Chapter 4: Hells Midden Assemblage.....	85
Description of site stratigraphy and features:.....	85
Description of Hells Midden Artifacts.....	98
Chipped Stone Artifacts.....	98
Faunal Materials.....	109
Bone tools.....	111
Ground Stone Artifacts.....	112
Other Sources of Interpretation.....	117
Fremont Artifacts.....	117
Summary of Assemblage.....	119
Chapter 5: How Old is Hells Midden?.....	122
Background on Chronometric Research at Castle Park.....	122
Methods for Sample Selection and Interpretation of ¹⁴ C Analysis.....	125
Individual Radiocarbon Results from Hells Midden.....	127
Faunal Samples.....	127

Maize Samples.....	142
Summarizing Radiocarbon Results	145
Conclusion.....	153
Summary Datasets on Radiocarbon Samples.....	158
Chapter 6: Multivariate Analysis of Settlement.....	160
Introduction to the question.....	160
Theoretical Perspectives on Sedentism in the Archaeological Record	161
Markers of Sedentism.....	164
Selecting Markers for Hells Midden	168
Volumetric Calculations of Excavations	169
Chipped Stone Diversity.....	172
Chipped Stone Frequency.....	175
Projectile Point Frequency and Percent Complete	176
Flake Tool Frequency	176
Ground Stone Frequency and Richness.....	177
Bone tool frequency.....	177
Methods and Results of Multivariate Analysis	179
Interpreting Mean Rankings	181
Interpreting Individual Variables.....	184
Summary of Multivariate Analysis	187

Chapter 7: Conclusions	191
References Cited	199
Appendix I – CUMNH Inventory Table	211
Appendix II – Transcribed Archival Materials, CUMNH	242
Appendix III – Additional Archival Photos	246
Appendix IV – Datasheets produced during lab analysis	289
Chipped stone artifact datasheet	289
Ground stone artifact datasheet 1	396
Ground stone artifact datasheet 2 (faces)	406
Appendix V – Artifact classification detail	408
Appendix VI – University of Georgia radiocarbon analysis report	413
Appendix VII – Multivariate Analysis of 1940 and 1947 field seasons	420

LIST OF TABLES

Table 1- Modeled regional climatic data, from Sharpe (2002:312).....	64
Table 2 - Fremont trait lists, synthesized from Morss (1931) and Reed and Metcalf (1999).....	81
Table 3 - Level designations used during 1947, '48, and '49	87
Table 4 - Raw material distributions for all chipped stone artifacts in the assemblage.....	100
Table 5 - Summary radiocarbon data for upper site deposits	154
Table 6 - Summary data gathered on collection items sampled for AMS analysis	158
Table 7 - Summary of UGAMS reported data, sorted by resulting radiocarbon age.	159
Table 8 - Volumetric calculations for comparing density of artifact classes.....	171
Table 9 - Consolidated classification of chipped stone tools for application to Simpson's D....	174
Table 10 - Sample table of Simpson's calculations using Excel.....	174
Table 11 - Summary of chipped stone artifact dataset, used for calculation of Simpson's D.....	178
Table 12 - Results of Multivariate Analysis for 1948 excavations.....	180
Table 13 - Results of Multivariate Analysis for 1949 excavations.....	180

LIST OF FIGURES

Figure 1 - Hells Midden overview. Ed Lohr standing on exposed bank, 1940	2
Figure 2 – (Left) Patrick Lynch monogram on a rock (Right) Another of Lynch's petroglyphs..	12
Figure 3 – H.M. Wormington and George Volk, sitting on Hells Midden in 1947	17
Figure 4 - Edison Lohr on Hells Midden.	21
Figure 5 - Example of 1940 field specimen cards from other sites in Castle Park.....	22
Figure 6 - Burgh's camp at the mouth of Hells Canyon.....	25
Figure 7 - Burgh's test trench, looking south	27
Figure 8 - Burgh's profile illustration with summary level descriptions	28
Figure 9 - Robert Burgh on top of Hells Midden from the perspective of the 1940 units.....	29
Figure 10 – “Jesses” Nusbaum, Jennings, and Lombard at '47 CUMNH camp	30
Figure 11 – (Left) Robert Lister stands in the partially backfilled 1947 trench. (Right) First day of 1948 excavation at the site.....	31
Figure 12 – Trenches 48-I and -II, showing the face of level 2, sections A through F	32
Figure 13 –1949 crew members (David Curtis, back, and Charles Best) clean up wall-fall.....	33
Figure 14 – Illustrations showing the correlation between Burgh’s units and the 1948 trenches.	34
Figure 15 – Construction of the trackway at the beginning of 1948 season.....	34
Figure 16 - Planview illustration of features in 1948 level 3.....	36
Figure 17 - Cache of blades (unmodified spalls) from 1948 Level 3	36
Figure 18 - Planview of floor near contact of 1948 Levels 4 and 5 (200 cmbs)	37
Figure 19 - Lister's summary of "principal traits" at Hells Midden (1951:39).....	38
Figure 20 - Profile of Hells Midden (Lister 1951:Figure 3).	39
Figure 21 – a. Overview shot of 1949 Trench-I following excavation, looking west. b. 1949 Trench-I and -II, maximum depth in photos. c. North wall '49-I.	41
Figure 22 – Duane Roberts screening, David Curtis shoveling fallen sediments from '48-II.....	41
Figure 23 – Screening 1949 sediments atop a massive mound of sediments	43
Figure 24 - Illustration from Dick's transcribed field notes showing 1948 and '49 trenches.....	44
Figure 25 - Lister (1951:8), shows the orientation of 1948-I and -II as well as 1949 units	45
Figure 26 - Unpublished profile illustration from Herb Dick's field notes.....	46
Figure 27 - Level designations for the three field seasons between 1947 and 1949	47
Figure 28 - Reconstructed site overview with excavation units labeled.....	48
Figure 29 - Estimated former extent of Hells Midden	50
Figure 30 – Map of the Colorado Plateau ecoregion, reproduced from Stier (2012)	59
Figure 31 - From Spangler (2002), map of the Uinta Basin Early Archaic occupations.....	75
Figure 32 - From Smith (2016), cultural chronological sequences of Southwestern Wyoming against radiocarbon age frequency for the region.....	78
Figure 33 - From Burgh and Scoggin (1948), a granary feature from Marigold's Cave	83
Figure 34 - Photo of potential “cists, or fireplaces,” in level 1948-3 (Lister 1951:Plate 5).	92

Figure 35 - Quartzite "blades" cached at a depth of 130 cmbs	93
Figure 36 – Lister draft profile illustration, 1948, which emphasizes the “living floors”	94
Figure 37 - Deepest artifact from Hells Midden. Level '49-15 (427-457 cmbs).	97
Figure 38 - Two projectile points from Scoggin and Lohr units	102
Figure 39 – Representative Mallory types from Hells Midden	104
Figure 40 – Split stemmed projectile points from Hells Midden.....	105
Figure 41 - Lanceolate flake-points from 1949 levels 8 and 9 (213-274 cmbs).....	106
Figure 42 - Gypsum points and a reworked drill	108
Figure 43 – Rosegate-like projectile points from Hells Midden.....	109
Figure 44 - Bone tool examples from Hells Midden: dice, awl, sinew seperator, and pendants	111
Figure 45 - Split cobble scraper, evidence both chipping on edge and surface polish.	113
Figure 46 – Paint palette, found at a depth of 122-152 cmbs in 1949 units.	114
Figure 47 – Scoggin’s illustration and photograph of a "cloud blower" or stone pipe.....	114
Figure 48 - Polished iron concretion, from 61-91 cmbs in 1949 units.	115
Figure 49 - Ground slate artifacts from Hells Midden.....	115
Figure 50 - "Stone ball"; Lister called this the deepest artifact from the site (1951:29).	116
Figure 51 - Various ground stones from the Hells Midden site.....	116
Figure 52 –Ceramic vessel illustration from Lister (1951) with photograph of one portion....	118
Figure 53 - More ceramic artifacts from Hells Midden, interior surface.....	119
Figure 54 - Single plot of calibration data for UGAMS# 63527	129
Figure 55 - UGAMS# 63527 before (left) and after sampling.	129
Figure 56 - Single plot of calibration data for UGAMS# 63528.	130
Figure 57 – UGAMS #63528 before (top) and after sampling.	130
Figure 58 - Single plot of calibration data for UGAMS# 63526.	131
Figure 59 - UGAMS#63526, before (left) and after sampling	132
Figure 60 – Single plot of calibration data for UGAMS#63530.	134
Figure 61 – UGAMS# 63530 before (left) and after sampling.....	134
Figure 62 - Single plot of calibration data for UGAMS#63531	135
Figure 63 - Sampled UGAMS#63531 before and after sampling	135
Figure 64 - Single plot calibration data for UGAMS#63529	136
Figure 65 – Hypothetical provenience locations for UGAMS #63529 within 1948-3.....	137
Figure 66 - UGAMS#63529, before and after sampling.	137
Figure 67 - Single plot of calibration data for UGAMS#63532	138
Figure 68 - UGAMS#65352 before and after (right) sampling	138
Figure 69 - Single plot calibration data for UGAMS#63533	139
Figure 70 - UGAMS#63533 before and after sampling.	139
Figure 71 - Single plot calibration data for UGAMS#63534	140
Figure 72 - UGAMS#63534 before and after sampling.	140
Figure 73 - Single plot calibration data for UGAMS#63535	141
Figure 74 - UGAMS#63535 before and after sampling.	141

Figure 75 – (Left) Single plot calibration, UGAMS#63536; (right) sampled cob fragment.	143
Figure 76 - (Left) Single plot calibration data UGAMS#63537; (right) sampled cob fragment.	143
Figure 77 - (Left) Single plot calibration date UGAMS#63538; (right) sampled cob fragment.	144
Figure 78 - Results of the Span query, completed using OxCal 4.4.....	146
Figure 79 – Results of statistically derived "start" Boundary using OxCal 4.4.....	146
Figure 80 - Results of statistically derived Span for the lower Hells Midden sequence	147
Figure 81 - Results of statistically derived "end" Boundary for the lower sequence	147
Figure 82 - Results of statistically derived "start" Boundary for the upper occupation.	148
Figure 83 - Results of statistically derived Span for the upper occupations.....	148
Figure 84 - Results of statistically derived "end" Boundary using OxCal 4.4	149
Figure 85 - Results of Span model for Fremont occupation.....	149
Figure 86 - Multiplot of calibration data for radiocarbon dates from upper site deposits.	150
Figure 87 - Multiplot of calibration data for radiocarbon dates from lower site deposits.	151
Figure 88 - Multiplot of calibrated data for entire radiocarbon sequence.	152
Figure 89 - Example of photogrammetric measurement of units from 1940	169
Figure 90 - Graphical representation of the mean rank values for 1949 and 1948 levels	181
Figure 91 - Graphic showing the positions of radiocarbon dates in relation to the sequence of settlement strategy suggested by the multivariate analysis.....	187

CHAPTER 1: INTRODUCTION TO HELLS MIDDEN

*If in those caverns you shelter take
Plais do to them no harm
Lave everything you find around hanging up or on the ground*

-Pat Lynch “claim notice,” found by the Mantle family (Robinson 1954:26)

Archaeological sites which show repeat occupations over millennia can express changes in human lifeways while controlling for those changes resulting from variable location; single sites like this are also relatively rare in Colorado. Hells Midden is a site in Northwestern Colorado which the University of Colorado Museum excavated in the 1940s. Their work uncovered nearly four meters of archaeological deposits and identified differences in material culture and subsistence packages within stratified context—generalized as an upper Fremont horticulturalist horizon and a lower hunter-gatherer horizon (Lister 1951). These different subsistence regimes are expected to be accompanied by distinctive settlement strategies which would be reflected in the archaeological assemblage recovered from this site. This thesis, will date the deposits using radiocarbon analysis and explore the topic of sedentism through a reanalysis of this legacy collection.

Description of site

Hells Midden is a site located within a prominent mound feature (Figure 1) on the south bank of the Yampa River, approximately 10 linear miles upstream of the confluence with the

Green River. The site is located on private land surrounded by Dinosaur National Monument (DNM) within a 680 acre riparian refugium called Castle Park (Bernard and Prokopetz 2005).

This site contains over four meters of buried cultural deposits, and the accumulation of this site is the result of both cultural and geologic factors. The mound feature that defines the site is an area of depositional accumulation at the base of a bedrock sandstone ledge. Shallow rock shelters are located within this ledge which would have been attractive activity areas for past occupants of the site. The Yampa River, which characterizes the isolated riparian ecosystem in the Castle Park area, is located approximately 100 meters to the north.



Figure 1 - Hells Midden is that mound at the center of the image, at the base of the bluff. The white arrow shows the estimated area of the 1940 excavations, the black shows the area of later excavations. CUMNH caption reads: "Hell's Midden at mouth of Hell canyon, as seen from south, in irrigation ditch, put through by Bill Hall (see Hell's Midden notes). Ed Lohr standing on exposed bank. Cir. May 16, 1940." (ARC.DNM_001_1795)

Castle Park was intensively studied in the 1940s by the University of Colorado Museum of Natural History (CUMNH); primarily these studies identified archaeological phenomena from occupation of the region by the Fremont complex. Hells Midden is particularly interesting in regard to these studies because excavators identified at this site a greater depth of human occupation than was represented by other sites in the region. This thesis work is primarily concerned with a reanalysis of this Hells Midden assemblage. More detailed description of the site's morphology and archaeological assemblage will follow in Chapters 2 and 4, respectively.

The earliest mention of the site in the archaeological literature comes from the journal of Charles Scoggin who, with Edison Lohr, spent 170 days in Castle Park recording archaeological sites and mapping the canyon for the University of Colorado Museum of Natural History. These initial results were published by Robert Burgh, assistant to the director at CUMNH, and Scoggin (posthumously) following additional testing of the site in 1947 by Burgh (1948). In 1948 and '49, CUMNH returned to the site to undertake excavation and train student archaeologists in a summer field school, led by Robert Lister and Herbert Dick, respectively. These latter seasons were responsible for collecting the bulk of the site materials, curated by CUMNH today. Aside from brief mentions in various syntheses on regional archaeology, Lister's monograph on Hells Midden (1951) is the only in-depth analysis of these materials and their context to date.

The assemblage consists of a wide array of organic, lithic, and ceramic artifacts including nearly 100 modified bone tools, more than 900 chipped stone tools, charred corn fragments, ground stone beads and blanks, and caches of hand stones, raw materials, and bifaces. The collection is well-organized within the CUMNH facilities, and access to the collection for this research was generously afforded by that institution. This assemblage is curated alongside other

materials from the Castle Park area, including Mantle's Cave, Marigold Cave, Rat Cave, and other sites studied and excavated during the four CUMNH field seasons mentioned previously. Research in recent decades have focused on these materials (Goff 2010; Sommer 2013; Truesdale 1993), and there remains great potential for research within this assemblage. A thorough inventory of these materials has been produced by CUMNH.

In addition to the well-preserved materials from these Castle Park sites, a rich archival record accompanies the material assemblage. These materials include historic photographs and associated photologs, field notes from student archaeologists and museum/field leadership, materials produced during publication and analysis of the assemblage, and relevant correspondences between DNM officials, CUMNH staff, and archaeologists consulted for reporting and interpretation. For the most part, materials in this archive are sorted logically and cover many aspects of the field work at Castle Park that cannot be gained from analysis of the assemblage, reports, and associated catalog records alone. Some materials from this assemblage have been digitized by the author and CUMNH staff to support this research, although large portions remain only available in physical form. Appendix I offers the summary inventory (and archival catalog designations) for those archival materials relevant to this work.

Research Goals of this Project

This reanalysis of the Hells Midden collection and archive is primarily aimed at addressing two questions about the site assemblage: how old are the deposits uncovered by the CUMNH excavators?, and how did the degree of sedentism practiced by site occupants change through time? All analyses conducted for this project, then, will support inquiry on these themes.

Radiocarbon dating of the assemblage was done on both faunal and floral ecofacts from the site assemblage. This analysis was conducted by the University of Georgia's Center for Applied Isotope Studies and is detailed in Chapter 5 of this work. The sampling methodology, interpretation, and presentation of these dates were guided by recent standards for radiocarbon reporting (Bayliss 2009; Bronk Ramsey 2009; Wood 2015). This analysis is relevant to testing Lister's assessments of two distinctive stratigraphic and material signatures in the deposits, representing a "horticultural" use of the site preceded by a "hunting gathering stage" of occupation (1951:38-42). The "horticultural" horizon is expected to date to the same period as other Fremont materials from Castle Park, shown to span, roughly, 800-1100 AD (Burgh 1950; Goff 2010; Schulman 1950; Truesdale 1993). The lower deposits remain undated, although an estimated age was offered by Lister (1500 BC for the lowest horizons [1951:13-14]). This thesis will provide dates for these lower stratigraphic levels (to a maximum depth of 350 cmbs) and provide evidence for whether occupations represented by the excavated contexts of Hells Midden were continuous. These dates will also provide evidence for the site's stratigraphic integrity, which is useful for assessing the second question of this work.

The second question of this research, how did sedentism vary through time, will be based on an analysis of the material record of habitation at this site. Primarily, this analysis will be conducted by a replicable comparison of multiple, quantifiable variables derived from the assemblage, inspired by Buckner's work (2020). These measures include the density of chipped stone artifacts, variety of ground stone artifacts, and diversity of the chipped stone assemblage, among five others. These analytical dimensions and the methods of this analysis are presented in Chapter 6. The quantifiable variables will be ranked and averaged from each excavated context. This data will then be compared to the qualitative characteristics of the site, including feature

type, description of floors or stratigraphic contexts that suggest intensity of occupation, and nature of the artifact assemblages to merge qualitative assessments of these materials with this quantified analysis. These data will be compared to the results of inquiry into the first research question to compare the degree of sedentism expressed at Hells Midden to other sites within a temporal context. Results of these questions will offer support to regional research into Fremont and Archaic occupations in the far northern Colorado Plateau.

Because of the complexity of understanding and describing sedentism in the archaeological record, a brief discussion of the way these terms will be used and the theoretical basis of these questions is warranted. These ideas will be discussed in more detail within Chapter 6: Multivariate Analysis of Settlement For now, a few points to guide the reader forward:

Sedentism may be thought of as a continuum, with absolute sedentism at one end and absolute mobility at its opposite extreme. It should be obvious that no population or individual can ever be absolutely mobile or sedentary, and it is probably intuitive that at different times in our lives, our positionality along this continuum will change (in our culture this may be during a move, a long backpacking trip, a temporary work reassignment, etc.). Some members of our society today are keen to live a “van life” spending at most days or weeks in a locale before relocating, but as a whole, the archaeological signature of our society would still be interpreted as a sedentary one. This is what is meant when Robert Kelly wrote that mobility is “a property of individuals” (Kelly 1992:44).

But, as in the example above, archaeologists generally describe populations, as individuals are nearly untraceable in the archaeological record. Other aspects of sedentism, such as untangling the equifinal effect of, for example, a short occupation by a large group vs. a lengthy, sparse occupation, may also be very difficult to approach. So, archaeologists must be

explicit about how they are conceiving of, measuring, and interpreting evidence for sedentism in the archaeological record.

For this work, and particularly for the multivariate analysis in Chapter 6, sedentism will be used as a general term to describe archaeological signatures which show high levels of discard, diversity of tool types, and other evidence which suggests populations were relatively less mobile than others. These markers will be explained in full in Chapter 6. The greatest challenge of using these quantitative metrics in an analysis like this is that there are many pathways to the formation of sites with these characters that may not be simply sedentary. For example, occupations which are short-term and transitory but include: 1) high population density, 2) rapid waste accumulation resulting from more intensive activities, or 3) frequently reoccurring occupations within small periods of time, for example, are expected to produce similar archaeological signatures to occupations which are lengthy by populations with low mobility. For this reason, in this work the term *sedentism* will be used as a blanket descriptor for these settlement strategies producing deposits with relatively high diversity, density, and other traits which can all be expected to result from intensive site use, high populations, or frequently recurring occupations. There are ways archaeologists can address these issues of equifinality to argue for one case or the other, and my work in Chapter 6 aims to do this through the careful selection of multiple metrics of the assemblage, the inclusion of additional data sources (such as features and stratigraphic characteristics), and the addition of qualitative assessments of the assemblage's character in order to delineate these similar results of the calculations.

Organization of thesis

This thesis is organized into five body chapters which each address different aspects of this project. Chapter 2 will describe the history of Euroamerican exploration and scientific

investigation within the broad region; the chapter will culminate with description of the CUMNH excavations at Hells Midden in 1940 and 1947-1949. This chapter will discuss challenges presented by different excavation methodologies between these seasons and offer summary spatial data of the site and excavation units.

Chapter 3 will describe the regional context of the site. First, an environmental context will describe the modern ecological conditions surrounding the site as well as paleoenvironmental models for this region. An archaeological context will follow, describing the distinguishing characteristics and chronology of Paleo-, Archaic, and Late Precontact eras of northern Colorado Plateau Indigenous occupations. Chapter 4 will use both data from this reanalysis and the description of excavators to outline the stratigraphy at the site, including the features and vertical position of artifacts and types. This assemblage will be described in detail with accompanying figures, particularly true for chipped stone, bone, and ground stone tools.

Chapters 5 and 6 will present methods and results of the primary research goals: radiocarbon dating of the site and multivariate analysis to understand the intensity of occupation through time. Chapter 5 will describe and provide figures for each of the thirteen sampled ecofacts from the site. Statistical analysis of the radiocarbon dates produced will also seek to understand the duration of occupations at Hells Midden. Chapter 6 will describe the methods used to quantify certain characteristics of the assemblage and compare them in a multivariate ranking. There will also be discussion on how variables were selected and how and why they are expected to increase with greater time spent on site. Chapter 6 will conclude with a comparison of these results to the chronological data presented in the previous chapter.

Chapter 7 will take these ideas and (attempt to) condense the material into a summary vision of past site use. These interpretations will be guided by synthesis of the data previously

presented and will make suggestions for further research which may answer some of the emergent and existing questions related to this research.

CHAPTER 2: HISTORY OF INVESTIGATION ON THE YAMPA

“The day has been a fine one; Mantles have been most hospitable. And now we have our supplies arranged for the winter, and in a few days we’ll set about doing good archaeology. What a wealth from the past this cañon must hold. This evening before dark, Ed and I came upon a 12’ midden deposit at the mouth of Hell Cañon, not 50 feet from Mantle’s place, unseen, perhaps unrecognized is the better adjective, by any one before, which is a treasure chest to be sure. Our first artifacts are from there.” -Scoggin field notes, 12 December 1939 (ARC.DNM01_001_001)

This chapter will introduce Hells Midden in a historical-geographical sense, summarizing historic occupation of the region, scientific and archaeological interest in Castle Park and the surrounding areas, and research conducted by the University of Colorado Museum.

Understanding these initial scientific inquiries into the region can help ground the theoretical perspectives use, highlight the varied field methodologies employed, and contextualize the investigations here within a historical perspective of Euroamerican expansion into indigenous-occupied lands. The chapter will be organized, more or less, temporally, too, beginning with the earliest written record of these lands and concluding with CUMNH research in the second half of the 20th century.

Archaeological research at Hells Midden was primarily undertaken over four field sessions in the 1940s by the University of Colorado Museum of Natural History (CUMNH). Prior to that, the Yampa and Green Rivers attracted European encroachment, exploration, and

expeditions. The earliest-known written accounts of this region were made in 1776 by the Dominguez-Escalante expedition which traveled north on the Green River, reaching Split Mountain before traversing southeast to the White River and Canyon Pintado, within 30 km of Castle Park (Bauer 2022:23-24; Robinson 1954:2). Anglo-Americans followed, with recorded travels in the vicinity of the Green and Yampa Rivers by Wilson Price Hunt and Robert Stuart in 1811 and 1812, respectively. Trappers followed; William Henry Ashley, who was a part of Jedediah Smith's party, recorded his entrée into this land in 1825, navigating the Green River (Burgh and Scoggin 1948:7; Robinson 1954:6). Ashley was one of the first Europeans to connect this drainage to that of the Colorado River; previous maps showed these waterways flowing into the closed basin of the Great Salt Lake (Robinson 1954:11).

Following these informal excursions by Euro-Americans, formal United States investigation of this landscape began. John C. Frémont passed through this area, and the report of his 1842 expedition is among the earliest written references to the name *Yampah* for the river, being a Shoshonean name for a wild carrot which grew “more abundantly, and in greater luxuriance, on one of the neighboring tributaries of the Colorado than in any part of this region” (Frémont 1845:124). John Wesley Powell famously recorded a series of river-based expeditions in 1869 and 1871 which detailed much about the Yampa and Green Rivers (Burgh and Scoggin 1948:8). Information gathered by Powell's expeditions (and, to a lesser extent, Frémont's) is incredibly useful for their ethnographic data. While in the Uinta Basin, Powell's crew even noted “quite abundant” evidence of past peoples, including architectural features and ground stones of a type “not used by nomadic peoples, as they are too heavy to be transported by such tribes” (Powell 1961:184-185, quoted in Spangler 2002:17-18). This quotation suggests the longevity of anthropological inquiry into mobility, temporality, and their material correlates.

These explorers, as well as subsequent 1870-1872 surveys by Ferdinand Hayden and Clarence King, were during the period Spangler refers to as the “Great Explorers” of the Uinta Basin (2002:16-19). This period culminated and concluded in 1876, with Edwin Barber’s publication of “Ancient Art in Northwestern Colorado.” This oddly titled monograph (one of three by Barber in this *Bulletin*) is about chipped stone artifacts collected in North and Middle Parks and along the Yampa and neighboring rivers (Barber 1876). This work is an outlier for being a scientific publication on archaeological research conducted in this early period. It would be nearly 50 years before further scientific inquiry was made on the cultural resources here.

Following this early exploratory period, falling squarely within the century prior to Colorado statehood, there was a major decline in archaeological investigation of the Uinta Basin or Dinosaur National Monument region. This was a time of Euroamerican immigration into the region, lasting from the 1880s to 1930s. It is during this time that one of the region’s more colorful inhabitants moved into the area. Patrick Lynch, “the hermit of Pat’s Hole,” made his home in the many caves and stone recesses within the area, apparently being introduced to the area by “his old friend Major Powell” (Robinson 1954:26). While we have little written record from Patrick Lynch (although there are some; see Robinson 1954:26), we can be certain he encountered the archaeology here based on the presence of his carved monogram and charcoal-etched depictions of ships at sites throughout the Monument (Figure 2 – (Left) Patrick Lynch monogram on a rock with unknown dog and boot).

In 1919, Charley Mantle moved to the mouth of Hells Canyon in Castle Park, receiving 160 acres and marrying Evelyn Fuller in 1926 (Gregg 2022:1). This couple and their family expressed interest, “beyond mere curiosity,” in the preservation of their ranch’s cultural resources and proved such by hosting multiple archaeological expeditions at the property (Burgh

and Scoggin 1948:8; Gregg 2022:1). These ranchers were also critical informants to the teams who worked at their ranch, having previously noted the presence of features and artifacts within some of the cave sites (Burgh and Scoggin 1948:22). Despite the interests of these landowners and the appearance of early writings on the regional archaeology, several factors, including the low population in the area, the rugged and remote terrain, and the professional bias toward Southwestern archaeology, hampered general professional understanding of the archaeology here (LaBelle 2019:1).



Figure 2 – (Left) Patrick Lynch monogram on a rock with unknown dog and boot; (Right) Another of Lynch's petroglyphs; these ship motifs are a common element of this temporally discrete rock art style. The text below the ship appears to read "Cumberland / Lynch 1902."

Slowly this changed, beginning with a pair of *Steamboat Pilot* articles published, within two months of each other, in 1920 and '21. The first article describes Youghal rancher James Loftis' exploration of a substantial architectural complex to the west of the confluence of the Yampa and Green Rivers. These features, described as being formerly "cedar covered with tiles

of baked clay,” were reported by Loftis to be very difficult to access (requiring him to use a rope ladder to descend into a crevice in the rock) (Anonymous 1920:5). This description of grain and storage features within these structures suggests that this site may have represented one of the “well-hidden and difficult-to-reach” granaries found in the Fremont sphere (Madsen and Simms 1998:298), which some have suggested is particularly characteristic of Uinta and Douglas Creek Fremont groups (Spangler 2002:324, 328). Years later, Jeançon (discussed below) attempted to follow up on these findings, though he reports that “Loftis was not very positive in his descriptions...and, although notes were made at the time, it was impossible for us to investigate the matter” (Jeançon 1927).

The expedition reported in the 1921 article described archaeology of the Mantle Ranch. This investigation was conducted by a “quartet” from Craig, who explored the Pats Hole and Castle Park regions between 7 and 31 January 1921. While it is not clear from the article what the men’s associations or expertise was, it does seem they were strictly concerned with uncovering evidence for past peoples in this canyon country. Their brief article is as useful for its description of the material culture in this region as it is for its insights into the climate and environment; the article describes Pat’s Hole as a “winter resort” and notes the varieties and abundance of game they encountered (including, in one tributary, trout “to the brim”). The article describes leaving the snowscape above the river canyon for a winter refugia in the lower elevations:

“Within five hours after they dropped off the rim of Blue Mountain at Youghal, they descended some 200 feet and from deep snows and high winds entered a pocket in the Yampa river canon where there was no snow and where the wind never blows. In fact, in certain spots along the banks of the warm springs, the grass was already green.”

With this and other reports coming from the region, interest among academics in the Uinta Basin grew steadily. Typical of the times, archaeological research in the area was tainted in its methodology and ethic by extractive practices which led to rapid site destruction and frequently haphazard recording. Researchers, primarily associated with museums and universities in the East, swooped in to extract archaeological, paleontological, and ethnographic materials with the goal of displaying the most attractive specimens from the West. Few sites which were recorded up to this period have been matched to current known sites (Spangler 2002:41-42), and the majority of these collections have been neglected or lost after their display, leaving the amount that can be learned from these works quite general indeed. Collections from this period are frequently unanalyzed, unprovenanced, and unavailable to modern researchers. While these multi-disciplinary academic and amateur descriptions of the region did increase the meager understanding of the indigenous occupants, it wasn't until the 1930s that archaeological research here took on a form familiar to our current conceptions of the discipline.

Research which follows these first decades of the 20th century was primarily descriptive; interpretations, when offered, were referential to existing literature, largely explained culture change with reference to diffusion and migration of Basketmaker and Puebloan culture from the Southwest. One early academic investigation was from a nearby institution, the University of Utah. In 1919 and 1920, Andrew A. Kerr led crews to collect Ute artifacts; in 1923, Kerr returned to the Cub Creek and Diamond Mountain areas, in far northeast Utah, for archaeological investigation. In 1928, Kerr returned to investigate sites at Dagget County, Utah, although this, nor any of his previous work, was apparently ever published (Spangler 2002:20).

In the 1920s, Jean Allard Jeançon of the Bureau of American Ethnology was conducting archaeological research in Colorado's southwestern region (Jeançon 1927; Anonymous 1920:5).

He continued work to the North with research in the Green River basin, being inspired and led to the region by the reports from Loftis and McCandless and Kimball, the latter pair being members of the party who explored the area in January of 1921 (Spangler 2002:24; Anonymous 1921).

Jeançon's report included a reprint of the 1921 *Steamboat Pilot* article and described a variety of architectural features his party encountered (Jeançon 1927; Spangler 2002:24). Jeançon's passion for Colorado archaeology was stated in popular press, and in the *Steamboat Pilot* he offers a call-to-action based on Loftis' findings: "This more than ever confirms the statement that Colorado is the cradle of this ancient nomadic civilization and that intelligent work will uncover ruins and relics of incalculable value to science and history" (Anonymous 1920:5).

Between 1930 and 1932, Albert Reagan conducted extensive archaeological investigation in northeastern Utah; particularly of interest for this study, due to their relative proximity to Hells Midden, are his works which focused in the Ashley and Dry Fork Canyons excavating rectilinear earthen lodges, identifying irrigation structures, and recording rock art of the region (Spangler 2002:30-34). Reagan's 1930s bibliography is staggering, publishing more than two dozen works on Utah archaeology (Spangler 2002:558-559). In this one can see the beginning of theoretically derived interpretations regarding the material remains of past cultures. For example, Reagan was an early proponent for a model of Numic expansion in this region as well, writing, "a new people then entered the region...these seem to have had some affiliation with the then Shoshonean peoples...for the glyphs they left show they had bear dances much as they are had by the Utes of the basin today" (Reagan 1933:131). Unlike most modern conceptions of this idea, Reagan believed this spread occurred *prior* to Fremont florescence (Reagan 1933:132).

More work took place in Castle Park in 1933, with a DuBois Expedition spending two days at the Mantle Ranch. In August of that year the Penrose-Taylor Expedition followed,

sponsored by the Colorado Biological Survey, Colorado College, and the Fountain Valley School. This group reported on several cave sites they excavated, including “Cave 1,” their designation for Mantle’s Cave, and described more wet-laid masonry storage features and residential structures (Spangler 2002:36-37). Burgh and Scoggin report that this expedition uncovered “articles of basketry, buckskin, wood, and well-preserved ears of corn” from Mantle’s Cave (1948:22). Wood collected during this expedition was given to the CUMNH, which proved to be the first of many interactions between the museum and this area in the next several decades (Burgh and Scoggin 1948:9; Gregg 2022). These materials were subsequently used to establish dendrochronologies for the region (Brown 1937). A final reported Castle Park research project in this decade was a 1936 Colorado Mountain Club expedition. Their observations, with an interpretation offered by H.M. Wormington (Figure 3), was published the following year (Wormington 1937). Coincidentally, at this same time an anthropology professor from the University of Colorado was recording sites 150 miles away in Range Creek Canyon, Utah, an area recognized today for rich archaeological record of Fremont populations (Spangler 2002:37).

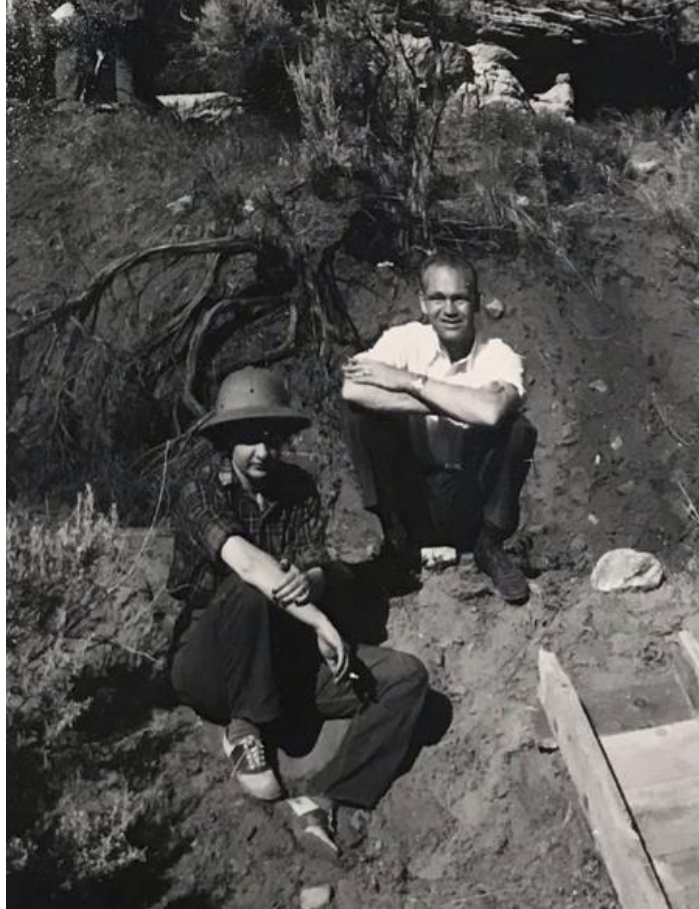


Figure 3 – H.M. Wormington with her husband, George Volk, sitting on the outside wall of the ditch at the base of Hells Midden in 1947. [ARC.DNM04_001_1637]. Wormington, perhaps best known for her work in Paleoindian archaeology, was an early expert on the Fremont Culture, refining hypotheses regarding their origin (1955).

In 1939, two men from Boulder, Frank C. Lee and J. R. Jones, brought several perishable artifacts they had excavated from Mantle’s Cave to Earl Morris, a well-known Southwest archaeologist and associate of the University of Colorado Museum (Burgh and Scoggin 1948:10). These objects included netting, snare bundles, a basketry ladle, and a basket containing fishhooks (Gregg 2022:1). These objects (dubbed “Cache 2”) stirred up enough interest at CUMNH that within a few months the museum had begun a six-month investigation of the precontact archaeology of the Mantle Ranch (Burgh and Scoggin 1948:9).

Where CUMNH meets Northwestern Colorado

The donation of “Cache #2” by Lee and Jones in 1939 opened the door to a decade of CUMNH research into the archaeology of Castle Park. The results of these CUMNH efforts were important for recognizing a fuller range of past human behavior in our state, and this region’s perishable artifacts are among the most well-recognized perishable materials found in Colorado. Inadvertently, this early work on the Mantle Ranch attracted attention from Dinosaur National Monument, which had recently expanded to entirely enclose the Ranch’s lands; the Monument noticed the work of Scoggin and Lohr in 1940, and subsequently required CUMNH to be permitted for continued work at Mantle’s Cave. This contact opened a door to further CUMNH research in the Monument (Breternitz 1970; Leach 1970).

1940s Castle Park Research

1939-40 – Scoggin and Lohr Inventory

It was in November 1939 that Hugo Rodeck, director of the CUMNH, was accompanied by Charles “Chili” Scoggin, student assistant to the director, to far northwestern Colorado to discuss with the Mantle family the potential for archaeological investigation of their ranch. This trip followed just months after the Lee-Jones pair introduced Earl Morris to the excellent archaeological preservation offered by the caves and rock shelters in the region. Archaeological reconnaissance conducted by Scoggin and another student, Edison Lohr, was to begin just a month later (Burgh and Scoggin 1948: 9; Gregg 2022:1).

Scoggin was put in charge of this new research project while pursuing a degree at the University of Colorado and working for the CUMNH (Burgh and Scogging 1948:1). He selected Edison Lohr to accompany him in Castle Park, the pair having developed their talent for archaeological recording alongside one another at the Lindenmeier site under Frank Roberts—

who had cut his teeth near Castle Park as assistant to Jeançon nearly two decades earlier (LaBelle 2019:5; Roberts 1944). Chili Scoggin had a personal magnetism and drive that is felt today when reading his field writings and correspondences. He was well-read on archaeological matters, setting himself apart with an “early and intense interest” in the archaeology of his boyhood home in Northeastern Colorado (LaBelle and Scoggin 2016:89). This passion is evident in his field notes from the Castle Park project.

Scoggin and Lohr arrived at the Mantle’s Ranch on December 12, 1939, driving in from Craig, Colorado. It must have been somewhat surreal for them to turn off from the large flat terrace, 600 feet above the Yampa River, and descend toward the Mantle’s Ranch, knowing the next six months would be spent at work in this landscape. They noted the presence of Hells Midden on their first night in the canyon, collecting their first field specimens, A1 through A8, that evening from around the site.

This six-months’ work was largely focused on excavating Mantle’s Cave. This Cave’s perishable assemblage contained some of the most visually striking artifacts excavated in Colorado (before or since), but it required significant effort to sufficiently sample the exceptionally large extent of the cave (Goff 2010:35-36). Despite Scoggin’s recognition of Hells Midden and the “treasure chest” he guessed it contained, there seemed to be no plan to excavate the site. However, on May 3rd, 1940, Hugo Rodeck, Earl Morris, and Robert Burgh visited the Mantle Ranch to collect specimens and gear in closing of this field session. During their visit, Scoggin fell ill; he laments in his journal “with the soreness in my throat making me miserable and disgusted that a pesky illness should spoil the chance to visit with the Boulder party, I gave up about three o’clock and went to bed.” He records Morris and Burgh fishing and enjoying some leisure time with the Mantle’s whilst Rodeck was gathering biological specimens. While

exploring, Morris noted the potential of Hells Midden and provided a directive to dig. Scoggin writes “Overlooked mentioning day before yesterday...that Earl saw the midden at the mouth of Hell Canyon, and seemed to think it was the most impressive deposit in the region he’d seen. Hope that Ed and I have time to give it some good inspection.” (May 3rd, 1940, Scoggin field notes [ARC.DNM01_001_004]).

Scoggin and Lohr were able to excavate the site just days before packing up for the season. On May 22nd, the site was cleared and prepared for excavation; several artifacts were gathered from the site’s surface and eroding from its exposed side walls. Over the course of May 23rd and 24th, the pair removed over eight cubic meters of sediment from the Midden, collecting more than 350 artifacts including bifaces and projectile points, bone dice and awls, scrapers and drills, a stone pipe or “cloud blower,” and more. Their work apparently entered the site’s deposits horizontally, beginning at the historic irrigation ditch at the base of the site and digging toward the back wall. These excavation units were divided into two areas, dubbed Trench A and B. Scoggin’s notes suggest excavations here reached a maximum depth of six feet six inches (just shy of 2 meters), although as he described (and is apparent in Figure 4), this depth was only removed from the back wall of the shelter, while northeastern unit walls were brought to equal elevation with the irrigation ditch which ran at the base of the Midden.



Figure 4 - Edison Lohr standing on Hells Midden, beneath the sandstone shelf which defines the shelter, before and after 1940 excavation [ARC.DNM04_001_1796 (upper); ARC.DNM04_001_1806 (lower)] . The pair completed this work in just two days (May 23-24, 1940). Unfortunately, provenience data for this season of excavation at Hells Midden has been lost. Note ditch feature, running in a line between Lohr and Scoggin (the photographer) just right of center in the upper photo; excavations removed sediment to an equal elevation with this historic feature. The area excavated in future sessions is just above Lohr's head and to his left in the upper photo Note the stratigraphy visible behind Lohr in the lower photo.

The materials excavated from Hells Midden this year lack provenience records. The pair's work elsewhere in the canyon speaks to their record keeping abilities, with trench, section,

and triangulated provenience of excavated materials carefully recorded on segments of brown paper field specimen forms (Figure 5). Unfortunately for researchers of Hells Midden, there exists an obvious paucity of field catalog labels in the CUMNH archives today. Because it is the only site in Castle Park which received its own University of Colorado Studies volume, it seems probable that these materials were removed during preparation of that work. Given the rapid excavation at the site, provenience data may not have been recorded; Burgh notes “debris...had slumped along the ditch, making segregation of artifacts by level impossible” (1948:26). Transcriptions of this FS series contains no such provenience (ARC.DNM01_001_023).

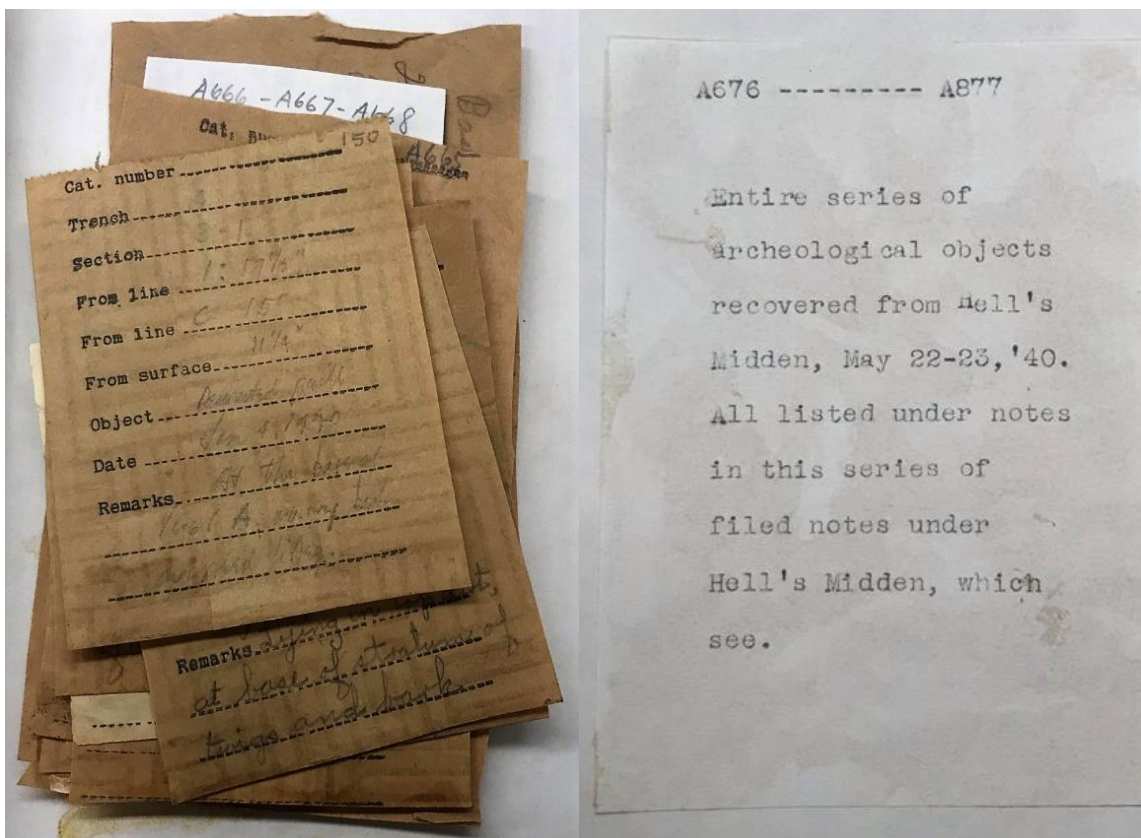


Figure 5 - Example of 1940 field specimen cards from other sites in Castle Park. Hells Midden's sequence (A1 – A8, A676 – A877, A1120) is completely missing from the CUMNH archives where the rest remains. This note was located within the archives where these records should be, but its meaning was not clear.

The pair left the Mantle’s Ranch on May 30, 1940, following 170 days of living in the canyon. Scoggin and Lohr worked tirelessly and without complaint in the winter cold, mapping

Castle Park and recording more than a dozen archaeological sites. For their efforts, which revealed some of the most impressive professionally excavated perishable artifacts in the state, Scoggin and Lohr were paid \$60 and \$40 respectively.

In addition to the rich archaeological data produced from this work, Scoggin and Lohr's time spent with the Mantle family also offered insight into the Euroamerican lore and lifeways of this region. Often these details were reported by Scoggin in rather fanciful ways, where his ability as a writer were demonstrated in his capturing of life in poetic form (see Appendix II for examples of these writings).

Following this field season, Scoggin continued to work for CUMNH in the winter months, working on preparation for a manuscript on the copious materials uncovered during the 1939-40 session. He used his charisma and previous experience to obtain a job with DNM, conducting further archaeological inventory for the park as a temporary ranger in the summer of 1941. In 1942, Scoggin was drafted to the war effort, although he was able to slightly defer his deployment for another summer of DNM field work, this time by boat, along the Yampa River (Roberts 1944:200). During this session he was accompanied by Parks Service officials and the Smithsonian Institution anthropology staff (Gregg 2022:2).

Lohr also served in the war, and upon his return had a long career as historian with the National Park Service (LaBelle 2019:6). Lohr was not much involved in the reporting on this Castle Park work, although he did publish a piece for *Desert Magazine* on the expedition (Lohr 1948). Unfortunately, Scoggin never returned from the war, being killed in action in 1944 (Roberts 1944; LaBelle 2019:6). A half-dozen page, untitled preliminary report on this research was written by Scoggin prior to his deployment and untimely death (ARC.DNM01_01_029).

1947 – Burgh Test Trench

In October of 1947, Robert Burgh, assistant to the director at CUMNH, began an intensive period of research in preparation for the release of a report (Burgh and Scoggin 1948) on the Castle Park investigations of 1939-40. While CUMNH wanted to conduct further field work in the Castle Park region, in part to mitigate sites which were under threat by a proposed Echo Park dam (Cosco 1995; LaBelle 2019:5), there was pressure from NPS officials to first report on the 1939-40 field work (Nusbaum to Burgh, 30 October 1947; reproduced in Appendix II). Prior to his deployment and untimely death, Scoggin had spent many months in the winters of 1941-42, preparing preliminary statements and organizing field forms, photographs, and artifacts from his work in Castle Park. All of this was immensely useful to Burgh, but he decided his ability to complete this report would require firsthand experience of the sites.

Between October 6th and 11th, Burgh tested the Midden during a nearly two-week research and networking trip. He spent time visiting sites, discussing regional archaeology, and viewing local museums and private collections with visiting Park archaeologists Jesse Jennings, and Jesse Nusbaum. He also spent time with DNM Custodian Jesse Lombard. During periods of this trip where Burgh and his party were camped, they stayed on the ranch near the old Mantle house (Figure 6). During other parts of this trip, Burgh stayed in Vernal, Utah, near the Monument's headquarters. Field notes from this trip are interspersed with interpretations and research questions for his upcoming report, suggesting a dedication of mind.

Two extant photos of Burgh's trenches served useful in calculating volumetrics for this present analysis (Figure 7). Burgh notes the presence of a cross in the sandstone, "cut in ledge to mark the spot" of his trench, but it is only thanks to photos and descriptions from the subsequent field sessions that the location of this trench becomes clear. Several pages of Burgh and

Scoggin's report detail the Hells Midden site (1948:26-29) and reference to the materials from this site occur throughout the work. He includes a profile from his work within the final report, and it is reproduced here for comparison to other sessions (Figure 8).



Figure 6 - Burgh's camp, noted in his field journal as being near the original Mantle homestead, at the mouth of Hells Canyon (ARC.DNM04_001_1820).

Burgh recognized, as did Scoggin and Lohr before him, that this site had great potential for understanding the sequence of occupation at Castle Park sites. In addition to three days spent in excavation at Hells Midden, Burgh dug at Mantle's Cave and visited many of the other sites previously recorded. His excavation methods at Hells Midden were standard for CUMNH. He screened the majority of materials (although screen size is not given) and worked hastily. His collection protocol is not explicated, but it is clear that his collected materials were not given individual provenience. Instead, provenience resolution is only to level; lots of artifactual material, based on their class and origin level, were given a single catalog number. For example, all chipped stone from 1947-1 was cataloged as a single lot (UCM #6628). Finally, while Burgh dug and recorded using imperial units (as can be seen in the 1948 report), the provenience

records associated with his material have been converted (at an unknown time) to grossly rounded metric depths (see Table 4). These metric descriptions of 1947 units is used in this present thesis.

Burgh ultimately excavated to a depth of more than three meters, identifying five stratigraphic levels. His descriptions, summarized in Figure 8, noted sterile sediments interlaying each horizon of cultural fill. These excavations also confirmed the expectation that cultural materials to the south (beneath the rock ledge) would have greater stratigraphic integrity than those to the north (at right in Figure 8). His excavations recognized a 40-50 centimeter top level of sparse cultural materials, containing evidence of Patrick Lynch's occupation and ephemeral Indigenous material culture. The first cultural horizon was the densest, decreasing in each subsequent level, interpreted as "less intensive occupation of the terrace," though Burgh notes that this claim was made "without statistical data" (1948:28). At this time, Burgh found no evidence to contradict his belief that the primary occupation was on the terrace above, and that cultural materials at Hells Midden represented refuse from the ledge site dubbed "Hells Half Acre." In the two subsequent seasons, Burgh would amend this claim in his field notes.

Burgh notes his trench followed Scoggin's toward the crest of the Midden, where it was believed artifact density would be greatest. This claim should not be taken literally to mean that their units were contiguous – instead Burgh relocated excavations to more-intact portions of the Midden. The actual difference in elevation, as estimated from field photographs, may have been as much as several meters (Figure 9).

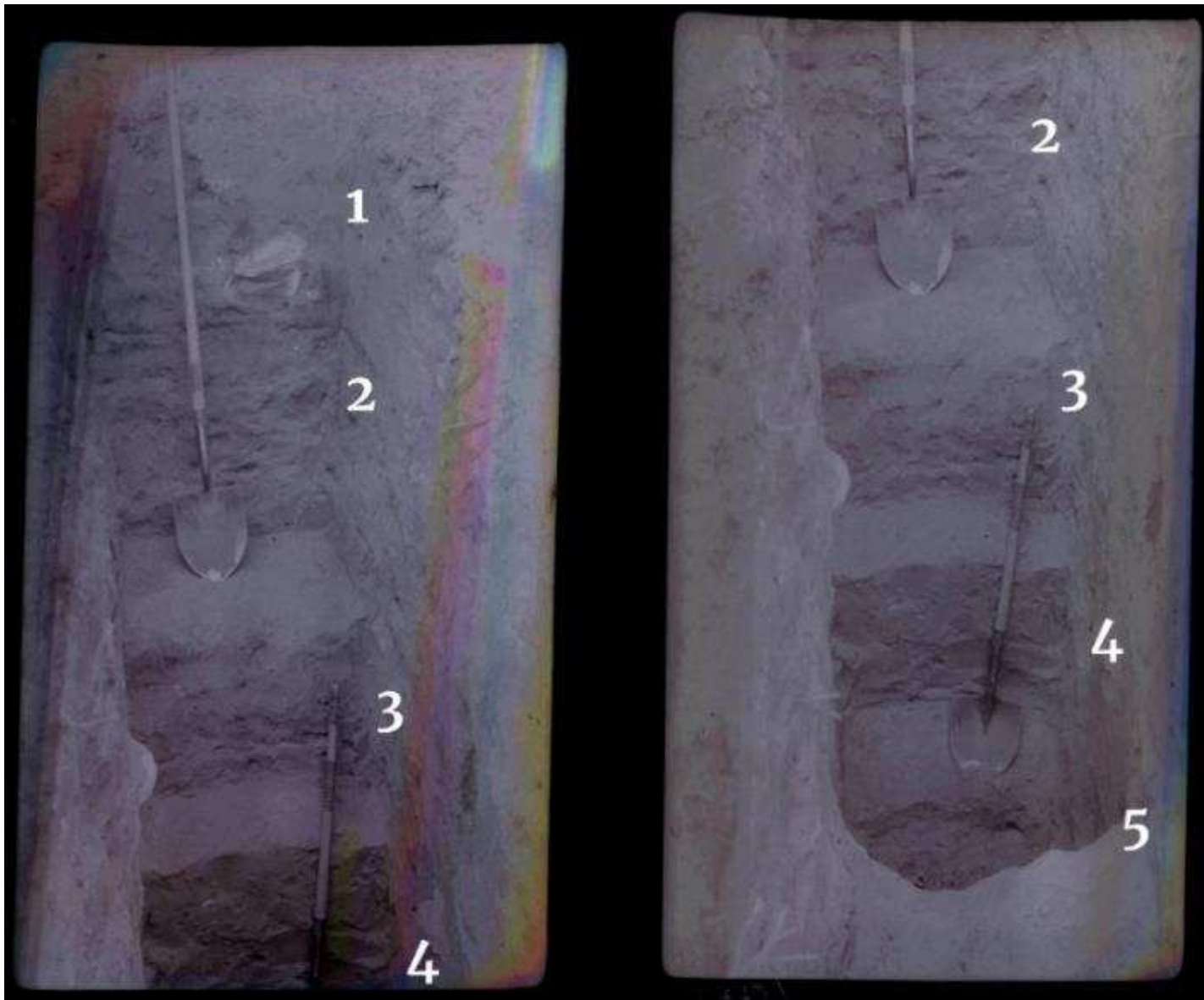


Figure 7 - Burgh's test trench, looking south. Photo taken in the rain (ARC.DNM04_001_1822). Added numbers show level designations.

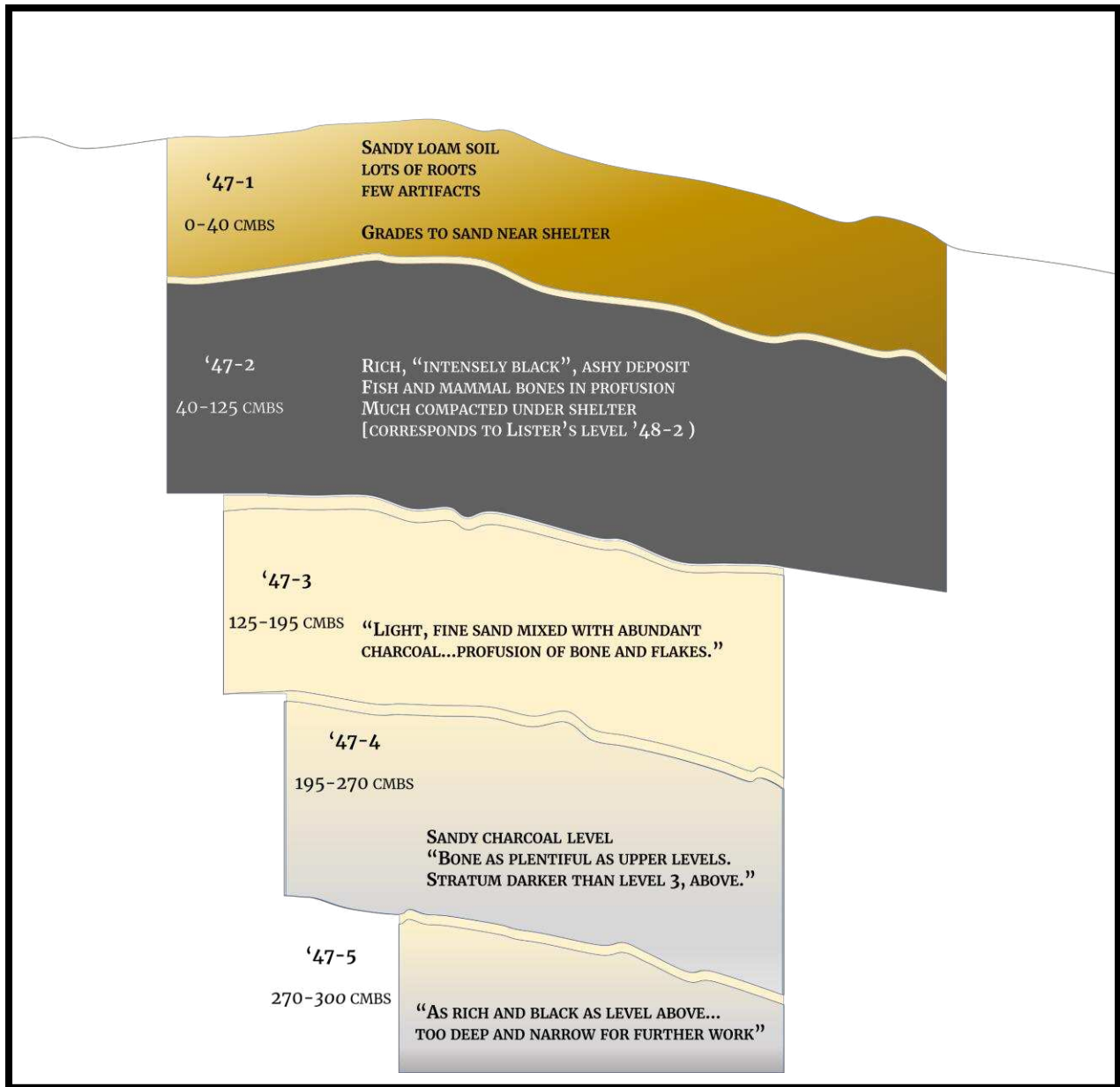


Figure 8 - Burgh's profile illustration with summary level descriptions. Corresponds with Figure 3 in the 1948 report,

Significantly, Burgh's work was always guided by robust theory regarding site formation and humility regarding the size of his sample. He suggests multiple times that the absence of certain evidence (for example, ceramics) should not be taken as evidence of absence until further work is completed. Correspondence in the archives also show Burgh grappling with the effect of taphonomy and how these may have changed under different paleoenvironmental regimes.



Figure 9 - Robert Burgh on top of Hells Midden from the perspective of the 1940 units (Figure 4). Note the difference in elevation between these units, at bottom left, and Burgh's location. (ARC.DNM04_001_1836)

This session's work concluded on October 11, with a 40 x 50 cm unit at a depth of 300 cm being too difficult to continue to excavate. It's not clear if Burgh's narrowing, stepped trench pattern was because he expected to reach sterile sediments at this depth or because he was budgeting for a quick session. He notes the difficulty of digging in such a small and deep unit, stating in a journal entry on October 11, 1947: "This morning I hired Jim Mantle, age 8, and

Nanny Mantle, age 10, to screen the material that I shoveled up from the nine-foot level. Paid them a dollar each” (a rate 2.85 times that paid to Scoggin for 6 months of labor in 1939-40). Burgh’s work confirmed the need for further excavation at the site, with a note that “future excavation at Hells Midden can be expected to provide series of artifacts in sufficient abundance for a comparative study of the various levels, and for chronological control of other sites in the canyon” (Burgh 1948:29).



Figure 10 – “Jesses” Nusbaum, Jennings, and Lombard at '47 CUMNH camp. (ARC.DNM04_001_1826, 1827).

1948 – First CU field school in Castle Park

Investigation of Hells Midden in 1948 were done at a grander scale than previous seasons. Five student-archaeologists (and a biology student) trenched the site and performed minor secondary archaeological work in Castle Park over five weeks. Robert Lister served as instructor; Hugo Rodeck, Robert Burgh, and Lowell Swenson—CUMNH Director, Scientific Assistant to the Director, and Technical Assistant to the Director, respectively—supported excavation, although Swenson primarily conducted biological studies (Lister 1951:ii).



Figure 11 – (Left) Robert Lister, instructor for the 1948 field school, stands in the partially backfilled 1947 trench. (Right) First day of excavation at the site; note careful work of crew near wall (ARC.DNM04_001_1839, 1840).

The crew arrived with excitement on 18 June 1948, although for the first week it rained, and work was postponed. Soon excavators caught their groove, however, clearing the surface vegetation on the site and opening a one-meter trench on 28 June. This trench overlay Burgh's (Figure 14) and would ultimately extend ten meters north and two meters east to west.

The two-meter-wide trench ran perpendicular from the shelter's wall with an orientation 10 degrees east of north. Trenches were designated, from east to west, as '48-I and '48-II, and north-south sections by letter, ascending from "A" as units moved away from the wall. As the depth of the trench increased, additional sections were necessary to account for the slope of the Midden toward the north. Section K was the designation for the final meter unit to the north, above the ditch (Section I was not used). Levels were designated by increasing numbers from surface (Table 4); levels 1-3 followed natural strata which largely aligned to Burgh's upper levels. Near the bottom of level three, attempts to follow natural boundaries were deemed to be needlessly slowing the work, so an arbitrary designation of 30 cm levels was adopted.

Figure 12 shows the two-meter-wide trench after removal of level '48-1. On this surface excavators found the first ceramic and corn artifacts from the site. Nails visible on the Midden's surface denote the section designations. Figure 13 show the ultimate scale of this trench.



Figure 12 – Trenches 48-I and -II, showing the face of level 2, sections A through F. The exposed west wall shows the Pat Lynch horizon as the first dark band. The individual on the left is in Burgh's trench, barely visible beyond the east wall. Note the curved surface of this level, reflective of the natural boundaries used (ARC.DNM04_001_1828).



Figure 13 – Taken at the beginning of the 1949 season, this photo gives a sense of scale for the completed 1948 trench. Here 1949 crew members (David Curtis, back, and Charles Best) clean up wall-fall which occurred between these seasons. (ARC.DNM04_001_1916).

All materials were screened on the outside of the ditch which surrounded the Midden. A trackway used to span the ditch with wheelbarrows can be seen in Figure 13. Illustrations by Lister show the design for this system (Figure 14), and Figure 15 shows construction of this feature. This same system was also used in the 1949 session, and large amounts of screened sediments from the '48 trench is visible at the start of the second field school season (Figure 22).

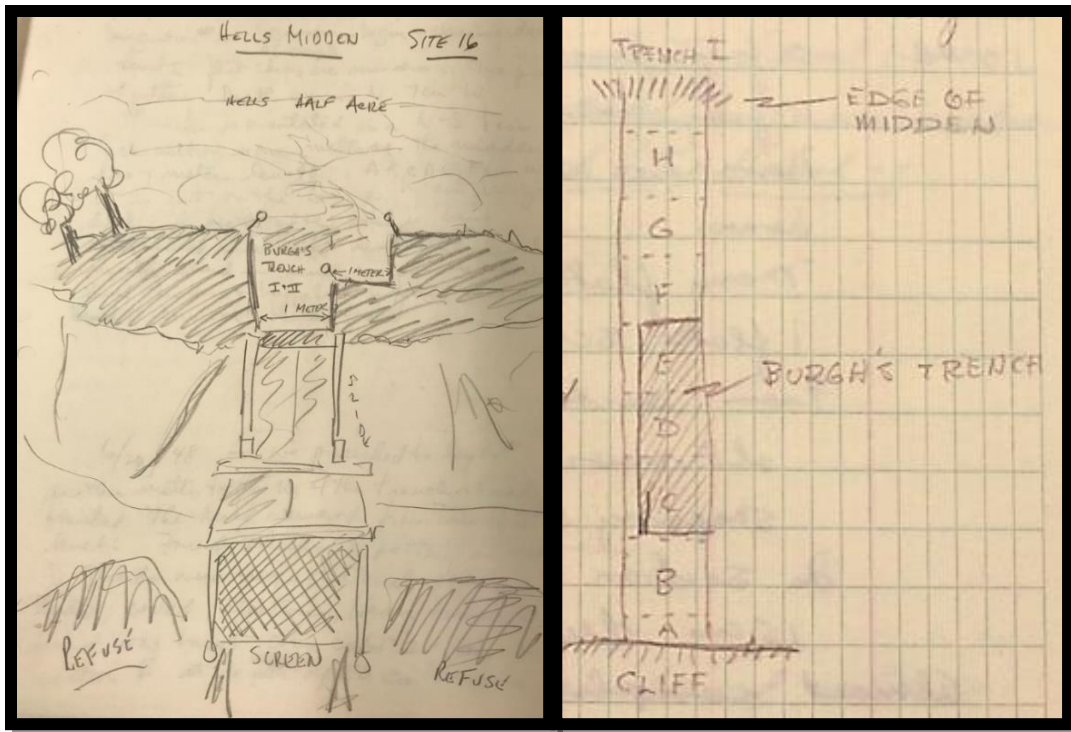


Figure 14 – Illustrations from Lister's 1948 field books, showing the set up for excavations and correlation between Burgh's units and the 1948 trenches.



Figure 15 – Construction of the trackway at the beginning of 1948 season. Looking west. (ARC.DNM04_001_1833)

In addition to working at Hells Midden, student archaeologists conducted minor excavations at other Scoggin/Lohr sites. Nonarchaeological wood was sampled for dendrochronological sequencing (Schulman 1950). Hells Midden sediment was screened using screens fine enough to yield the ultrafine textile fragments from the site (CUMNH#6608). A singular reference to ¼" screen was found in student field notes. Excavation was completed with shovels; trowels were used inconsistently, primarily in sections A & B. Few artifacts are recorded with an in situ triangulation, and horizontal provenience of section or even trench of origin is rare in catalog records from this season.

For most excavated materials, vertical provenience, most commonly to level resolution, is reported. Occasionally, records of material provenience are accompanied with an absolute elevation (for example, a six "blade" cache provenienced to "Upper 30 cm level 4 Sect. A at 1572.98 masl"). From this and other absolute elevations offered in conjunction with depth below surface, I was able to calculate a surface elevation of 1574.9 meters above sea level (masl). Whether this signifies a vertical datum, from which all reported "depths below surface" were measured is unknown. The switch to arbitrary level designations which had parallel surfaces does suggest some standardization, but no explicit reference is made to using this method.

Field records offer more details than the 1951 report, particularly regarding features encountered. In field notes, attempts to capture triangulated feature dimensions and occurrence are made, as reproduced here for the recording of charcoal stains (Figure 16), caches (Figure 17), and floor surfaces (Figure 18). Floor features, which are hard-packed surfaces frequently in stratigraphic association with fire features, were described throughout the deposits to a depth of 2.5 meters, most recognizably in levels 2 (50-120 cmbs), 3 (120-170 cmbs), and 6 (230-260

cmbs). These features are discussed in Lister's report on the work (1951:43-44), although illustrations were never reproduced for this report, except in profile view.

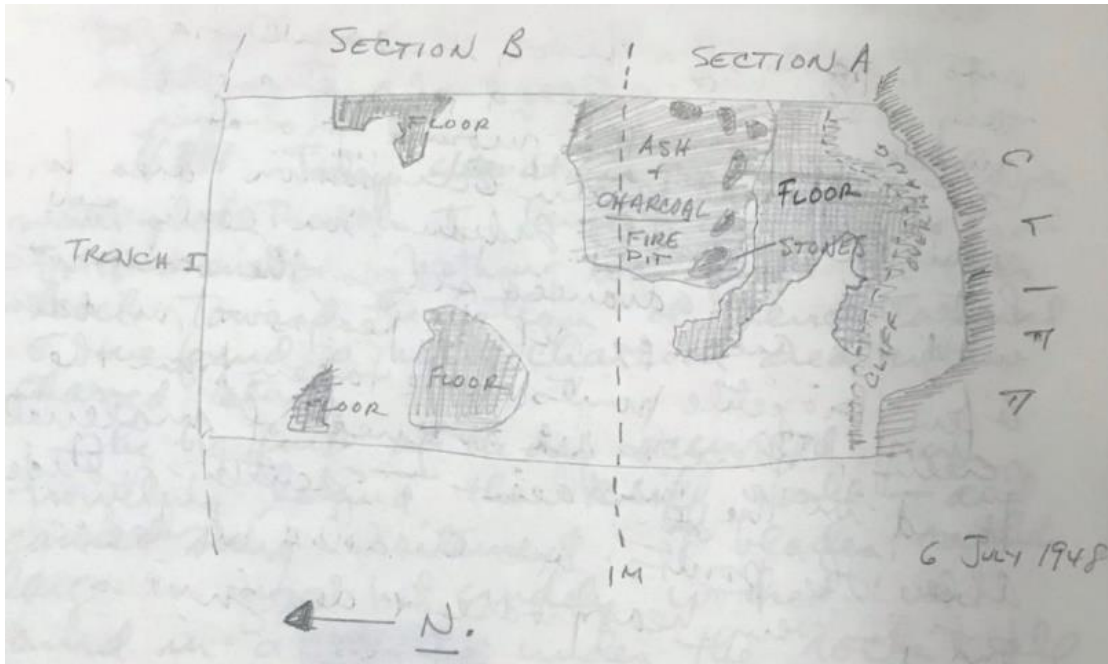


Figure 16 - Planview illustration of features (a house floor and hearth feature) encountered in 1948 level 3. Illustration produced in Lister's field journal was captioned "Hells Midden Trench I, Top of Lower 30 cm of Level 3, Alt. 1573.5 masl" (ARC.DNM01_004_002).

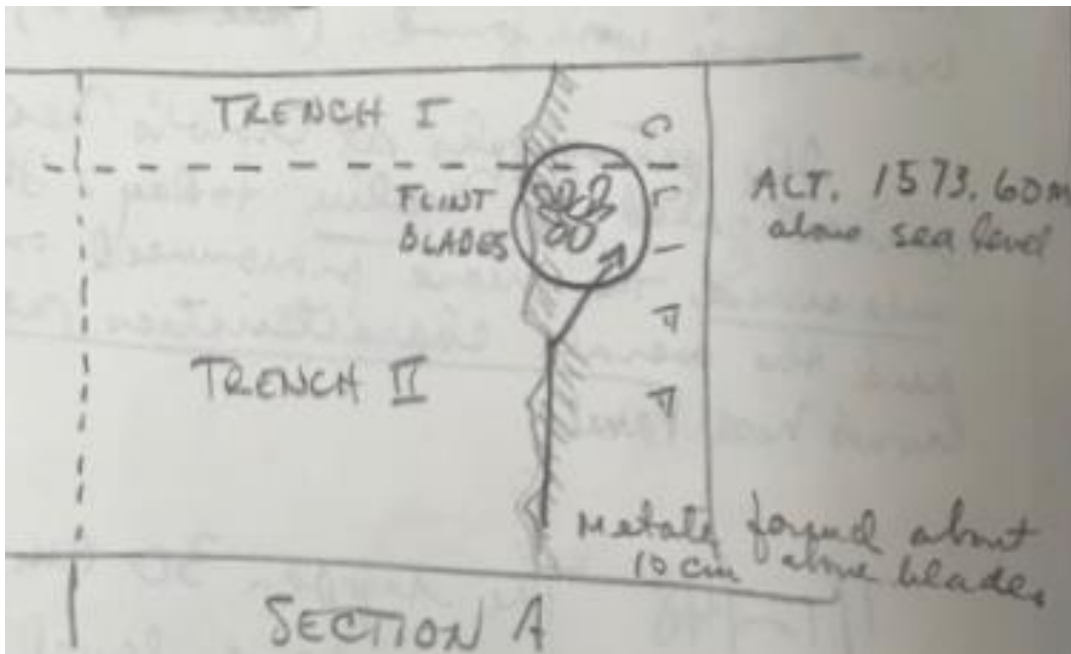


Figure 17 - Cache of blades (unmodified spalls) from 1948 Level 3. Note the comment "metate found about 10 cm above blades." From Lister field notes (ARC.DNM01_004_002).

The presence of features is significant to interpreting habitation of the Midden and the related terrace site, Hells Half Acre, and will be discussed in detail in Chapter 4. In describing this 1948 session, it is enough to say that where Burgh, following the 1940 and '47 excavations, interpreted cultural levels at Hells Midden to be primarily “deposited when the terrace was inhabited” (1948:28), Lister flipped this argument based on results of his excavations, suggesting that “artifacts found on Hells Half Acre do point to an occasional use of the area by occupants of the rock shelter [Hells Midden]” (1951:43). Burgh’s field notes from 1948 suggest he agreed with this revised claim considering results of further testing.

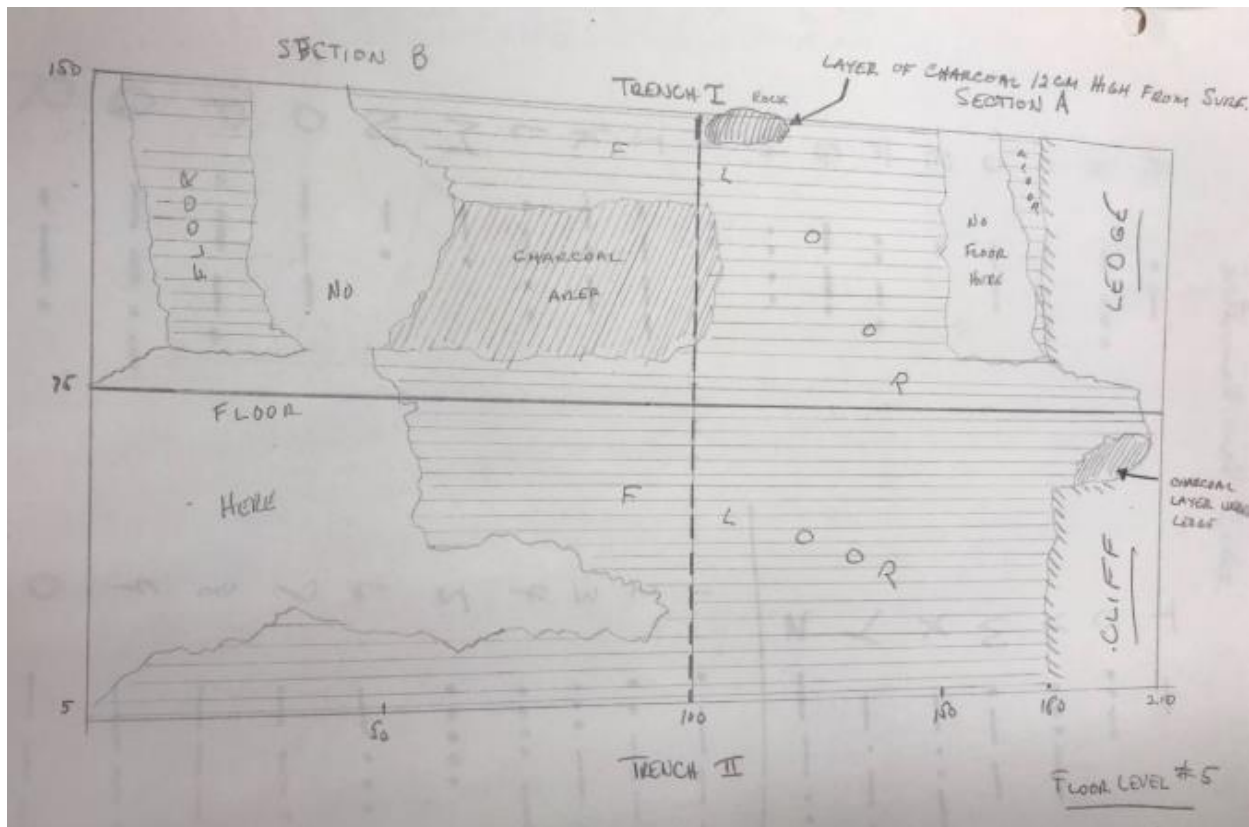


Figure 18 - Planview of floor near contact of 1948 Levels 4 and 5 (200 cms); note odd scaling on e-w dimension shows units as 75 cm wide. Illustration caption reads “1572.95 meters above sea level.” (ARC.DNM01_004_002).

The greatest success of this season’s trenching was the exposure and illustration of a large profile of the trench’s west wall. (Figure 20), with detailed photographs taken to assist in interpretation. These photos are included in Appendix III. This trench was not backfilled, and, as

shown in illustrations (Figure 14) and photographs (Figure 22), screened sediments were simply piled outside of the ditch wall (Figure 23). Excavations this season removed over 75 m³ of sediments from the site (including the estimated 3.2 m³ represented by Burgh's trench). This large-scale excavation provided much more data on the nature of the site's deposits, and Lister summarized the cultural stages in his report (1951), reproduced here as Figure 19.

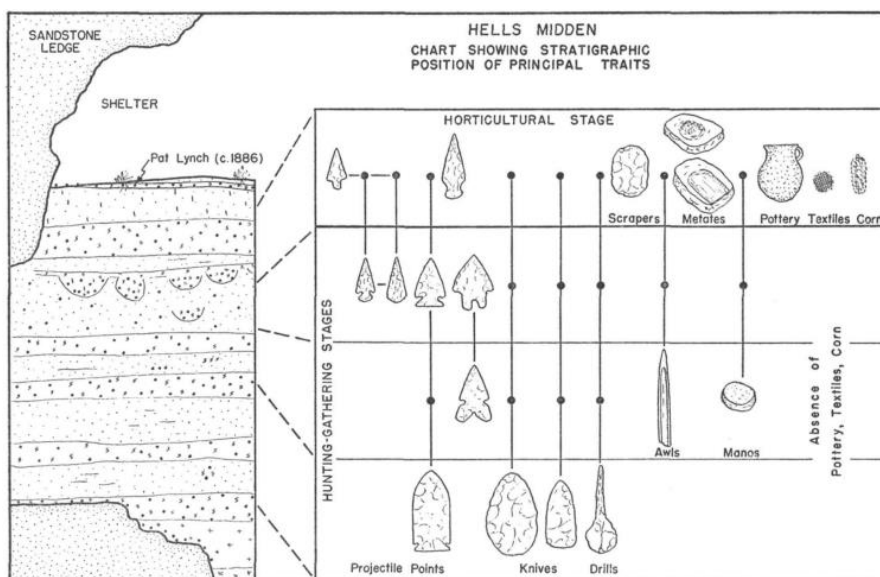


Figure 19 - Lister's summary of "principal traits" at Hells Midden (1951:Figure 32). In this present thesis, Lister's stages will be referred to as "upper" and "lower" sequences.

In the report prepared by Lister following the two field school seasons, he spends the bulk of his time reporting on data from Hells Midden. He believes focus on this site is warranted

"on the assumption that a new and earlier chapter in the prehistory of this most interesting area is revealed. The culture of the upper portion of Hells Midden is identified with the Fremont River culture, but stratigraphically earlier deposits indicate the presence of pre-horticultural, pre-pottery horizons represented by a series of stone and bone artifacts extending to a depth of 4.55 meters below the surface of the midden" (1951:1).

It is seeking understanding of the pre-horticultural (*lower*) horizons which justifies this present research into this site, as these periods remain less represented in the archaeological literature of this area. Analysis in later chapters will test Lister's claims for these sequences.

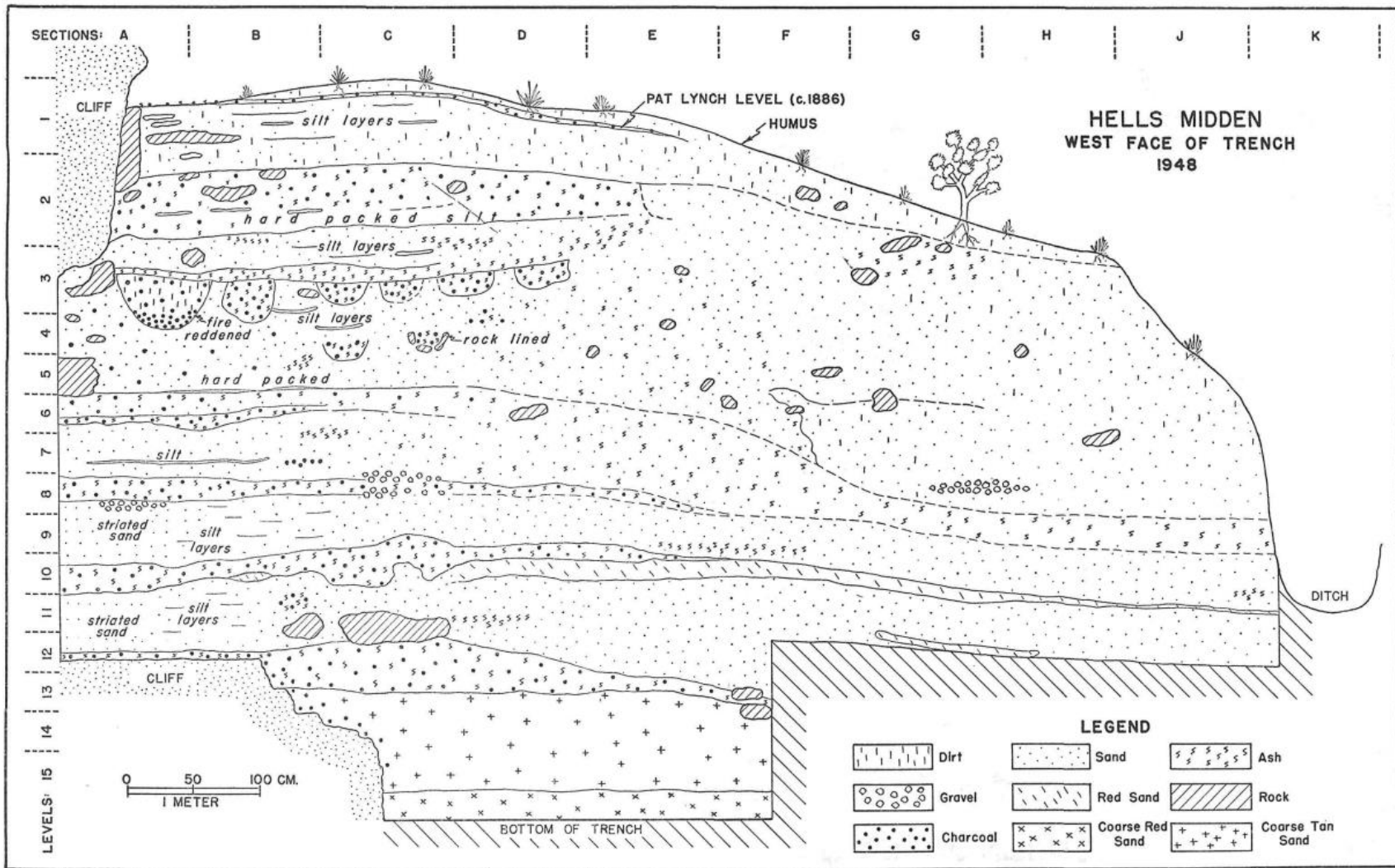


Figure 20 - Profile of Hells Midden (Lister 1951:Figure 3). A similar unpublished profile illustration which emphasizes the living floors can be seen in Figure 36. See Figure 27 for graphic presentation of how these levels correlate with the 1947 and '49 excavated contexts.

1949 – Second CU field school

A second CU field school at Castle Park was conducted in 1949 with a broader research focus than the two previous sessions. This session was led by Herbert Dick, successor to Burgh following his departure from CUMNH. In addition to excavation of over 20 m³ of sediment at Hells Midden, field school investigation targeted excavations at Marigold's Cave and tested other Castle Park sites. Reconnaissance survey was also conducted in other areas of the Monument. Hells Midden work began on Independence Day, 1949, with the task of clearing wall-fall from a portion of the 1948 trench (Figure 13, Figure 22).

This season targeted excavation of sediments against the shelter wall. The 1949 units, dubbed '49-I and -II, were located directly adjacent to the 1948 units. Trench '49-I ran 12 feet to the west of sections "A, B, and half of C" along the shelter wall (Lister 1951:9). Between depths of 84" and 132", Dick horizontally excavated "1949-II" into the shelter wall, where the sandstone receded south. This trench is shown in published illustration (Figure 25), unpublished lab notes (Figure 24), and photographs from the 1949 season (Figure 21.b). Researchers should note that catalog records may give depths for this trench in shallow terms (i.e., '49-II 0-24"); this suggests 0-24" from the top of '49-II, which began at a depth of 84" below the surface.

Dick's field notes and photograph captions should be referenced cautiously with regards to orientation at the site. In Lister's designation, the 1949 units were located *west* of the 1948 trenches (whose bearing of 10 degrees east of north is accepted and used throughout this text). According to Dick, at least in the beginning of this season, these units were north of 1948's. An example of this error is Dick's description of the south end of his trench being the open end when it's clear from illustrations and photographs that this was cut into Lister's western profile. It's unclear how this orientation confusion was introduced, but it

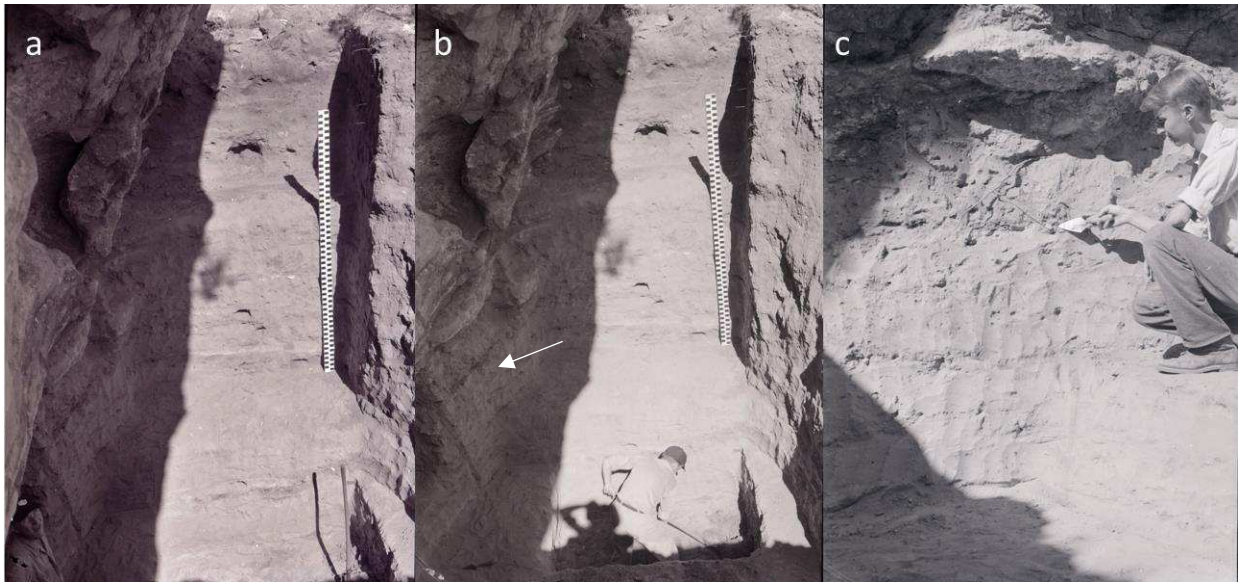


Figure 21 – **a.** Overview shot of 1949 Trench-I following excavation, looking west. (ARC.DNM04_001_1912c). **b.** Looking west; 1949 Trench-I and -II, maximum depth in photos; Trench '49-II indicated with arrow. Duane Roberts is identified as the excavator (ARC.DNM04_001_1910). **c.** North wall '49-I, prior to excavation of '49-II. Charles Best is pointing to a charcoal horizon, illustrated in Figure 26. (ARC.DNM04_001_1911).



Figure 22 – Duane Roberts screening, David Curtis shoveling fallen sediments from '48-II (ARC.DNM04_001_1915).

seems by the end of the session Dick had sorted it out for he provides a final drawing of the excavated surface at Hells Midden which confirms published and modern georeferenced orientations. For standardization purposes, any reference to bearing (which, necessarily will be general) within this work follows Lister's published data.

Unlike Lister's segregation of units into 1x1m sections and trenches which seldom are reported in the catalog provenience records, Dick's horizontal designations ('49-I and '49-II) are almost always included alongside depth data. While these are reported, the excavated area is frequently unknown, making volumetric analysis of Dick's 1949 units a challenge. As can be seen in Figure 21, the excavated area changed frequently with depth, often following the natural contour of the sandstone ledge. For assessments of artifact density, undertaken in Chapter six of this work, volume was calculated using the available descriptions and photographs. These calculations can be reviewed in Table 10. Two shapes with very different dimensions, both drawn to represent these 1949 units, can be compared in Figure 24 - Illustration from Dick's transcribed field notes (ARC.DNM01_005_003), showing location of both 1949 trenches in relation to the 1948 trench. Note that the plan view at left is oriented with North pointing down.

This sketch corresponds, roughly, with Figure 25, reproduced from Lister's report (1951). and Figure 25.



Figure 23 – Charles Best (left) and David Curtis screening 1949 sediments atop a massive mound of previously screened sediments. This shot was presumably taken from atop the Midden's crest.

Additional confusion introduced by Dick was the use of arbitrary, 12 in levels for '49 units; 12 inches is comparable, but distinct enough to cause frustration, to the arbitrary 30 cm used in 1948. And though these depths are nearly equivalent, the fact that Lister only began using arbitrary levels at the close of level '48-3 but Dick used them from the surface down means these levels never come close to being equivalent. A graphic showing the correlation between the 1947, '48, and '49 level designations is found in Figure 27. Lister's report glosses over this difference, claiming that "material from the 1949 excavation has been carefully fitted into the levels as they have been designated in 1948" (1951:9). Because his method is never explicated (although presumably it relates to impressions of the stratigraphic contexts), all analysis conducted in later chapters of this work are done separately for the excavated levels.

Dick was ultimately little involved in reporting on the site, although the amount of analysis he completed within the field is somewhat impressive. For example, field notes contain tabulated faunal sheets, graphed distribution of raw materials, projectile point distribution by level, and more. Few of these materials made it into the report, and Lister “assumes all responsibility for the interpretations derived” (1951:ii). While Lister worked on this report, Dick was preparing a manuscript on Marigold’s Cave; portions of these draft materials are available in the CUMNH archives.

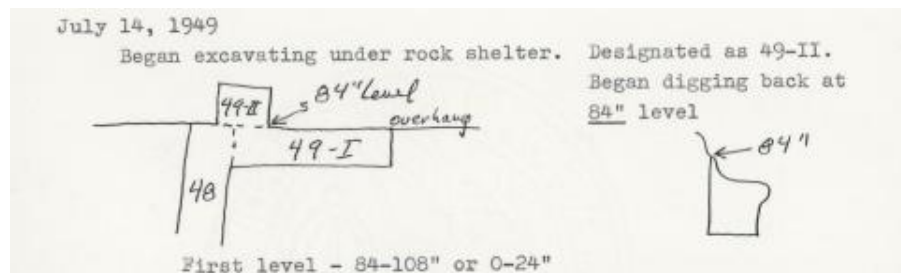


Figure 24 - Illustration from Dick's transcribed field notes (ARC.DNM01_005_003), showing location of both 1949 trenches in relation to the 1948 trench. Note that the plan view at left is oriented with North pointing down. This sketch corresponds, roughly, with Figure 25, reproduced from Lister's report (1951).

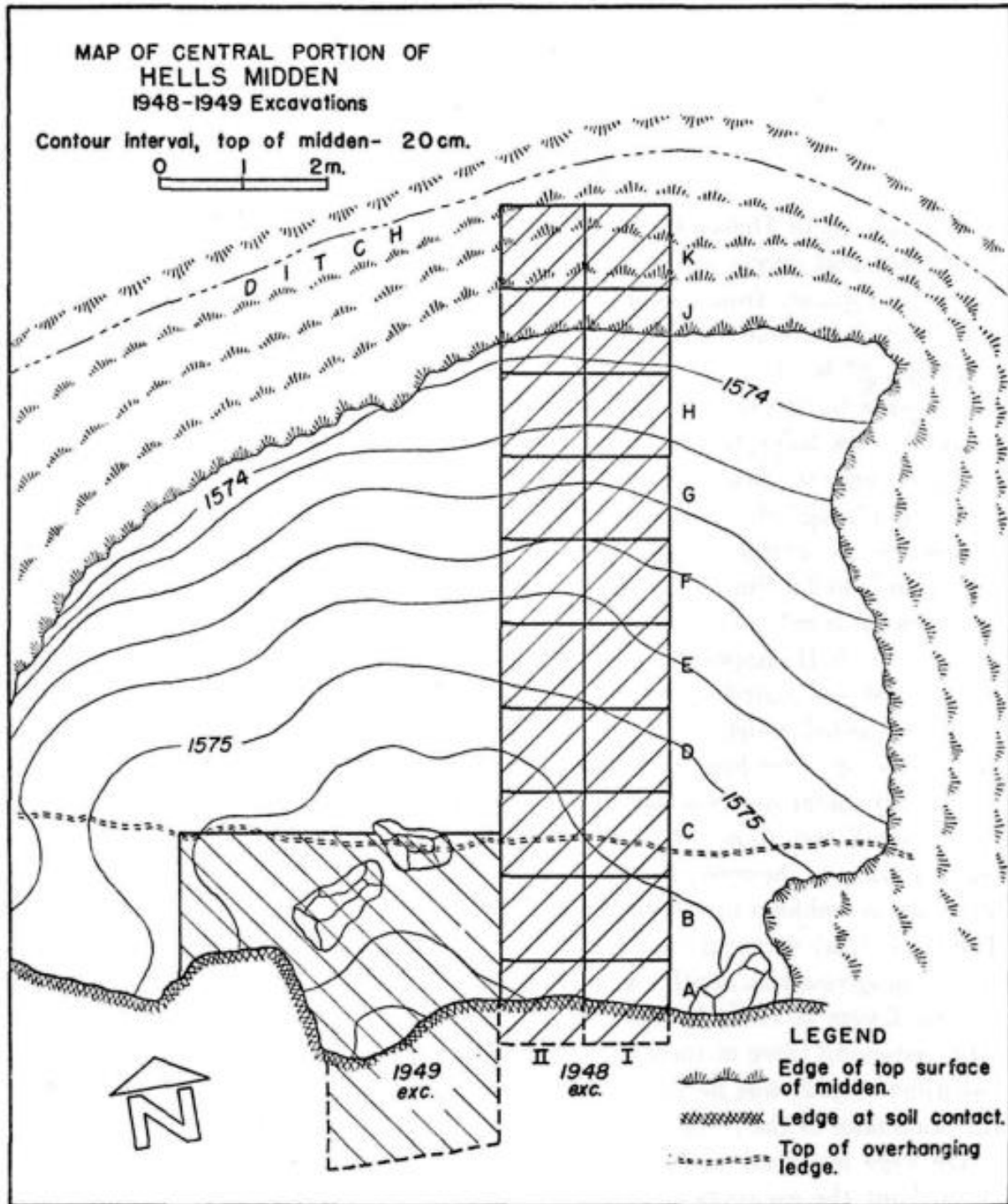


Figure 25 - From Lister (1951:Figure 2), this shows the orientation of 1948-I and -II as well as 1949 units. 1949-II is unlabeled but is represented by the portion of the 1949 unit to the south of the shelter wall. Burgh's 1947 unit should be plotted within 1948-I as shown in Figure 14.

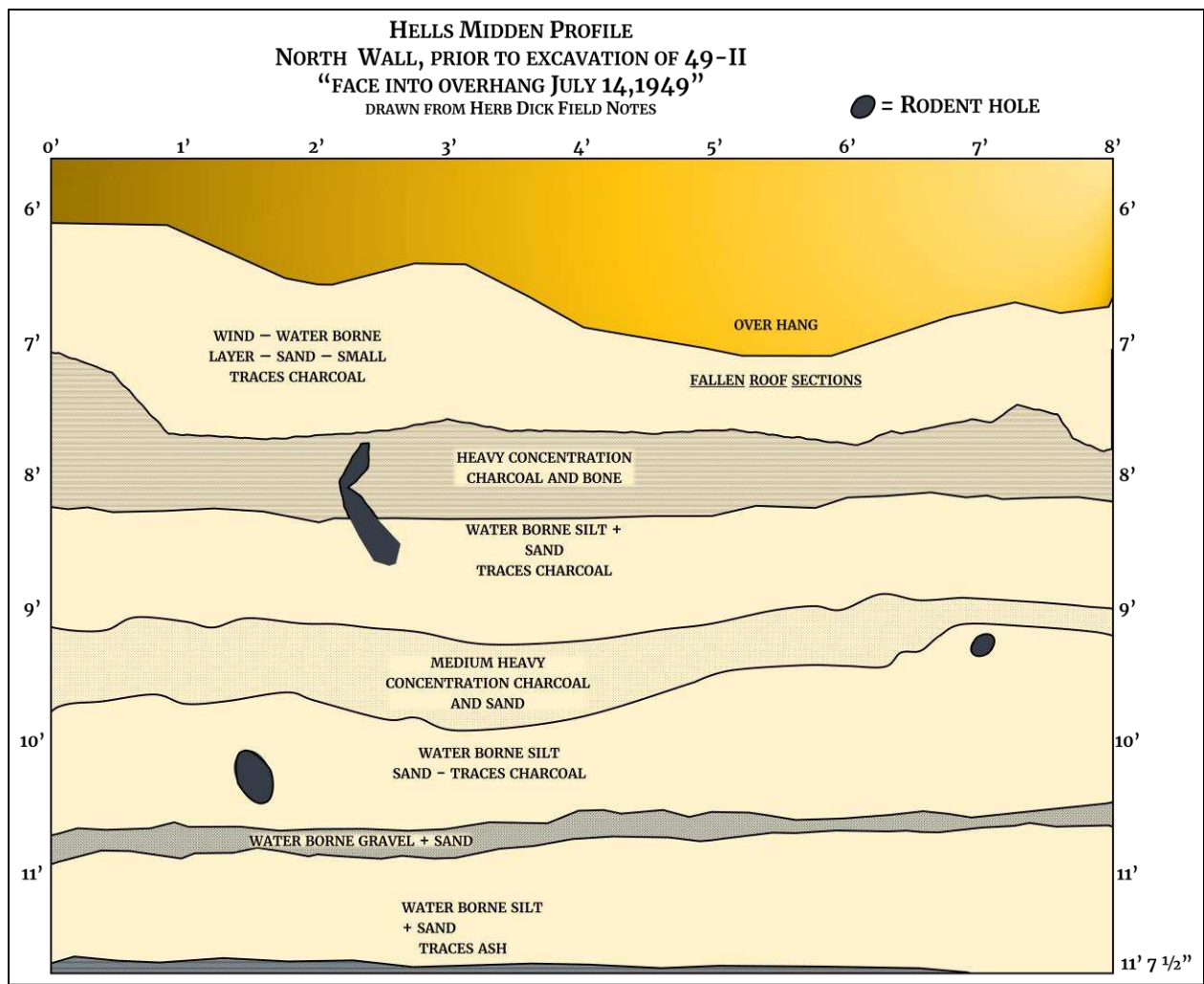


Figure 26 - Unpublished profile illustration, reproduced digitally, from Herb Dick's field notes (ARC.DNM01_005_006_002). Dick's notes erroneously referred to this as the "West Wall." Corresponds to Figure 21c. This area was excavated horizontally as '49-II. The charcoal bearing level at this depth and beneath this shelter proved to be very productive.

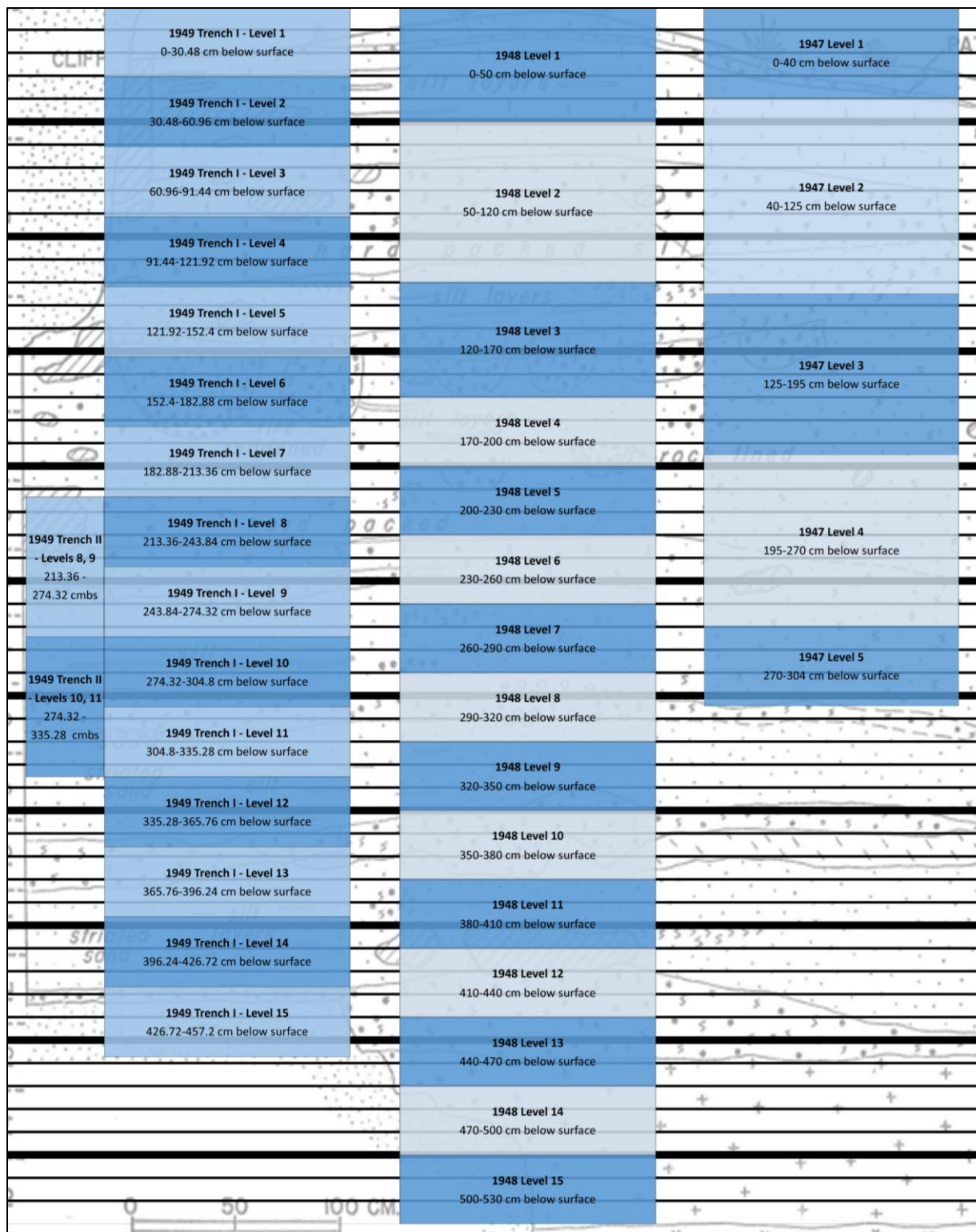


Figure 27 - Level designations for the three field seasons between 1947 and 1949. Lines in the background correspond to 10 cm depths; darker lines are 50 cm. The horizontal extent (north to south, left to right) is arbitrary and not to scale.

Summary of CUMNH Field Work, Spatial Relationship of Excavations, and Site Description

One of the greatest challenges for this research was understanding the spatial extent and relationship of units excavated during the four seasons. Descriptions within the published reports were approximate and general, but in combination with references in field notes and photographs it was possible to make sense of these arrangements.

First, in the posthumous report with Burgh, Scoggin's trench is noted as being "made along the irrigation ditch at the upstream [eastern] end, well beneath the shelter of the overhanging ledge" (Burgh and Scoggin 1948:26). Photographs confirm Scoggin and Lohr's focus on this back (upstream) portion of the trench (Figure 1, Figure 4). Burgh's units were west of the Scoggin/Lohr unit, and this 1947 trench was subsumed within the 1948 units. Dick's 1949 trenches were located west still of the 1948 trench. 1940 trenches were located west still of the 1948 trench.

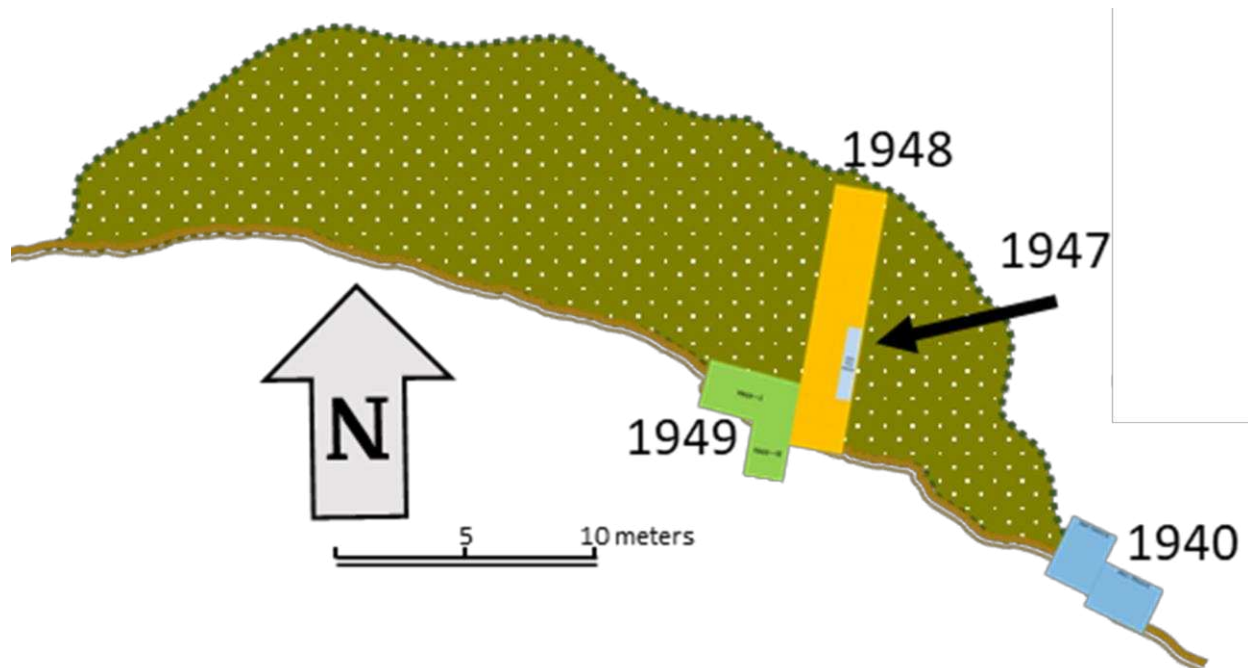


Figure 28 – Reconstructed site overview with excavation units labeled; Lister estimates that more than 600 cubic meters of the site remained following their excavations. The sandstone ledge is indicated at the bottom of this graphic; the Yampa River would be above this shape and Hell Creek to the right.

Following four seasons of excavation, general statements about the Midden can be made. Hells Midden is a 4-5 meter tall mound on the west wall of Hell Canyon's mouth, approximately 50m south and 10m above the Yampa River. Less than 10 meters to the east, Hells Creek flows in a "well-defined channel," parts of which may be seen in the immediate foreground of Figure 1. The south end of the site is defined by a sandstone bluff whose surface is approximately 10 meters above the alluvial terrace on which the Mantle Ranch and the site sits (see Figure 1). The area atop this bluff, designated "Hells Half Acre" was, as discussed, hypothesized to be the location of an "extensive campsite", from which sediments and cultural materials were discarded or washed over the edge, which accumulated to form the midden (Burgh and Scoggin 1948:21). While this hypothesized terrace site was not located by CUMNH archaeological testing, the exact processes involved in Hells Midden formation deserve further geomorphological testing.

The "Midden" is quite large, recorded by CUMNH investigators as being more than 25 meters wide (east to west), 9 meters deep (north to south), and 5 meters high (Lister 1951:4). Investigators estimate the Midden's former extent, prior to erosion caused by flooding of Hell Creek, may have exceeded 70 by 20 meters (Figure 29). This sandstone terrace offers small rock shelters along its face; CUMNH targeted excavations where these shelters were most substantial and the height of the Midden greatest on the present surface, at the eastern half of the Midden. The maximum crest of the Midden is located just below the shelter's lip. The height of this ledge is several meters above the Midden's crest, though in the past the Midden was less prominent and, as such, this height was presumably much greater. The reported height of the shelter "ceiling" ranges from 2-5 meters above the surface (probably due to a lack of standardization regarding the locations being measured). Shelter depth is relatively shallow, rarely exceeding 2 meters, north to south.

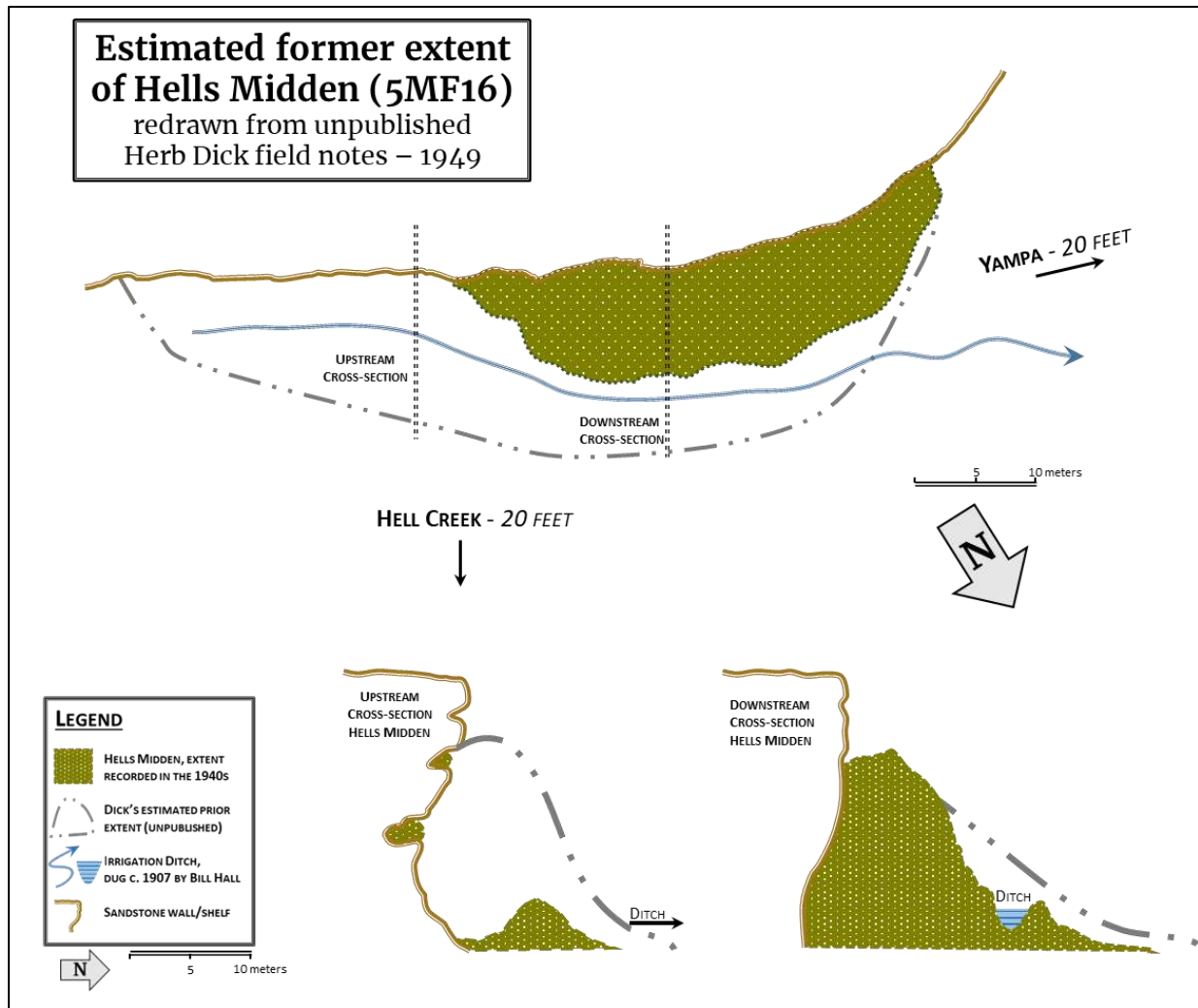


Figure 29 - Redrawn from Dick field notes (ARC.DNM01_001_034), this graphic shows estimated former extent of Hells Midden prior to erosion caused by Hell Creek and the modern irrigation feature at base of site. The 1940 units targeted a portion more like the upstream cross section while later seasons targeted the feature's crest, more like the downstream cross section.

The subsurface topography of the sandstone wall was revealed by excavation units at the site, particularly those which excavated immediately adjacent to the sandstone wall (1940 “Trench A”; both 1948 trenches, levels 1, 2, and 3; and both 1949 trenches, especially ’49-II). Illustrations of the western wall profile from Lister (1951) revealed that the rock wall recedes south and away from the Midden at, approximately, 1.5 meters below the surface (see Figure 20 and 1949 photos: Figure 21).

No definitive answer is ever offered for the question of site boundaries, though CUMNH researchers make it clear that cultural materials are eroding out of the midden’s exposed edges regularly due to natural factors and the ditch at the Midden’s base. The site seems to be, de facto, limited to the footprint of the rise, bounded by the historic irrigation ditch at the base of the mound to the north, east and west, and the sandstone ledge to the south. Based on the estimated former extent of the Midden, as shown in Figure 29, it seems likely that materials from the Midden are to be found entirely surrounding this prominent mound feature. It is unknown what effect the large trench has had on the site’s morphology in the last 70+ years.

The historic irrigation feature at the base of the mound was described by Charley Mantle as having been built c. 1907 or ’08 by Bill Hall. The purpose was to tap Hell Creek to irrigate fields to the west of this creek (ARC.DNM01_023_004). The edges of the Midden certainly had the appearance of being heavily eroded in the 1940s (see, for an example, Figure 3).

Subsequent CUMNH work in Dinosaur National Monument

Following the two successful field seasons of 1948 and 1949, there was a pause in investigations. During 1950 and 1951, Robert Lister wrote up the results of these investigations, publishing a University of Colorado Studies issue on their research (1951). While there is

evidence that Hugo Rodeck received an excavation permit from the Department of the Interior in 1950, no materials or record relating to this work has been found (Gregg 2022:3).

At an unknown date, probably in the late 1950s or early '60s, Elaine Anderson, a noted zooarchaeological expert, conducted a faunal analysis on portions of the Hells Midden assemblage. This unpublished (and undated) work, available within the CUMNH archives, identified taxa and portion of hundreds of bones from Hells Midden, summarizing the data with minimum number of individual (MNI) counts for sixteen mammal and three bird species from the 1948 faunal assemblage. Anderson spent two chapters of her life at CU: first, earning her undergraduate and graduate degrees from the University of Colorado in 1960 and 1965, and, later, serving as “Adjunct Professor, EPO, University of Colorado, Boulder” (Graham and McDonald 2002:9). This work may have been conducted sometime during either of these periods. Several things are unknown about this analysis, such as: when it was conducted, why it was conducted, why it only detailed the 1948 assemblage (with, curiously, a single bison bone included from the Scoggin and Lohr excavation), as well as why these results were never published or referenced in any of the reports on the site. This information would be useful to know, as it could suggest a period of renewed interest in Castle Park (and as such, may have coincided with Breternitz’s work in the 1960s).

Between 1963 and 1965, CUMNH work within Dinosaur National Monument resumed under the direction of David Breternitz. The goals of this work were to “undertake an archaeological survey and compile an Archaeological Base Map for the Monument” (Breternitz 1970:1). While the results of their archaeological survey (conducted in 1963) have not been published, there was an extensive report written by collaborative effort of student-archaeologists who excavated sites for this project in 1964 and 1965. This work describes 20 of the 22 sites

excavated and offers further regional context, discussed in the following chapter (Breternitz 1970).

Larry Leach, who served as a graduate field assistant under Breternitz, returned to DNM in 1966 and 1967 in order to commence testing at the Deluge Shelter, which he reported on in his dissertation (Leach 1970). Like Hells Midden, this site contains a sequence of occupational history which is unusual for sites in this area. This work, like Breternitz's, offered good context for other archaeological finds in the area and will be compared to Hells Midden in later chapters. A good summary of the sequence presented in Leach's dissertation is in Spangler (2002:71).

Following this Breternitz study, interest waned slightly as CUMNH research shifted toward the Great Plains and the Southwest. In the last few decades, study in the region was revitalized, guided by research interests of former DNM archaeologist James Truesdale and former CUMNH curator Sheila Goff. Increased accessibility of AMS analysis allowed Truesdale to secure highly resolute dates on materials from Castle Park, dating materials from caches within Mantle's Cave (Truesdale 1993). Later work by Goff produced new dates and redated other specimens (2010). This was followed by Caitlin Sommer's thesis on cordage and select perishable materials from Mantle's Cave (2013). Castle Park has recently been listed as an archaeological district in the National Register of Historic Places (Bernard and Prokopetz 2005).

Conclusions

The staff at CUMNH continue to care for materials collected by the museum in the 1940s from Castle Park and DNM staff oversee protection of this landscape. While research access to collections can be a challenge for museum staff everywhere, CUMNH graciously allowed further study into these collections. More than ever, the significance of these and other museum

collections should be recognized by archaeologists seeking to understand the precontact past. While archaeological site discovery is slowing across the discipline (Surovell et al.2017) and the “curation crisis” continues, existing collections may offer rich insights into the past. Research archaeologists should recognize the potential of museum collections to answer many pertinent questions despite the challenges of legacy datasets.

The rise of compliance archaeology has greatly increased the site counts for all regions of our country, particularly those with large public land holdings, increasing what we know about the past record. Still, these findings are frequently reported only in grey literature which, alongside the physical collections, can be difficult to access. Large synthetic works (Spangler 2002), ethnographic studies (Ott 2010), and context studies (Reed and Metcalf 1999) completed for this region offer great insights into the archaeological record, but, like all our works, need to be continually tested as new data and models are produced. Further chronological understanding of the Northwest Colorado region, particularly in those times of lesser radiometric frequency, can increase understanding about past land use which may afford greater protection and understanding of the cultural resources here. Research within curation facilities may prove able to achieve these goals if it is done with the same thoughtfulness and rigor as is afforded field research projects.

CHAPTER 3: HELLS MIDDEN IN A REGIONAL CONTEXT

“For volume and depth of occupational debris, Hells Midden is unrivalled in the Yampa Canyon. Although less dramatic than the cave sites, it is of major importance for chronological control in the region...Up to now, it has only been tested, but its yield is so rich that even this limited sampling has been of value for the interpretation of other sites” (Burgh and Scoggin 1948:26).

This chapter describes the regional context of the Hells Midden site, offering a basic description of the environment surrounding the site and a summary of the regional archaeology. The contextualization of this site in relation to the local environment will be useful in understanding formation processes, including both the ecological factors which attract human occupation at the site as well as the taphonomic factors which allowed evidence of their occupation to be preserved and subsequently discovered. Comparison to the regional archaeological record will highlight relationships between the cultural deposits at Hells Midden and sites across the region.

Where is Hells Midden? A discussion of place designations

Prior to discussion of the regional context of Hells Midden, it is important to define the spatial designations used to refer to this region, as well as to understand the attributes by which these designations are defined. As is the case with any point on a map, Hells Midden is situated within multiple “places,” each defined by certain similarities of characteristics and designed by researchers to be suitable to specific research foci. Most of these designations (such as those based in culture or ecology) are fuzzy in their boundaries and may be referred to in very different

ways depending on the author's purpose, disciplinary bias, or scale of discussion. Rarer are designations of space which are clearly bounded by hard geographic lines which will not vary between researchers, even those in different fields (the obvious example being hydrological drainages). It is useful to recognize, like most categorizations in natural science, that these designations are heuristic boundaries and, as such, should be explicitly defined with consideration of the utility to the research at hand. Recognizing these regions and where Hells Midden sits within them can be useful in understanding the influences of neighboring regions and resource communities on the site's occupants.

Because of the various dimensions which space may be divided and categorized along, spatial designations necessarily overlap and vary in scale. Some may be nested (such as political designations of *country-state-county* or the multi-level ecoregions used by USGS [Chapman et al. 2006]), although others, being defined by different dimensions, will not be arranged in this sort of spatial hierarchy. By recognizing this variety of spatial patterns, one can begin to understand how these heuristics can influence archaeological interpretation (for example, different conclusions will be produced if the materials from Hells Midden are binned and compared with the Rocky Mountain and Plains regions to the east or to the Colorado Plateau and Great Basins to the south and west). In conceptualizing relevant spatial designations to drive interpretation, archaeologists should remain particularly vigilant to the effect of time on these spaces; as Grayson discusses for the Great Basin, many of the designations used to define that area today (such as those based on ethnographic culture regions or floral communities) are unlikely, or at least unproven, to be reflective of that areas' characteristics during the ancient past (1993:40-41). This is suggested by migrations of the archaeological relevant space through time.

Too often, the limitations and biases introduced to our interpretation by these categorizations is ignored or not plainly expressed, and we may unknowingly slip into the application of, apparently, useful comparisons which are based on an unquestioned acceptance of such assumptions used in established interpretations. Spangler succinctly states this point: “The tyranny of categories is manifest when archaeologists uncritically accept artificial boundaries, thereby perpetuating atheoretical assumptions through sheer repetition” (2002:2). That said, an ecosystem approach to comparison of archaeological phenomena is considered for this work to be the most meaningful for archaeological interpretation, as its impact on human societies is expressed across all spaces and times.

Political boundaries are artificial and arbitrary. Though these designations are useful to land managers, they should not be expected to be reflected in patterns of past human land use—perhaps excepting those periods where these boundaries exerted constraints on human behavior. Those political boundaries that Hells Midden sits in are stable and self-explanatory, so it is unnecessary to delve into the history of these designations except to make a few brief notes. First, these political boundaries may have a significant impact on the amount of archaeological information that can be produced and distributed. Private and public lands offer distinct challenges for archaeologists to access and study, and the distribution of these lands, as well as projects requiring compliance archaeology within them, certainly affects understanding of archaeological distributions within them. What is known of Moffat County’s archaeological record (and much of the Uintah Basin) is affected, negatively, by the low population density of this region, but has seen a major increase in knowledge production on past inhabitants thanks to legally required archaeological investigation on large public lands (namely Dinosaur National Monument) and infrastructure development (LaBelle 2019:2).

Let us begin by defining the designations to be used in this text while discussing this region. While the areas discussed below have multiple definitions and descriptions, often contradicting one another, this brief survey of terms will describe the way these terms will be used in this thesis, based on relevant sources.

The Intermountain West is an archaeological region characterized by high-altitude ecosystems interspersed with low-lying drainages; this environmental character is expected to have confined past human use of the landscape and created a distinctive character for the archaeology in this region (Madsen and Metcalf 2000:ii). This area, described in an archaeological volume for this region, is bounded by the Colorado Front Range to the East and the Wasatch Range on the West; it extends north to the Canadian Rockies and south to the junction of the San Juan and Colorado Rivers (Madsen and Metcalf 2000:ii). This designation of an intermountain west is guided both by broad environmental similarities *and* commonalities in the adaptations of archaeological inhabitants to those environmental constraints. I will prefix the term with “Greater” to denote the large and arid “uninhabited third” of the United States, between the Rockies and Sierra Nevada mountains (encompassing the Great Basin, Colorado Plateau, and neighboring areas).

The Colorado Plateau is an ecoregion which stretches north to south across the Colorado/Utah border with a western leg that follows the Arizona/Utah border. It is, roughly, 150 miles across east to west, primarily located within the state of Utah, and is bisected diagonally by the Green River (Stier 2012:219). As it is used in this work, the Colorado Plateau follows the US Geological Survey definition of this *ecoregion* (multiscalar spatial designations that integrate “geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology” (Chapman et al. 2006). These ecoregions are organized in nested “levels”

hierarchies; the Colorado Plateau represents a Level III designation (situated in the larger-still designation of “Western United States” [Sleeter et al. 2012:313-315]). Hells Midden is located, more specifically, within a Level IV ecoregion described as the “Semiarid Benchlands and Canyonlands” (Chapman et al. 2006). Significant to our study, this ecoregion’s northern boundary is just north and east of the Yampa River at Castle Park, where it transitions into another Level III ecoregion, the Wyoming Basin; to the west is the Wasatch and Uinta Mountains ecoregion and to the east the Southern Rockies ecoregion (Chapman et al. 2006).

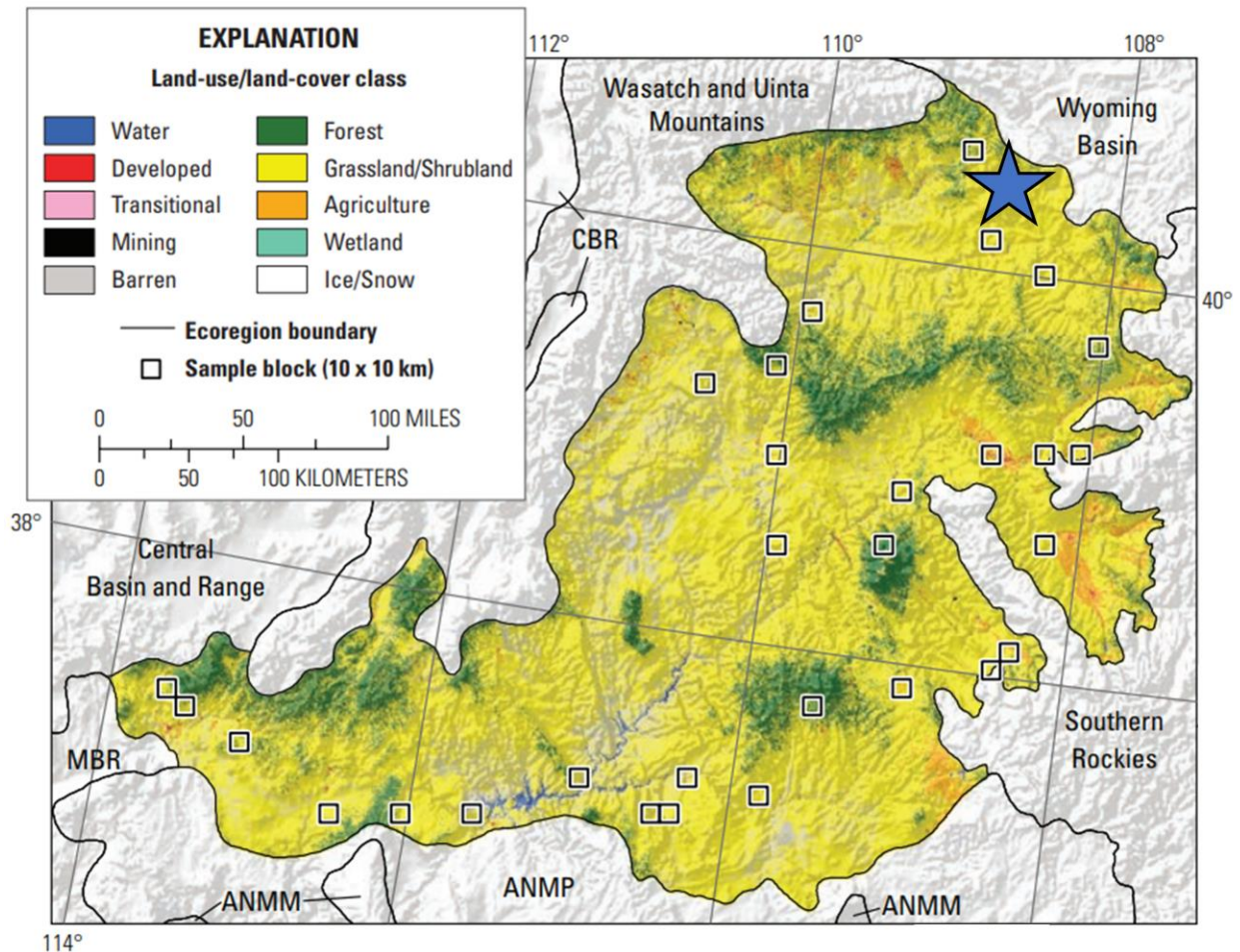


Figure 30 – Map of the Colorado Plateau ecoregion, reproduced from Stier (2012:Figure 1). The blue star indicates the position of Hells Midden. Note its proximity to three other ecoregions.

While the Colorado Plateau is an ecologically defined region, archaeologists often distinguish the Northern Colorado Plateau to delineate a Formative boundary between Ancestral Puebloan and Fremont groups (Simms 2008). A similar distinction is made in the series of *Colorado Context Studies* to distinguish the Northern Colorado River Basin from the Four Corners region of the state (Reed and Metcalf 1999). This designation of space should be used carefully as it may be built on past assumptions regarding the “northern periphery” and lead to circular definitions (where Fremont groups are defined as agriculturalists in the Great Basin and *northern Colorado Plateau*, the latter being distinguished by the presence of Fremont agriculturalists [Finley et al.2020:94]).

The Uinta Basin is a designation I will refer to frequently along the dimensions described by Spangler (2002). Spatially, this region is bounded by the Uinta Mountains to the north, the southern edge of the Tavaputs Plateau to the south, the Piceance Basin to the east, and the Wasatch Plateau to the west (Spangler 2002:3). The entire region falls within the Green River drainage, which roughly bisects the Uinta Basin from northeast to southwest, and the majority of it is located within the Colorado Plateau ecoregion. . Elevation here, as in much of the intermountain west, is highly variable, with high peaks exceeding 13,000 feet in the north and frequent, deeply incised river canyons across the lowlands. The archaeological character reflects adaptations to lifeways at the crossroads of the northern Colorado Plateau, the Great Plains/Rockies, and the eastern Great Basin (Spangler 2002:4).

Finally, another region to be invoked frequently is **Castle Park**, among the smallest and most specific region designations used to describe the area around Hells Midden and the Mantle Ranch (Burgh and Scoggin 1948; Burgh 1950; Lister 1951). This area is a 680-acre low-lying region of the Yampa Canyon with a broad flood plain and multiple archaeological sites (Bernard

and Prokopetz 2005:1). It is three miles long (following the Yampa) and, at its maximum extent, one-third of a mile wide (north to south), and is located ten miles upstream of Echo Park, where the Yampa and Green Rivers confluence. Two tributary canyons, Hell and Red Rock Canyon, seasonally feed the Yampa at Castle Park, draining water from the Blue Mountain area to the south; these canyons are the only access point for the region, with large sandstone cliffs blocking access from the north. Here, at the mouth of Hell Canyon in Castle Park, the Mantle family homesteaded, and today these lands remain in private hands, encircled by DNM. This region is recognized for the dense grouping of precontact (particularly Formative) sites, and this may be explained by its low aridity, high winter temperature, and high species diversity as compared to surrounding uplands within this rugged canyon country. Recently this region was nominated (as the “Castle Park Archaeological District”) to the National Register of Historic Places and given the state site designation of 5MF5803 (Bernard and Prokopetz 2005). Hells Midden, being on private land, is not a contributing site to this designation, although it is obviously related to the other archaeological phenomena here.

Hells Midden Environment Context

Hells Midden is located near the northern boundary of the Colorado Plateau ecoregion in far Northwestern Colorado. Located just south of the Yampa River, at the mouth of Hell Canyon in Castle Park, this area has been called “the preeminent example of canyon land prehistory in northwestern Colorado” (Bernard et al. 2004:1). This area is within the “Semiarid Benchlands and Canyonlands” ecoregion, defined by great topographic variability, little surface water, and high rates of evaporation (Chapman et al. 2006). Castle Park’s appeal may be understood as a kind of oases from these surrounding environmental conditions, providing water, soils, and warmer temperatures than are common within this ecoregion (Bernard and Prokopetz 2005:1).

Hells Midden itself is a prominent sheltered mound, rising several meters above the alluvial terrace which is a favorable location for settlement by many species and intensive agriculture by ours. This thesis will seek to demonstrate this favorability through time based on evidence from the precontact land-use record at Hells Midden.

Geology

Castle Park is named for the large, “fortress-like” sandstone cliffs which tower above the Yampa River here—practically vertical on the canyon’s northern side (Bernard and Prokopetz 2005:1). These cliffs are composed of Weber sandstone which were initially deposited in the Pennsylvanian period (Burgh and Scoggin 1948:13), being subsequently uplifted. The physiographic character of this region was defined by four common features (“of particular relevance to the study of ancient culture”) in Burgh and Scoggin’s report: caves, river terraces, benches, and mountain summits (1948:13-14). While southern aspect caves and rock shelters would seem the most obvious location for human habitation, Burgh and Scoggin note that the six degrees to the south dip of the Weber sandstone makes southern facing caves, which would be “otherwise more suitable for habitation...subject to continuous seepage” (Burgh and Scoggin 1948). This is a very important factor in settlement systems here and explains the paucity of archaeology materials in places like Rat Cave (on the north side of the river) as compared to Mantle’s and Marigold’s (Burgh and Scoggin 1948:18). Surely the difficulty in accessing the north side of the canyon would have also made these areas difficult to access in seasons of high flows of the Yampa. Hells Midden is located immediately beneath a bench along the river terrace, and this setting is recognized as being attractive to a range of human and nonhuman occupants.

Climate

The weather in Castle Park and the Yampa Canyon is “relatively salubrious” for all seasons as compared to surrounding uplands (Bernard and Prokopetz 2005:1), a fact noted anecdotally in historic accounts of the region (see chapter 2, this volume, for this reference in the *Steamboat Pilot*). Between 19 June and 24 July 1942, researchers recorded a median temperature of 70° F and a 37% relative humidity for Castle Park (incorrectly cited to [Burgh and Scoggin 1948] in [Bernard and Prokopetz 2005:1]). Lister notes that the parks along the Yampa Canyon were frequently snow free and slightly warmer than surrounding regions (1951:2). Temperatures between 0° and 28° F are common in the winter months, and in the summer, temperatures rarely exceed 90° F (Bernard and Prokopetz 2005:1); annual precipitation for the Colorado Plateau ranges from 6 to 16 inches (15 to 40 cm; [Stier 2012:219]). In this region, aridity is caused by the rates of evaporation, not a lack of precipitation, and this effect is reduced by the protection from wind afforded at Castle Park.

Paleoenvironmental reconstruction for this region has primarily been undertaken in the context of CRM reports related, primarily, to oil extraction and pipeline development. A few scholars have undertaken further work to understand the ancient environmental landscape of the northern Colorado Plateau and Uinta Basin region (Finley et al.2020; Sharpe 2002). These studies frequently have a primary interest in describing conditions for the Formative transition, seeking explanations for the florescence of agriculture here during the last two millennia of Indigenous occupation. Due to the nature of these paleoenvironmental reconstructions, these studies may be conducted on broad spatial scales. Still, these general climatic trends can inform our interpretations of human adaptations.

Sharpe's work, based on radiocarbon-dated flora from packrat middens, modeled Holocene temperatures and precipitation data (2002). When compared to modern data from Vernal, Utah (50 km to the west of Hells Midden), this research showed a generalized pattern of warming and drying of the climate. The warming between the early Holocene (modeled from a midden dating to 9870 ¹⁴C years BP) was slight, particularly for the January estimates (only 1° to 3° C), whereas precipitation may have been 2 to 3 times greater than modern. For the later part of this sequence, represented by an uncalibrated ¹⁴C age of 3000 BP, Sharpe notes recovered taxa are "almost identical" to those recovered from a modern midden, suggesting little change since that time (2002:312). Table 1 is a reproduction of table 1 in his work (Sharpe 2002:312).

Table 1- Modeled climatic data from packrat middens in Dinosaur National Monument compared to modern data from Vernal, Utah. (Sharpe 2002:Table 1)

Estimated Past Temperature and Precipitation		
Date (¹⁴ C yr B.P.) and month	Temperature °C	Precipitation (mm)
9870 January	-11 to -9	26 to 91
8460 January	-8 to -4	21 to 51
3000 January	-7 to -1	13 to 44
Modern Vernal, Utah, January	-8	12
9870 July	11 to 18	39 to 64
8460 July	17 to 20	22 to 41
3000 July	18 to 23	20 to 41
Modern Vernal, Utah, July	21	14

Note: Sand Canyon Alcove, 40°20'N latitude, 109°01'W longitude, 1920 m elevation. Vernal Airport, 40°27'N latitude, 109°31'W longitude, 1600 m elevation. The Vernal Airport climate record is 72 yr long.

While these climatic models are intriguing, the archaeological record suggests, at least in the Holocene (and where data are available), environmental conditions have not changed enough to significantly alter the overall assemblage of species recovered from sites in the Uinta Basin and surrounding regions (Spangler 2002:4). Additionally, our understanding of these paleoenvironmental conditions, even if somewhat wetter or cooler in different periods of the

past, can still be conceived in the relationship of these subregions today. The basic foundation of these systems has not changed in human timescales (for example, riparian environments here always contained more developed soils, greater floral diversity, etc. than surrounding uplands), and so our generalized relative statements about Castle Park, such as it being a boundary setting with more available water than surrounding areas, will hold true throughout the Holocene.

Ecology

Today three floral communities are typically described for this ecoregion; these communities show similarities to neighboring floral assemblages in the northern Great Basin and southern Wyoming Basin, primarily being distinguished by their distribution as affected by the complex topography of this canyon country (Bernard and Prokopetz 2005:3; Reed and Metcalf 1999:7-8). These three communities may be generalized to elevation, although there are obviously many factors that play into these distributions (Reed and Metcalf 1999:16); in order of ascending altitude, the plant communities are riparian, saltbush/shadscale, and juniper/pinyon (Bernard and Prokopetz 2005:3).

Castle Park is in the riparian zone which contains significant plant species of economy such as cottonwood and willow, dogbane (or Indian hemp) and reeds; these materials were all used by the indigenous inhabitants for production of fibers, wood tools, and basketry (Bernard and Prokopetz 2005:3). Additionally, the Yampa River was noted by John Frémont to be a seasonal gathering place for the Shoshoneans, who gathered a wild carrot species (*Perideridia gairdneri*) they called Yampa, for which the river was named (Moore and Porterfield 2017). Frémont wrote that this plant is “best among the roots used for food,” although he incorrectly identified it with a related European species, *Anathum graveolens*, in his writings (Frémont 1845:128). This root has apparently been identified from archaeological contexts at Basket Cave

within CUMNH's collection's (UCM #5756); it is referred to in published reports as *Carum gairdneri* - a taxonomic synonym, not preferred. (Bernard et al. 2004:83)

A favorable condition for occupation at Hells Midden is its position along an ecotone. Being near boundaries of three ecoregions, a wide range of elevations, and multiple floral and faunal communities distributed across these spaces serves as a major draw for all members of ecological communities; agriculturalists and hunter gatherers are no exception, as this ecotonal position afforded these occupants access to a variety of resource patch types (Peters et al. 2009). The use of several resource communities in the past is supported by evidence from Castle Park for the consumption of pinyon and juniper (Jones 1948:49). For Formative sites in the Uintah Basin, there is a positive relationship between site density and the availability of water, arable lands, and pinyon-juniper resources (Spangler 2002:6).

For discussions in later chapters about sedentism at Hells Midden, it is worth noting that riparian and wetland environments have the strongest evidence for low-mobility lifeways in the precontact record of the northern Colorado Plateau and Great Basin regions (Simms 2008:35-37; Spangler 2002:5). As will be discussed, this relates to the availability of high-density biotic communities relative to surrounding desert regions. This character encouraged a redundant and repeated use of particular areas on the landscape, such as Castle Park. During some climatic episodes, this environmental pattern may have necessitated a "tethered nomadism" which established land use patterns around access to water sources (Binford 1980:7; 1990:147).

Animal species present in these river valleys and surrounding terraces were, likewise, attracted to Castle Park because of the lush riparian conditions. Most species present today are evidenced in the paleofaunal record to have ancestry preceding human occupation in this region; some species, namely moose, have been introduced recently (and are not present in the

archaeofaunal record), while bison and grizzly bears have been almost entirely eliminated in the historic period (Reed and Metcalf 1999:20; Spangler 2002:7). Bison, absent in the region today and uncommon historically, are present in assemblages from the Uinta Basin (including Hells Midden) and are frequently depicted in rock art in the region (Spangler 2002:7). Modern big-game species include elk, mule deer, pronghorn, and bighorn sheep, all of which are present in the faunal assemblage at Hells Midden (Bernard and Prokopetz 2005). Migratory species (such as cervids and pronghorn) will tend toward the lowlands in the winter months and retreat to higher elevations in the summer (Reed and Metcalf 1999:20), and as such it is difficult to infer, with archaeofaunal analysis conducted to date, whether it was through logistical excursions or opportunistic hunting that these foodstuffs were introduced in Castle Park assemblages (Spangler 2002:6). Interestingly, this pattern of cold season dwelling in the lowlands in aggregate group and dispersal into uplands during other periods may be described for human settlement here, too. Smaller mammalian species, present year-round, include marmot, otters, beaver, mice, lagomorphs, and prairie dogs; all are common in archaeological assemblages from Castle Park and neighboring sites (Bernard and Prokopetz 2005; Burgh and Scoggin 1948; Lister 1951).

Carnivores in the region today include black bear, coyote, several species of fox, mountain lion, bobcat, badger, wolverine, and smaller species like mink, ringtail cats, weasels, and raccoon (Reed and Metcalf 1999:20). Wolves, too, were present in the past, and recently wolves have been observed in this northwestern area of Colorado (Carodine 2020). Somewhat surprisingly, carnivore bones are sometimes found in sites in the area (including Hells Midden) with obvious human modification (Spangler 2002:7). Ethnographic observation of Ute people suggests the inclusion of these species in subsistence during times of stress (Spangler 2002:457) as well as the use of badger, wolf, and coyote fur for use as robes (Spangler 2002:470).

Other species, including fish, grouse, wild turkey, and insects (particularly grasshoppers), are also found in precontact contexts at Castle Park and the Uinta Basin (Jones 1948:94; Spangler 2002:98). The importance of these species in past subsistence should not be ignored as there are obvious taphonomic biases working against the preservation of these materials in archaeological assemblages, and yet evidence for them abounds (Janetski 1997:1077). Large caches of snares and fishhooks from Castle Park sites (Burgh and Scoggin, Goff, etc.) as well as ethnographic evidence for the importance of these lower-ranked species (Janetski 1997:1077) speak to the importance of trapping and fishing among Indigenous occupants. Chapter 4 of this work will discuss observations made during the present analysis on these faunal materials.

Regional Archaeology

The regional archaeology surrounding the Hells Midden site may be most readily compared to that archaeological record of the Great Basin and Colorado Plateau (Simms 2008). The Great Basin culture area was discussed by Kroeber as an intermediate area, whose inhabitants, at different periods in the precontact era, often express adaptations like those of the Southwest, Plains, and California; he proposes these similarities are likely due to a common origin from a “primitive” Southwest-Basin culture (Kroeber 1963:50). The view of this region as “marginal” to neighboring culture areas persists and has been influenced by challenging logistics for field research as well as incomplete datasets derived from contract archaeological work in the region (Wade 1970:107). Additionally, for more than a century the major focus of archaeologists in this larger region was devoted to the study of Ancestral Puebloan and, to a lesser extent, Fremont agriculturalists (Agenbroad 1990:12; Madsen and Metcalf 2000:ix). In part this attention was due to a disciplinary prestige bestowed to archaeology within ancestral Puebloan contexts; however, it also relates to a real abundance of material culture deposited and preserved

from these late periods relative to earlier times in the archaeological past. Modeling of the pre-Formative occupations surrounding the Uinta Basin is becoming more common as compliance archaeology increases the dataset to be queried. This chapter seeks to identify the common threads of inquiry and interpretation offered in these works.

Before summarizing regional archaeology, we must understand the theory and methods employed by archaeologists to glimpse the processes through which this archaeological knowledge was produced. Archaeologists in the first part of the 20th century were concerned with culture history, which, in an area with relatively few stratified sites and during a time where absolute dating methods were in their infancy, produced haphazard and “often-imaginative speculations” regarding the origin of cultures and the diffusion of traits (Spangler 2002:41). Cultural historical perspective of researchers tends to equate material culture with human populations, and so varieties of chipped stone artifacts (particularly hafted bifaces and projectile points) or ceramics or architectural traditions became categorized and sorted based on presumed ethnic or cultural identity of the tool user. This is problematic considering evidence from this region and elsewhere that shows that point types, such as “Desert Side Notch” and “Rose Spring,” are not constrained culturally or spatially as researchers previously believed (Spangler 2002:2). Still, the reports derived from these past methods and theories are foundational sources for understanding sites within this region, and so my discussion will necessarily reference these early interpretations alongside more recent scholarship.

While Ancestral Puebloan regions south of this project’s study area have overshadowed the archaeology of the Northern Colorado Plateau in the past, a number of large synthetic works in the past two decades have greatly enhanced our understanding of the archaeology at a regional scale (Madsen and Metcalf 2000; Reed and Metcalf 1999; Simms 2008; Spangler 2002). What

follows is a summary of these synthetic models of chronology and generalized human lifeways in this region through time. This chapter will be organized along the traditional tripartite “era” designations used in across the continent: Paleo, Archaic, and Late Prehistoric (note *era*, used here, refers to a temporal span not population or behavioral suite (following Reed and Metcalf [1999:5-6]). A summary table of these divisions is below (Table 2 - Temporal descriptors from Spangler (2002), used throughout this work. In discussion that follows, more attention will be given to those times represented by the deposits at Hells Midden.

Table 2 - Temporal descriptors from Spangler (2002), used throughout this work.

Era	Relevant Sub Era	Calendrical Range
Paleoindian	-	13,000 - 6,000 BC
Archaic	Early Archaic	6000 - 3000 BC
	Middle Archaic	3000 - 500 BC
	Late Archaic	500 BC - AD 550
Late Precontact	Formative	AD 550 - 1300
	Shoshonean	AD 1300 - 1850
Contact Era	-	AD 1650 - Present

Paleoindian Era – pre-6000 BC

Sparse evidence for occupation of the Northern Colorado Plateau by the first Native American groups comes primarily in the form of diagnostic isolate stone tools (Spangler 2000:50; Loosle 2002:13); these are generally lanceolate (and later, stemmed), and are well-known in North American archaeology. Radiocarbon date frequencies reflect a near-absence of dates for the Paleoindian era in this region (pre-6000 BC calendar years) (Spangler 2000). This absence is so severe that archaeologists in much of the 20th century did not share consensus on a Paleoindian presence on the Colorado Plateau (Agenbroad 1990:20; Reed and Metcalfe 1999:57). However, the increase in compliance archaeology has firmly established this presence,

though the character of Paleoindian lifeways on the Colorado Plateau continues to elude the neat temporal and behavioral modeling which dominates discussion of these groups elsewhere. Lacking sufficient local data, much of what is written about these inhabitants for this region is repeated generalizations from Paleoindian lifeways elsewhere on the continent (Reed and Metcalf 1999:57; Simms 2008:106-112).

Paleoindian era lifeways in the Green and Yampa River basins are described similarly to their description across the continent: small hunter-gatherer bands practicing highly mobile strategies, rapidly colonizing the landscape with specialized resource procurement strategies (Loosle 2002:13). High mobility, which can be seen in the rapid spread of Clovis technology, was afforded by low human populations on the landscape and an abundance of game (Kelly and Todd 1988; Simms 2008:132-133). Paleoindian sites display a higher degree of redundancy (in materials, assemblage composition, etc.) than do later periods. This has been used to suggest that low population density and high foraging returns in this era allowed behavioral conservatism where frequent movement was the primary adaptive response to stresses (Simms 2008:112).

While these general trends in Paleoindian lifeways seem to be largely supported by the Colorado Plateau dataset, there is a lack of research which would refine our temporal models for Paleoindian habitation of this region (Spangler 2000:50). In part, this is due to a lack of excavated contexts containing Paleoindian materials (Reed and Metcalf 1999:170). Recent research in Montrose County, Colorado, has suggested the lack of Paleoindian aged sites in that region may be due to near-complete erosion of sediments from the period (Hauser et al. 2022). Modeling chronology for a period defined by isolate surface finds is difficult to do, and interpretation of human behavior from Early Holocene sites should be considered with recognition of the great span of time that has had a constant effect on sites of such antiquity.

In addition to general statements on the Paleoindian period, evidence from this region suggests little difference in adaptations or technology between Paleoindian and Early Archaic sites in this area (Spangler 2002:208). For neighboring regions in the intermountain West contain components of apparently “Archaic” material culture and site settlement patterns (such as notched projectile points, ground stone tools, and reduced residential mobility) which, when dated, have been revealed to be contemporary to Paleoindian traditions elsewhere (Reed and Metcalf 1999:58-60; Spangler 2002:209). The cause of this may be cultural (with some suggesting regional terminations of Paleoindian traditions c. 8000 BP [Loosle 2002:13]) or natural (the result of mixed deposits within excavated sites) (Reed and Metcalf 1999:60). It does seem clear, however, that Paleoindian occupations across the eastern Great Basin and Colorado Plateau are ephemeral and reflect high residential mobility during the initial colonization period; length of site occupation and other adaptive traits apparently shift once these populations had begun to “settle in” to the region (Janetski et al.2012:127).

Because this era precedes any intensive deposition of cultural materials at Hells Midden, it does not bear heavily on the focus of this thesis. Comprehensive regional studies of the cultural chronologies are available to interested researchers (Reed and Metcalf 1999; Spangler 2000, 2002). Questions, plainly, remain for this period in the Uinta Basin, such as whether Paleoindian populations were more closely affiliated with groups from the Plains or Great Basin (Spangler 2002:208), what the relationship is between sites in the river canyons with contemporary high altitude adaptations to the east (Reed and Metcalf 1999:171), what factors resulted in the Late Paleo to Early Archaic shift toward more generalized, logistical procurement strategies c. 8000 BP, and can regional wetland settlement strategies, shown to persist throughout later periods, be identified in these earlier periods?

For the purpose of reviewing Hells Midden and its relationship to regional settlement systems through time, it is enough to note that there exists a lack of sites which can be easily analyzed for markers of sedentism until the late Archaic period. This suggests ephemeral use of this landscape, evidenced by a record of conservative technology and redundant settlement strategies, which persisted for nearly half of the human occupational record here. Evidence of low-intensity landscape use (if Hells Midden was ever involved in such systems) would be extremely difficult to detect where reoccupation, population packing, or seasonal sedentism did not afford such accumulations of debris. If established models offer true details on the lifeways in this period, mobility may have been so enmeshed in human behavior during this era that even highly ecologically attractive locations, like Castle Park, were considered to be less attractive than the perceived or actual benefits of a highly mobile lifeway.

Archaic Era – 6000 BC – AD 500

During the period referred to as the Archaic (6000 BC-AD 500), major changes in lifeways on the Colorado Plateau included frequent reuse of certain areas on seasonal floral procurement cycles, the establishment of “base camps” within river canyons (suggesting increased logistical mobility and reduced frequency for residential moves [Binford 1980]), and greater investment into food storage and production. However, the hunter gatherer lifeways practiced in the Uinta Basin are characteristic of the “Archaic stage” worldwide, and, relative to the preceding adaptations, was marked by an increase in certain classes of tools, such as ground stone types, alongside a generalized increase in diversity and density of cultural materials at sites (Willey and Phillips 1958:106). Once these adaptations were established in human societies here, they were long-lasting, persisting throughout the archaeological record into Euroamerican colonization. Formative strategies (expressed in Fremont groups) significantly altered lifeways

during their brief florescence here, and so the Archaic is considered completed c. AD 550. During the later part of the Archaic era preceding horticultural land use in the Formative, populations altered their subsistence and settlement strategies, and there appears an increasing intensification of resource use, leading to overall decreased mobility.

If *Archaic* is discussed as an adaptive suite, many argue that some form of these practices were in use here from the Late Paleoindian period until the protohistoric era (Reed and Metcalf 1999:71). Spangler doubles down on this claim, suggesting this model is “particularly relevant to the Uinta Basin” (2002:228). This claim is supported by evidence in our immediate study area for seasonal sedentism, diverse foodways, low residential mobility, an increase in ground stone technology, and an intensification of local resource use, all of which began and persisted after the onset of the Archaic (Buenger and Goodrick 2019; Pool and Reed 2020; Simms 2008:149-150; Spangler 2002:309-311).

Like other period designations used in archaeology worldwide, the Archaic is frequently divided into early, middle, and late. While these subperiods are distinguished from one another based on changing material culture and site patterns, the Archaic is overall conceived of as a relatively stable period of prehistory in the region, marked by an increase in projectile point typologies and a “broad-based” hunter gatherer lifeway (Reed and Metcalf 1999:71). This presumed stability of lifeways during the archaic became well-entrenched in the Great Basin and Colorado Plateau archaeological literature during the middle of the 20th century; here, many prominent archaeologists proposed the concept of the Desert Culture, most notably Jesse Jennings (1956; Spangler 2002:228), who visited the Hells Midden site with Robert Burgh in 1947 (Figure 10). The basic traits of this proposed Desert Culture are an increase in diet breadth, as evidenced by snares, fishhooks, basketry, and ground stone tools, and winter population

aggregations which broke into smaller groups in the summer (Simms 2008:148-166; Spangler 2002:228). Being derived from culture historical models, this Desert Culture concept has been challenged for underemphasizing the environment as an explanation for cultural variation, but as Bettinger notes, “fundamentally different strategies of adaptation...can neither be comfortably subsumed under the Desert Archaic concept nor properly explained as the product of differences in the local environment” (1978:28). Still, in broad strokes, the seasonal settlement model described by Simms (2008) and others does seem to describe the facts of the archaeological record in this period. And, importantly, the seasonal aggregation and provisioning of repeatedly occupied places on the landscape, particularly shelters and caves, appears to also fit the data available from Hells Midden.

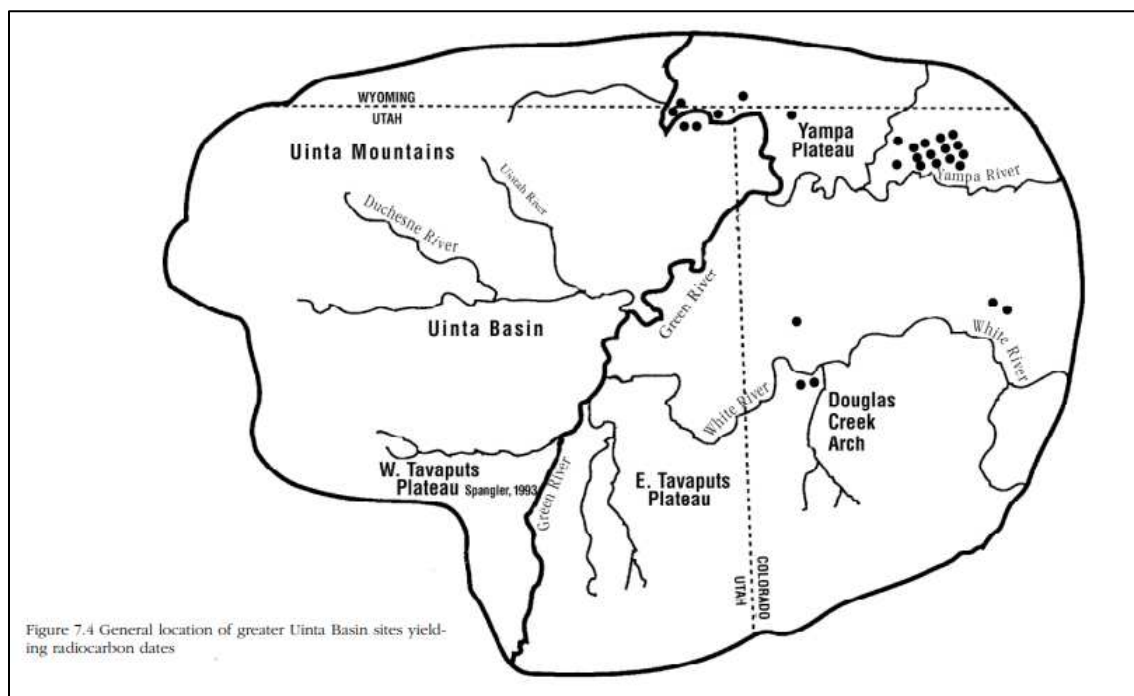


Figure 31 - Taken from Spangler (2002), this map of the Uinta Basin shows a clustering of Early Archaic occupations north and east of the confluence of the Yampa and the Green Rivers.

Archaeologists in this region generally correlate the Early Archaic period with material culture from the Northwest Plains, and there has been a suggestion that the Green River served

as a western barrier for the Early Archaic sedentary expressions (Spangler 2002:243). Still, the spatial distribution of Early Archaic radiocarbon dates may suggest a tight clustering north of the Yampa and east of the Little Snake rivers, although sampling biases are also affecting these distributions (Spangler 2002:246; Figure 31, this text). Following the onset of the Middle Archaic (3000 BC), cultural connections are more frequently drawn to the south and west (Spangler 2002:255-257).

Simms proposes that in the Archaic period, given that mobility was on a downward trend from the preceding Paleo- period, niche construction of the environment became more important within these systems. The “built environment” can serve as a positive feedback loop among human population where provisioned areas of a landscape encourage reoccupation and the creation of persistent places on the landscape (2008:152-154). In this region, caches of materials, particularly in times of greater aggregation, become much more common at cave sites in this period (Burgh and Scoggin 1948). Additional evidence for intensive landscape use and wide diet breadth come from roasting pits which were used to process large amounts of root vegetables within the Green Basin (Francis 2000). These features of built landscapes and site reuse will be discussed in more detail in Chapters 4 and 6.

Within the Yampa Canyon and nearby river valleys, house pits begin to appear in the record during the Archaic (Slaughter 2010). While riparian sites appear to have been the preferred habitation setting, evidence for occupation in the uplands, while “sparse, it was not insignificant” (McDonald 2000:124); lowland shelter sites have much more archaeological support for the seasonal population aggregation models, and the environmental benefits of these areas, described in the preceding section, would naturally incentivize reoccupation which would feed into niche construction of these places and draw further and more frequent occupations.

Again, this model fits the data from Hells Midden, and suggests an intensification of landscape use and repeat occupation of certain places within the seasonal round.

In summary, the Archaic period in the Uinta Basin and surrounding regions follows many of the trends set into motion in the Paleoindian period; major differences include increased diet breadth, overall increase in areal populations while maintaining relatively small band size during the summer months, and seasonal aggregation of peoples at increasingly provisioned sites. As noted, many of these trends, including conceptualization of the Yampa and Green rivers as boundary places, persisted into the contact era and parallel practices of the Numa recorded by Euroamericans in the past 300 years.

Use of certain areas, particularly riparian lowlands, was much more intensive than in the preceding Paleoindian era; other regions, particularly high elevation sites and arid uplands, maintain a scant record of human use in this period. This pattern almost certainly relates to the higher community population during winter months and within river valleys; sites at high elevations were utilized logistically and by very small groups, leaving an ephemeral record in these areas. How this form of increasing sedentism relates to the florescence of the Formative adaptations which follow this period is one of the prime motivations of this present research, but Hells Midden may be reasonably assumed, based on common habitation locales in this era, to have served as a frequently, intensively, and densely occupied site during the precontact era. The evidence in the lower sequence of the site suggests many of these trends of built environment and persistent place production which may have enabled the agricultural production eventually practiced here. Radiocarbon results, presented in chapter 5, and analysis of sedentism in chapter 6 will be compared to help understand some of these processes and their expression through time.

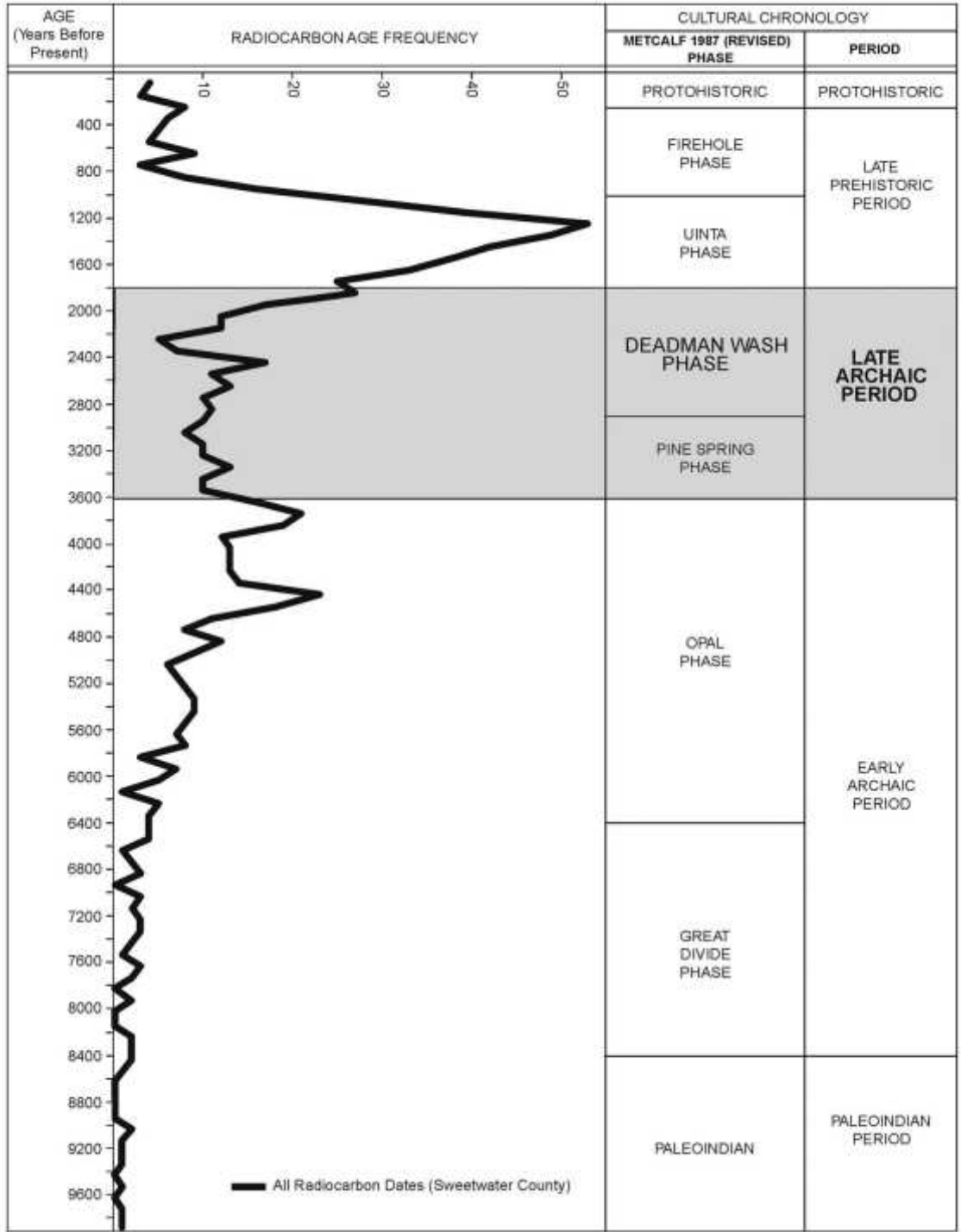


Figure 32 - This figure from Smith (2016) shows the cultural chronological sequences of Southwestern Wyoming against radiocarbon age frequency for the region. These data suggest an increasing population in the greater region occurring during the transition from the Late Archaic to the Late Prehistoric, beginning roughly 2200 rcybp and peaking around 1200 rcybp. Another increase is noted for the Early to Late Archaic transition.

Late Precontact Era – 500-1500 AD

Two terms, Late Precontact and Formative, are used, sometimes interchangeably, to discuss the period after the Archaic and before the post-1500 colonial contact and proto-contact eras. For the purposes of this work, Late Precontact will be the more general temporal descriptor, referring to the millennium between 500 AD and 1500 AD. Formative, here, will describe lifeways and not a temporal span. It will be reserved to discuss the period of maize agriculture and related material culture, frequently associated with Fremont agriculturalists. The material markers of the “Formative” may include maize and associated crops, ceramics, textiles, and masonry architecture. All of these markers are apparent in the record of Castle Park.

Because of the discussion above regarding the similarity of lifeways between the Archaic and later populations’ adaptations in the northern Colorado Plateau, most focus here will be given to describing Formative Fremont lifeways. This makes good sense in application to Hells Midden, as the evidence suggests Formative occupations were the primary Late Precontact use of this site between the Archaic and Contact eras. The following section will describe Fremont Culture as it has been discussed in the literature of the past century. While this period and culture is, without question, “the most thoroughly investigated of any period... on the northern Colorado Plateau” (Spangler 2002:317), generalizations about these groups based on research in the core Fremont regions may be muddying our interpretations of these archaeological cultures within this region. Further studies here may provide further evidence that the image is more complex than cultural history models can describe.

The Fremont Culture was first described by Noel Morss following research conducted in the namesake river valley during the summer of 1928 for the Claflin-Emerson expedition. He wrote:

“... we had every reason to believe that any remains found by us would fall readily into the established sequence of Southwestern cultures with only minor local variations. Quite to the contrary, the Fremont drainage proved to be the seat of a distinctive culture, to which nearly all the local remains are to be assigned” (Morss 1931:iii-iv).

This quote reveals several salient points in discussing the history of Fremont archaeology. First, it emphasizes the culture history approach used in the period and the focus on Puebloan archaeology within this region. Secondly, the last clause of this quote highlights the intensive occupations practiced by these Fremont groups wherever their lifeways spread. The focus on Fremont across their sphere is not, primarily, researcher bias in the northern Colorado Plateau, but reflects massive archaeological record these groups left on the landscape during their florescence. As human agents practicing sedentism in areas of frequently reoccupied sites, their intensive presence can also be reasonably expected to destroy (or disturb beyond recognition) evidence of earlier, less intensive occupations. Both of these may be shown for the upper sequence at Hells Midden and within other sites in Castle Park as well.

Morss' work suggests that Fremont Culture is widespread, and that the full extent of their material markers are yet to be discovered. Interestingly, he references Jeançon's work in Western Colorado as well as suggesting a possible association of Fremont materials with the masonry granaries found to the north and east of the Fremont River drainages (1931:77). Still, many of the material markers identified by Morss remain diagnostic markers of this group. These traits are summarized in Table 3 - Fremont trait lists, synthesized from Morss (1931) and Reed and Metcalf (1999)..

Table 3 - Fremont trait lists, synthesized from Morss (1931) and Reed and Metcalf (1999).

Material Markers of Fremont Culture	Present at Hells Midden?	Castle Park?
Rod-and-Bundle Basketry	-	X
Unfired clay figurines	Maybe	X
Storage cists	X	X
“Utah” Metates	X	X
Maize, Squash, Bean Agricultural Complex	X	X
Worked bone tools, ornaments, and gaming pieces	X	X
Fine textile and cordage tradition	X	X
Coiled pottery tradition	X	X

Since the 1970s, key researchers in the Fremont sphere have pushed back against these trait list definitions of this culture, noting that many of these “diagnostic” traits actually precede and post-date Formative florescence in the region (Aikens 1972). Rarely, too, are all traits found at any single site. Attempts have been made to further subdivide Fremont occupation into smaller regional variants (Bauer 2022:9-14; Madsen and Schmitt 2005:12; Spangler 2002:323-329), each with their own list of traits. Loosle and Kiaha express their agreement with leading Fremont scholars that “too much unproductive effort has been exerted to define the Fremont” (2002:22)—I agree! None of these cultural boundaries are necessary for discussion of temporality and settlement, for these cultural processes are universal in human societies. So, Fremont, as it will be used here, simply refers to Formative populations who sometimes farmed and whose lifeways

reflect changes experienced by societies “who live within the matrix of farming communities” (Madsen and Simms 1998:322-323, quoted in Loosle and Kiaha [2002:22]).

In these populations, the process of increasing sedentism clearly reached new heights. This is apparent in the Uinta Basin by the massive increase in archaeological density of materials dating to the Formative period (Spangler 2002:331). The emergence of Fremont cultural expressions led to changes in subsistence pathways, and these sometime included investment in agriculture. Spangler notes that in the Uinta Basin, subsistence packages never appear to fit a strictly foraged or farmed diet, and he attributes this to the transitional geography of the region and its relations to the Plains, Southwest, and Great Basin regions (Spangler 2002:317). Burgh and Scoggin’s report also noted this likelihood, suggesting Fremont occupations at Castle Park were by “a people whose practice of agriculture did nothing to diminish their interest in the older occupations of hunting, fishing, and harvesting wild plant foods” (1948:90). Climate and the willingness of the land to yield agriculture products almost certainly played a role, too. Further resolution on the temporality of maize in this region coupled with paleoenvironmental data will surely help uncover this story (Finley et al.2020). Ongoing research is attempting to understand the temporal sequence of these subsistence strategies in far Northwestern Colorado (LaBelle and Meyer 2023), and corn dates from Hells Midden will add data to these chronometric analyses.

Fremont occupation was recognized within the Castle Park region very early in the CUMNH explorations of the area, and the evidence for highly sedentary lifeways under these cultural regimes here is supported by their recording of abundant and diverse artifact assemblages, wide ranges of cache types and cached materials identified in cave sites, architectural investment at Marigold’s Cave (Figure 33), and high frequencies of ground stone artifacts across this landscape. Further evidence for settlement strategy practiced by these groups

will be sought in the analysis conducted in this thesis. While Hells Midden lacks the rich perishable materials and architectural features of cave sites, it does suggest intensive occupations through other lines of evidence, and these will be compared across the site to understand changes before and after this period. Comparison to radiocarbon dates for this area (Goff 2010; Truesdale 1993), which suggest Fremont occupation of several centuries centered at, roughly, AD 1000, will be compared to the dates at Hells Midden, too, to understand how much time is represented within these very deep (>150 cm) deposits. Data from the surrounding Castle Park evidence will be used to create arguments about changes in settlement systems and related phenomenon following the florescence of these groups.

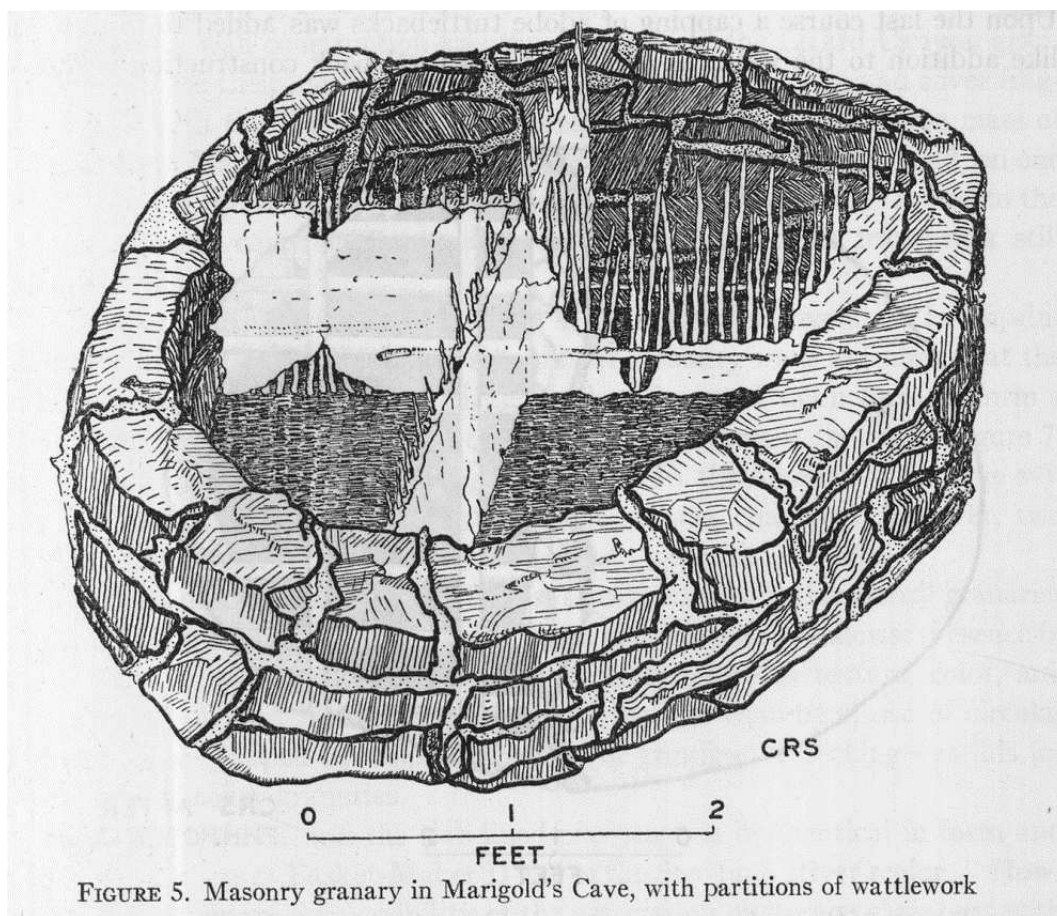


FIGURE 5. Masonry granary in Marigold's Cave, with partitions of wattlework

Figure 33 - Taken from Burgh and Scoggin (1948: Figure 5), a granary feature from Marigold's Cave suggests incredible investment into architecture and food storage.

Conclusions

Indigenous adaptations to the Intermountain Region, including the northern Colorado Plateau, shows a remarkable continuity through time. Occupational intensity and degrees of sedentism apparently increase through time in this region, based on evidence from architectural features such as pit houses and storage features. Landscape provisioning also seems to be more important following the Paleoindian eras, owing to a generalized subsistence strategy which used seasonally available plant stuffs in a reoccurring occupational regime. During the Late Precontact era, subsistence pathways appear to have shifted slightly to include domesticated foodstuffs. These subsistence changes resulted in the construction of granary features, population packing, and resource depletion in increasingly sedentary occupations during Fremont regimes. These regional trends will be compared to those settlement patterns observed at Hells Midden in the following chapters.

CHAPTER 4: HELLS MIDDEN ASSEMBLAGE

This chapter will introduce the dataset available from Hells Midden. This collection of materials and notes from the CUMNH investigations in the 1940s offers many opportunities for inquiry but necessarily excludes others. This chapter will provide overviews of the Hells Midden assemblage, offering definitions and characteristics of different classes, elements, and types of artifacts, as they are used in this work. Summary statistics on different artifact classes will be offered alongside observed patterning in the Hells Midden record. Detailed spreadsheets of recorded data on chipped stone, ground stone, and sampled faunal and floral materials can be found in Appendix IV.

Description of site stratigraphy and features:

As stated in chapter two, unstandardized excavation methods used during the four seasons at Hells Midden make direct comparison of stratigraphy within different areas of the site a real challenge. Fortunately, the large trench excavated during the 1948 season allowed an illustrated profile to be produced for much of the site's north-south extent. This profile, a handful of illustrated plan maps of excavated surfaces, written description in field notes and published reports, and artifact distributions are the primary sources of data for reconstructing the Hells Midden strata. Lister's report provides a summary of site's levels (1951:9-14) and field notes from all four seasons offer additional description and illustrations. This section will serve to summarize the salient points across these works with added interpretation of the present author.

A general note should first be made on the level designations used in published works and CUMNH provenience data. In 1947-49, reported vertical proveniences were commonly given only as an arbitrary level; these level designations varied each year (Figure 27). And while vertical proveniences and level extents were reported in depth below the surface, there is no explicit surface elevation offered for any year. Photos and illustrations show that surface (and buried surface) elevations vary. Profile maps show these horizons dipping on either side of the Midden's crest. Different horizontal unit locations were also used: Dick excavated adjacent to the shelter wall, wholly within the "dip," while Lister, the year previous, cut through the crest. As a result, two stratigraphically associated artifacts excavated in different years could be assumed to not be because reported depths below surface would be so different (Figure 20).

Another thing to be mindful of is that in 1948, levels beneath level three were dug in 30 cm intervals; before that they were excavated following natural strata. After this switch, level faces became parallel, suggesting a single vertical datum from which depths were measured. Likewise, it's assumed 1949 excavations also used a vertical datum, though whether this was the same or similar to 1948's is not reported. While I calculated an estimated surface datum for 1948 (1574.9 meters above sea level [masl]), based on recorded elevations and known level depths of subsurface features (see Figure 16, Figure 17, and Figure 18), it is useless without evidence it was used in 1949 too.

My descriptions of vertical provenience will primarily note depth below the surface (bs), following written notes, catalog data, and published works. To avoid monotony, I will also refer to level designations by year and level number (i.e., 1948-3). Table 4 shows their correspondence with depths below surface. Figure 27 presents these data in a scaled graphic. While designation reference may seem to favor Lister's system, that is consequence of his foundational report

(1951) glossing over this difficulty and only referencing '48 designations. This section will be organized following Lister's proposed "Horticultural" and "Hunter-Gathering" stages (roughly split at 170 cmbs and distinguished by Fremont occupation), though I substitute "upper" and "lower" to describe this dichotomy without arguing for a dominant subsistence system associated with these occupational periods.

The following section will describe the sequence of occupation (from most recent to most ancient) observed in the 1940s excavations and through this reanalysis. Stratigraphic descriptions will be presented alongside descriptions of the features present at Hells Midden. Features will also be described here. While features here are limited, particularly as compared to nearby Mantle's and Marigold Caves, the features that were recorded by the excavators offer insight into settlement strategies as it relates to architectural investment, site provisioning, and reuse of space. Descriptions of artifacts used for interpretation will conclude this chapter.

*Table 4 - Level designations used during 1947, '48, and '49. Italics signify levels dug using natural stratigraphic horizons. "U" and "L" denote upper and lower, which were used to discriminate between different occupation surfaces within these broad levels. *Level '48-4 was described as having upper and lower portions, but their respective depths are unknown.*

1947	cmbs	1948	cmbs	1949	inbs	cm conversion
<i>47-1</i>	<i>0-40cm</i>	<i>48-1</i>	<i>0-50cm</i>	<i>49-1</i>	<i>0-12in</i>	<i>0-30.48</i>
<i>47-2</i>	<i>40-125cm</i>	<i>48-2</i>	<i>50-120cm</i>	<i>49-2</i>	<i>12-24in</i>	<i>30.48-60.96</i>
<i>47-3</i>	<i>125-195cm</i>	<i>48-2 (U)</i>	<i>50-85cm</i>	<i>49-3</i>	<i>24-36in</i>	<i>60.96-91.44</i>
<i>47-4</i>	<i>195-270cm</i>	<i>48-2 (L)</i>	<i>85-120cm</i>	<i>49-4</i>	<i>36-48in</i>	<i>91.44-121.92</i>
<i>47-5</i>	<i>270-300cm</i>	<i>48-3</i>	<i>120-170cm</i>	<i>49-5</i>	<i>48-60in</i>	<i>121.92-152.4</i>
		<i>48-3 (U)</i>	<i>120-150cm</i>	<i>49-6</i>	<i>60-72in</i>	<i>152.4-182.88</i>
		<i>48-3 (L)</i>	<i>140-170cm</i>	<i>49-7</i>	<i>72-84in</i>	<i>182.88-213.36</i>
		<i>48-4*</i>	<i>170-200cm</i>	<i>49-8</i>	<i>84-96in</i>	<i>213.36-243.84</i>
		<i>48-5</i>	<i>200-230cm</i>	<i>49-9</i>	<i>96-108in</i>	<i>243.84-274.32</i>
		<i>48-6</i>	<i>230-260cm</i>	<i>49-10</i>	<i>108-120in</i>	<i>274.32-304.8</i>
		<i>48-7</i>	<i>260-290cm</i>	<i>49-11</i>	<i>120-132in</i>	<i>304.8-335.28</i>
		<i>48-8</i>	<i>290-320cm</i>	<i>49-12</i>	<i>132-144in</i>	<i>335.28-365.76</i>
		<i>48-9</i>	<i>320-350cm</i>	<i>49-13</i>	<i>144-156in</i>	<i>365.76-396.24</i>
		<i>48-10</i>	<i>350-380cm</i>	<i>49-14</i>	<i>156-168in</i>	<i>396.24-426.72</i>
		<i>48-11</i>	<i>380-410cm</i>	<i>49-15</i>	<i>168-180in</i>	<i>426.72-457.2</i>
		<i>48-12</i>	<i>410-440cm</i>			

	48-13	440-470cm	
	48-14	470-500cm	
	48-15	500-530cm	

Historic Euroamerican Occupation

The first obvious occupational horizon occurs in the top 10 cm of the Midden at the crest. To the south, it was exposed on the surface (Figure 20). This horizon is from occupation of the Midden by Patrick Lynch, the “Hermit of Pat’s Hole,” mentioned in chapter two. This Lynch horizon contained camp refuse such as buttons, bits of leather, newspaper and *Judge* magazine fragments, seventeen brass cartridges cases, and “a grocery list written on the back of a coffee-can label” (Lister 1951:11). These materials remain in the museum’s collection but were not analyzed for this thesis research. Lynch is presumed to have occupied the site in the late 1880s based on the date of 1886 on the newspaper (Lister 1951:11). Dick’s notes also suggest this level contained “a number of brass cartridges dating 1880 to 1883” (5 July 1949; ARC.DNM01_005)

Upper Precontact Occupations – 50–180 cmbs

Beneath the Lynch level, 30-40 centimeters of loosely compacted sediments with few artifacts evidence noncultural deposition of material, likely from the terrace above, prior to Anglo-American and after Fremont site use. The loose sediments, lack of artifacts, and mention of fossil mud puddles suggest an extremely ephemeral human use of the site during this period (Lister 1951:10). These noncultural deposits overlay the uppermost precontact level, a culturally-dense horizon of dark ashy sediments, found exposed at 50 cmbs and continuing to 170 cmbs. The areas of this site excavated, then, show little to no use of the site by post-Fremont indigenous groups. At the upper interface, Lister’s crew found their first evidence of Formative occupation: a ceramic sherd (Figure 53) and charred corn cob. The preservation of fragile artifacts such as charred corn at 50 cmbs mirrors the preservation of newspaper fragments in the

Lynch level above; this may suggest occasional and rapid sealing of cultural deposits—meaningful for site formation.

Lister considered this interface, between the nearly sterile sediments of 1948-1 and the darker grey horizon at 1948-2, to be hard packed from use as a living surface floor (and this was how he interpreted many of the stratigraphic horizons he encountered). These floors, both within these and lower levels, were discovered primarily beneath the shelter's overhang (Sections A and B) (1951:43). Lister explained hard-packed sediments within Hells Midden as “shelter floors, or simply portions of occupation areas hardened by campfires and by the movements of people upon these surfaces” (1951:11). Lister states that the largest “section of floor” was 60 cm square in section A; both this and the next largest floor portion, in section B, were immediately adjacent to fire features and stratigraphically level with cist features, described below (1951:43). The removal of vegetation from the surface may have contributed to the formation of these distinct strata. Clearing of surface vegetation was likely a desirable first step for human dwelling on this site (it was, after all, the first step for occupation by archaeological investigators in the 1940s).

Excavators in all four CUMNH seasons noted the similarity of these charcoal-rich upper deposits with Fremont occupations. The sherd and maize's position *on top of* this surface in 1948, and a lack of cultural materials above, suggests these were discarded during the most recent Fremont use of the site. Following the disposal of these materials, this surface and its contents were sealed by sediments from above. It was composed of abundant evidence for Fremont occupation within a dark matrix which characterizes these Formative levels (Figure 36). The artifacts recovered from this stratum (50-170 cmbs) were incredibly dense and varied in form, suggesting occupations that were frequent, dense, lengthy, and/or intensive. Chapter 6 will quantify and compare this character between upper and lower portions of the site.

In the upper 70 cm of this first cultural level (1948-2), a series of “horizontal lenses of hard-packed, or fire-hardened, dirt” was described (Lister 1951:11). A well-defined surface underlying these “horizontal lenses” marked the boundary between Lister’s 1948-2 (to 120 cmbs) and ‘48-3 (to 170 cmbs). While artifact density and variety were similar across these depths, the lower horizon lacked direct evidence of maize, ceramic, or textiles; still, Lister referred to this entire ashy matrix as the “horticultural stage.” Other differences expressed by ‘48-3 include an increased frequency of “bifacial knives” and a coincident decrease in one-handed manos, relative to ‘48-2 (Lister 1951:40-41). Debitage counts for these levels, tabulated by Dick, suggest similar flint knapping intensity across these upper Fremont horizons (Lister 1951:27).

A second hard packed surface was encountered roughly 20 cm beneath the contact of ‘48-2 and ‘48-3. This feature-rich horizon is called “u3” (upper 1948-3) in Lister’s preliminary profile (Figure 36). In this floor, excavators found six remnant pits, described as lens features, which had been excavated by site inhabitants. One was a fire feature, ringed by oxidized sediments and abundant charcoal. Dick described a similar feature at 60” (152 cmbs), “identicle [sic] to those found in Sand dune area near Marigolds” (8 July 1949). A 1948 plan view illustration of a typical Castle Park hearth from 1948-u3 is in Figure 16.

Lister’s remaining pits were cautiously interpreted as storage cists (Lister 1951:11). These features were illustrated in the ‘48 profile and Lister notes that their superimposition “may be assignable to periods of occupation” (1951:11). Interpretation as cists is supported by similar features at nearby sites. “Pothole” cists, similar unlined pits, were identified in Mantle’s Cave “almost entirely barren of artifacts and foodstuffs” (Burgh and Scoggin 1948:25). This report offers illustrations of several forms of cists at Mantle’s Cave, suggesting these features have

“little uniformity in size or contour... dug with a minimum of effort, and modified as required for storage” (1948:32). Hells Midden’s cists follow this pattern. A photograph from the 1951 report (Figure 34) shows two example cists in profile.

Another storage feature in the lower half of the Fremont horizon is a cache of large quartzite “blades” (Figure 17; Figure 35). These five utilized spalls and two bifaces were found at 130 cmbs against the shelter wall, all exhibiting edge modification which may be use wear. Caches like this can support understanding of a site’s relationship to the land use patterns. Large metates, too, speak to provisioning of the site for a delayed benefit of task efficiency. Discussion on caching behavior and its implications for understanding Indigenous land use, social, and economic systems will follow later in this chapter alongside description of a similar chipped stone cache in the lower portions of the site.



Figure 34 - Photo of potential “cists, or fireplaces,” in level 1948-3. Enhanced for visibility from Lister (1951:Plate 5). His caption reads: “Cross-section of two of the cists, or fireplaces, found in Level 3 or the 1948 excavations.”

In summary, this upper portion of the Hells Midden site is defined by the 1.5 meter thick ashy strata. The bottom seems to be about 170 cmbs, and Dick noted the presence of corn at this depth in level 1949-6 (152-183 cmbs). Lister’s report agreed, defining the “horticultural stage” as represented by levels 1948-2 and 1948-3 (50-170 cmbs) (1951:38). Stratigraphically and materially, this entire level is nearly homogenous, with similar artifact density and floor and cist features throughout. Deposits and features here suggest a primary occupation of the site throughout the represented period. Deposit density suggests an intensive occupation of the site in this era. Researchers recognized these materials are clearly linked to other Fremont sites in Castle Park and across the *Fremont-sphere* (Lister 1951:45-46), and this hypothesis remains generally supported by more recent models of Formative lifeways in this region. Chronometric

sequencing of these deposits, in chapter 5, will support efforts to understand these deposits and offer evidence to refine these claims with an improved temporal dimension.



Figure 35 - Quartzite "blades" cached at a depth of 130 cms. These are relatively massive, with an average mass of 51.8 grams. The bottom-left specimens (UCM#6567.b and 6567.d) are bifacially worked, the remainder are lightly utilized spalls. See Figure 17.

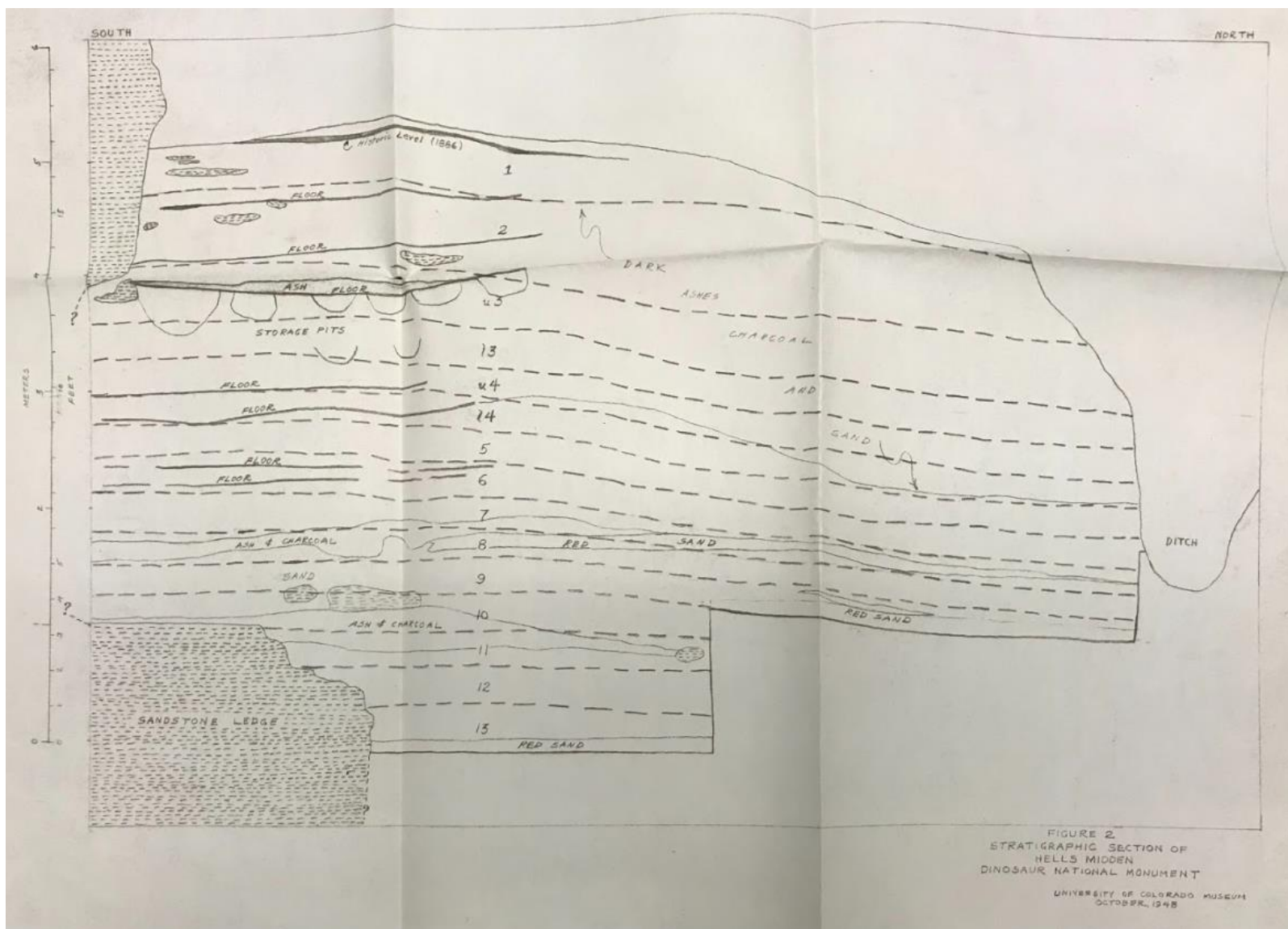


Figure 36 - Preliminary profile illustration, 1948, which emphasizes the living floors. Note levels 3 and 4 in this illustration are divided into upper and lower portions to emphasize the two surfaces within these levels. Produced by Lister following 1948 season, west wall of Hells Midden (from CUMNH archive).

Lower Precontact Occupation – 170-450 cmbs

Beneath those strata dubbed the “horticultural” stage, a “hunter-gathering” stage was posited by Lister. These lower occupation levels of Hells Midden were divided into an upper, middle, and lower horizon, represented by 1948 levels 4 & 5 (170-230 cmbs), 6 & 7 (230-290 cmbs), and 8 through 11 (290-410 cmbs), respectively (Lister 1951:38-42). Despite these distinctions, artifact assemblages across these depths are mostly similar. Features, including floors and pits, decrease in frequency as depths increase. No “well-defined floor areas” were identified below 250 cmbs (1951:44). This may suggest low intensity occupations (infrequent, short, small group size) at the site in these times.

The dichotomy of horticultural and hunter-gathering stages offered by Lister does reflect real distinctions in material culture and site use patterns, although the names may put too much emphasis on labels which likely represent populations with nuanced and varied subsistence practices. Deposits in these lower levels differ from upper Fremont levels, most obviously, in artifact density and richness (that is, variety of types). Features follow a similar pattern. Chapter 6 of this thesis will seek to evaluate the differences between these levels based on a quantified analysis. Here, description of general trends will set up the interpretations to follow.

Because assemblage compositions change little across these lower occupations, discussion will mainly highlight features (including caches) for these lower levels. First, a few points about artifacts: counts for all classes decrease with depth. Stylistically and technologically, chipped stone types do change over time. Bow and arrow technology (as evidenced by smaller projectile points) may be present within the most recent levels of the lower portion of the site, suggesting use prior to Fremont occupations. While this technology shift is

difficult to recognize in the archaeological record, it has been suggested as a key piece of the intensification process in this region (Smith 2021; Spangler 2002:302-304).

Features in lower horizons include floor features and caches of materials and tools. Both ground stone and chipped stone caches are described in these lower strata. Caching behavior suggests provisioning of this site for continued use and may suggest that Hells Midden and Castle Park were frequented locations within cyclical foraging rounds. By caching tools or materials at a site, particularly those with high transport or procurement costs (ground stones and quality tool stones), foraging costs are reduced for reoccupying groups (Pelton 2017:2); this pattern likely incentivized recurring occupations at Hells Midden.

The ground stone cache comes from 250 cmbs; five lightly used manos had each been formed through pecking into a classic hand stone loaf (1951:29, Plate 5). These were probably intended to be incorporated into seasonal plant resource exploitation, as practiced by Shoshonean people in the Yampa Canyon historically (Frémont 1845).

A chipped stone cache, found in level 1948-4 (170-200 cmbs), was deposited by a mobile group or individual which reduced the cost of procuring tool stone at a future date. The four bifaces and two unmodified pieces of debitage are a high-quality local pumpkin chert; the total mass of these materials is approximately 430 grams—nearly one pound of raw material. These few chipped stone blanks are highly flexible and could have served a variety of purposes to a future dweller at this site. The lowest artifact from the 1940s excavations is a similar early stage bifacially worked chert spall (Figure 37).

Beyond depths of 350 cmbs, there are few diagnostic artifacts in Hells Midden. Those artifacts that are found at greater depths are infrequent, though often found within strata bearing

charcoal, animal bones, or other evidence of human occupation. Features are generally less common in these levels than in the upper portion of the site, though they were described between 170 and 250 cmbs, the top 80 cm of these lower levels. Two such described features are hard-packed floors within Level '48-4; their depth or nearness is not given, although they are apparent in Figure 36 (note upper and lower '48-4). The upper remnant floor in this level was near a rock-lined hearth feature.



Figure 37 - The most deeply buried, unequivocal artifact from Hells Midden (UCM #6979). Level '49-15 (427-457 cmbs). Scale represents 5 cm.

Two cists were found in stratigraphic association with the floor and hearth: a 70 cm long, 12 cm deep oval cist and a 40 cm diameter circle, 10 cm deep cist. These, too, were filled with “camp refuse” (1951:43-44). Figure 26 shows a profile, reproduced from '49 field notes, of sediments on the shelter wall between 180 and 350 cmbs. Most notable is a “heavy concentration of charcoal and bone” at 240 cmbs; this corresponds to level 1948-6, an occupation level with

two hard-packed floors (Figure 36). These were the most deeply buried floors discovered, with little or no portions of floor recognized below 1948-6. This absence may reflect less intensive occupation or taphonomic processes which erased this record, given more time for these processes to act on these earlier occupations. Given the evidence for reoccupation in this canyon through time, we should consider how cultural processes may have altered this record, too (for example through reconstruction of features, reuse of surface artifacts, etc.).

While early models of the site's formation suggested it was as a midden which accumulated from debris from Hells Half Acre, later seasons of investigators found evidence to suggest, instead, that at various times in the past, the surface of the "Midden" itself served as a primary use area. Site provisioning and features certainly suggest this. While the geomorphology of the site needs more research, it seems human presence at Hells Midden within all excavated depths contributed to the deposition of a significant portion the site.

Description of Hells Midden Artifacts

The artifactual assemblage at Hells Midden was described in general terms, with exceptions, in previously published works (Burgh and Scoggin 1948; Lister 1951). While remaining report preparation papers within the CUMNH archive suggest some post-field analysis on parts of the lithic and faunal assemblage, statements regarding these derived data are sparse in published site materials. What follows is, primarily, derived from a new analysis of the artifact assemblage. Full spreadsheets of these data may be found in Appendix IV.

Chipped Stone Artifacts

Within the CUMNH Hells Midden catalog there are 1,096 chipped stone artifacts. Fourteen of these were not located during analysis. Total chipped stone material recovered from

the site was evidently much higher, as can be seen from, for example, debitage counts presented within Lister's report which exceed 7,000 specimens from the 1949 sections alone (1951:27). These materials are presumed to have been tabulated and discarded on site, although no reference is made to this by the excavators. Only those chipped stone artifacts directly observed during the author's analysis will be included within discussion and analysis here. Vertical provenience is cataloged with 854 (78.9%) chipped stone artifacts within the CUMNH collection. Of those without records regarding their depth, 38 have provenience to a 1949 "spill" event, presumably the one photographed in Figure 13, which contained materials from all levels below the surface to a depth of 120 in (305 cm).

Multiple raw material types are represented in this assemblage. These were recorded alongside other attributes on the lithic materials (Table 5 shows a basic summary of the distribution of these recorded types). Raw material assessment was rudimentary and involved splitting into the general geologic types of cryptocrystalline silica (CCS), quartzites (QZT), obsidian (OBS), and other volcanics (VOL) represented by four basalt-like materials. For all but obsidian, a description of the color was recorded using generalized descriptions that account for variability within a single source. These classifications were made based on macro-attributes and are used in interpretation cautiously. No extensive comparison to the local materials was undertaken, although it was noted by CUMNH researchers that DNM contains multiple tool stone sources (Burgh and Scoggin 1948). Many of the artifacts within this assemblage that still bear cortex appear to be primarily sourced from secondary deposits within the stream channels. Well-known local CCS materials present in the assemblage include "tiger" cherts and Uinta quartzites (Loosle 2000:280) as well as river-cobble sourced "pumpkin" (Morgan) cherts.

Table 5 - Generalized raw material distributions for all chipped stone artifacts in the assemblage.

Material	Count	Percent
CCS	855	79.02%
Quartzite	217	20.06%
Basalt	4	0.37%
Sandstone	4	0.37%
Obsidian	2	0.18%
Total	1082	

Lithics were classified into elements based on gross morphological characteristics including general shape, flake patterning (bifacial or unifacial), the presence or absence of hafting elements, the size, evidence of use wear (such as battering or polishing), and more. Two classification schemes were applied to the assemblage, one which emphasized differences among the artifact types which is used in qualitative assessment and discussion of deposits. This categorization scheme identified sixteen chipped stone elements; definitions and sorting methods are described in detail in Appendix V. For the purposes of chipped stone analyses which will compare settlement strategy, a more conservative scheme was used which emphasized similarities among certain artifact classes (for example, grouping multiple scraper types and flake tools into one category). This system, meant to make these data more directly comparable, is described in chapter six.

Projectile Point Types at Hells Midden

In addition to identifying elements present in the chipped stone assemblage, hafted bifaces (projectile points) were typed based on recognized classification sequences used in regional literature. This was done to support comparison of this assemblage to nearby sites. These data coupled with dates produced through this present research will add further data by which changes in population and technology in the broader region can be understood. Challenges

to these aspirations include the difficulty, discussed in chapter three, of different typological sequences being used by researchers with backgrounds in either the Great Basin or Great Plains region, of which the northern Colorado Plateau often stands as a neglected spatial link (particular during certain periods of the archaeological past). Many of the types commonly employed in the Northern Colorado Plateau are, really, Great Basin types, frequently defined by type sites that may be more than 500 miles away--as is the case for Rose Spring points and its variants (Bischoff and Allison 2021:5). In other periods, Northwest Plains typologies are the most referenced, as previously discussed.

Neither Burgh and Scoggin nor Lister belabored projectile point typologies because of few studies describing point varieties and distribution available at that time. Lister mentioned similarities to types described in the Southwest, Great Basin, and California (1951:46-48), but CUMNH archaeologists mostly used descriptive labels such as “side-notched; concave base” (Burgh and Scoggin 1948:47) or “expanding stem; indented base” (Lister 1951:18). An exception in the former report describes a convex base as resembling “the standard Shoshoni arrow point” (1948:47-48; Figure 38), excavated without vertical control in 1940. While this description suggests the well-described “Desert side notched” style, a post-Formative form which is described as replacing Fremont Rosegate styles (Baumhoff and Byrne 1959), this is at the far east of this type’s range, and it is not otherwise represented at Hells Midden from later seasons. This example demonstrates how temporal or stratigraphic context can assist classifications where morphology alone may not be temporally diagnostic.



Figure 38 - Two projectile points from 1940 units (UCM #5216 and #5221). Described as “standard Shoshoni arrow point” (Burgh and Scoggin 1948:47-48) and similar Desert side-notched points. Scale represents 5 cm.

While some archaeologists have used projectile point typologies to argue for the movement of populations or shifts in population identity, these are not relevant to this project. Instead, typologies will be used to understand chronological dimensions of human technology, offering room to discuss ideas such as: *how long did this point style persist at Hells Midden? Do these overlapping point types reflect a pattern that has also been documented for other sites in the region? etc.* Again, the primary reason for their inclusion is for the benefit of future research which may draw on these data to refine stylistic chronologies.

All typological assessment is done based only on gross morphological characteristics. Many types here are very similar through time, and certain diagnostic attributes overlap between regional and temporal types (for example the dizzying variety of bifurcate stemmed and convex based types [McKean, Pinto, Gatecliff, Elko, Northern Side Notch, Mallory, Desert Side Notch]). There’s also little consensus on typology for the northern Colorado Plateau, owing to its nearness to the Intermountain West and Great Plains. Type revisions are frequently proposed in this region, and largely accepted, which consolidate styles shown to exist on a graded continuum

(Thomas 1981). My use of typologies will mostly follow hyper-regional research of Spangler (2002), drawing on other sources as needed.

Projectile point styles in the northern Colorado Plateau are a challenge, primarily related to this region's nearness (and past cultural affinity) to the Plains and Great Basin regions. That this region may have served as a connection between these regions seems apparent from the archaeology, but it confuses stylistic assignment of material culture generally. Similar morphologies, too, may be shared by several types which are limited spatially and temporally. Chronometric data is necessary, then, for making some of the claims below.

Many of the point types in the lower portion of Hells Midden, which will be discussed first, are present throughout the deposits. This may be used as evidence for a number of claims: these lower deposits may be more turbated than the upper Formative horizons; or different types may represent sequential and coincident habitation by multiple mobile cultures throughout the Archaic; or different hafted biface forms may represent different technologies or specialized functions for different forms which is scarcely visible in the record today (i.e. some styles being projectile points and others knives); or finally, these different forms may have been frequently upcycled by nomadic peoples who encountered and reused surface artifacts sourced from archaeological sites (the *Rejuvenation Hypothesis*; see Bettinger et al.[1991]). My thinking aligns most closely with the rejuvenation hypotheses regarding this variety, believing that it is most probable that chipped stone tools were frequently upcycled and reworked, but these questions are outside of this project's scope and no explanation above will apply to each instance. Suffice to say, the forms present in the lower sections are basically absent in upper Fremont deposits and vice versa. Discussion of types in upper sections will follow discussion of lower sections.

A series of side-notched, straight-edged, flat to convex based projectile point have been recovered from these excavations. These types compare favorably with **Mallory** and **San Rafael** point types. Mallory type's appearance is dated to c. 2500 BC (Middle Archaic) on the Plains, while San Rafael is generally considered a Late Archaic diagnostic (post-550 BC) on the Colorado Plateau; this suggests to some a diffusion of this type from east to west (Spangler 2002:273-274). A dozen examples were recovered in lower portions of '48 and '49 units; another half dozen was recovered in 1940. Proveniences between 170 and 330 cmbs suggest a persistence of this type throughout major pre-Fremont occupations. The several recovered from 1940 units suggests exposure by Scoggin and Lohr of pre-Fremont levels on this east end of the site. Most of these side-notch points uncovered at Hells Midden are bases which suggests use of the site as a base camp for mobile hunters during these Archaic occupations.



Figure 39 – Representative large side-notch types from Hells Midden, distinguished by deep base concavity (nearly notched), parallel edges, and narrow, intrusive side notches. The base is frequently wider than the point, and points are occasionally built on flakes and largely unifacially modified. Left to right, by column top to bottom, these are UCM#s 6584-f, 6946, and 6932; (center) 6583-e, 6926, and 6589-e; (right) 6545 and 5220. Note similarities to those in Figure 38. Scale represents 5 cm.

A series of notched or bifurcate stemmed points, both shouldered and shoulderless, compare favorably to the Pinto typology. At Hells Midden, these points range in depth from 170-274 cmbs. They are distinguished by split bases and wide corner notches and were found in both shouldered and shoulderless forms at Hells Midden. Pinto types are considered to be hallmarks of the Early Archaic in the Colorado Plateau, with suggested range of 6000-3000 BC. Similar forms which post-date 3000 BC, shown to be distinguished by basal notch morphology and spatiotemporal distribution, are classed as Gatecliff (Spangler 2002:246-247), but the Colorado Plateau is seemingly outside of this type's spatial distribution. They also share interesting similarities with points recovered from the Yarmony pithouse, dated to c. 6000 BC (Metcalf and Black 1991:92-98, Figures 7.1-7.3).



Figure 40 – Split stemmed projectile points from Hells Midden presented with depths. Gross morphology is like Pinto, Gatecliff, and Yonkee/McKean types. The top specimens are UCM# 6581.n (left, broken) and 6576.b; the second row contains UCM#s 6915 and 6924.1; the base portion at bottom is UCM#6989. On the right is UCM#6989, a base reworked into a scraper; it lacks vertical provenience. Scale represents 5 cm.

Unnotched lanceolate with basal concavities also appear in the Hells Midden assemblage. Within the Colorado Plateau, both Humboldt and some McKean types are morphologically similar to these varieties (concave base lanceolate points), although distinct from split-stem types. While there are a few lanceolate that fit Humboldt morphology at Hells Midden (Figure 41), their position suggests a too recent date for Humboldt forms (Spangler 2002:247). Figure 40 presents representative examples of these split-stemmed types, presented by stratigraphic relationship at this site.



Figure 41 - Lanceolate flake-points from 1949 levels 8 and 9 (213-274 cmbs). UCM# 6913 (left) and #6924.2. Note the needle-tips. Scale represents 5 cm.

Excurvate point forms, similar to the “ubiquitous” Elko points in this region (Spangler 2002:272), are found in Hells Midden in high quantities. The variety of documented Elko forms have been subdivided into numerous schemes which include both side and corner notched varieties. Basic characteristics include a flat cross section; flaking is commonly nonintrusive on ventral faces. Edges are either straight or excurvate and the overall point shape is triangular. O’Connell notes they are “broad in relation to their thickness” (1967:131). This series is present throughout the Archaic and early Formative period across the greater Intermountain West.

Because of this, they are not particularly useful indicators of time (Spangler 2002:272). At Deluge Shelter, for example, they occur throughout a large portion of the site, with uncalibrated ¹⁴C dates from 1890 BC to 325 AD (Leach 1970; Spangler 2002:71). At Hells Midden, they appear to cluster at the Archaic-Formative transition, commonly occurring as high as 120-150 cmbs (1948-3) and as deep as 200cm. They are one of the only point types which spans this sequence, with their most recent occurrence in the upper portions of 1948-3 (120-150 cmbs); their deepest common occurrence is just beneath this upper portion of the site (1948-4 [170-200 cmbs]). Isolated examples, such as UCM#6941, appear as deep as 335-366 cmbs, at the bottom of significant cultural levels (1949-12). The similarity to both earlier (Pinto) and later types (Rosegate), particularly for incomplete specimens, was a challenge to the author and assignment to this type is given cautiously.



Figure 42 - Excurvate side and corner notched projectile points, similar to Elko types. From bottom left, clockwise: UCM# 6941, 6907.8, 6907.7, 5236, 5205, 6536-k, 6536.p, 6536-g, 5228, and 6570-d. Scale represents 5 cm.

A final Archaic style to note are contracting and convex stemmed points. These are present in low numbers in Hells Midden's lower section and are similar to Gypsum types, not "particularly common" in the Uinta Basin (Spangler 2002:274). Though similar socket-stemmed bifaces are present in upper deposits, Gypsum points are considered a marker of the late Middle and early Late Archaic (Spangler 2002:273). One narrow biface (likely a drill or boring tool) from lower Formative deposits looks like it may be a reworked Gypsum point based on the stem's nearly columnar cross section. An example from 213-244 cmbs has shoulders similar to Gatecliff (a connection between these types is noted in Spangler [2002:273]). A third, found in 1949 Trench-II between 213 and 274 cmbs, is very similar to later types found in the Fremont horizons. These are presented in Figure 43.



Figure 43 - Gypsum points and a drill, suggested to represent a heavily reworked Gypsum. From left these are UCM# 6915 (213-244 cmbs), 6924.4 (213-274 cmbs), and 5005 (122-152 cmbs). The middle example is nearly indistinguishable from point styles found in the Formative levels. Scale represents 5 cm.

Late Precontact sequences at Hells Midden are populated with regular, triangular point types most like **Rosespring/Eastgate** types, hallmarks of Fremont occupation. Examples from

the upper levels at Hells Midden are relatively small (3 cm length is typical), corner or base notched with sharp ears, and have fine edge retouch. They are often associated with triangular unnotched forms which may have functioned as preforms or knives. Larger hafted bifaces also occur with these types, likely representing knives or dart points used alongside these smaller arrow points. Similar corner notched types are also found in low counts in lower horizons which may represent early bow and arrow use or intrusion of these artifacts from upper deposits.



Figure 44 - 6565.e (left), 6533.m (middle), and 6534.f (right). These artifacts were found in 1948 levels 1, 2, and 3, respectively. The artifact at the left is presumed to be a preform and the others are Rosegate types. Scale represents 5 cm.

Faunal Materials

By far the most abundant class of artifacts from the Hells Midden site is animal remains. Excluding any modified bone tools, gaming pieces, pendants, etc. (discussed separately), this assemblage exceeds 2,300 individual bone fragments. Represented taxa include elk, sheep, deer, bison, rabbit, and prairie dog, as well beaver, mollusk, and several bird and fish species. While an in-depth faunal analysis of this assemblage was outside the scope of this project, all “lots” of bone were examined by the author. Evidence of carnivory and other modifications could suggest other-than-human introduction of these specimens to the assemblage, but the overwhelming

majority (>95%) of bone is consistent with expectations for human kitchen refuse from normal subsistence activities (cut marks, burning, etc.).

As discussed in chapter two, previous lab work was conducted on portions of this assemblage, and the summary data from these analyses are presented in Appendix IV. In this work, Elaine Anderson identified 16 species from the 1948 assemblage, with a summed minimum number of individuals (MNI) of 133. The most abundant taxa identified in this work, in terms of MNI, being represented by small mammals: *Cynomys leucurus* (white-tailed prairie dog, MNI=30) and *Sylvilagus sp.* (unidentified cottontail species, MNI=17). While these species are fossorial, their inclusion in the assemblage may prove to be cultural, supported by the number of snares found within the region (Burgh and Scoggin 1948; Goff 2010) as well as ethnographic and archaeological data supporting these species inclusion in subsistence packages of Indigenous hunters (Janetski 1997; Simms 2008:168). The counts of fish bone are high, too, though this is again supported by finds of fishhooks at Mantle's Cave (Burgh and Scoggin 1948). It is significant that these small species would be so abundantly represented given the taphonomic and processing biases against their inclusion within these assemblages.

In addition to cut marks observed by the author across all major represented taxa, additional human modifications, primarily burning, were also observed. Future work could seek to detail these faunal dimensions in more detail and apply faunal datasets into analyses like those that will be conducted in subsequent chapters. Diet may be reconstructed by these analyses. For our purposes, description of these materials is primarily undertaken to describe materials used for AMS dating of these deposits. These details are presented in the following chapter.

Bone tools

Bone materials which were modified with intent to produce a bone product are here generalized as “bone tools.” These include bone tools (such as awls or knives) and, presumably, non-utilitarian modified bones such as gaming pieces, beads, and pendants. There are 87 of these artifacts which have provenience and are used in analysis for chapter six of this work. While other heavily modified bones were identified within lots which primarily contained subsistence bone refuse, the discussions and analysis of bone tools in this thesis only used artifacts of this type which were identified as such within the CUMNH catalog records of the site.

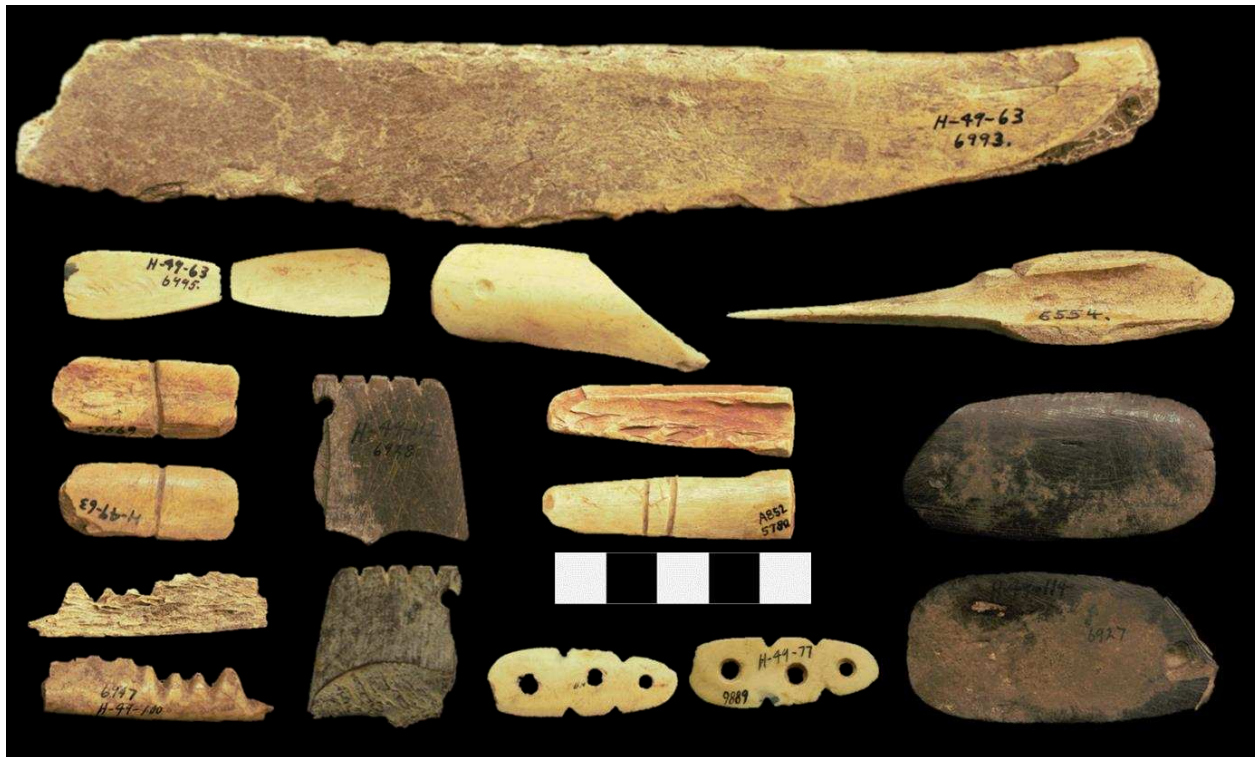


Figure 45 - Bone tool examples from Hells Midden, includes "dice" (above scale [UCM# 5780] and two at middle-left [UCM#6995.1 and 6995.2]), an awl (second from top right [UCM#6554]), a "sinew separator" (top [UCM#6993]), and several, likely non-utilitarian, pendants and pendant blanks (toothed at bottom left, UCM#6947; blackened fragment, 6928; part-drilled at middle-top, 5786; three-drilled at bottom middle, 6886; and bottom right, 6927). Note the dice frequently have one or both sides incised and interior surfaces painted. Scale represents 5 cm.

Ground Stone Artifacts

Ground stone artifacts are also a significant contributor toward understanding precontact site use. Hells Midden contains a relatively high density of these artifact types in a variety of forms. Types of ground stone include hand stones and nether stones, stone beads and bead-blanks, stone tubes, and highly polished burnishing stones. Other implements which were plainly used in some sort of abrading activity, likely related to hide manufacture, and are flaked along the edge straddle the boundary between ground and chipped stone artifact types.

For this analysis a total of 69 ground stone artifacts were recorded. Like chipped stone tools, the recovered number of ground stone is known to be much higher; large nether stones and metates were not relocated or analyzed for this project. Some of these may have been left in the field, but others are believed to have been so large that they were collected and stored elsewhere. An example of this is a massive trough metate identified in level 1948-2, described by Lister as weighing 150 pounds (1951:27). Similar nether stones were located at Hells Half Acre and cataloged with this assemblage; these were not included in this analysis. While the author of this work found a trough metate that fit this description and looked similar to Lister's illustration (1951:28) within the CUMNH collection on an over-sized storage shelf, identification was not uncertain and so it is not included in discussion here. Summary of Lister and Dick's recovered artifacts in this class can be found within the 1951 report (pp. 27-29).



Figure 46 - Split cobble or sandstone spalls, evidence both chipping on edge and heavy wear on surfaces. UCM#6529.t and 5333. Scale represents 5 cm.

For my purposes, recording of ground stone artifacts largely followed Adams (2014), with an altered classification scheme which took input from other significant works on the subject (Hard 1996). All ground stone were sorted into the following categories (with code following in parentheses): hand stones, being a general category for the active grinding stone and which includes formal manos and expedient tools, were sorted into “one-handed” (OH), “two-handed” (TH), hammer stone (HR), and mixed-use hand/hammer stones (HM). Nether stones, being the passive component of these technologies and including both formal metates and less intensively used grinding slabs, were coded as “NS.”

A final class, termed miscellaneous (MS), included stone balls, beads, “gaming pieces,” and the “cloud blower” tube. This was the largest class of ground stone implements (n=30). Some of these artifacts, classified as ground stone by the original excavators, were considered to be insufficiently modified to classify them as unequivocally cultural; this includes the “stone ball” (UCM # 6606) which Lister considered to be the deepest artifact from the site (at 4.5 meters below the surface). For our purposes it was classed as a hammerstone, although the evidence for percussion on its face may be non-cultural (Figure 51 - “Stone ball” (UCM # 6606) described by Lister as being the deepest artifact recovered from the site (level 1948-13; 440-470 cmbs) (1951:29)). Two of the more anomalous artifacts from this class include a heavily worn and polished iron concretion (UCM # 6889; Figure 49) and a painted, potentially flaked,

sandstone cobble (UCM # 6960; Figure 47 – Paint palette (UCM # 6960), found at a depth of 122-152 cmbs in 1949 units). Discoidal or columnar slate artifacts were placed in this category as well and were probably produced for use as jewelry (Figure 50). Interestingly, this artifact class was only recovered in the 1940 units from the site, although a sandstone discoid was recovered in 1949 (UCM#6901).

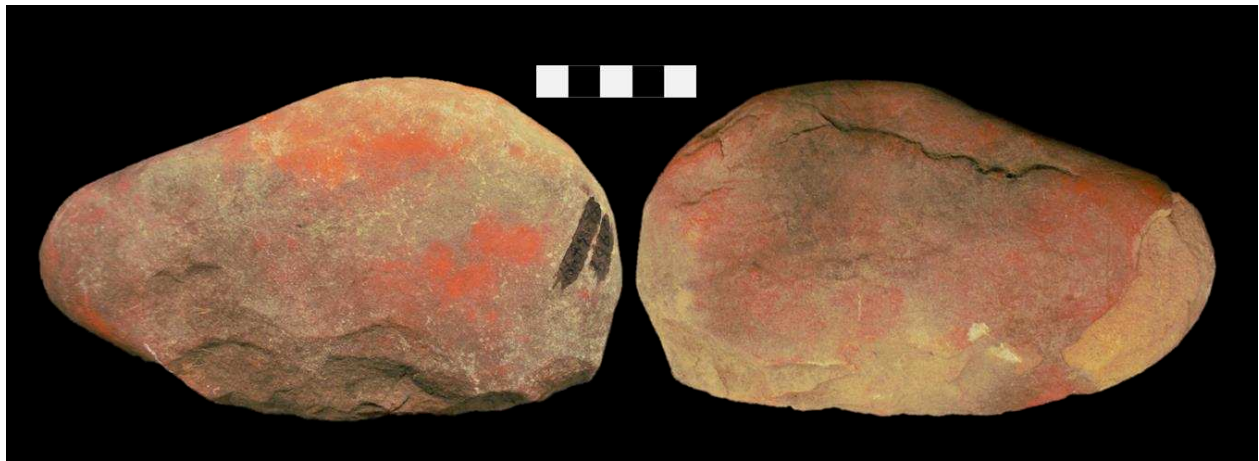


Figure 47 – Paint palette (UCM # 6960), found at a depth of 122-152 cmbs in 1949 units. Scale represents 5 cm.

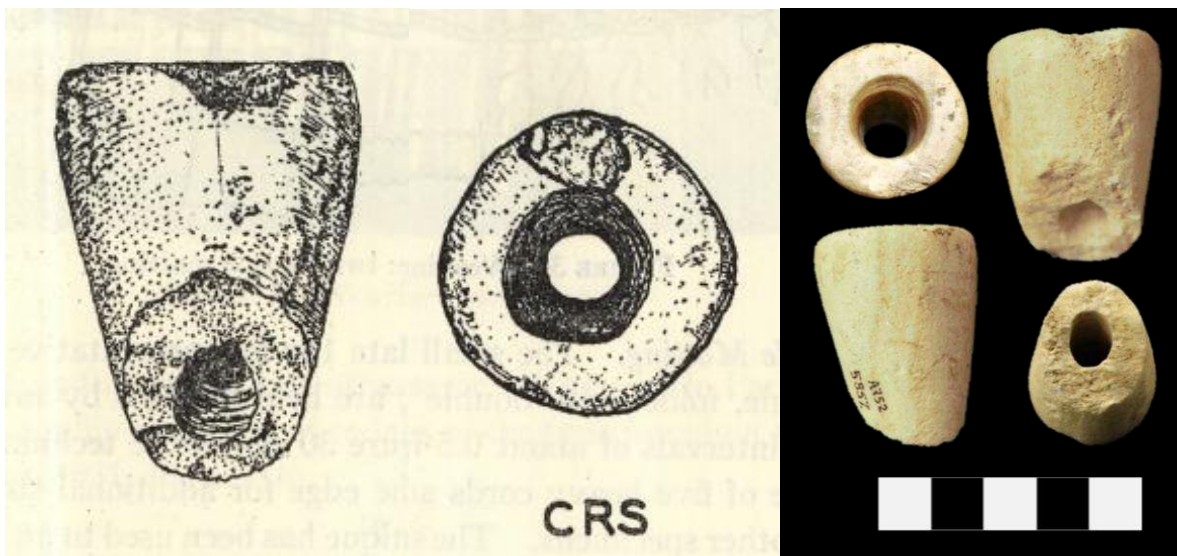


Figure 48 – Scoggin's illustration and photos of a "cloud blower" or stone pipe (Burgh and Scoggin 1948:Figure 29). The material seems to be a white alabaster with calcite inclusions. UCM#5857. Scale represents 5 cm.



Figure 49 - Polished iron concretion (UCM # 6889), from 61-91 cmbs in 1949 units. Scale represents 5 cm.

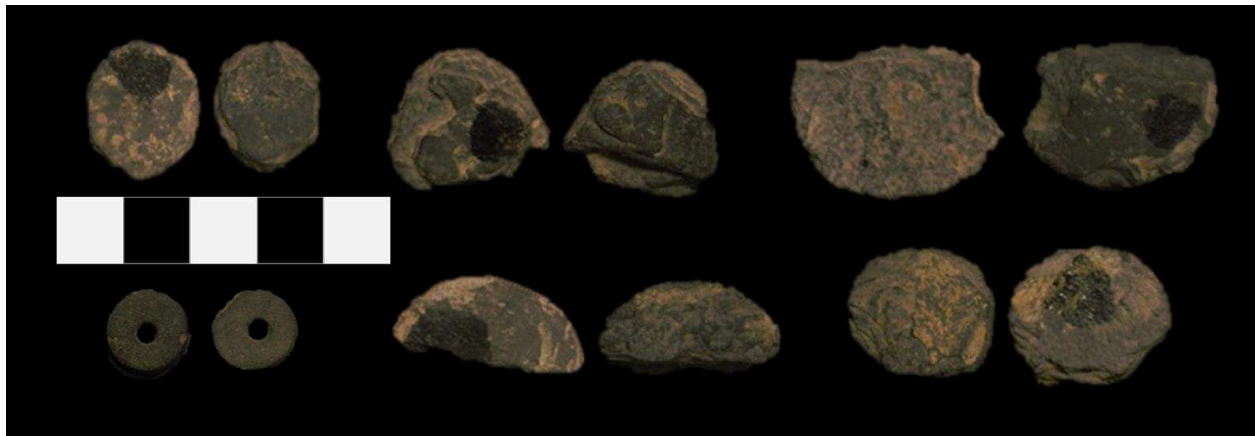


Figure 50 - Ground slate artifacts from Hells Midden. Some of these are described as gaming pieces in CUMNH catalog records, though there is little to distinguish the sides which would be expected for dice. Most likely they represent blanks for beads, like the one seen at bottom left. All of these artifacts are from 1940 excavations. From bottom left, clockwise: UCM# 6982, 5218, 5217, 5244, 5225, 5367. Scale represents 5 cm.

Ground stone tools are used in analysis qualitatively and quantitatively. The presence of large nether stones and caches of hand stone tools suggests a site provisioning that is useful to understanding occupational intensity; indeed this fact was recognized by Burgh and Scoggin in

their report when they wrote, in discussion subtitled *Dwellings*, “such ponderous artifacts as these [metates] are indicative...of established residence; therefore, the possibility of finding subterranean houses should not be overlooked, even though surface indications are unpromising” (1948:37) (and recall Powell’s similar sentiment, quoted in chapter two). General spatial distribution seems to suggest common upcycling of these artifacts as well, reworking and reintroducing older stone tools into more recent deposits. In chapter six, ground stone will be quantified, similarly, to chipped stone artifacts, as another proxy for sedentism in multivariate analysis. Full data sheets with metrics and other gathered data are presented in Appendix IV.



Figure 51 - "Stone ball" (UCM # 6606) described by Lister as being the deepest artifact recovered from the site (level 1948-13; 440-470 cmbs) (1951:29). Reexamination for this thesis found insufficient evidence to accept it unequivocally as a cultural artifact. Scale represents 5 cm.

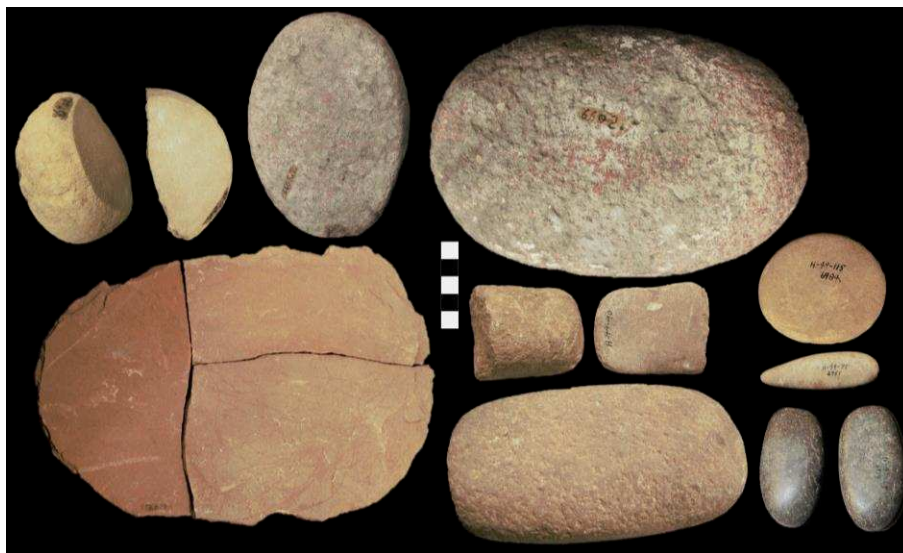


Figure 52 - Various ground stones from the Hells Midden site. Includes a refit nether stone (bottom left), well-polished cobbles (likely burnishing stones for ceramic production [bottom right]), and heavily modified hand stones. From top left, clockwise: UCM# 6961, 6605, 6602, 6984, 6951, 6919, 6976.4 (middle hand stone, split), 6626 (bottom center), and 6604. Scale represents 5 cm.

Other Sources of Interpretation

Fremont Artifacts

Grayware ceramic artifacts were uncovered from the site, as well, and are present in the collection. Their provenience is from a narrow vertical distribution at approximately 50-140 cmbs. A refit vessel with a contracting neck, illustrated in Lister's volume, was assembled from nearly two dozen sherds (1951:31-34; Figure 53). Examination of a sample of sherds from Hells Midden, and comparison of these materials to Marigold's Cave sherds, by Anna Shepherd, was reported in that volume with the suggestion that sourcing of clays would be of importance (Lister 1951:32-34). These ceramics are often considered to be part of a Formative package of traits associated with agriculture in this region, and recent research is focused on understanding the mechanisms of ceramic sourcing, production, and exchange within Fremont groups (i.e., Biela 2023; Watkins 2006). The depth of these artifacts suggests they are from these later Formative occupations of Castle Park. Multiple models have been presented to explain these processes within the Fremont sphere including ceramic manufacture being done in agriculturally marginal regions, exchange of ceramics through "trade fairs" which would aggregate at "central places" which are recognized as large Fremont village sites (Janetski 2002), and other models which suggest ceramic production was a household industry within Fremont groups and should show high variation in ceramic raw material use across the broad region (Schuster 1996). None of these questions have been resolved, and work is being done today to untangle inconsistencies in typological classification and description across archaeological reports (Biela 2023).

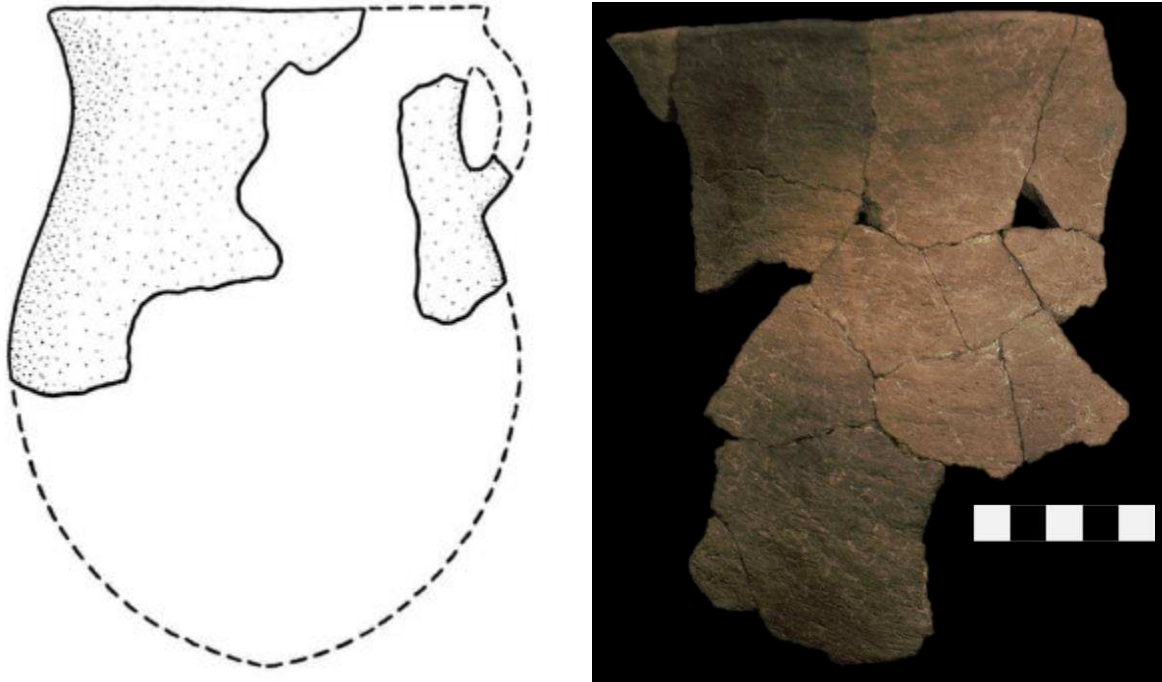


Figure 53 – Left: Ceramic vessel from Hells Midden, illustrated by Lister (1951). Right: photograph of one portion, by author (UCM# 6596). This vessel was found on the surface of a dense, ashy horizon at 50 cmbs. Scale represents 5 cm.

Ceramic artifacts have not been extensively studied for Hells Midden, and future work may aim to understand clay sources near Castle Park and any archaeological features which may suggest local ceramic production. A comment in Dick’s field book, dated 27 June 1949 (while working at Marigold’s Cave) reads: “The peculiar grayish clay for the figurines and floor plaster appears in a cut bank along the Yampa River some 250-300’ below the cave (Marigold) itself. It is an excellent clay...Many hearths or ash layers appear in the bank above the clay” (ARC.DNM01_005_003_004). Future work could seek to confirm if the figurines and any of the ceramics found at Castle Park sites are, in fact, produced from this material and if any careful testing could help reveal if production was occurring on this landscape or if ceramics were being traded in (Figure 54). For our purposes, the significance of ceramics here and at other Castle Park sites is in: 1) the general similarity between different ceramic artifacts from sites within Castle Park (Burgh and Scoggin 1948:66; Lister 1941:33-34), 2) the life-trajectory ceramic

sherds may experience within more sedentary cultures (i.e. from broken vessel to pendant or whorl), and 3) the significance of their presence generally as it relates to discussion of population packing and sedentism within Formative systems.



Figure 54 - More ceramic artifacts from Hells Midden, interior surface. Scale represents 5 cm.

These deposits also contain bone tools and dice. An unfired bit of clay, too small to identify, and fragments of fine, twill weave textile fragments from level 1948-2 are perhaps the most unique artifact types in these levels (Lister 1951:34-36). These artifacts are only used in qualitative assessment of the site and were not carefully reexamined for this thesis research.

Summary of Assemblage

The Hells Midden assemblage, as can be seen, is diverse and reflects a wide range of material types discarded by previous site occupants. These materials are relatively well-stratified, based on published and unpublished descriptions by CUMNH crews, however, in many cases, the coarse resolution of provenience records challenges attempts to clearly understand these cultural horizons. Still, there are enough cultural materials and excavated horizons within this assemblage to answer meaningfully questions regarding habitation and site use through time at Hells Midden.

As discussed, faunal materials are the most abundant artifact class, represented by over 2,300 specimens of fragmented bone. Bone tools, severely biased against by preservation pressures, are also present and can help understand some of the behaviors that may have occurred here and within Castle Park. Chipped stone artifacts, being the aim of many typological schemes over the decades, offer us a compelling “control” on our understanding of the temporal dimension of occupation at the site; by analyzing changing projectile point styles, and how these may vary within a vertical horizon, can offer us indication about changing technological regimes *and* the effects of turbation on these deposits. All of these artifacts, as outlined above, will be revisited and further quantified in Chapter 6 to understand how site use changed through time.

Other evidence for human activity at this site, in the form of ground stone artifacts, caches of chipped and ground stone, and in-tact subsurface features, gives researchers the opportunity to examine the kind of occupations that were occurring at the site. While a high density of artifacts on its own could offer only equally likely explanations for an assemblage’s character (for example a dense lithic scatter could suggest a site was occupied very frequently for short-term manufacture activities or infrequently for a single intensive manufacture episode), artifacts like ground stone and fire or storage features allow us to tilt this scale in favor of one explanation or another. These features, caches, and artifacts suggest, most probably, that reoccupation and lengthy occupations are more likely than intensive or frequent short term stays. This conclusion may be further supported by evidence from Chapter 6 for assemblage diversity—something, too, that would be expected of lengthy and recurring site use.

This chapter outlined the basic composition of the assemblage and explained where reanalysis efforts focused for this research project. In-depth analysis was concerned primarily with modified bone, chipped stone, and ground stone tools. Other portions of the assemblage,

such as the faunal and ceramic assemblage were cursorily analyzed for this project, but further understandings of the site would certainly benefit from greater attention paid to these classes. This thesis will use these reanalyses to understand the character of occupation at Hells Midden; Chapter 6 will expand on these analytical next steps for understanding this assemblage.

CHAPTER 5: HOW OLD IS HELLS MIDDEN?

“Future excavations of Hells Midden can be expected to provide series of artifacts in sufficient abundance for a comparative study of the various levels, and for chronological control of other sites in the canyon. “ (Burgh and Scoggin 1948:29).

This chapter will introduce the results of thirteen radiocarbon ages received from samples of bone (n=10) and maize charcoal (n=3) distributed across strata at the Hells Midden site. The results of these analyses offer absolute chronometry to an assemblage which, prior to this thesis, remained undated. The reader will find below a historical background of archaeological dating at Hells Midden and surrounding sites, descriptions of the artifacts sampled for this research, and the results of these thirteen dates compared to the regional record described in the first section of this chapter. Some preliminary statistical interpretations will also be offered to “fill in the gaps” of a large vertical distribution of samples. These data offer powerful insights into the temporality of indigenous occupation at the Hells Midden site, and these results will be used to test existing interpretations of the archaeological record of Castle Park.

Background on Chronometric Research at Castle Park

Before this work, no absolute chronometric analyses have been conducted for the Hells Midden site, although researchers with the University of Colorado were obviously interested in the questions these data could answer (Burgh and Scoggin 1948:26, 29; Lister 1951:6; Scoggin field notes, quoted herein, Chapter 2). Absolute dating methods were limited in this period, almost exclusively, to dendrochronology, and so CUMNH archaeologists frequently mention their hope of identifying “sufficient charcoal” which could be used to absolutely sequence the

deposits (Burgh and Scoggin 1948:29). Tree ring specimens from Castle Park were used both to build a sequence for this region (Brown 1937; Shulman 1950) and to date features from Marigold's Cave (Burgh 1950; Lister 1951:46). Noncultural wood was collected by these crews to aid in the creation of the tree ring sequence for the northern Colorado Plateau (for example Dick gathered some burned piñon from the site which Mantle had burned c. 1920 or '21 [field notes, 7 July 1949]). Researchers expressed their desire to recover charcoal from Hells Midden which would be large enough for dendrochronological dating of the occupations, however none was found in a sufficient state of preservation for this work.

Lacking absolute methods, Lister offers age estimates for these deposits based on accumulation rates of the sediments. Two proposed ages were calculated by distinct methods: first, he noted 50 centimeters of sediment between the uppermost Fremont horizons and the 1880s Patrick Lynch horizon. Using a terminal Fremont date of 800 AD, Lister divided the 1000 years between this Fremont occupation and Lynch's by the depth to estimate an accumulation rate of twenty years per centimeter of the Midden. Applying this rate to the lower depths, Lister estimated a 4000 year span "necessary for the accumulation of the natural levels [noncultural] alone." He then applied similar calculations using, instead, an estimated Fremont temporal span of 400 years, which, over one meter of this occupation, would suggest a deposition of one centimeter every four years; this second method gave an estimate of 1500BC for the lowest horizons (1951:13).

Lister's methods were interesting, but his estimates for Fremont span and terminus are not reflective of the more recent chronological models of occupations in this region. Relative methods by Burgh also used dates derived from Fremont occupations within the core described by Morss (1931). Additional complexity not accounted for in Lister's methods, as demonstrated

later in this chapter, was an increased accumulation rate of Hells Midden during these Formative occupations, something partially explained by increased human action. Still, Lister’s estimates are shown to be surprisingly near the results of absolute dates for the site.

One CUMNH site in Castle Park has been dated more recently. Mantle’s Cave (5MF1) has been sampled for radiocarbon dates by two researchers associated with CUMNH and DNM (Goff 2010:38; Truesdale 1993, respectively). Results of these eight dates suggest several centuries of deposition within Mantle’s Cave, centered around the 11th century AD (calendrical date). Anomalous dates come from the Mantle’s Cave deer skin headdress, with dates on two portions of this artifact returning radiocarbon ages of 3305 +/- 55 and 3180 +/- 50 (Goff 2010:38). This artifact’s association with Fremont-age materials within “Cache 3” (a moccasin, UGAMS# 01897; 1310 +/- 50 RCYBP) suggests these materials were deposited in this later period, likely representing an older artifact upcycled from earlier deposits on the landscape.

Table 6 – Summary of "New Chronometric Data for Mantle's Cave (5MF1)." Taken from Goff (2010:Table 1).

UGAMS #	Object/ Cache Number	Material	Radiocarbon Age (YBP±1σ)	Radiocarbon ¹³ C Corrected Age (YBP±1σ)	δ ¹³ C (‰)	Calendar Age Calibrated to 2σ
00931-A	Headdress UCM 6102 (from front of headdress) Cache 3 (Figure 4)	Deerskin	3305 ± 54	3362 ± 54	-21.50	95.4% probability 1770 B.C. (95.4%) 1510 B.C.
01898	Headdress UCM 6102 (from back of headdress) Cache 3 (Figure 4)	Deerskin	3180 ± 50	3220 ± 50	-22.33	95.4% probability 1620 B.C. (95.4%) 1410 B.C.
00931-B	Game snare UCM 5962 Cache 2 (not illustrated)	Cordage, vegetal	1044 ± 48	1085 ± 48	-22.50	95.4% probability 810 A.D. (95.4%) 1030 A.D.
01897	Moccasin UCM 6193a (A271) Cache 3 (Figure 3)	Cordage, vegetal	1310 ± 50	1330 ± 50	-23.92	95.4% probability 600 A.D. (94.3%) 780 A.D. 790 A.D. (1.1%) 810 A.D.
02155	Pendant UCM 6103 Cache 5 (not illustrated)	Cordage, vegetal	1310 ± 45	1320± 45	-23.71	95.4% probability 630 A.D. (95.4%) 810 A.D.
02156	Patchwork bag UCM 6108 Cache 1A (Figure 2)	Deerskin	1070 ± 45	1090± 45	-23.13	95.4% probability 820 A.D. (1.3%) 850 A.D. 860 A.D. (94.1%) 1030 A.D.

Analyses conducted by the University of Georgia Center for Applied Isotope Studies. Calendar calibrations carried out with Oxcal computer program (v.3.5) (Bronk Ramsey, 1995, *Radiocarbon* v. 37 no. 2, pp. 425–420), using atmospheric data from 'INTCAL98' (Stuiver et al., 1998, *Radiocarbon* v. 40, pp. 1041–1083). Calibrations rounded per Stuiver and Polach (1977), *Radiocarbon* v. 19 no. 3, pp. 355–363.

Advances in modeling local chronology come from large syntheses of radiocarbon dates. These projects have gathered dates from sites across the Uinta Basin, allowing spatial and temporal analysis at a large scale using radiometric frequency curves and other derivative data (Spangler 2000, 2002). Other studies have used radiometric data in conjunction with floral assemblage analysis in pack rat middens to understand the paleoenvironment here across the Holocene (Sharpe 2002). These data are also being compared against agricultural occupation to understand the relationship between culture and regional moisture, for example (Finley et al. 2020). All these works may add context to the dates presented below, and future syntheses may include this data to support further inquiry into these questions. Review Table 2 in Chapter 3 for explanation of how temporal eras are being referred to in this work.

Methods for Sample Selection and Interpretation of 14C Analysis

This research represents the first attempt to use absolute methods to age the deposits from Hells Midden. Sample selection was guided by a desire to understand the age of deposits across the primary cultural horizons (between 50 and 350 cmbs). Thirteen ecofacts were sampled and AMS dated by the University of Georgia: ten bone samples between 61 and 350 cmbs and three charred corn cobs from upper Fremont deposits (50-120 cmbs) were selected. Three samples of charred corn cobs were selected from four lots (a total of twelve pieces) with any provenience recorded in the collection.

Suitability of bone samples was considered more carefully, an option afforded by the large assemblage to select from. Suitability was based on size and weathering stage of the bone, as well as taxa represented. As bone size increases, the probability of vertical movement is presumed to decrease (Schiffer 1983:680). Bones from larger migratory species were used as these have less chance of being deposited by non-human action. Fossorial and nonmigratory

species (such as lagomorphs or beaver), while abundant in the deposits, are also more likely affected by marine reservoir effects introduced by the riparian environment and were not used. Weathering stages were recorded (following Behrensmeyer 1978) to approximate preservation of these bones. These data will be presented below with photographs of sampled bone.

Maize samples were collected from charred cob fragments. These were only available for the upper half of Fremont deposits and ranged in depth from 50 to 120 cmbs. For maize and bone dates, the “target event” is the human use of the site (i.e. the cooking and discard event) while the dated event is the death of the individual—harvest and hunt dates. Two samples (both maize) were recorded to exact depths below the surface (50 and 80 cmbs), while remaining sample records are of poorer resolution (a 30 cm [or 12 in] depth range for eleven samples and 70 cm for a single bone sample). This complicates interpretation, as will be discussed below, but results of these analyses are in general agreement with the stratigraphic sequence. Future dates on different samples from the same strata are suggested to further insight on date distributions across single excavated levels which contain multiple occupational strata.

Calibration of the resulting dates and any statistical summaries derived therefrom, used OxCal 4.4 (following Bronk Ramsey [2009]). Because of uncertain stratigraphic relationships between excavation levels and the low resolution of sample provenience, intensive Bayesian analysis is not reported here. Further sampling from the collection *may* reduce this uncertainty, and gifted statisticians will likely be able to produce meaningful models of the data presented here. For this research, calibrated dates from these deposits offer sufficient resolution for situating the site into regional chronologies.

Individual Radiocarbon Results from Hells Midden

This section will offer radiocarbon ages for deposits at Hells Midden between 50 and 350 cmts. Results of AMS analysis by the University of Georgia's Center for Applied Isotope Studies (UGAMS) will be presented alongside description of the sampled materials. Table 8 summarizes significant data recorded for these samples by the author. Table 9 summarizes AMS data for these samples, as reported by UGA. The full report of data from the University of Georgia's AMS lab can be found in Appendix VI.

In-text description will describe the faunal and maize samples, each with their own subsection. Each section will be ordered by radiocarbon age, beginning with the most recent. In-text description will offer calibrated date ranges. Plots of calibrations, produced with OxCal, will be presented alongside photographs of sampled materials. Captions beneath single plots will provide median calibrated ages, presented based on calculations done by CAIS (Appendix VI). Useful sample detail and interpretation of results will also be provided in text, situating the dates within their context in the site and the CUMNH collection. A multiplot of these calibration data is presented at the conclusion of the chapter with summary statistics on these ages.

Faunal Samples

In this section, faunal specimens will be described alongside results of AMS ^{14}C and stable isotope ratio $\delta^{13}\text{C}$ analysis conducted by the University of Georgia's Center for Applied Isotope Studies (CAIS) in February 2023. For the ten bone materials, a well-preserved portion, weighing between 1 and 2 grams, was sampled in the CUMNH Archaeozoology Laboratory with assistance from Will Taylor, curator of archaeology, and Chance Ward, graduate research assistant. Samples were removed from the larger fragments either by hand or with a diamond cutting disk on a rotary tool; rotary bits, when used, were discarded and replaced between each

sample and the tool cleaned. After sampling, sampled portions were sealed in sterile bags, surfaces were cleaned, and gloves discarded and replaced. Samples were photographed before and after sampling; the remaining portions were returned to their original location in the collection.

UGAMS# 63527

Depth: 1949-3 (61-91 cmbs)

Mass: 11.2 g

CUMNH#: 1949.01.042

Horizontal provenience: '49-I

Max. dimension: 87.4mm

^{14}C Age: 890, +/- 20

Weathering stage: 1

Taxa: Artiodactyl

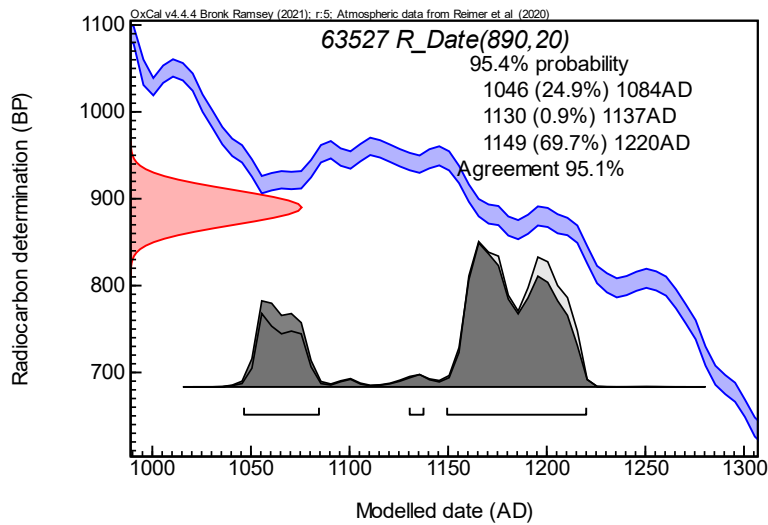


Figure 55 - Single plot of calibration data for UGAMS# 63527. The median probability calibrated age is 1173 AD.

This sample, from the upper Fremont horizons along the shelter wall, is a long bone fragment exhibiting a spiral (green) fracture. This ecofact is well-preserved and large relative to most of the bone within the assemblage; it's length and location beneath the rock shelter decrease the likelihood of post-depositional disturbance. The date also agrees with corn dates from the same horizons at Hells Midden and other Fremont materials in Castle Park.



Figure 56 - UGAMS# 63527 before (left) and after sampling. The circle at right inset image shows cut mark, with position located by the white arrow at left. Scale represents 5 cm. Inset image not to scale.

UGAMS#63528

CUMNH#: 6898

^{14}C Age: 1140, +/- 20

Depth: 1949-5 (122-152 cmbs) Horizontal provenience: '49-I

Weathering stage: 1

Mass: 10.4g

Max. Dimension: 94.7 mm

Taxa: Artiodactyl

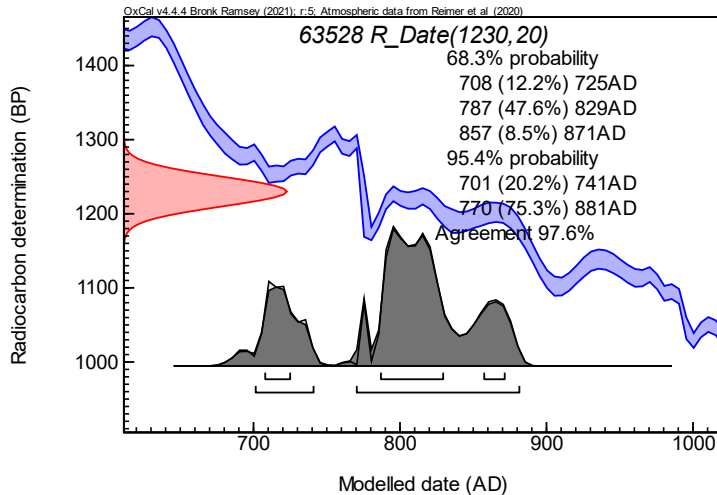


Figure 57 - Single plot of calibration data for UGAMS# 63528. The median probability calibrated age is AD 804.

This large portion of long bone midsection was sourced from against the shelter wall and appears polished on the interior of the fragment. Morphology does not suggest the intended product, and trajectories can be imagined which would lead to most bone tool forms encountered at the site. While production can introduce problematic dates due to curation or scavenging of materials, there is nothing in this date which suggests the dated and target events are necessarily in disagreement; the median probability age of the early 9th century AD aligns well with Fremont dates from Castle Park (Burgh 1950; Goff 2010).



Figure 58 – UGAMS #63528 before (top) and after sampling. Scale represents 5 cm.

UGAMS#63526
Depth: 1948-2 (50-120 cmbs)
Mass: 4.5g

CUMNH#: 1948.01.065
Horizontal provenience: Unknown
Max. Dimension: 38.4 mm

^{14}C Age: 1540, +/- 20
Weathering stage: 1-2
Taxa: Artiodactyl

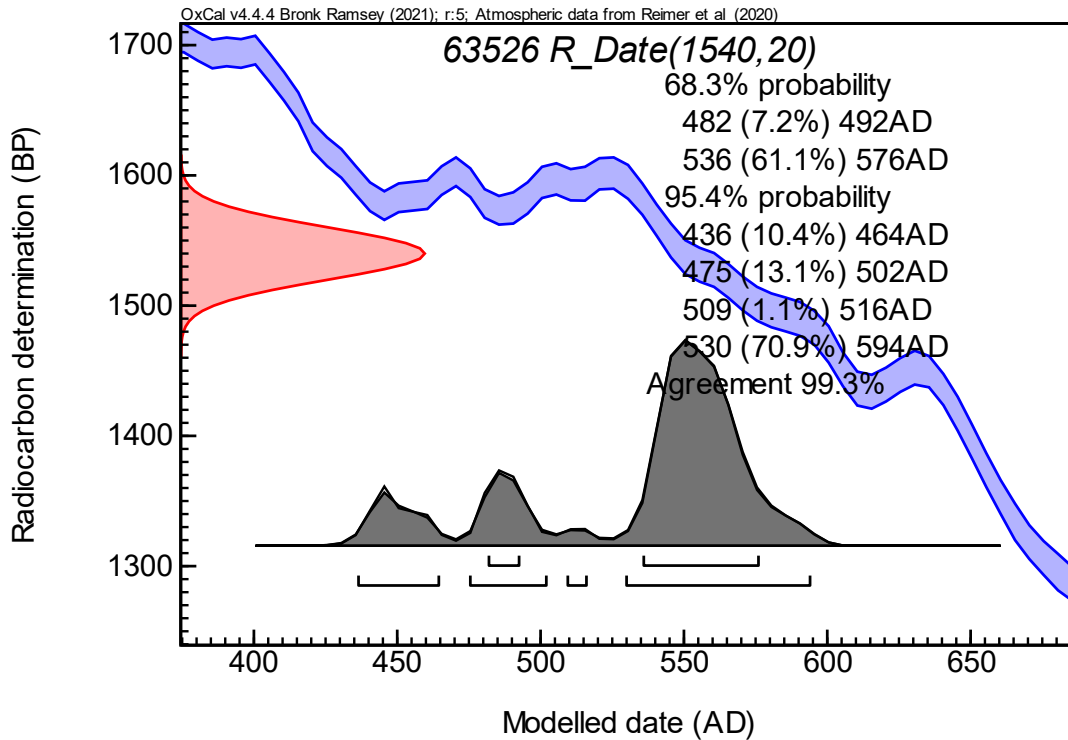


Figure 59 - Single plot of calibration data for UGAMS# 63526. Note the multiple possible ranges, a result of a “wiggly” curve. Median probability calibration is AD 547.

This bone was sourced from 1948-2, the uppermost Fremont strata; however, this calibrated date is earlier than expected for this sequence based on a few Castle Park dates for Formative occupation from Mantle’s Cave (Goff 2010; Truesdale 1993) as well as the general stratigraphic sequence of the site and other dates resulting from this analysis. This age is more in line with the earliest dates for Formative agriculture in the region at Steinaker Gap (Spangler 2002:278-279, 315). If accepted, this date can offer insight into the Late Archaic to Formative

transition (c. AD 500), although it remains a singular data point suggesting occupation of the site at that time.

While there was clear human modification on this bone, as can be seen in Figure 60, punctuations along the break offer some evidence for carnivory as well. While it was imagined that these two modifications occurred relatively close in time, this may not be true. This bone was also small relative to most of the bones sampled (<4cm), and this may increase the effects of taphonomic disturbances as smaller bone can be expected to experience more vertical mobility (Schiffer 1987). Horizontal provenience of this sample is lacking, so there is a possibility it was recovered in the northern portions of the site, where stratigraphic integrity was greatly reduced. This sample was selected from a collection lot of eighteen faunal ecofacts which included a dozen rodent teeth, burnt lagomorph bones, and bison elements. A portion of a bone awl was also located in this lot. The spatial relationship between materials in this lot is unknown, excepting common vertical provenience from level '48-2.



Figure 60 - UGAMS#63526, before (left) and after sampling. Cut marks are indicated with arrows at left. Scale represents 5 cm.

The disagreement with the general stratigraphic sequence may be explained by a confluence of factors including a 70 cm vertical provenience, the radiocarbon age's intercept with a flat section of the calibration curve, and evidence for nonhuman carnivory that may suggest upcycling and redeposition of older bone at Hells Midden. Other possibilities remain, such as the animal being especially affected by a reservoir effect from the riparian setting, but the previous explanations seem most likely.

UGAMS#63530
Depth: 1949-6 (152-183 cmbs)
Mass: 12.3g

CUMNH#: 1949.01.013
Horizontal provenience: '49-I
Max. Dimension: 40.8 mm

^{14}C Age: 2810, +/- 20
Weathering stage: 2-3
Taxa: *Ovis canadensis*

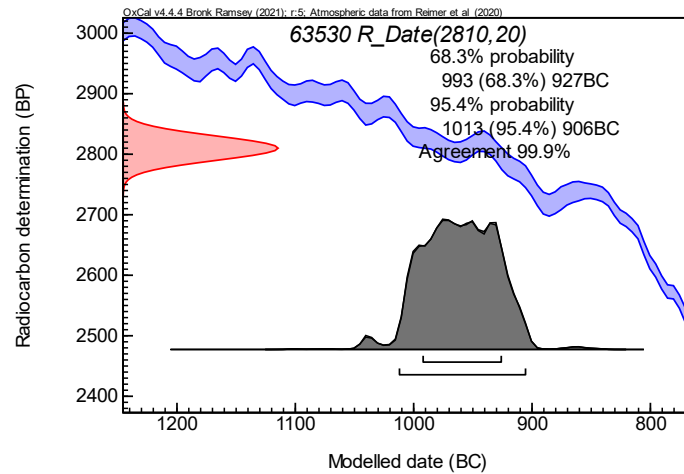


Figure 61 – Single plot of calibration data for UGAMS#63530. Median probability calibrated date is 963 BC. This date represents the most recent occupation in Hells Midden lower portion.

This bone was identified in CUMNH catalog records, alongside six others in the lot, as bighorn sheep. This femoral head is highly weathered relative to other sampled specimens and may evidence gnawing; it contains clear cut marks. This date suggests a temporal gap of nearly 1500 years between adjacent upper strata. Its vertical provenience cross cuts the contact of upper and lower portions of this site; as such I presume that this date marks the occupation immediately underlying the intensification evidenced at 170 cmbs. The stratigraphic sequence agrees, so I consider this a good date.



Figure 62 – UGAMS# 63530 before (left) and after sampling. Cut marks shown with arrows. Scale represents 5 cm.

UGAMS#63531
Depth: 1949-7 (183-213 cmbs)
Mass: 4.7g

CUMNH#: 1949.01.048
Horizontal provenience: '49-I
Max. Dimension: 37.9 mm

^{14}C Age: 3010, +/- 20
Weathering stage: 2
Taxa: *Ovis canadensis*

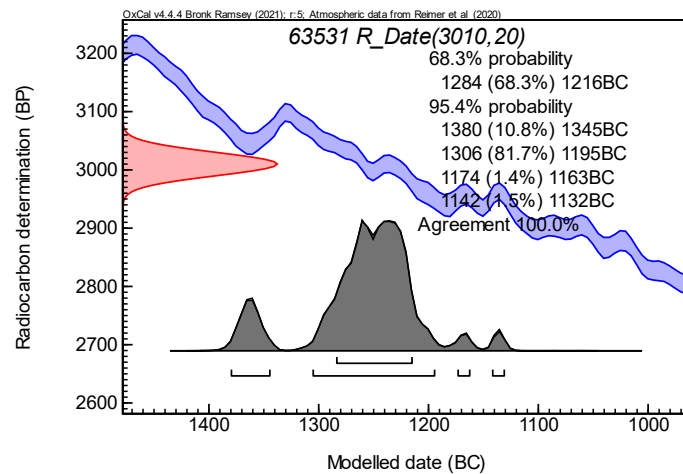


Figure 63 - Single plot of calibration data for UGAMS#63531. Median probability calibrated date is 1252 BC.

This date follows the stratigraphic sequence and suggests a steady occupation of the site in the Late Archaic horizons of the site. No temporal gap is noted for these two upper dates of the Archaic occupations, as resulted from the two sample dates above. This bone contains cut marks consistent with human processing and is well-preserved. Its collection location was a lot containing 19 additional faunal specimens, ranging from small species (i.e., *Neotoma*) to bison.

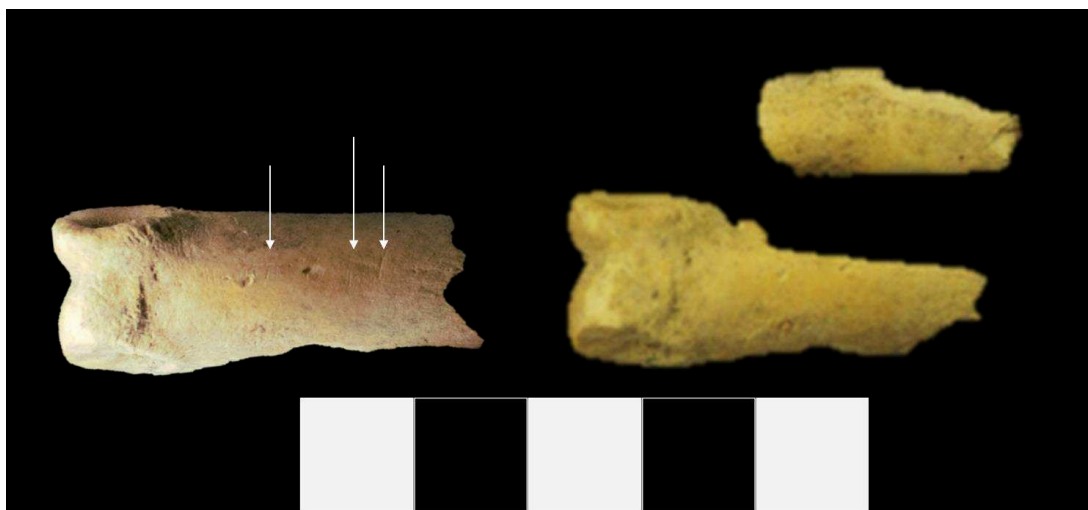


Figure 64 - Sampled UGAMS#63531 before and after sampling. Cut marks indicated with arrows. Scale represents 5 cm.

UGAMS#63529
Depth: '48-3(L) (140-170 cmbs)
Mass: 6.6g

CUMNH#: 1948.01.092
Horizontal provenience: Unknown
Max. Dimension: 62.4 mm

^{14}C Age: 3050, +/- 20
Weathering stage: 2
Taxa: Bovid, likely

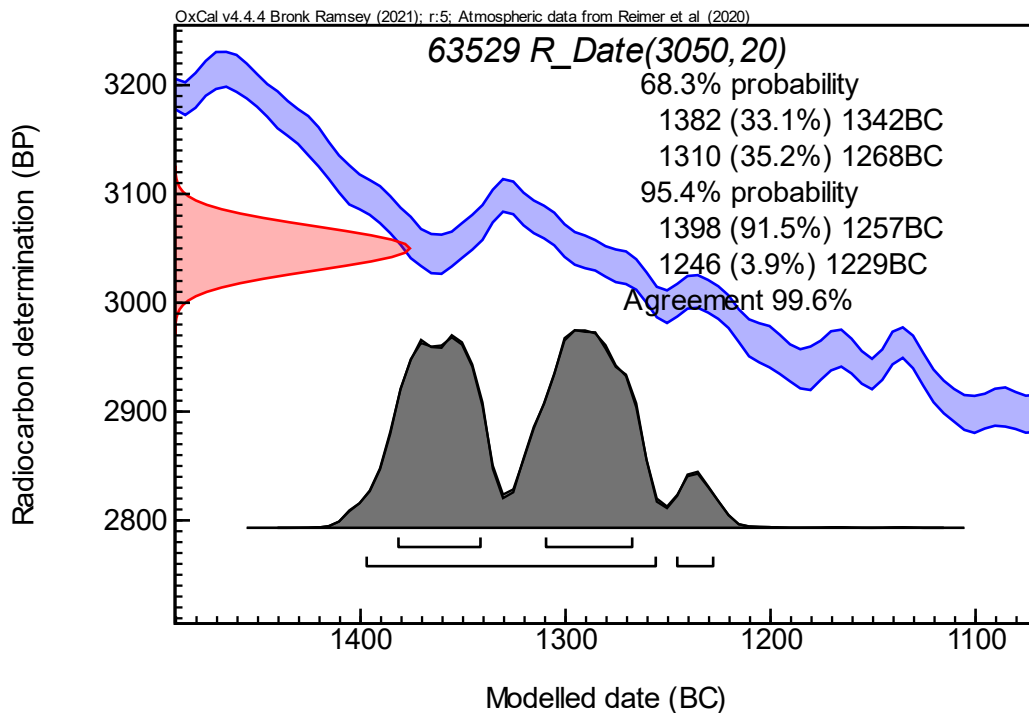


Figure 65 - Single plot calibration data for UGAMS#63529. The median probability calibrated age is 1350BC.

This sample is older than the primary occupations within level 1948-3, but it suggests a similar discontinuity as the result from UGAMS#63530. That sample came from a similar stratigraphic position, as well, which is an area of high disturbance by the bottom boundary of Fremont occupation. Remember this was the first level to follow an arbitrary level distinction (at 170 cmbs on its bottom surface). Figure 66 suggests *possible* locations from which older materials may have been recovered in this level. This stratigraphic relationship was not described in catalog records, but its curation as a single ecofact (not part of a lot) may signify a recognition by Lister and crew of a discontinuity with other materials from this level. This and the above dates suggest a stratigraphic discontinuity between the upper and lower portions of the site.

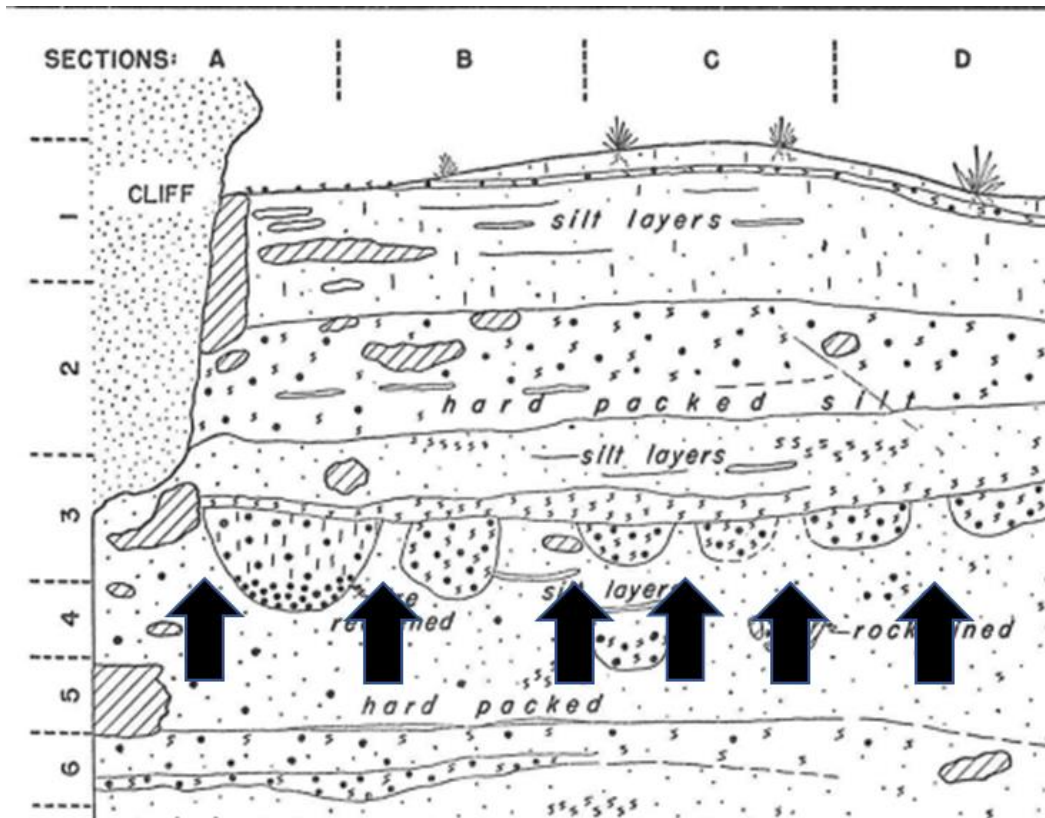


Figure 66 – Hypothetical provenience locations for UGAMS #63529 within 1948-3, modified from Lister (1951:Figure 3). These arrows are indicating lower cultural strata which were disturbed by cultural digging of these features during upper occupations of the site, included in the arbitrary lower level 3 boundary at 170 cmbs.



Figure 67 - UGAMS#63529, before and after sampling. Cut marks indicated with white arrows. Scale represents 5 cm.

UGAMS#63532
Depth: '49-8 (213-244 cmbs)
Mass: 7.7g

CUMNH#: 1949.01.024
Horizontal provenience: '49-I
Max. Dimension: 56.2 mm

^{14}C Age: 3580, +/- 20
Weathering stage: 1
Taxa: Cervid, likely

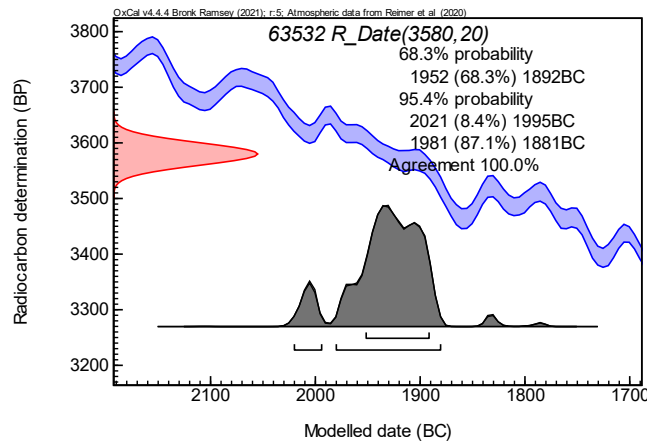


Figure 68 - Single plot of calibration data for UGAMS#63532. Median probability calibration is 1930 BC.

This well-preserved long bone midshaft is moderately modified along its edges, similar to UGAMS#63528 (Figure 58). In addition, dense clusters of cut marks indicate this intentional shaping. As discussed for the other modified sample, bone used in production may be a poor match between target and dated events. While a difference of more than six centuries is shown between this sample's median probability calibration and that of UGAMS#63531, excavated from the level above, without more dates it is difficult to assess if a target/dated event mismatch is represented by this result. The date is evaluated as a good indicator for this level's age.



Figure 69 - UGAMS#63532 before and after (right) sampling; inset image shows grinding or cut marks and is not to scale. Scale represents 5 cm.

UGAMS#63533
Depth: '49-9 (244-274 cmbs)
Mass: 4.5g

CUMNH#: 1949.01.002
Horizontal provenience: '49-I
Max. Dimension: 34.5 mm

^{14}C Age: 3690, +/- 20
Weathering stage: 2-3
Taxa: *Ovis canadensis*

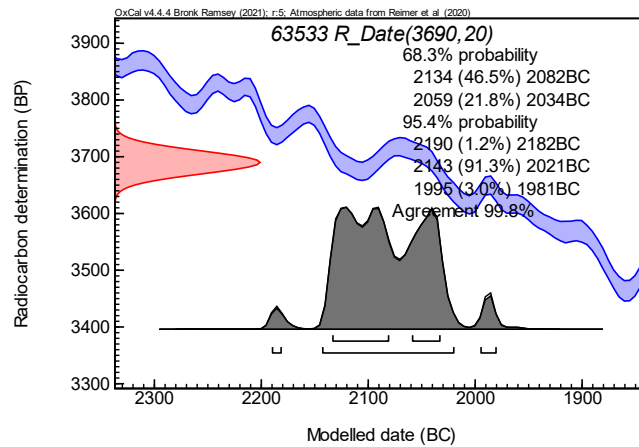


Figure 70 - Single plot calibration data for UGAMS#63533. Median probability calibration is 2088 BC.

This sample was located in a lot of twenty-two fragments of bighorn bones and teeth. Cut marks were present on many of the bones in this lot. Stratigraphically, this date agrees with the general sequence and is very near in age to sample UGAMS#63532 taken from 1949-8, immediately above. This may suggest mixing of these strata or a more intensive occupation of the site during several decades in the 21st and 20th centuries BC. Lack of greater spatial data on this artifact and the tortuosity of the calibration curve makes these claims difficult to verify.



Figure 71 - UGAMS#63533 before and after sampling. White arrows indicate cut marks. Scale represents 5 cm.

UGAMS#63534

CUMNH#: 1949.01.011

^{14}C Age: 4410, +/- 20

Depth: '49-10 (274-305 cmbs)

Horizontal provenience: '49-I

Weathering stage: 2-3

Mass: 8.2g

Max. Dimension: 71.1 mm

Taxa: Artiodactyl

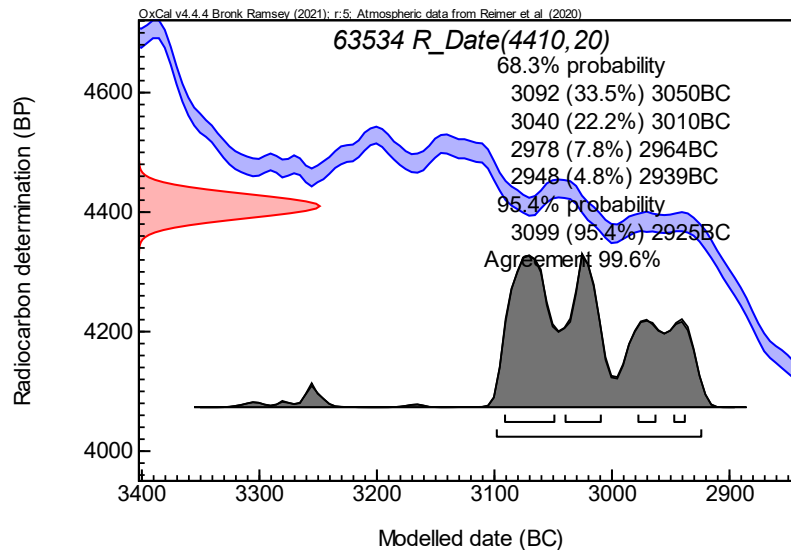


Figure 72 - Single plot calibration data for UGAMS#63534. The median probability calibrated age is 3029 BC.

This sample represents the lowest date received for 1949 excavation levels. While the two levels above (UGAMS#s 63533, 63532) produced dates clustering around 2000 BC, this date's median calibration (3029 BC) precedes those by nearly one thousand years. Again, the coarse provenience may be obscuring differences in depth which might explain this difference in age. This bag contained thirteen faunal materials, some of which were calcined, with remnant ashy sediments. This level is shown to contain an ash and charcoal rich deposit in Lister's profile (corresponding to lower portion of '48-7 and upper portion of '48-8 [Figure 20]). This origin is implied by the bag's contents.



Figure 73 - UGAMS#63534 before and after sampling. Inset after photo not to scale. Scale represents 5 cm.

UGAMS#63535
Depth: '48-9 (320-350 cmbs)
Mass: 7 g

CUMNH#: 1948.01.091
Horizontal provenience: '48-II
Max. Dimension: 57.8 mm

^{14}C Age: 4670, +/- 25
Weathering stage: 3
Taxa: Cervid

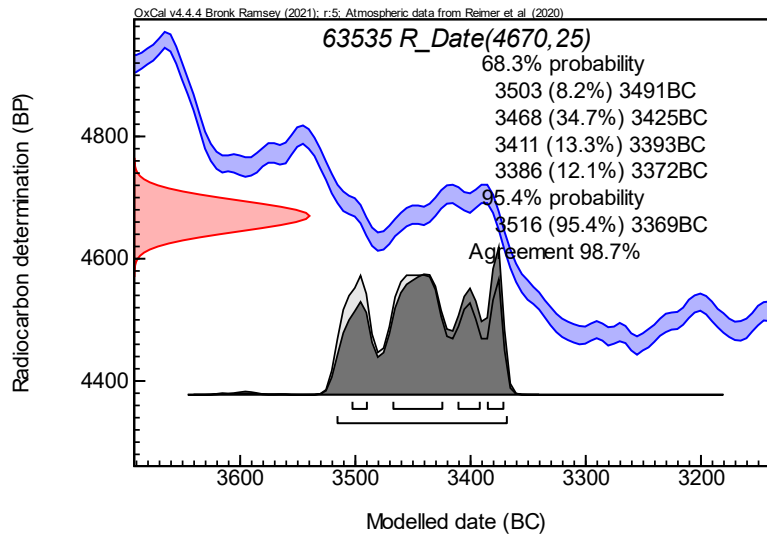


Figure 74 - Single plot calibration data for UGAMS#63535. The median probability calibrated age is 3448 BC.

This sample represents the oldest absolute date from Hells Midden and was excavated from charcoal-rich strata at the bottom of intensive occupation in the site's lower half. While future researchers may be able to date materials from lower levels still, this bone represents the lowest material which could be confidently used based on this project's design. This bone was identified by the author as a cervid metapodial, based on similarities to comparative samples in the CUMNH Archaeozoology Lab. It contains no obvious cultural modifications (although the morphology of its fracture may suggest percussion breakage consistent with human action).



Figure 75 - UGAMS#63535 before and after sampling. Inset after image not to scale. Scale represents 5 cm.

Maize Samples

Maize samples were selected to directly date evidence of agricultural occupation and use of the Castle Park landscape. All corn recovered by excavators (excluding a kernel most likely from the Patrick Lynch horizons) was burnt, a factor supportive of their preservation. Unlike bone, many of the corn samples found were identified through field notes and provenience records to exact stratigraphic positions. Dates will be presented with calibration plots and photos of the cob prior to sampling. Again, readers are encouraged to refer to Appendix VI for full AMS methodology employed by the CAIS. Sampling was done by hand; sterile gloves, cleaned surfaces, and fresh packaging material was used for each sample, largely as described for bone.

Ongoing research by the Center for Mountain and Plains Archaeology (CMPA) is conducting large chronometric analyses of precontact corn dates from Rio Blanco and Moffat Counties, Colorado. Funding for the corn dates herein was provided by the CMPA (with support for the larger corn dating project from both the CMPA and BLM). The utility of synthesizing these dates from across this region has been demonstrated by preliminary results of these investigations (LaBelle 2023). These data show a rather strong statistical clustering of these agricultural events which singular radiocarbon dates cannot be expected to capture.

Hells Midden contains more maize samples that may be dated. While only one lot of corn with vertical provenience remains undated from this site (CUMNH#6611, from 1948-2 [50-120 cmbs]), those lots with provenience can be redated to enhance understanding. The remaining (two) precontact lots of corn can also be dated. A vegetal fragment identified as *Cucurbita* is also in this assemblage (UCM#6954); future research could seek to understand how agricultural complexes were used in this area by expanding their studies of direct agricultural evidence to this ecofact type.

UGAMS#63536 CUMNH#: 6612
 Depth: '48-2 (surface, 50 cmbs) Horizontal provenience: '48-II, B
 Mass: 0.15 g Max. Dimension: 17.1 mm

^{14}C Age: 970, +/- 20
 Taxa: *Zea mays*

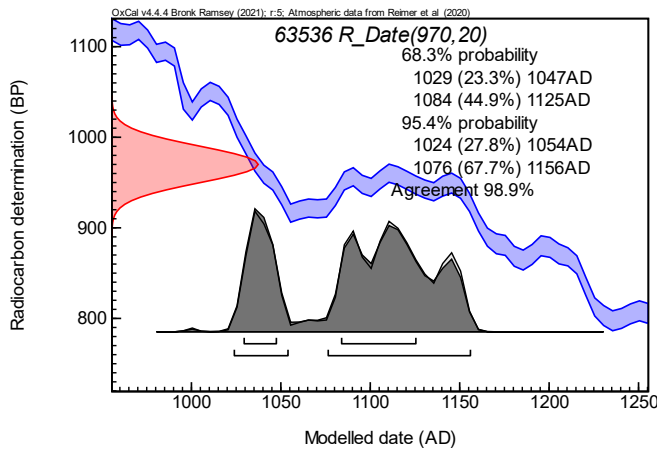


Figure 76 – (Left) Single plot calibration data for UGAMS#63536. Median probability calibrated age is AD 1099; (right) sampled charred cob fragment.

This singular charred cob fragment was the first direct agricultural evidence for the site. It was found associated with ceramic sherds (CUMNH# 6596) (Figure 53). The preservation of these materials suggests a rapid sealing of these deposits following their deposition. Because of its secure provenience, this date may serve to bracket the top of the Formative horizons.

UGAMS#63537 CUMNH#: 6610
 Depth: '48-2 (@ 80 cmbs) Horizontal provenience: '48-I, A
 Mass: 0.23 g Max. Dimension: 18.6 mm

^{14}C Age: 1110, +/- 20
 Taxa: *Zea mays*

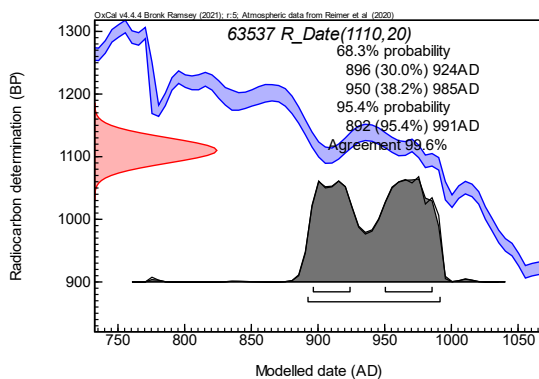


Figure 77 - (Left) Single plot calibration data for UGAMS#63537. The median probability calibrated age is AD 943; (right) sampled charred cob fragment.

This cob fragment was collected by 1948 crews; provenience records state it was found “30 cm below top of level 2” in section A of trench 1. It is well-preserved. No other artifacts in the collection are recorded as coming from this exact provenience, although '48-2 was densely populated with artifacts and provenience records are often split into upper and lower portions. This date is in excellent agreement with dates from Mantle’s Cave (Goff 2010; Truesdale 1993). Four fragments were found in this collection during my analysis, but it is unknown how many were collected or how many cobs this collection may represent.

UGAMS#63538

CUMNH#: 6900

¹⁴C Age: 1140, +/- 20

Depth: '49-4 (91-122 cmbs)

Horizontal provenience: '49-I

Taxa: *Zea mays*

Mass: 0.23 g

Max. Dimension: 21.3 mm

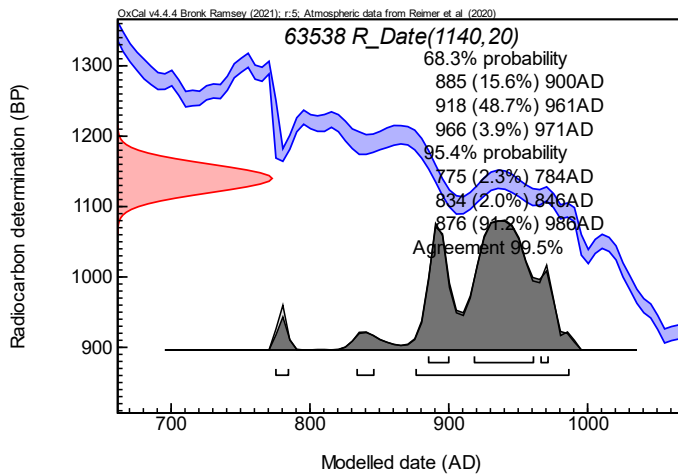


Figure 78 - (Left) Single plot calibration date for UGAMS#63538. Median probability calibrated age is AD 929; (right) sampled charred cob fragment.

This cob fragment was collected against the shelter wall during the 1949 field season; its collection lot contained six charred cob fragments. This may represent the deepest direct agricultural evidence from the site, although other unprovenienced lots of cob fragments exist and may be dated by future work. It is also the only direct agricultural ecofact with provenience

indicating its presence in the lower portion of the upper Formative horizon (lower level 1948-2). The dates agree with others produced for Castle Park.

Summarizing Radiocarbon Results

While radiocarbon dates are incredibly useful in archaeological study, their utility for understanding past human behavior has been recently recognized to primarily come from Bayesian analysis of the radiocarbon results (Bronk Ramsey 2009). Largely this is because AMS analysis is not actually producing a date but a chemical ratio which may be statistically calibrated into range of dates. Many Bayesian statistical analyses can be employed to create stronger interpretations from these datasets, and archaeologists can employ detailed prior information, based on excavated contexts, for example, to make strong interpretive statements about radiometric data. For these data here, I employed some basic analyses on these dates which are available in the OxCal software which was also used to calibrate these data. The questions asked of this dataset were, in plain terms: *how long was this site occupied?* (Figure 79); *when did site occupation begin?* (Figure 80); *how long did the lower sequence of occupation last?* (Figure 81 - Results of statistically derived Span for the lower Hells Midden sequence. Produced using OxCal 4.4. These data suggest the Middle Archaic occupations at the site most likely (68.3%) lasted between 2418 and 2528 years.); *when did this lower sequence end?* (Figure 82); *when did the site's upper occupation begin?* (Figure 83); *how long did the upper, Formative occupation of the site last?* (Figure 84); and *when did the Formative occupations at the site end?* (Figure 85). Multiplots of calibrated dates are available in Figure 87 (Upper Sequence [n=6]), Figure 88 (Lower Sequence [n=7]), and Figure 89 (entire site [n=13]).

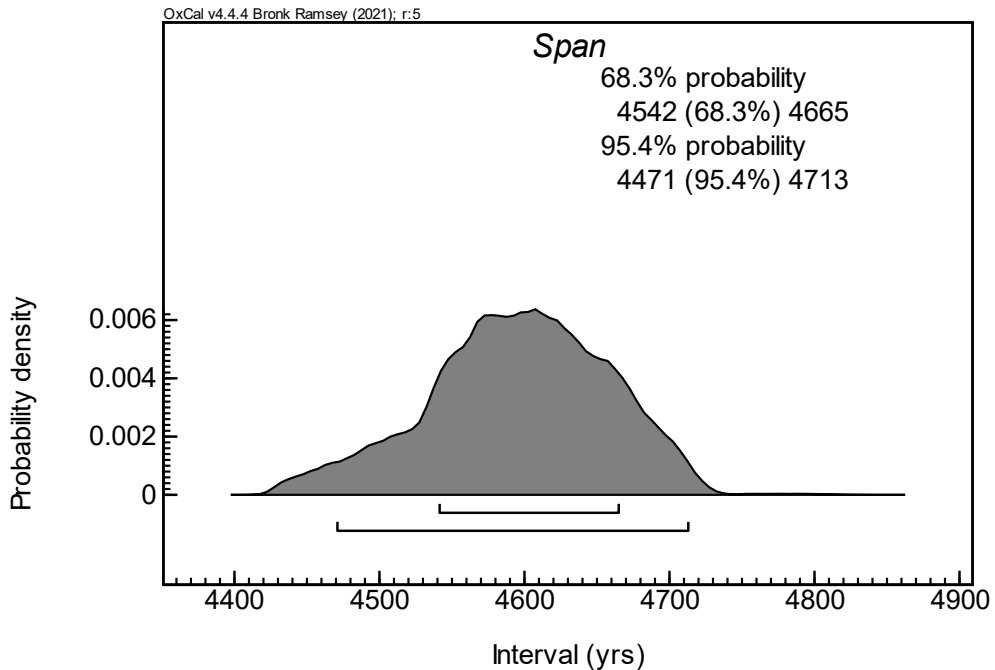


Figure 79 - Results of the Span query of all dates, completed using OxCal 4.4. These data suggest the site's occupation range, represented by radiocarbon ages presented above, most likely (68.3% probability) lasted for a span between 4,542 and 4,665 years. See Figure 89 for multiplot of this data.

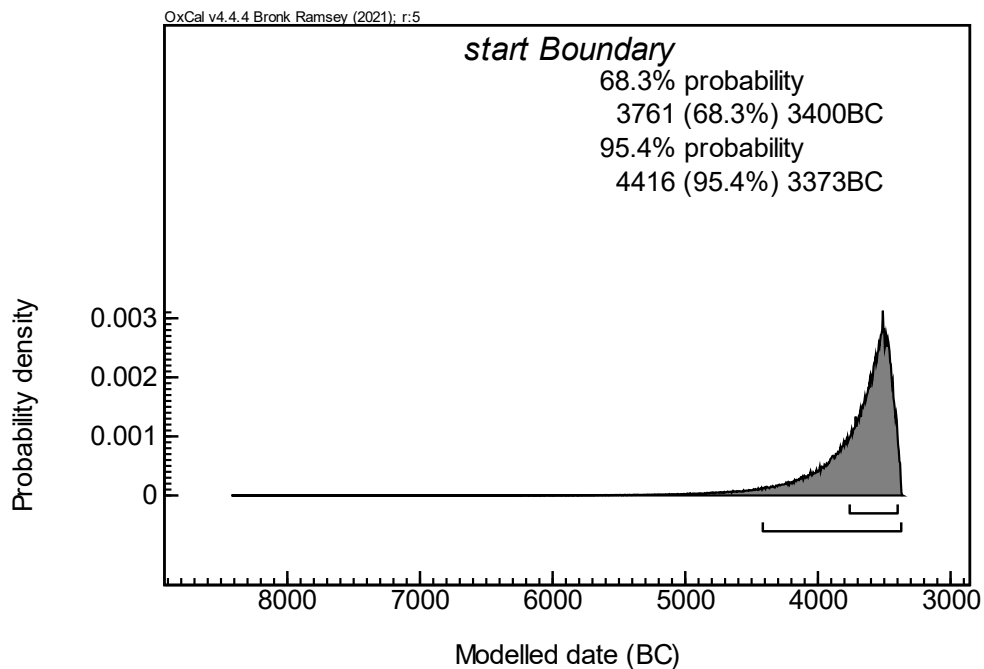


Figure 80 – Results of statistically derived "start" Boundary using OxCal 4.4. Suggests the lowest dated occupations of the site (320-350 cmts) were most likely (68.3% probability) made after a start date between 3,761 and 3,400 BC. Because of few dates from that period, this is a very similar result to the oldest radiocarbon age from the site (UGAMS#63535). See Figure 89 for multiplot of this data.

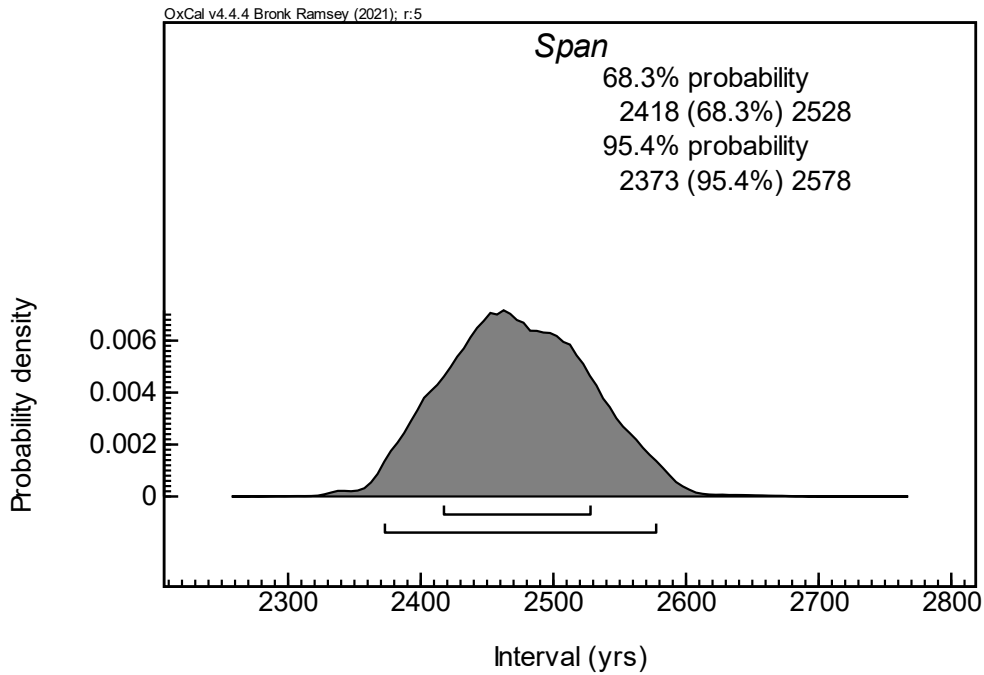


Figure 81 - Results of statistically derived *Span* for the lower Hells Midden sequence. Produced using OxCal 4.4. These data suggest the Middle Archaic occupations at the site most likely (68.3%) lasted between 2418 and 2528 years. See Figure 88 for summary multiplot of lower occupations.

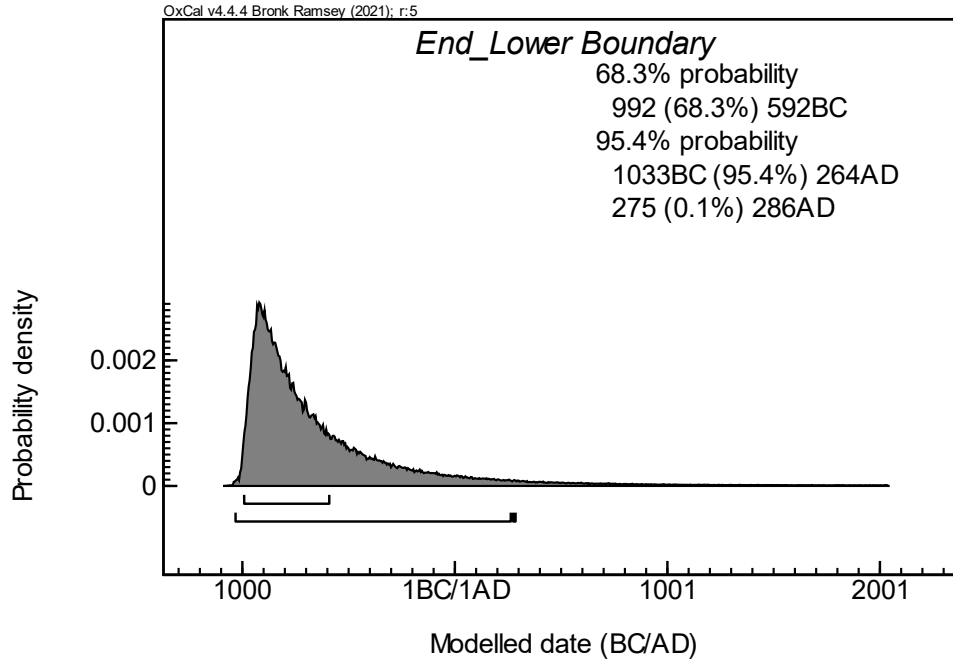


Figure 82 - Results of statistically derived "end" Boundary for the lower Hells Midden sequence. Produced using OxCal 4.4. These data suggest a 68% probability that the Late Archaic sequence ended by the 6th century BC. Greater certainty of this occupations end places it prior to AD 264. See Figure 88 for summary multiplot of lower occupations.

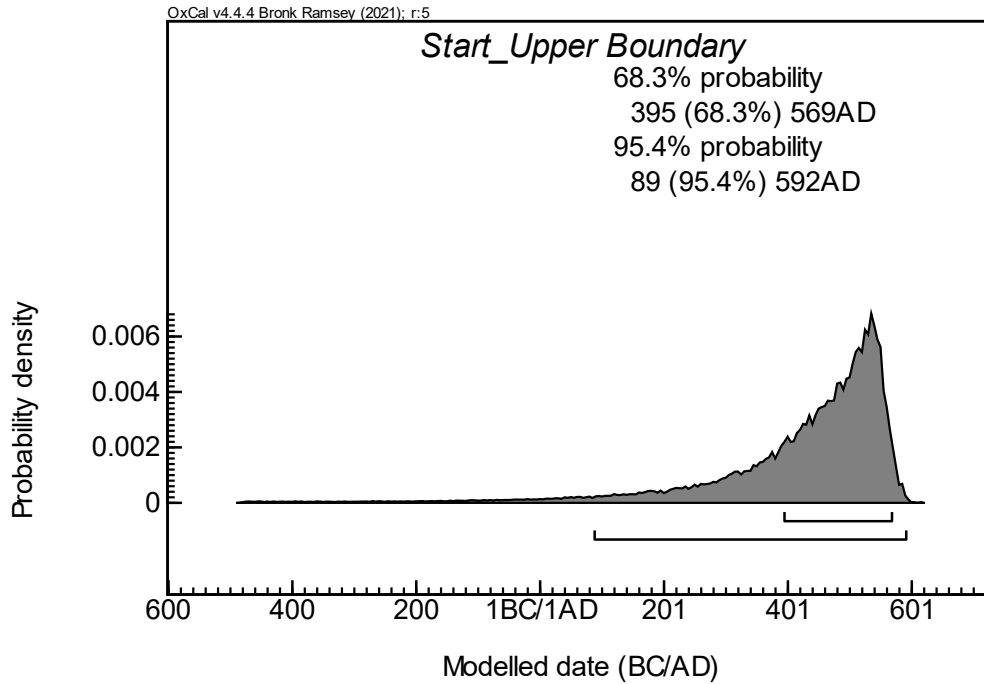


Figure 83 - Results of statistically derived "start" Boundary for the upper Hells Midden occupation. Produced using OxCal 4.4. This model only employed dates for the upper portion of the site, presented in Figure 87. Suggests a beginning occupation most likely (68.3%) between AD 395 and 569.

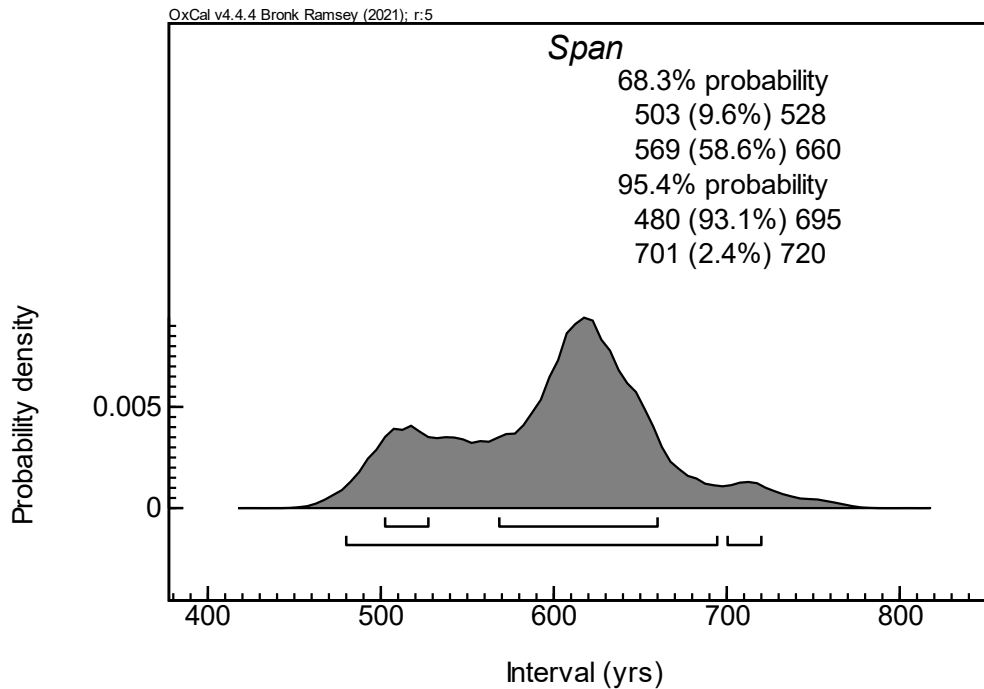


Figure 84 - Results of statistically derived Span for the upper Hells Midden occupations. Produced using OxCal 4.4. These data suggest the Formative occupations at the site most likely (68.3%) lasted between 500 and 660 years. This model only employed dates for the upper portion of the site, presented in Figure 87.

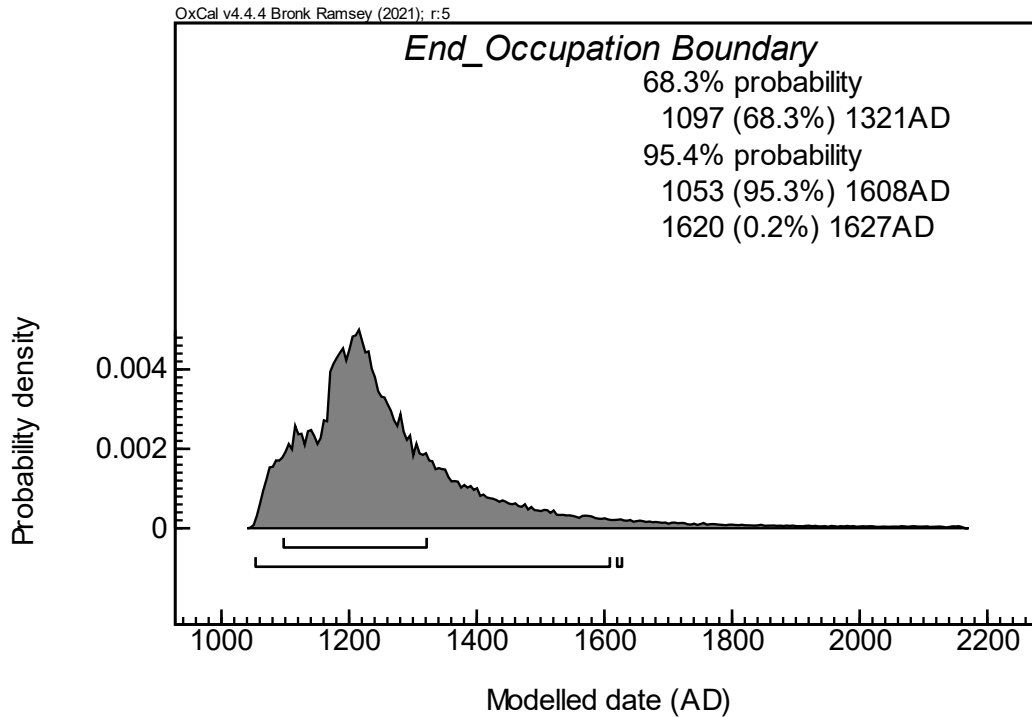


Figure 85 - Results of statistically derived "end" Boundary using OxCal 4.4. Suggests terminal Formative occupation between the turn of the 12th and beginning of 14th century, AD. This model only employed upper occupation dates, shown in Figure 87.

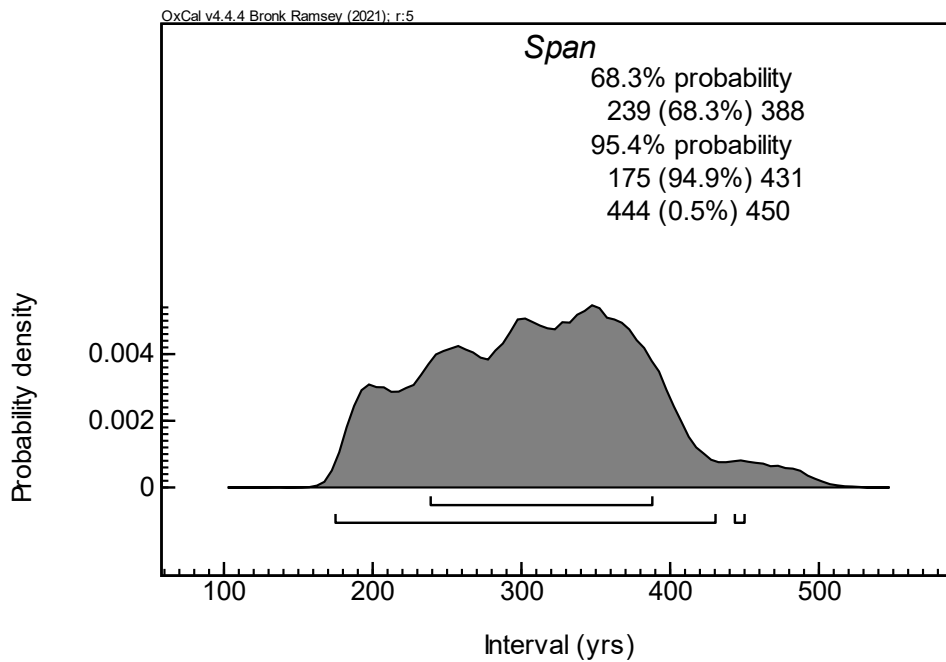


Figure 86 - Results of Span model for Fremont occupation excluding the radiocarbon age of 1540 BP +/- 20. Produced using OxCal 4.4. Suggests a high probability (95.4%) of an occupation of two to four centuries by these group. This model only employed upper occupation dates, shown in Figure 87.

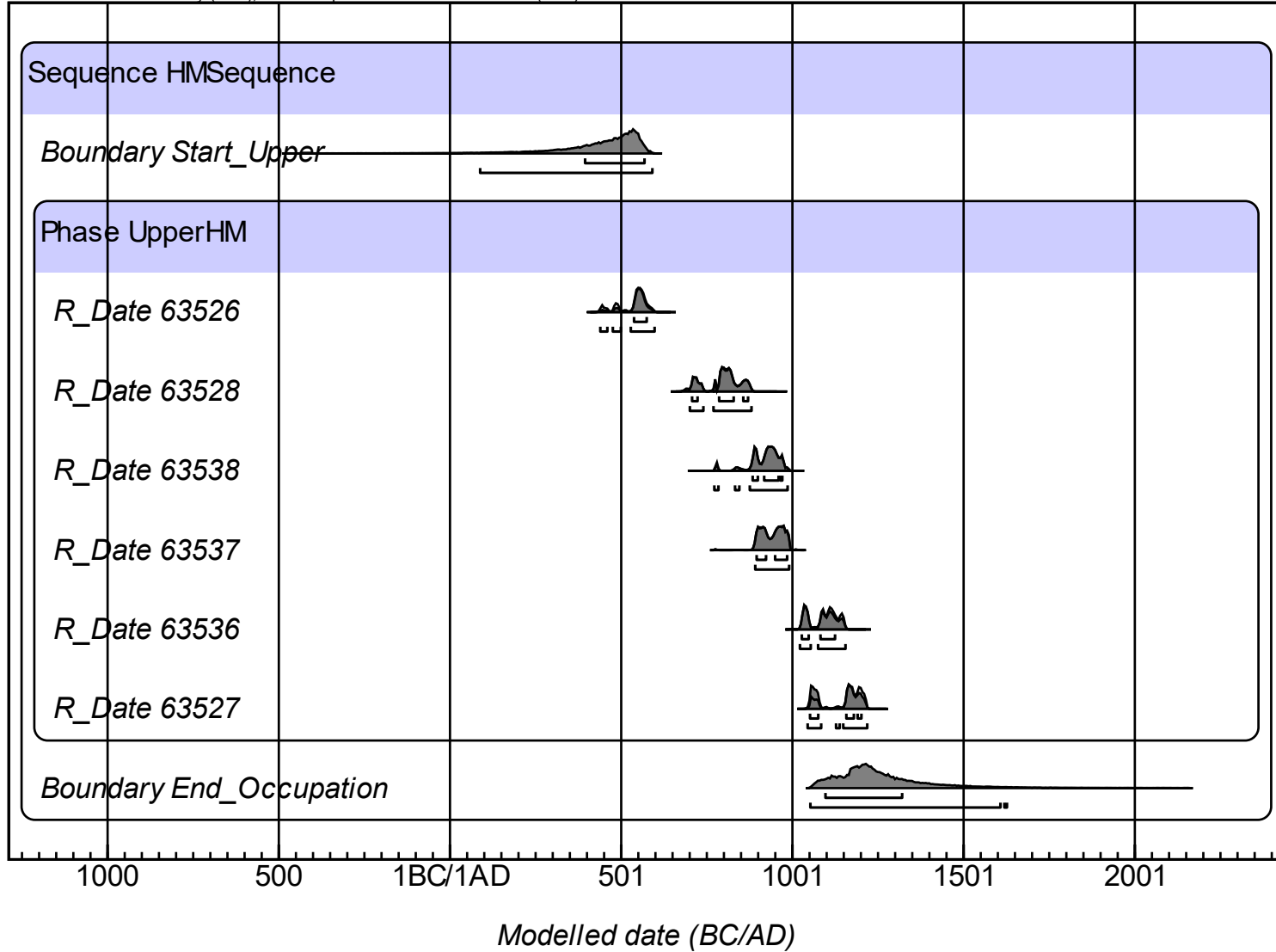


Figure 87 - Multiplot of calibration data for radiocarbon dates from upper site deposits.

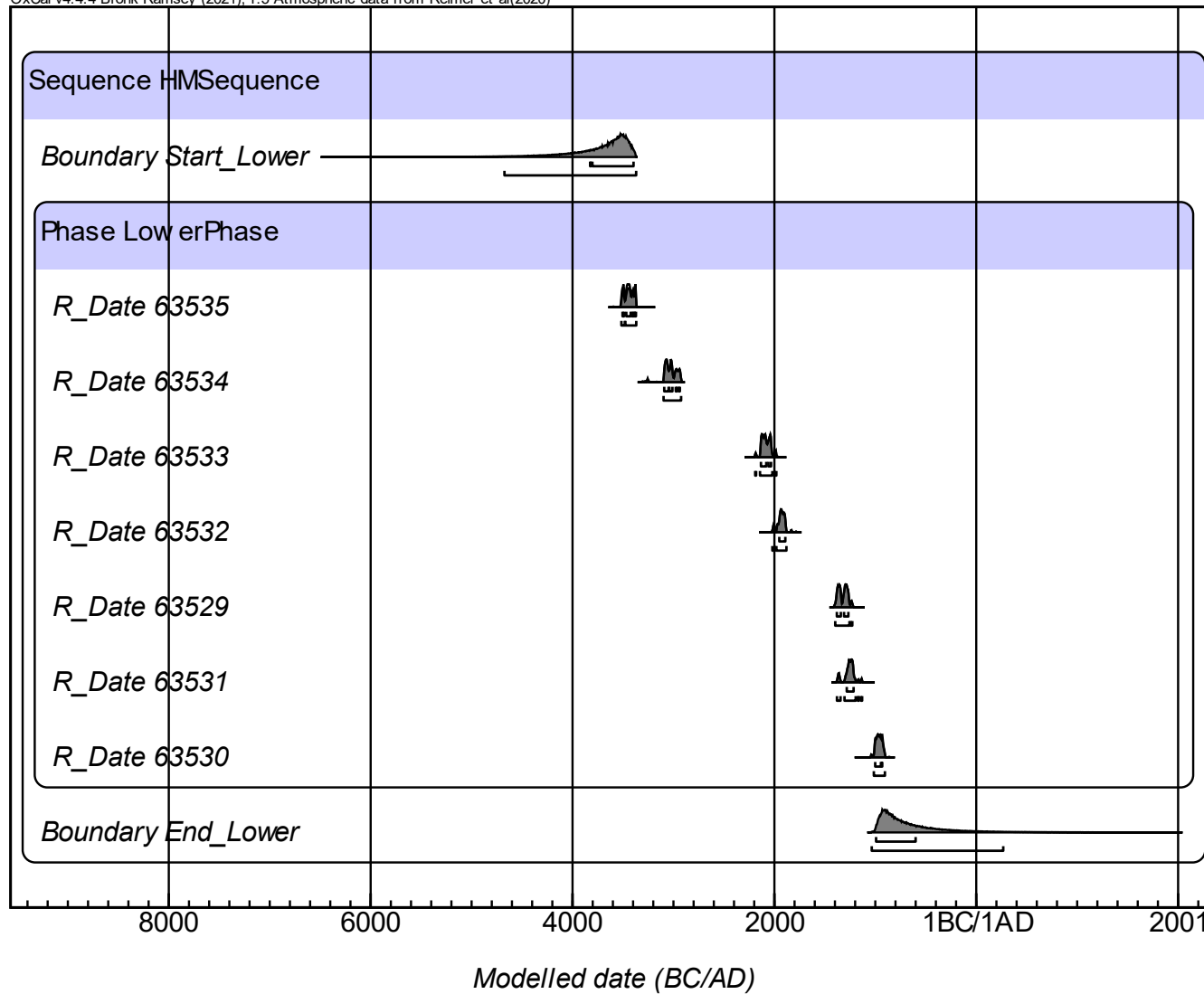


Figure 88 - Multiplot of calibration data for radiocarbon dates from lower site deposits.

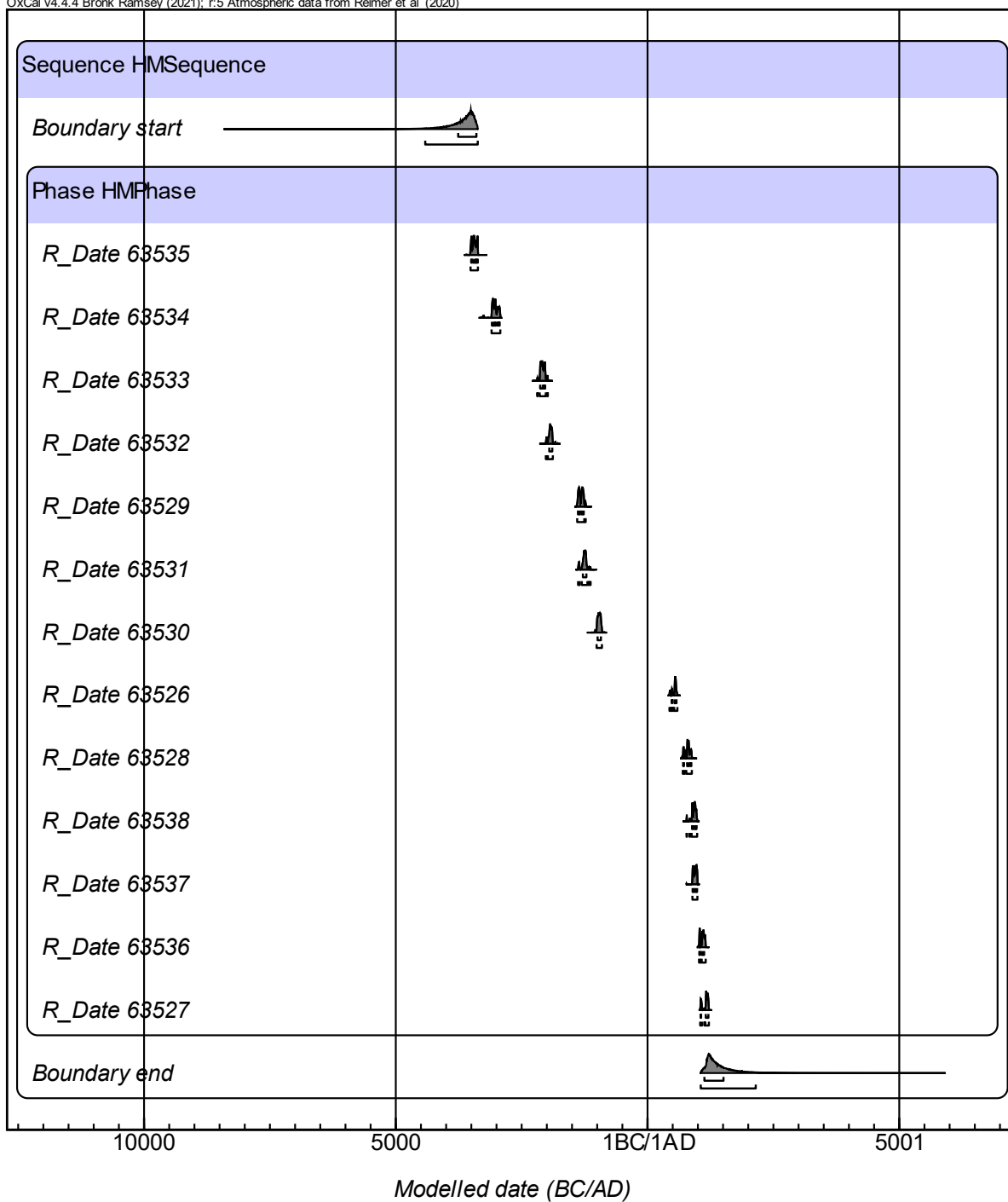


Figure 89 - Multiplot of calibrated data for entire radiocarbon sequence secured from Hells Midden for this project. Note the clear temporal gap (between UGAMS#63530 and 63526) which is represented stratigraphically and described throughout this text as “upper” and “lower” sections – corresponding with Lister’s (1951) description of “Horticultural” and “Hunting-Gathering” stages of occupation.

Conclusion

These data shows a generalized sequence of Castle Park site use that suggests repeat occupation through time and will influence our interpretations of settlement analysis for the now-dated cultural strata. Perhaps the greatest revelation from these dates is confirmation of the claim by CUMNH excavators that there are two distinct sequences of site occupation, split, roughly, at 170 cubs (particularly apparent in Lister's report [1951]). While Lister's claims of this entire sequence being horticultural is not necessarily supported by regional or site-specific data, there seems to be a real difference in site use; this claim will be further supported by the analysis in the following chapter. While my suspicion going into this research was that the lower portions of this upper sequence may correlate to Late Archaic or early Formative occupants who practiced minimally intensive agriculture (see Spangler 2002:333-340), this now seems unsupported. Instead, the record shows a relatively tight clustering of Fremont occupation which is similar to those dates produced by Goff (2010), Truesdale (1993), and earlier tree-ring dates (Burgh 1950) for Fremont occupations in this region. The lower portion sits pretty squarely within the Middle and early Late Archaic occupations for this region. Future chronological modeling for Castle Park should seek to combine all these data into Bayesian models for occupation there.

Another fact confirmed by these researchers was the, perhaps intuitive, decrease in stratigraphic integrity as units moved north. This is apparent in illustrations from Lister's excavations which excavated the site in a large north-south trench. Future researchers may find more useful radiometric data by sampling materials from the 1949 excavations which occurred against the shelter wall; the downside of this approach is difficulty comparing these levels to those described in Lister's report and profiles of the site.

Table 7 - Summary radiocarbon data for upper site deposits. Asterisk (*) denotes a corn date. The only date significantly out of step in this sampled sequence is the result from UGAMS 63526, although it is in the range of Formative lifeways in the region.

Sample	Excavated Level	Median Probability Cal. Age (reported RCYBP, error)
UGAMS 63536*	1948-2 (50 cmbs)	1099 AD (970, 20)
UGAMS 63537*	1948-2 (80 cmbs)	943 AD (1110, 20)
UGAMS 63526	1948-2 (50-120 cmbs)	547 AD (1540, 20)
UGAMS 63527	1949-3 (61-91 cmbs)	1173 AD (890, 20)
UGAMS 63538*	1949-4 (91-122 cmbs)	929 AD (1140, 20)
UGAMS 63528	1949-5 (122-152 cmbs)	804 AD (1230, 20)

As stated earlier, for the purposes of our work, these dates are sufficient. Still, because all dates were included within the Bayesian analyses presented in the previous section, those results should be considered tentative. Future research, particularly those employing statistical analysis, should consider these dates carefully considering the other data presented here and in previously published work on the site. Focusing exclusively on excavations from a single season for future radiocarbon sampling (using, for example, only 1949 trench samples) may reduce uncertainty.

Inferences on Fremont site use derived from this data are significant, though they primarily served to confirm what has been hypothesized about the temporality of these occupations within Castle Park. While it was hoped dates could offer data on occupations spanning the Late Archaic to Formative (Fremont) transition, none were identified; in fact, a 1500 year gap between dated sequences is suggested at the upper and lower sequence interface (170 cmbs, roughly). This may suggest several hypotheses: 1) Fremont occupations here

sufficiently scrubbed this record from the site (perhaps from intensive clearing of the site's surface); 2) landscape use changed in the millennium preceding Fremont occupation in a way that led to an apparent abandonment of Hells Midden and Castle Park; or 3) that other factors, perhaps environmental conditions like drought, affected site formation and removed this sequence. These each may be answered by research at different scales (1 through further field work at the site, 2 and 3 through further landscape scale studies into population movements or the paleoenvironment).

A significant finding from these dates, though, is the relatively rapid accumulation of materials in this upper sequence. Refer again to Figure 84; this model suggests that these upper Fremont horizons lasted *at most* (with 95% probability) seven centuries. And this model includes the outlier, possibly intrusive, date of 1540 +/- 20 RCYBP (see Figure 86 for the same model excluding this result). This suggests that over a period of several centuries, more than a meter of culturally-dense sediments accumulated on this site. This is highly significant for understanding the cultural processes of site formation, particularly when this is compared to the lower sequence; dates presented here span, at most, 180 cm of deposits, yet the results suggest 3,000 years or more of occupation. Plainly land and site use regimes changed under Fremont occupation, producing records of dense archaeological materials.

The lifeways practiced at Hells Midden in the Late Precontact period, then, can be considered to have involved lengthier and more frequent stays at the site, probably with greater population density, as well (the following chapter will test this claim). These data may also be interpreted to suggest that Fremont occupants disturbed shallowly buried archaeological horizons through their activities on a site (at Hells Midden this includes excavation of pit features into underlying deposits). Upcycling of cultural materials (such as reworking chipped stone tools) can

be considered another mechanism by which Late Precontact occupants removed evidence of nearly preceding occupations. One must be careful, therefore, of making claims regarding the absence of data for the transitional Late Archaic to Formative Periods, as these archaeological materials may have once been present but erased by more recent intensive site use.

So, while these dates offer insights into the Fremont occupations here and at Hells Midden, I would argue the real utility in dating this sequence is in understanding pre-Fremont site use. It is clear from the data presented in this chapter that during the Middle Archaic period, Hells Midden was an attractive spot, with 2,500 years of occupation (Figure 81). While it is argued that there is an increase in sedentism during the Late Archaic period for this region, I would suggest the series of seven Hells Midden dates from the Middle Archaic period suggests frequent and recurring, if not *sedentary*, occupation at this site in those times. The data presented here will be coupled with analysis of this question in the next chapter.

While further dates should be sought which can confirm this sequence and make efforts to identify gaps in this sequence, this general trend of intensive Middle Archaic occupation with a paucity of evidence for habitation in the Late Archaic seems to follow the regional pattern described for the Yampa Canyon and that seen at similarly stratified sites like Deluge Shelter (Leach 1970; Spangler 2002:71). At Deluge Shelter, seven occupational strata are considered to represent the Middle Archaic sequence; two strata overlay this sequence, the upper being dated to AD 325 (radiocarbon years). This follows a series of strata dated to the period represented by the upper portion of Hells Midden. Further inquiry into these stratified sites may be able to identify if this absence of Late Archaic evidence is a result of cultural processes (either Late Archaic peoples dwelling elsewhere *or* erasure of this record by Fremont occupations) or taphonomic factors. The data from this study alone do not offer sufficient data to claim whether

it is a real historical phenomenon that is being evidenced by the Late Archaic absence at Hells Midden. Further dating of the CUMNH collection will almost certainly refine interpretations relating to both the Middle and Late Archaic occupations and allow greater modeling of site use in this period. The implications of these data, in relation to the overall record of the Uinta Basin, northern Colorado Plateau, and sequencing broader Archaic and Formative settlement strategies, should prove highly meaningful, but their applications to these research questions is beyond our scope here.

Summary Datasets on Radiocarbon Samples

Table 8 - Summary data gathered on collection items sampled for AMS analysis. Additional information presented in text descriptions, this chapter. Size class was coded numerically on a scale of 1 – 5. Size class 3 is roughly deer or pronghorn size (50-100kg) and 4 is elk to bison sized (100-500kg). Size classes are based only on rough estimate by the author and were not compared to cortical thickness or other absolute metrics sometimes used.

UGAMS#	UCM #	Depth cmbs (U)	Depth cmbs (L)	Level	Element	Portion	Size Class	Taxa	Max Length (mm)	Mass (g)	Burnt? (Y/N)	Cut Marks? (Y/N)	Tooth Marks? (Y/N)	Weathering stage
63526	1948.01.065	50	120	48-2	Radius	Proximal	4	Artiodactyl	38.4	4.5	N	Y	IND	1-2
63527	1949.01.042	60.96	91.44	49-3	LBN	Midshaft	3	Artiodactyl	87.4	11.2	N	Y	N	1
63528	6898	121.92	152.4	49-5	LBN	Midshaft	3	Artiodactyl	94.7	10.4	N	N	N	1
63529	1948.01.092	140	170	48-3	Phalanx	Proximal	4	Bovid	62.4	6.6	N	Y	N	2
63530	1949.01.013	152.4	182.88	49-6	Femur	Proximal	3	<i>Ovis</i>	40.8	12.3	N	Y	IND	2-3
63531	1949.01.048	182.88	213.36	49-7	Tarsal	Distal	3	<i>Ovis</i>	37.9	4.7	N	Y	N	2
63532	1949.01.024	213.36	243.84	49-8	LBN	Midshaft	3	Artiodactyl	56.2	7.7	N	Y	N	1
63533	1949.01.002	243.84	274.32	48-9	Podial	Proximal	3	Artiodactyl	34.5	4.5	N	Y	N	2-3
63534	1949.01.011	274.32	304.8	49-10	Metapodial	Proximal	3	Artiodactyl	71.1	8.2	N	N	N	2-3
63535	1948.01.091	320	350	48-9	Metapodial	Proximal	3	Cervid	57.8	7	N	N	N	3
63536	6612	50	50	48-1	Corn	Cob	-	Maize	17.1	0.15	Y	-	-	-
63537	6610	80	80	48-2	Corn	Cob	-	Maize	18.6	0.23	Y	-	-	-
63538	6900	91	122	49-4	Corn	Cob	-	Maize	21.3	0.23	Y	-	-	-

Table 9 - Summary of UGAMS reported data, sorted by UGAMS test number. Note samples listed as charcoal are charred maize cob.

UGAMS#	UCM #	Material	$\delta^{13}\text{C},\text{‰}$	$\delta^{15}\text{N},\text{‰}$	C/N	^{14}C years BP	\pm	pMC	\pm
63526	1948.01.065	collagen	-18.88	5.39	3.34	1540	20	82.59	0.22
63527	1949.01.042	collagen	-19.12	4.43	3.34	890	20	89.51	0.24
63528	6898	collagen	-19.61	6.21	3.32	1230	20	85.84	0.22
63529	1948.01.092	collagen	-18.71	4.12	3.38	3050	20	68.41	0.19
63530	1949.01.013	collagen	-18.94	4.42	3.27	2810	20	70.47	0.19
63531	1949.01.048	collagen	-18.96	4.54	3.29	3010	20	68.78	0.2
63532	1949.01.024	collagen	-19.39	4.45	3.29	3580	20	64	0.18
63533	1949.01.002	collagen	-18.67	4.18	3.3	3690	20	63.19	0.18
63534	1949.01.011	collagen	-18.74	4.77	3.3	4410	20	57.76	0.17
63535	1948.01.091	collagen	-18.85	4.93	3.29	4670	25	55.94	0.16
63536	6612	charcoal	-10.48	n/a	n/a	970	20	88.58	0.23
63537	6610	charcoal	-11.53	n/a	n/a	1110	20	87.06	0.23
63538	6900	charcoal	-10.75	n/a	n/a	1140	20	86.76	0.23

CHAPTER 6: MULTIVARIATE ANALYSIS OF SETTLEMENT

“The problem of dwellings is an important one in the Yampa Canyon, and our knowledge of Hells Midden cannot be considered complete without an understanding of the circumstances of residence.” (Burgh and Scoggin 1948:29)

“The nature of residence is situational rather than chronological.” (Price 2022:241)

This chapter will detail the multivariate analysis and the qualitative interpretations of sedentism in the record of Hells Midden. This analysis will be foundational to our argument, offering a replicable and immediately comparable mechanism by which to measure changes in occupational strategy and site use through time. This chapter will describe how these calculations were made, discuss the reasons and expectations behind each variable, and provide the results of these analyses. In conclusion, those data will be compared with other information derived from the assemblage and regional record to help explain the observed variation through time.

Introduction to the question

The second goal of my research into Hells Midden was to understand how occupational intensity may have varied at the site through time. Sedentism may be understood in many ways, in part because it is so primary to anthropological research. In the Uinta Basin and surrounding areas, settlement strategies are defined as a primary characteristic of human archaeohistory. Indeed, it's a main area of study within archaeological research worldwide (Kintigh et al. 2014:880). Hells Midden occupational sequence offers great promise for studying changes through time at a single site. In the Uinta Basin and surrounding areas, where semi-sedentary

lifeways are described for much of human history, there are still dramatic changes to settlement strategies with the introduction of agriculture. Studying site use through time can help understand this change.

Initial impressions of Hells Midden as a refuse area for occupations on the ledge above were fair given the data they had available and the site's general appearance. However, this view has needlessly skewed interpretation of this site, downplaying the significance of its deposits and role at various points in time as a primary occupational surface. I am interested in how this site's use may have changed over time, and in this chapter sedentism will be analyzed using multiple quantified measures to compare this difference between excavated contexts. This chapter will introduce the theoretical approaches to this research in archaeology, outline the metrics to be used as proxies for sedentism, and present the results of a multivariate analysis. Discussion will follow in the concluding chapter of this thesis.

Theoretical Perspectives on Sedentism in the Archaeological Record

The degree of sedentism (and its inverse mobility) practiced by populations is often used to describe and explain differences between human societies, both ethnographically and archaeologically. This is because when groups reorganize their settlement strategies, shifting along this mobility-sedentism continuum, their social organization, subsistence strategies, demography, and ideology will necessarily be reorganized (Bettinger and Baumhoff 1982; Eerkens, 2003:282; Kelly 1992:43-44; Surovell 2009:61). Ethnographic research has described a wide range of mobility strategies (Kelly 2013:80-84), and this variation has been ordered into numerous classifications (Binford 1980; Murdock 1967:159). While these categorizations are useful for framing interpretation and discussion of the past, they are most validly applied to archaeological phenomena at large spatial scales. For this study, I will not attempt a

categorization of the various occupations at Hells Midden in absolute mobility terms (such as describing velocity, frequency, or group size) or categorize occupational periods in a binary or spectrum (such as the widely used “collector” or “forager” designations [Binford 1980]) rather this study will describe the evidence for sedentism across these stratigraphic assemblages in relation to adjacent levels. This will be done by ranking a series of variables for each excavated context at Hells Midden. A multivariate analysis will be used to quantify these interpretive metrics; these results will be compared against qualitative assessment of the assemblage composition and how this might relate to the mobility expressed by groups inhabiting Hells Midden.

Sedentism, as an aspect of social organization, may be used to both *describe* and *explain* a range of past human behaviors (Morgan 2015). Some behaviors associated with increased sedentism are relatively intuitive and direct: for example, Kelly has argued that populations with greater sedentism are more likely to invest in food storage to reduce risks resulting from increased reliance on smaller resource bases (1992:58). Other effects of increased sedentism are indirect, complex, and result from a range of variables, such as changing mechanisms of enculturation, gender-roles, and the increased importance of alliance building (1992:58-59). These processes are expected to result in measurable differences in the material record of these populations, and it is these differences that will be compared to understand how sedentism and mobility varied at Hells Midden through time.

Research into archaeological sedentism has spent a lot of energy seeking to trace its emergence and cause, usually by seeking correlation with several factors (such as the severity of winters, latitude, and effective temperature [Binford 1990]; increasing population pressure [Flannery 1972; Hitchcock 2004]; or technological innovation (Bettinger and Baumhoff 1982;

Hoffecker and Hoffecker 2017:296]). Many of these concepts were developed out of Steward's work in this greater region which compared environment with social organization using ethnographic and archaeological data (Parsons 1972; Steward 1938; Zeanah 2002:239).

Important to understanding the ways archaeologists may use sedentism as a concept, is Morgan's distinction between use in an *explanatory* or *descriptive sense*. There is a "fundamental theoretical divergence" between these two perspectives which will produce radically different interpretations of the archaeological record (Morgan 2015:165). The divergence between these two viewpoints should become clear as we review discussion of sedentism worldwide, but, in a very general sense, the former can be thought of as giving primacy to the environment or external forces to which sedentism is a necessary (or at least likely) response, whereas the latter favors human agency and populations' ability to select certain settlement strategies among multiple possible solutions to problems of housing, resource procurement, etc. In this latter usage, settlement can be understood as one possible manifestation of human action on the landscape, but it is not evaluated as a correct or necessary adaptive strategy. It is one among many social behaviors that can be observed archaeologically, and, like others archaeological traits, certainly had far more variation in its expression than can be observed today.

This project will tend toward discussing sedentism in a descriptive sense; in part, this is because it is beyond the scope of this research to analyze and compare all possible causal pathways for the emergence of sedentism and its consequences to the local environment, the population in question, their neighbors, etc. That said, it seems useless to deny that there are patterns described worldwide in the expression of sedentism (including feature and artifact density and diversity or environmental factors) which may reasonably predict for other traits that

can be observed archaeologically (Binford 1990; Morgan 2015:196; Shott 1986; Smith 2021). These generalized schemes, while certainly informative, can, if relied on too much, obscure what is observed at the local, site scale; as such, these perspectives should be made explicit and be tempered with consideration of the points addressed above. The predictive potential of sedentism, as expressed at Hells Midden and corroborated with the regional record, will be discussed in the concluding portion of this thesis.

Markers of Sedentism

Sedentism has been a primary variable by which the transition to agriculture has been studied and described. In many cases, the spread of agriculture and an accompanying suite of traits (including sedentism, most related to this study) has been described as a process of diffusion related to population packing and consequent demographic expansion (Bellwood 2006). This process has been dubbed the Neolithic Revolution (more commonly “Formative Transition” in American archaeology), and its effect on past communities has been compared, in terms of scale, to the Industrial Revolution (Greene 1998:98). Despite the popularity of this neolithization paradigm for agriculture’s rise and spread, there are issues of chronological resolution, taphonomy, and preservation that make viewing this process very difficult in singular archaeological sites or ethnographic parallels. Peter Bellwood, who advocates for a basically similar, although more nuanced, model of agricultural dispersal, writes that “whatever the...conditions conducive to agricultural adoption, the ‘bottom line’ observation still holds. Nowhere in the ethnographic record do we observe any adoption of agriculture that has imparted expansionary success to the adopting population” (Bellwood 2006:37).

Practically since the conceptualization of a “neolithization process” (toward sedentism and increasing population density), archaeologists and historians working in many areas of the

world have sought counter examples to suggest the change was gradual, not “revolutionary” (Bellwood 2006:21; Krossa et al.2017:8-9; Ramsey et al.2016). These have been explained in adaptive terms, using external factors to explain agricultural and settlement systems as a process of intensification (Hitchcock 2004; Morgan 2015).

Some scholars have suggested that the debate on agricultural beginnings and dispersals in human societies persists because of difficulty pinpointing archaeological evidence of the “earliest Neolithic” (Price 2022:238). This absence of a transitioning proto-agricultural occupation was demonstrated by dates from Hells Midden, too, in the previous chapter. There are reasonable taphonomic factors one can imagine which would explain a paucity of data in this period, but some have noted how, unlike many phenomena we study in the archaeological past, we have next-to-no ethnographic parallels to understand the dispersal of these behaviors. The paucity of this period in data worldwide has also been explained by an experimental phase before intensive agriculture; in this period site selection would necessarily be brief as budding agriculturalists were in search of suitable acreage to farm (Price 2022:239). Whatever the site formation processes, observing a transition toward agriculture is very hard indeed. Comparing settlement in lower and upper occupations of Hells Midden may express this process in general terms, adding another data point to the complex picture of Formative transition in the West.

For the northern Colorado Plateau, differences between Fremont and the preceding Archaic occupations have been widely debated, frequently in the context of understanding Fremont ethnogenesis. While early models were based on a lack of dates for the transitory period, where “neolithization” is presumed to have occurred, more recent work has identified these dates in the regional record. Because Fremont material is varied across its relatively wide spatial expanse, it has been a challenge to describe when cultivation becomes agriculture.

Schroedl, for example, suggested that the introduction of corn into subsistence pathways is distinct from corn agriculture; “corn was simply another plan that people could manipulate and harvest within the local environment” (Schroedl 1992:12, quoted from Spangler 2002:283).

Discussions of both sedentism and agriculture frequently slip into dichotomies regarding these strategies that bias interpretation with assumptions that cannot be reasonably tested. For example, neolithization narratives are bound in a simplification of past groups as either gatherers or farmers, and only rarely is it explained how much agriculture an individual or group must practice to cease being a hunter-gatherer. There are many known cases where non-subsistence agriculture was practiced by foraging groups. For example, the well-known *sedentary hunter-gatherers* of the Pacific Northwest were apparently cultivating tobacco as early as the 9th century AD yet are described as non-farmers (Tushingham et al. 2013). “Sedentism” as descriptor may be used informally, as in the previous sentence, but its interdependence with numerous variables of societies, coupled with the detailed ethnoarchaeological parallels, has allowed many more classificatory dimensions of this broad topic to be described. I will use this term in its simplest sense, as an increase in site use related to, even temporary, reductions of mobility. The issues of equifinality discussed above do not suggest to me that this topic is untouchable; instead, I will be comparing and describing these trends generally, subsuming concepts of occupational intensity, demographic density, duration of habitation, and reoccupation.

While Binford has posited a number of complex factors (effective temperature, latitude, and the severity of winters) which may be correlated with sedentism in ethnographic populations (1990), other anthropologists have emphasized population pressure as being the chief causative agents for these changes (Flannery 1972; Hitchcock 2004). Still others have sought to understand how technological innovation coupled with environmental change allowed decreased mobility

among human populations of the past (Bettinger and Baumhoff 1982; Hoffecker and Hoffecker 2017:296; Smith 2021). My research will favor environmental explanations because these are, in general, least reliant on archaeological sampling (and therefore more comparable across time) as compared to technological explanations (arguing for the arrival of maize agriculture, for example). These environmental factors have also been shown to be a relatively reliable predictor for sedentism when compared to ethnographic groups, and its effect is considered to be universal (Binford 1990; Kelly 2013:80-84).

In American archaeology, the classification scheme often used for understanding different settlement strategies is offered by Binford's definition of residentially mobile ("foragers") and logistically mobile ("collectors") populations (1980). Building on this, archaeologists have suggested metrics by which the degree of a population's mobility may be measured (Binford 1990:120-121; Hall 1990; Hitchcock 2004:101-102). As a result, ample ecological and paleoenvironmental data has been produced for the area of the Great Basin and Colorado Plateau which are used to explain changes in these settlement strategies (Bernard and Prokopetz 2005:3; Chapman et al. 2006; Finley et al.2020; O'Rourke et al.2007:12-13; Reed and Metcalf 1999:13; Sharpe 2002:312; Simms 2008:65-103; Stier 2012; Sundjordet 2022). These resources will allow consideration of the environmental factors which enabled different settlement strategies in prehistory (Kelly 1992:54-55). Interpretation of these concepts should integrate taphonomic processes to temper explanations which may otherwise overstate the effect of human occupants on the appearance of these archaeological levels (Burger et al. 2008; Lyman 1987; Schmitt and Lupo 1995). Site formation is the result of both human and noncultural processes, and, where possible, I will attempt to identify these processes (Schiffer 1987).

Selecting Markers for Hells Midden

The degree of sedentism practiced by past peoples is significant for its relationship to many other cultural phenomena which can be interpreted archaeologically. However, as with any other form of archaeological inquiry, the researcher must be conscious of their research questions, the quality of their dataset, and the cultural processes which produced the sites under study. Certain measures, particularly those relating to diversity and artifact density, are often used to explain variability observed in the archaeological record. However, in these cases it is important that these indices, used to quantify the available dataset, are taken as only a single line of evidence; additional data should also be quantified and compared to the results of the other indices or measurements generated by the researcher. For our study, several quantified variables will be compared with qualitative impressions of the dataset to understand changing settlement through time. In this section the variables used for analysis later in this chapter will be described alongside expectations for their behavior in settlement systems of increased sedentism.

Selecting multiple variables for comparison can add multiple lines of evidence which may strengthen the analyst's conclusions; this added nuance ensures more robust interpretations of the record, in ways that a single variable cannot. It is additionally important to select multiple variables within archaeological contexts, where spatial patterning, artifact traits, and associations between materials can vary substantially from the original depositional character of a site (Schiffer 1987:13-21). While it's tempting to overlay the integrity of an archaeological landscape and idealize sites as sealed, discrete, and preserving of a record of human action on a landscape, in fact archaeological sites are constantly being reformed, affecting the frequency, morphology, and spatial relationships of artifacts and features.

For these reasons, variable selection should be guided by 1) ethnographic data on tool use, selecting artifactual evidence which can be inferred to have meaningful associations with lifeways; 2) thoughtful consideration of multiple artifact classes which will be differentially affected by taphonomic processes; and 3) consideration for how materials were recovered and curated. As such, eight variables were chosen across artifact classes that are assumed to have been significant in past site use, collected with similar frequency during all four field seasons, and diversly affected by post-depositional processes which would alter observed distributions. Because of uncertainty in association and additional error that could be introduced by any attempt to associate the asynchronous level designations (subsequently called *analytical units* in this chapter), each excavated context will be individually tabulated and ranked.

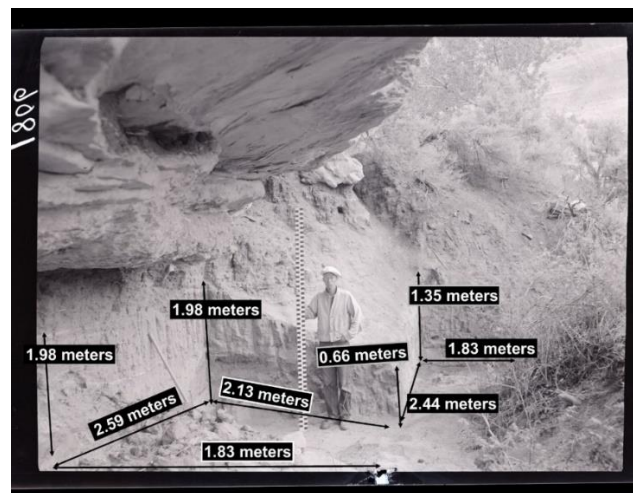


Figure 90 - Example of photogrammetric measurement of units used to calculate volume of excavated units. This was used to calculate volume of 1940 (above), 1947, and portions of 1949 units.

Volumetric Calculations of Excavations

To control against variation in frequency measures for artifact types that reflect the size of an analytical unit, all frequency variables were converted to density measures by dividing *artifact counts* by the *level (analytical unit) volume*, expressed in cubic meters. Volume was calculated based on available reported data and is an estimate of actual volume. Where unit

dimensions were not given, they were estimated using archival photos (Figure 90 - Example of photogrammetric measurement of units used to calculate volume of excavated units.).

Volumetric calculations and results are available in Table 10 - Volumetric calculations for comparing density of artifact classes between excavation trenches..

Table 10 - Volumetric calculations for comparing density of artifact classes between excavation trenches. Subtractions had to be made from the 1948 excavation units because they included what had been previously excavated by Burgh. Because of the incongruity of level depths for 1947 and 1948, the volume from the former had to be calculated for partial levels in the latter. These numbers are presented in the last column.

Session	Excavated Context	Area (m ²)	Depth (m)	Volume (m ³)	Shape of unit	Additional Calculations for 1948
1940	Trench A	2.29	2.59	5.92	Trapezoidal Prism	
1940	Trench B	0.92	2.44	2.24	Right-Triangular Prism	
1940	Total	-	-	8.17		Volume to subtract from 1948
1947	Level 1 (0-40cm)	1.39	0.40	0.56	Laterally stepped trench	.56 from 48-1
1947	Level 2 (40-125cm)	1.39	0.85	1.18	Laterally stepped trench	0.118 from 48-1, 0.826 from 48-2, 0.59 from 48-3
1947	Level 3 (125-195cm)	1.01	0.70	0.70	Laterally stepped trench	0.45 from 48-3, 0.25 from 48-4
1947	Level 4 (195-270cm)	0.93	0.75	0.70	Laterally stepped trench	0.05 from 48-4, 0.28 from 48-5, 0.28 from 48-6, 0.093 for 48-7
1947	Level 5 (270-300")	0.21	0.30	0.06	Laterally stepped trench	0.04 from 48-7, 0.21 from 48-8
1947	Total	-	-	3.20		Volume prior to Subtracting Burgh
1948	Level 1 (0-50cm)	9.00	0.50	3.82	Trench through Midden	4.50
1948	Level 2 (50-120cm)	13.00	0.70	8.27	Trench through Midden	9.10
1948	Level 3 (120-170cm)	16.00	0.50	6.96	Trench through Midden	8.00
1948	Level 4 (170-200cm)	17.00	0.30	4.80	Trench through Midden	5.10
1948	Level 5 (200-230cm)	18.00	0.30	5.12	Trench through Midden	5.40
1948	Level 6 (230-260cm)	18.00	0.30	5.12	Trench through Midden	5.40
1948	Level 7 (260-290cm)	18.00	0.30	5.27	Trench through Midden	5.40
1948	Level 8 (290-320cm)	18.00	0.30	5.19	Trench through Midden	5.40
1948	Level 9 (320-350cm)	18.00	0.30	5.40	Trench through Midden	
1948	Level 10 (350-380cm)	18.00	0.30	5.40	Trench through Midden	
1948	Level 11 (380-410cm)	18.00	0.30	5.40	Trench through Midden	
1948	Level 12 (410-440cm)	17.40	0.30	5.22	Trench through Midden	
1948	Level 13 (440-470cm)	8.00	0.30	2.40	Trench through Midden	
1948	Level 14 (470-500cm)	6.00	0.30	1.80	Trench through Midden	
1948	Level 15 (500-530cm)	6.00	0.30	1.80	Trench through Midden	
1948	Total	-	-	71.98		
49-I	Level 1 (0-30.48cm)	7.25	0.30	2.21	Stepped at West	
49-I	Level 2 (30.48-60.96)	7.25	0.30	2.21	Stepped at West	
49-I	Level 3 (60.96-91.44)	7.25	0.30	2.21	Stepped at West	
49-I	Level 4 (91.44-121.92)	7.25	0.30	2.21	Stepped at West	
49-I	Level 5 (121.92-152.4)	7.25	0.30	2.21	Stepped at West	
49-I	Level 6 (152.4-182.88)	5.23	0.30	1.59	Stepped at West	
49-I	Level 7 (182.88-213.36)	5.23	0.30	1.59	Stepped at West	
49-I	Level 8 (213.36-243.84)	5.23	0.30	1.59	Stepped at West	
49-I	Level 9 (243.84-274.32)	5.23	0.30	1.59	Stepped at West	
49-I	Level 10 (274.32-304.8)	5.23	0.30	1.59	Stepped at West	
49-I	Level 11 (304.8-335.28)	3.34	0.30	1.02	Stepped at West	
49-I	Level 12 (335.28-365.76)	3.34	0.30	1.02	Stepped at West	
49-I	Level 13 (365.76-396.24)	2.23	0.30	0.68	Stepped at West	
49-I	Level 14 (396.24-426.72)	2.23	0.30	0.68	Stepped at West	
49-I	Level 15 (426.72-457.2)	2.23	0.30	0.68	Stepped at West	
49-II	Level 8-9 (213.36-274.32)	3.25	0.61	1.98	49-II, Rectangular Prism	
49-II	Level 10-11 (274.32-335.28)	3.25	0.61	1.98	49-II, Rectangular Prism	
49-I	Total			23.09		

Chipped Stone Diversity

Diversity measures have been frequently used to describe and compare patterns of human behavior across space and time; most generally, the questions which archaeologists apply to diversity measures relate to occupational intensity, raw material acquisition, and site use patterns (Burnett 2005; Reckin and Todd 2020; Scheiber and Finley 2011; Yellen 1977). Diversity measures, most basically, are a means to quantify and describe the degree of variation within archaeological assemblages. In modern archaeological usage, these indices are understood as a quantification of the distribution of artifact counts among several classes. This present study will seek to use diversity metrics, in comparison and conjunction with several other variables, as a proxy for sedentism. Because of the various ways diversity may be calculated, it will be giving slightly more attention than the remaining variables which are more directly derivative from the artifactual dataset.

Comparing the diversity of assemblages across excavated levels is used here to serve as a single indicator of sedentism. In general, greater diversity of materials within an excavated context suggests that these deposits were created during periods of greater sedentism at the site. This pattern of anthropogenic site formation, sometimes called “the Clark Effect,” suggests that more time spent on a site will result in a wider range of human activities performed there; in the process, a greater diversity of materials will be exhausted, broken, or for other reasons discarded at a particular locale (Schiffer 1983:685; Surovell 2009:61).

A foundational use of such measures aimed to describe how artifact diversity patterned in different areas of a site (for example indoor vs. outdoor spaces; public vs. private spaces) in an ethnoarchaeological context (Yellen 1977:108-109). Subsequent projects have applied these measures across broad landscapes, for example to understand how past lithic resource use varied

at landscape scales (Burnett 2005; Reekin and Todd 2020; Scheiber and Finley 2011). This chapter's analysis, comparing diversity with other variables, was principally inspired by Buckner's application of similar metrics to understand site reoccupation within the Medicine Bow Range (2020).

In other literature, diversity is commonly used without explanation and subsumes related measures of *richness*, which describes the number of classes within an assemblage. Related to this is the term *evenness*, which is used to describe the distribution, or apportionment, of individual items across the defined classes (Jones and Leonard 1989:2). Others have described evenness as the equitability of relative abundance within assemblages (Faith and Du 2017). Many of the most widely used calculations for diversity, both in archaeology and other fields, typically combine measures of richness and evenness into a single diversity metric; this singular value, while often simply called diversity, may be more accurately referred to as "heterogeneity" measure (Bobrowsky and Ball 1989:5). It should be noted that these indices, derived from ecology, refer to the classes being compared as *species*; reference to such here follows this legacy but in application to our dataset describes artifact categories compared.

While several groupings of artifacts could be calculated for this assemblage, my use of diversity metrics is limited to chipped stone tool data sets, as these exhibit the greatest preservation across time and show similarities of form throughout Native American occupation. Ground stone artifacts were quantified in terms of richness (that is, number of types), but sample sizes were too limited for meaningful calculation of diversity. While chipped stone was classified into more than a dozen tool types for the general analysis of this assemblage, a "splitter" methodology is suboptimal for understanding diversity. Seeking ranges of human action on the site, rather than ranges of lithic technology, is more meaningful for this analysis, and the

reclassification used here is expected to reflect this while selecting artifacts which can be reasonably considered to have been curated and recovered in similar quantities between field seasons. Responding to collection and recovery differences, debitage, angular debris, edge modified flakes, and cores were necessarily excluded from analysis. The consolidated scheme is presented in Table 11. These tool classes are expected to have had a similar utility and prevalence through time. A table demonstrating how this formula was calculated within Excel, and summed data on the number of provenienced artifacts from each class, is in Table 12.

Table 11 - Consolidated classification of chipped stone tool types for application to Simpson's D. Total counts across the assemblage include unprovenienced artifacts which are not used in diversity analysis.

Informal Tool (IT)	Utilized flake tools, denticulate scrapers, graters, choppers	n=147
Projectile Point (PP)	Bifacial and flake points	n=251
Drill (DR)	Drills	n=16
Scrapers (SC)	Classic "snub nose" types and three split-cobble scrapers	n=39
Undifferentiated Bifaces (UB)	Formal knives, early and late-stage bifaces without hafting elements	n=387

Table 12 - Sample table of Simpson's calculations using Excel. For demonstration, diversity of all artifacts with provenience from 1947, '48, and '49 was calculated. Refer to page above for calculation.

All '47-'49 Levels Simpson's		
	n-1	n(n-1)
IT	132	17556
UB	285	81510
SC	22	506
DR	12	156
PP	189	35910
N-1		135638
644		
N(N-1)		Simpson
415380		0.67346

For this study, a calculation of Simpson's index will be used for understanding diversity across analytical units. This measure was chosen because its unbiased estimate allows study of finite samples which will reduce the effect of sample size or rare "species" relative to other measures (Faith and Du 2017). The unbiased estimator (D') equation for the Simpson index is:

$$D' = \sum \left(\frac{n_i(n_i - 1)}{N(N - 1)} \right)$$

where n_i is individual species abundance and N is the total number of specimens in the analytical unit. These data were calculated in Microsoft Excel. For our purposes, the result of this calculation will be modified for presentation as $1 - D'$, so increased diversity results in a higher value. This calculation is equivalent to the probability of interspecific encounter (PIE) calculation (Faith and Du 2017; Hurlbert 1971). Because particularly small samples will give high heterogeneity scores (because a hypothetical assemblage of two artifacts representing two classes displays perfectly equitable distribution), excavated contexts with fewer than 10 samples were not included in the final multivariate analysis.

Chipped Stone Frequency

Using the same classes as analyzed for the chipped stone diversity (that is, all chipped stone artifacts except cores, debitage, angular debris, and edge modified flakes), this metric summed the counts within the excavated contexts. It is expected that chipped stone discard will be positively correlated with increases in occupational intensity, as greater site usage should leave a record in more occupational debris, including broken tools. The range of frequency counts across levels was 0 ($n=9$) to 143 (1948-2). These data were converted to density measures (that is, chipped stone frequency/ m^3) which was greatest in 1949-8 (23.86).

Projectile Point Frequency and Percent Complete

Projectile points are common markers of human archaeological presence. Their utility as temporal “index fossils” is frequently invoked in American research, and their specific form and spatial arrangement can influence interpretation of a site’s relationship to settlement and resource procurement through time. In this research, it is expected that greater sedentism will result in more complete points being recovered, suggesting manufacture and storage of ready-to-use tools. As such, projectile points were counted and converted to density – with the greatest density in Lister’s 1948-2, with 6.41 projectile points per cubic meter of excavation. Complete point abundance was expressed as a percentage, calculated by dividing the number of complete by the number of total projectile points, per level.

Flake Tool Frequency

Flake tools are widely associated with increased sedentism, and many studies in the Southwest have employed analysis of lithic assemblages based on this expectation (Parry and Kelly 1987). This is due to increased reliance on expedient flake technology and core use among more sedentary populations who can afford to accumulate bulky cores which would be needlessly costly for highly mobile groups (generally utilizing bifacial cores and conservative lithic toolkits). While comparison of cores and flakes would have been perhaps more revealing of this trend, cores and flakes were not uniformly collected by CUMNH excavators. As such, flake tools (summed from informal tools and scrapers - Table 11 - Consolidated classification of chipped stone tool types for application to Simpson's D. Total counts across the assemblage include unprovenienced artifacts which are not used in diversity analysis. were calculated in terms of count and density. The maximum raw count was 30 flake tools within 1948-2, and greatest density observed was in 1949-3 (6.34 flake tools/m³).

Ground Stone Frequency and Richness

Ground stones, being relatively generalist tools, were classified using a simpler scheme than chipped stone tools. This sorting was described in Chapter 4 of this work. As stated there, many more artifacts of this class were described by CUMNH excavators than were encountered by the author in the collection or catalog records. Still, these artifacts were counted and converted to density along the same lines as other types described above. In addition, ground stone richness was also calculated, because sample sizes are too small for meaningful diversity calculation (no attempt to standardize richness to volume was used). The greatest density of ground stone tools was recovered from level 1949-11 (8.83 tools per m³, respectively).

Bone tool frequency

Bone tools were the last artifact type to be quantified and compared in this analysis. While a variety of bone tool forms were identified across this sequence, the most uncommon types (such as pendants, dice, etc.) were primarily located in the upper portion of the site. Awls, however, were present throughout the sequence, recovered almost entirely from the lower levels of 1949 units. Despite this uneven distribution, awls are included as the sole non-lithic derived measure of sedentism in the site. It is expected that they would be positively associated with lengthier occupations at Hells Midden because of their proposed use in the manufacture of basketry and clothing (Buc and Loponte 2007:145).

Table 13 - Summary of chipped stone artifact dataset, used for calculation of Simpson's D. Each table represents a different season of excavation. Excluded levels had no artifact data to fit. Recall that minimum sample size for calculating diversity was ten (presented as totals). Note for 1948, artifacts designated into upper and lower sections were summed into their main level designation.

Artifact Class	1940
IT	9
UB	73
SC	14
DR	2
PP	42
Total	140

Artifact Class	47 - 2	47 - 3	47 - 4	Totals
IT	1	2	2	5
UB	7	3	4	14
SC	1	0	0	1
DR	1	0	0	1
PP	5	4	1	10
Totals	15	9	7	31

Artifact Class	48 - Surface	48-1	48-2	48-2 (L)	48-2 (U)	48-3	48-3 (L)	48-3 (U)	48-4	48-5	48-6	48-7	48-8	48-9	48-10	Totals
IT	5	10	15	1	13	4	1	1	1	0	3	0	3	0	0	57
UB	1	8	25	7	25	11	23	27	38	6	2	1	2	0	2	178
SC	0	3	1	0	0	0	0	1	1	0	0	1	1	0	0	8
DR	0	1	1	0	2	0	0	2	0	0	0	0	0	0	0	6
PP	0	5	27	6	20	5	15	18	14	6	3	1	5	1	3	129
Totals	6	27	69	14	60	20	39	49	54	12	8	3	11	1	5	378
Sum, Upper and Lower			143			108										

Artifact Class	49-2	49-3	49-4	49-5	49-6	49-7	49-8	49-8 & 9	49-9	49-10	49-12	49-15	Totals
IT	2	14	11	6	3	15	12	1	7	0	0	0	71
UB	1	11	12	7	12	11	14	4	21	0	0	1	94
SC	0	1	0	2	3	3	2	0	1	2	0	0	14
DR	0	0	1	2	1	0	1	0	1	0	0	0	6
PP	0	9	10	4	5	1	9	4	5	3	1	0	51
Totals	3	35	34	21	24	30	38	9	35	5	1	1	236

Methods and Results of Multivariate Analysis

The variables described in the preceding section were tabulated by level into a Microsoft Excel spreadsheet. To recap, the measures used were density-controlled frequencies (on all chipped stone tools, flake tools, projectile points, ground stone, and bone tools), diversity (richness and evenness) of chipped stone tools, richness of ground stone tools, and relative abundance of complete projectile points. For each measure, the PERCENTRANK.INC function was used in Microsoft Excel to rank the results for each against the results from all levels. The ranks for each value were averaged, and this result may be used to summarize the results of all eight ranking procedures. To simplify interpretations of this data, a conditional format for the percentile rank columns was used which colored cells red, yellow, or green to denote percentile ranks in the lowest, middle, and highest thirds. Results of these analyses can be found in Table 14 and Table 15.

While 1948 and '49 data are used as the array to derive percent rank presented in this chapter, the same analysis was conducted for units excavated during the 1940 and '47 sessions. In those cases, the comparative "array" for percentile ranking included all excavated contexts. The tables of these analyses are available in Appendix VII. While I chose to not include these data, in part because of the different horizontal differences between 1940 and later units as well as difficulty calculating volumetric data in the irregular units of 1940 and 1947, whether they were included in the comparative array did not seem to affect the results much at all. Interpretation of the data will follow by order of variable, but first implications of the mean rank results should be evaluated.

Table 14 - Results of Multivariate Analysis for 1948 excavations. Note color coding which divides the resulting percentile rank value into upper (green), middle (yellow), and lower (red) thirds.

Analytical Unit	CS Tools	/m ³	% Rank	Chipped Stone Diversity	% Rank	Flake Tools	/m ³	% Rank	Ground Stone Tools	/m ³	% Rank	G Stone Richness	% Rank	Projectile Points	/m ³	% Rank	% PP Complete	% Rank	Bone Tools	/m ³	% Rank	Mean % Rank
1948 Lvl 1	27	7.06	0.68	0.75	0.97	13	3.40	0.81	1	0.26	0.61	1	0.61	5	1.31	0.65	0.00%	0.00	2	0.52	0.58	0.61
1948 Lvl 2	143	17.28	0.90	0.67	0.77	30	3.63	0.84	3	0.36	0.65	3	0.84	53	6.41	1.00	26.42%	0.81	20	2.42	0.87	0.83
1948 Lvl 3	108	15.52	0.84	0.56	0.68	7	1.01	0.71	5	0.72	0.71	4	1.00	38	5.46	0.94	15.79%	0.68	5	0.72	0.68	0.78
1948 Lvl 4	54	11.25	0.74	0.45	0.61	2	0.42	0.55	0	0.00	0.00	0	0.00	14	2.92	0.77	21.43%	0.74	2	0.42	0.52	0.49
1948 Lvl 5	12	2.34	0.58	0.55	0.65	0	0.00	0.00	0	0.00	0.00	0	0.00	6	1.17	0.61	0.00%	0.00	2	0.39	0.48	0.29
1948 Lvl 6	8	1.56	0.52	0.00	0.00	3	0.59	0.61	0	0.00	0.00	0	0.00	3	0.59	0.48	0.00%	0.00	0	0.00	0.00	0.20
1948 Lvl 7	3	0.57	0.35	0.00	0.00	1	0.19	0.52	0	0.00	0.00	0	0.00	1	0.19	0.39	0.00%	0.00	0	0.00	0.00	0.16
1948 Lvl 8	11	2.12	0.55	0.75	0.94	4	0.77	0.65	0	0.00	0.00	0	0.00	5	0.96	0.55	0.00%	0.00	0	0.00	0.00	0.33
1948 Lvl 9	1	0.19	0.29	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	1	0.19	0.35	100.00%	0.97	0	0.00	0.00	0.20
1948 Lvl 10	5	0.93	0.39	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	3	0.56	0.45	66.67%	0.90	0	0.00	0.00	0.22
1948 Lvl 11	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00	0.00%	0.00	0	0.00	0.00	0.00
1948 Lvl 12	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00	0.00%	0.00	0	0.00	0.00	0.00
1948 Lvl 13	0	0.00	0.00	0.00	0.00	0	0.00	0.00	1	0.42	0.68	1	0.61	0	0.00	0.00	0.00%	0.00	0	0.00	0.00	0.16
1948 Lvl 14	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00	0.00%	0.00	0	0.00	0.00	0.00
1948 Lvl 15	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00	0.00%	0.00	0	0.00	0.00	0.00

Table 15 - Results of Multivariate Analysis for 1949 excavations.

Analytical Unit	CS Tools	/m ³	% Rank	Chipped Stone Diversity	% Rank	Flake Tools	/m ³	% Rank	Ground Stone Tools	/m ³	% Rank	G Stone Richness	% Rank	Projectile Points	/m ³	% Rank	% PP Complete	% Rank	Bone Tools	/m ³	% Rank	Mean % Rank
1949 Lvl 1	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00	0.00%	0.00	1	0.45	0.55	0.07
1949 Lvl 2	3	1.36	0.45	0.00	0.00	2	0.91	0.68	0	0.00	0.00	0	0.00	0	0.00	0.00	0.00%	0.00	0	0.00	0.00	0.14
1949 Lvl 3	35	15.85	0.87	0.69	0.81	14	6.34	0.94	4	1.81	0.84	2	0.77	9	4.07	0.87	66.67%	0.90	9	4.07	0.97	0.87
1949 Lvl 4	34	15.39	0.81	0.70	0.87	11	4.98	0.90	17	7.70	0.97	3	0.84	10	4.53	0.90	20.00%	0.71	15	6.79	1.00	0.87
1949 Lvl 5	21	9.51	0.71	0.79	1.00	6	2.72	0.77	3	1.36	0.81	2	0.77	4	1.81	0.68	25.00%	0.77	3	1.36	0.84	0.79
1949 Lvl 6	24	15.07	0.77	0.70	0.84	3	1.88	0.74	3	1.88	0.87	1	0.61	5	3.14	0.81	0.00%	0.00	6	3.77	0.94	0.70
1949 Lvl 7	30	18.83	0.94	0.65	0.74	15	9.42	1.00	0	0.00	0.00	0	0.00	1	0.63	0.52	100.00%	0.97	1	0.63	0.61	0.60
1949 Lvl 8	38	23.86	1.00	0.72	0.90	12	7.53	0.97	0	0.00	0.00	0	0.00	9	5.65	0.97	44.44%	0.84	1	0.63	0.61	0.66
1949 Lvl 9	35	21.97	0.97	0.59	0.71	7	4.39	0.87	4	2.51	0.90	3	0.84	5	3.14	0.81	0.00%	0.00	2	1.26	0.77	0.73
49-II Lvl 8-9	9	4.54	0.65	0.00	0.00	1	0.50	0.58	5	2.52	0.94	3	0.84	4	2.02	0.74	50.00%	0.87	6	3.03	0.90	0.69
49-II Lvl 10-11	1	0.50	0.32	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	1	0.50	0.42	0.00%	0.00	2	1.01	0.74	0.19
1949 Lvl 10	5	3.14	0.61	0.00	0.00	0	0.00	0.00	2	1.26	0.77	1	0.61	3	1.88	0.71	0.00%	0.00	2	1.26	0.77	0.44
1949 Lvl 11	0	0.00	0.00	0.00	0.00	0	0.00	0.00	9	8.83	1.00	3	0.84	0	0.00	0.00	0.00%	0.00	0	0.00	0.00	0.23
1949 Lvl 12	1	0.98	0.42	0.00	0.00	0	0.00	0.00	1	0.98	0.74	1	0.61	1	0.98	0.58	0.00%	0.00	1	0.98	0.71	0.38
1949 Lvl 13	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00	0.00%	0.00	0	0.00	0.00	0.00
1949 Lvl 14	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00	0.00%	0.00	0	0.00	0.00	0.00
1949 Lvl 15	1	1.47	0.48	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00	0.00%	0.00	0	0.00	0.00	0.06

Interpreting Mean Rankings

The mean rank derived from this analysis is a useful output for inferring patterns of sedentism practiced at the site through time. I will discuss these in chronological order and describe the general trends. Figure 91 is a useful graphical representation of the rank data produced from this analysis.

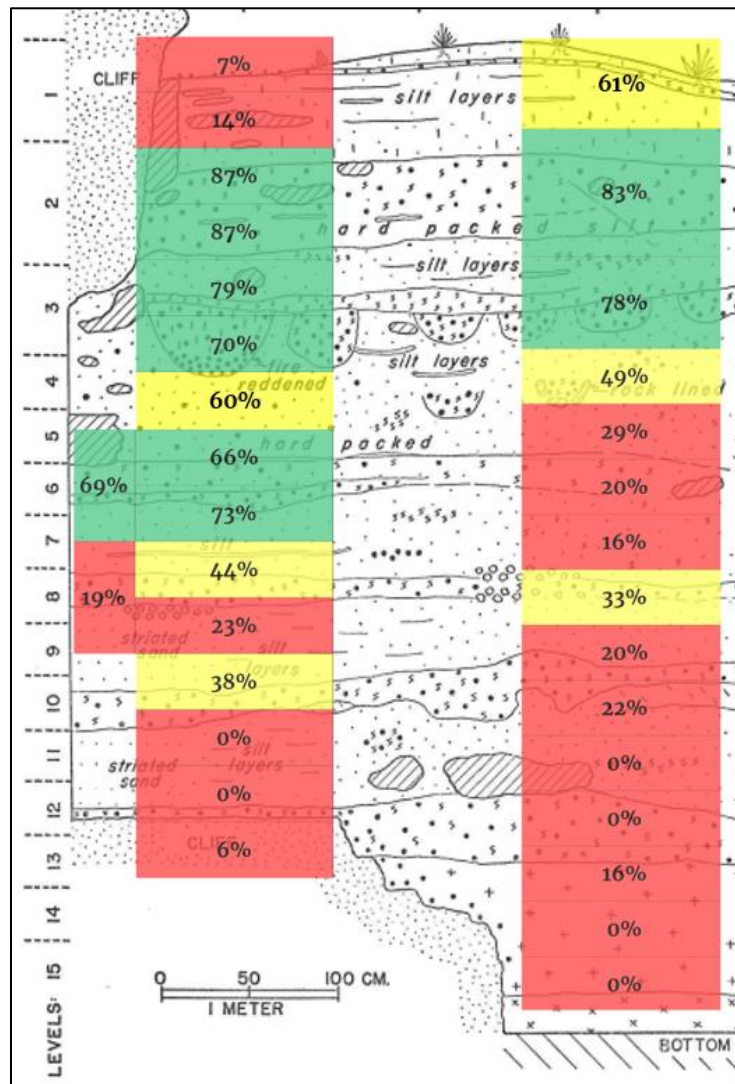


Figure 91 - Graphical representation of the mean rank values for 1949 (left) and 1948 (right) levels. Note the close association of higher-ranked levels and charcoal-bearing strata (for example at 48-12, -8, and -6. These data and their calculations are presented in Table 14 and Table 15

Unsurprisingly, sparse artifactual materials within the site's lowest horizons evidence a period of very low-intensity site use, and they support the generalization of these deposits into a lower sequence which began at roughly 350 cmbs. More than half of the excavated contexts beneath this level contained zero artifactual data which could be compiled for ranked analysis. These deposits remain undated.

Mean ranking scores first raise, unsurprisingly, at 440 cmbs, above noncultural coarse sands noted at the bottom of the 1948 trench, with evidence for *some* habitation suggested by both 1949 and 1948 data. At this depth Lister described the lowest charcoal-bearing strata and Dick's crew uncovered the most deeply buried unequivocal artifact (Figure 37). A noncultural sand-silt layer overlays this and marks a lapse in evidence for human site use.

The next period of increased habitation at the site occurs at the bottom boundary of the site's main lower occupation sequence, described through radiocarbon analysis as probably beginning in the mid-3rd millennium, calibrated BC (Figure 80). This period is represented by a charcoal-rich strata which overlays more than half a meter of noncultural silt sand deposits which, in both 1949 and '48 trenches, ranked in the zeroth percentile, having no artifacts to count within this analysis. Following the start of this lower sequence, occupational deposits are present in every excavated context. But, also beginning here, the results of the multivariate analysis show a departure for the 1948 north-south trench and the deposits excavated in 1949 against the shelter wall.

Evidence uncovered from Lister's 1948 levels produced mean ranks very similar to that expressed in the lowest cultural context, averaging only 24% across this entire lower sequence (180cm-360 cmbs). Over the comparable sequence represented by Dick's levels '49-7 thru -12, ranks averaged 49% (Figure 91). Evidence for sedentism ranked in the upper third for deposits

across the site in 1949 levels 8 and 9 (213-274 cmbs). Supporting evidence for this intensity is given by Lister's description of hard packed floors in the site's profile as well as increased rates of accumulation for the deposits, as evidenced by results from UGAMS#63532 and #63533. Lister describes this level (equivalent to '48-5 and -6) as containing fine hard-packed surfaces, some with possible cists, interspersed with water-lain silt deposits. This suggested to him a seasonal use of the shelter in this period.

Lister's 1948 levels remain low-ranking until the onset of Fremont occupation; here his levels jump from mid-ranking to nearly the 80th percentile between levels 48-4 and 48-3. Dick's 1949 levels, unsurprisingly, follow this same trend. High sedentism in these levels was assumed because of the general Fremont record, the incredible density and variety of materials in this upper horizon, and the short temporal span of accumulation in this upper sequence, as shown in the previous chapter.

The rankings for levels above the upper sequence drop rapidly in 1949 levels but show a relatively high rank (61%) for Lister's excavations. Here, high chipped stone tool frequency (n=27) suggests an intensity of occupation that was not otherwise noted by the investigators or supported by other evidence outside of these quantifications. The '48-1 rank is somewhat at odds with excavator descriptions of these deposits; while Dick records greater evidence for sedentism at all depths, relative to Lister, levels '49-1 and 2 only include a single bone tool, two flake tools and an early-stage biface. I can only suggest the Lister may have included surface artifacts across the site into the '48-1 collection.

Interpreting Individual Variables

This section will attempt to derive from the quantitative analysis above an understanding of settlement patterns at Hells Midden. The above analysis was conducted to produce replicability in this research design, but it is limited in its ability to offer direct interpretation. Variation in ranked measures used for this analysis will be used as a proxy for sedentism at the Hells Midden site, but, of course, these metrics are only heuristics which are limited in their interpretive value without other considerations. Here these variables will be considered individually to understand how multiple measured dimensions vary in relation to the mean ranks presented above.

First, a mention should be made for the taphonomic and site formation processes which are implied by this resulting dataset. While comparison of 1948 and '49 units was sought to understand changes in the occupations through time (that is, on the vertical axis), inadvertently, this analysis revealed how the record of occupation changes horizontally. The '48 and '49 units compared were arranged perpendicular to one another, and this method proved useful for describing the site's stratigraphic sequence (from a large north and south exposure in 1948) and gathering supplemental data and artifacts, such as collection of cached materials and perishable types which were poorly represented in the exposed units dug in '48. This multivariate analysis, though designed to produce occupational data, produced significant insights into how the site's formation processes vary, in a quantifiable way, on a horizontal scale which was otherwise a challenge to see in my reanalysis owing to incomplete provenience. Though I sought section provenience from 1948 to understand the difference in deposits across the site, this analysis revealed that comparison of these units may serve as a proxy to understand this difference.

The 1949 excavations demonstrated relatively higher evidence for sedentism during all dated periods of site occupation (Figure 91). While the relative integrity of these deposits had been previously inferred from their position within the shelter, it was not expected that this analysis would reveal statistical evidence for this variation. All indices respond positively to the enhanced protection of the site shelter, and both year's mean rank data, when averaged, demonstrates this (44% for '49, 29% for '48). This effect is most apparent for bone tool distribution. In 1949, these tools are shown to be present throughout the lower sequence deposits, but data from 1948 only recovered these artifacts in the uppermost four levels of the site; the relative youth of these deposits and a greater density of these tool types (shown in the 1949 units) can explain their presence in upper horizons. Other evidence for site provision, such as caches and ground stones, too, were far less abundant in '48 units than '49. Average chipped stone density for all '49 levels was 7.79/ m³; 1948 units averaged only about half of this value (3.92/ m³). Almost certainly this is the result of both human and nonhuman action: there is protection offered by the shelter and this fact was likely exploited by past shelter inhabitants when choosing where to store their tools and other materials.

Chipped stone tool frequencies, like the general data, show higher counts in 1949, particularly in deposits between 250 and 300 cmbs (near the level where '49-II was excavated). A tight clustering of dates in these levels 8 and 9, suggest a calibrated age for these deposits of, approximately, 2000 BC (Figure 92). 1948 levels 6 and 7, which correspond to this same period, contain so few chipped stone materials they were excluded from diversity measurement. Meanwhile, level '49-8 was the highest ranking of the sequence in terms of chipped stone density (>23/ m³). Upper sequences for both years are more similar than are measures in lower

portions of the site. This may be a result of less time for erosional processes to act on these more recent deposits or a result of different use of the space through time.

Related chipped stone measures, such as flake tool frequency, showed high ranks in 1949 levels above 270 cmbs as well. Flake tool abundance can suggest reduced mobility that encouraged (or enabled) expedient tool manufacture. This manufacture is evident in the site's lithic assemblage; multiple artifacts within this assemblage contained cortex which suggests that raw materials were occasionally sourced from Yampa River cobbles. Level ranks for '48-5, 6, and 7 were only redeemed by mid-ranked densities of projectile points and flake tools.

Earlier horizons in Lister's 1948 levels, too, are frequently only elevated in their mean by one or two variables. A good example is the 20% and 22% ranks for Lister's 9 and 10; while this level has good stratigraphic evidence for occupations in the form of ashy stratigraphic deposits and middle-rank sedentism secured through 1949 data, the mean '48 rank suggesting low evidence for sedentism comes almost solely from high percentages of complete points. Similarly, level '48-13, producing a higher mean rank than Dick's associated horizons, is solely reliant on ground stone density and richness.

Regarding ground stones distributions, there were more levels without ground stone than with, and so its presence within any level resulted in instant ranking above 60%. Reiteration of this model, which could choose to count and associate all described ground stone from the site, could result in more variability among ranked scores for this class. Bone tools, too, showed a similar distribution, particularly for the exposed area of 1948 units. The frequency of bone awls and scrapers in this assemblage could be suggestive of a cold weather occupation where investment in production of clothing, basketry, and hides would have been more probable.

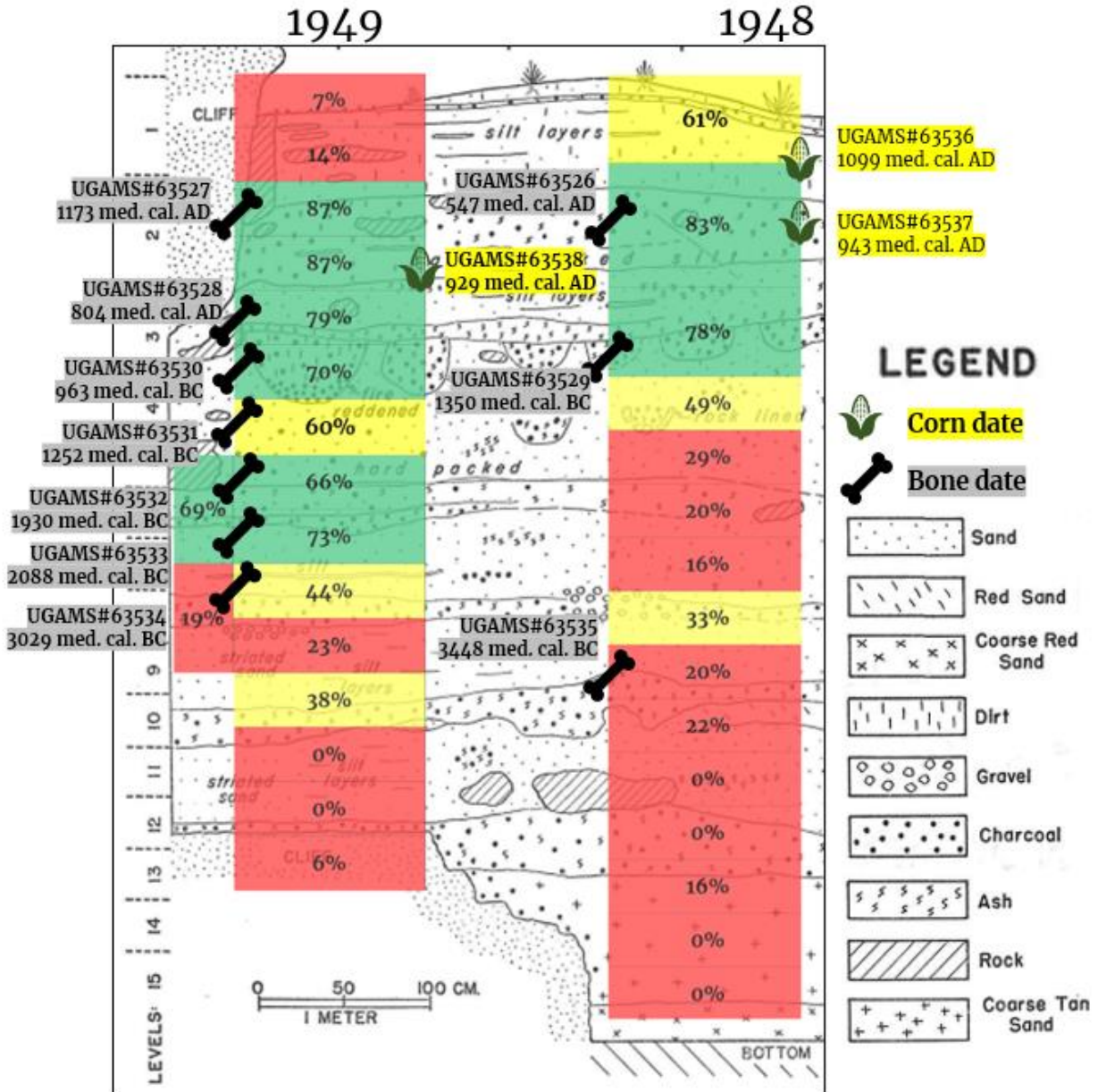


Figure 92 - Graphic showing the positions of radiocarbon dates in relation to the mean rankings suggested by the multivariate analysis.

Summary of Multivariate Analysis

The data presented in this chapter have proven useful in understanding sedimentation expressed at Hells Midden through time, and the association of these levels with absolute dates has greatly enhanced our ability to interpret anthropogenic site formation at Hells Midden. These

data show a change in settlement strategy occurred during Fremont occupation of this landscape, although it should be reiterated that a large temporal gap between the upper and lower sequences at this site makes it difficult to pinpoint or describe the character of settlement immediately prior to this transition in land use. So, for now, we may accept that some process of neolithization which affected not only subsistence pathways but also occupational strategy occurred with the onset of Fremont occupations at Hells Midden and within Castle Park.

However, these data also offered some unexpected insights into the taphonomic processes affecting the site, and these processes suggest that archaeological recovery of evidence could bear as heavily on interpretation as the actual cultural behavior which we hope to understand. Imagine that the data analyzed for this thesis was limited to the 1948 excavations. Should I have been similarly fated to conduct this analysis 70 years after this excavation, my interpretations would be massively divergent from the work produced here. This is apparent in reading interpretations of the site within the two reports (Burgh and Scoggin 1948; Lister 1951), or, at larger scales, comparing those reports' interpretations and understanding of Fremont occupations as compared to the comprehensive tome which Spangler produced (2002). While this is not a new concept, it is useful to recognize that tools such as the multivariate analysis conducted here can describe these patterns while seeking to quantify data about past human occupation.

It is worth noting that when results were calculated, it became obvious that, for some variables, the absence of them was so common across levels that any time a presence was recorded, that level immediately ranked high. This is particularly true for the variables of *projectile point completeness*, *ground stone frequency and richness*, and *chipped stone diversity* but is a fact across all variables used. Chipped stone frequency highlights the effect of this

absence on ranking as it is the only variable across levels that ever produced a lower third (<33%) rank. While I noted this response of the data early on in the research, further consideration (with input by the experts) led me to conclude that this was okay because the absences noted, in most cases, are indicators of a kind themselves.

While the absence of certain artifact types, for example ground stone, is likely a true cultural correlate with low sedentism, future approaches which utilize a ranking system like this are encouraged to spend more time at play with the results and types of data that may be used. There exists a high likelihood that these results can be skewed by collecting and recovery strategies, too. I would suggest this was a useful way to summarize data about this assemblage, however it would be intriguing to include a wider range of variables on cultural deposits that could be used to tease out nuanced associations between occupations, temporality, and material culture. These data could potentially be scaled down, too, seeking quantifiable differences in the few centuries of Fremont occupations at the site.

This analysis also put on display the discrepancies in data derived from differing excavation methodology, spatial sampling, and recording protocol's employed in the 1948 and 1949 field seasons. For nearly every level, the mean rank score was higher for the assemblage from the 1949 season. This probably is the result of different sampling areas; the 1949 trench was dug along the back wall of the shelter, an area more likely to accumulate discarded materials. The unknown association of stratigraphic levels with the arbitrary excavation levels makes direct comparison of these mean ranks problematic. With future excavations, finer scale analytical units could be used in conjunction with this methodology to help quantify some of the variation encountered.

Further works with this assemblage may employ similar methods. One abundant dataset, which could be meaningfully employed to this analysis by someone with the technical skill, is the faunal assemblage. Diversity metrics could be used to reconstruct subsistence strategies or occupational duration through time based on these counts. Additionally, comparison of more data between '48 and '49 units could highlight additional distinguishing characteristics of these two areas. Variables like these could be used for less interpretive and more methodological means, for example to guide selection of radiocarbon samples from this site. No matter the future use of these data, this analysis produced clear interpretive mechanisms for understanding occupational intensity and offered support for understandings of site formation, stratigraphic, and variation across its sections.

CHAPTER 7: CONCLUSIONS

This thesis sought to understand the chronology of occupation at the Hells Midden site and compare settlement strategy and site use through time. To those ends, this project was successful, however questions remain. This chapter will summarize the main results of the analyses conducted for this project, restate their interpretation, and make suggestions for future research direction based on the data produced here.

Analysis conducted for this work included a detailed recording of the chipped and ground stone assemblage. These data are presented in Appendix IV. A brief examination of other materials in the assemblage and of the faunal materials, to source quality radiocarbon dates, was also conducted. Ten faunal and three charred corn samples were dated by the University of Georgia CAIS lab, and results were presented in chapter 5. Lastly, data derived from the artifact analysis were ranked, comparing multiple variables expected to increase with sedentism at the site, and these results compared to the temporal data afforded by radiocarbon analyses.

The site's deposits contained a wide range of projectile point types which are coarse temporal indicators, particularly for the northern Colorado Plateau. As such, elucidating the chronology of site occupation required radiocarbon dating. Absolute dating of the deposits was also sought to confirm Lister's hypothesis for two distinct stratigraphic signatures in the site. The results of those, thoroughly reported in chapter 5, showed that the upper sequence of the Hells Midden site aligned very closely with the other Fremont occupations in Castle Park which have been previously dated. This occupation likely lasted only two or three centuries (Figure 86). The singular anomalous date from the entire sampled sequence (UGAMS# 63526), with a radiocarbon age of 1540 +/- 20 BP, is most likely intrusive into these Fremont deposits and its

inclusion significantly increases the proposed span of occupation. While limited efforts to date Castle Park Fremont are later than this date (Goff 2010; Truesdale 1993), it is possible it represents an early occupation in this upper half of the site.

The lower sequence of Hells Midden, as shown through a series of seven radiocarbon dates, evidences a much longer reuse of the site, a slower rate of accumulation for these deposits as compared to the upper sequence, and a steady occupation throughout the Middle Archaic era. These occupations likely spanned three millennia or more (Figure 81) and almost certainly began sometime after the 45th century BC (Figure 80). This sequence of radiocarbon dates is shown to have likely ended between 1000 and 600BC (Figure 82), while the upper horizon likely started between the fourth and sixth centuries AD (Figure 83); and that model is derived from dates which include the anomalous UGAMS# 63526, discussed above.

A gap, likely more than 1000 years at the end of the Late Archaic, exists between these upper and lower deposits. While this *may* be used to support claim for a long-term “abandonment” of the Hells Midden site, I suggest that it is more likely an erasure of these Late Archaic levels from the site by later, intensive and dense occupations by the Fremont complex in the Late Precontact era. The fact that regional abandonment is not apparent in the record across the broad region coupled with the stratigraphic evidence for intrusion into lower levels of the site by these Formative groups (Figure 20) suggests that site clearing, digging of the surface, and trampling of what was then the surface of the site eradicated this record. The early UGAMS# 63526 may be a representative ecofact showing this sort of cultural disturbance of deposits at the site.

Late Archaic erasure may be further supported by areal evidence from Spangler that populations increased across this period, based on radiometric frequencies (2002:285).

Elsewhere in his chapter he states that for the Yampa Basin, “settlement patterns appear to have remained constant” (2002:293). Sites, like those at Steinaker Draw, show evidence for early agriculture in this period (BC 500- 550 AD; 2002:290-291), although it’s also suggested that some of these early agricultural dates could be the result of old wood (2002:315). This hypothesized erasure of Late Archaic deposits at Hells Midden, while significant to understanding Formative site use, cannot be uncovered by analysis of a single site. Future research at Hells Midden may seek more radiocarbon dates to see if *any* radiometric evidence of this period was collected, although the provenience resolution afforded by this collection will limit the ability to carefully sample for this horizon. More successful testing may be conducted by updating synthetic datasets into cohesive, landscape scale narratives of cultural settlement patterns. As it stands, there is insufficient evidence to claim whether Hells Midden was or was not occupied in this Late Archaic period.

The multivariate analysis, presented in chapter 6, offered some additional insights into the site formation and occupation sequence. As shown, primarily for Dick’s 1949 excavated contexts, sedentism (as measured with eight variables compared to the assemblage) had a relatively steady increase through time, although the degree shown by Formative deposits was far greater for the 1948 and 1949 seasons. The data also showed that the Fremont occupation, though occurring for several centuries, may have had two distinct periods of occupation, the earlier horizon ranking slightly lower across measures considered. The greatest value of this analysis was in assessing taphonomic effects on the site deposits.

From the sequence of radiocarbon ages and the diverse assemblage of artifacts from the site, Castle Park’s character obviously attracted semi-sedentary human site use; first, in an intensive way, during the Middle Archaic, and then later with a Fremont occupation. As

mentioned, I suspect a recurring, continuous occupation *from* the Middle Archaic to the Late Precontact eras, but that claim is not directly evidenced by radiometric dates. This, I would claim, is because of the complexity of site formation processes (Schiffer 1987). Discontinuity in the multivariate results from Lister's 1948 and Dick's 1949 excavations also suggest variability in the site formation processes acting across the site.

But on some dimensions, Lister's units are recorded as having greater evidence for more-qualitative markers of sedentism, such as features, living surfaces, and other more-qualitative markers of sedentism, which are absent (or unrecorded) for 1949 units. These are humbling results, and they signify the importance of wide and explicit field sampling, lab analysis along multiple lines of artifactual evidence, and appropriate caution in making claims about past human behavior from the record as it is visible to us today. As my advisor succinctly stated to me: "archaeology is not paleo-cultural anthropology." This fact may be compounded by the taphonomic pressures on site materials once collected; information slowly leaks from these assemblages as materials slowly leaked from the banks of the Hells Midden.

Caches and features are, to my mind, the greatest evidence for site reuse, signaling, perhaps, a provisioning of Hells Midden for return occupations. In trying to understand how chipped stone blanks or ground stones came to be cached, several scenarios come to mind. It seems, most basically, that a dweller on the large landscape deposited these materials as an investment into future use of the site. Hells Midden may have been one spot among many, with caches strategically spaced across the landscape at known locations which conveniently fit into transhumance routes. As Burgh and Scoggin's report notes regarding the large nether stones (resounding Powell's comments) "such ponderous artifacts as these are indicative in other areas of established residences" (1948:37). They were likely stored (or left) for planned future use.

Hells Midden and Castle Park may be a remarkably dense cache-space (with caches and storage features at Mantle's and Marigold's Caves [Burgh and Scoggin 1948]). This may be because of Castle Park's natural sandstone features and caves, its relative abundance of water and plant resources, or because of some other differentiating characteristic within an Indigenous built-landscape which may not be visible today. Cache-spaces, like Castle Park, may have been held in social memory. Unfortunately, it is extremely difficult to infer at what temporal scale caches operated; however long the anticipated delay for future reward, caches seem to produce positive feedback loops of reoccupation at certain places, because increased efficiency is rewarded through habitation at sites of frequent human habitation. This cost reduction or increase in efficiency effectively moves Castle Park nearer to further away places, attracting more intensive and frequent occupation by reducing costs associated with habitation there. This reuse of Castle Park is then compounding: further reuse of Hells Midden would be expected to deposit further materials on the landscape as people continue to spend time there. These deposits could be both tools intentionally cached and raw materials or other artifacts left as waste—one person's trash is another's treasure. Thereby a positive feedback loop of reoccupation is patterned through the site's use which is incentivized by access to materials cached and discarded on site.

These behaviors of archaeological sites reflect what Michael Schiffer calls the “effects of settlement longevity” (1987:44-46). This cultural behavior has a powerful effect on site formation, inputting both additive (i.e., provisioning materials for future use) and reductive effects (extraction of deposited materials, sweeping, or waste management). And, as has been shown for Hells Midden, places which draw more intensive, frequent, or dense occupations may also attract increased deposition and rates of accumulation which are major additive effects on site formation.

While understanding sedentism and site reuse via the methods presented in chapter six presents several shortcomings in understanding the site's archaeological character, it was not useless. Taphonomic data and comparison of different season's excavations allowed a useful metric for assessing these differences. The methods could be strengthened by inclusion of other metrics which would be differentially affected by the passage of time and, ideally, in a way that would allow comparison to historic occupations. Given the equifinality issues of the record of sedentism in archaeology, more analysis is needed to refine these claims; those further analyses should, probably, be aimed at the regional record and seek to identify changes in diversity or assemblage make up across sites within small periods.

Future use for analyses like these could be used to compare similarity of deposits at a single site. For example, Lister suggested the Fremont occupation of the site had two natural strata that showed differences in material culture ('48-2 and -3), and these results appear to be supported by differences in the mean rank values for 1948-2 as compared to -3, and 1949-2 and -3 as compared to 1949-3. For working with a legacy collection excavated with divergent and hard-to-compare methodologies, this analysis did a fair job in highlighting similarities and differences between excavation at different areas of the site and with different resolutions.

Interpretive short comings for such a general labeling and "extraction" of sedentism from archaeological metrics, as used in this thesis, are a real challenge to validating such claims. As stated, the markers measured here may be equivalent whether occupations were frequent, lengthy, dense, or intensive. Residential sedentism by some groups during certain periods may be hidden by a provisioning of specialized goods across many smaller taskscapes within an area like Castle Park (Pelton 2017). This suggests that Hells Midden's ranking is likely a poor proxy for general sedentism in the Castle Park area. The evidence does not support permanent occupation

at Hells Midden in any period. For this reason, further inquiry into these assemblages and nearby sites may be able to make more general land-use statements that a single site's reanalysis in a singular thesis cannot grasp.

Future work should first understand the effect of the large exposure of trenches on the site's current morphology. High resolution mapping of the site could be coupled with excavation focused on identifying the strata uncovered in the 1940s CUMNH sessions. Stratigraphic recording in high resolution, for example using structure from motion photogrammetry, could enhance the ability to interpret these findings and reanalyze them at a later date, if needed (Koenig et al. 2017). Testing across the extent of the site (for example, downstream at the western portion) may also prove useful in assessing the horizontal continuity of the strata exposed by Burgh, Lister, and Dick. The temporal distribution of deposits dug by Scoggin and Lohr, for example, are not sufficiently associated to horizons in other areas of the site. But these less prominent areas of the site may have afforded greater protection to past inhabitants; further, testing in these other areas, and comparison of artifact density to the '47-49 excavations could also support interpretation of the geomorphic processes which produced the site. As well, future work may apply analysis to the sediment samples from the site within CUMNH's collection (UCM# 6620 and 6635).

There are many other things that could be done with this assemblage. My first suggestion would be an in depth faunal analysis of this assemblage and residue analysis on the artifacts in order to attempt dietary reconstructions. The high rates of fish in these deposits suggest the importance of these food sources across time, and by understanding their distribution and the distribution of other food stuffs through time, diet could be well-described according to its variation through time (Darlington 2018; Shaffer 1992). Recent work which has sought to

produce phytolith indices for recognizing Fremont site use could be tested against this site's deposits (Pearce 2017).

Work on subsistence studies could also apply analyses used elsewhere in the greater Intermountain West to understand settlement intensification through the lens of niche construction and localized resource depression of big game, particularly within agricultural settlement systems (Driver and Woiderski 2008). Additionally, the high amounts of bone tools at this site could afford analyses regarding their distribution, use wear analysis to interpret specific activities represented by these tools, and interpretation regarding the relative expense of producing such tools, their degree of curation, and contextualizing their preservation within a taphonomic framework.

Finally, more work can be done within the relatively well-defined region of Castle Park to statistically assess radiometric dates from this region. Bayesian analysis should be carefully applied to understand the Fremont span of occupation in this area and the florescence of direct agricultural evidence here. Further radiometric dates should be sought from the previously excavated materials to search for pre-Fremont components of the cave sites within Castle Park.

This work has produced significant answers for the research goals sought, however, like all scientific discovery, more questions have been produced. The edge of mystery remains, and will remain, but this work has shown a longevity of occupation at Hells Midden and its, apparent, attractiveness to Indigenous peoples of the past. The questions applied here may now branch out, and larger scale studies may incorporate data produced through this work to further understanding of settlement in the region through time.

REFERENCES CITED

- Adams, Jenny L.
2013 *Ground Stone Analysis: A Technological Approach*, 2nd Edition. University of Utah Press: Salt Lake City.
- Agenbroad, Larry D.
1990 Before the Anasazi: Early Man on the Colorado Plateau. *Plateau* 61(2).
- Aikens, C. Melvin
1972 Fremont Culture: Restatement of Some Problems. *American Antiquity* 37(1):61-66.
- Anonymous
1920 Cliff Dweller Remains Found in Moffat County. *Steamboat Pilot* 8 December 36(20):5. Steamboat Springs, Colorado.
1921 Explorers Found Prehistoric Ruins in Western Moffat Co. *Steamboat Pilot* 9 February 36(29):3. Steamboat Springs, Colorado.
- Barber, Edwin
1876 Ancient Art of Northwest Colorado. *Bulletin of the United States Geological and Geographical Survey of the Territories* (2):65-66.
- Bauer, Joshua A.
2022 A Rock and a Hard Place: Exploring Fremont Territoriality Through the Pinnacle Architecture of Douglas Creek, Rio Blanco County, Colorado. Master's Thesis. Department of Anthropology and Geography, Colorado State University.
- Baumhoff, M.A., and J.S. Byrne
1959 Desert Side-Notched Points as a Time Marker in California. *Papers on California Archaeology* (72):32-65.
- Bayliss, Alex
2009 Rolling Out Revolution: Using Radiocarbon Dating in Archaeology. *Radiocarbon* 51(1):123-147.
- Behrensmeyer, A.K.
1978 Taphonomic and ecologic information from bone weathering. *Paleobiology* 4: 150-162.
- Bellwood, Peter
2006 *First Farmers: The Origins of Agricultural Societies*. Blackwell Publishing: Malden, MA.
- Bernard, Mary, and A. Wayne Prokopetz
2005 National Register of Historic Places Nomination Form, Castle Park Archeological District, Moffat County, Colorado, National Register #84131775.

- Bernard, Mary, A. Wayne Prokopetz, and Bob Havice
 2004 Castle Park Archaeology & Overview of Cultural Resources at Dinosaur National Monument, Moffat County, Colorado.
- Bettinger, Robert L.
 1978 Alternative Adaptive Strategies in the Prehistoric Great Basin. *Journal of Anthropological Research* 34(1):27-46. <http://www.jstor.org/stable/3629629>
- Bettinger, Robert L and Martin A. Baumhoff
 1982 The Numic Spread: Great Basin Cultures in Competition. *American Antiquity* 47(3):485-503.
- Bettinger, Robert L., James F. O'Connell, and David Hurst Thomas
 1991 Projectile Points as Time Markers in the Great Basin. *American Anthropologist* 93(1):166-172. doi:10.1525/aa.1991.93.1.02a00140
- Biela, Kimberly
 2023 *A Comprehensive Analysis of Indigenous Ceramics in Rio Blanco County, Colorado*. Poster presented at the 45th annual meeting of the Colorado Council of Professional Archaeologists, 11 March 2023, Ouray.
- Binford, Lewis R.
 1980 Willow Smoke and Dogs' Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation. *American Antiquity* 45(1):4-20.
- 1990 Mobility, Housing, and Environment: A Comparative Study. *Journal of Anthropological Research* 46(2):119-152.
- Bobrowsky, Peter T., and Bruce F. Ball
 1989 The theory and mechanics of ecological diversity in archaeology. In *Quantifying Diversity in Archaeology*. Eds. Robert D. Leonard and George T. Jones. University of Cambridge Press: Cambridge, United Kingdom.
- Breternitz, David A.
 1970 Archaeological Excavations in Dinosaur National Monument, Colorado-Utah, 1964-1965. *University of Colorado Studies, Series in Anthropology* (17). University of Colorado Press: Boulder.
- Bronk Ramsey, Christopher
 2009 Bayesian Analysis of Radiocarbon Dates. *Radiocarbon* 51(1):337-360.
- Brown, F. Martin
 1937 Dendrochronology. *Antiquity* 11(44):409-426.
- Buckner, Paul
 2020 There and Back Again in the Rawah Wilderness: Reoccupation at High Elevations in the Medicine Bow Mountains, Colorado. Master's Thesis. Department of Anthropology and Geography, Colorado State University.
- Buc, Natacha, and Daniel Loponte
 2007 Bone Tool Types and Microwear Patterns: Some Examples from the Pampa Region, South America. In *Bones as Tools: Current Methods and Interpretations in Worked Bone*

- Studies*, Christian Gates St-Pierre and Renee B. Walker, eds. BAR International Series 1622.
- Buenger, Brent A., and Stacy R. Goodrick
2017 Mid-Holocene hunter-gatherers, housepits, and landscape reuse: Sweetwater River, Wyoming. *Plains Anthropologist*: 1-22.
- Burger, Oskar, Lawrence C. Todd, and Paul Burnett
2008 The Behavior of Surface Artifacts: Building a Landscape Taphonomy on the High Plains. In *Archaeological Landscapes on the High Plains*, Laura L. Scheiber and Bonnie J. Clark, eds. University Press of Colorado: Boulder.
- Burgh, Robert F.
1950 A Fremont Basket Maker house in Dinosaur National Monument. *Tree-Ring Bulletin* 16(3):19-20.
- Burgh, Robert F., and Charles R. Scoggin
1948 The Archaeology of Castle Park, Dinosaur National Monument. *University of Colorado Studies, Series in Anthropology* 2. University of Colorado Press, Boulder.
- Burnett, Paul
2005 Surface Lithic Scatters in the Central Absarokas of Wyoming. Master's Thesis, Department of Anthropology, Colorado State University.
- Carodine, Victoria
2020 If Wolves Are Already in Colorado, Should We Still Reintroduce Them? 5280. Digital. January 10, 2020.
- Cosco, Jon M.
1995 *Echo Park: Struggle For Preservation*. Johnson Printing: Boulder, Colorado.
- Chapman, S.S., Griffith, G.E., Omernik, J.M., Price, A.B., Freeouf, J., and Schrupp, D.L.,
2006 Ecoregions of Colorado (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey.
- Darlington, David
2019 Interpretation of the Wyoming Basin's Holocene faunal record: deboning, transport, NISP/MNI estimates, and food yields. *Plains Anthropologist* 64:215-232.
- Driver, Jonathan C., and Joshua R. Woiderski
2008 Interpretation of the "lagomorph index" in the American Southwest. *Quaternary International* 185:3-11.
- Eerkens, Jelmer W.
2003 Sedentism, Storage, and the Intensification of Small Seeds: Prehistoric Developments in Owens Valley, California. *North American Archaeologists* 24(4):281-309.
- Faith, J. Tyler, and Andrew Du
2017 The measurement of taxonomic evenness in zooarchaeology. *Archaeological and Anthropological Sciences* (10):1419-1428.

- Finley, Judson Byrd, Erick Robinson, R. Justin DeRose, and Elizabeth Hora
2020 Multidecadal Climate Variability and the Florescence of Fremont Societies Eastern Utah. *American Antiquity* 85(1):93-112.
- Flannery, Kent V.
1972 The Cultural Evolution of Civilizations. *Annual Review of Ecology and Systematics* 3:399-426.
- Francis, Julie E.
2000 Root Procurement in the Upper Green River Basin: Archaeological Investigations at 48SU1002. In *Intermountain Archaeology*. Madsen and Metcalf, eds.
- Frémont, John Charles
1845 *Report of the Exploring Expedition to the Rocky Mountains in the Year 1842 and to Oregon and North California in the Years 1843-44*. Gales and Seaton, Printers: Washington D.C. Accessed 7 February 2023
- Greene, Kevin
1998 V. Gordon Childe and the vocabulary of revolutionary change. *Antiquity* 73:97-109.
- Goebel, Ted, Bryan Hockett, Kenneth D. Adams, David Rhode, and Kelly Graf
2011 Climate, environment, and humans in North America's Great Basin during the Younger Dryas, 12,900-11,600 calendar years ago. *Quaternary International* 242:479-501.
- Goff, Sheila
2010 A New Look at Fremont Cordage from Mantle's Cave in Northwest Colorado. *Kiva* 76(1):33-54.
2015 Northern Ute People (Uintah and Ouray Reservation). *Colorado Encyclopedia*. Accessed 8 February 2023. <https://coloradoencyclopedia.org/article/northern-ute-people-uintah-and-ouray-reservation>
- Graham, Russel Wm., and H. Gregory McDonald
2002 In Memoriam: Elain Anderson 1936-2002. *Mammoth Trumpet* 17(3):8-9.
- Grayson, Donald K.
1993 *The Desert's Past: A Natural Prehistory of the Great Basin*. Smithsonian Institution Press: Washington.
- Gregg, Will
2022 *Historical note: Dinosaur National Monument expedition records*. Unpublished manuscript prepared for CUMNH.
- Hall, Simon Lee
1990 Hunter-Gatherer-Fishers of the Fish River Basin: A Contribution to the Holocene Prehistory of the Eastern Cape. PhD Dissertation, Department of Archaeology, University of Stellenbosch.
- Hard, Robert J., Raymond P. Mauldin, and Gerry R. Raymond
1996 Mano Size, Stable Carbon Isotope Ratios, and Macrobotanical Remains as Multiple Lines of Evidence of Maize Dependence in the American Southwest. *Journal of Archaeological Method and Theory* 3(4):253-318.

- Hauser, Neil, Alan Watchman, Shannon Mahan, and Teri Hauser
 2022 *Where are the Paleo Sites on the Eastern Flank of the Uncompaghre Plateau?* Paper presented at the 44th annual meeting of the Colorado Council of Professional Archaeologists, 5 March 2022: Denver.
- Hitchcock, Robert K.
 2004 Mobility, Sedentism, and Intensification: Organizational Responses to Environmental and Social Change Among the San of Southern Africa. In *Processual Archaeology: Exploring Analytical Strategies, Frames of Reference, and Cultural Processes*, edited by Amber L. Johnson. Prager/Greenwood: Westport.
- Hoffecker, John F. and Ian T. Hoffecker
 2017 Technological complexity and the global dispersal of modern humans. *Evolutionary Anthropology* 26:285-299. DOI: 10.1002/evan.21553
- Hurlbert S.H.
 1971 The nonconcept of species diversity: a critique and alternative parameters. *Ecology* 52:577-586
- Janetski, Joel C.
 1997 Fremont Hunting and Resource Intensification in the Eastern Great Basin. *Journal of Archaeological Science* 24:1075-1088.
- Janetski, Joel C., Mark L. Bodily, Bradley A. Newbold, and David T. Yoder
 2012 The Paleoarchaic to Early Archaic Transition on the Colorado Plateau: The Archaeology of North Creek Shelter. *American Antiquity* 77(1):125-159.
- Jeançon, Jean Allard
 1927 Antiquities of Moffat County, Colorado. *The Colorado Magazine* IV:18-27.
- Jennings, Jesse D.
 1956 The American Southwest: A Problem in Cultural Isolation. In *Seminars in Archaeology: 1955*, edited by Robert Wauchope, pp. 59-127. *Memoirs of the Society for American Archaeology* No. 11. Washington, D.C.
- Johnson, Clay, and Byron Loosle
 2002 *Prehistoric Uinta Mountain Occupations*. Heritage Report for Ashley National Forest, US Department of Agriculture #2-02/2002.
- Jones, George T. and Robert D. Leonard
 1989 The concept of diversity: an introduction. In *Quantifying Diversity in Archaeology*. Eds. Robert D. Leonard and George T. Jones. University of Cambridge Press: Cambridge, United Kingdom.
- Jones, Volney H
 1948 Prehistoric Plant Materials from Castle Park. Appendix III in *Archaeology of Castle Park, Dinosaur National Monument*. *University of Colorado Studies, Series in Anthropology* 2. University of Colorado Press, Boulder.

- Kelly Robert L.
 2013 *The Lifeways of Hunter-Gatherers: The Foraging Spectrum*, 2nd Edition. Cambridge University Press, Cambridge.
- 1992 Mobility/Sedentism: Concepts, Archaeological Measures, and Effects. *Annual Review in Anthropology* 21:43-66.
- Kelly, Robert L., and Lawrence C. Todd
 1988 Coming into the Country: Early Paleoindian Hunting and Mobility. *American Antiquity* 53(2):231-244.
- Kintigh, Keith W., Jeffrey H. Altschul, Mary C. Beaudry, Robert D. Drennan, Ann P. Kinzig, Timothy A. Kohler, W. Frederick Limp, Herbert D.G. Maschner, William K. Michener, Timothy R. Pauketat, Peter Peregrine, Jeremy A. Sabloff, Tony J. Wilkinson, Henry T. Wright, and Melinda A. Zeder
 2014 Grand challenges for archaeology. *Proceedings of the National Academy of Sciences* 111(3). <http://www.pnas.org/cgi/doi/10.1073/pnas.1324000111>
- Koenig, Charles W., Mark D. Willis, and Stephen L. Black
 2017 Beyond the Square Hole: Application of Structure from Motion Photogrammetry to Archaeological Excavation. *Advances in Archaeological Practice* 5(1):54-70.
- Kroeber, A.L.
 1963 *Cultural and Natural Areas of Native North America*. University of California Press: Berkeley.
- Krossa, Veronica Rohde, Matthias Moros, Guillaume Leduc, Martin Hinz, Thomas Blanz, and Ralph Schneider
 2017 Regional climate change and the onset of farming in northern Germany and southern Scandinavia. *The Holocene*. DOI: 10.1177/0959683617702223.
- LaBelle, Jason M.
 2019 In Search of the Fremont: Edison Lohr's Photo Tour of Mantle's Cave and Castle Park, Northwestern Colorado. *Southwestern Lore* 85(2):1-46.
- LaBelle, Jason M. and Kelton A. Meyer
 2023 *Fremont Farming Communities along the Base of Blue Mountain, Moffat County*. Paper presented at 45th Annual Meeting of Colorado Council of Professional Archaeologists, 9-12 March 2023. Ouray, Colorado.
- LaBelle, Jason M., and William E. Scoggin
 2016 "Chili" Scoggin and the Early Exploration of the Barn Butte Site (25GD1), Western Nebraska. *Central Plains Archaeology* 15:89-108.
- Leach, Larry Lamont
 1970 Archaeological Investigations at Deluge Shelter in Dinosaur National Monument. Ph.D. Dissertation. Department of Anthropology, University of Colorado.
- Lightfoot, Kent G., and Antoinette Martinez
 1995 Frontiers and Boundaries in Archaeological Perspective. *Annual Review of Anthropology* 24:471-492. <http://www.jstor.org/stable/2155946>

- Lister, Robert
1951 Excavations at Hells Midden, Dinosaur National Monument. *University of Colorado Studies, Series in Anthropology* 3. University of Colorado Press: Boulder.
- Lohr, Edison P.
1948 Winter Dig in Yampa Canyon. *Desert Magazine* 11(6):9-12.
- Loosle, Byron
2000 The Acquisition of Nonlocal Lithic Material by the Uinta Fremont. *Journal of California and Great Basin Anthropology* 22(2):277-294.
2002 Introduction. In *Prehistoric Uinta Mountain Occupations*. Johnson and Loosle, eds. Heritage Report for Ashley National Forest, US Department of Agriculture #2-02/2002.
- Loosle, Byron, and Krista M. Kiaha
2002 Research Context. In *Prehistoric Uinta Mountain Occupations*. Johnson and Loosle, eds. Heritage Report for Ashley National Forest, US Department of Agriculture #2-02/2002.
- Lyman, R. Lee
1987 Zooarchaeology and Taphonomy: A General Consideration. *Journal of Ethnobiology* 7(1):93-117.
- Madsen, David B., and Steven R. Simms
1998 The Fremont Complex: A Behavioral Perspective. *Journal of World Prehistory* 12(3):255-336.
- Madsen, David B., and Michael D. Metcalf, eds.
2000 *Intermountain Archaeology*. University of Utah Anthropological Papers 122. University of Utah Press: Salt Lake City.
- Madsen, David B., and Dave N. Schmitt
2005 *Buzz-Cut Dune and Fremont Foraging at the Margin of Horticulture*. University of Utah Anthropological Papers, University of Utah Press: Salt Lake City.
- McDonald, Stan
2000 Archaic Use of the Wasatch Plateau Uplands: A Preliminary View. In *Intermountain Archaeology*. Madsen and Metcalf, eds. University of Utah Anthropological Papers 122. University of Utah Press: Salt Lake City.
- Metcalf, Michael D., and Kevin D. Black
1991 Archaeological Excavations at the Yarmony Pit House, Eagle County, Colorado. *Cultural Resource Series* (31): BLM, Denver.
- Morgan, Christopher
2015 Is it Intensification Yet? Current Archaeological Perspectives on the Evolution of Hunter-Gatherer Economies. *Journal of Archaeological Research* 23:162-213.
- Moore, Molly, and Sarah Porterfield
2017 Yampa River. *Colorado Encyclopedia*, <https://coloradoencyclopedia.org/article/yampa-river>. Accessed 7 February 2023.

- Morss, Noel
 1931 The Ancient Culture of the Fremont River in Utah: Report on the Explorations under the Claflin-Emerson Fund, 1928-29. *Papers of the Peabody Museum of American Archaeology and Ethnology* 12(3).
- Murdock, George Peter
 1967 Ethnographic Atlas: A Summary. *Ethnology* 6(2):109-236.
- O'Connell, James F.
 1967 Elko Eared/Elko Corner-Notched Projectile Points as Time Markers in the Great Basin. P 129-140.
- O'Rourke, Dan, Doug Kullen, Lynn Gierck, Konnie Wescott, Matt Greby, Georgia Anast, Matt Nesta, Lee Walston, Robert Tate, Alison Azzarello, Bill Vinikour, Bob Van Lonkhuyzen, John Quinn, and Ron Yuen.
 2007 *Class I Cultural Resource Overview for Oil Shale and Tar Sands Areas in Colorado, Utah, and Wyoming*. Report prepared for US Department of the Interior, Bureau of Land Management, by Argonne National Laboratory.
- Ott, Richard
 2010 *Perspectives on Ute Ethnohistory in West Central Colorado*. Report prepared for Ute Indian Tribe of the Uintah and Ouray Reservation, Ute Mountain Ute Tribe, Southern Ute Indian Tribe, and the Bureau of Land Management, Colorado State Offices. Order No. L07PX00794.
- Parry, William J. and Robert L. Kelly
 1987 Expedient Core Technology and Sedentism. In *The Organization of Core Technology*. Jay K. Johnson and Carol A. Morrow, eds. Westview Press: Boulder and London.
- Parsons, Jeffrey R.
 1972 Archaeological Settlement Patterns. *Annual Review of Anthropology* 1:127-150.
- Pearce, Madison Natasha
 2017 Laying the Foundation for a Fremont Phytolith Typology Using Select Plant Species Native to Utah County. Master's Thesis. Department of Anthropology, Brigham Young University.
- Pelton, Spencer R.
 2017 Provisioning the High Country: A Distributional Analysis of Ground Stone Tools from the Colorado Front Range. *Plains Anthropologist* 62(4):1-22.
- Peters, Debra P.C., James R. Gosz, and Scott L. Collins
 2009 Boundary Dynamics in Landscapes. In *Princeton Guide to Ecology*, edited by Simon A. Levin. Princeton University Press, Princeton, NJ:458-463.
- Pool, Kelly J., and Charles A. Reed
 2020 Archaic-Age Architecture in Northwest Colorado. *Reviews in Colorado Archaeology* 3(1):1-22.
- Powell, John Wesley
 1875 *Exploration of the Colorado River of the West and its tributaries : Explored in 1869*,

1870, 1871, and 1872, under the direction of the secretary of the Smithsonian Institution.
Government Printing Office: Washington, D.C.

Price, T. Douglas

2022 *Seeking the first farmers in western Sjælland, Denmark*. Oxbow Books: Havertown, PA.

Ramsey, Monica N., Lisa A. Maher, Danielle A. Macdonald, Arlene Rosen

2016 Risk, Reliability and Resilience: Phytolith Evidence for Alternative ‘Neolithization’ Pathways at Kharaneh IV in the Azraq Basin, Jordan. *PLOSOne*.

Reagan, Albert B.

1933 Archaeological Finds in Northeastern Utah. *Proceedings of the Iowa Academy of Science* 40(1):131-132.

Reckin, Rachel and Lawrence C. Todd

2020 Illuminating high elevation seasonal occupational duration using diversity in lithic raw materials and tool types in the greater Yellowstone Ecosystem, USA. *Journal of Anthropological Archaeology* (57).

Reed, Alan D., and Michael D. Metcalf

1999 *Colorado Prehistory: A Context for the Northern Colorado River Basin*. Colorado Council of Professional Archaeologists, Denver, Colorado.

Robinson, Harry B.

1954 *Historical Aspects of Dinosaur National Monument*. Report prepared by the Region Two Office, National Park Service: Omaha, Nebraska,

Roberts, Frank H. H.

1944 Charles R. Scoggin, 1914-1944. *American Antiquity* 10(2):198-201.

Scheiber, Laura L., and Judson Byrd Finley

2011 Obsidian Source Use in the Greater Yellowstone Area, Wyoming Basin, and Central Rocky Mountains. *American Antiquity* 76(2):372-394.

Schiffer, Michael B.

1983 Towards the Identification of Formation Processes. *American Antiquity*, 48, 675-706.

1987 *Formation Processes of the Archaeological Record*. University of Utah Press: Salt Lake City.

Schmitt, Dave N. and Karen D. Lupo

1995 On Mammalian Taphonomy, Taxonomic Diversity, and Measuring Subsistence Data in Zooarchaeology. *American Antiquity* 60(3):496-514.

Schroedl, Alan R.

1984 Archaic and Late Prehistoric Adaptation in Southwestern Wyoming: The Frontier Pipeline Excavations. Report prepared by P-III Associates, Inc. for Bureau of Land Management, Wyoming. Cultural Resource Series No. 3.

1992 Culture History. In *The Burr Trail Archeological Project: Small Site Archeology on the Escalante Plateau and Circle Cliffs, Garfield County, Utah*, by Betsy L. Tipps, pp. 5-20. Cultural Resources Report 439-01-9132, PIII Associates, Salt Lake City, Utah.

- Schulman, Edmund
1950 A dated beam from Dinosaur National Monument. *Tree-Ring Bulletin* 16(3):18-19.
- Schuster, Lance J.
1996 Fremont Pottery Production: Ceramic Evidence from Baker Village (26Wp63), Nevada. Master's Thesis, Department of Anthropology, Brigham Young University, Provo.
- Shaffer, Brian S.
1992 Interpretation of Gopher Remains from Southwestern Archaeological Assemblages. *American Antiquity* 57(4):683-691.
- Sharpe, Saxon E.
2002 Constructing Seasonal Climograph Overlap Envelopes from Holocene Packrat Midden Contents, Dinosaur National Monument, Colorado. *Quaternary Research* 57:306-313.
- Shott, Michael
1986 Technological Organization and Settlement Mobility: An Ethnographic Examination. *Journal of Anthropological Research* 42(1). <http://www.jstor.com/stable/3630378>
- Simms, Steven R.
2008 *Ancient Peoples of the Great Basin and Colorado Plateau*. Left Coast Press: Walnut Creek, California.
- Slaughter, Stephanie
2010 5MF6255: Excavations at an Early Archaic Basin House Site in the Yampa River Valley, Moffat County, Colorado. Master's Thesis. Department of Anthropology, Colorado State University.
- Sleeter, Benjamin K., Tamara S. Wilson, and William Acevedo, editors
2012 *Status and Trends of Land Change in the Western United States—1973 to 2000*. Professional Paper 1794-A, U.S. Department of the Interior, U.S. Geologic Survey.
- Smith, Craig S.
2021 The bow and arrow, population, environment, and seeds: Intensification in southwest Wyoming. *Journal of Anthropological Archaeology* 62.
2016 The Dry Muddy Creek site and the early Late Archaic period in southwest Wyoming. *Plains Anthropologist*: 1-27. <http://dx.doi.org/10.1080/00320447.2015.1095449>
- Smith, Geoffrey M., Pat Barker, Eugene M. Hattori, Anan Raymond, and Ted Goebel
2013 Points in Time: Direct Radiocarbon Dates on Great Basin Projectile Points. *American Antiquity* 78(3).
- Sommer, Caitlin Ariel
2013 Animacy, Symbolism, and Feathers from Mantle's Cave, Colorado. Master's Thesis. Department of Anthropology, University of Colorado.
- Spangler, Jerry D.
1993 Site Distribution and Settlement Patterns in Lower Nine Mile Canyon: The Brigham Young University Surveys of 1989-91. Master's thesis, Brigham Young University, Provo, Utah.

- 2000 Radiocarbon Dates, Acquired Wisdom, and the Search for Temporal Order in the Uinta Basin. In *Intermountain Archaeology*, edited by David B. Madsen and Michael D. Metcalf. University of Utah Press: Salt Lake City. Pp 48-68.
- 2002 *Paradigms and Perspectives Revisited: A Class I Overview of Cultural Resources in the Uinta Basin and Tavaputs Plateau*. Prepared for Vernal Field Office, Bureau of Land Management, Vernal, Utah.
- Steward, Julian H.
- 1938 Basin-Plateau Aboriginal Sociopolitical Groups. Smithsonian Institution Bureau of American Ethnology Bulletin No. 120. Washington, D.C.
- Stier, Michael P.
- 2012 Colorado Plateaus Ecoregion. In *Status and Trends of Land Change in the Western United States – 1973 to 2000*, edited by Benjamin M. Sleeter, Tamara S. Wilson, and William Acevedo. US Geological Survey Professional Paper 1794-A.
- Sundjordet, Steven
- 2022 *Gone With the Wind: Late 12th Century Ancestral Puebloan Deforestation Limited Soil Moisture Recharge in the Northern Colorado Plateau Region*. Talk given at 44th Annual Meeting of the Colorado Council for Professional Archaeologists, Denver.
- Surovell, Todd A.
- 2009 *Toward a Behavioral Ecology of Lithic Technology: Cases from Paleoindian Archaeology*. University of Arizona Press: Tucson.
- Surovell, Todd A., Jason A. Toohey, Adam D. Myers, Jason M. LaBelle, James C. M. Ahern, and Brian Reisig
- 2017 The End of Archaeological Study. *American Antiquity* 82(2):288-300.
- Thomas, David Hurst
- 1981 How to Classify the Projectile from Monitor Valley, Nevada. *Journal of California and Great Basin Anthropology* 3:7-43.
- Truesdale, James A.
- 1993 A Radiocarbon Age for the Flicker Feather Headdress from Mantle's Cave (5MF1), Dinosaur National Monument, Utah-Colorado. *Southwestern Lore* 59(3):26-33.
- Tushingham, Shannon, Dominique Ardura, Jelmer W. Eerkens, Mine Palazoglu, Sevini Shahbaz, and Oliver Fiehn
- 2013 Hunter-gatherer tobacco smoking: earliest evidence from the Pacific Northwest Coast of North America. *Journal of Archaeological Science* 40:1397-1407.
- Wade, Sandra C.
- 1970 Site 5MF132. In *Archaeological Excavations in Dinosaur National Monument, Colorado-Utah, 1964-1965*. David Breternitz, ed. University of Colorado Studies, Series in Anthropology 17. University of Colorado Press, Boulder.
- Watkins, Christopher N.
- 2006 Parowan Pottery and Fremont Complexity: Late Formative Ceramic Production and Exchange." MA Thesis, Department of Anthropology, Brigham Young University.

Willey, Gordon R., and Philip Phillips

1975 *Method and Theory in American Archaeology*. University of Chicago Press: Chicago

Wood, Rachel

2015 From revolution to convention: the past, present, and future of radiocarbon dating.

Journal of Archaeological Science 56:61-72. <http://dx.doi.org/10.1016/j.jas.2015.02.019>

Wormington, H. M.

1937 Interpretation of Archeological Report. *Trail and Timberline* 219:6-9. Denver, Colorado.

1955 *A Reappraisal of the Fremont Culture: With a Summary of the Archaeology of the Northern Periphery*. Denver Museum of Natural History: Denver, Colorado.

Yellen, John E.

1977 *Archaeological Approaches to the Present: Models for Reconstructing the Past*.

Academic Press: New York.

Zeanah, David W.

2002 Central Place Foraging and Prehistoric Pinyon Utilization in the Great Basin. In *Beyond Foraging and Collecting: Evolutionary Change in Hunter Gatherer Settlement Systems*.

Ben Firzhugh and Junko Habu, eds. Kluwer Academic/Plenum Publishers: New York. pp 231-256.

APPENDIX I – CUMNH INVENTORY TABLE

This table summarizes the collection records from CUMNH for the Hells Midden assemblage. All columns are as-cataloged within this collection, excepting the count column, which was created during this thesis analysis. In other words, the categories and names for the objects are not my own and do not always agree with the classification made for this reanalysis. In cases in the text where a CUMNH number is suffixed with a letter or number, it suggests an individual specimen within a larger lot. Letters are sub-designations given by CUMNH, while numbers are my own. These are not replicated here, but are used, as needed, for the summary datasheets in Appendix IV – Datasheets produced during lab analysis Collection dates are color coded based on year – 1939 or 1940 was Scoggin and Lohr excavations; 1947 was Burgh excavations (Burgh and Scoggin 1948); 1948 was Lister’s field school season and 1949 was Dick’s field school season (Dick 1951).

Object #	Object Name	Category	Description	Date Collected	Count
05113	SCRAPER	Lithic	Brown jasper side scraper fragment.	12/12/1939 --AD	1
05197	KNIFE	Lithic	Chert knife blade fragment.	05/23/1940 --AD	1
05198	POINT	Lithic	Brown quartzite point fragment.	05/23/1940 --AD	1
05199	POINT	Lithic	Brown jasper point tip.	05/23/1940 --AD	1
05200	SCRAPER	Lithic	Black jasper scraper fragment.	05/23/1940 --AD	1
05201	POINT	Lithic	Yellow jasper point tip fragment.	05/23/1940 --AD	1
05202	POINT	Lithic	Red jasper point tip.	05/23/1940 --AD	1
05203	BLADE	Lithic	Yellow jasper blade fragment.	05/23/1940 --AD	1
05204	POINT	Lithic	Red jasper point tip.	05/23/1940 --AD	1

05205	POINT	Lithic	White chert projectile point fragment.	05/23/1940 --AD	1
05206	POINT	Lithic	Jasper stemmed projectile point.	05/23/1940 --AD	1
05207	KNIFE	Lithic	Quartzite knife blade base.	05/23/1940 --AD	1
05208	POINT	Lithic	Quartzite stemmed point base.	05/23/1940 --AD	1
05209	BLADE	Lithic	Quartzite stemmed knife blade.	05/23/1940 --AD	1
05210	DRILL	Lithic	Jasper asymmetrical drill.	05/23/1940 --AD	1
05211	POINT	Lithic	Chert stemmed projectile point.	05/23/1940 --AD	1
05212	BLADE	Lithic	Chert blade fragment.	05/23/1940 --AD	1
05213	POINT	Lithic	Jasper stemmed projectile point.	05/23/1940 --AD	1
05214	BLADE	Lithic	Quartzite blade. The blade is "leaf-shaped".	05/23/1940 --AD	1
05215	POINT	Lithic	Quartzite stemmed projectile point.	05/23/1940 --AD	1
05216	POINT	Lithic	Chalcedony base LN point.	05/23/1940 --AD	1
05217	GAMING PIECE	Lithic	Slate gaming piece.	05/23/1940 --AD	1
05218	GAMING PIECE		Slate gaming piece.	05/23/1940 --AD	1
05219	POINT	Lithic	Chert base LN point fragment.	05/23/1940 --AD	1
05220	POINT	Lithic	Large point base. The point fragment is made from dark chalcedony.	05/23/1940 --AD	1
05221	POINT	Lithic	White chert projectile point.	05/23/1940 --AD	1
05222	KNIFE	Lithic	Quartzite stemmed knife blade fragment.	05/23/1940 --AD	1
05223	BLADE	Lithic	Quartzite blade. The blade belongs to either a knife or a drill.	05/23/1940 --AD	1
05224	BLADE	Lithic	Quartzite knife blade base.	05/23/1940 --AD	1
05225	GAMING PIECE	Lithic	Slate gaming piece.	05/23/1940 --AD	1
05226	FKAKE	Lithic	Chalcedony worked FKake.	05/23/1940 --AD	1
05227	FKAKE	Lithic	Chert worked FKake.	05/23/1940 --AD	1
05228	KNIFE	Lithic	Red chalcedony stemmed knife.	05/23/1940 --AD	1
05229	BLADE	Lithic	Knife blade fragment.	05/23/1940 --AD	1
05230	KNIFE	Lithic	Yellow chert stemmed knife fragment.	05/23/1940 --AD	1
05231	BLADE	Lithic	Chalcedony knife blade base.	05/23/1940 --AD	1
05232	POINT	Lithic	Red jasper stemmed projectile point.	05/23/1940 --AD	1
05233	POINT	Lithic	Chalcedony point fragment.	05/23/1940 --AD	1

05234	POINT	Lithic	White chalcedony stemmed arrow point.	05/23/1940 --AD	1
05235	BLADE	Lithic	Brown quartzite stemmed blade.	05/23/1940 --AD	1
05236	POINT	Lithic	Yellow jasper point base.	05/23/1940 --AD	1
05237	BLADE	Lithic	Red jasper blade fragment.	05/23/1940 --AD	1
05238	POINT	Lithic	Brown chert stemmed projectile point.	05/23/1940 --AD	1
05239	POINT	Lithic	Red jasper stemmed point fragment.	05/23/1940 --AD	1
05240	BLADE	Lithic	Chalcedony blade fragment.	05/23/1940 --AD	1
05241	POINT	Lithic	Brown quartzite stemmed projectile point.	05/23/1940 --AD	1
05242	BLADE	Lithic	Quartzite blade base. The blade is "leaf shaped".	05/23/1940 --AD	1
05243	POINT	Lithic	Point fragment.	11/1939 --AD -- -- 05/1940 --AD	1
05244	GAMING PIECE		Slate gaming piece.	05/23/1940 --AD	1
05245	GAMING PIECE		Gaming piece.	05/23/1940 --AD	1
05246	GAMING PIECE		Gaming dice.	05/23/1940 --AD	1
05264	KNIFE	Lithic	Yellow chert knife fragment.	05/22/1940 --AD	1
05265	BLADE	Lithic	Yellow chert blade tip.	05/22/1940 --AD	1
05266	SCRAPER	Lithic	Jasper circular scraper fragment.	05/22/1940 --AD	1
05267	SCRAPER	Lithic	Chert/slate circular scraper fragment.	05/22/1940 --AD	1
05268	BLADE	Lithic	Chert blade.	05/22/1940 --AD	1
05269	KNIFE	Lithic	Red quartzite FKake knife fragment.	05/22/1940 --AD	1
05270	BLADE	Lithic	Red jasper blade fragment.	05/22/1940 --AD	1
05271	KNIFE	Lithic	Jasper circular knife fragment.	05/22/1940 --AD	1
05272	KNIFE	Lithic	Mottled jasper FKake knife fragment.	05/22/1940 --AD	1
05273	KNIFE	Lithic	Chert FKake knife fragment.	05/22/1940 --AD	1
05274	BLADE	Lithic	Quartzite rough blade.	05/22/1940 --AD	1
05275	BLADE	Lithic	Red Quartzite blade.	05/22/1940 --AD	1
05276	SCRAPER	Lithic	Chert circular scraper.	05/22/1940 --AD	1
05277	KNIFE	Lithic	Red quartzite knife fragment.	05/22/1940 --AD	1
05278	BLADE	Lithic	Chert crude blade fragment.	05/22/1940 --AD	1
05279	SCRAPER	Lithic	Jasper side scraper fragment.	05/22/1940 --AD	1

05280	KNIFE	Lithic	Grey chert sub circular knife.	05/22/1940 --AD	1
05281	KNIFE	Lithic	Chalcedony FKake knife.	05/22/1940 --AD	1
05282	KNIFE	Lithic	White Chalcedony circular knife fragment.	05/22/1940 --AD	1
05283	DRILL	Lithic	Red chert stone drill.	05/22/1940 --AD	1
05285	SCRAPER	Lithic	Red jasper scraper fragment.	05/22/1940 --AD	1
05286	KNIFE	Lithic	Chert circular knife fragment.	05/23/1940 --AD	1
05287	SCRAPER	Lithic	Chert side scraper fragment. The scraper has a serrated edge.	05/23/1940 --AD	1
05288	FKAKE	Lithic	Quartz utilized FKake.	05/23/1940 --AD	1
05289	SCRAPER	Lithic	Jasper scraper fragment.	05/23/1940 --AD	1
05290	BLADE	Lithic	Chert knife blade tip.	05/23/1940 --AD	1
05291	BLADE	Lithic	Yellow Quartzite large blade fragment.	05/23/1940 --AD	1
05292	KNIFE	Lithic	Yellow jasper FKake knife scraper.	05/23/1940 --AD	1
05293	BLADE	Lithic	Jasper blade tip.	05/23/1940 --AD	1
05294	KNIFE	Lithic	Quartzite large knife blade fragment.	05/23/1940 --AD	1
05295	SCRAPER	Lithic	Yellow jasper scraper fragment.	05/23/1940 --AD	1
05296	SCRAPER	Lithic	Jasper scraper fragment.	05/23/1940 --AD	1
05297	SCRAPER	Lithic	Large stone scraper. The stone is multicolored.	05/23/1940 --AD	1
05298	BLADE	Lithic	Jasper knife blade fragment.	05/23/1940 --AD	1
05299	KNIFE	Lithic	Chert FKake knife.	05/23/1940 --AD	1
05300	BLADE	Lithic	Quartzite blade fragment. The blade is noted as "sub. angular".	05/23/1940 --AD	1
05301	BLADE	Lithic	Jasper knife blade tip.	05/23/1940 --AD	1
05302	SCRAPER	Lithic	Chert scraper fragment.	05/23/1940 --AD	1
05303	BLADE	Lithic	Quartzite circular blade fragment.	05/23/1940 --AD	1
05304	BLADE	Lithic	Jasper circular blade fragment.	05/23/1940 --AD	1
05305	BLADE	Lithic	Chalcedony blade tip.	05/23/1940 --AD	1
05306	BLADE	Lithic	Jasper knife blade fragment.	05/23/1940 --AD	1
05307	BLADE	Lithic	Jasper blade fragment.	05/23/1940 --AD	1
05308	KNIFE	Lithic	Red jasper knife blade fragment.	05/23/1940 --AD	1
05309	KNIFE	Lithic	Red quartzite knife fragment.	05/23/1940 --AD	1

05310	KNIFE	Lithic	Yellow jasper and chert FKake knife	05/23/1940 --AD	1
05311	KNIFE	Lithic	Red jasper knife fragment.	05/23/1940 --AD	1
05312	KNIFE	Lithic	Jasper FKake knife.	05/23/1940 --AD	1
05313	KNIFE	Lithic	Yellow chert FKake knife.	05/23/1940 --AD	1
05314	BLADE	Lithic	Chalcedony knife blade. The object is noted as being a knife blade reject and is made of red chalcedony.	05/23/1940 --AD	1
05315	BLADE	Lithic	Jasper knife blade.	05/23/1940 --AD	1
05316	KNIFE	Lithic	Yellow jasper knife blade fragment.	05/23/1940 --AD	1
05317	STONE		Oval potter's stone of igneous. The stone is dark in color.	05/23/1940 --AD	1
05318	BLADE	Lithic	Chert knife blade fragment.	05/23/1940 --AD	1
05319	SCRAPER	Lithic	Chalcedony side scraper fragment.	05/23/1940 --AD	1
05320	POINT	Lithic	Chert projectile point tip.	05/23/1940 --AD	1
05321	BLADE	Lithic	Chert knife blade fragment.	05/23/1940 --AD	1
05322	KNIFE	Lithic	Yellow jasper circular knife blade.	05/23/1940 --AD	1
05323	POINT	Lithic	Chalcedony projectile point tip.	05/23/1940 --AD	1
05324	SCRAPER	Lithic	Yellow chalcedony scraper fragment.	05/23/1940 --AD	1
05325	FKAKE		Utilized obsidian FKake.	05/23/1940 --AD	1
05326	SCRAPER	Lithic	Red chalcedony side scraper fragment.	05/23/1940 --AD	1
05327	BLADE	Lithic	Chert knife blade tip.	05/23/1940 --AD	1
05328	BLADE	Lithic	Jasper circular blade fragment.	05/23/1940 --AD	1
05329	KNIFE	Lithic	Quartzite knife blade fragment.	05/23/1940 --AD	1
05330	SCRAPER	Lithic	Chert CSW scraper.	05/23/1940 --AD	1
05331	BLADE	Lithic	Chalcedony knife blade fragment.	05/23/1940 --AD	1
05332	KNIFE	Lithic	Quartzite circular knife fragment.	05/23/1940 --AD	1
05333	SCRAPER		Circular scraper.	05/23/1940 --AD	1
05334	FKAKE	Lithic	Jasper utilized FKake.	05/23/1940 --AD	1
05335	SCRAPER	Lithic	Yellow chalcedony scraper.	05/23/1940 --AD	1
05336	FKAKE	Lithic	Chalcedony worked FKake.	05/23/1940 --AD	1
05337	BLADE	Lithic	Chert circular blade fragment.	05/23/1940 --AD	1
05338	BLADE	Lithic	Jasper circular blade fragment.	05/23/1940	1

05339	BLADE	Lithic	Quartzite reject blade.	05/23/1940 --AD	1
05340	BLADE	Lithic	Jasper circular blade section.	05/23/1940 --AD	1
05341	SCRAPER	Lithic	Jasper scraper fragment.	05/23/1940 --AD	1
05342	SCRAPER	Lithic	Red jasper side scraper fragment.	05/23/1940 --AD	1
05343	SCRAPER	Lithic	Yellow jasper scraper fragment.	05/23/1940 --AD	1
05344	SCRAPER	Lithic	Jasper knife blade tip.	05/23/1940 --AD	1
05345	FKAKE	Lithic	Quartzite utilized FKake.	05/23/1940 --AD	1
05346	BLADE	Lithic	Chert blade fragment.	05/23/1940 --AD	1
05347	BLADE	Lithic	Jasper rough blade fragment.	05/23/1940 --AD	1
05348	BLADE	Lithic	Chert knife blade tip.	05/23/1940 --AD	1
05349	BLADE	Lithic	Red jasper blade fragment.	05/23/1940 --AD	1
05350	SCRAPER	Lithic	Chert scraper fragment.	05/23/1940 --AD	1
05351	POINT	Lithic	Chalcedony projectile point tip.	05/23/1940 --AD	1
05352	FKAKE	Lithic	Chert utilized FKake.	05/23/1940 --AD	1
05353	KNIFE	Lithic	Red jasper circular knife fragment.	05/23/1940 --AD	1
05354	POINT	Lithic	Quartzite projectile point fragment.	05/23/1940 --AD	1
05355	FKAKE	Lithic	Chert worked FKake fragment.	05/23/1940 --AD	1
05356	BLADE	Lithic	Jasper knife blade fragment.	05/23/1940 --AD	1
05357	BLADE	Lithic	Jasper knife blade fragment.	05/23/1940 --AD	1
05358	SCRAPER	Lithic	Chert rough scraper.	05/23/1940 --AD	1
05359	POINT	Lithic	Chert projectile point fragment.	05/23/1940 --AD	1
05360	SCRAPER	Lithic	Jasper scraper fragment.	05/23/1940 --AD	1
05361	BLADE	Lithic	Blade fragment.	05/23/1940 --AD	1
05362	SCRAPER	Lithic	Yellow Jasper side scraper fragment.	05/23/1940 --AD	1
05363	POINT	Lithic	Oolite projectile point fragment.	05/23/1940 --AD	1
05364	SCRAPER	Lithic	Jasper scraper fragment.	05/23/1940 --AD	1
05365	SCRAPER	Lithic	Red chert side scraper fragment.	05/23/1940 --AD	1
05366	SCRAPER	Lithic	Yellow jasper scraper fragment.	05/23/1940 --AD	1
05367	GAMING PIECE		Slate gaming piece.	05/23/1940 --AD	1
05368	GAMING PIECE		Gaming stone.	05/23/1940 --AD	1

05369	BLADE	Lithic	Quartzite crude blade fragment.	05/23/1940 --AD	1
05370	BLADE	Lithic	Quartzite blade fragment.	05/23/1940 --AD	1
05371	SCRAPER	Lithic	Chert scraper fragment.	05/23/1940 --AD	1
05372	KNIFE	Lithic	Quartzite knife fragment.	05/23/1940 --AD	1
05373	KNIFE	Lithic	Jasper FKake knife.	05/23/1940 --AD	1
05374	BLADE	Lithic	Chert knife blade fragment.	05/23/1940 --AD	1
05375	KNIFE	Lithic	Jasper FKake knife.	05/23/1940 --AD	1
05376	KNIFE	Lithic	Red jasper knife blade fragment.	05/23/1940 --AD	1
05377	KNIFE	Lithic	Chalcedony FKake knife.	05/23/1940 --AD	1
05378	KNIFE	Lithic	Jasper FKake knife fragment.	05/23/1940 --AD	1
05379	KNIFE	Lithic	FKake knife fragment.	05/23/1940 --AD	1
05380	POINT	Lithic	Jasper projectile point.	05/23/1940 --AD	1
05464	KNIFE	Lithic	Quartzite knife fragment.	12/11/1939 --AD	1
05561	FKAKE	Lithic	Jasper FKake with worked edge.	12/12/1939 --AD	1
05562	FKAKE		Jasper FKake.	12/12/1939 --AD	1
05563	FKAKE		Chert unworked FKake.	12/12/1939 --AD	1
05564	KNIFE		Chert FKake knife.	12/12/1939 --AD	1
05565	KNIFE	Lithic	Quartzite circular knife fragment.	12/12/1939 --AD	1
05566	KNIFE	Lithic	Chert perforator knife fragment.	12/12/1939 --AD	1
05567	KNIFE	Lithic	Circular knife blade.	12/12/1939 --AD	1
05653	KNIFE	Lithic	Large knife fragment. The knife is black in color and appears "rippled".	05/23/1940 --AD	1
05654	KNIFE	Lithic	Large knife fragment. The fragment is black.	05/23/1940 --AD	1
05667	BEAD		Slate bead. The bead is circular with a hole in the center.	05/23/1940 --AD	1
05673.01	BONE	Faunal Remains	1 lot unidentified animal bone. Several bones within the lot are charred.	11/1939 --AD -- -- 05/1940 --AD	29
05673.02	BONE	Faunal Remains	Lynx, bobcat bone fragment. The bone is identified in the previous inventory as "unworked" and "proximal end of right ulna".	11/1939 --AD -- -- 05/1940 --AD	1
05673.03	BONE	Faunal Remains	Odocoileus hemionus, mule deer bone fragments. The bone's are identified as "fragment of scapula, distal end of cannon bone, 1/2 of distal epiphysis of cannon bone".	11/1939 --AD -- -- 05/1940 --AD	3
05673.04	BONE	Faunal Remains	1 lot unidentified bird bone.	11/1939 --AD -- -- 05/1940 --AD	10

05673.05	BONE	Faunal Remains	1 lot big horn sheep bone fragments. See researcher notes for more detailed information.	11/1939 --AD -- -- 05/1940 --AD	19
05673.06	BONE	Faunal Remains	Canis lupus, wolf bone fragment. The bone was identified as the "metatarsal" bone.	11/1939 --AD -- -- 05/1940 --AD	1
05673.07	BONE	Faunal Remains	Bone, unidentified animal. The bones are identified as "3 phalanges, 3 other bone fragments".	11/1939 --AD -- -- 05/1940 --AD	6
05673.08	BONE	Faunal Remains	Marmota, marmot bone fragments. The bone has been identified as "right mandible w/I, P4, M3 and right mandible w/I, P4".	11/1939 --AD -- -- 05/1940 --AD	2
05673.09	BONE	Faunal Remains	Cynomys, prairie dog bone fragments. See researcher notes for more detailed information.	11/1939 --AD -- -- 05/1940 --AD	30
05673.10	BONE	Faunal Remains	Castor canadensis, beaver bone fragments. The fragments are identified as "auditory bulla, molar, right ulna".	11/1939 --AD -- -- 05/1940 --AD	3
05673.11	BONE	Faunal Remains	1 lot Sylvilagus, cottontail. See catalog notes for more information.	11/1939 --AD -- -- 05/1940 --AD	
05673.12	BONE	Faunal Remains	1 lot Citellus, ground squirrel bone. See catalog notes for more detailed information.	11/1939 --AD -- -- 05/1940 --AD	3
05673.13	BONE	Faunal Remains	Citellus richardsoni.	11/1939 --AD -- -- 05/1940 --AD	2
05673.14	BONE	Faunal Remains	Fish bones. See catalog notes for more detailed information.	11/1939 --AD -- -- 05/1940 --AD	18
05673.15	BONE	Faunal Remains	Neotoma, wood rat bone. See catalog notes for more detailed information.	11/1939 --AD -- -- 05/1940 --AD	2
05673.16	SHELL		Land snail shell fragments.	11/1939 --AD -- -- 05/1940 --AD	3
05673.17	BONE	Faunal Remains	Castor canadensis, beaver bone.	11/1939 --AD -- -- 05/1940 --AD	1
05760	TOOTH	Faunal Remains	3 teeth. The teeth have been identified as "Erithezon dorsatum, porcupine, 3 molars".	05/24/1940 --AD	3
05761	BONE --TOOTH	Faunal Remains	Beaver jaw fragment. This object is identified as "Castor canadensis, Beaver, right jaw with incisor".	05/24/1940 --AD	1
05762	BONE	Faunal Remains	Bone fragment. The bone is listed as "humerus of carnivore".	05/24/1940 --AD	1
05763	BONE --TOOTH	Faunal Remains	Fox jaw fragment. The object is noted as "Vulpes, right jaw". The object is also identified as "w/P2-3 (juv)" teeth.	05/24/1940 --AD	1
05764	BONE	Faunal Remains	Castor Canadensis, beaver bone.	05/24/1940 --AD	1
05765	BONE	Faunal Remains	Beaver jaw fragment. The object has been identified as "Castor canadensis, Beaver, fragment of left jaw".	05/24/1940 --AD	1
05766	BONE	Faunal Remains	Castor Beaver bone fragment.	05/24/1940 --AD	
05767	BONE	Faunal Remains	Bone fragment.	05/24/1940 --AD	1
05768	BONE	Faunal Remains	Bone, deer. The object is identified as "Deer, femur-fragmentary". This object is associated with lot 1948.01.003. See catalog notes for more information.	05/24/1940 --AD	1

05769	BONE --TOOTH	Faunal Remains	Castor Canadensis, beaver bone fragments. The bones are identified as "left incisor-M3, left scapula".	05/24/1940 --AD	2
05770	BONE	Faunal Remains	Castor Canadensis, beaver bone. The bone is identified as the mid-section of the femur.	05/23/1940 --AD	1
05771	BONE	Faunal Remains	Bone fragment. The bone is identified as "femur frag. of fowl".	05/24/1940 --AD	1
05772	TOOTH	Faunal Remains	Molar, deer.	05/24/1940 --AD	1
05773	BONE	Faunal Remains	Bone, deer. The bone is identified as "metapodial frag". This object is associated with lot 1948.01.003. See catalog notes for more information.	05/24/1940 --AD	1
05774	BONE	Faunal Remains	Fox bone fragment. The object has been identified as "Vulpes, right illium."	05/24/1940 --AD	1
05775	BONE	Faunal Remains	Rib of carnivore. See catalog notes for more detailed information.	05/24/1940 --AD	1
05776	BONE	Faunal Remains	Rib of carnivore. See catalog notes for more detailed information.	05/24/1940 --AD	1
05780	GAMING PIECE		Notched bone fragment. This object has 2 lines carved into the surface and is noted as being a "scapula frag".	05/23/1940 --AD	1
05781	AWL		Bone awl fragment. The object is identified as an "atlas bone" on the catalog card.	05/23/1940 --AD	1
05782	BONE	Faunal Remains	Notched Scapula Fragment of Bone.	05/23/1940 --AD	1
05783	AWL		Bone awl.	05/23/1940 --AD	1
05784	BONE	Faunal Remains	Utilized Bone.	1939 --AD -- --1940 - -AD	1
05785	AWL --BONE		Bone Awl	1939 --AD -- --1940 - -AD	1
05786	BONE	Faunal Remains	Utilized bone fragment.	05/23/1940 --AD	1
05787	BONE	Faunal Remains	Bone bead fragment.	05/23/1940 --AD	1
05788	GAMING PIECE		Bone gaming piece.	05/23/1940 --AD	1
05789	BONE	Faunal Remains	Bone bead.	05/23/1940 --AD	2
05790	AWL		Bone Awl Fragment.	1939 --AD -- --1940 - -AD	
05791	BONE	Faunal Remains	Animal bone. This bone is an unidentified circular bone tube fragment.	05/23/1940 --AD	1
05792	GAMING PIECE		Bone gaming piece.	05/23/1940 --AD	1
05793	BONE --tool		Bone tool fragment.	05/23/1940 --AD	1
05794	AWL --BONE		Bone Awl	1939 --AD -- --1940 - -AD	1
05795	AWL --BONE		Bone Awl Fragment	1939 --AD -- --1940 - -AD	1

05796	AWL --BONE		Bone Awl Fragment.	1939 --AD -- --1940 - -AD	1
05798	GAMING PIECE		Marked Bone Dice Fragment	1939 --AD -- --1940 - -AD	1
05799	GAMING PIECE		Bone dice.	05/23/1940 --AD	1
05800	AWL		Bone awl fragment.	05/23/1940 --AD	1
05801	BONE	Faunal Remains	Bone punch fragment.	05/23/1940 --AD	1
05802	AWL		Bone awl fragment.	05/23/1940 --AD	1
05803	BONE	Faunal Remains	Bone fragment.	05/23/1940 --AD	1
05836	BONE	Faunal Remains	Beaver bone. This object is identified as "Castor canadensis, Beaver, proximal end of radius".	05/22/1940 --AD	1
05837	BONE	Faunal Remains	Small mammal rib. See catalog notes for more detailed information.	05/22/1940 --AD	1
05838	BONE	Faunal Remains	Fish bone, pectoral.	05/22/1940 --AD	1
05856	BONE	Faunal Remains	Small mammal rib. See catalog notes for more detailed information.	05/22/1940 --AD	1
05857	PIPE		Stone pipe fragment.	05/23/1940 --AD	1
05858	AWL		Bone awl fragment. The fragment appears to have been burned.	05/23/1940 --AD	1
05861	BONE	Faunal Remains	Bone, bison. The bone is identified as "Proximal portion of Ungulate tibia".	05/24/1940 --AD	1
06196	POINT	Lithic	Point tip fragment. The point is made from purple chalcedony.	05/23/1940 --AD	1
06247	LOT, MIXED		1 bean, 1 pea, 1 corn kernel. The bean is black, the pea is green, and the kernel is golden.	05/23/1940 --AD	3
06521	FKAKE	Lithic	FKaked stone. 06521b shows evidence of burning with possible charcoal remnants on it's surface.	06/1948 --AD	12
06522	FKAKE	Lithic	FKaked stone. 06522d-e appear to be base fragments of points.	06/1948 --AD	5
06523	FKAKE	Lithic	Points, FKakes, and choppers. Object 06523f is a type specimen and is located in the Hell's Midden type specimen box.	07/1948 --AD	
06524	FKAKE	Lithic	FKaked stone. The FKakes vary in color, shape, and size and are listed as bifacial knives, points, and scrapers. 06524a is a type specimen and is housed in the Hell's Midden type specimen box.	06/1948 --AD	25
06525	FKAKE	Lithic	FKaked stone. The FKakes are classified as points, scrapers, and utilized FKakes.	07/1948 --AD	24
06526	FKAKE	Lithic	FKaked stone artifacts.	07/1948 --AD	5
06527	STONE		Ground stone.	07/1948 --AD	2

06528	POINT --KNIFE --FKAKE	Lithic	Utilized points, knife, and FKake fragments. 06528e is a type specimen and is located in the Hell's Midden type specimen box.	06/30/1948 --AD -- -- 07/01/1948 --AD	13
06529	FKAKE	Lithic	FKaked stone artifacts. The FKakes vary in color, shape, and size.	07/1948 --AD	20
06530	FKAKE	Lithic	FKaked stone artifacts.	07/1948 --AD	9
06531	FKAKE	Lithic	Points, FKakes.	07/1948 --AD	13
06532	FKAKE	Lithic	Point, scrapper, and FKakes.	07/1948 --AD	26
06533	FKAKE	Lithic	Utilized FKakes. 06533t is a complete point. Objects 06533q and 06533p are type specimens and are located in the Hell's Midden type specimen box.	07/1948 --AD	19
06534	FKAKE	Lithic	FKakes, point, scrappers, and chopper. 06534f is a type specimen and is located in the Hell's Midden type specimen box.	07/1948 --AD	10
06535	FKAKE	Lithic	Points, FKakes. Object 06535b is a type specimen and is located in the Hell's Midden type specimen box.	07/1948 --AD	25
06536	FKAKE	Lithic	Points and FKakes.	07/1948 --AD	
06537	STONE	Lithic	FKaked stone artifacts.	07/1948 --AD	23
06538	FKAKE	Lithic	Points, scrappers, FKakes.	07/1948 --AD	25
06539	SCRAPER	Lithic	Sandstone scrapper. The object has visible scrap marks on the side that has been numbered. On the other side, there are marks that are dark in color, possibly imprinted onto the object.	07/1948 --AD	1
06540	STONE	Lithic	FKaked stone.	07/1948 --AD	3
06541	STONE		FK	07/1948 --AD	4
06542	FKAKE	Lithic	FKaked stone.	07/1948 --AD	12
06543	STONE	Lithic	FKaked stone.	07/1948 --AD	5
06544	FKAKE	Lithic	Utilized FKakes.	07/1948 --AD	
06545	FKAKE	Lithic	FKaked stone. 06545a is a point, 06545b is a point fragment, and 06545c is missing.	07/1948 --AD	1
06546	FKAKE	Lithic	FKaked stone.	07/1948 --AD	4
06547	STONE		FKaked stone.	07/1948 --AD	4
06548	FKAKE --BONE		1 stone FKake, 2 worked bone fragments.	07/1948 --AD	3
06549	AWL		Bone awl.	07/1948 --AD	1
06550	BONE	Faunal Remains	Bone bead.	07/1948 --AD	1
06551	BEAD		Bone Bead.	07/1948 --AD	1

06552	BONE	Faunal Remains	Polished bone fragment.	07/1948 --AD	1
06553	BONE	Faunal Remains	Worked Bone Fragment.	07/1948 --AD	1
06554	BONE	Faunal Remains	Bone needle.	07/1948 --AD	
06555	BONE	Faunal Remains	Bone fragment. The object is identified as "notched scapula (?)".	07/1948 --AD	1
06556	ANTLER		Antler spatula. This object needs it's accession information completed. I am in the process of researching who the donor "Nanny Mantle" was.	1946 --AD --pre	1
06557	TUBE --BONE		Bone tube	07/1948 --AD	1
06558	AWL		Bone Awl.	07/1948 --AD	1
06559	AWL --ANIMAL		Bone awls	07/1948 --AD	3
06560	AWL		Bone Awl.	07/1948 --AD	1
06561	AWL		Bone Awl.	07/1948 --AD	1
06562	BONE	Faunal Remains	Bone beads.	07/1948 --AD	2
06563	WOOD		Charred wood. The 2 fragments are black and have grooves throughout.	06/16/1948 --AD -- -- 07/30/1948 --AD	2
06564	AWL		Bone awl.	07/1948 --AD	1
06565	FKAKE	Lithic	FKaked stone. Object 06565i is a point. Object 06565e is a type specimen and is located in the Hell's Midden type specimen box.	07/1948 --AD	12
06566	BONE	Faunal Remains	Bone, unidentified.	06/16/1948 --AD -- -- 07/30/1948 --AD	11
06567	BLADE	Lithic	FKaked stone blades.	07/1948 --AD	8
06568	CHOPPER -- SCRAPER	Lithic	FKaked stone	07/1948 --AD	6
06569	FKAKE	Lithic	FKaked stone. The stone is red in color.	07/1948 --AD	1
06570	STONE		FKaked stone.	07/1948 --AD	5
06571	AWL		Bone Awl	07/1948 --AD	1
06572	STONE		FKaked stone.	07/1948 --AD	3
06573	POINT, PROJECTILE	Lithic	Point	07/1948 --AD	1
06574	SCRAPER	Lithic	FKaked stone	07/1948 --AD	1
06575	FKAKE	Lithic	FKaked stone	07/1948 --AD	1
06577	SCRAPER	Lithic	Large FKaked stone artifact.	07/1948 --AD	1

06578	FKAKE	Lithic	FKaked stone. The FKakes vary in color, shape, and size.	07/1948 --AD	
06579	FKAKE	Lithic	FKaked stone implement.	07/1948 --AD	1
06580	FKAKE	Lithic	FKaked stone artifacts.	07/1948 --AD	7
06581	FKAKE	Lithic	FKaked stone.	07/1948 --AD	14
06582	FKAKE	Lithic	FKaked stone.	07/1948 --AD	6
06583	AWL		Bone Awl.	07/1948 --AD	1
06584	AWL		Bone Awl.	07/1948 --AD	1
06585	AWL		Bone Awl.	07/1948 --AD	1
06586	PENDANT	Lithic	Slate pendant. The pendant has four notched grooves located on one short side.	07/1948 --AD	1
06587	FKAKE	Lithic	Points, knives, scrappers. 06587d is a type specimen point and is located in the Hell's Midden Type Specimen box.	07/1948 --AD	8
06588	STONE		FKaked stone. The stone's range in color, shape, and size.	06/16/1948 --AD -- -- 07/30/1948 --AD	3
06589	FKAKE	Lithic	FKaked stones. The stones vary in color, shape, and size.	07/1948 --AD	5
06590	STONE	Lithic	FKaked stone. One of the FKakes is shaped similar to a point and is red, another is also shaped similar to a point and is dark brown, the third is rounded and light brown. The previous inventory lists the objects as "point; knife; scraper".	07/1948 --AD	3
06591	FKAKE	Lithic	FKaked stone artifacts. "a" is a point that is dark in color, "b" is rounded and light brown in color, "c" is a point, "d" is a large knife fragment, and "e" is a small, light brown fragment. 06591c is a type specimen and is located in the Hell's Midden type specimen box and is glued to a paper backing.	07/1948 --AD	4
06592	FKAKE	Lithic	FKaked stone. The stone's vary in color, shape, and size.	07/1948 --AD	7
06593	FKAKE	Lithic	FKaked stone.	07/1948 --AD	1
06594	FKAKE	Lithic	FKaked stone.	07/1948 --AD	4
06595	POINT, PROJECTILE	Lithic	Point fragment.	07/1948 --AD	1
06596	JAR -- FRAGMENT		Ceramic jar fragment. See catalog notes for more information.	07/1948 --AD	1
06597	SHERD		Sherd. The sherd is identified as "Uinta greyware" and "culinary ware".	07/1948 --AD	1
06602	MANO		Quartzite mano.	07/01/1948 --AD	1
06604	STONE		Sandstone slab. The stone has been broken into 3 separate pieces.	07/1948 --AD	3

06605	MANO		Mano.	07/15/1949 --AD	1
06606	LOT, MIXED	Lithic --Faunal Remains	Lot of mixed materials, including 1 large pebble, approximately 29 stone FKakes, and 2 snail shells. R.H. Lister helped collect these objects. See field book 48-3-20.	07/01/1948 --AD -- -- 07/30/1948 --AD	33
06607	BONE	Faunal Remains	Ten small bone rings.	07/01/1948 --AD -- -- 07/30/1948 --AD	10
06608	cloth		Textile fragments. Objects e-f are type specimens and are located in the type specimen box for Hell's Midden.	07/1948 --AD	6
06609	STICK		Charred stick with annular groves.	07/1948 --AD	1
06610	CORN		Charred corn.	07/1948 --AD	1
06611	CORN		Charred corn.	07/1948 --AD	1
06612	CORN		Charred corn.	07/1948 --AD	4
06613	pigment		Yellow pigment.	06/16/1948 --AD -- -- 07/30/1948 --AD	3
06614	STONE		Rock crystals.	07/1948 --AD	3
06615	CARTRIDGE		RiFKe cartridge.	07/1948 --AD	1
06616	CARTRIDGE		RiFKe cartridge.	07/1948 --AD	1
06618	OBJECT, UNIDENTIFIED	Lithic	Slate fragment.	07/1948 --AD	1
06619	STONE	Lithic	Black mineral substance (asphalt or gilsomite). Burgh and R.H. Lister collected this object. See field book 48-3-16.	07/1948 --AD	1
06620	Sample, Soil		1 lot soil sample. The lot is red in color and consists of 4 large, circular pieces with multiple smaller objects.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
06621	NEWSPAPER		4 newspaper fragments, 1 Arbuckle coffee label. The coffee label has a shopping list or inventory written in pencil on one side.	07/1948 --AD	
06622	AWL		Bone awl.	07/1948 --AD	1
06626	MANO		3 mano fragments.	07/1948 --AD	5
06628	FKAKE	Lithic	FKaked Stone.	10/1947 --AD	2
06629	BONE	Faunal Remains	3 bone awls, 1 cut bone, 1 hollowed bone.	10/1947 --AD	5
06630	SCRAPER -- POINT --FKAKE	Lithic	Scraper, point, FKaked stone.	10/1947 --AD	25
06631	POINT --FKAKE --SCRAPER	Lithic	Chert, quartzite points, FKakes, and scrapers.	10/1947 --AD	14
06632	AWL		Bone awls.	10/1947 --AD	2
06633	FKAKE		FKaked stone.	10/1947 --AD	11

06635	Sample, Soil		Soil, 7 lots of samples. Please see component parts for more detailed information.	07/21/1948 --AD	4
06636	BALL		Stone ball.	07/1948 --AD	1
06752	FKAKE	Lithic	FKakes, ground stone, chopper, and grinding bowl.	07/1948 --AD	13
06753	LOT, MIXED	Faunal Remains --Ground Stone	1 long bone, 1 small animal jaw with teeth, 1 large bone fragment, 1 burned bone fragment, 1 metal ring (possible bullet cartridge), 4 stone (FKaked and ground).	07/1948 --AD	9
06867.1	SHELL, SHOTGUN		Shotgun shells. The Bullet casings are empty shells with only the backing still attached. 06870.01a is a type specimen and is located in the type specimen box separate from the rest of the lot.	07/05/1949 --AD	11
06867.2	SHELL, SHOTGUN		The shell casings are smaller than 06867.01a-k.	07/05/1949 --AD	2
06867.3	SHELL, SHOTGUN -- FRAGMENT		The object is the FKat, metallic part of a bullet shell that would also be where the primer is located.	07/05/1949 --AD	1
06868	LEATHER -- FRAGMENT		Leather strap. The leather strap has a single hole that appears to have been punched.	07/05/1949 --AD	1
06869	BONE	Faunal Remains	Bone Tube.	07/15/1949 --AD	1
06870.1	BUTTON		06870.01a is a type specimen and is located in the box with the other type specimens. 06870b-d are buttons are the same style of metal button, although sizes vary. See catalog notes for more details.	07/05/1949 --AD	4
06870.2	BUTTON		Metal or wooden button. The button has 4 holes in the center. See catalog notes for more detail.	07/05/1949 --AD	1
06870.3	BUTTON		Wooden button. The button has 2 holes in the center. See catalog notes for more detail.	07/05/1949 --AD	1
06871	LEAD		The catalog card states that this object may be "bullet lead". The object is rectangular with one end appearing to have been worked.	07/05/1949 --AD	1
06872	BLADE		Knife blade.	07/05/1949 --AD	1
06873	NAIL		Square-cut nails. 06873a is a type specimen and is located in the type specimen box.	07/05/1949 --AD	1
06874	PIPE		Pipe fragments.	07/05/1949 --AD	2
06875	cloth		Cloth fragment.	07/05/1949 --AD	1
06876	FKAKE	Lithic	Utilized FKakes.	07/06/1949 --AD	14
06877	POINT --FKAKE	Lithic	9 points, 1 point base fragment, 4 FKakes.	07/06/1949 --AD	14
06878	KNIFE	Lithic	Bifacial knives.	07/06/1949 --AD	3
06879	POINT, PROJECTILE	Lithic	Projectile points.	07/07/1949 --AD	11

06880	POINT	Lithic	2 projectile points, 1 fragment.	07/07/1949 --AD	3
06881	KNIFE	Lithic	Bifacial knife fragments.	07/07/1949 --AD	3
06882	FKAKE	Lithic	Utilized FKakes.	07/07/1949 --AD	3
06883	DRILL	Lithic	Expanding base drill.	07/07/1949 --AD	1
06884	AWL		Bone awls.	07/07/1949 --AD	11
06885	TUBE --BONE		Bone Tube Halves	07/07/1949 --AD	2
06886	PENDANT -- BONE		Bone Pendant. Oblong bone notched twice on each side and has three holes drilled thru it.	07/07/1949 --AD	1
06887	KNIFE	Lithic	Bifacial knife.	07/05/1949 --AD	1
06888	CHOPPER	Lithic	Rounded bifacial chopper.	07/06/1949 --AD	1
06889	IRON		Polished iron Concretion.	07/06/1949 --AD	1
06891	KNIFE	Lithic	Bifacial knives.	07/07/1949 --AD	2
06892	KNIFE	Lithic	Bifacial knife fragments.	07/09/1949 --AD	3
06893	FKAKE	Lithic	Utilized FKakes.	07/09/1949 --AD	8
06894	STONE		Pebble. The pebble is stream worn, resulting in is smooth appearance.	07/09/1949 --AD	1
06895	SCRAPER	Lithic	Large scraper.	07/07/1949 --AD	1
06896	KNIFE	Lithic	Bifacial oval knife. The knife is light brown in color and speckled with black.	06/20/1949 --AD -- -- 07/22/1949 --AD	1
06897	SCRAPER	Lithic	Knife/ scraper. The knife has serrated edges.	07/07/1949 --AD	1
06898	BONE	Faunal Remains	Worked bone fragments. Two of the bone fragments are burned throughout.	07/07/1949 --AD	1
06899	BONE	Faunal Remains	Bone awl points. One of the points has been burned.	07/07/1949 --AD	2
06900	CORN		Charred corn.	07/07/1949 --AD	6
06901	STONE		Stream worn pebbles.	07/07/1949 --AD	2
06902	CHOPPER	Lithic	Bifacial chopper. The chopper shows signs of charring along one of the long sides.	07/07/1949 --AD	
06903	KNIFE	Lithic	Bifacial knives.	07/08/1949 --AD	3
06904	FKAKE	Lithic	Utilized FKakes. One of the FKakes are red and are a fragment from the base of a point.	07/08/1949 --AD	4
06905	KNIFE	Lithic	Bifacial knives.	07/08/1949 --AD	3
06906	FKAKE	Lithic	Utilized FKakes.	07/09/1949 --AD	7
06907	POINT, PROJECTILE	Lithic	Projectile points.	07/08/1949 --AD	10

06908	DRILL	Lithic	Drill, mid section. The sides of the drill are notched.	07/08/1949 --AD	1
06910	BONE	Faunal Remains	Worked bone.	07/08/1949 --AD	5
06911	AWL		Bone awls.	07/08/1949 --AD	2
06912	FKAKE	Lithic	Utilized FKakes.	07/13/1949 --AD	
06913	FKAKE	Lithic	Utilized FKakes.	07/09/1949 --AD	5
06914	KNIFE	Lithic	Bifacial knives, oval.	07/09/1949 --AD	3
06915	POINT, PROJECTILE	Lithic	Projectile points. The points vary in color and shape.	06/20/1949 --AD -- -- 07/22/1949 --AD	7
06916	DRILL	Lithic	Large drill, expanding base.	07/09/1949 --AD	1
06917	SCRAPER	Lithic	End Scraper. The scrapper is rounded and narrows at one end. This end appears to have been broken.	07/09/1949 --AD	1
06918	KNIFE	Lithic	Quartzite or chalcedony bifacial knife.	07/09/1949 --AD	1
06919	STONE		Smooth pebble.	07/06/1949 --AD	1
06920	AWL		Bone awl.	07/09/1949 --AD	1
06921	AWL		Bone awls. One of the awls appears to have been burned.	07/11/1949 --AD	4
06922	SAW	Lithic	Limestone saw. One side of the saw is serrated.	07/11/1949 --AD	1
06923	FKAKE	Lithic	Utilized FKakes.	07/15/1949 --AD	4
06924	POINT, PROJECTILE	Lithic	Projectile points.	07/14/1949 --AD	4
06925	KNIFE	Lithic	Bifacial knives.	07/14/1949 --AD	2
06926	POINT, PROJECTILE	Lithic	Projectile point.	07/14/1949 --AD	1
06927	BONE	Faunal Remains	Worked bone.	07/15/1949 --AD	1
06928	PENDANT -- BONE		Broken Bone Pendant. Portion of rectangular pendant, one side notched, hole drilled in one section.	07/14/1949 --AD	1
06929	AWL		Bone awls.	07/14/1949 --AD	2
06930	KNIFE	Lithic	Bifacial knife fragments.	07/11/1949 --AD	8
06931	DRILL	Lithic	Stone drill. The cross section of the drill is diamond shaped.	07/11/1949 --AD	1
06932	POINT, PROJECTILE	Lithic	Projectile point fragments. One of the fragments is a "concave base projectile" and the other is a "point section".	07/11/1949 --AD	2
06933	FKAKE	Lithic	Utilized FKakes.	07/11/1949 --AD	5
06934	FKAKE	Lithic	Chert, Sandstone utilized FKakes.	07/04/1949 --AD	18
06935	KNIFE	Lithic	Bifacial knife fragments.	07/12/1949 --AD	9

6936	POINT, PROJECTILE	Lithic	FKaked points.	07/1948 --AD	2
06936	DRILL	Lithic	Drill base.	07/12/1949 --AD	1
06937	CHOPPER	Lithic	Yellow jasper chopper, core type.	07/14/1949 --AD	1
06938	KNIFE	Lithic	Bifacial knife fragment.	07/14/1949 --AD	1
06939	FKAKE		Utilized FKakes.	07/14/1949 --AD	2
06940	KNIFE	Lithic	Bifacial knives.	07/13/1949 --AD	2
06941	POINT, PROJECTILE	Lithic	Notched projectile point.	07/13/1949 --AD	1
06942	AWL --ANIMAL		Bone awls	07/14/1949 --AD	2
06943	BONE	Faunal Remains	Worked Bone.	07/14/1949 --AD	3
06944	KNIFE	Lithic	Bifacial knives. One of the knives is smaller and red in color, while the other is large, rounded, and light brown with black speckles throughout. The catalog card identifies both objects as having a "rounded base".	07/11/1949 --AD	2
06945	KNIFE	Lithic	Tanged knife	07/11/1949 --AD	1
06946	POINT, PROJECTILE	Lithic	Projectile Point. The point has a concave base.	07/11/1949 --AD	
06947	BONE	Faunal Remains	Worked Bone.	07/11/1949 --AD	2
06948	SHERD		Pottery sherds. Please see catalog notes for more information.	07/12/1949 --AD	8
06949	BONE	Faunal Remains	Incised bone. Bone is a tube and is incised around the outside center of the bone.	07/12/1949 --AD	1
06950	SHERD	Ceramic	Pottery sherd.	07/05/1949 --AD	1
06951	STONE		Smoothed pebble.	07/04/1949 --AD	1
06952	SHELL, SHOTGUN		The shot gun shells are metal with an open tip.	07/12/1949 --AD	2
06953	AWL --BONE		Bone Awl.	07/12/1949 --AD	1
06954	CORN		2 pieces of maize, 1 vegetal fragment. Both pieces of maize are burned.	07/04/1949 --AD	3
06955	OBJECT, UNIDENTIFIED		Metal band. The band has a narrow ledge around the base with ornamental designs around the sides.	07/1949	1
06956	HAMMERSTONE		Red jasper and quartz hammerstones.	07/06/1949 --AD	3
06957	STONE		Smooth stone.	07/06/1949 --AD	1
06958	MANO		Mano	07/1949 --AD	1

06960	STONE		Sandstone mano covered with hematite or red ochre. The hematite or ochre is red in color and the texture appears to be powdered.	07/1949 --AD	1
06961	MANO		Broken mano	07/16/1949 --AD	2
06962	STONE		2 pebbles. The pebbles are smooth and oval in shape.	07/16/1949 --AD	
06963	MANO		2 mano. 1 mano is missing.	07/16/1949 --AD	2
06964	STONE		Quartzite core.	07/16/1949 --AD	1
06965	HAMMERSTONE		Hammerstones. The smaller hammerstone's material is jasper, and the larger is quartzite.	07/16/1949 --AD	2
06966	MANO		Sandstone mano. All of the objects are considered stream worn pebbles.	07/16/1949 --AD	6
06967	MANO		Sandstone mano.	07/16/1949 --AD	1
06968	ANVIL		Anvil.	07/16/1949 --AD	1
06972	KNIFE	Lithic	Bifacial knives.	07/04/1949 --AD	7
06973	POINT	Lithic	Projectile point fragments.	07/04/1949 --AD	4
06974	FKAKE	Lithic	Stone FKakes.	07/04/1949 --AD	10
06975	BLADE	Lithic	Blade.	07/04/1949 --AD	1
06976	MANO		3 Sandstone, 1 quartz mano. 2 of the mano are oval and 2 are elongated.	07/07/1949 --AD	4
06978	STONE		Stream worn pebbles.	07/07/1949 --AD	11
06979	KNIFE -- SCRAPER	Lithic	Red jasper knife/scrapper combination.	07/16/1949 --AD	1
06980	POINT	Lithic	Point fragments. The catalog card notes, "Projectile points notched and square base types. All broken."	07/1949 --AD	4
06981	FKAKE	Lithic	Utilized FKakes.	07/07/1949 --AD	26
06982	BEAD		Unfinished slate bead.	07/07/1949 --AD	1
06983	MANO		Manos.	07/1949 --AD	2
06984	STONE		Sandstone pebble. The pebble is circular in shape and smooth.	07/1949 --AD	1
06985	FKAKE	Lithic	Utilized FKakes.	07/15/1949 --AD	39
06986	POINT, PROJECTILE	Lithic	Projectile point base.	07/13/1949 --AD	1
06987	MANO		4 mano.	07/15/1949 --AD	4
06988	SCRAPER	Lithic	Quartzite snub-nose scraper.	07/13/1949 --AD	1
06989	POINT, PROJECTILE	Lithic	Yellow jasper projectile point base.	07/13/1949 --AD	1

06990	FKAKE	Lithic	Utilized stone FKakes.	07/15/1949 --AD	15
06991	MANO		Mano.	07/14/1949 --AD	1
06992	FKAKE	Lithic	Utilized FKake. The FKake is made from red jasper.	07/05/1949 --AD	1
06993	SINEW -- SEPARATOR		Sinew Separator.	07/06/1949 --AD	1
06994	AWL		Bone awls.	07/06/1949 --AD	6
06995	BONE	Faunal Remains	Worked bone. One of the objects has a black residue along a short side (possibly ink). The other object has a notch carved into the bone, located around the center.	07/06/1949 --AD	2
06996	SHERD		Pottery sherds.	07/06/1949 --AD	7
06997	KNIFE	Lithic	Bifacial knife.	07/06/1949 --AD	1
06998	Sample, Soil		Unfired clay fragment. The catalog card describes the object as "Cylindrical piece of reddish unfired clay, possibly a part of a figurine".	07/06/1949 --AD	1
06999	SHERD		Pottery sherd. The catalog card describes the object as "plain ware, semi polish on exterior or smoothing".	07/08/1949 --AD	1
07000	POINT, PROJECTILE	Lithic	1 projectile point, 1 projectile point fragment.	07/09/1949 --AD	2
07001	KNIFE	Lithic	Quartz bifacial knives.	06/20/1949 --AD -- -- 07/22/1949 --AD	4
07002	KNIFE	Lithic	Red jasper knife/scrapper.	07/09/1949 --AD	1
07003	SCRAPER	Lithic	Snub nose scraper.	07/09/1949 --AD	
07004	TUBE --BONE		Bone Tube.	07/09/1949 --AD	1
07140	POINT	Lithic	Bifacial knife or point. The point fades from a dark brown/grey to a light brown on both sides.	06/13/1949 --AD	1
07777	AWL		Bone awl.	06/19/1950 --AD	
07778	KNIFE	Lithic	Bifacial Knife	06/19/1950 --AD	1
07779	POINT	Lithic	Projectile point framents.	06/19/1950 --AD	2
06890a	POINT, PROJECTILE	Lithic	Projectile Points. The points range in size and color.	1949	7
06890x	FKAKE	Lithic	Utilized FKakes. The FKakes vary in color, shape, and size.	07/07/1949 --AD	6
06969a	SHELL		17 snail shells and a small bag of soil.	07/07/1949 --AD	17
06970a	BONE	Faunal Remains	Fish vertebrae.	06/20/1949 --AD -- -- 07/22/1949 --AD	2
06971a	SHELL		3 snail shells.	06/20/1949 --AD -- -- 07/22/1949 --AD	

1947.01.001	BONE	Faunal Remains	Cynomys leucurus, prairie dog bone. This object can be found in it's own bag within larger bag 1948.01.004. See catalog notes for detailed information.	10/1947 --AD	3
1947.01.002	BONE	Faunal Remains	Odocoileus Hemionus, mule deer. See catalog notes for more detailed information.	10/1947 --AD	1
1947.01.003	BONE	Faunal Remains	1 lot animal bone. This lot of bones is unidentified.	10/1947 --AD	5
1948.01.001	BONE	Faunal Remains	Bison bone.	06/16/1948 --AD -- -- 07/30/1948 --AD	9
1948.01.002	BONE	Faunal Remains	Odocoileus hemionus, mule deer bone.	06/16/1948 --AD -- -- 07/30/1948 --AD	10
1948.01.003	BONE	Faunal Remains	Unidentified bone. See catalog notes for detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	28
1948.01.004	BONE	Faunal Remains	Cynomys leucurus, prairie dog bone, 1 lot. See catalog notes for detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	190
1948.01.005	BONE	Faunal Remains	One lot bone, unidentified. See catalog notes for more information.	06/16/1948 --AD -- -- 07/30/1948 --AD	24
1948.01.006	BONE	Faunal Remains	Bone, beaver. See catalog notes for more information.	06/16/1948 --AD -- -- 07/30/1948 --AD	35
1948.01.007	BONE	Faunal Remains	Bone, unidentified. See catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	10
1948.01.008	BONE	Faunal Remains	Bone, unidentified. A vial is present within the bag containing multiple small objects. See catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	9
1948.01.009	BONE	Faunal Remains	Bone, unidentified. See catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	2
1948.01.010	BONE	Faunal Remains	Bone, bird and mammal. The bone has been identified as both bird and mammal, but is marked as "unidentified". See catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	12
1948.01.011	BONE	Faunal Remains	Bone, unidentified. See catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	6
1948.01.012	BONE	Faunal Remains	Bone, unidentified. See catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.013	BONE	Faunal Remains	Bone, unidentified. See catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	3
1948.01.014	BONE	Faunal Remains	Bone, unidentified. See catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	8
1948.01.015	BONE	Faunal Remains	Bone, unidentified. See catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	18
1948.01.016	BONE	Faunal Remains	1 lot animal bone, unidentified. See catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	48
1948.01.017	BONE	Faunal Remains	Odocoileus hemious, mule deer bone. See catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	34
1948.01.018	BONE	Faunal Remains	Fish bone fragments. See catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	6

1948.01.019	BONE	Faunal Remains	Ovis canadensis, big horn sheep bone. See catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	19
1948.01.020	BONE	Faunal Remains	Great horned owl bone. See catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.021	BONE	Faunal Remains	Fish, abdominal vertebrae. See catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.022	BONE	Faunal Remains	1 lot bone, abdominal vertebrae. See catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	6
1948.01.023	BONE	Faunal Remains	1 lot fish bone. The bones are identified as "caudal vertebrae + fragments of left + right pharyngeals of Gila; largest fragment is G. robusta". See catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	3
1948.01.024	BONE	Faunal Remains	1 lot fish bone. The bones are identified as "2 right pharyngeals of Gila robusta- "15" T.L.". See catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	2
1948.01.025	BONE	Faunal Remains	Bone, abdominal vertebrae. See catalog notes for more detailed information.	07/12/1948 --AD	2
1948.01.026	BONE	Faunal Remains	1 lot bone. The bones are identified as "Ribs, Abdominal Vertebrae, and Basipterygial Fragment". See catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	22
1948.01.027	BONE	Faunal Remains	Bone with teeth. The bone is identified as "left pharyngeal (complete) of the Fkannelmouth sucker, Catostomus Latipinnis". See catalog notes for more detailed information.	07/02/1948 --AD	2
1948.01.028	BONE	Faunal Remains	Bone. The bone is identified as "Not Fish". See catalog notes for more detailed information.	07/01/1948 --AD	1
1948.01.029	BONE	Faunal Remains	Bone. Please see catalog notes for more detailed information.	07/02/1948 --AD	1
1948.01.030	BONE	Faunal Remains	1 lot bone. The bone is identified as either "Gila robusta" or "Gila elegans, left pharyngeal". Please see catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	2
1948.01.031	BONE	Faunal Remains	1 lot bone. Please see catalog notes for more detailed information.	07/01/1948 --AD	5
1948.01.032	BONE	Faunal Remains	Animal bone. The bone is identified as the "3rd (cervical) abdominal vertebrae" of a Ptychocheilus lucius. Please see catalog notes for more detailed information.	07/01/1948 --AD	1
1948.01.033	BONE	Faunal Remains	1 lot bone. The bones are identified as "thoracic vertebrae". Please see catalog notes for more detailed information.	07/01/1948 --AD	8
1948.01.034	BONE	Faunal Remains	Bone fragment of Gila Robusta. The bone is identified as "part of right cleithrum". Please see catalog notes for more detailed information.	07/01/1948 --AD	1
1948.01.035	BONE	Faunal Remains	1 lot animal bone. The bone is identified as "caudal vertebrae, unidentifiable Basipterygium" and an "unknown	06/16/1948 --AD -- -- 07/30/1948 --AD	9

			fragment". Please see catalog notes for more detailed information.		
1948.01.036	BONE	Faunal Remains	1 lot animal bone. The bones are identified as "Right pharyngeal (incomplete) of <i>Catostomus latipinnis</i> , 2 caudal vertebrae (fish)". Please see catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	3
1948.01.037	BONE	Faunal Remains	1 lot animal bone. The bones are identified as "neural spines (3), caudal vertebrae (2), median fin support (radial?) (1), 2 paryngeal teeth, Cyprinidae". Please see catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1949 --AD	19
1948.01.038	BONE	Faunal Remains	Bone, animal. The object is identified as "right prootic cyprinidae". Please see catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.039	BONE	Faunal Remains	Bone, animal. The bone is identified as a "caudal vertebrae". Please see catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.040	BONE	Faunal Remains	2 bones, animal. The larger bone is identified as "caudal vertebrae of <i>Ptychocheilus lucius</i> " and the smaller bone is identified as "caudal vertebrae". Please see catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	2
1948.01.041	BONE	Faunal Remains	Vertebrae, animal. The bones are identified as "largest (caudal) vertebrae is of <i>Ptychocheilus lucius</i> ; 5 other vertebrae not identified". Three of these bones are abdominal vertebrae. Please see catalog notes for more detailed information.	07/02/1948 --AD	6
1948.01.042	BONE	Faunal Remains	Bone from Gila. The object is identified as "Basioccipital of Gila, perhaps <i>G. elegans</i> ". Please see catalog notes from more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.043	BONE	Faunal Remains	Bone, <i>Catostomus latipinnis</i> . The bone is identified as "left quadrate" with the specimen being "> 500mm". Please see catalog notes for more detailed information.	07/01/1948 --AD	1
1948.01.044	BONE	Faunal Remains	Bone, animal. The bone is identified as "caudal vertebrae" and "broken pharyngeal of Gila". Please see catalog notes for more detailed information.	07/01/1948 --AD	4
1948.01.045	BONE	Faunal Remains	Bone, animal. The bone is noted as "unidentified basioccipital". Please see catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.046	BONE	Faunal Remains	Bone. The object is identified as "basioccipital of Gila, probably <i>G. robusta</i> ". Please see catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.047	BONE	Faunal Remains	Bone. The bones are identified as "Right pharyngeal (slender bone) <i>Ptychocheilus lucius</i> " and " Left pharyngeal <i>Gila elegans</i> ". Both bone fragments have teeth attached. Please see catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	2

1948.01.048	BONE	Faunal Remains	Three bone fragments. The objects are identified as "Basioccipital of Ptychocheilus lucius, Pharyngeal tooth fragments- Cyprinidae, Caudal vertebrae- Fish". Please see catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	3
1948.01.049	BONE	Faunal Remains	Bone with teeth. The object is identified as "Gila robusta (?) left pharyngeal". Please see catalog notes for more detailed information.	07/01/1948 --AD	1
1948.01.050	BONE	Faunal Remains	Three bone fragments. The fragments are identified as "Epibranchial (right) P. lucius" and " Anterior dorsal fin ray Cyprinidae". Please see catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	3
1948.01.051	BONE	Faunal Remains	1 lot animal bone fragments. The fragments are identified as "Part of left pharyngeal arch and teeth of a sucker perhaps Catostomus latipinnis", "large abdominal vertebrae, prob. Ptychocheilus lucius (on basis of size)", and "1 caudal vertebrae (unidentified)". Please see catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	4
1948.01.052	BONE	Faunal Remains	Bone fragment. The bone is identified as "abdominal vertebrae". Please see catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.053	BONE	Faunal Remains	Animal vertebrae fragment. The bone is identified as "1st cervical or abdominal vertebra" of "Ptychocheilus lucius or Gila". Please see catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.054	BONE	Faunal Remains	Bird quadrate. Please see catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.055	BONE	Faunal Remains	Bone, fish. The object is identified as "right pharyngeal, Cyprinidae". Please see catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.056	BONE	Faunal Remains	Single bone with 2 attached teeth. The object is identified as "Right pharyngeal arch (incomplete) and teeth of Gila cypha. Please see catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.057	SHELL		Land snail shells and fragments. Please see catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	14
1948.01.058	POINT		Stone point.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.059	BONE --WOOD --STONE		1 lot stone, animal bone, and wood.	06/16/1948 --AD -- -- 07/30/1948 --AD	
1948.01.060	BONE	Faunal Remains	Fish bone. The bones have been identified as "right clethrum (right ramus broken) and precaudal vertebra (about no. 24) of the Colorado squawfish, Ptychocheilus lucius girard".	06/29/1948 --AD	~40

1948.01.061	BONE	Faunal Remains	Bone fragment. The bone is identified as "Ondatra zibethicus, muskrat".	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.062	BONE	Faunal Remains	1 lot animal bone, unidentified. Two of the bones are charred.	06/16/1948 --AD -- -- 07/30/1948 --AD	~25
1948.01.063	BONE --STONE --TIN	Faunal Remains --Lithic	Bone, stone, and tin. 1 lot (14 objects) of various pieces of stone, obsidian, some bone, a tin lid, and a burned object.	06/28/1948 --AD	14
1948.01.064	BONE	Faunal Remains	1 lot bone. The larger bone is completely charred, while many of the smaller fragments housed within the vial also show signs of burning.	06/16/1948 --AD -- -- 07/30/1948 --AD	7
1948.01.065	BONE	Faunal Remains	1 lot unidentified bone. A few of the bone fragments are charred.	06/16/1948 --AD -- -- 07/30/1948 --AD	18
1948.01.066	BONE	Faunal Remains	Animal bone. 1 lot (2 objects) of unidentified animal bone.	06/16/1948 --AD -- -- 07/30/1948 --AD	2
1948.01.067	BONE	Faunal Remains	1 lot bone. The bone has been identified as "Sage Grouse".	06/16/1948 --AD -- -- 07/30/1948 --AD	3
1948.01.068	BONE	Faunal Remains	Animal bone. 1 lot (2 objects) of Canis bones, identified as possibly Coyote.	06/16/1948 --AD -- -- 07/30/1948 --AD	2
1948.01.069	BONE	Faunal Remains	1 unidentified bone fragment.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.070	BONE	Faunal Remains	1 lot unidentified bone.	06/16/1948 --AD -- -- 07/30/1948 --AD	2
1948.01.071	BONE	Faunal Remains	Bone fragment. The bone has been identified as "wild turkey".	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.072	BONE	Faunal Remains	1 lot mixed fish bone.	06/16/1948 --AD -- -- 07/30/1948 --AD	18
1948.01.073	BONE	Faunal Remains	1 lot bone. The lot has 2 distinct bone fragments, one of which has a tooth attached. The lot is identified as "Thomomys, pocket gopher".	06/16/1948 --AD -- -- 07/30/1948 --AD	3
1948.01.074	BONE	Faunal Remains	Bone, complete. The bone is identified as "lynx, bobcat".	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.075	BONE --TOOTH	Faunal Remains	1 lot bone and teeth. The lot is identified as "Eutamias, chipmunk". Some of the bone fragments still have teeth attached and there is 1 tooth that has separated completely from the bone.	06/16/1948 --AD -- -- 07/30/1948 --AD	4
1948.01.076	BONE	Faunal Remains	1 lot bone. The bone is identified as "Taxidea Taxus, Badger". One of the bones show evidence of charring.	06/16/1948 --AD -- -- 07/30/1948 --AD	3
1948.01.077	BONE --TOOTH	Faunal Remains	1 lot bone. The bone was identified as "Marmota FKaviventris, yellow-bellied marmot". Among the bone fragments are also teeth and claws.	06/16/1948 --AD -- -- 07/30/1948 --AD	36
1948.01.078	BONE	Faunal Remains	Animal bone. 1 caudal vertebrae, identified as "fish."	06/29/1948 --AD	1
1948.01.079	BONE	Faunal Remains	1 lot animal bone. This lot of two bones is identified as right pharyngeal of Cyprinid, Gila robusta, also known as the roundtail chub fish.	06/16/1948 --AD -- -- 07/30/1948 --AD	2

1948.01.080	SHELL	Faunal Remains	1 shell. This object is identified as a brachiopod shell.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.081	BONE	Faunal Remains	1 lot animal bone. This lot of bones is unidentified.	06/16/1948 --AD -- -- 07/30/1948 --AD	~10
1948.01.082	BONE --TOOTH	Faunal Remains	1 lot bone and teeth. The bone is identified as "Urocyon cinereoargenteus, gray fox". Object 16-108 is a jaw fragment with teeth still attached.	06/16/1948 --AD -- -- 07/30/1948 --AD	4
1948.01.083	BONE --TOOTH	Faunal Remains	1 lot bone and teeth. The lot is identified as "Citellus, ground squirrel". Please see catalog notes for more detailed information.	06/16/1948 --AD -- -- 07/30/1948 --AD	22
1948.01.084	BONE --TOOTH	Faunal Remains	1 lot bone and teeth. The lot is identified as "Neotoma, wood rat". Please see catalog notes for more detailed information. The lot has 12 loose teeth without an identifying number. Some of these bone and tooth fragments are charred.	06/16/1948 --AD -- -- 07/30/1948 --AD	42
1948.01.085	BONE --TOOTH	Faunal Remains	1 lot bone and teeth. The lot is identified as "Sylvilagus, cottontail". Please see catalog notes for more detailed information. Within this lot are multiple charred bones and teeth.	06/16/1948 --AD -- -- 07/30/1948 --AD	78
1948.01.086	BONE --TOOTH	Faunal Remains	Unidentified bone, teeth fragments.	06/16/1948 --AD -- -- 07/30/1948 --AD	4
1948.01.087	BONE	Faunal Remains	Unidentified bone fragment.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.088	BONE	Faunal Remains	Charred, unidentified bone.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.089	BONE	Faunal Remains	Bone, unidentified.	06/16/1948 --AD -- -- 07/30/1948 --AD	2
1948.01.090	BONE	Faunal Remains	Bone, unidentified. One bone, labeled 16-187 is charred.	06/16/1948 --AD -- -- 07/30/1948 --AD	5
1948.01.091	BONE	Faunal Remains	Bone, unidentified.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.092	BONE	Faunal Remains	Bone, unidentified.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.093	BONE	Faunal Remains	Bone, unidentified.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.094	BONE	Faunal Remains	Bone, unidentified.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.095	BONE --TOOTH	Faunal Remains	Bone or tooth, unidentified.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.096	BONE --TOOTH	Faunal Remains	Bone, tooth fragments. The bone and teeth are unidentified.	06/16/1948 --AD -- -- 07/30/1948 --AD	3
1948.01.097	TOOTH --BONE	Faunal Remains	Tooth fragments. The previous inventory claims they are bone, but appear to be 2 tooth fragments of varying size.	06/16/1948 --AD -- -- 07/30/1948 --AD	2

1948.01.098	BONE --TOOTH	Faunal Remains	Bone, tooth fragments. The lot has not been identified as to which species they came from.	06/16/1948 --AD -- -- 07/30/1948 --AD	3
1948.01.099	BONE	Faunal Remains	Bone, unidentified. The fragment is charred throughout.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.100	BONE	Faunal Remains	Bone, unidentified. Both bone fragments are charred.	06/16/1948 --AD -- -- 07/30/1948 --AD	2
1948.01.101	BONE --TOOTH	Faunal Remains	Bone, tooth fragment. The previous inventory states that this object is bone, but it appears to be a tooth. The object is charred throughout.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.102	BONE --TOOTH	Faunal Remains	Bone or tooth fragment, unidentified. The previous inventory states that the object is bone, however, it appears to be a tooth.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.103	BONE	Faunal Remains	Animal bone. This bone is an unidentified mammal bone.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.104	BONE --TOOTH	Faunal Remains	1 lot animal bone and teeth. These four teeth and bone are unidentified.	06/16/1948 --AD -- -- 07/30/1948 --AD	4
1948.01.105	BONE	Faunal Remains	Bone. This bone is slightly curved and it is listed as unidentified.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.106	BONE	Faunal Remains	Animal bone. This bone is unidentified, listed as mammal in field notes.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.107	BONE	Faunal Remains	Animal bone. This bone is unidentified, listed as mammal in field notes.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.108	BONE	Faunal Remains	Animal bone. This bone is unidentified.	06/16/1948 --AD -- -- 07/30/1948 --AD	1
1948.01.109	METAL -- LEATHER -- FRAGMENT		1 lot metal, leather. This lot is currently missing as of 4/8/2015. See catalog notes for more information.	06/29/1948 --AD	
1949.01.001	BONE	Faunal Remains	One lot bone, unidentified. See catalog notes for detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	38
1949.01.002	BONE	Faunal Remains	Bone, big horn sheep. The bones are identified as "Ovis Canadensis". See catalog notes for more information.	06/20/1949 --AD -- -- 07/22/1949 --AD	22
1949.01.003	BONE	Faunal Remains	Bone. The bone has been identified as "Odocoileus hemionus, mule deer". See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	13
1949.01.004	BONE	Faunal Remains	Bone. The bone is identified as "Castor canadensis, Beaver".	06/20/1949 --AD -- -- 07/22/1949 --AD	18
1949.01.005	BONE	Faunal Remains	Bone. The bone is identified as "Castor Canadensis". See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	16
1949.01.006	LOT, MIXED		Bone, seed, soil, twig. For more information see catalog notes.	07/05/1949 --AD	15
1949.01.007	BONE	Faunal Remains	Bone. The bone is identified as "Taxidea Taxus". For more detailed information see catalog notes.	06/20/1949 --AD -- -- 07/22/1949 --AD	1
1949.01.008	BONE	Faunal Remains	Bone, bison. See Catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	3

1949.01.009	BONE	Faunal Remains	Bone. This object is identified as "marmota, marmot". See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	49
1949.01.010	BONE	Faunal Remains	Bone. This object was identified as "odocoileus hemonus, mule deer". See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	31
1949.01.011	LOT, MIXED		Bone, shell. The bone has been identified as "Beaver, cottontail, deer, snail shell". See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	13
1949.01.012	BONE	Faunal Remains	Bone, one lot. The bone has been identified as "Cynomys, prairie dog". See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	32
1949.01.013	BONE	Faunal Remains	Bone. The bone has been identified as "ovis canadensis, bighorn sheep". See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	7
1949.01.014	BONE	Faunal Remains	Sylvilagus, cottontail bone. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	13
1949.01.015	BONE	Faunal Remains	Fish bone, 1 lot. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	63
1949.01.016	BONE	Faunal Remains	Ovis canadensis, big horn sheep bone. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	18
1949.01.017	BONE	Faunal Remains	Odocoileus hemionus, mule deer. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	8
1949.01.018	BONE	Faunal Remains	Bird bone. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	2
1949.01.019	BONE	Faunal Remains	Sylvilagus, cottontail bone. See catalog card for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	12
1949.01.020	BONE	Faunal Remains	Bone, bison. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	3
1949.01.021	BONE	Faunal Remains	Castor canadensis, beaver bone. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	11
1949.01.022	BONE	Faunal Remains	Castor canadensis, beaver bone. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	11
1949.01.023	BONE	Faunal Remains	Castor canadensis, beaver bone. See catalog notes for more detailed information.	07/19/1949 --AD	21
1949.01.024	BONE	Faunal Remains	1 lot animal bone, unidentified. See catalog notes for more detailed information.	07/09/1949 --AD	~270
1949.01.025	BONE	Faunal Remains	Bison bone fragment. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	1
1949.01.026	BONE	Faunal Remains	Bone, unidentified. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	31
1949.01.027	BONE	Faunal Remains	1 lot Ovis canadensis, big horn sheep bone.	06/20/1949 --AD -- -- 07/22/1949 --AD	29
1949.01.028	BONE	Faunal Remains	Odocoileus hemionus bone, mule deer. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	40

1949.01.029	BONE	Faunal Remains	Ovis canadensis, beaver bone. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	21
1949.01.030	BONE	Faunal Remains	Odocoileus hemionus, mule deer bone. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	32
1949.01.031	BONE	Faunal Remains	Unidentified bone. See catalog notes for more detailed information.	07/06/1949 --AD	
1949.01.032	BONE	Faunal Remains	Eutamias, chipmunk bone. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	1
1949.01.033	BONE	Faunal Remains	Bird bone fragments. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	2
1949.01.034	BONE	Faunal Remains	One lot Cynomys, Prairie dog bone. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	20
1949.01.035	BONE	Faunal Remains	Neotoma, wood rat bone. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	2
1949.01.036	BONE	Faunal Remains	One lot Neotoma, wood rat bone. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	4
1949.01.037	BONE	Faunal Remains	Fish bone. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	4
1949.01.038	BONE	Faunal Remains	One lot Neotoma, wood rat bone. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	4
1949.01.039	BONE	Faunal Remains	Marmota, marmot bone. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	1
1949.01.040	BONE	Faunal Remains	Odocoileus, deer bone and/or teeth. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1940 --AD	3
1949.01.041	BONE	Faunal Remains	Fish bone. See catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	2
1949.01.042	BONE	Faunal Remains	1 lot bone.	07/06/1949 --AD	442
1949.01.043	SHELL		1 lot shell. Please see catalog notes for more detailed information.	06/20/1949 --AD -- -- 07/22/1949 --AD	11
1949.01.044	COPROLITE		Unidentified scat.	07/19/1949 --AD	1
1949.01.045	BONE	Faunal Remains	1 lot bone. The bone is identified as "Sylvilagus cottontail".	06/20/1949 --AD -- -- 07/22/1949 --AD	27
1949.01.046	BONE	Faunal Remains	1 log bone. The bone is identified as " Odocoileus hemionus" and "fish".	06/20/1949 --AD -- -- 07/22/1949 --AD	4
1949.01.047	BONE	Faunal Remains	2 bone fragments, 1 with teeth attached. The bone is identified as "Castor canadensis, beaver".	06/20/1949 --AD -- -- 07/22/1949 --AD	2
1949.01.048	BONE	Faunal Remains	1 lot bone. The bone has been identified as "snail, bird, sylvilagus, thomymys, ovis, neotoma, and citollas". A few of the bone fragments have teeth attached.	06/20/1949 --AD -- -- 07/22/1949 --AD	20
1949.01.049	BONE --TOOTH	Faunal Remains	1 lot bone and teeth. The bone is identified as "Marmota Fkariventris" or yellow-bellied marmot.	06/20/1949 --AD -- -- 07/22/1949 --AD	6
1949.01.050	BONE --TOOTH	Faunal Remains	1 lot bone. The bone is identified as "Sylvilagus", or cottontail.	06/20/1949 --AD -- -- 07/22/1949 --AD	9

1949.01.051	BONE	Faunal Remains	2 bone fragments. The bone is identified as "bison".	06/20/1949 --AD -- -- 07/22/1949 --AD	2
1949.01.052	BONE	Faunal Remains	1 lot bone, mixed. The bone is identified as "deer, rabbit, fish, marten, and marmot".	06/20/1949 --AD -- -- 07/22/1949 --AD	8
1949.01.053	BONE	Faunal Remains	1 lot fish bone.	06/20/1949 --AD -- -- 07/22/1949 --AD	9
1949.01.054	BONE	Faunal Remains	1 lot bird bone.	06/20/1949 --AD -- -- 07/22/1949 --AD	3
1949.01.055	BONE	Faunal Remains	1 bird bone.	07/19/1949 --AD	1
1949.01.056	BONE	Faunal Remains	1 lot marmot bone.	06/20/1949 --AD -- -- 07/22/1949 --AD	3
1949.01.057	BONE --TOOTH	Faunal Remains	1 lot bone and teeth. The bone and teeth are identified as a "Neotoma, wood rat".	06/20/1949 --AD -- -- 07/22/1949 --AD	2
1949.01.058	BONE	Faunal Remains	1 lot bone. The bone is identified as "Sylvilagus, cottontail". In addition to bone, one of the fragments contains either a tooth or a claw.	06/20/1949 --AD -- -- 07/22/1949 --AD	3
1949.01.059	BONE --TOOTH	Faunal Remains	FK	06/20/1949 --AD -- -- 07/22/1949 --AD	13
1949.01.060	BONE	Faunal Remains	1 lot of animal bones. The animal bones are identified as Sylvilagus (cottontail).	06/20/1949 --AD -- -- 07/22/1949 --AD	11
1949.01.061	BONE --SHELL	Faunal Remains	1 lot bone and shell. The object have been identified as "bird, fish, and shell".	06/20/1949 --AD -- -- 07/22/1949 --AD	3
1949.01.062	BONE	Faunal Remains	Animal bone. This bone is identified as an Artiodactyl.	06/20/1949 --AD -- -- 07/22/1949 --AD	1
1949.01.063	BONE	Faunal Remains	1 lot animal bone. The lot (2 bones) is identified as Ovis canadensis (bighorn sheep).	06/20/1949 --AD -- -- 07/22/1949 --AD	2
1949.01.064	BONE	Faunal Remains	1 lot animal bone. This lot of animal bones is identified as bird.	06/20/1949 --AD -- -- 07/22/1949 --AD	5
1949.01.065	BONE	Faunal Remains	1 bone fragment. The bone is identified as "Citellus tridecemlineatus".	06/20/1949 --AD -- -- 07/22/1949 --AD	1
1949.01.066	BONE --TOOTH	Faunal Remains	1 lot bone and tooth. The bone is identified as "Marmota, marmot". There are 2 teeth present on one of the bone fragments.	06/20/1949 --AD -- -- 07/22/1949 --AD	2
1949.01.067	BONE	Faunal Remains	1 lot bone. The bone is identified as "Beaver, chipmunk, deer, wood rat". The largest bone shows signs of charring.	06/20/1949 --AD -- -- 07/22/1949 --AD	4
1949.01.068	BONE	Faunal Remains	1 lot bone. The bone is identified as "Marmota, marmot".	06/20/1949 --AD -- -- 07/22/1949 --AD	2
1949.01.069	BONE	Faunal Remains	1 lot bone. The bones are identified as "Deer, fish, cottontail".	06/20/1949 --AD -- -- 07/22/1949 --AD	3
1949.01.070	BONE	Faunal Remains	1 lot bone. The bone is identified as "Sylvilagus".	06/20/1949 --AD -- -- 07/22/1949 --AD	7
1949.01.071	BONE --TOOTH	Faunal Remains	Bone and teeth. The bone is identified as "Marmota, marmot". The bone fragment has 3 teeth still attached.	06/20/1949 --AD -- -- 07/22/1949 --AD	1

1949.01.072	BONE --TOOTH	Faunal Remains	1 lot bone and teeth. The bone is identified as "Neotoma".	06/20/1949 --AD -- -- 07/22/1949 --AD	
1949.01.073	BONE	Faunal Remains	Bone fragment. The bone has been identified as "artiodactyl".	06/20/1949 --AD -- -- 07/22/1949 --AD	1
1949.01.074	BONE	Faunal Remains	1 lot bone. This lot has been identified as "bird".	06/20/1949 --AD -- -- 07/22/1949 --AD	5
1949.01.075	TOOTH	Faunal Remains	1 lot teeth. The teeth are identified as coming from "Marmota, marmot".	06/20/1949 --AD -- -- 07/22/1949 --AD	38
1949.01.076	BONE	Faunal Remains	1 lot bone. The bone is identified as "Neotoma".	06/20/1949 --AD -- -- 07/22/1949 --AD	8
1949.01.077	BONE	Faunal Remains	1 lot animal bones. This lot of 8 bones is identified as "Citellus," ground squirrel.	06/20/1949 --AD -- -- 07/22/1949 --AD	8
1949.01.078	BONE	Faunal Remains	1 lot animal bone. This lot of three bones is identified as "Citellus," ground squirrel.	06/20/1949 --AD -- -- 07/22/1949 --AD	3
1949.01.079	BONE	Faunal Remains	1 lot animal bone. This lot of three bones is identified as "Citellus, Cynomys" (ground squirrel and prairie dog).	06/20/1949 --AD -- -- 07/22/1949 --AD	3
1949.01.080	BONE	Faunal Remains	1 lot animal bone. This lot of two bones is identified as "Odocoileus hemionus," Mule Deer.	06/20/1949 --AD -- -- 07/22/1949 --AD	2
1949.01.081	BONE	Faunal Remains	1 lot animal bone. This lot of four bones is identified as "Neotoma," wood rat.	06/20/1949 --AD -- -- 07/22/1949 --AD	4
1949.01.082	BONE	Faunal Remains	1 lot animal bone. This lot of two bones is identified as "fish."	06/20/1949 --AD -- -- 07/22/1949 --AD	2
1949.01.083	BONE	Faunal Remains	1 animal bone. This bone is identified as "fish."	06/20/1949 --AD -- -- 07/22/1949 --AD	1
1949.01.084	BONE	Faunal Remains	1 lot animal bone. This lot of four bones is identified as "Citellus," ground squirrel.	06/20/1949 --AD -- -- 07/20/1949 --AD	3
1949.01.085	SHELL		Shell fragments. The object has been identified as "snail" and appears to have been 1 shell that has been broken into 2 pieces.	06/20/1949 --AD -- -- 07/22/1949 --AD	1
1949.01.086	BONE --SHELL	Faunal Remains	3 shells, 2 vertebrae, 1 large bone fragment. The shells are identified as "snail" and the bones are identified as "Castor canadensis, beaver" and "fish". Two of the shells are broken, 1 is complete.	06/15/1949 --AD	6
1949.01.087	BONE	Faunal Remains	Bone, Sylvilagus. Two of the bone fragments are charred.	06/20/1949 --AD -- -- 07/22/1949 --AD	5
TIN-0578	CORN		Corn cob fragment. This object is a type specimen and is located in Hell's Midden's type specimen box. See catalog notes for more details.		1
TIN-0579	BONE --TOOTH	Faunal Remains	Skull, animal. The skull fragment still contains teeth.		1
TIN-0580	TOOTH --BONE	Faunal Remains	1 lot tooth fragments and bone. A few of the teeth appear to have been charred and are blackened in color. Please see catalog notes for more detailed information.		13

APPENDIX II – TRANSCRIBED ARCHIVAL MATERIALS, CUMNH

Transcribed materials here are primarily historical in interest. Minimum revisions have been made to standardize spelling, but no material has been altered past its original meaning.

Untitled [Last of His Kind] - 14 May 1940

*I tossed a looped hand-twist over the neck
Of my favorite pony I call "Painted Wreck."
I throw on the saddle; my jeans hit the cantle
And I loped down the canyon to see Charley Mantle.*

*Old Charley's a puncher who's lost lots of fun
Rid'en the mean ones with back bone and spur.
The number of broncos he's broke is past count'en;
Their bones are all scattered over Blue Mountain.*

*I remember the winter he first went to work—
As a scrawny-kid wrangler he looked like a Turk.
But he showed lots of bottom and by the next spring
He was sett'en the rough ones and make'en 'em ring.*

*There was lots of wild horses roam'en 'round thin
That attracted the fancy of all the best men
And Charley went out every spring and each fall
for a couple of seasons and headed them all.*

*He spent a few years by improv'en his claim
Down in a canyon without any name.
And when it was ready, he hung up his hat
And built him a snug ranch down on the flat.*

*He got him a wife, the best girl in the west,
And he spread out his outfit and figured to rest.*

*But his family was growing and he sure had to dig
To keep up with the youngsters gett'en so big.*

*It sure did provoke him to keep on the hop
When he thought that once married his work days would stop.*

*And one thing he did and he did right well
Was name the old canyon: he called it plain Hell.
So I'm going down to see him and I'm rid'en fast;
I can't wait to suit him with talk of the past.*

*I'll tell of the old life, so carefree and rough
when ten skinny horses a day was a enough.
For when I get lonesome I want to be where
I can visit with Charley and get him to swear.*

*Old Charley Mantle's the last of his kind
He's all bone and powder under the rind.
And when he is gone the one has fell,
He'll be missed by the cowboys who knew him in Hell.*

Excerpt of Letter to Robert Burgh, from Jesse L. Nusbaum, NPS Region Three

Archaeologist - 30 October 1947

“

October 30, 1947

Mr. Robert Burgh,

c/o University of Colorado Museum,

Boulder, Colorado.

Dear Bob:

Your detailed letter of October 16, written from Vernal, Utah, concerning your stratigraphic tests in Dinosaur National Monument has been reviewed with interest and satisfaction.

The midden was unbelievably deep. Apparently, it provides a chronological scale for the several periods of occupation of campgrounds on the inclined slope above it which constituted the drainage basin and gathering area for the intermittent stream that carried the campground debris over the ledge formation and deposited it in the progressively heightened mound. Charcoal, ash, etc. – light materials – would be gathered and transported by light run-offs. Heavier bone and chipped materials and the heavier sands and lighter gravels would only be transported during heavier run-offs. In my opinion, the sterile, or clean, sand-gravel lenses, or layers, would only be deposited following protracted periods of non-use, after transportable cultural or occupational debris had been removed. Only sudden and excessive rainfall would wash the campground clean in a short period and such storms would obviously cut, damage, or alter the character of the midden mound due to heavy discharge over the ledge.

At some future time, I think your tests should be deepened to virgin mineral soil or half

the midden should be excavated, as you suggest, comparatively to determine earliest use of the campground above or possible actual occupation of the midden base, if such was the case prior to establishment of the campground above.

Finding the stratum of charcoal and ash in Mantle Cave under the rock fall on which the masonry cists were built certainly indicates long occupation.

The new data on extensive occupation of the terraces 400 to 600 feet above Yampa River merit careful and extensive study. I wouldn't be surprised, either, if pit houses would be found there, as in the Falls Creek Cave region near Durango, Colorado.

The field for archaeological research in Dinosaur appears to be opening up and expanding and more study and investigation are indicated before the archaeological story can be studied completely. However, I am still of the opinion that Scoggin's notes and materials should be reported first, and that new research which has indicated should be covered separately and later. That is logical and sound procedure in my opinion....

[two paragraphs regarding the rest of his trip where he and Burgh met]

Hope your report on the Scoggin work is going ahead to your satisfaction.

With all good wishes,

Sincerely,

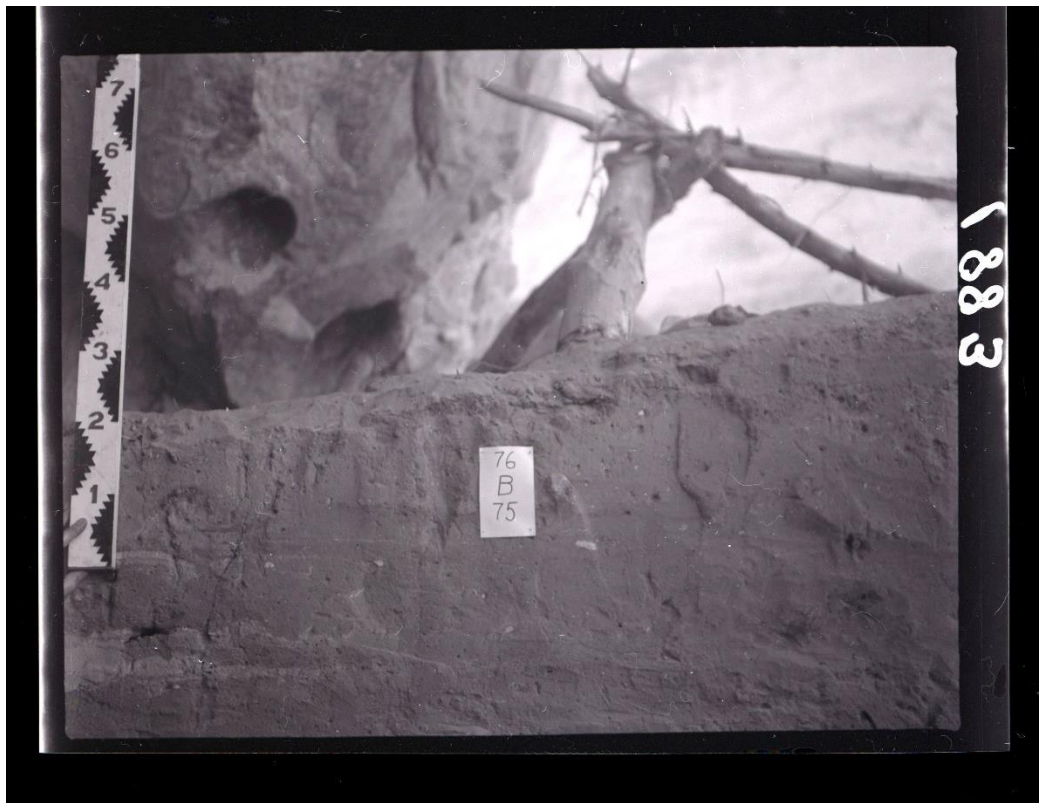
Jesse L. Nusbaum,

Archeologist. "

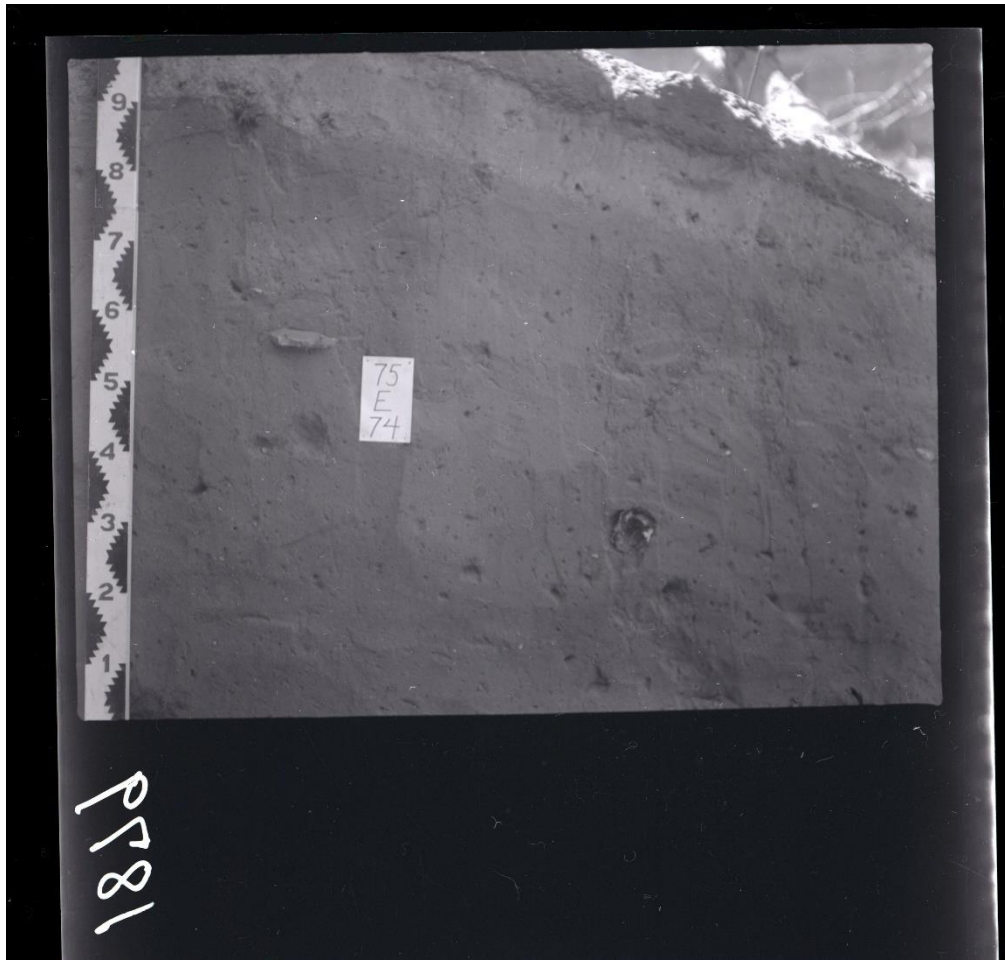
APPENDIX III – ADDITIONAL ARCHIVAL PHOTOS

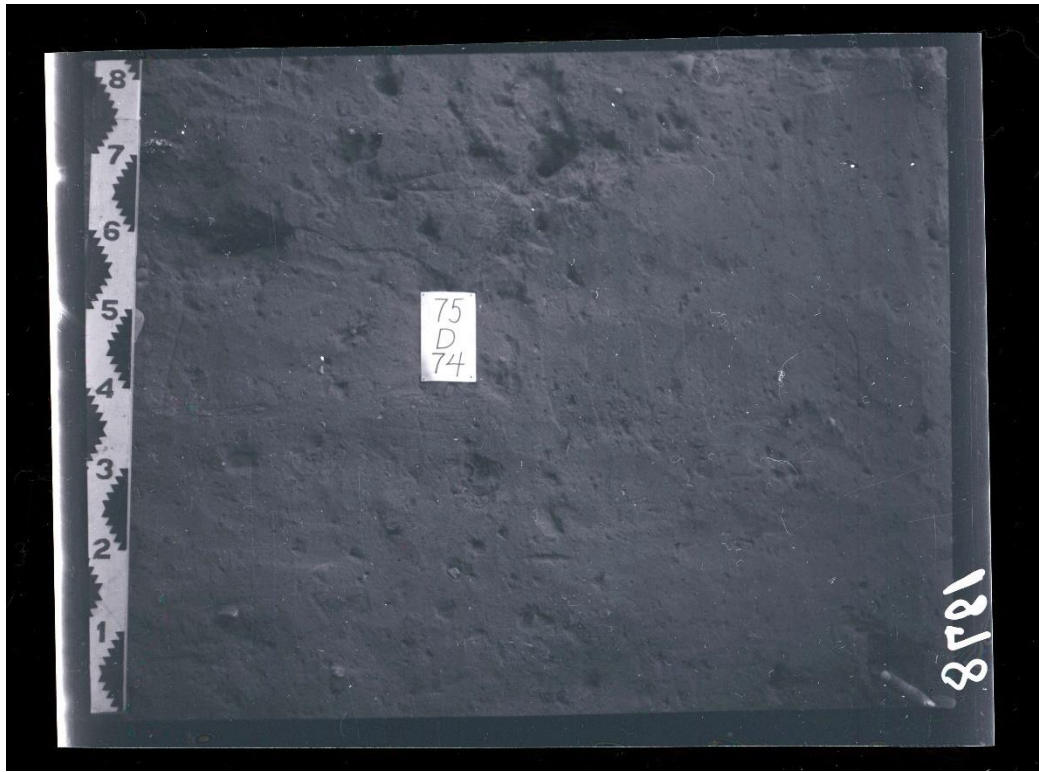
Here are archival photos from 1948 and 1949 excavations, not included elsewhere in the text. This collection is primarily composed of a profile photo series taken in 1948. The meaning of the photo cards within these profile images is unknown. These were not relied on for this thesis work, but are reproduced here for accessibility to future researchers.









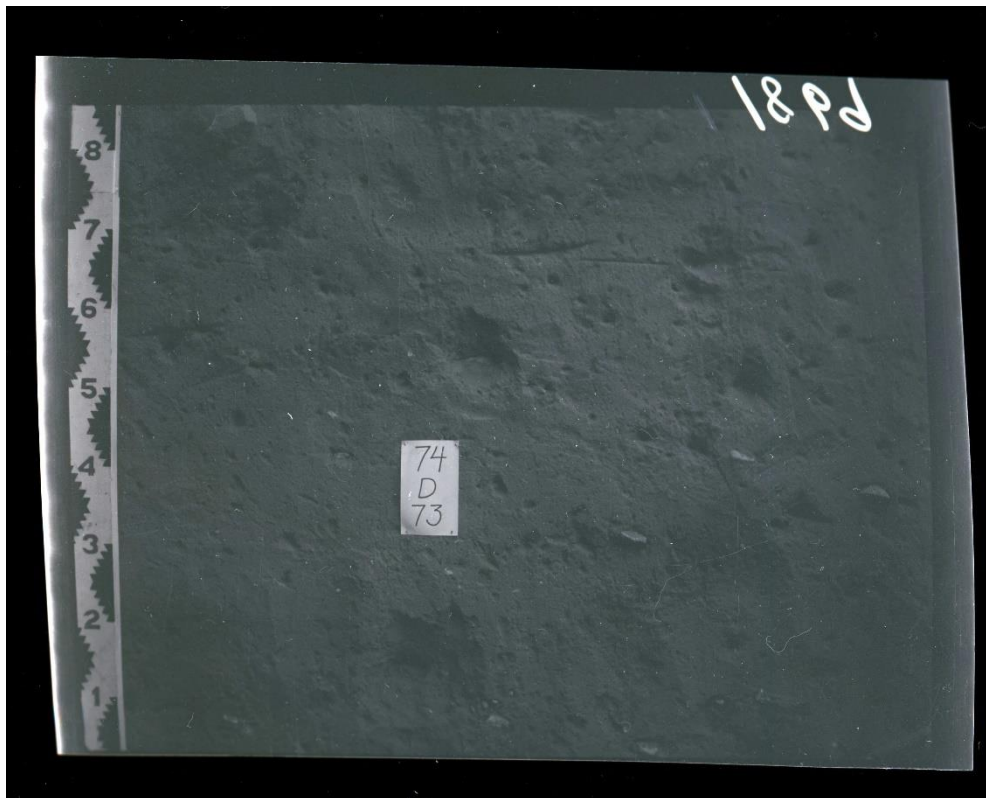
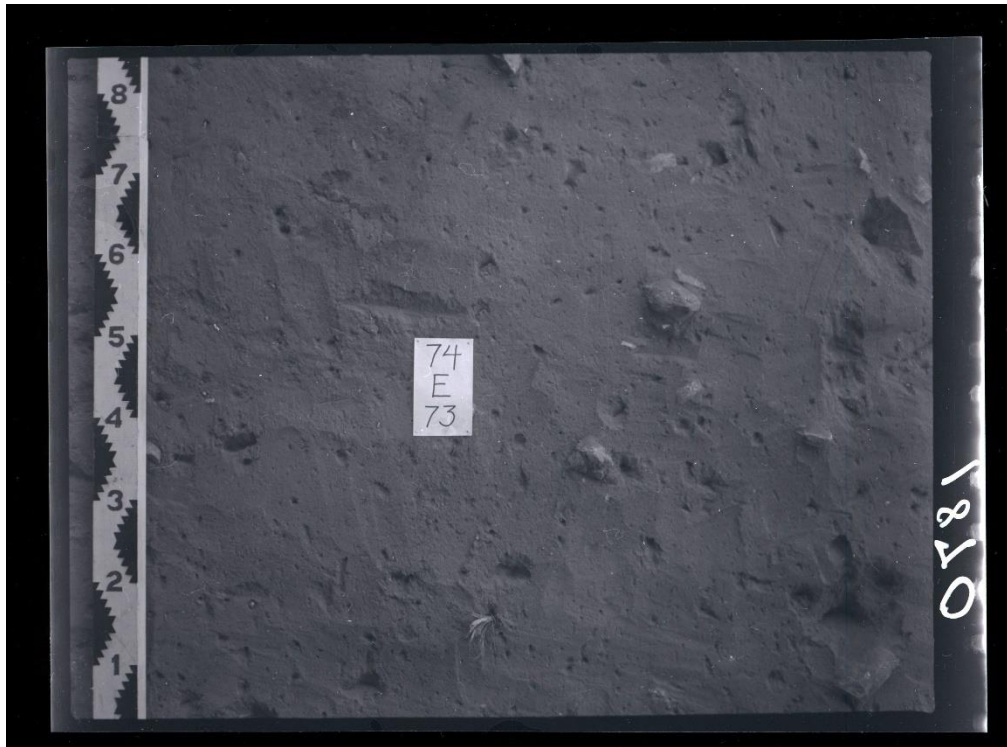


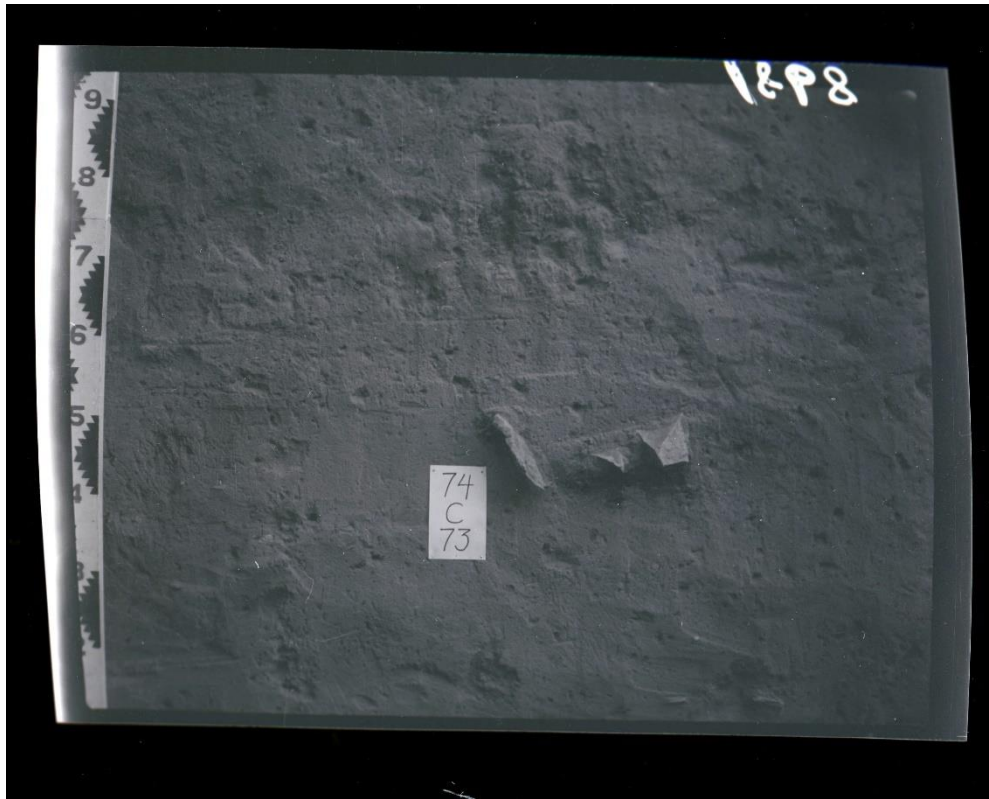


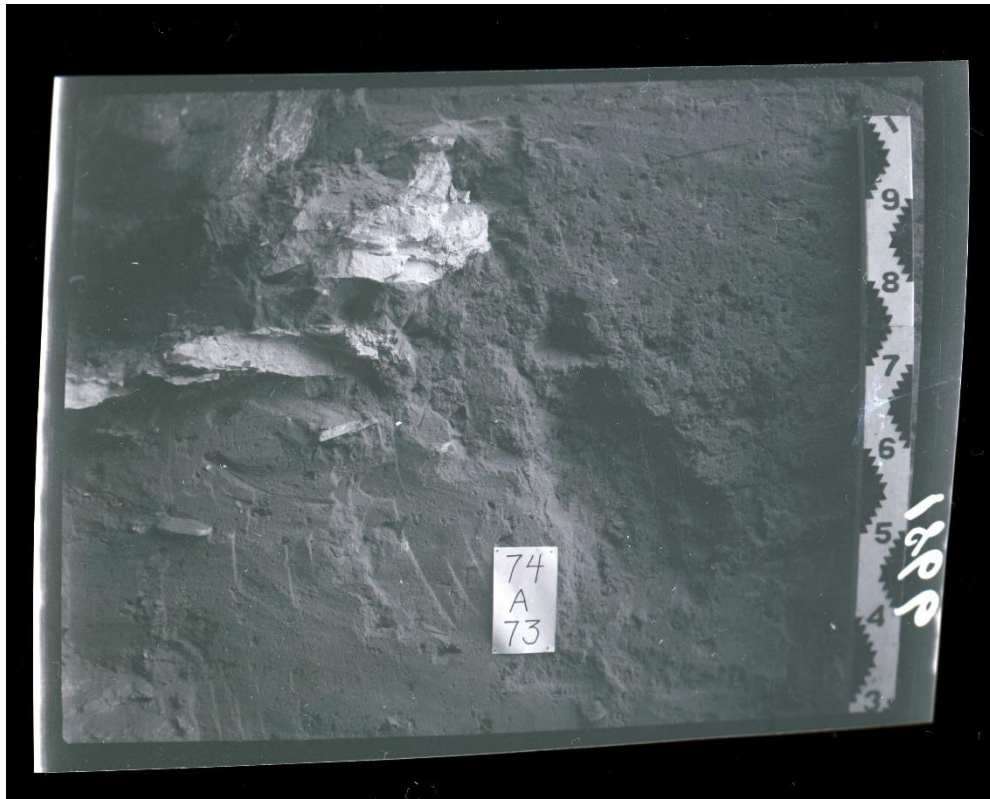


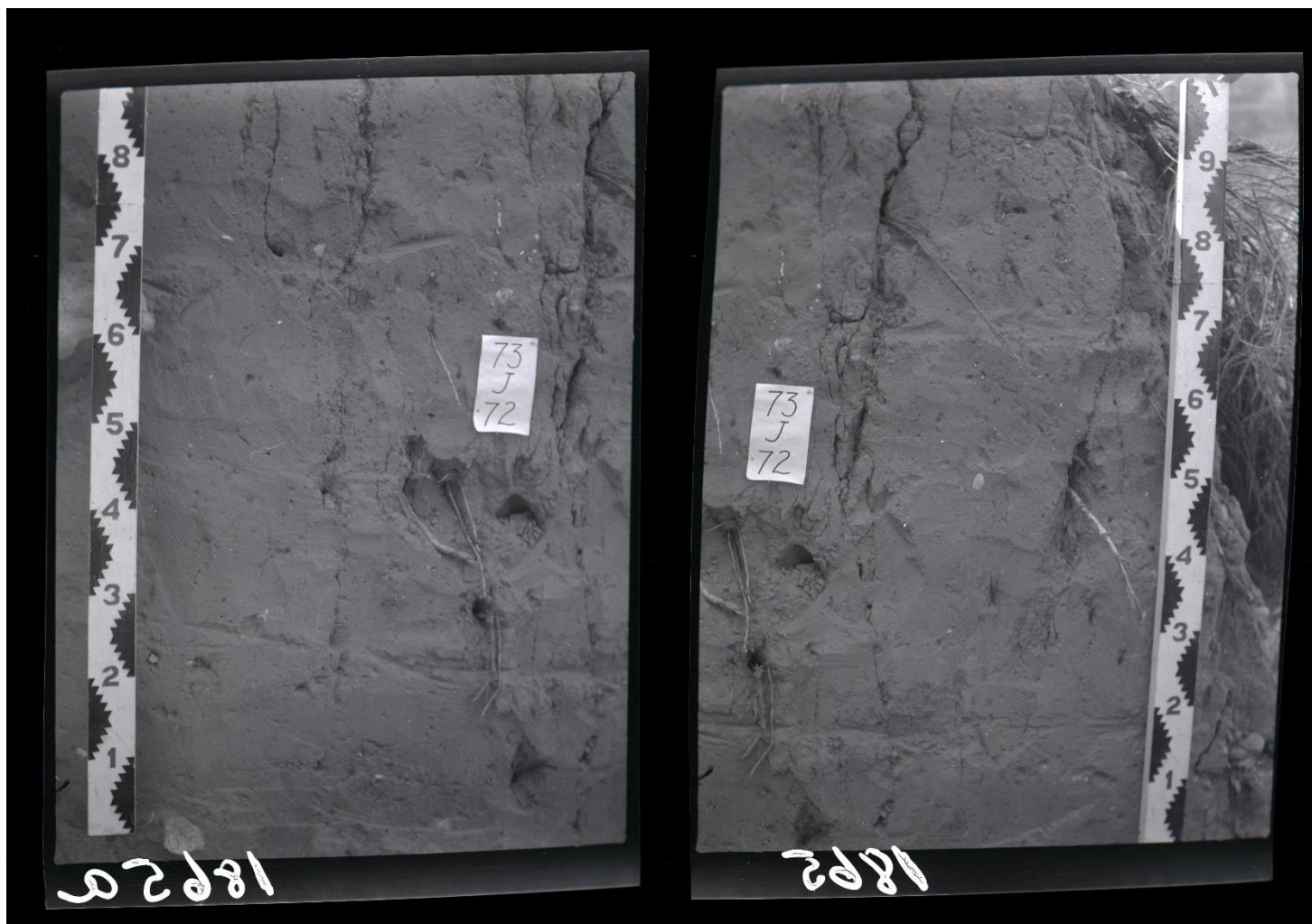


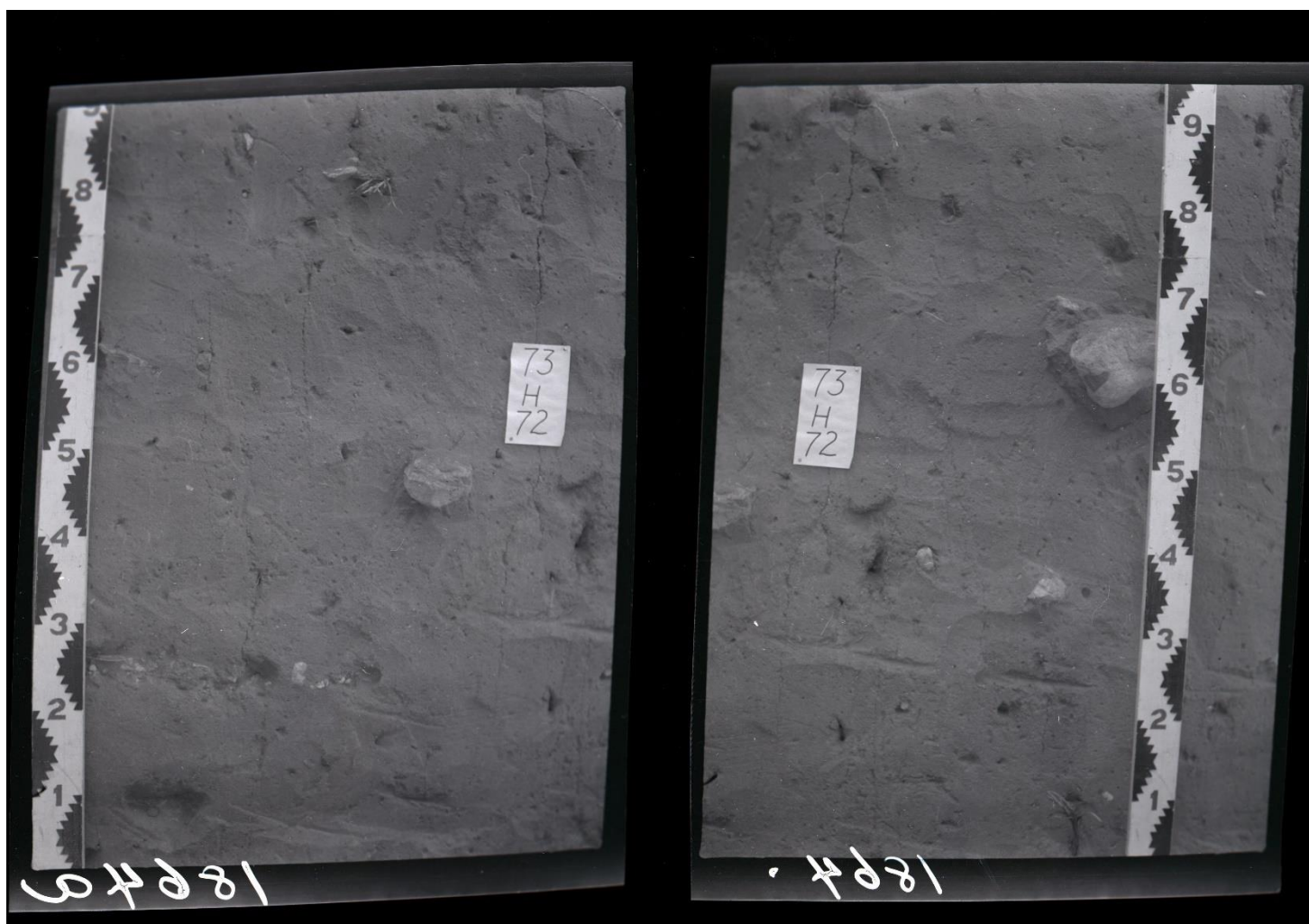


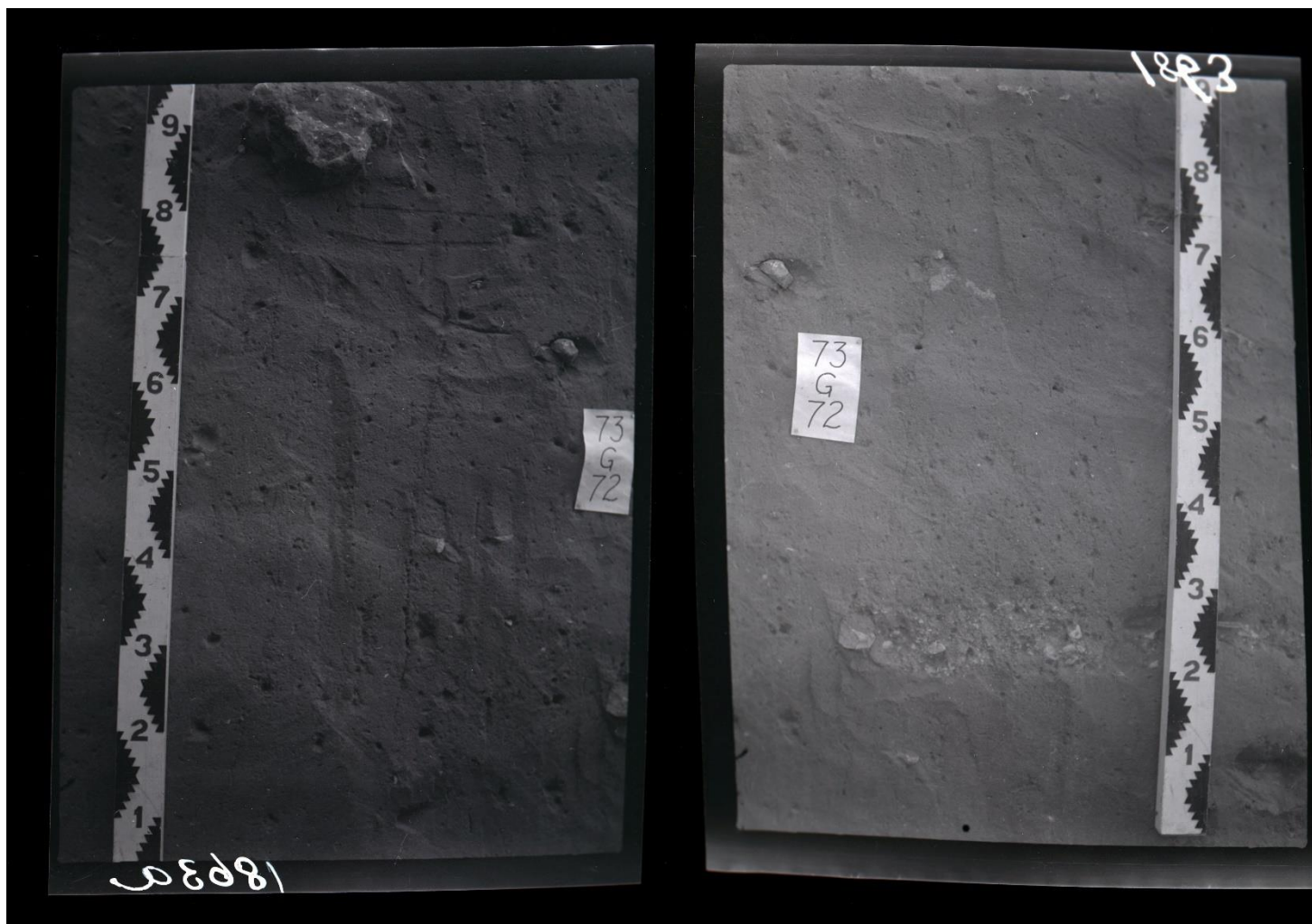


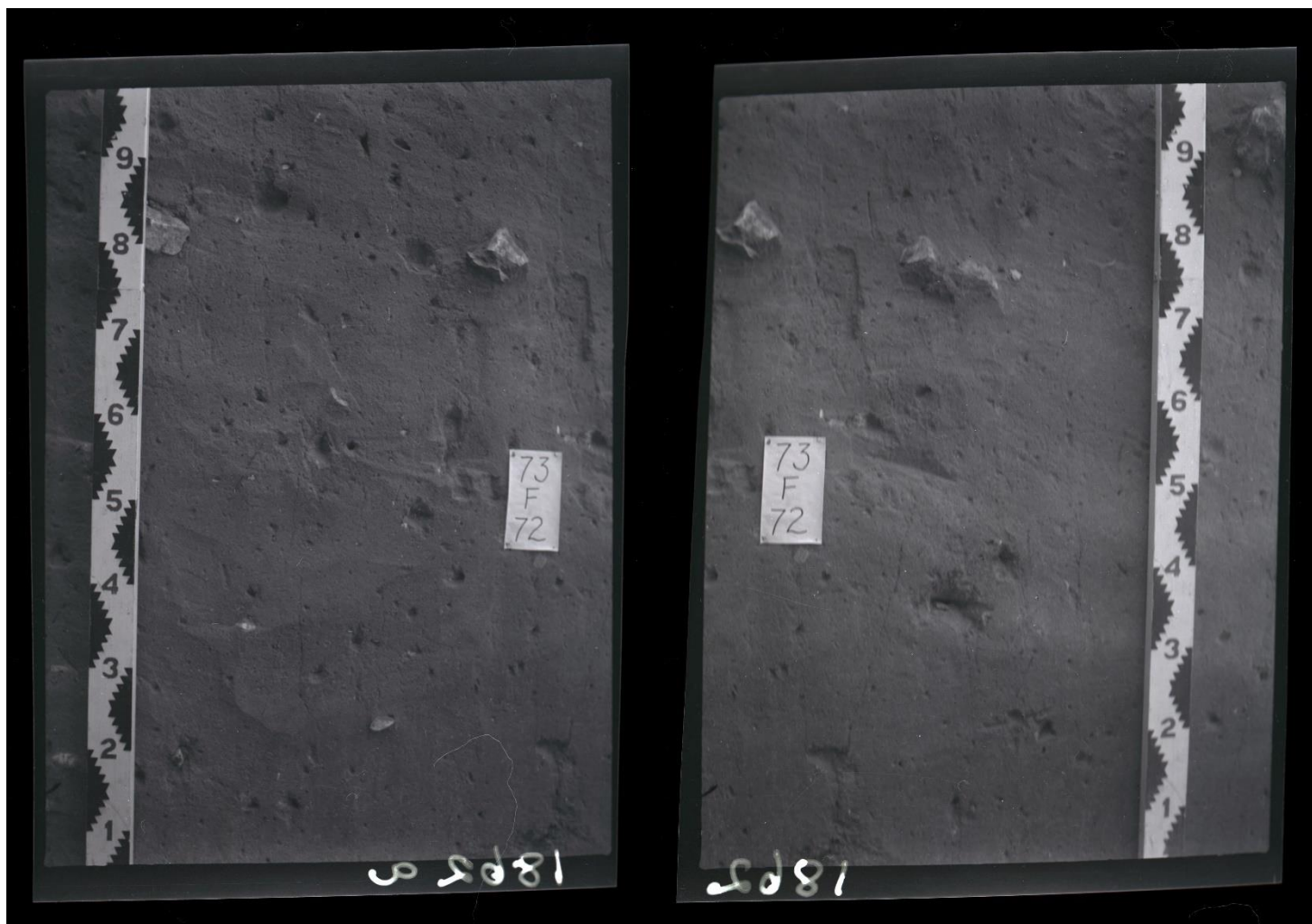




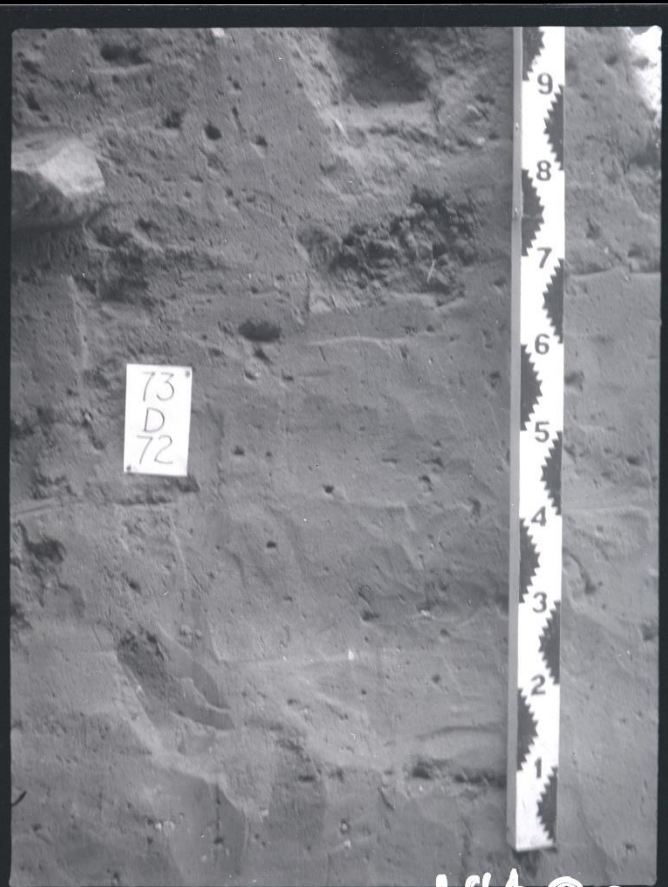








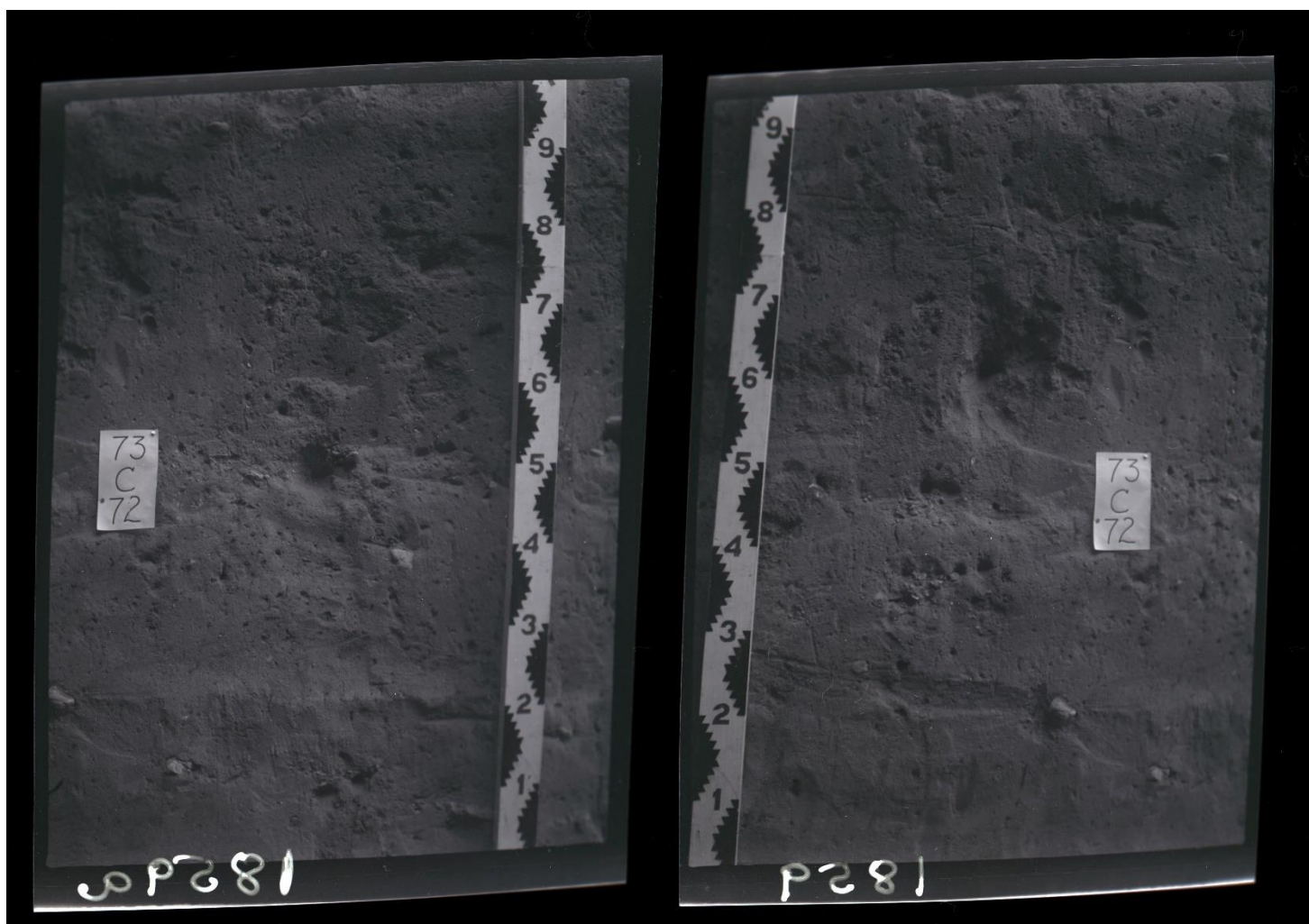


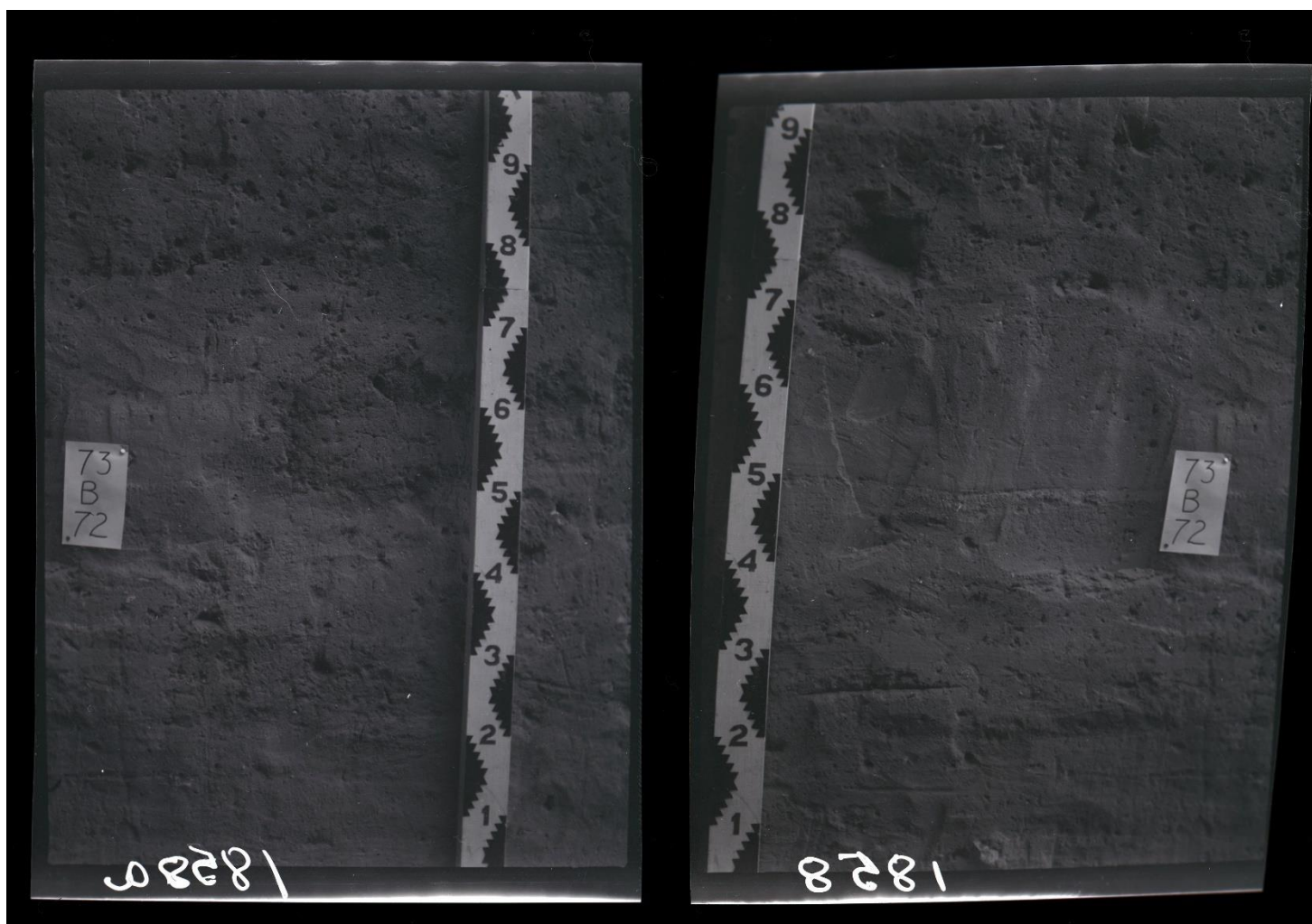


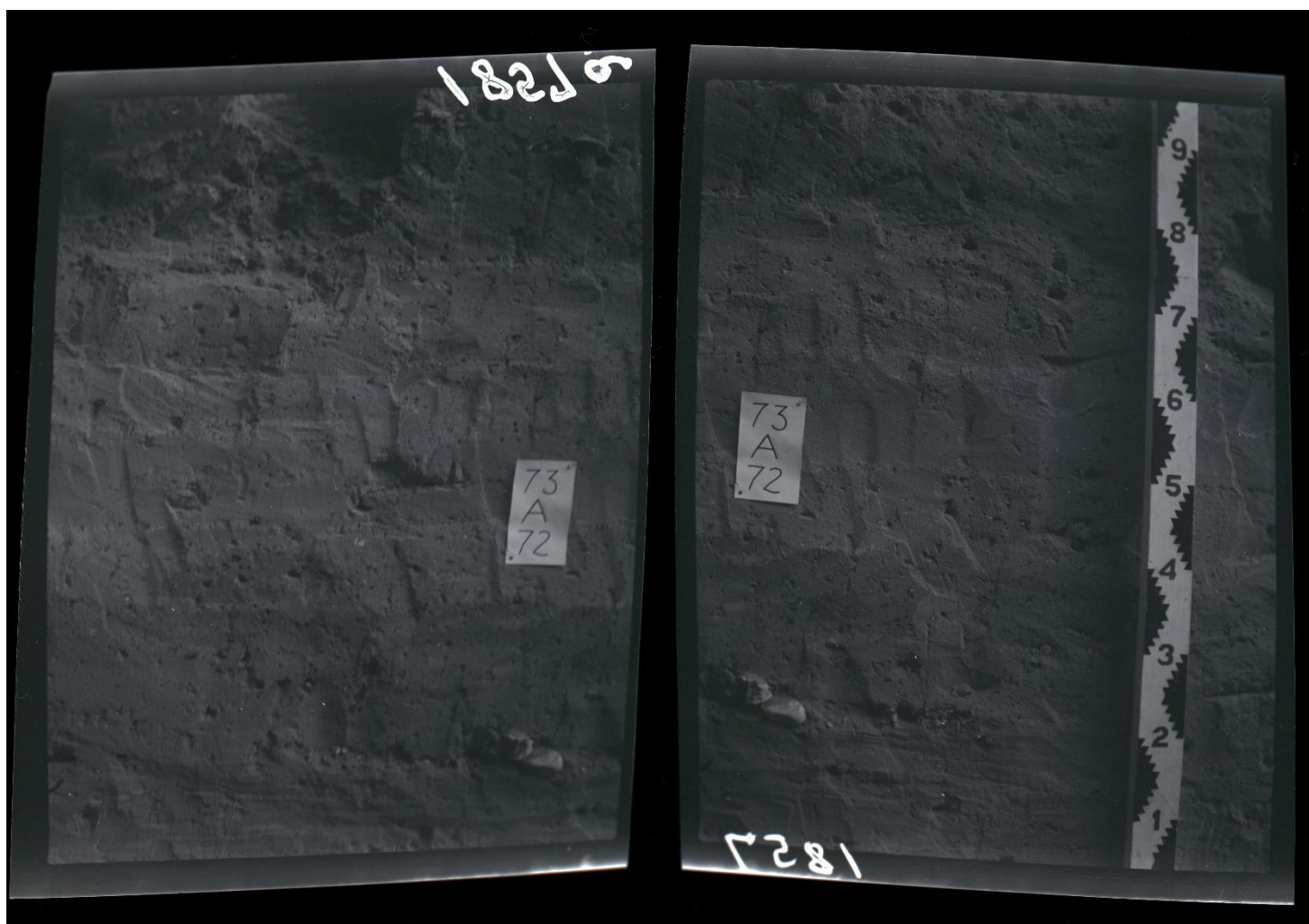
1860a

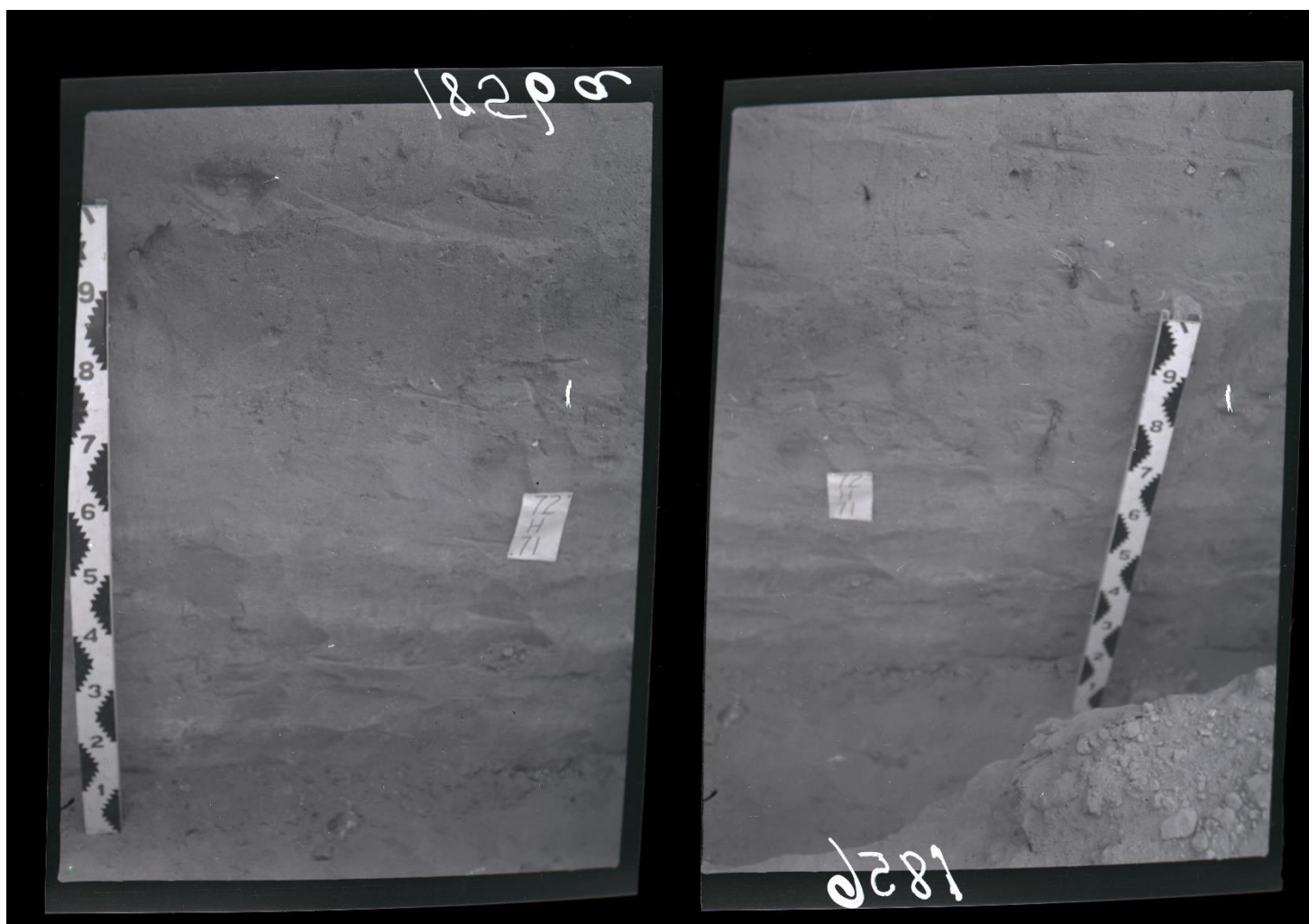


1860

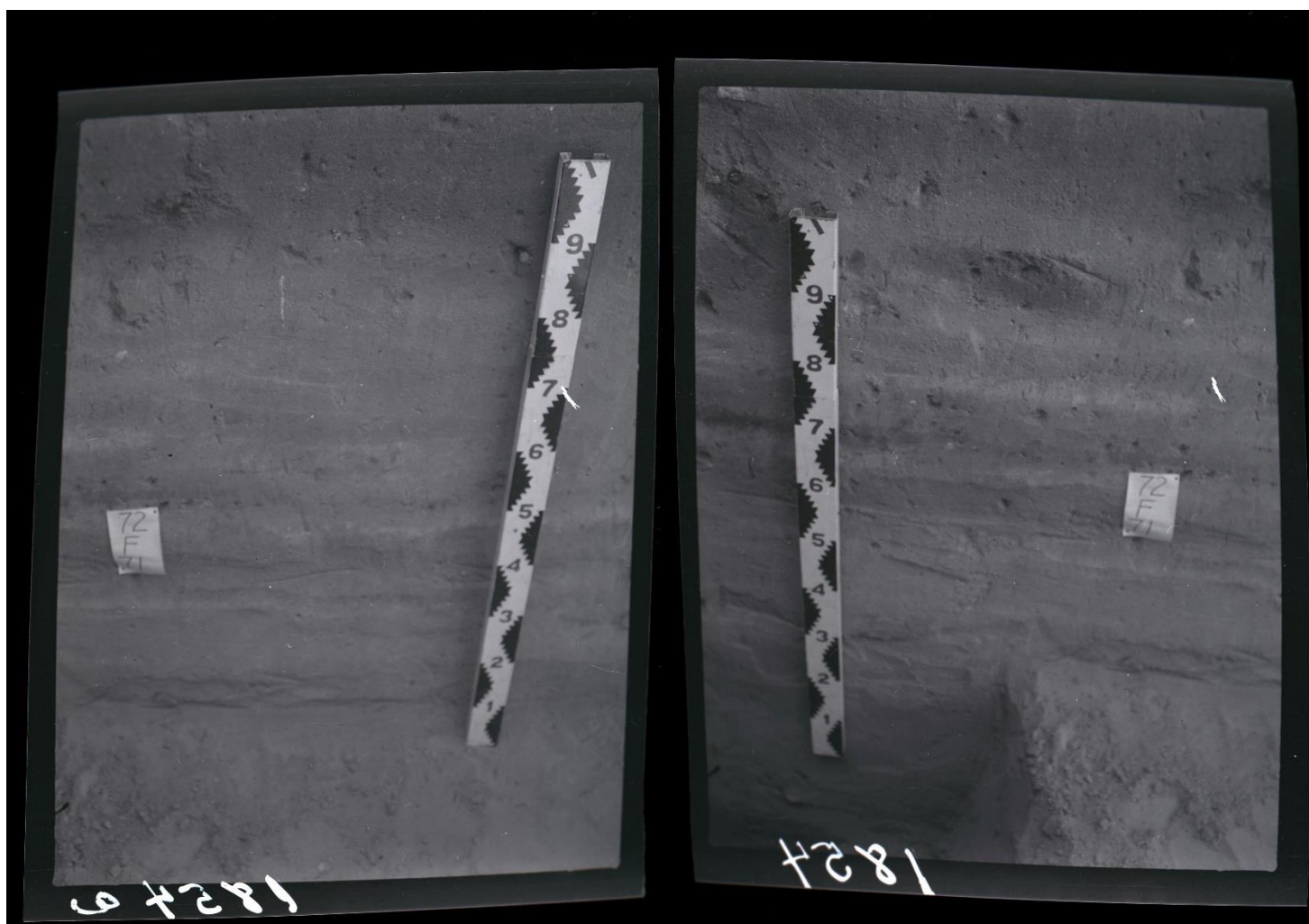


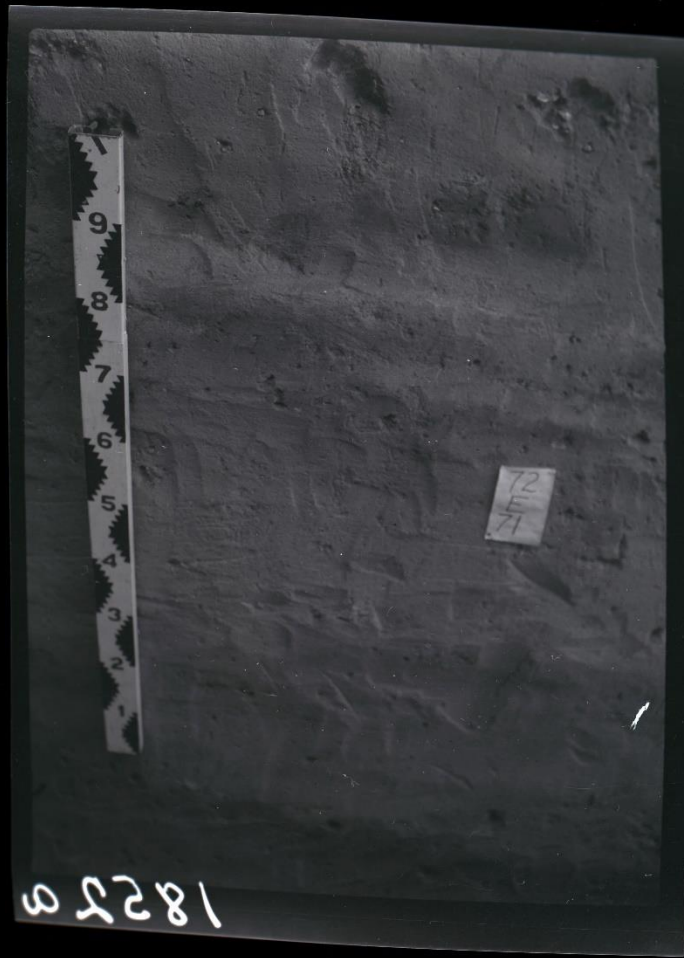
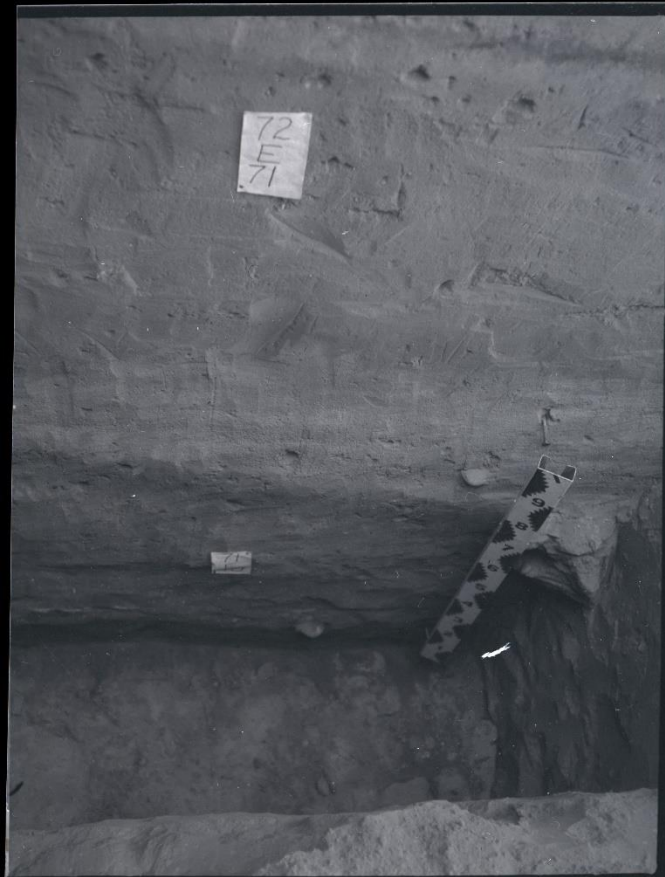


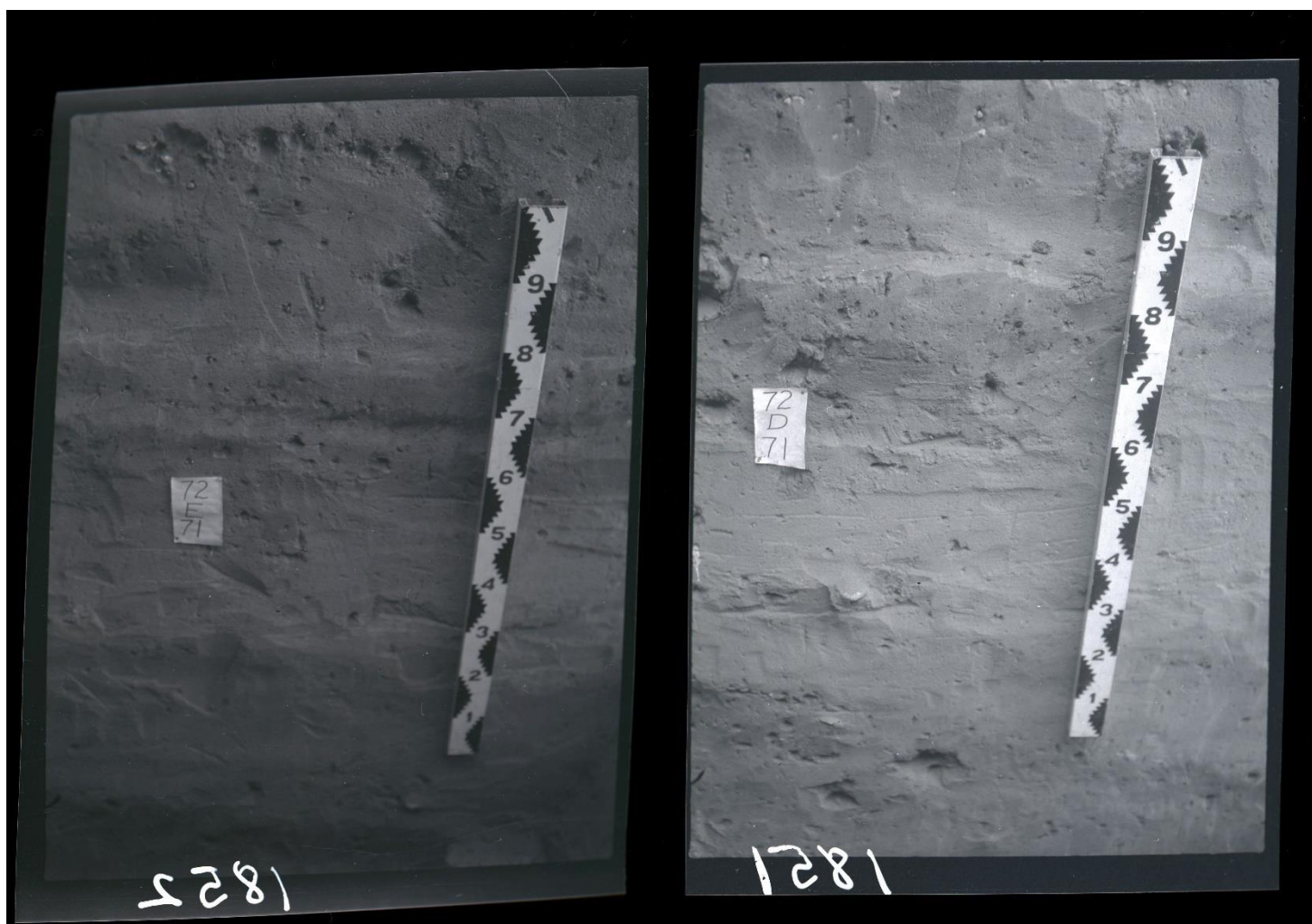


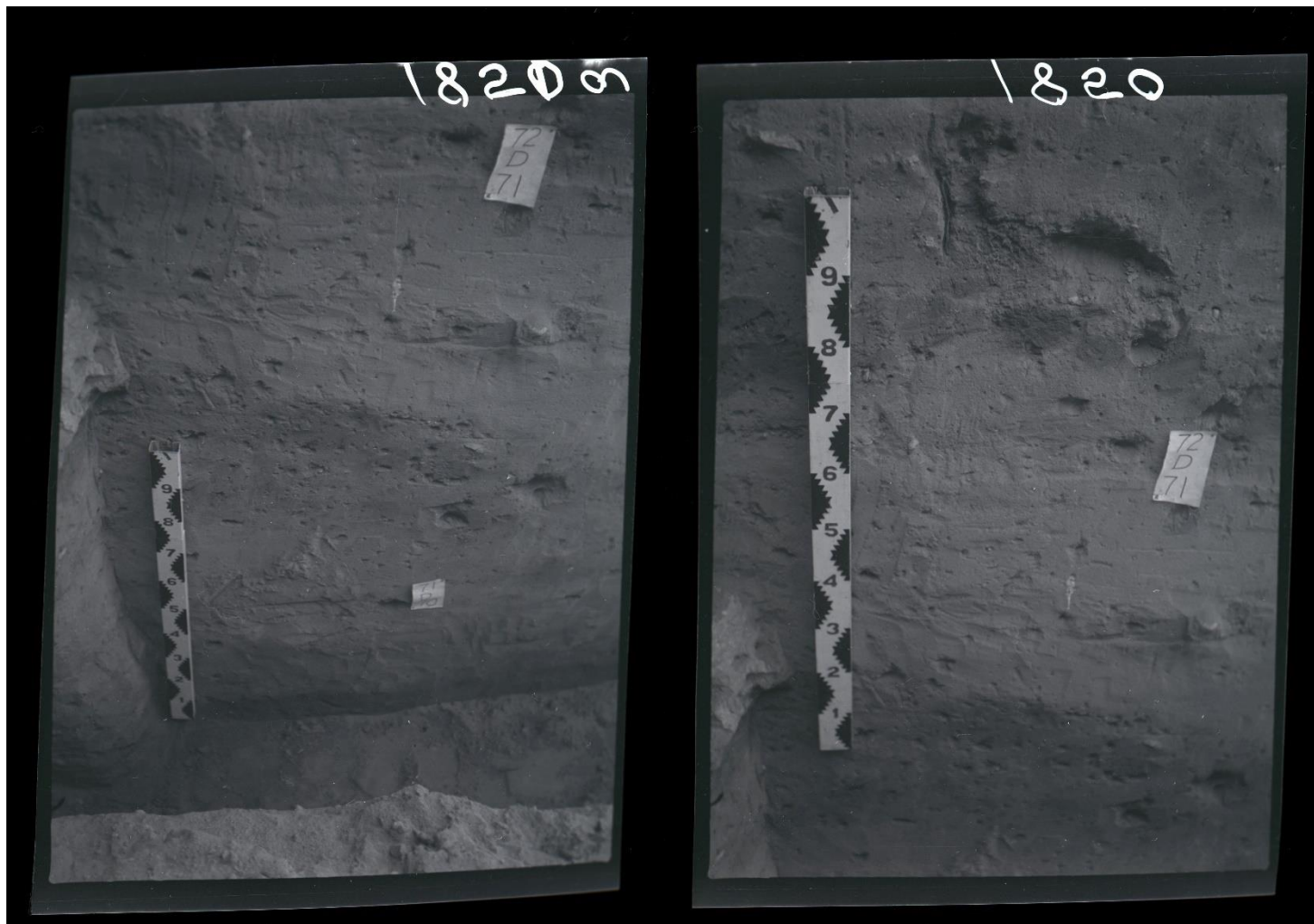


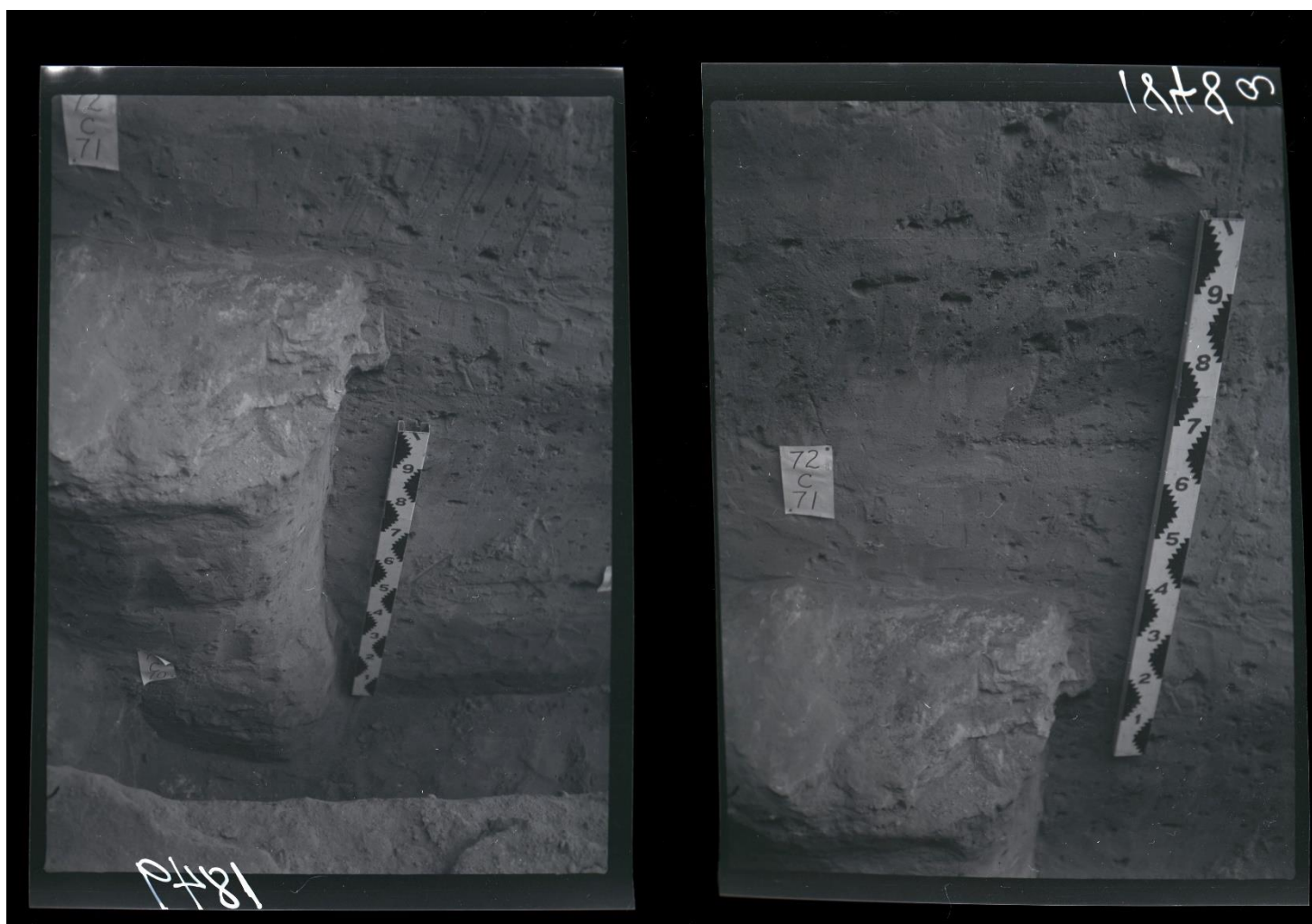


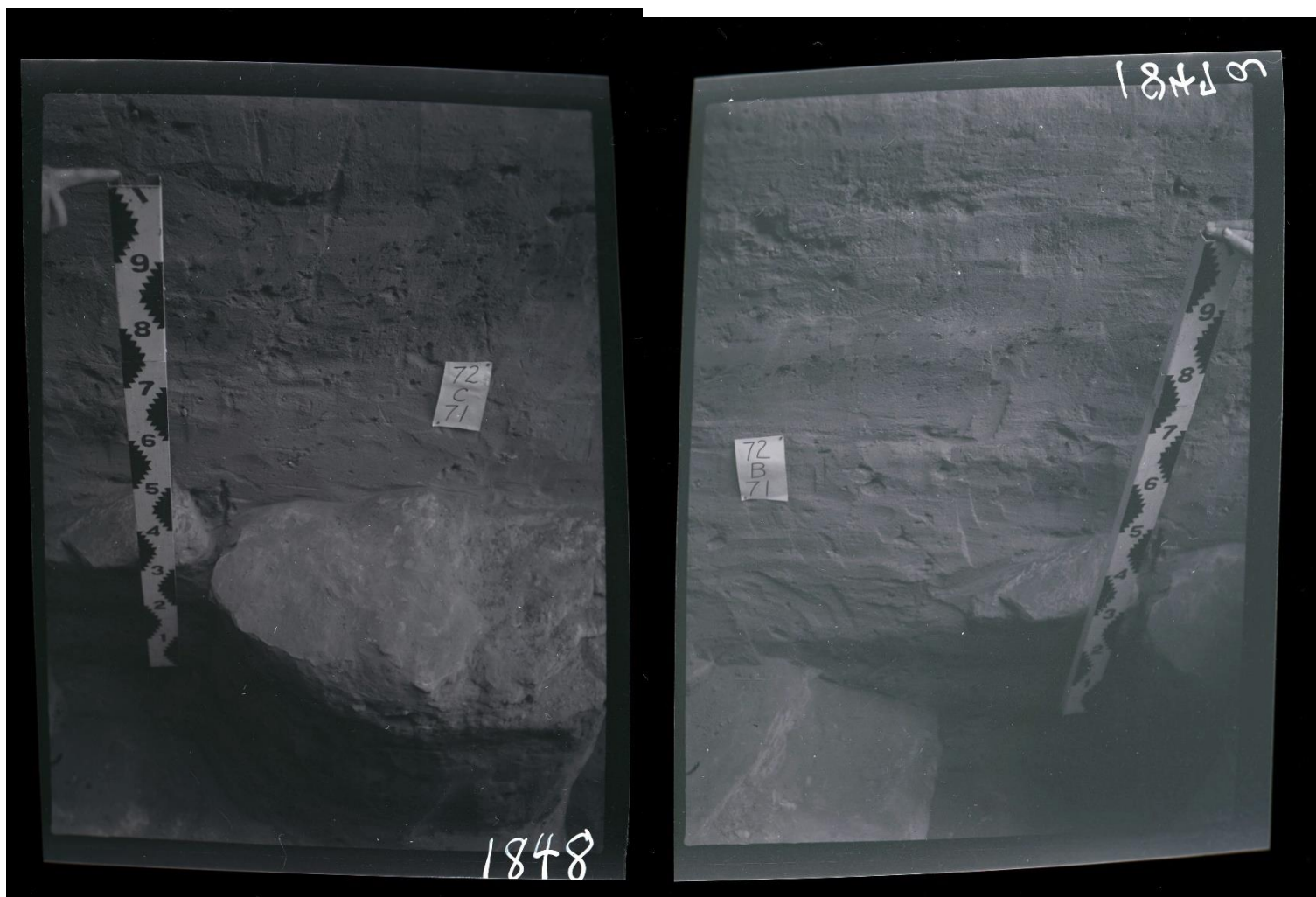


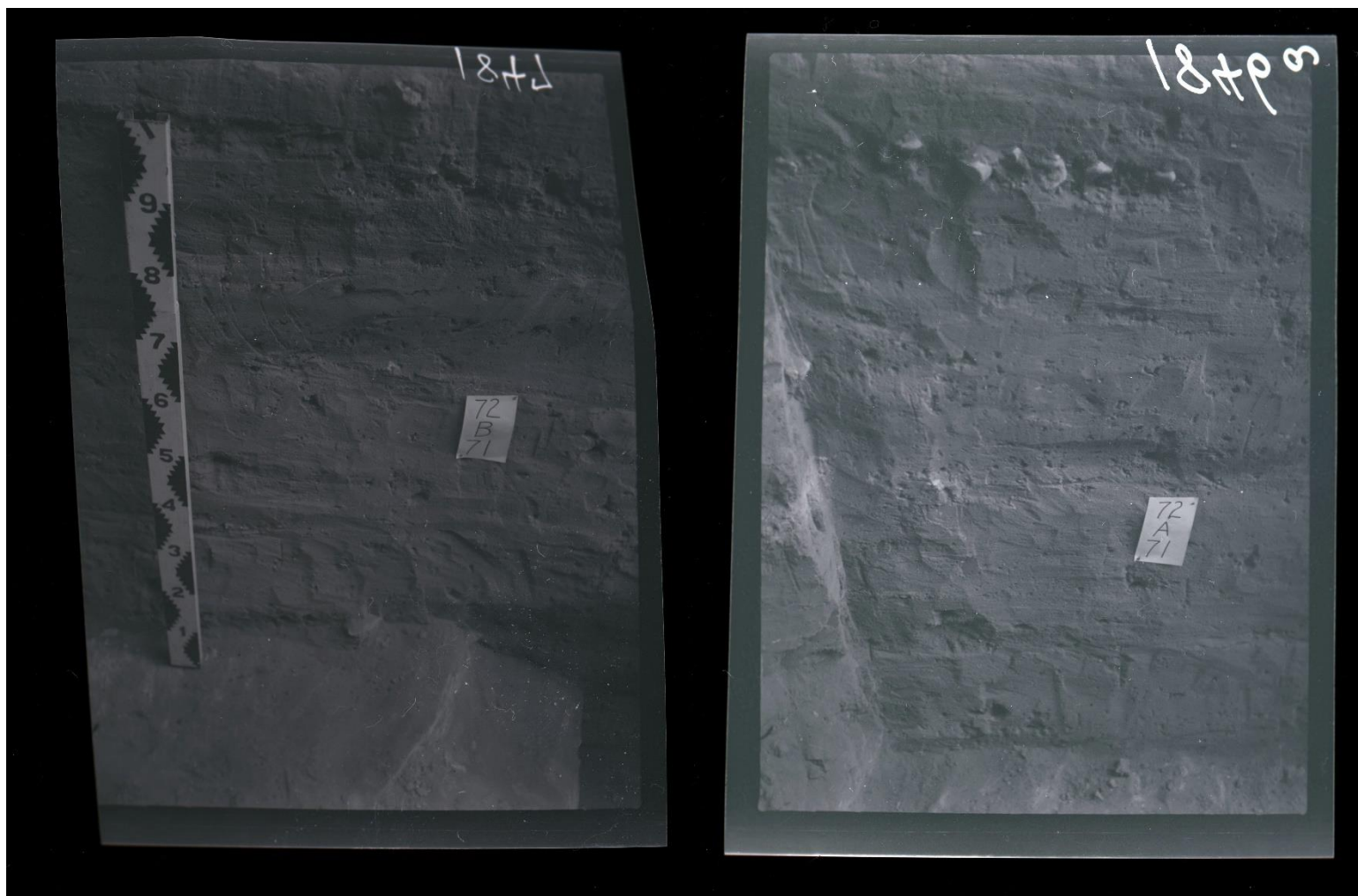


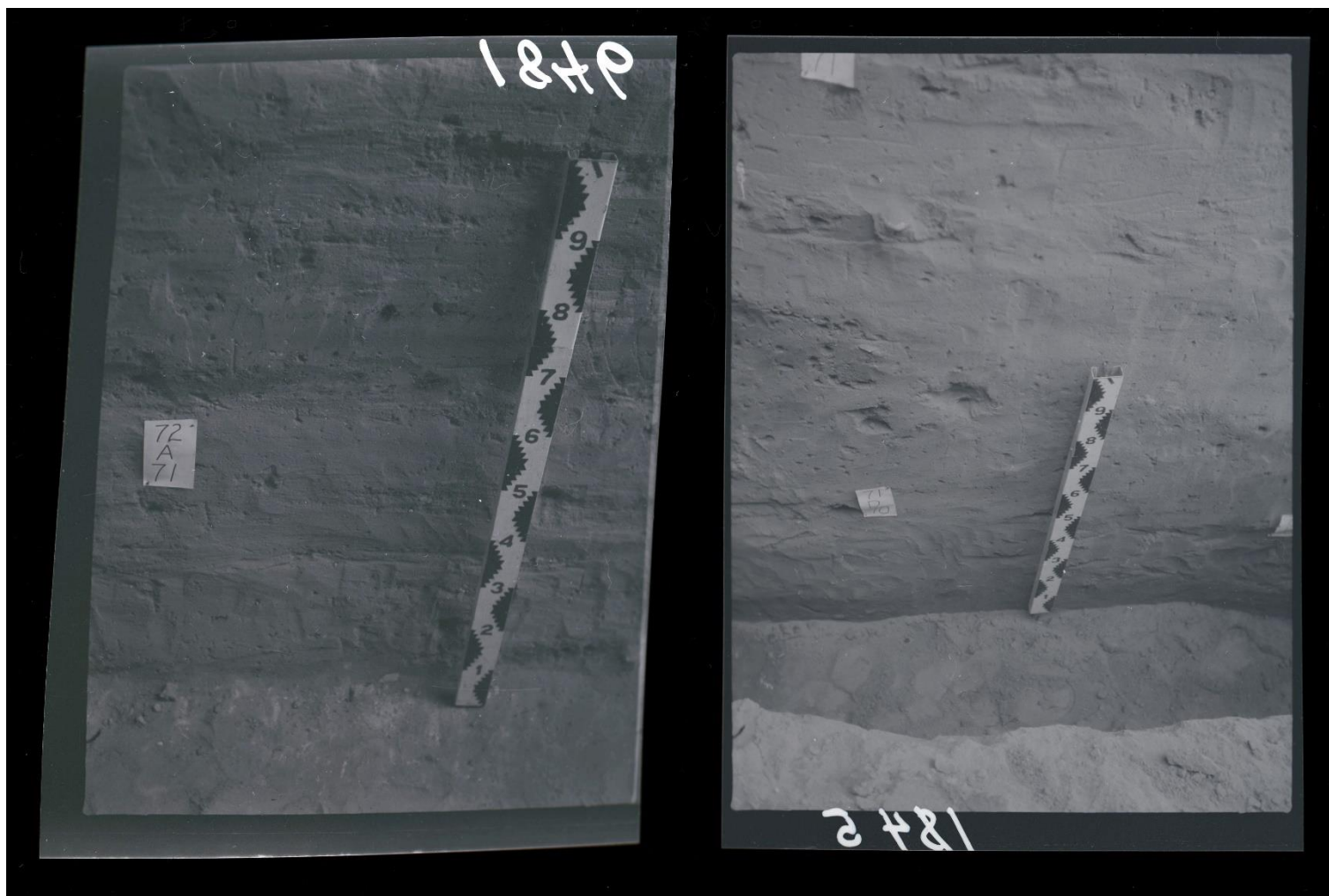




















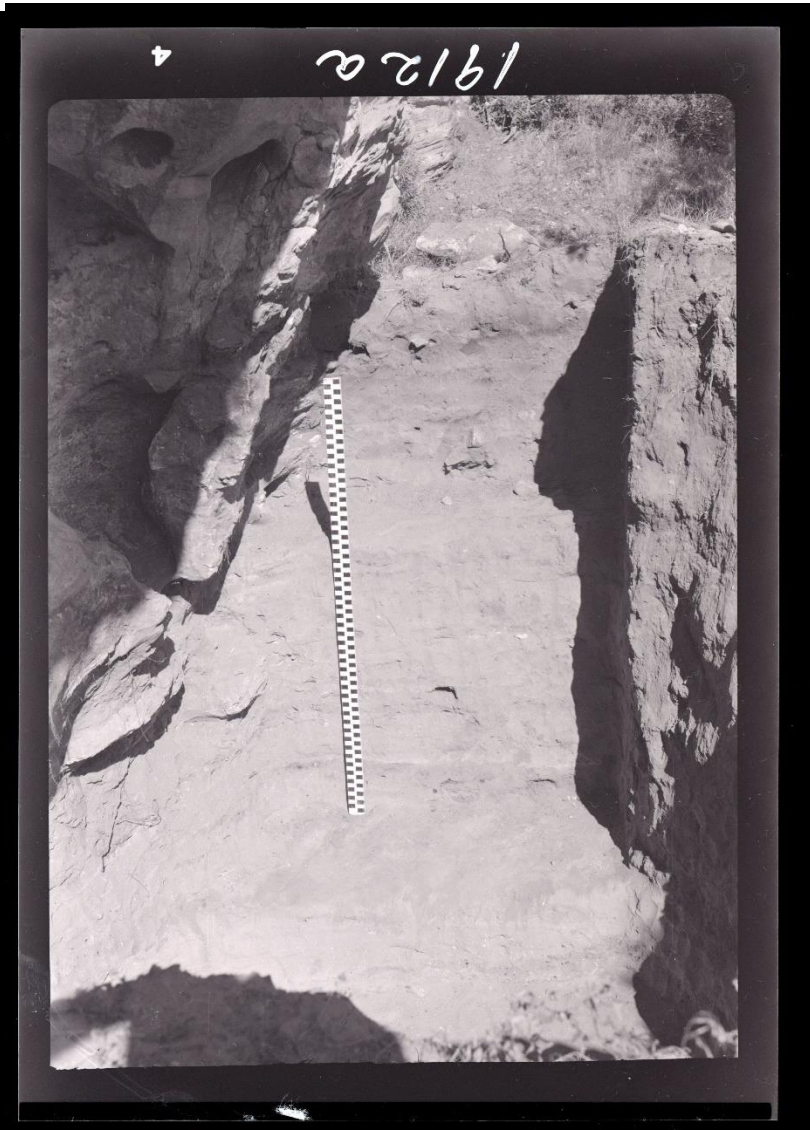
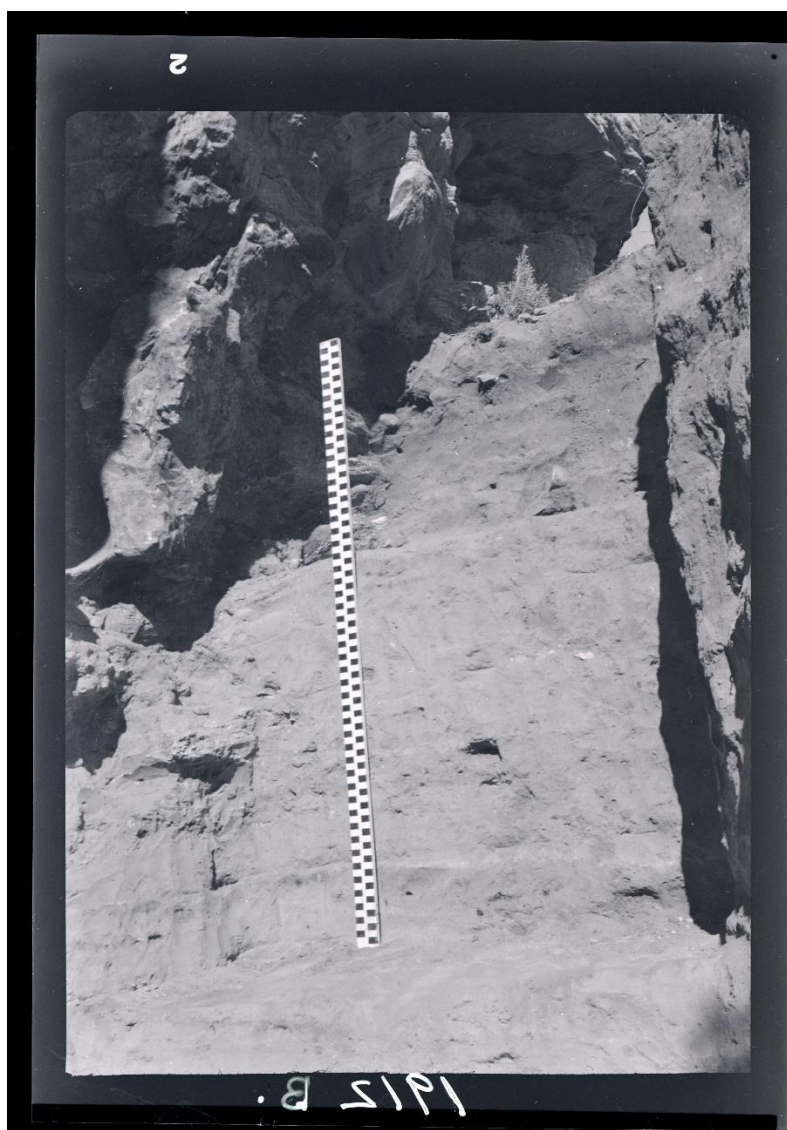


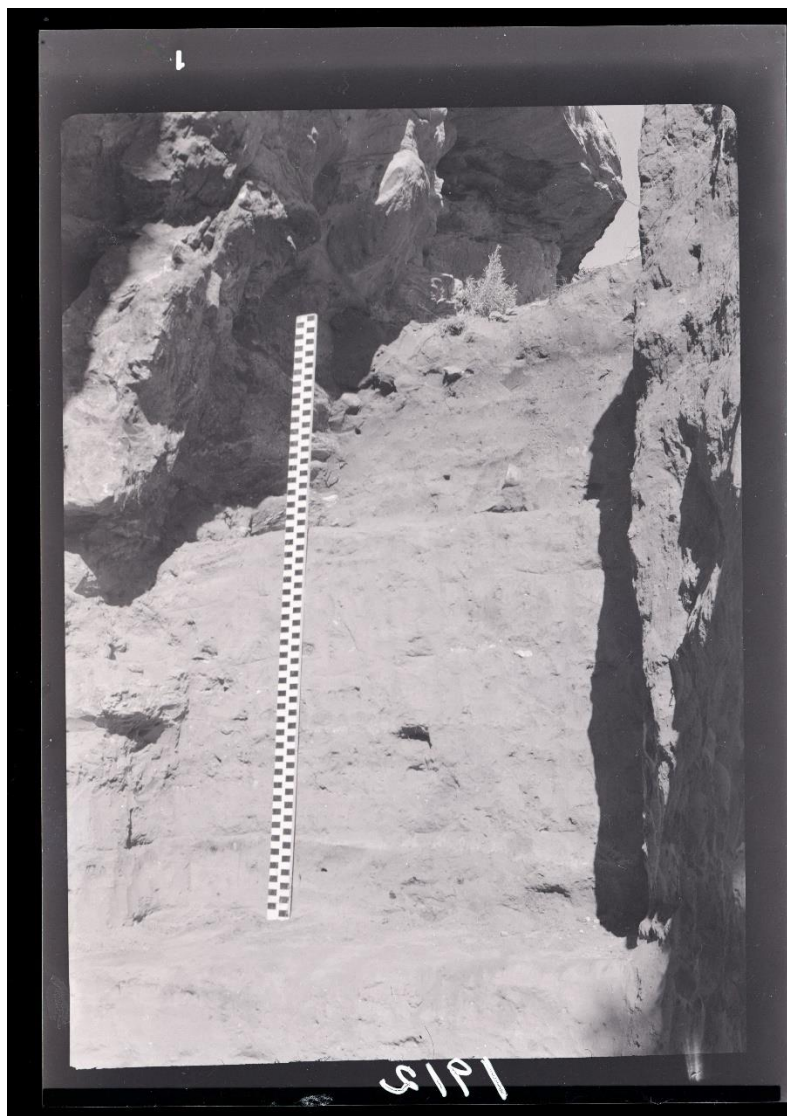


1831



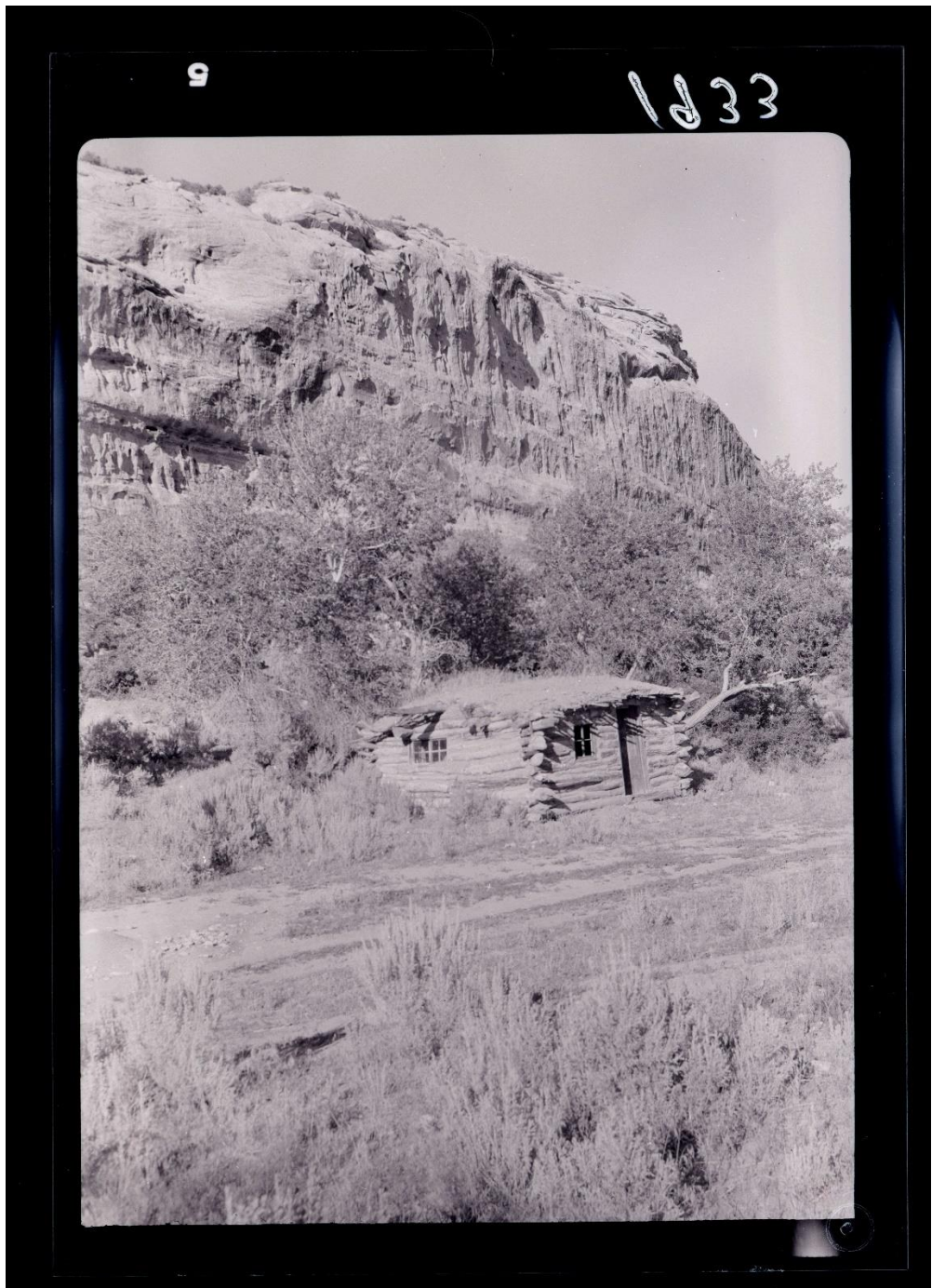
1949 Excavation photos







1949 Field Camp near the old Mantle cabin



Old Mantle Cabin



APPENDIX IV – DATASHEETS PRODUCED DURING LAB ANALYSIS

These are the data collected on chipped stone materials from the Hells Midden assemblage. Two ground stone data sheets will follow in this appendix. All entries are my own.

Portion was recorded as either tip (T), base (B), midsection (M), or lateral (L). Burning was assessed Y if it had more than one characteristic indicating it had been burned (such as crazing, potlidding, etc). Cortex was recorded as present (Y) or absent (N). Reworking was recorded as either total, meaning the morphology of the tool was greatly altered by reworking (YT), retouched, meaning edges were maintained or sharpened without significant alteration to shape (YR), no retouch (No), or indeterminate (IND). Class designations are explained in Appendix V.

Chipped stone artifact datasheet

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
5113	-	BFES	N	B	27.28	35.05	9.4	8	CCS-Pumpkin	D	Y	N	Cortex orange and worn, river cobble	
5197	-	FK	N	B	32.52	19.98	5.46	3.16	QZT-Red	Y	N	N	May be a preform, long, slightly excurvate edges	
5198	-	BP	N	B	13.65	14.05	4.23	0.69	QZT-Red	N	N	Ind	Concave base, corner notch expanding stem (ear not present)	

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
5199	-	BP	N	T	24.63	11.72	4.5	1.1	CCS-Pumpkin	N	N	N	Ind. point with sharply converging edges	
5200	-	SN	N	L	13.84	18.54	3.58	0.86	CCS-Oil	N	N	N		
5201	-	FP	N	T	25.34	18.57	3.44	1.09	CCS-Pumpkin	N	N	Ind	Likely a mallory, again owing to point angle and thinness; ind.	
5202	-	BP	N	T	22.58	18.2	3.2	1.1	CCS-Pumpkin	N	N	Ind	Very similar to 5201; slightly serated edges	
5203	-	BP	N	M	20.67	17.9	5.15	1.85	CCS-Pumpkin	Y	N	YT	Broken tip reworked to scraper, <1	
5204	-	FP	N	T	14.43	11.87	3	0.51	CCS-Black	Y	N	Ind	Ind., poorly made but could be obscured by fire	
5205	-	BP	N	B	19.8	24.6	4.12	2.34	CCS-White	N	N	N	Elko Corner Notch, convex base, slightly serated edges	
5206	-	BP	Y	-	53.61	21.06	7.39	8.36	CCS-Pumpkin	N	N	YR	Resharpener, removal of patina; type is a side notched, slightly expanding base, convex; excurvate edges	
5207	-	FK	N	B	19.48	16.09	3.18	1.46	QZT-Grey	N	N	N	Likely a preform or used point, edges unground but well-finished	
5208	-	BP	N	B	18.42	19.49	7.66	3.07	QZT-Bluegrey	N	N	Ind	Side notch, expanding stem, very very thick	
5209	-	FK	Y	-	100	28.2	6.6	24	QZT-Grey	Y	N	YR	Stemmed knife, similar to paleoindian point types; slightly assymetrical; very heavy wear on edges	
5210	-	DR	Y	-	36.15	34.55	4.98	3.19	CCS-Pumpkin	N	N	YR	Well-used hafted drill; notch preserved	
5211	-	BP	Y	-	30.06	16	5.4	2.18	CCS-Oil	N	N	N	Shallow corner notches	
5212	-	FK	N	L	30.29	19.1	3.02	1.83	CCS-Red	Ind	N	N	Unsure about this one, may be a point, basally thinned; could also be oriented the other way. An undifferentiated biface, for sure.	
5213	-	BP	Y	-	41.22	20.3	7.41	5.7	CCS-Pumpkin	N	N	N	Side ntoch, convex base, excurvate edges	
5214	-	FK	Y	-	56.64	23.61	7.95	10.18	QZT-Red	N	N	N		

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cms)
5215	-	BP	Y	-	49.81	27.48	5.38	5.77	QZT-Red	N	N	Y	Concave base, expanding stem corner notch; rounded ears and feet	
5216	-	BP	N	B	14.78	19.11	3.52	1	CCS-Translucent	N	N	N	Mallory-style	
5219	-	BP	N	B	31.47	29.67	6.69	7.7	CCS-Oil	N	N	N		
5220	-	BP	N	B	13.7	26.7	4.16	1.48	CCS-Bluegry	N	N	N	Mallory style base	
5221	-	BP	Y	-	45.28	21.2	4.89	3.74	CCS-White	N	N	N	Large square, concave, mallory-type. Edges unground, Side notched with long base, triangular; missing ~3mm of tip	
5222	-	BP	Y	-	38.8	25.2	6.67	7.51	QZT-Tan	N	Y	YT	Reworked tip to a scraper-like end; Side notched, slightly expanding base with cortex at most proximal end	
5223	-	BP	N	M	43.77	14.77	6.35	4.25	QZT-Tan	N	N	N	Long, lanceolate, split stem	
5224	-	FK	N	B	23.06	23.45	3.87	2.55	QZT-Mottled	N	N	N	Base of a preform or knife - squared biface	
5226	-	FP	N	M	23.05	18.48	3.48	1.6	CCS-Pink	Y	N	Ind	corner notched, contracting stem; broken at base and tip; neck with 7.8	
5227	-	BP	N	L	19.57	21.13	5.71	3	CCS-Grey	Y	N	N	Squared ear; ground stem	
5228	-	FK	Y	-	32	24.62	4.91	3.39	CCS-Red	N	N	IND	May have been reworked from elko PP	
5229	-	FK	N	M	20	14.34	4.08	1.36	QZT-Bluegrey	N	N	N	Squared razor size biface	
5230	-	SN	N	B	24.12	25.52	3.46	2.22	CCS-Pumpkin	N	N	YT	Likely rebuilt from a point, owing to corner notches; one edge reworked to large scraper angle	
5231	-	FK	N	B	12.85	21.54	3.67	1.39	CCS-Transparent	N	N	N	May be a point base, but no indication of notching/hafting	
5232	-	BP	Y	-	31.55	20.3	4.95	2.7	CCS-Pumpkin	N	Y	N	Side notch, rounded base, slightly rounded edges	
5233	-	BP	N	T	39.68	16.75	3.95	1.8	CCS-Mottled	N	N	N	Very finely FKkaed, comedial; one sharp ear	
5234	-	BP	N	T	19	9.6	2.73	2.2	CCS-Translucent	N	N	N	Corner notch, expanding base; both notches in tact, ears present, small and sharp	

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
5235	-	BP	N	B	29.7	24.24	4.2	3.77	QZT-Pumpkin	Y	N	N	Side notch, convex base, straight edges	
5236	-	BP	N	B	16.34	29.56	3.94	2.07	CCS-Pumpkin	N	N	N	elko Wide Corner notch, well-expressed ears, convex base expanding stem	
5237	-	BP	N	T	28.5	20	3.84	1.92	CCS-Pumpkin	N	N	N	Only tip, slightly excurvate edges	
5238	-	BP	Y	-	36.33	19.16	6.45	4.41	CCS-Bluegrey	N	Y	N	Side notch, slightly expanding base; built on FKake with cortex visible at most proximal edge	
5239	-	BP	Y	-	30.74	19.55	4.45	2.14	CCS-Pumpkin	N	N	N	Corner notch, sharp ears, thin stem (7mm)	
5240	-	FK	N	B	27	20.42	3.77	2.76	CCS-Mottled	N	N	N	May be a preform; edges feel ground	
5241	-	BP	Y	-	35.14	20.8	5.69	3.9	QZT-Pink	N	N	N	Side notch, expanding convex stem	
5242	-	UFT	N	B	18.39	24.83	6.6	2.95	CCS-Red	Y	N	N	Looks like a failed biface or knife; FKaking is non-intrusive	
5243	-	FP	Y	-	15.82	15.17	2.85	0.7	CCS-Red	N	N	YT	Mallory-like base, distal end apparently reworked to tiny point (~5mm notch-tip)	
5264	-	UFT	Y	-	32.6	46.51	8.18	8.5	CCS-Pumpkin	N	N	N	~42mm of cutting edge	
5265	-	BFES	N	T	53.25	40.15	13.45	24.69	CCS-Pumpkin	N	N	N		
5266	-	SN	N	T	35.77	42.95	11.54	16.93	CCS-Pumpkin	N	N	N		
5267	-	DEB	N	L	88	29.83	10.23	25.5	CCS-Oil	y	n	n		
5268	-	COR	Y	-	62.46	45.4	22.1	49.49	QZT-Bluegrey	IND	Y	N	Buff thin grey cortex	
5269	-	UFT	N	B	45	46.34	9.2	15.32	QZT-Red	N	N	N	~40mm of unifacial FKaking near bulb	
5270	-	BFES	Y	-	54.75	32.85	9.54	12.41	CCS-Red	Y	N	N	Heavily burnt, spalled an entire face off, nearly the entire edge intact	
5271	-	BFLS	N	B	36.3	52.78	11.41	24.62	CCS-Pumpkin	N	N	N		
5272	-	SN	Y	-	25.87	29.2	7.9	6.7	CCS-Pink	Ind	Y	N	Buff gray concrete-like cortex	
5273	-	BFLS	N	L	45.45	24.19	6.21	8.12	CCS-Pumpkin	Y	N	N		

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
5274	-	BFLS	Y	-	76.23	37.83	13.4	29.7	QZT-Red	N	N	YR	Retouch on tip; made by novice knapper owing to large mass at top	
5275	-	Core	Y	-	62.8	32.36	17.55	35.62	QZT-Red	N	N	N	Tested cobble	
5276	-	BFES	Y	-	52.61	43.2	9.5	22.73	CCS-GreyBanded	N	Y	N	Banded grey blue, buff orangish cortex, inclusions	
5277	-	FK	N	M	49.24	46	10.4	28.73	QZT-Red	N	N	N	Converging edges may suggest this is a point, but too massive and large	
5278	-	BFES	N	B	42.07	50.93	8.3	26.12	CCS-Oil	Y	N	N		
5279	-	BFES	N	T	35.5	33.84	11.5	14.1	CCS-Red	Y	N	N		
5280	-	BFLS	Y	-	53.38	37.81	10.46	20.47	CCS-Bluegrey	N	Y	N	Cortex is tan and buff; may be patination/oxidation as it appears over areas that appear to have been FKaked. Material has a buff luster	
5281	-	DEB	Y	-	57.74	30.2	4.8	6.888	CCS-Pumpkin	N	N	N	Contains patina on the dorsal side	
5282	-	BFES	N	B	19.33	33.18	7.57	5.11	CCS-White	N	N	N	-	
5283	-	DR	N	M	37.51	25.69	10.54	5.24	CCS-Pumpkin	N	N	N	Drill thickness 5.7mm - Expanding base, nonhafted	
5285	-	SN	N	T	38	32.5	13.25	12.5	CCS-Red	Y	N	N	Heavily burnt, 17.5mm if scraoer edge at distal end	
5286	-	BFLS	N	T	31.74	46.33	9.53	16.53	CCS-Bluegrey	N	Y	N	Cortex tan buff	
5287	-	DS	N	L	44.75	20.7	9.85	8.17	CCS-Oil	N	N	N		
5288	-	DEB	N	L	42.24	32.9	8.14	10.98	QZT-Transparent	Ind	N	N	May be an agate or similar chalcedony, somewhat coarse grain; also shows several failed percussion blows	
5289	-	BFES	N	L	31.71	36.72	10.75	14.27	CCS-Pumpkin	N	N	N		
5290	-	BP	N	T	41.8	32	10.7	11.22	CCS-Red	N	N	N	Very thick, sharp point, roughly finished edges	
5291	-	BFES	Y	-	60.89	34.43	14.5	23.58	QZT-Tan	N	N	N		
5292	-	BFLS	N	M	55.1	46.73	6.35	18.32	CCS-Pumpkin	Y	N	Y		
5293	-	BFES	N	T	19.75	22.72	6.93	3.01	CCS-Pumpkin	Y	N	N		

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
5294	-	BFLS	N	L	58.25	37.06	11.06	22.77	CCS-Banded	N	N	N	Petrified Wood	
5295	-	SN	N	T	28.63	27.75	5.6	5.21	CCS-Pumpkin	Y	N	N	Heavily burnt, ~3mm of working edge	
5296	-	BFES	N	T	22.3	32	8.84	7.78	CCS-Pumpkin	N	N	N		
5297	-	BFES	Y	-	47.56	45.5	20.3	40.12	CCS-Pumpkin	N	Y	N		
5298	-	FK	N	L	37.37	27.31	8.31	7.58	CCS-Pumpkin	Y	N	N	Well-worn edge	
5299	-	SN	N	L	40.2	46	5.86	11.78	CCS-Pumpkin	N	N	N	Heavily patinated with a white waxy layer. Only on one portion is this exteriorly opatinated bit remove	
5300	-	BFLS	Y	-	38.1	27.3	6.84	6.1	QZT-Grey	N	N	N		
5301	-	FK	N	T	27.34	18.53	5.18	2.81	CCS-Pumpkin	N	N	N		
5302	-	BFES	N	L	29.3	33	14.14	12.16	CCS-Bluegrey	Y	Y	N	Buff thin grey cortex	
5303	-	BFLS	N	B	31.78	41.27	5.77	9.56	CCS-White	N	N	N		
5304	-	BFES	N	L	35.3	12.83	10.95	4.07	CCS-Red	Y	N	N		
5305	-	DEB	N	L	18.22	16.66	4.2	1.04	CCS-Red	N	N	N		
5306	-	BFES	N	M	35.3	26.86	6.56	7.06	CCS-Red	Y	N	N		
5307	-	SN	N	T	42.34	38.67	9.32	18.12	CCS-Pumpkin	N	N	N		
5308	-	FK	N	B	28.83	21.21	5.19	3.56	CCS-Red	Y	N	N	May be a preform	
5309	-	BFLS	N	T	59.56	40	11.1	23.83	QZT-Red	N	N	N		
5310	-	DEB	Y	-	52.36	26.178	6.56	8.55	CCS-Pumpkin	N	Y	N		
5311	-	DEB	Y	-	38	26.19	7.19	7.43	CCS-Red	Y	N	N		
5312	-	UFT	Y	-	39.29	25.45	6.44	5.54	CCS-Red	N	N	N		
5313	-	DEB	Y	-	58.78	34.5	7.66	10.38	CCS-Pumpkin	N	Y	N		
5314	-	FK	Y	-	31.39	14.21	4.92	2.04	CCS-Pumpkin	Ind	N	YR	An exhausted knife, may be worn which suggests hafting	
5315	-	UFT	Y	-	97	29.7	9.86	23.97	QZT-Orange	N	Y	N	Black cortex; mottled material; very similar to a formal blade, struck from a core; if late may suggest use of increased core technology!!!!	

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
5316	-	BFES	N	L	19.75	34.88	6.55	4.24	CCS-Pumpkin	IND	N	N		
5318	-	FK	Y	-	41.46	18.98	4.69	3.02	CCS-Red	N	N	YR	An exhausted knife	
5319	-	DEB	N	B	26.29	32	9.18	5.83	CCS-Oil	ND	N	N		
5320	-	BP	N	T	18	20.33	4.41	1.18	CCS-Pumpkin	N	N	N		
5321	-	BFES	N	B	16.65	26.42	7.31	3.57	CCS-Mottledred	Y	N	N		
5322	-	FK	N	T	29.9	39.11	4.3	6.26	CCS-Pumpkin	N	Y	N		
5323	-	BP	N	T	25.75	12.7	2.76	0.48	CCS-Red	N	N	N	Finely made point tip	
5324	-	SN	N	T	38.5	41.23	10.6	21.65	CCS-Tan	N	N	N	A classic snubnose, very large, represents ~1/2 of the total tool	
5325	-	DEB	Y	-	35.95	32.33	2.7	2.1	OBS	N	N	N		
5326	-	BFES	N	L	37.1	22.37	11.85	7.59	CCS-Pumpkoin	Y	N	N		
5327	-	FK	N	B	23.7	17.5	4.75	2.18	CCS-Bluegrey	N	N	N		
5328	-	FK	N	L	41.3	28.66	4.36	5.33	CCS-Pumpkin	Y	Y	N	Cortex is a buff grey - these	
5329	-	FK	N	L	35.56	15.51	4.18	2.69	QZT-Tan	N	N	N		
5330	-	SN	Y	-	29.93	24.73	4.7	3.53	CCS-Pumpkin	N	N	N		
5331	-	UFT	N	B	20.38	18.7	2.75	1.22	CCS-Mottled	N	Y	N	Patinated, probably FKaked from an old FKake with patina	
5332	-	BFLS	N	T	41.53	38.21	9.25	14.66	QZT-Tan	N	N	N		
5333	-	Chi-tho	Y	-	59.19	52.85	7	36.1	Sandstone	N	N	N	FKaked around entire edge, a small stream cobble. Dorsal face worn likely from leather work	
5334	-	UFT	Y	-	34.93	30.22	3.55	4.52	CCS-Red	N	N	N	BEautifully banded material, red with black concentric ciercles	
5335	-	SN	Y	-	29.5	25.86	3.04	3.59	CCS-Tan	N	Y	N		
5336	-	UFT	N	T	17.34	21.6	4.6	1.98	CCS-Translucent	N	N	N		
5337	-	BFES	N	L	39.7	15.67	7.82	4.02	CCS-Bluegrey	N	N	N		
5338	-	BFES	N	L	50.81	20.6	10.5	9.66	CCS-Pumpkin	N	N	N		

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
5339	-	FK	Y	-	43.98	18.12	6.24	5.1	QZT-Grey	N	N	YR		
5340	-	BFES	N	L	47.12	24.65	8.78	10.93	CCS-Pumpkin	N	N	N		
5341	-	GR	N	L	35.42	27.94	7.6	9.63	CCS-Oil	N	N	N		
5342	-	FK	N	L	50.33	23.61	9.6	9.09	CCS-Red	N	Y	N		
5343	-	BFLS	N	B	14.36	23.22	5.3	1.95	CCS-Pumpkin	N	N	N		
5344	-	FK	N	L	27.27	19	3.72	1.57	CCS-Red	Y	N	N		
5345	-	UFT	N	L	42.1	25.48	6.6	5.31	CCS-White	N	N	N		
5346	-	BP	N	T	32.36	24.62	4.85	2.97	CCS-Grey	N	N	N	Unknown type, just a point tip	
5347	-	BFES	N	L	46.35	21.21	14	13.06	QZT-Pumpkin	N	N	N		
5348	-	BFLS	N	T	19	26.94	4.78	2.06	CCS-Pumpkin	N	N	N		
5349	-	BFLS	N	L	23.38	17.86	4.46	1.83	CCS-Red	Y	N	N		
5350	-	UFT	Y	-	28.68	21.33	7.98	5.22	CCS-Red	Ind	N	N		
5351	-	BP	N	T	16.5	17.5	3.56	0.87	CCS-Pumpkin	N	N	N		
5352	-	UFT	N	B	24.89	18.38	3.93	1.85	CCS-Red	N	Y	N		
5353	-	BFES	N	L	45.65	13.78	9.87	6.09	CCS-Red	IND	N	N		
5354	-	BP	N	T	36.77	16.2	3.9	2.04	QZT-Tan	N	N	N	Unknown type, just a point tip	
5355	-	DEB	N	L	22.06	16.7	5.06	1.76	CCS-Banded	N	N	N		
5356	-	FP	N	T	16.4	21.08	3.23	1.17	CCS-Pumpkin	N	N	N		
5357	-	BFLS	N	L	27.54	21.83	6.4	3.07	CCS-Red	Y	N	N		
5358	-	DEB	N	T	42.91	29.84	9.86	12.8	CCS-White	Ind	Y	N		
5359	-	BP	N	T	32.32	16.06	5.08	2.56	CCS-Grey	N	N	N		
5360	-	BFES	N	L	55.94	31.86	10.34	14.88	CCS-Pumpkin	Y	N	N		
5361	-	FK	N	T	37.8	25.53	7.44	5.96	QZT-Tan	N	N	N		
5362	-	DEB	Y	-	49.7	25.7	8.39	11.24	CCS-Pumpkin	N	Y	N		
5363	-	BP	N	T	34.43	19.91	5.05	2.67	QZT-Mottled	N	N	N		
5364	-	ANG	Y	-	25.67	17.14	7	2.5	CCS-Pumpkin	Y	N	N		

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmbs)
5365	-	DEB	N	M	24.9	51.21	5.09	7.54	CCS-Pumpkin	N	Y	N		
5366	-	BFES	N	L	31.64	17.78	9.09	4.39	CCS-Pumpkin	N	N	N		
5369	-	BFES	N	T	63.04	39.89	12.99	23.14	QZT-Grey	Y	N	N		
5370	-	BFES	Y	-	34.48	27.18	9.44	8.45	QZT-Tan	N	N	N		
5371	-	DEB	N	T	22	26.2	6.24	2.79	CCS-Pumpkin	N	N	N		
5372	-	SN	N	B	37.1	25.83	4.72	4.33	QZT-Red	N	N	N		
5373	-	FP	Y	-	29.95	18.54	5	1.88	CCS-Pumpkin	N	Y	N		
5374	-	FK	N	B	26.14	14.71	2.9	1.44	CCS-Pink	N	N	N		
5375	-	SN	N	B	27.91	21.04	5.46	3.07	CCS-Pumpkin	N	N	N		
5376	-	FK	N	L	18.46	16.27	3.28	1.06	CCS-Red	N	N	N		
5377	-	DEB	Y	-	38.63	28.22	4.57	4.72	CCS-Oil	N	N	N		
5378	-	BFLS	N	L	30.13	15.68	5	2.36	CCS-Oil	N	N	N		
5379	-	BFLS	N	M	12.96	16.94	5	1.07	CCS-Pumpkin	N	N	N		
5380	-	BP	N	T	22.22	13.22	2.77	0.79	CCS-Bluegrey	N	N	N		
5464	-	FK	N	L	43.1	18.81	4	3.46	QZT-Tan	N	N	YR		
5561	-	UFT	N	L	51.47	32.22	10.7	12.8	CCS-Pumpkin	N	N	N		
5562	-	DEB	Y	-	45.75	26.1	7.3	8	CCS-Pink	N	Y	N		
5563	-	Deb	Y	-	43.5	19.85	3.1	1.56	CCS-White	N	N	N	Beautiful multicolored chert	
5564	-	DEB	Y	-	40.44	23.33	4.3	3.3	CCS-Red	N	N	N		
5565	-	FK	N	T	64.26	44.59	8	20.8	QZT-Tan	N	N	N		
5566	-	UFT	Y	-	47.2	22	6.9	6.3	CCS-Red	N	N	N		
5567	-	COR	Y	-	64.37	40.24	20.67	42.6	QZT-Tan(Fossiliferous)	N	N	N		
5653		UFT	Y	-	85.05	43.13	8.5	21.56	CCS-Oil	N	N	N	Platform prep; Cutting edge along entire length, both edges	
5654		BP	N	T	44.68	30	5.46	5.07	CCS-Oil	Y	N	N	Heavily burnt; nondiagnostic tip	

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6196	-	BFLS	N	M	13.89	7.83	2.07	0.26	CCS-Pink	N	N	N	May be a point or a drill, too incomplete to tell	
6521	a	UFT	Y	-	70.34	46.6	12.65	38.14	CCS-Pumpkin	N	N	N		0-50
6521	b	FK												0-50
6521	c	DEB	Y	-	44.13	47.52	13.66	26.81	QZT-Red	N	N	N		0-50
6521	d	UFT	Y	-	47.86	29.14	4.9	5.44	CCS-Pumpkin	N	N	N		0-50
6521	e	UFT	Y	-	31.58	13.42	3.35	1.45	QZT-Red	N	N	N		0-50
6521	f	BP	N	T	21.2	25.77	5.68	2.56	CCS-Pumpkin	N	N	N		0-50
6521	g	DR	N	B	31.14	26.22	6.11	3.59	CCS-Pumpkin	N	N	N		0-50
6521	h	FK	N	L	23.62	19.56	4.1	1.76	QZT-Tan	N	N	N		0-50
6521	i	FK	N	L	40.95	24.33	6.68	6.08	CCS-Pink	N	N	N		0-50
6521	j	FK	N	B	20.97	15.84	3.7	1.22	CCS-Pumpkin	N	N	N		0-50
6521	k	UFT	N	B	11.98	17.47	2.25	0.53	CCS-Pumpkin	N	N	N		0-50
6521	l	UFT	Y	-	46.03	25.29	7.2	6.69	CCS-Oil	Y	N	N		0-50
6522	a	UFT	Y	-	45.09	23.19	3.35	4	CCS-Pumpkin	N	N	N		50
6522	b	UFT	N	M	15.83	25.62	7.35	2.98	QZT-Red	N	N	N	15.78 mm worked edge on one side	50
6522	c	BFES	N	T	38.01	58.29	16.3	30.1	CCS-Red	Y	N	N		50
6522	d	BP	N	B	30.18	21.82	5.72	3.72	CCS-Red	Y	N	N	Slight expanding stem, broad corner notch	50
6522	e	FP	N	B	27.75	30.81	5.51	5.15	CCS-Oil	N	N	YT	Expanding FK at base, corner notch	50
6523	a	BP	N	B	28.54	24.76	5.9	4.19	CCS-Pumpkin	Ind	N	Ind	Corner notch, expanding stem, squared shoulders and convex base, base thin, unground	50-120
6523	b	SN	Y	-	27	28	6.23	4.3	QZT-Red	N	N	YT	Heavily reworked from a corner notch, expanding base point into a scraper - HEAVILY polished from use, edge entirely ground smooth and surface polished - very well-curated artifact, unbroken	50-120

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmts)
6523	c	UFT	Y	-	35.21	21.25	3.5	2.34	CCS-Transparent	N	N	N		50-120
6523	d	UFT	Y	-	30.88	18.5	4.45	1.34	CCS-Pumpkin	N	N	N		50-120
6523	e	DS	N	B, L	26.61	16.71	2.4	1.25	CCS-Red	Y	N	Ind		50-120
6523	f	BFES	Y	-	81.79	53.57	20.44	80.1	QZT-Orange	N	N	N		50-120
6523	g	BFES	N	T	21.94	21.93	7.24	3.35	QZT-Grey	N	N	N		50-120
6523	h	BFES	N	M	17.85	44.23	9	6.76	QZT-Red	Ind	N	N		50-120
6523	i	BFES	N	B	18.58	24.78	6.67	2.7	CCS-Red	Y	N	N		50-120
6523	j	FP	Y	-	24.67	12.46	2.79	0.83	CCS-Red	Y	N	YT	Reworked to drill-like tip, heavily burnt; sharp shoulders and contracting stem	50-120
6523	k	UFT	N	B	20.54	20.6	3.69	2	CCS-Pumpkin	N	N	N	Squared base	50-120
6523	l	BFLS	N	B	28.92	27	4.19	4.56	CCS-Red	N	N	N		50-120
6523	m	FK	N	T	34.73	24.6	6	3.98	CCS-Red	Y	N	N	Heavily burnt, backed type with one edge ground	50-120
6523	n	BFLS	Y	-	17.96	10.57	3.74	0.55	CCS-Transparent	N	N	N		50-120
6523	o	FP	N	B	23	17.14	3.62	1.49	CCS-Pumpkin	N	N	N	Corner notch, expanding shallow base, sharp shoulders	50-120
6523	p	BP	N	B	21.92	10.96	3.45	0.86	CCS-Pink	N	N	N	Corner notch, slightly expanding stem, wide corner notches	50-120
6523	q	BP	Y	-	38.3	24.24	6.55	5.8	CCS-Black	N	N	N	Wide Corner notches, expanding stem, convex base	50-120
6523	r	BP	N	T	22.86	10.88	2.13	0.38	CCS-Grey	N	N	N		50-120
6523	s	FP	N	T	15.78	10.73	2.14	0.38	CCS-Red	N	N	N		50-120
6523	t	FP	Y	-	23.5	10	2.64	0.5	CCS-Mottledgrey	N	N	N	Expanding stem, convex base, lightly touched along edge to shape	50-120
6523	u	FK	N	B	27.5	15.42	4	1.74	CCS-Pumpkin	N	N	N	Razor biface; preform?	50-120
6523	v	BP	Y	-	34.41	20.21	5.12	3.06	CCS-Mottledred	N	N	N	Unnotched triangular type	50-120

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6524	a	FK	N	T	43.68	31	7.15	9.54	QZT-Red	N	N	N		50-120
6524	b	BP	Y	-	37.77	11.75	4.24	1.29	QZT-Tan	N	N	N		50-12
6524	c	FK	Y	-	17.5	11.43	2.84	0.53	CCS-Red	N	N	N		50-120
6524	a	BP	Y	-	29.5	19.09	5.14	2.5	CCS-Bluegrey	N	N	N	Side notch, FK at base tapers to feet (like a corner notch), excurve edges and rounded ears	50-120
6524	e	BP	N	-	14.63	11.5	1.78	0.26	CCS-Red	Y	N	N		50-120
6524	f	BP	N	T	12.67	10.24	2.74	0.35	CCS-Red	N	N	N		50-120
6524	g	FK	Y	-	23.35	11.57	3.13	0.7	CCS-Pumpkin	N	N	N		50-120
6524	h	FK	N	B	24.64	11.68	3.66	1.26	CCS-White	N	N	N		50-120
6524	i	BP	N	T	23.21	12.07	2.93	0.76	QZT-Red	N	N	N		50-120
6524	j	FP	N	T	14.74	13	2.59	0.54	CCS-Red	N	N	N		50-120
6524	k	BP	N	T	21.22	14.19	2.85	0.89	CCS-Pumpkin	N	N	N		50-120
6524	l	BP	N	B	37.13	16.77	6.37	4.02	CCS-Pink	Y	N	N		50-120
6524	m	FP	N	B	22.73	16.84	3.35	0.95	QZT-Red	N	N	N		50-120
6524	n	FK	N	B	28.5	18.66	4.24	2.76	CCS-Pumpkin	N	N	N		50-120
6524	o													50-120
6524	p	FK	N	B	32.1	16.29	4.11	2.53	QZT-Red	N	N	N		50-120
6524	q	FK	N	B	34.21	22.69	4.21	2.95	CCS-Pumpkin	N	N	N		50-120
6524	r	UFT	N	T	37.63	25.62	8.23	7.09	CCS-Red	N	N	N		50-120
6524	s	UFT	Y	-	31.95	18.83	4.67	2.73	CCS-Transparent	N	N	N		50-120
6524	t	UFT	N	B	41.3	20.69	4.3	3.15	CCS-Pumpkin	N	N	N		50-120
6524	u	FK	Y	-	54.69	25.79	6.98	9.25	CCS-Bluegrey	Y	N	N		50-120
6524	v	BP	N	B	35	25.85	8.24	6.39	CCS-Bluegrey	Y	N	N		50-120
6524	w	DS	Y	-	47.06	30.52	12.9	16.47	QZT-White	N	N	N		50-120
6524	x	FK	N	T	63.14	26.36	7.31	14.38	CCS-Oil	N	N	YT		50-120

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
6524	y	UFT	Y	-	40.69	34.83	14.88	20.16	CCS-Red	N	Ind	N		50-120
6524	z	ANG	Y	-	32.44	23.56	7.72	6.85	CCS-Oil	N	Y	N		50-120
6525	a	BP	N	L	32.61	25.57	7.75	7.38	CCS-Pumpkin	Ind	N	N	May be a knife, however there appears to be a notch below the worked edge; similar to 6525.s.	50-120
6525	b	UFT	N	T	40.14	25.25	6.53	6.1	QZT-Tan	N	N	N	utilized edge (14.5mm)	50-120
6525	c	BFLS	N	B	25.57	24.3	5.64	3.34	CCS-Pumpkin	N	N	N	Squared biface; wear along one face	50-120
6525	d	FK	N	M	53.61	51.33	8.44	23.97	QZT-Orange	N	N	N	Large, edge retouch percussion	50-120
6525	e	BFES	N	B	34.64	25.41	6.09	6.63	CCS-Mottledtan	N	N	N	Squared biface with some wear on edges	50-120
6525	f	FP	N	T	23.88	12.88	2.2	0.53	CCS-Red	N	N	N	Finely FKaked point, unifacial primarily	50-120
6525	g	BP	N	T	20.86	16.09	4.3	1.07	CCS-Red	N	N	N		50-120
6525	h	BFES	N	T	35	12.51	5.01	2.51	QZT-Red	N	N	N	May be drill? Unlikely to be a point tip due to narrow width	50-120
6525	i	UFT	Y	-	43.82	22.05	8.58	6.23	CCS-Pumpkin	Y	Y	N		50-120
6525	j	UFT	N	M	17.32	14.76	2.77	1.23	CCS-Bluegrey	N	N	N	Unifacially worked; may be preform blank	50-120
6525	k	BFES	N	L	55	34.5	18.83	22.23	CCS-Pumpkin	Y	n	N	Angular breakage makes assesment difficult	50-120
6525	l	BP	N	T	37.26	20.83	5.21	3.71	CCS-Bluegrey	N	N	N	Nondiagnostic, straight converging edges; random FKaking	50-120
6525	m	FP	N	T	13.51	8.08	1.66	0.23	CCS-Red	N	N	N		50-120
6525	n	DR	Y	-	77.43	16.7	8.5	9.81	CCS-Bluegrey	N	Y	N	Handheld drill tool; shape suggests formal core technology	50-120
6525	o	FK	N	T	31	20.48	4.35	3.5	CCS-Pink	N	N	N	Has similar crescentic shape to other knives in collection	50-120
6525	p	FK	N	B	21.4	18.75	4.04	2.01	CCS-Pink	N	N	N	Squared biface type; so	50-120
6525	q	BP	N	T	26.57	20.87	3.82	2.11	QZT-Red	N	N	N		50-120
6525	r	UFT	N	B	42.41	15.87	2.74	2.53	CCS-Red	Y	N	N	Heavily burnt; shape suggests formal core, as with xxx.N	50-120

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
6525	s	BP	N	M	24.43	40.91	7.19	8.16	CCS-Pumpkin	N	N	N	Large point, broke above notches; notches appear perpendicular to orientation, but may be corner notched as well	50-120
6525	t	UFT	Y	-	39.1	20.07	4.28	3.26	CCS-Bluegrey	N	Y	N		50-120
6525	u	UFT	N	T	24.18	19.87	4.5	1.52	QZT-Bluegrey	N	N	N	Material too coarse to say confidently where modification has occurred	50-120
6525	v	BP	N	L	30.56	27.45	5.05	4.18	CCS-Bluegrey	Ind	N	N	May be transverse impact break at tip or result of burning	50-120
6525	w	DEB	Y	-	29.08	16.41	3.28	1.17	QZT-Orange	N	N	N		50-120
6525	x	GR	Y	-	43.13	16.04	8	4.5	CCS-Oil	N	N	N	Poor FKaking, wear on distal end suggests it may have been used as a graver/awl	50-120
6526	a	UFT	N	B	56.74	36.32	5.57	8.98	QZT-Red	N	N	N		12-24in
6526	b	UFT	Y	B	32.04	19.69	5.69	3.38	CCS-Pumpkin	N	N	N	Modified uniaxially on one edge, similar to denticulate	12-24in
6526	c	UFT	N	B	18.78	19.13	3.33	1.05	CCS-Red	Y	N	N	Heavily burnt	12-24in
6526	d	BFES	N	T	26.9	21.4	7.1	2.97	CCS-Pumpkin	N	N	N		12-24in
6526	e	UFT	N	T	30.71	33.47	11.81	11.7	CCS-Bluegrey	Y	Y	N	Moderately worked along distal end	12-24in
6528	a	BP	N	T	12.72	10.93	2.86	0.37	CCS-Pink	N	N	YR	Nondiagnostic tip	
6528	b	BFLS	N	B	22.29	21.85	5.86	3.47	CCS-Red	N	N	N		
6528	c	FP	Y	-	41.17	17.82	4.44	2.62	CCS-Pumpkin	N	N	YR	Expanding convex base, corner notch	
6528	d	BFES	Y	-	72.21	26.04	14.76	24	CCS-Bluegrey	N	N	YR	Patina forming; may be a borer or drill for large wood pieces, extensive where - somewhat denticulate along the edges	
6528	e	UFT	N	B	31.08	23.17	4.05	3.15	CCS-Red	N	N	N	EM along one edge entire length	
6528	f	FK	N	B	35.49	16.68	4.47	2.28	CCS-Red	N	N	N	May be a preform, long guitar pick shape	
6528	g	FK	N	T	24.23	20.09	5.67	3.09	CCS-Red	N	N	YR		

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
6528	h	FP	N	T	15.78	14.02	4.44	0.76	CCS-Bluegrey	N	N	N	Nondiagnostic tip	
6528	i	BP	N	L	33.58	16.37	5.87	2.24	CCS-Bluegrey	Ind	N	YR	Expanding convex base, corner notch	
6528	j	FK	N	T	30.12	16.63	3.54	1.78	CCS-Bluegrey	N	N	N	May be preform, point not well defined; no wear on edge	
6528	k	GR	N	B	28.93	11.58	4.53	1.45	CCS-Mottledred	N	N	N	Odd graver tip on a squared biface base, set at an angle to base	
6528	l	BP	Y	-	30.6	11.77	3.35	0.97	CCS-Grey	N	N	N	Corner notch expanding base	
6528	m	FK	N	T	55.6	43.6	8.34	20.67	QZT-Orange	N	N	YR	"Backed knife" crescentic shape	
6528	e	FK	Y	-	37.18	13.87	4.26	1.9	QZT-Red	N	N	N	Preform, built on FKake; labeled e, though e already logged for this number	
6529	a	UFT	Y	-	43.8	31.44	10.3	10.72	CCS-Pumpkin	N	N	N	Worked portion: 25.3mm and 38mm	50-85
6529	b	FK	N	B	24.23	19.9	6.85	3	CCS-Pink	N	N	N	Very thin along edge-"Squared biface" type; not heavily worn on edges	50-85
6529	c	BP	N	T	28.77	12.1	2.97	0.89	CCS-Red	N	N	N	Nondiagnostic, straight converging edges	50-85
6529	d	BFLS	N	T	18.65	16.3	3.46	0.92	CCS-Pumpkin	N	N	N	Nondiagnostic, straight converging edges	50-85
6529	e	BP	N	T	24.34	14.6	3.66	1.48	CCS-Pink	N	N	N	Nondiagnostic, straight converging edges	50-85
6529	f	FK	N	T	27.04	28.91	5.05	4.21	QZT-Tan	N	N	N	Same shape as those above - very patterned form	50-85
6529	g	BFES	N	L	25.4	11.08	5.28	1.26	QZT-Bluegrey	N	N	N	Too small to class well	50-85
6529	h	FP	Y	-	25.59	12.74	2.31	0.76	CCS-Red	N	N	N	Socket base, ears at 90 to stem	50-85
6529	i	FP	Y	-	29.59	14	3.65	1.37	QZT-Red	N	N	N	Likely a preform; guitar pick	50-85
6529	j	FP	N	T	15.92	10.32	2.55	0.39	CCS-Pumpkin	N	N	N	FKake point, nondiagnostic	50-85
6529	k	BP	Y	-	24	12.13	4.66	1.08	CCS-Pink	N	N	N	Stemmed point	50-85
6529	l	FK	N	B	14.5	15.05	4		CCS-Pumpkin	N	N	N	Deep red, squared biface type, moderate wear on edges. Well FKaked	50-85

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6529	m	FK	N	L	40.84	22.32	6.84	5.74	CCS-Tiger	N	Ind	N	Incredible tiger- emf, very well worked edge	50-85
6529	n	UFT	N	B	35.71	19	5.3	4.29	QZT-Red	N	Y	N	Worked edge along both entire length	50-85
6529	o	UFT	Y	-	33.65	17.37	5.25	2.51	CCS-Pumpkin	N	N	N	Utilized edge along entire length on one edge, 19.5m of modification on the other end	50-85
6529	p	UFT	N	T	34.8	24.52	6.92	5.84	CCS-Pumpkin	N	Y	N		50-85
6529	q	BFES	Y	-	42.86	30.36	13.56	18.53	QZT-Bluegrey	N	N	N		50-85
6529	r	BFES	Y	-	34.93	27.64	8.28	8.65	CCS-Red	N	N	N		50-85
6530	a	UFT	N	L	35.01	18.73	4.45	3.03	QZT-Red	N	N	N		85-120
6530	b	FK	N	B	19.74	11.19	3.66	0.89	QZT-Red	N	N	N		85-120
6530	c	FP	N	T	19.77	17.79	2.45	0.85	CCS-Pumpkin	N	N	N		85-120
6530	d	FK	Y	-	32.71	20.03	6.18	3.39	QZT-Bluegrey	N	N	N		85-120
6530	e	FK	N	B	24.1	10.84	3.24	0.83	CCS-Red	N	N	N		85-120
6530	f	FK	N	B	22.26	13	5.13	1.41	QZT-Bluegrey	N	N	N		85-120
6530	g	FK	Y	-	34.33	11.08	3.8	1.5	QZT-Red	N	N	N		85-120
6530	h	BFES	N	B	37.06	20.92	7.21	4.65	CCS-Red	Ind	N	N		85-120
6530	i	FP	N	B	25.25	12.57	2.46	0.72	CCS-Pumpkin	N	N	N		85-120
6530	j	UFT	Y	-	43.41	24.23	9.4	8.34	CCS-Pumpkin	N	Y	N		85-120
6531	a													85-120
6531	b	DS	N	T	29.36	30.86	8.14	7.1	CCS-Pumpkin	Y	N	N		85-120
6531	c	BFES	N	L	34.2	20.48	6.7	5.37	CCS-Black	N	Y	N		85-120
6531	d	BP	N	T	14.06	11.24	2.89	0.39	CCS-Red	N	N	YR		85-120
6531	e	FP	Y	-	33.74	13.6	3.16	1.05	CCS-Pumpkin				Sharp ears, corner notch, expanding base	85-120
6531	f													85-120
6531	g	BFLS	N	L	36	17.32	4.4	3.43	CCS-Oil	N	N	N		85-120

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
6531	h	FP	N	T	22.6	11.75	1.75	0.37	QZT-Red	N	N	N	Serrated tip	85-120
6531	i													85-120
6531	j	FK	N	B	34.33	23.41	5.42	4.72	CCS-Pumpkin	N	N	N		85-120
6531	k	FK	N	T	21.51	13.86	3.83	1	CCS-Pumpkin	N	N	YT		85-120
6531	l	BP	N	B	50.17	25.58	6.38	9.08	CCS-Pumpkin	Y	N	YR	Expanding stem, convex base, wide notches	85-120
6531	m	FK	Y	-	51.43	27.1	5.47	7.99	CCS-Bluegrey	N	N	N	Built on FKake, platform visible	85-120
6531	n													85-120
6531	o	BFLS	N	M	22.43	19.25	4.69	1.85	CCS-Red	Y	N	N	Very fragmentary along edge owing to burning; may be a projectile point but too broken to tell	85-120
6531	p													85-120
6531	q													85-120
6531	r	BP	N	T	20.71	12.58	3.34	0.78	CCS-Oil	Y	N	N	Corner notch on one piece, may be a knife	85-120
6532	a	UFT	Y	-	51.38	36.6	8.29	11.87	CCS-Bluegrey	N	N	N	Entire length, both edges	85-120
6532	b	DR	Y	-	58.8	20.66	12.98	11.81	QZT-Tan	N	N	N	Handheld borer/drill - worn at distal end	85-120
6532	c	FK	N	L	66.76	31.23	5.83	11.22	CCS-Red	N	N	YR		85-120
6532	d	BP	Y	-	45.41	19.95	5.23	4.07	CCS-Pumpkin	N	N	YR	Similar to x,y,l - Corner notched expanding convex base	85-120
6532	e	UFT	N	T	27.46	19.01	6.1	2.15	CCS-Mottledred	N	N	N	16mm worked edge	85-120
6532	f	BFLS	Y	-	42.1	19.47	3.9	4.06	CCS-Red	N	Y	N	Small inclusions on highs are presumed to be cortex; artifact may be a preform	85-120
6532	g	BFLS	N	B	28.92	29.99	4.44	3.85	CCS-Red	Y	N	N	May have been hafted with a broad base and shallow side notch - not patterned enough to say for sure	85-120
6532	h	DEB	N	B	13.64	19.29	2.5	0.66	QZt-Red	N	N	N		85-120

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6532	i	BP	N	B	23.92	20.33	3.96	2.33	CCS-Bluegrey	Y	N	YR	Same as x&y, Corner notch, convex base	85-120
6532	j	BFLS	N	M	29.09	63.39	9.1	16.95	CCS-Red	Y	N	N		85-120
6532	k	BFES	N	T	49.69	38	7.77	10.53	CCS-Mottledtan	Ind	N	N		85-120
6532	l	UFT	Y	-	46.4	31.6	3.98	4.71	CCS-Pumpkin	N	N	N	Entire length, one edge	85-120
6532	m	UFT	N	B	15.86	18.43	3.83	0.91	QZT-Red	N	N	N	Entire length, both edges	85-120
6532	n	FK	N	M	17.78	29.42	5.69	2.66	CCS-Pumpkin	N	N	N	May have been PP	85-120
6532	o	DEB	Y	-	31.42	28.04	6.92	4	CCS-Pumpkin	Y	N	N		85-120
6532	p	BFES	Y	-	38.52	30.81	11.78	15.55	CCS-Bluegrey	N	Y	N		85-120
6532	q	UFT	Y	-	29.66	20.21	4.44	3.24	CCS-Mottledred	Y	N	N		85-120
6532	r	UFT	Y	-	38.06	21.06	5.45	3.29	QZT-Red	N	N	N	Entire length, both edges	85-120
6532	s	UFT	N	T	41.29	20.35	5.82	4.43	CCS-Red	Y	N	N		85-120
6532	t	UFT	Y	-	38.49	31.74	9.47	7.75	CCS-Red	Y	N	N	Entire length, both edges	85-120
6532	u	BP	Y	-	36.34	17.99	5.96	3.71	CCS-Pumpkin	Ind	N	YR	Wide side notches, small shoulders, convex base	85-120
6532	v	UFT	Y		45.71	25.69	3.44	4.4	QZT-Red	N	N	N	Prepared platform; modified along entire length, both sides	85-120
6532	w	DR	N	T	22.67	9.12	5.15	1.07	CCS-Bluegrey	N	N	N		85-120
6532	x	BP	N	L	19.77	11	2.86	0.58	CCS-Bluegrey	N	N	YR	Corner notch - only ear present	85-120
6532	y	BP	N	L	35.82	19.12	3.41	2.02	CCS-Pumpkin	Y	N	YR	Corner notch, angular ear, convex base	85-120
6532	z	BFLS	N	L	24.05	23.15	5.39	2.57	CCS-Bluegrey	Y	N	N		85-120
6533	a	FK	N	B	77.9	59.26	10.03	47.02	QZT-Tan	N	N	Ind		85-120
6533	b	DS	Y	-	34.28	21.55	8.71	5.18	CCS-Red	N	N	N		85-120
6533	c	BP	N	T	19.16	12.31	3.34	0.76	CCS-Bluegrey	N	N	N	Nondiagnostic tip	85-120
6533	d	GR	Y	-	53.85	18.88	5.68	5.83	CCS-Red	Y	N	YR	Unifacial modification along entire circumference	85-120

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
6533	e	BFLS	N	B	24.18	15.76	3.93	1.78	CCS-Bluegrey	N	N	N		85-120
6533	f	DEB	Y	-	84.9	17.35	9.8	12.67	CCS-Pumpkin	N	Y	N	No modification or utilization of the end, this shows preparation of platforms and careful removal of blades from cores; cortex is white, buff, and hard	85-120
6533	g	UFT	N	B	51.14	26.09	5.71	7.31	CCS-Bluegrey	N	N	N	34mm on one edge; 22mm	85-120
6533	h	DEB	Y	-	41.59	32.71	9.36	9.34	CCS-Pumpkin	N	N	N	Unmodified	85-120
6533	i	FK	N	T	29.64	26.72	4.53	3.04	CCS-Pink					85-120
6533	j	BFLS	N	B	35.98	35.44	8.69	10.79	QZT-Tan	N	N	N		85-120
6533	k	UFT	N	B	29.54	21.97	3.78	2.19	CCS-Pumpkin	N	N	N	Worked along entire edge, both sides	85-120
6533	l	BFES	Y	-	35.45	27	6.77	6.36	CCS-Oil	Y	N	N		85-120
6533	m	BP	N	M	24.49	12.67	4.17	1.1	CCS-Pumpkin	Y	N	N	Massively burnt - barbed ears downpointed, serated; no base or tip present	85-120
6533	n	FP	N	T	30.04	20.78	3.91	1.6	CCS-Pumpkin	Y	N	N	Barbed ear, slightly excurvate blade; only half of one notch present- contains needle point, apparently broken	85-120
6533	o	BP	N	T	15.9	18.62	2.98	0.87	CCS-Pink	N	N	N		85-120
6533	p	BP	N	B	49.8	18.67	8.69	8.2	Red QZT	N	N	N	Expanding base, wide side notched slightly expanding, slightly convex base; tip missing - broken from impact approx. 1 length missing	85-120
6533	q	BP	Y	-	26.2	16.95	4.2	1.75	CCS-Red	N	N	N	Corner notch, short ears, shallow notched, convex base, slightly expanding no feet	85-120
6533	r	DEB	N	B	16.22	19.72	3.23	1.03	CCS-Mottledred	Y	N	N		85-120
6533	s	BP	N	T	32.55	13.768	3.63	1.56	CCS-Grey	N	N	N	Nondiagnostic tip	85-120
6533	t	FP	Y	-	33.03	19.66	6.26	3.99	QZT-Red	N	N	N	Side notch, expanding convex stem; square shoulders, excurvate bladea	85-120

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6533	u	UFT	N	T	15.28	14.11	3.55	0.68	CCS-Red	N	N	N	Utilized on one edge, entire length	85-120
6534	a	UFT	N	T	25.88	25.32	4.15	3.14	QZT-Tan	N	Y	N	Converging edges	120-170
6534	b	FK	N	B	19.39	12.68	2.62	0.74	CCS-Pumpkin	N	N	N	Razor biface; preform?	120-170
6534	c	UFT	N	T	19.2	11.74	2.69	0.59	QZT-Red	N	N	N		120-170
6534	d	BP	Y	-	34.46	18.57	3.75	1.91	CCS-Red	N	N	N	Corner notch, expanding stem, convex base, sharp shoulders	120-170
6534	e	DEB	Y	-	28.26	12.84	1.46	4.17	CCS-Pumpkin	N	N	N		120-170
6534	f	FP	Y	-	25.4	10.7	2.67	0.5	CCS-Bluegrey	N	N	N	Rosegate	120-170
6534	g	BFES	Y	-	40.92	31.5	13.25	17.89	CCS-Red	N	Y	N	A tested cobble, bifacially worked	120-170
6534	h	BFES	Y	-	35.3	25.44	6.35	5.58	CCS-Bluegrey	N	M	N		120-170
6534	i	BFLS	N	B	31.36	31.43	7.15	6.75	QZT-Red	N	N	N	Built on FKake, platform visible	120-170
6534	j	FK	N	B	20	18	3.84	1.63	CCS-Red	N	N	N	Razor biface; preform?	120-170
6534	k	CH	Y	-	70.2	50.97	35.49	130.16	CCS-Red	N	Y	N	Heavily worn and hammered along edges, white material rubbed on high ridges - bone?	120-170
6534	l	FP	Y	-	23.27	12.62	2.98	0.67	QZT-Red	N	N	N	Corner notch, expanding stem, FKat base, sharp shoulders	120-170
6535	a	UFT	Y	-	54	55.65	10.55	29.14	QZT-Tan	N	Y	YR	All edges utilized, entire length and width	120-150
6535	b	DS	Y	-	93.7	62.64	18.89	117.76	QZT-Red	N	N	N	Well worn - type specimen of denticulate scrapers	120-150
6535	c	BFLS	N	L	69.45	26.5	8.81	16.52	CCS-Pumpkin	Ind	N	N	Well worn on edges	120-150
6535	d	FK	N	T	41.82	30.43	6.44	7.49	QZT-White	N	N	N	Well worn edges, may reflect material quality and not use wear	120-150
6535	e	BFLS	Y		56.63	35.62	6.73	12.39	CCS-Pumpkin	N	N	YR	Glued	120-150
6535	f	BP	N	B	29.05	28.74	4.72	4.44	CCS-Pumpkin	N	N	N	FKat base, corner notch, prominent barbed ears	120-150
6535	g	BFES	N	L	33.47	23.68	8.78	5.67	CCS-Pumpkin	Ind	N	N		120-150
6535	h	BFES	Y	-	49.95	40.97	15.36	31.08	CCS-Red	N	N	N	Well worn	120-150
6535	i	UFT	N	B	33.18	29.49	10.22	12.15	CCS-Pumpkin	Ind	N	N		120-150

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cbs)
6535	j	BFLS	N	B	37.59	41.53	5.39	8.46	CCS-Pumpkin	Ind	N	N	Patina'd	120-150
6535	k	BFES	N	L	34.89	18.75	8.6	4.98	CCS-Red	Y	N	N		120-150
6535	l	BFLS	N	T	20.15	25.73	6.42	8.47	CCS-Pumpkin	N	N	YR		120-150
6535	m	BFLS	N	L	33.92	30.88	5.65	5.33	CCS-Red	Y	N	N	Massively burnt, transverse break	120-150
6535	n	BP	N	T	34.45	21.05	7.47	4.43	CCS-Red	N	N	N	Nondiagnostic tip	120-150
6535	o	BFES	N	B	24.1	27.41	4.7	4.41	QZT-Tan					120-150
6535	p	DEB	N	M	22.77	20.24	5.22	2.56	QZT-Red	N	N	N	Nonutilized FKake segment	120-150
6535	q	FP	N	B	25.36	14.88	3.28	1.16	CCS-Pumpkin	N	N	YR	Corner notch, expanding base, convex bottom	120-150
6535	r	BFLS	Y	-	32.12	23.62	6.57	4.76	CCS-Pumpkin	N	N	N		120-150
6535	s	FP	N	B	18.84	11.81	3.21	0.6	CCS-Red	Y	N	Y	Corner notch, expanding base, convex bottom	120-150
6535	t	BP	N	B	23.52	20.32	3.71	1.98	CCS-Oil	Y	N	YR	FKat base, corner notch	120-150
6535	u	BFLS	N	M	17.68	14.08	3.96	1.064	CCS-Red	Ind	N	Ind	May be a preform, poorly thinned relative to others	120-150
6535	v	ANG	Y	-	19.95	14.73	4.4	1.41	QZT-White	Ind	Ind	N	May be noncultural	120-150
6535	w	FK	N	B	18.3	15.57	3.15	1.18	CCS-Red	N	N	N	May be a preform - shows similar breakage, though; could the 90 break in these be induced and relate to hafting?	120-150
6535	x	FP	N	L	23.67	11.78	4.11	0.88	CCS-Pumpkin	N	N	YR	Nondiagnostic blade portion - fine parallel retouch similar to most rosegate style	120-150
6535	y	Bp	N	M	15.95	12.51	3.85	0.76	CCS-Pink	N	N	YR	Nondiagnostic midsection; similar angle to rosegates	120-150
6535	z	BP	N	B	27.24	24.77	4.8	3.77	CCS-Grey	N	N	YR	Side notch, rounded edge on FKat base - Northern Side Notch style	120-150
6536	a	UFT	Y	-	65.39	56.6	12.18	14.7	CCS-Pumpkin	N	N	N	Unifacial FKaking around entire perimeter	120-150
6536	b	BFLS	N	B	57.74	36.91	8.64	22.67	CCS-Pumpkin	N	N	N	May be a preform, broken like other squared bifaces	120-150

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cbs)
6536	c	BFES	N	L	34.83	34.79	13.61	5.52	CCS-Red	N	N	N		120-150
6536	d	FK	N	T	33.97	33.26	7.7	7.24	CCS-Pumpkin	N	N	N		120-150
6536	e	BP	N	T	24.92	15.13	2.64	0.7	CCS-Grey	Y	N	N	Massively burnt	120-150
6536	f	BP	N	M	29.48	27.32	9.83	3.59	CCS-Mottledred	N	N	N	Barbed ear, straight blade, corner notch	120-150
6536	g	BP	N	B	36.6	18.4	6.99	4.33	CCS-Pumpkin	N	N	YR	Slightly excurvate blade, side notches, slightly barbed shoulders, convex base	120-150
6536	h	FK	Y	-	47.13	25.26	2.96	3.49	CCS-Pumpkin	N	N	N	May be a preform; large kite shaped blade (missing portion to side)	120-150
6536	i	FK	N	T	57	45.24	5.92	15.13	CCS-Pumpkin	N	N	N	Backed knife; dull point, likely used for multitool	120-150
6536	j	BFES	N	T	39.68	27.46	5.87	6.66	CCS-Pumpkin	Y	N	N	Massive burning	120-150
6536	k	BP	N	B	26.85	19.51	3.85	2.02	CCS-Red	Y	N	N	FKat base, corner notch, sloping shoulders	120-150
6536	l	BFLS	N	B	30.84	32.02	10.21	4.98	CCS-Pumpkin	N	N	YR		120-150
6536	m	FP	N	T	22.76	13.59	2.35	0.54	CCS-Pumpkin	N	N	N		120-150
6536	n	BFLS	N	M	12.78	21.3	5.28	1.6	CCS-Transparent	N	N	Ind		120-150
6536	o	DEB	N	B	16.51	21.55	4.83	1.56	CCS-Red	N	N	N		120-150
6536	p	BFLS	N	T	26.75	16.73	7.5	3.47	QZT-Red	N	N	N		120-150
6536	q	BP	N	T	20.97	16.18	2.38	,6	CCS-Pumpkin	N	N	N		120-150
6536	r	BFLS	N	B	16.89	10.64	2.4	0.37	CCS-Red	Y	N	N	Fragmentary, difficult to assess	120-150
6536	s													120-150
6536	t	BP	N	T	20.47	22.04	3.27	1.09	CCS-Pumpkin	N	N	N		120-150
6537	a	FK	Y	-	89.51	40.54	8.32	32.23	CCS-Pumpkin	N	N	N		140-170
6537	b	BFES	Y	-	103.69	36.34	16.61	65.69	QZT-Red	N	N	N		140-170
6537	c	FK	N	T	32.52	41.63	6.84	10.765	QZT-Red	N	N	YR		140-170

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmts)
6537	d	BP	N	B	34	21.13	4.92	3.215	CCS-Pink	Ind	N	N	Serrated corner notch, concave base with sharp tangs	140-170
6537	e	BP	N	L	21.2	18.62	4.48	1.56	QZT-Tan	Y	N	N	Corner notched, eared - very coarse material	140-170
6537	f	BP	N	M	18.6	27.16	4.89	3.05	QZT-Tan	N	N	N	Corner notched, non diagnostic	140-170
6537	g	BP	N	B	21.51	18.64	5.29	2.34	CCS-Pumpkin	N	N	YR	Expanding stem, rounded corner, convex base , corner notch	140-170
6537	h	FK	N	L	21.24	21.15	4.6	1.8	CCS-Pink	N	N	N		140-170
6537	i	BFLS	N	B	34.12	27.74	6.32	5.89	CCS-Pumpkin	Y	N	N		140-170
6537	j	FK	N	B	29.8	30.17	7.03	7.04	QZT-Tan	N	N	Y		140-170
6537	k	UFT	N	B	53.67	44.22	14.12	38.72	QZT-Red	N	Y	N		140-170
6537	l	FK	Y	-	44.06	24.33	4.75	4.22	CCS-Red	N	N	Y		140-170
6537	m	BFLS	N	B	45.12	35.21	9.76	18.48	CCS-Pumpkin	N	N	N		140-170
6537	n	FK	N	B	41.5	36.05	5.2	9.27	CCS-Oil	N	N	N		140-170
6537	o	DR	N	M	19.7	30.83	5.49	2.99	QZT-Tan	N	N	N		140-170
6537	p	BP	N	B	16.22	22.9	3.86	1.63	CCS-Pink	N	N	N		140-170
6537	q	BFES	Y	-	40.27	26.41	7.48	7.75	CCS-Red	Y	N	N		140-170
6537	r	FK	N	T	30.8	41.69	7.34	8.07	CCS-Pink	N	N	N		140-170
6537	s	BP	N	T	27.32	30	5.07	3.65	CCS-Pumpkin	N	N	N		140-170
6537	t	BP	N	T	30.86	25.85	4.27	2.83	CCS-Pumpkin	N	N	N		140-170
6537	u	DR	N	T	29.38	8.04	4.67	0.955	CCS-Pink	N	N	N		140-170
6537	v	FK	N	B	27.72	22.94	6.3	4.5	CCS-Bluegrey	N	N	N		140-170
6537	w	FK	N	B	15.5	28.23	4.56	1.87	CCS-Red	N	N	N	Ground on one	140-170
6538	a	DEB	Y	-	71.14	38.88	11.63	26.16	QZT-Red	N	N	N	Blade-like FKake with central dorsal ridge	140-170
6538	b	DS	N	T	51.08	39.77	10.08	18.53	CCS-Oil	Y	N	N	Massively burnt	140-170
6538	c	BFLS	Y	-	71.35	44.75	6.59	24.81	CCS-Pumpkin	N	N	N		140-170
6538	d	BP	N	-	25.36	23.54	5.11	3.19	QZT-Tan	N	N	N		140-170

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cbs)
6538	e	BFLS	N	T	68.58	39.54	14.27	30.34	CCS-Pumpkin	N	N	N		140-170
6538	f	BFLS	N	L	40.09	23.83	6.41	6.48	CCS-Pumpkin	Y	N	N		140-170
6538	g	Deb	N	B	17.8	31.02	8.15	4.85	CCS-Red	Ind	N	N		140-170
6538	h	UFT	N	B	35.25	36.87	7.25	8.91	QZT-Bluegrey	Y	Y	N		140-170
6538	i	BFES	N	T	28.54	39.75	9.51	7.32	CCS-Red	Y	N	N		140-170
6538	j	BP	N	T	22.08	20.17	3.45	1.21	QZT-Red	N	N	N		140-170
6538	k	FK	N	T	30.03	30	5.33	4.7	CCS-Oil	N	N	N		140-170
6538	l	BP	N	B	10.21	16.42	3.6	0.59	CCS-Red	N	N	N	Basally thinned convex base, corner notched	140-170
6538	m	FK	N	T	30.34	14.65	3.42	1	CCS-Pumpkin	N	N	Ind		140-170
6538	n	BP	N	T	23.05	22.17	4.42	2.13	CCS-Pumpkin	N	N	N		140-170
6538	o	DEB	N	L	24.3	21.19	3.2	1.62	Slate	N	N	N		140-170
6538	p	BP	Y	-	40.39	19.16	6.13	3.02	CCS-Pumpkin	N	N	N	Basally thin expanding base, corner notch with prominent tangs	140-170
6538	q	UFT	Y	-	49.79	25.8	9	12.33	CCS-Pumpkin	Ind	Y	N		140-170
6538	r	BP	N	T	21.5	13.6	3.28	0.65	CCS-Transparent	N	N	N		140-170
6538	s	FK	N	L	29.41	25	5.46	4.12	CCS-Pink	N	N	YR		140-170
6538	t													140-170
6538	u	FK	N	B	28.72	34.33	5.23	6.27	CCS-Red	N	N	N		140-170
6538	v	BP			33.3	20.2	4.4	2.53	CCS-Red	N	N	YR		140-170
6538	w	BFES	N	L	44.08	25.65	6.4	7.67	CCS-Red	Y	N	N		140-170
6538	x	BFLS	N	M	30.24	30.9	6.12	5.28	CCS-Pumpkin	Y	Ind	N	Heavily burnt	140-170
6538	y	FP	N	M	26.35	21.15	3.94	2.63	QZT-Tan	N	N	N	Corner notch, expanding base - too fragmentary for more id	140-170
6538	z	FK	N	T	20.92	20.66	3.27	1.1	CCS-Pink	N	N	YR		140-170
6539	-	Chi-tho	N	L	72.11	53.8	10.74	56.28	SS	N	N	N	Like a Cthi Ro, heavily worn scraper	140-170

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmbs)
6540	a	FK	N	B	34.63	20.12	3.97	2.86	VOL-Black	N	N	N		170-200
6540	b	BFLS	N	B	39.36	32.32	6.35	10.76	CCS-Black	N	N	N		170-200
6540	c	FK	N	L	26.24	20.5	3.95	1.87	CCS-Red	N	N	N		170-200
6541	a	BFES	N	B	28.59	28.79	4.86	4.08	CCS-Pumpkin	Y	N	N		140-170
6541	b	BFES	N	T	40.45	30.7	4.82	5.74	CCS-Pumpkin	Y	N	N		140-170
6541	c	BP	N	T	27.26	15.57	3.92	1.24	CCS-Grey	N	N	N		140-170
6541	d	FK	Y	-	26.15	16.72	3.18	1.4	CCS-Oil	N	Y	N		140-170
6542	a	FK	N	B	53.5	49.5	10.65	30.8	CCS-Pink	N	N	N		170-200
6542	b	BP	N	T	35.14	25.5	6.43	4.8	CCS-Pink	Y	N	YR		170-200
6542	c	fk	n	L	15.63	12	3.18	0.63	CCS-Pink	Y	N	IND		170-200
6542	d	BFLS	N	M	37	37.7	7.77	9.2	CCS-Pink	Y	N	N		170-200
6542	e	BFES	N	T	47.15	30.9	10.63	12.2	CCS-Oil(Fossiliferous)	Y	Y	N	Built on river cobble	170-200
6542	f	UFT	Y	-	41.77	27.41	6.27	7	CCS-Pumpkin	N	N	N		170-200
6542	g													170-200
6542	h	BFLS	Y	-	60.76	41.5	11.4	30.5	QZT-Red	N	N	N		170-200
6542	i	BP	N	T	26.54	23.83	4.45	2.2	CCS-Red	Y	N	IND		170-200
6542	j	BFES	N	T	36.74	44.31	8.7	14.4	CCS-Tiger	N	N	N		170-200
6542	k	BFLS	N	T	15	25.53	7.72	2.8	CCS-Pumpkin	N	Y	N		170-200
6542	l	BP	N	T	29.67	16.34	2.33	1	CCS-Pumpkin	Y	N	N		170-200
6542	m	BP	N	B	13.97	20	4.4	1.43	CCS-Red	Y	N	N	Expanding base corner notch - FKat base	170-200
6543	a	FK	N	B	14.3	23.38	4.33	1.6	CCS-White	N	N	N		170-200
6543	b	BP	N	T	31.69	14.64	3.92	1.8	CCS-Bluegrey	IND	N	N	Rosegate - sharp ear fine parallel FKaking ; slight seration	170-200
6543	c	BFLS	N	T	35.52	35.7	7.28	8.8	QZT-Red	Y	N	N		170-200
6543	d	BP	N	T	33	27.66	3.49	2.9	CCS-Pumpkin	Y	N	N	Nondiagnostic; random FKaking, wid	170-200

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6543	e	UFT	Y	-	43.53	23.14	5.92	6.4	CCS-Pumpkin	N	N	N		170-200
6545	a	BP	Y	-	39.33	24.4	5.12	4.68	QZT-Red	N	N	2	Mallory-type, shallow side notches; squared concave base	
6545	b	BP	Y	-	40.6	28.4	5.45	6.6	QZT-Pumpkin	N	N	N	Pinto split base	
6546	a	BFLS	N	L	27.22	26.35	5.17	3.97	CCS-Amber	Y	N	N	Massively burnt, obstructs surface	350-380
6546	b	BP	N	T	19.5	19.2	4.33	1.32	CCS-Pumpkin	N	N	N		350-380
6546	c	BP	N	T	28.89	221.6	3.92	1.71	CCS-Amber	N	N	N		350-380
6546	d	UFT	Y	-	65	40	8.2	18.2	CCS-Red	N	N	N	Crescentic shape	350-380
6547	s	FK	N	B	35.4	15.63	8.26	5.46	CCS-Pumpkin	N	Ind	N	Heavily worn squared biface, may be a drill, unsure	170-200
6547	a	BFLS	N	B	26.2	21.3	5	3.9	CCS-Red	Y	N	N		170-200
6547	b	FK	N	L	40	22.34	7.2	6	CCS-Pumpkin	Y	N	N		170-200
6547	c	UFT	N	D	47.46	34.27	5	9.2	CCS-Pumpkn	Y	N	N		170-200
6547	d	FK	N	L	30.23	16.09	5.89	2.6	CCS-Red	Y	N	YR		170-200
6548	t	Chi-Tho	Y	-	57.16	55.28	9.24	45.69	SS (?)	N	Y	N	ChiTho- scraper built on cobble spall; well worn and polished	0-50
6565	a	UFT	N	L	42.59	43.27	15.3	29.4	QZT-Bluegrey	Y	N	N		0-50
6565	b	UFT	Y	-	50.46	20.05	5.61	4.37	CCS-Pumpkin	Ind	N	N	Worked ege entire length on one side, 35.2 mm on other	0-50
6565	c	BFES	N	L	38.88	19.4	8.1	6.95	CCS-Pumpkin	Y	N	N		0-50
6565	d	UFT	N	T	43.7	20.5	4.95	4.42	CCS-Red	N	T	N	Working edge entire length on one side, 26.8mm on other	0-50
6565	e	FK	N	B	37.3	16.1	4.1	2.3	CCS-Pink	N	N	N	Preform	0-50
6565	f	UFT	Y	-	29.05	17.83	5.85	2.13	CCS-Pumpkin	N	Y	N	Worked edge 15mm	0-50
6565	g	UFT	Y	-	19.62	8.23	1.79	0.27	CCS-Red	N	N	N	Worked edge entire, both edges	0-50
6565	h	DEB	Y	-	26.44	18.59	4.4	1.92	CCS-Bluegrey	Y	Y	N		0-50
6565	i	FP	N	M	22.57	13.21	3.37	0.85	CCS-Mottledtan	Ind	N	N	Nondiagnostic, straight converging edges	0-50
6565	j	BFLS	N	T	18.24	14.42	3.61	0.93	CCS-Pumpkin	Ind	N	Ind		0-50

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmbs)
6565	k	BP	N	M	29.84	35.79	7.04	6.61	CCS-White	N	N	Ind	Very small ear and notch (3.8mm) present on one face, converging edges	0-50
6565	l	UFT	Y	-	48.41	40.05	10.45	16.08	VOL-Black	N	Ind	N		0-50
6565	m	DS	Y	-	39.32	26.61	14.35	12.97	CCS-Oil	Y	Y	N		0-50
6567	a	UFT	Y	-	68.22	42.42	16	51.5	QZT-Pink	N	Y	N		120-170
6567	b	UFT	Y	-	83	51.75	16.69	61.87	QZT-Pink	N	N	N	43mm utilized edge, shaped to a point, unifacially	120-170
6567	c	UFT	Y	-	81.11	45.85	12.55	44.9	QZT-Pink	N	Y	N		120-170
6567	d	BFLS	Y	-	79.55	50.38	13.28	54.48	QZT-Pink	N	N	N		120-170
6567	e	UFT	Y	-	75.05	38.12	13.75	33.15	QZT-Pink	N	N	N		120-170
6567	f	UFT	Y	-	65.05	48.41	10.15	34.8	QZT-Pink	N	N	N		120-170
6567	g	BFES	Y	-	74.93	50.34	14	53.65	QZT-Pink	N	N	N		120-170
6567	h	DEB	Y	-	70.1	57.13	17.7	80.06	QZT-Pink	N	Y	N		120-170
6568	a	BFLS	N	T	52.7	57.1	14.66	42.4	CCS-Pumpkin	N	N	N		170-200
6568	b	BFES	Y	-	75.5	48.17	18.6	57.1	CCS-Pumpkin	N	Y	N		170-200
6568	c	BFES	Y	-	76.84	54.77	24	93.4	CCS-Pumpkin	N	N	N	Tan form of pumpkin chert	170-200
6568	d	BFES	Y	-	67	57.71	19.5	67.09	CCS-Pumpkin	Y	N	N		170-200
6568	e	DEB	Y	-	75.28	62.75	20	94.9	CCS-Pumpkin	N	Y	N		170-200
6568	f	DEB	Y	-	64.77	52.77	18	74-69	CCS-Pumpkin	N	N	N	A package of heavy spalls and rough bifaces - total weight in grams in comments	170-200
6569		BP	N	L	32.26	17.24	2.92	1.27	CCS-Red	N	N	N	Concave base, narrow corner notches, slightly excurvate blade	120-170
6570	a	DEB	N	B	47.3	36	9.66	17.6	CCS-Translucent	Ind	N	N		170-200
6570	b	SN	N	L	37.62	25.8	7.4	8.1	CCS-Pumpkin	Y	Y	Ind	Buff cortex	170-200
6570	c	BFES	N	T	40	51.75	13.3	30.4	QZT-Pumpkin	N	Y	N	Buff cortex; river cobble-worn	170-200

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6570	d	FP	N	B	25.72	27.8	2.7	2.63	CCS-Oil	N	N	YR	ELKO Very thin corner notched point, FKat wide base, shallow corner notches; one ear missing, the other appears reworked to obscurity	170-200
6570	e	BFLS	N	T	35.32	35.28	8	9.6	CCS-Pumpkin	Y	N	N		170-200
6572	a	FK	N	T	45.1	54.94	8.4	19.8	QZT-Red	Y	N	YR		170-200
6572	b	FK	N	L	36.55	29.65	7.54	5.666	QZT-Red	N	N	YR		170-200
6572	c	ANG	Y	-	55.15	33.55	15.42	16.3	CCS-Pumpkin	Y	N	N		170-200
6573	-	BP	Y	-	40.49	22.32	4.47	2.97	CCS-White	N	N	N		170-200
6574	-	BFES	Y	-	43.35	36.06	9.64	16.87	CCS-Translucent	N	Y	N		140-170
6575	-	BP	Y	-	25.29	15.51	3.77	1.46	CCS-Oil	N	N	N	Low corner notch, similar to Avonlea; made of material that looks an awful lot like KRF	140-170
6576	a	BFLS	N	L	63	35.1	9.1	17.91	CCS-Pumpkin	N	N	N		170-200
6576	b	BP	Y	-	37.53	24.96	4.89	3.39	CCS-Pumpkin	N	N	N	Split base Pinto style - FKaring shoulders, corner notched	170-200
6577	-	BFES	Y	-	102.35	61.24	18.35	114.57	CCS-Red	N	Y	N	Largely unifacially worked, platform preparation around edges	170-200
6578	a	FK	Y	-	40.24	28.47	7.38	9.28	CCS-Whitemottled	N	Y	N	Backed knife, built from cobble FKake with cortex visible bipolarly	120-170
6578	b	FK	Y	-	37.84	29.91	7.47	9.36	CCS-Oil	N	Y	N	Backed knife, built on cobble with cortex at back	120-170
6578	c	BP	N	B	45.72	25.9	6.97	7.56	CCS-Bluegrey	Y	N	N	Expanding convex base, side notched; massively burnt - reglued	120-170
6578	d	FK	N	M	19.5	33.73	4.89	3.36	QZT-Red	Ind	N	N	Small midsection, well FKaked edges-likely heat treated	120-170
6578	e	BFES	Y	-	66.22	44.57	12.79	42.6	QZT-Bluegrey	N	Y	N		120-170
6579	-	UFT	N	T	43	28.54	8.53	8.59	CCS-Mottled	N	N	N		140-170
6580	a	FK	N	B	43.17	43.56	8.48	20.4	QZT-Grey	N	N	N	Another squared biface, sharing the break, but on a much larger scale; edges are worn.	200-230

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6580	b	FK	N	L	45.39	30.49	5.7	5.53	CCS-Pumpkin	Y	N	N	Finely FKaked, too burnt to determine much	200-230
6581	c	BFES	N	L	32.76	40.73	7.2	10.6	CCS-Pumpkin	Ind	N	N		170-200
6581	a	BFES	Y	-	63.62	43.32	8.8	36.5	CCS-Pumpkin	N	Y	N	Tabular chert, orange cortex, knapped around perimeter, little intrusion of FKaking	170-200
6581	b	DEB	N	B	49.83	39.38	11.3	20.64	CCS-Pumpkin	Y	Y	N	Cortex river rounded red patina, crystal band inclusions	170-200
6581	c	FK	N	L	31.73	32.22	5.79	5.9	CCS-Red	Y	N	YR	"Backed knife" built on FKake with thick portion (bulb) thinned with edge prep - reverse edge is ground smooth	170-200
6581	d	BP	N	B	22.45	23.65	4.89	3.3	CCS-Pumpkin	N	N	Ind	5746-5749	170-200
6581	e	BFLS	N	T	45.88	49.6	8	11.7	CCS-Translucent	N	N	N		170-200
6581	f	BFES	N	T	30.2	50.5	9.5	14.4	CCS-Red	N	N	N		170-200
6581	g	DEB	Y	-	42.47	62.6	10	23.3	QZT-Bluegrey	N	Y	N	Cortex tan, thin, not river worn - primary	170-200
6581	h	BP	Y	-	36.3	26.37	4.87	3.5	ccs-pUmpkin	N	N	N	Pinto split base, ear broken	170-200
6581	i	BP	Y	-	25.5	14.35	4.22	1.6	CCS-Pink	N	N	N	Small triangular/lanceolate point, indented base	170-200
6581	j	DEB	N	T	30.93	49.79	9.05	10.9	CCS-Banded(Oil/Ti ger?)	N	N	N		170-200
6581	k	UFT	N	T	27.53	23.97	3.97	3.1	CCS-Red	N	N	N		170-200
6581	l	FK	N	L	27.72	12.75	5.6	1.6	QZT-Mottled	Y	N	IND		170-200
6581	m	BP	N	T	40.95	24.37	8.44	6.5	CCS-Bluegrey	Y	N	N	IND	170-200
6581	n	BP	N	B	23.14	24.14	4.9	2.2	CCS-Pumpkin	Y	N	N	Pinto split base	170-200
6581	o	FK	N	T	35.78	18.74	5.6	4.1	CCS-Pumpkin	N	N	Y	Base missing, likely less than 7mm	170-200
6582	d	BFES	N	T	43.82	35.55	7.53	15.95	CCS-Pumpkin	Ind	N	N		170-200
6582	a	UFT	Y	-	71.77	59.89	17.5	63.4	QZT-Tan	N	N	N		170-200

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
6582	b	UFT	N	T	30.67	42.13	12.88	16.7	CCS-White	N	N	N		170-200
6582	c	FK	N	T	36.9	45.75	8.77	15	CCS-Pumpkin	N	N	YR		170-200
6582	d	FK	N	T	62.78	30.2	10	14.1	QZT-Red	N	N	N	Well-worn	170-200
6582	e	BFLS	N	T	29.64	37.28	7.62	7.7	CCS-Pumpkin	N	N	N		170-200
6582	f	DEB	Y	-	38.6	33.6	12.68	16.2	QZT-White	N	Y	N	Built on river cobble	170-200
6583	e	BP	N	B	22.08	21.25	4.1	2.27	CCS-Oil	N	N	N	Mallory - no concavity at base, all squared with side notches	200-230
6584	f	BP	N	B	19.34	25.04	4.5	2.15	CCS-Pumpkin	Y	N	N	Heavily burnt Mallory - concave base "rabbit ears"	170-200
6585	g	FP	N	B	27.8	17.2	3.9	1.71	CCS-Bluegrey	N	N	N	Expanding base stemmed	200-230
6587	a	UFT	N	T	48.08	41.86	10.8	19.42	QZT-Tan	N	N	N	Carbonates across entire surface	200-230
6587	b	FK	N	M	27.5	45.1	6	8.03	CCS-Pumpkin	Ind	N	N	Apparently crescentic shape, too, but no tip present;	200-230
6587	c	Fk	N	T	42.9	23.28	5.24	3.6	CCS-Mottledtan	N	N	N	May be heat treated based on luster	200-230
6587	d	BP	N	B	18.64	25.64	3.87	2	CCS-Pumpkn	N	N	N	Mallory base	200-230
6587	e	BP	N	M	15	21.13	3.69	1.18	CCS-Oil	N	N	N	Stemmed, side notched or shouldered	200-230
6587	f	BFES	N	L	19.21	23.28	5.45	1.92	CCS-Pumpkin	Ind	N	N		200-230
6587	g	BP	N	T	27.93	15.23	4.92	1.82	CCS-Rootbeer	N	N	N	Missing base; MOST LIKELY EXPANDING STEMMED	200-230
6587	h	FK	N	T	38.7	33.3	6.24	7.84	QZT-Tan	Ind	N	N		200-230
6587	i	BP	N	B	19.53	29.73	4.34	28.4	CCS-Mottledtan	N	N	N	Corner notch, prominent ears, expanding base	200-230
6588	1	BFES	N	T	37.06	39.63	8.81	13.34	CCS-Bluegrey	N	N	N		230-260
6588	2	BFES	N	M	33.47	36.3	7.91	11.94	CCS-Whitepink	N	N	N		230-260
6588	3	FP	N	B	16.31	19.12	4.29	1.6	CCS-Bluegrey	N	N	N	Side notch, FKat base	230-260
6589	a	UFT	Y	-	66.25	78.9	20.72	85.44	QZT-Tan	N	Y	N	Buff cortex, used along this edge which is equivalent to width	230-260
6589	b	UFT	N	L	62.74	30.34	6.65	12.64	QZT-Pink	N	N	N	Utilized edge (45mm)	230-260

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cbs)
6589	c	UFT	Y	-	32.18	32.06	6.08	5.37	CCS-Pumpkin	N	Ind	N	Utilized edge (26mm)	230-260
6589	d	FP	N	T	31.89	23.66	5.63	3.37	CCS-Pumpkin	N	N	N	May be a preform as edges are not retouched; converging to sharp point	230-260
6589	e	BP	N	B	14.64	26	3.15	1.13	CCS-Oil	Y	N	N	Mallory base	230-260
6590	a	BFLS	Y	-	48.51	29.62	8.99	13.34	QZT-Bluegrey	N	N	N		260-290
6590	b	SN	Y	-	42.32	34.1	10.29	16.39	CCS-Pumpkin	N	N	N		260-290
6590	c	BP	N	T	25.21	18.43	4.14	1.8	CCS-Red	N	N	N		260-290
6591	a	FP	N	T	33.32	16	3.67	1.12	CCS-Mottledred	Y	N	N	Heavily burnt with a large transverse break at base; notches not present, may be a preform, however edges finely retouched and point neele thin	290-320
6591	b	SN	Y	-	36.29	34.39	5.82	7.33	CCS-Pumpkin	N	N	N	Classic snub nose, if a bit thin	290-320
6591	c	BP	N	B	30.68	25.1	3.4	4.4	CCS-Pumpkin	N	N	N	Corner notch, shallow and narrow, FKat base sharp feet	290-320
6591	d	BFLS	Y	-	71.16	34.35	14.25	29.122	CCS-Mottledtan	Y	N	Y	One edge obliterate by battering and subsequent heat spalling; high lustre	290-320
6591	e	FP	N	M	12.35	16.83	2.91	0.72	CCS-Pumpkin	N	N	N	Corner notch, barbed ears	290-320
6592	a	BP	N	B	6.61	22.18	2.28	0.26	CCS-Rootbeer	N	N	N	Similar to Chaco, Bonito, Camelback style base - barbed feet-	290-320
6592	b	GR	Y	-	51.77	29.2	7.2	7.45	CCS-Pumpkin	Y	N	N	Multifunction bifacial blade; graver tip	290-320
6592	c	DS	Y	-	48	26.05	14.42	16.13	CCS-Pumpkin	N	N	N	Expedient	290-320
6592	d	BFLS	N	T	31.36	28.31	4.24	4.52	CCS-Mottledred	Y	N	Ind		290-320
6592	e	UFT	N	L	32.23	24.93	4.82	3.85	CCS-Red	Y	N	N		290-320
6592	f	BP	N	B	19.13	23.4	4.58	2.23	CCS-Oil	N	N	N	Corner notch expanding base-prominent barbed ears	290-320
6592	g	UFT	N	T	18	18.96	2.88	1.15	CCS-Red	Ind	Y	Ind	Entire edge utilized	290-320
6593	a	FP	N	B	16.95	22.97	4	1.7	CCS-Oil	N	N	N	FKat base corner notch, sharp feet	350-380
6593	b	BFES	N	B	38.95	43	8.71	16.5	CCS-Red	Y	N	N		350-380

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6594	a													50-120
6594	b	BFES	N	T	28.53	48.25	14.2	19.56	CCS-Pumpkin	N	Y	N	Poor chunky piece	50-120
6594	c	UFT	Y	-	38.62	43.66	6.9	11.92	CCS-Tan	N	Y	N	24mm utilized edge	50-120
6594	d	UFT	Y	-	64.86	48.92	15.94	54	CCS-Pumpkin	N	Y	N	34.46mm utilized edge	50-120
6594	e	UFT	N	L	23.07	20.64	7.77	3.84	CCS-Pumpkin	Y	Y	N	Patina'd	50-120
6595	-	BP	Y	-	20.73	16.67	3.47	1.43	CCS-Oil	Ind	N	YT	Reworked edge - expanding base side notch, feet on base; distal end entirely reworked	320-350
6606	1	ANG	Y	-	35.7	29.27	9.12	8.4	CCS-Pumpkin	N	N	N		440-470
6606	2	Deb	Y	-	43.34	28.19	5.4	5.3	CCS-Pumpkin	N	N	N		440-470
6606	3	Deb	Y	-	36.2	33.83	6.16	5.36	CCS-Pumpkin	N	Y	N		440-470
6606	4	Deb	Y	-	41.65	27.89	4.6	3.04	CCS-Pumpkin	N	N	N		440-470
6606	5	Deb	Y	-	24.28	21.95	6.15	3.79	CCS-Grey	Y	N	N		440-470
6606	6	ANG	Y	-	31.27	23.5	9.95	5.48	CCS-Pumpkin	N	N	N		440-470
6606	7	Deb	Y	-	33.38	19.26	3.35	1.93	CCS-Pumpkin	N	Y	N		440-470
6606	8	Deb	Y	-	16.5	29	6.6	2.28	CCS-Pumpkin	N	N	N		440-470
6606	9	Deb	Y	-	39.65	22.9	3.28	2.1	CCS-Pumpkin	N	N	N		440-470
6606	10	Deb	Y	-	19.15	24.86	6.53	2.2	CCS-Grey	N	N	N		440-470
6606	11	Deb	Y	-	23.29	27.7	3.83	2.29	CCS-Pumpkin	N	N	N		440-470
6606	12	Deb	Y	-	32.37	17.7	7.68	2.94	CCS-Pumpkin	N	Y	N		440-470
6606	13	Deb	N	B	16	19.33	3.3	1.06	CCS-Pumpkin	N	N	N		440-470
6606	14	Deb	Y	-	25.47	17.89	3.56	1.1	CCS-Pumpkin	N	N	N		440-470
6606	15	Deb	N	B	16	17.63	3.65	1.08	CCS-Pumpkin	N	N	N		440-470
6606	16	Deb	Y	-	19.84	15.34	2	0.59	CCS-Pumpkin	N	N	N		440-470
6606	17	Deb	N	B	19.63	22.51	3.73	1.9	CCS-Pumpkin	N	N	N		440-470
6606	18	Deb	N	T	20.97	22.76	2.31	0.94	CCS-Pumpkin	N	N	N		440-470

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmbs)
6606	19	Deb	Y	-	20.57	19.06	2.87	0.73	CCS-Pumpkin	N	N	N		440-470
6606	20	Deb	Y	-	14.8	28.44	3.58	0.9	CCS-Pumpkin	N	N	N		440-470
6606	21	Deb	Y	-	15.87	22.46	3.07	0.69	CCS-Pumpkin	N	N	N		440-470
6606	22	Deb	Y	-	16.2	20.16	3.54	0.76	CCS-Pumpkin	N	N	N		440-470
6606	23	Deb	N	M	26.26	8.82	4.12	0.84	CCS-Grey	N	N	N		440-470
6606	24	Deb	N	B	13.19	18.53	2	0.43	CCS-Pumpkin	N	N	N		440-470
6606	25	Deb	N	T	11	11	1.85	0.15	CCS-Pumpkin	N	N	N		440-470
6606	26	Deb	Y	-	20.27	16.22	1.43	0.6	CCS-Pumpkin	N	N	N		440-470
6628	a	UFT	N	B	41.89	38.34	6.69	9.68	QZT-Orange	N	N	N		0-40
6628	b	ANG	N	-	42.32	21.71	12.68	11.57	QZT-Bluegrey	N	N	N		0-40
6630	a	BFES	Y	-	43.21	27.48	11.05	11.02	CCS-Oil	N	N	N		40-125
6630	b	DEB	Y	-	49.95	48.9	15.5	31.94	CCS-Pink	N	N	N		40-125
6630	c	UFT	Y	-	39.08	17.16	7.27	3.29	CCS-Pumpkin	N	N	N		40-125
6630	d	DEB	N	-	14.51	19.55	4.38	1.4	CCS-Pink	N	N	N		40-125
6630	e	DEB	Y	-	34.32	21.27	2.69	1.8	CCS-Pink	N	N	N		40-125
6630	f	DEB	Y	-	54.73	47.93	15.85	32.81	CCS-Pumpkin	Y	N	N		40-125
6630	g	DEB	Y	-	37	29.3	9.55	10.19	CCS-Pink	N	Y	N		40-125
6630	h	BFES	Y	-	49.66	38.65	15	27.44	CCS-Pink	N	N	N		40-125
6630	i	ANG	Y	-	55.94	37.38	12.1	26.4	QZT-Red	Y	N	N		40-125
6630	j	DEB	Y	-	37.49	12.71	3.35	1.14	CCS-Oil	Y	N	N		40-125
6630	k	BP	N	M	36.5	27.2	4.85	4.61	QZT-Red	N	N	N		40-125
6630	l	BFES	Y	-	47.39	24.65	11.58	13.21	QZT-Bluegrey	N	N	N		40-125
6630	m	DEB	Y	-	44.04	21.09	10.55	11.31	QZT-White	N	Y	N		40-125
6630	n	FK	N	T	39.04	25.33	4.33	4.76	CCS-Pink	N	N	N		40-125
6630	o	BP	N	T	19.61	18.61	4.15	1.32	CCS-Oil	N	N	N		40-125
6630	p	DEB	Y	-	43.65	20.5	5.98	4.97	CCS-Pink	N	N	N		40-125

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmts)
6630	q	FK	Y	-	38.57	21.44	4.44	3.63	CCS-Red	N	N	N		40-125
6630	r	BP	N	T	28.59	21.92	4.33	2.88	QZT-Red	N	N	N		40-125
6630	s	BP	N	M	18.8	12.47	3.21	0.844	CCS-Pumpkin	N	N	N		40-125
6630	t	FK	N	B	16.03	25.33	4.62	2.2	CCS-Pink	N	N	N		40-125
6630	u	DR	N	B	27.9	21.53	6.6	3.46	QZT-Red	N	N	N		40-125
6630	v	SN	Y	-	22.66	21.62	5.1	2.64	CCS-Transparent	N	N	YT		40-125
6630	x	FK	N	T	52.25	40.9	5.92	10.22	QZT-Tan	N	N	N		40-125
6630	y	FP	N	B	18.67	10.95	2.69	0.47	CCS-Pumpkin	N	N	N		40-125
6631	a	BFES	N	T	31.53	31.73	6.95	7.49	CCS-Pumpkin	Ind	N	N		125-195
6631	b	UFT	N	B	40.39	29.35	9.76	10.42	CCS-Pumpkin	N	N	N		125-195
6631	c	UFT	N	L	59.52	22.02	8.69	9.21	CCS-Red	Y	N	N	Clearly patterned edge retouch, like a side scraper, along 33mm of edge	125-195
6631	d	FK	N	M	29.28	70.61	9.25	17	CCS-Pink	Ind	N	N	25mm of preserved edge	125-195
6631	e	UFT	N	T	41.05	21.5	8.7	7.39	CCS-Oil	N	N	N		125-195
6631	f	UFT	Y	-	46.23	31.29	3.48	5.72	QZT-White	N	Y	N	Roughly 2 of utilized edge	125-195
6631	g													125-195
6631	h	BFES	N	L	15.96	28.57	8.55	3.69	CCS-Red	N	N	N		125-195
6631	i	FP	Y	-	19.76	11	3.02	0.55	CCS-Oil	N	N	Ind	Small expanding stem, corner notched with squared ears	125-195
6631	j	UFT	Y	-	46.3	30.66	6.86	7.98	CCS-Oil	Y	N	N	Built on a blade, entire edge utilized	125-195
6631	k	UFT	N	L	41.13	21.07	12.44	8.63	QZT-White	N	N	N		125-195
6631	l	BP	N	T	30.63	20.23	3.97	2.87	QZT-Red	N	N	N	Shallow side notch, ovate excurvate edges	125-195
6631	m	FP	N	B	20.57	21.21	4.36	1.46	CCS-Bluegrey	Ind	N	N	Basally thinned, corner notched, prominent ears ; Pelican Lake?	125-195
6631	n	DEB	N	T	51.54	37.7	10.77	19.88	QZT-White	N	Y	N		125-195
6631	o	BP	N	L	19.1	8.47	3.58	0.52	CCS-Bluegrey	N	N	N	Long ear, unground and rounded at edge; wide rounded notch	125-195

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cbs)
6633	a	BFES	N	L	42.43	32.22	12.31	10.8	CCS-Pumpkin	Y	N	N	Massively burnt, obstructs surface	195-270
6633	b	BFLS	N	L	38.68	22.73	4.29	4.1	CCS-Pumpkin	N	N	N		195-270
6633	c	ANG	Y	-	42.47	31.18	8.17	10.06	CCS-Bluegrey	Y	N	N	Massively burnt, obstructs surface	195-270
6633	d	BFLS	N	M	44.8	26.4	9.77	10.55	CCS-Amber	Y	N	N	Massively burnt, obstructs surface	195-270
6633	e	UFT	Y	-	39.2	37.37	6.33	5.92	CCS-Pumpkin	N	N	N		195-270
6633	f	ANG	Y	-	30.52	8.4	6.8	2.06	CCS-Pumpkin	Y	N	N		195-270
6633	g	Deb	Y	-	39.85	34	9.65	10.48	QZT-Tan	N	N	N		195-270
6633	h	Deb	Y	-	37.18	27.54	7.81	4.76	CCS-Black	N	Y	N	Built on cobble	195-270
6633	i	UFT	Y	-	54.36	23	5.04	5.96	CCS-Pumpkin	N	N	N		195-270
6633	j	BP	N	M	17.97	11.18	3.09	0.57	CCS-Black	N	N	N	Side notched, serated edges	195-270
6633	k	BFLS	N	L	17.77	10.79	4.12	0.74	CCS-Pumpkin	N	N	N		195-270
6752	1	Core	Y	-	56.65	51.6	38.66	120.48	CCS-Black	N	N	N	Less than 4 apparent FKakes removed; river cobble	0
6752	2	UFT	Y	-	24.42	31.97	7.87	4.91	CCS-Pumpkin	N	N	N		0
6752	3	UFT	Y	-	41.44	38.13	10.5	14.16	CCS-Bluegrey	N	N	N		0
6752	4	Deb	Y	-	30.5	36	13.8	11.95	CCS-Pumpkin	N	N	N		0
6752	5	UFT	Y	-	63.41	48.71	13.97	44.67	CCS-Transparent	N	N	N	One edge utilized on entire face; 60mm	0
6752	6	DEB	Y	-	38.74	57.17	16.05	42	QZT-Bluegrey	N	Y	N	FKake made on a cortical FKake, built from a tumbled river cobble	0
6752	7	UFT	N	M	31.61	25.21	7.85	5.89	CCS-Pumpkin	N	Y	N		0
6752	8	UFT	N	-	35	19.6	11	5.2	CCS-Red	N	Y	N		0
6752	9	FK	N	B	34.25	29.05	6.14	5.65	QZT-Red	N	N	N		0
6752	10	UFT	Y	-	39.17	24.62	12.57	9.27	CCS-Red	N	N	N		0
6753	1	SN	Y	-	41.48	31.92	5.48	6.84	CCS-Pumpkin	N	N	N	Classic snub nose	0-50
6753	2	SN	Y	-	46.26	38.19	10.42	22.88	CCS-Pumpkin	N	N	YR	Classic snub nose	0-50
6753	3	BFLS	N	B	34.11	29.61	6.33	6.822	CCS-Bluegrey	Y	N	N		0-50

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
6876	1	UFT	Y	-	50.72	31.74	9.21	14.86	CCS-Bluegrey	N	N	N	Full length utilized on both edge	61-91
6876	2	UFT	Y	-	50.19	31.33	17.42	27.73	CCS-Pumpkin	N	Y	N	May be more akin to tested cobble, however one edge approximately 27mm across shows patterned unifacial FKaking - Cortex suggests it was a river cobble	61-91
6876	3	UFT	Y	-	35	23.03	8	7.39	CCS-Bluegrey	N	Y	N	Cobble spall with cortex across one entire surface, both lengths utilized	61-91
6876	4	UFT	Y	-	42.33	22.55	12.37	9.16	CCS-Red	N	Y	N	Cobble spall with cortex across one entire surface, both lengths utilized	61-91
6876	5	UFT	N	T	31.59	29.63	7.45	6.98	CCS-Red	Y	Y	N	2 edges utilized: 17mm and 23mm	61-91
6876	6	UFT	Y	-	42.73	22.42	5.04	3.56	CCS-Pumpkin	N	N	N	Single dorsal ridge, may indicate core technology with prepared platform; max length on both sides	61-91
6876	7	SN	Y	-	35.34	18.21	6.76	5.6	CCS-Pink	N	Y	N	Built on cobble spall	61-91
6876	8	DEB	N	L	39.25	26.85	6	5.05	CCS-Pumpkin	Y	N	Ind	Very hard to make out original morph - too badly burnt and fragmented	61-91
6876	9	BFLS	N	T	34.66	13.81	3.87	1.7	CCS-Pumpkin	Y	N	N		61-91
6876	10	UFT	Y	-	49.32	32.34	5.2	5.76	CCS-Pumpkin	N	N	N	Distal end 28 mm, 38 mm on lateral edge	61-91
6876	11	UFT	N	T	59.2	33.72	8.56	12.08	QZT-Orange	N	N	N	Entire edge utilized	61-91
6876	12	UFT	Y	-	44.16	19.04	6.14	4.63	CCS-Pumpkin	N	Y	N	30mm worked edge; 23mm on other edge	61-91
6876	13	UFT	N	B	36.43	25.59	5.97	5.2	QZT-Orange	N	Y	N	Two 25mm worked edges	61-91
6876	14	UFT	Y	-	27.92	36.87	10.34	10.63	CCS-Bluegrey	N	N	N		61-91
6877	1	FK	Y	-	35.57	17.01	4.41	2.35	CCS-Pumpkin	N	N	N	Expanding base corner notch	61-91
6877	2	BP	Y	-	31.6	16.69	4.67	2.02	CCS-Mottledtan	N	N	N		61-91
6877	3	BFES	N	B	23.24	17.82	4.03	1.8	CCS-Bluegrey	N	N	N		61-91
6877	4	FK	N	B	17.94	18.07	3.27	1.4	CCS-Tan	N	N	N		61-91

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cbs)
6877	5	BP	Y	-	24.84	15.04	4.3	1.3	CCS-Transparent	N	N	N	Expanding base corner notch	61-91
6877	6	FK	N	B	18.94	18.69	3.16	1.28	CCS-Bluegrey	N	N	N		61-91
6877	7	BP	Y	-	32.37	13.08	3.68	1.27	CCS-Pumpkin	N	N	N	Expanding base, shouldered	61-91
6877	8	BP	N	T	22.08	14.89	3.82	1.21	CCS-Red	N	N	N		61-91
6877	9	BP	N	M	19.95	17.71	3.27	1.21	CCS-Red	N	N	N		61-91
6877	10	BP	Y	-	25.76	16.4	3.41	1.093	CCS-Tiger	Y	N	N	Expanding base corner notch	61-91
6877	11	BP	N	T	23.52	13.29	3.26	0.9	CCS-Mottledtan	N	N	N		61-91
6877	12	BP	Y	-	26.97	13.05	2.96	0.84	CCS-Oil	N	N	N	Expanding base corner notch	61-91
6877	13	FP	Y	-	28.5	12.63	2.35	0.72	CCS-Pumpkin	N	N	N	Corner notch	61-91
6877	14	FK	N	M	14.37	12.88	2.93	0.67	CCS-Black	Y	N	N		61-91
6878	1	BFES	N	B	32.74	24.51	9.74	6.3	CCS-Pumpkin	Ind	Y	N		61-91
6878	2	BFES	N	B	37.14	23.43	6.25	6.23	CCS-Pumpkin	Ind	Y	N		61-91
6878	3	BFES	N	T	27.39	34.96	5.31	5.59	CCS-Pumpkin	Ind	N	N		61-91
6879	1	FK	N	T	66.36	24.68	10.39	17.8	QZT-Grey	N	N	N		91-122
6879	2	FK	N	T	51.55	23.23	8.93	6.94	CCS-Red	Y	N	N	Similar morphology to above	91-122
6879	3	BP	N	T	34.46	18.58	3.47	2.17	CCS-Pumpkin	N	N	N	Beautifully FKaked point tip	91-122
6879	4	BP	Y	-	31.43	17.65	4.44	1.5	CCS-Transparent	N	N	N	Corner notch, missing one portion of base	91-122
6879	5	BP	N	B	22.22	11.66	4.18	0.8	CCS-PinK	N	N	N	Expanding stem, shouldered	91-122
6879	6	BP	N	T	32.19	16.87	3.9	1.84	CCS-Bluegrey	N	N	N	Nondiagnostic tip	91-122
6879	7	BP	N	T	25.73	10.94	3.54	0.95	CCS-White	N	N	N	Nondiagnostic tip	91-122
6879	8	BP	N	M	19.39	11.2	3.14	0.63	CCS-Bluegrey	N	N	N	Nondiagnostic tip	91-122
6879	9	BP	N	T	19.58	12.57	2.6	0.58	QZT-Tan	N	N	N	Nondiagnostic tip	91-122
6879	10	BP	N	T	20.12	15.1	3.6	0.96	QZT-Orange	N	N	N	Nondiagnostic tip	91-122
6879	11	BP	Y	-	40.2	18.46	6.14	4.37	CCS-White	N	N	N	Archaic looking; thick rounded base, stemmed with shoulders	91-122

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
6879	12	BP	N	B	37.59	28.89	5.22	7.15	CCS-Oil	Y	N	N	Large archaic dart point or blade	91-122
6880	1	FK	N	B	16.16	12.5	2.98	0.65	QZT-Red	N	N	N	Razor biface; preform?	91-122
6880	2	UFT	Y	-	29.73	17.48	3.55	1.59	CCS-Red	Y	N	N		91-122
6880	3	BFES	N	B	28.49	18	5.41	2.59	CCS-Black	N	N	N		91-122
6881	1	FK	N	T	23.1	22.39	4.86	2.57	CCS-Pumpkin	N	N	N		91-122
6881	2	BFES	N	B	24.94	25.42	7.43	5.06	CCS-Pumpkin	Ind	N	N		91-122
6881	3	BFES	N	B	15	25.91	3.6	1.57	CCS-Pumpkin	N	N	N		91-122
6882	1	UFT	Y	-	24.67	22.4	4.1	2	CCS-Pumpkin	N	N	N		91-122
6882	2	UFT	N	M	21.52	26.88	6.6	4.05	CCS-oil	Y	N	N		91-122
6882	3	BFES	N	L	49.15	29.87	8.7	14.43	CCS-Oil	Y	N	N		91-122
6883	-	DR	Y	-	40.16	15	6.1	3.17	CCS-Pumpkin	N	N	N		91-122
6887	-	UFT	N	B	19.55	33.96	6.52	4.47	CCS-Red	Ind	N	N		30-61
6888	-	CH	Y	-	59.23	49.53	23.52	82.36	QZT-Bluegrey	N	N	N	Impact fractures along edge, bifacially worked; well worn and "backed"	61-91
6890	1	DS	N	B	56	30.66	7.15	14.04	CCS-Bluegrey	N	N	N	Unifacial modification along entire circumference	61-91
6890	2	UFT	N	B	37.39	31.5	9.13	11.63	CCS-Tiger	N	N	N		61-91
6890	3	FK	N	L	27.25	20.63	3.7	3.14	CCS-Pumpkin	N	N	N	Well patterned FKakes along entire intact edge (27.5mm)	61-91
6890	4	UFT	N	L	55.7	25.8	6.14	6.14	CCS-Red	N	N	N	Lateral portion worked (40mm); base worked (20.5mm)	61-91
6890	5	UFT	Y	-	44.78	33.57	4.65	6.34	CCS-Pumpkin	N	N	N	Utilized along entire perimeter; very thin and straight FKake	61-91
6890	6	UFT	N	B	30.05	26.11	7.15	7	CCS-Tiger	Y	N	N		61-91
6891	1	FK	N	T	27.8	26.32	5.1	3.66	CCS-Pink	N	N	N		122-152
6891	2	FK	N	T	22.9	23	4.19	2.52	QZT-Bluegrey	N	N	N		122-152
6892	1	BFLS	N	B	22.06	34.35	4.8	4.59	QZT-Tan	N	N	N		122-152
6892	2	BFLS	N	T	15.63	30.74	4.32	1.72	QZT-Red	N	N	N		122-152

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
6892	3	BP	N	B	15.7	28.7	4.81	2.83	QZT-Tan	N	N	N	Base thinned and ground - no apparent basal thinning FKakes, ground edges	122-152
6893	1	UFT	N	M	48.82	25.31	5.75	6.15	CCS-Pink	N	N	N	25mm utilized on either opposite edge	122-152
6893	2	SN	Y	-	26.63	23.55	6.27	4.03	CCS-Pink	N	N	N		122-152
6893	3	UFT	N	B	25.17	32.86	6.82	5.69	CCS-Pink	N	Y	N	Cortex white buff, hard	122-152
6893	4	UFT	N	T	33.13	23.98	3.95	3.36	CCS-Red	N	N	N	Utilized along entire length	122-152
6893	5	UFT	N	M	34.6	18.64	3.87	3.12	CCS-Pumpkin	N	N	N	Utilized along entire length	122-152
6893	6	UFT	Y	-	37.55	16.04	5.55	2.32	CCS-Bluegrey	N	Y	N	Utilized along entire length; cortex tan, buff, hard	122-152
6893	7	UFT	Y	-	24.64	15.14	2.97	1.51	CCS-Oil	N	Y	N	River cobble; cortex buff otherwise same as interior; utilized 22.71 across face	122-152
6893	8	UFT	Y	-	39.43	29.41	3.33	3.26	CCS-Oil	Y	N	N	30mm of worked edge	122-152
6895	-	SN	N	L	76.42	51.15	24.15	79.1	CCs-Red	N	N	N		122-152
6896	-	BFES	Y	-	57.15	41.8	16	28.82	CCS-Pumpkin	N	N	N		122-152
6897	-	UFT	Y	-	34	16.12	5.77	3.24	QZT-Bluegrey	N	Y	N		122-152
6902	-	BFES	Y	-	87.65	45.36	21.7	83.23	QZT-Bluegrey	Y	Y	-	Lister's classic "Chopper" type - supported by wear along long edge; however the FKaking is pretty rudimentary and angles not large enough on edge for me to consider it a chopper	91-122
6903	1	BFLS	N	T	35.19	48.11	10.9	19.26	CCS-Pink	N	N	N		152-183
6903	2	BFES	Y	-	48.48	29.73	8.66	14.56	CCS-White	N	Y	N		152-183
6903	3	FK	N	B	27.19	30.97	4.87	4.39	QZT-Red	N	N	N		152-183
6904	1	UFT	Y	-	52.5	38.98	10.94	18.09	CCS-Red	N	N	N		152-183
6904	2	UFT	Y	-	38.35	23.56	7.04	5.88	CCS-Bluegrey	Y	N	YR		152-183
6904	3	FK	N	B	16.36	16.25	4.5	1.51	CCS-Grey	N	N	N		152-183

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmts)
6904	4	FP	N	T	22.99	12.68	1.55	0.34	CCS-Red	Y	N	N		152-183
6905	1	BFES	N	M	35.86	37	6.67	9.96	CCS-Black	Ind	N	N		152-183
6905	2	FK	Y	-	47.76	29.65	6.53	9.53	QZT-Tan	N	N	N	Base notch and stem	152-183
6905	3	BFES	N	T	25.31	32.06	6.9	5.03	CCS-Pumpkin	N	Y	N		152-183
6906	1	UFT	N	B	51.81	39.33	4.67	7.55	CCS-Red	Y	N	Ind	Massively burnt	152-183
6906	2	BFES	N	T	10.38	22.85	4.64	0.86	CCS-Bluegrey	N	N	N		152-183
6906	3	FK	N	T	29.81	12.2	3.63	0.98	CCS-Bluegrey	N	N	N	May be a preform tip, built on a FKake	152-183
6906	4	UFT	Y	-	41.95	31.61	10.1	12.65	CCS-Bluegrey	N	Y	N	25mm utilized edge	152-183
6906	5	UFT	Y	-	32.93	19.48	2.1	1.47	CCS-Red	Y	N	N		152-183
6906	6	SN	N	T	24.18	22.51	6.91	3.97	CCS-Red	Y	N	N	Massively burnt	152-183
6906	7	DS	N	T	38.51	21.1	6.04	4.11	CCS-Pumpkin	N	N	YR	Side scraper on back end of denticulate section	152-183
6907	1	SN	Y	-	29.13	21.95	3.49	2.93	QZT-Pink	N	N	YT	Reworked from a projectile point, missig one ear, expanding, concave base	152-183
6907	2	BP	N	T	30.45	22.85	4.75	3.16	QZT-Black	Ind	Y	YR		152-183
6907	3	FK	N	T	37.84	28.51	5.51	6.25	CCS-Pumpkin	N	N	YR	Resharpener on only one edge, "backed" knife, ground on opposite edge	152-183
6907	4	BFLS	N	B	38.25	21.33	4.96	5.63	CCS-Oil	N	N	N		152-183
6907	5	UFT	Y	-	37.36	21.31	3.71	2.55	CCS-Red	N	N	N	Sharpened along edge, no grinding or hafting elements present - Knife or preform?	152-183
6907	6	UFT	Y	-	23.94	12.84	2.89	0.86	CCS-Pink	N	N	N	Heavily patinate, similarly worked around edge, though here the tip is the bulb; is this a knife or a preform?	152-183
6907	7	BP	N	B	14.13	19.8	3.86	1.08	CCS-Pink	N	N	Ind	Elko Convex base, basally thinned, corner notched	152-183
6907	8	BP	N	B	18.22	18.91	4.36	1.2	CCS-Pink	N	N	Y	Elko Basally thinned, convex base, corner notched	152-183

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cbs)
6907	9	FK	N	B	15.05	20.66	3.43	1.42	CCS-Bluegrey	N	N	Ind	May be a preform - razor blade sized blank	152-183
6907	10	BFLS	N	T	25	20.33	5.67	2.77	QZT-Red	N	N	N	Roughly made	152-183
6907	11	BP	N	T	18.34	12.04	4.02	0.67	CCS-Pink	N	N	N		152-183
6908	-	DR	N	M	21.22	20.67	4.74	1.85	CCS-Black	N	N	N		152-183
6912	1	UFT	N	B	50.42	27.67	11.06	14.95	QZT-Red	N	Y	N	Single dorsal ridge, may indicate core technology with prepared platform; max length on both sides	183-213
6912	2	UFT	N	B	56.38	19.33	8.58	7.72	CCS-Pumpkin	N	N	N	Prepared platform, single dorsal ridge; max length on one edge	183-213
6912	3	UFT	N	B	37.25	67.71	8.81	12.9	CCS-Pumpkin	Ind	N	YR	Similar to scraper uniface morphology, however FKake is irregular; patterned FKaking located along platform/bulb and distally along one side 46.81mm	183-213
6912	4	UFT	Y	-	54.52	27.35	4.31	7.67	CCS-Pumpkin	N	N	YR	Roughly 70mm edge modified length-very similar to scraper, but uniface patterning not limited to one edge, but across nearly entire perimeter	183-213
6912	5	UFT	Y	-	57.71	22.24	6	6.64	CCS-Oil	N	Y	N	33mm and 21mm worked edge	183-213
6912	6	UFT	Y	-	44.58	23.67	4.95	4.45	CCS-Red	N	N	N	Entire length, both edges	183-213
6912	7	UFT	y	-	49.02	33.7	10.18	10.2	CCS-Mottledtan	Ind	N	N	An overshot FKake that removed a large portion of core mass - utilized along 30mm of edge, distal end may have been end of a scraper but too fragmentary to tell	183-213
6912	8	UFT	Y	-	51.11	29.1	7.17	10.02	CCS-Pumpkin	N	N	N	Core-prepared platform FKake; utilized along entire length	183-213
6912	9	UFT	Y	-	34.96	27.15	4.32	2.52	CCS-Pumpkin	N	N	N	Utilized along entire length	183-213
6912	10	UFT	Y	-	33.02	34.16	6.52	5.14	CCS-Red	Ind	N	N	40mm utilized edge	183-213
6912	11	UFT	Y	-	35.75	26.09	3.83	3.04	CCS-Pumpkin	N	N	N	24mm	183-213
6912	12	UFT	N	B	21.49	33.79	5.95	4.93	CCS-Pumpkin	N	N	N	Busted up, difficult to asses	183-213

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6912	13	UFT	N	B	34.34	21.72	6.92	4.48	CCS-Pumpkin	N	Y	N	44mm utilized edge	183-213
6912	14	BFES	N	B	29.2	38.59	7.27	8	CCS-Pumpkin	N	N	N		183-213
6912	15	UFT	N	M	45.4	35.6	8.52	15.25	CCS-Red	Y	N	Ind	26mm worked edge, unifacial similar to end scraper	183-213
6912	16	BFES	Y	-	13.54	35.61	7.04	13.53	CCS-Mottledtan	Y	N	N		183-213
6912	17	UFT	N	L	57.07	36.87	24.58	28.88	CCS-Red	Ind	N	N	36mm worked edge	183-213
6912	18	SN	N	T	32.82	37.79	8.06	8.18	CCS-Pumpkin	Ind	N	N		183-213
6912	19	UFT	N	L	50.6	28.69	5.38	5.57	CCS-Pumpkin	N	Y	N	30mm worked edge	183-213
6912	20	UFT	N	T	24.65	28.69	5.48	3.47	CCS-Pumpkin	N	N	N	Entire length, both edges	183-213
6912	21	FK	N	T	16.8	27.49	3.36	1.26	CCS-Grey	Y	N	Ind	Massively burnt	183-213
6912	22	UFT	Y	-	39.89	27.9	9.85	8.9	CCS-Tiger	Ind	n	N	Prepared platform, single dorsal ridge; max length on one edge	183-213
6912	23	SN	N	L	33.26	16.61	8.06	4.01	CCS-Pumpkin	Y	Y	N		183-213
6912	24	UFT	Y	-	43.1	31.85	14.07	15.16	CCS-Pumpkin	N	Y	N	Covered in cortex on one face - chalky yellow	183-213
6912	25	BFLS	N	L	28.9	13.18	5.65	1.55	CCS-Red	Ind	N	N		183-213
6912	26	UFT	N	L	44.76	21.69	7.75	7.69	CCS-Pumpkin	N	Y	N	Actual coverage of patina, not cortex; suggests this may be a reused tool from earlier occupations based on cultural scarring beneath patina and fresher removals lacking patina	183-213
6912	27	UFT	N	L	34.64	16.2	2.3	1.53	CCS-Red	Ind	N	N		183-213
6912	28	BFES	N	L	40.6	21.23	7.96	4.97	CCS-Red	Y	N	N		183-213
6912	29	ANG	Y	-	21.75	13.51	6.41	1.73	CCS-Pumpkin	N	Y	N		183-213
6913	1	BFES	Y	-	68.18	41.16	17.35	43.79	CCS-Pumpkin	N	N	N		213-244
6913	2	BFES	N	B	36	31	7.32	11.27	CCS-Oil	N	N	N		213-244
6913	3	FP	N	T	27.38	13.49	3.74	1.11	CCS-Pumpkin	Y	N	N		213-244
6913	4	UFT	Y	-	50.23	37.56	6.27	1.29	CCS-Pumpkin	N	Y	N	Built on cobble, worked edge ~43mm	213-244

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6913	5	BFLS	N	T	43.24	24	10.02	8.94	QZT-Bluegrey	Y	N	N		213-244
6914	1	FK	Y	-	59.67	43.18	8.67	22.12	CCS-Oil	N	N	N	Base, has a notch which may be for hafting; wide compared to others, but roughly crescentic in form	213-244
6914	2	BFLS	N	L	31.14	30.4	5.14	6.23	CCS-Oil	Y	n	N		213-244
6914	3	FK	N	T	28.36	28.45	6.45	4.77	CCS-Mottledtan	Ind	N	N	Edge not straightened, but otherwise morphology and wear suggests use as knife	213-244
6915	1	BP	Y	-	35.48	22.68	5.18	2.71	CCS-Oil	N	N	N	Split base, needle point, eared	213-244
6915	2	BP	Y	-	20.66	16.11	5.21	1.78	CCS-oil	N	N	YT	Split base, reworked to scraper type of tool	213-244
6915	3	BP	N	B	22.53	22.65	4.45	1.87	QZT-Red	N	N	N	Socket base, eared	213-244
6915	4	BP	N	B	26.41	25.55	5.32	3.82	CCS-Pumpkin	N	N	N	Split base, shallow, square ears	213-244
6915	5	BP	N	B	15.11	19.16	5.68	1.45	QZT-Bluegrey	N	N	N	Mallory-type; squared base with concave base, side notches	213-244
6915	6	BP	N	B	24.08	28.01	5.13	2.77	QZT-Red	Y	N	N	Split Base corner notched	213-244
6915	7	BP	N	T	37.24	27.74	3.91	3.21	CCS-Pumpkin	N	N	N	Wickedly fine needle point	213-244
6916	-	DR	N	M	44.3	35.23	9.34	11.33	CCS-Mottledtan	N	N	N	22.9mm worked edge along proximal edge	213-244
6917	-	SN	Y	-	37	25.55	4.56	4.96	QZT-Bluegrey	N	N	N	Classic snub nose	213-244
6918	-	BFLS	Y	-	60.87	34.15	16.13	27.65	CCS-Bluegrey	N	N	N		183-213
6922	-	FK	Y	-	148.85	27.29	7.64	47.5	QZT-Grey	N	Y	N	A tabular quartzite	244-274
6923	1	Deb	Y	-	48.52	25.26	4.96	5.7	QZT-Tan	N	N	N		213-274
6923	2	DEB	Y	-	44.5	21	5.24	3.85	CCS-Pumpkin	N	Y	N		213-274
6923	3	DEB	Y	-	40.13	26.3	3.96	2.94	CCS-Pink	N	N	N		213-274
6923	4	DEB	Y	-	38.94	25.7	7.75	5.33	CCS-Pink	N	N	N		213-274
6924	1	BP	N	B	35.39	30.25	3.54	4.1	CCS-Pumpkin	N	N	IND	Pinto split base	213-274
6924	2	FP	Y	-	36.42	19.63	3.94	2.8	CCS-Bluegrey	N	N	N	split base lanceolate, built on a cured FKake, snub ears, needle point	213-274

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6924	3	BP	N	T	28.8	15.28	4.29	1.5	CCS-Pumpkin	N	N	IND	Very finely FKaked, diamond in cross section, parallel comedial FKakes	213-274
6924	4	BP	Y	-	29.85	13.85	4.72	1.5	CCS-Pumpkin	Y	N	N	contracting stem, sharp ears	213-274
6925	1	FK	Y	-	74.95	45.67	9.88	35.46	CCS-Pumpkin	N	N	YR	Large leaf shaped hand blade, plainly used and retouched across 6.5 of edge	213-274
6925	2	FK	N	M	20.46	26.5	4	2.34	CCS-Pumpkin	Y	N	Ind		213-274
6926	-	FP	N	B	13.23	25.88	4.42	1.58	CCS-Pumpkin	N	N	N	Mallory type base	274-335
6930	1	BFES	N	T	42.9	43.75	13.3	30.3	CCS-Pumpkin	N	N	N		244-274
6930	2	BFES	N	T	33.07	42.66	10.73	18.5	CCS-Bluegrey	Y	N	N		244-274
6930	3	BFLS	N	T	32.33	43.78	9.78	14.3	CCS-Pumpkin	N	Y	N		244-274
6930	4	BFLS	N	T	46.21	29.1	7.77	10.4	QZT-Tan	N	N	N		244-274
6930	5	BP	N	T	41.35	31.4	5.55	4.5	CCS-Pumpkin	N	N	N		244-274
6930	6	BP	N	T	29.98	28.39	4	3.7	CCS-Red	Y	N	N		244-274
6930	7	DEB	N	B	28.8	28.03	7	6.44	CCS-Green	N	Y	N		244-274
6930	8	BFLS	N	T	26.59	35	7.4	8.3	CCS-Pumpkin	N	N	N		244-274
6931	-	DR	Y		50.03	16.83	7.22	3.53	CCS-Pumpkin	N	Y	N	Expanding base	244-274
6932	1	BP	N	B	17.93	16.66	3.67	1.09	CCS-Pumpkin	Y	N	Ind	Mallory-type, very narrow notches, large base; ear more medial than shoulder, may suggest resharpening; this and the other in this lot are VERY thin	244-274
6932	2	BP	N	T	18.5	17.38	2.62	0.666	CCS-Pumpkin	Ind	N	Ind	Ind. but very thin, likely a mallory as well, assuming this lot was found closely associated. These two artifacts show, roughly, the range of CCS Pumpkin	244-274
6933	1	UFT	N	L	43.44	16.64	4.08	3.46	CCS-Grey	N	N	N		244-274
6933	2	UFT	N	T	28.76	22.57	2.8	2.55	CCS-Red	N	Y	N		244-274
6933	3	UFT	N	B	25.74	26.02	4.04	2.9	CCS-Pumpkin	Ind	N	N		244-274

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmts)
6933	4	FK	N	T	22.84	23.2	3.8	1.73	CCS-Pumpkin	N	N	N		244-274
6933	5	FK	N	T	31.8	19.46	8.46	3.81	CCS-Pumpkin	Y	N	YR		244-274
6934	1	COR	Y	-	69	54.12	23.7	68.7	CCS-Red	N	Y	N	Obviously a river cobble, approx. 30% of surface covered in cortex	0-305
6934	2	DEB	Y	-	47.2	39.7	17.4	19.9	CCS-Pumpkin	IND	N	N		0-305
6934	3	ANG	Y	-	45.5	31.8	15	21	CCS-Pumpkin	Y	N	N	Heavily burnt	0-305
6934	4	DEB	Y	-	34.14	43.5	7.8	7.6	CCS-Pumpkin	N	N	N		0-305
6934	5	DEB	N	T	37.77	18	5.3	4.6	QZT-White	N	N	N	Exotic quartzite	0-305
6934	6	UFT	Y	-	45.1	29.4	6.3	9.5	QZT-Red	N	N	YR		0-305
6934	7	DEB	Y	-	48.3	27.9	4.38	2.8	CCS-Pumpkin	N	N	N		0-305
6934	8	DEB	Y	-	47.4	19.3	11.4	7.1	CCS-Pumpkin	N	N	N		0-305
6934	9	DEB	Y	-	51.4	20	4.3	4.3	CCS-Oil	N	N	N		0-305
6934	10	DEB	Y	-	40.54	24	2.92	3.2	QZT-Red	N	N	N		0-305
6934	11	DEB	Y	-	36.72	20.22	5.3	2.9	QZT-Red	N	N	N		0-305
6934	12	DEB	Y	-	50.77	31.95	4.34	6	QZT-Red	N	N	N		0-305
6934	13	DEB	Y	-	38.26	20.58	2.52	2.5	CCS-Pumpkin	N	N	N		0-305
6934	14	DEB	Y	-	33.16	23.11	3.2	2.2	QZT-Orange	N	N	N		0-305
6934	15	DEB	Y	-	32.5	27	5.15	2.7	CCS-Pumpkin	N	Y	N		0-305
6934	16	DEB	Y	-	29.83	19.2	3.56	1.4	CCS-White	N	N	N		0-305
6934	17	DEB	Y	-	26.8	24.42	7	3.4	VOL-Black	N	N	N		0-305
6934	18	DEB	N	T	30.5	39	3.78	2.4	CCS-Oil	N	N	N		0-305
6935	1	FK	N	L	50.5	21.24	7.67	8.2	CCS-Pumpkin	Y	N	N		0-305
6935	2	UFT	N	B	24.11	29.95	5.5	5.71	CCS-Pumpkin	N	N	N		0-305
6935	3	FK	N	L	38.38	21.9	5.85	4.68	CCS-Red	Y	N	N		0-305
6935	4	BFES	N	T	27.78	25.57	7.2	4.81	CCS-Mottledtan	N	N	N		0-305
6935	5	BFES	N	T	22.46	22.32	4.94	2.55	CCS-Pink	Y	N	N		0-305

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6935	6	BFLS	N	T	24.5	27.3	7.36	3.98	QZT-Red	N	N	N		0-305
6935	7	UFT	N	L	32.4	26.14	6.95	6.57	QZT-Red	N	N	N	Shape like a lateral edge of a crescent - oriented with this as lat, but point may be tip	0-305
6935	8	FK	N	T	29.73	29.1	5.75	5.55	CCS-Pumpkin	N	N	N	Shaped same as above, however here it was oriented as tip	0-305
6935	9	FK	N	T	23.4	18.41	5.93	2.09	CCS-Red	Ind	N	N	Shaped same as above, however here it was oriented as tip	0-305
6936	-	DR	N	B	68.31	28.42	6.86	11.7	CCS-Pink	N	N	N		0-305
6937	-	COR	Y	-	61.6	55.5	25.15	91.54	CCS-Pumpkin	N	Y	N	Noted as chopper in inventory - inaccurate, no corroborating use wear	213-274
6938	-	BFLS	N	L	67.19	42.7	7.4	14.2	CCS-Pumpkin	Y	N	N	Massively burnt	213-274
6939	1	BFES	Y	-	57.05	44.64	12.66	34	CCS-Bluegrey	N	N	N		213-274
6939	2	UFT	N	B	75.42	35.9	9.62	23.06	QZT-Grey	N	N	N	Blade-like FKake with central dorsal ridge	213-274
6940	1	UFT	N	L	41.77	22.19	7	5.82	CCS-Red	N	Y	N		335-366
6940	2	UFT	N	L	36.38	27	6.83	6.33	CCS-Red	N	Y	N		335-366
6941	-	BP	N	T	39.19	23.84	3.71	3.17	CCS-Bluegrey	N	N	N	Elko Corner notch, sharp shoulders	335-366
6944	1	SN	N	T	38.86	50.56	9.08	21.77	CCS-Pumpkin	N	N	N		274-305
6944	2	SN	N	T	19.82	28.41	4.19	2.83	CCS-Red	N	N	N		274-305
6945	-	FP	N	B	43.87	36.96	7.25	11.64	QZT-Red	N	N	N	Side notch;	274-305
6946	-	BP	N	B	24.73	26.12	4	2.52	CCS-Pumpkin	N	N	N	Mallory style	274-305
6964	-	Core	Y	-	145	104.45	53.15	740	QZT-Tan	N	N	N	Banded quartzite	274-305
6972	1	BFLS	N	T	49.33	38.97	8.33	21.34	CCS-Pumpkin	Y	N	N		
6972	2	BFLS	N	B	34.23	41.68	9.26	16.59	CCS-Pumpkin	N	N	N		
6972	3	UFT	Y	-	57.8	36.12	9.68	18.92	QZT-Red	N	N	N		
6972	4	BFLS	Y	-	33.4	23.88	6.75	5.23	QZT-Bluegrey	N	N	N		

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
6972	5	BFLS	N	L	32.92	29.64	8.7	6.76	CCS-Pumpkin	Y	Ind	N		
6972	6	BFES	N	L	38.97	14.5	9.37	4.34	QZT-White	Y	N	N		
6972	7	UFT	N	B	34.67	32.66	6.23	4.25	CCS-Oil	N	N	N		
6973	1	BP	N	B	29	21.22	5.85	3.31	CCS-Bluegrey	Y	N	Ind	Pinto split base, wide shoulders	
6973	2	FK	N	B	20.45	20.86	3	1.67	CCS-Red	N	N	N	Razor biface; preform?	
6973	3	BP	N	M	14.11	9.8	2.77	0.43	QZT-Red	N	N	Ind	Corner notch sharp shoulders expanding base	
6973	4	BP	N	M	15.05	19.18	4.3	1.39	CCS-Pink	N	N	N	Indeterminate	
6974	1	UFT	N	B	45.65	41.92	8.3	16.7	QZT-Red	N	Y	N	No retouch but use wear across entire length, both edges; cortex is rough with little to no patination	49-Spill
6974	2	BFES	Y	-	62.75	36	12.36	25.35	QZT-Bluegrey	N	Y	Y	Cortex is orange buff	49-Spill
6974	3	SN	Y	-	50.15	35.5	10.8	16.6	QZT-Red	N	N	YR		49-Spill
6974	4	ANG	Y	-	24.86	24.5	12.24	8.2	QZT-Bluegrey	N	Y	N	Patinated cortex is glossy orange	49-Spill
6974	5	BFES	N	L	37.44	39.7	7.2	11	QZT-Tan	N	N	Ind	Looks to be hafted with a pointed ear and notch present; the edge is steep and well worn suggesting use as a scraper	49-Spill
6974	6	BFES	N	T	42.3	21	6	4.47	CCS-Pumpkin	N	Y	N	Likely a Fkake point preform broken in production, given the converging edges	49-Spill
6974	7	BP	N	M	26.59	20.69	4	1.8	CCS-Mottledpink	N	N	N	A beautiful point with mottled blacks purples and pinks; no diagnostic elements, though quite thin	49-Spill
6974	8	FP	N	T	29.3	15	3.6	1.25	CCS-Pumpkin	N	N	N	Nondiagnostic, but narrow; Fkaking random	49-Spill
6974	9	SN	N	B	28.16	19.75	5.64	3.5	CCS-Oil	N	Y	N	Cortex is striated tan, similar to p-wood bark	49-Spill
6974	10	DEB	N	B	13.15	21	4.15	1.33	CCS-Red	N	N	N		49-Spill

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
6975	-	FK	N	T	77.6	44.64	6.6	28.82	QZT-Grey	N	N	N	Very smooth, may have been ground at one point and FKaked to resharpen	
6979	-	FK	Y	-	65.22	35	8.08	20.81	CCS-Pumpkin	N	N	N		427-457
6980	1	BP	N	T	32.13	21.81	5.24	2.83	CCS-Black	N	N	N	Corner notch	
6980	2	BP	N	M	23.92	29.22	4.23	2.56	CCS-Pumpkin	N	N	N	Split stem	
6980	3	FP	N	M	13.84	22.82	3.08	1.43	CCS-Bottle brown	N	N	N	Corner notch	
6980	4	FP	N	B	8.64	13.48	1.91	0.25	CCS-Red	N	N	N	Convex base, side notch	
6981	1	UFT	Y	-	53.89	37.03	10.1	9.17	QZT-Red	N	N	N		91-122
6981	2	UFT	Y	-	51.84	39.66	11.93	22.67	QZT-Bluegrey	N	Y	N		91-122
6981	3	UFT	Y	-	52.65	27	4.63	6.99	QZT-Red	N	N	N	Unifacially FKaked along one edge	91-122
6981	4	UFT	N	T	44.47	30.24	10.77	12.88	QZT-Red	N	N	N		91-122
6981	5	UFT	Y	-	45.08	34.2	19.44	29.71	CCS-Oil	N	Y	N		91-122
6981	6	FK	Y	L	46.97	47.18	8.95	16.27	CCS-Oil	Ind	N	N		91-122
6981	7	UFT	N	B	43.15	30.66	4.32	5.91	CCS-Red	N	N	N		91-122
6981	8	DEB	N	-	45.08	35	9.44	12.62	CCS-Pumpkin	N	N	N		91-122
6981	9	UFT	Y	-	51.34	25.63	8.22	8.9	CCS-Pumpkin	N	Y	N	Patterned edge 36mm	91-122
6981	10	UFT	Y	-	56.72	18.87	4.62	4.84	QZT-Red	N	N	N	Classic blade with dorsal ridge	91-122
6981	11	UFT	N	M	31.89	23.67	3.05	3.13	QZT-Tan	N	N	N		91-122
6981	12	UFT	Y	-	40.26	16.5	4.57	2.53	CCS-Red	N	N	N		91-122
6981	13	UFT	N	T	46	20.2	10.12	5.47	CCS-Oil	N	N	N		91-122
6981	14	UFT	N	M	23.68	23.4	8.53	4.47	CCS-Pumpkin	N	N	N		91-122
6981	15	UFT	Y	-	45.56	27.25	4.24	3.89	CCS-Red	N	N	N		91-122
6981	16	BFLS	N	B	26.78	29.94	6.05	5.26	CCS-Banded	N	N	N		91-122
6981	17	FK	N	T	35.03	34.21	5.94	8.18	CCS-Transparent	Y	N	N		91-122
6981	18	DEB	Y	-	41.28	33.85	8.61	8.93	CCS-Pumpkin	N	N	N		91-122

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6981	19	UFT	Y	-	37.51	21.57	2.75	2.34	CCS-Pumpkin	N	N	N		91-122
6981	20	UFT	Y	-	42.9	22.5	4.82	4.52	CCS-Pumpkin	N	N	N		91-122
6981	21	UFT	N	B	29.33	22.39	3.14	2.12	CCS-Pumpkin	N	N	N		91-122
6981	22	UFT	N	B	36.38	20	4.48	2.62	CCS-Red	N	N	N		91-122
6981	23	UFT	N	B	14.68	22.36	3.07	1.3	CCS-Pumpkin	N	N	N		91-122
6981	24	UFT	Y	-	20.11	23	3.15	1.56	CCS-Pumpkin	N	N	N		91-122
6981	25	UFT	N	B	31.27	17.39	3.58	1.79	CCS-Red	N	N	N		91-122
6981	26	DEB	N	L	19.76	19.86	5.78	1.44	CCS-Red	N	Y	N		91-122
6985	1	UFT	Y	-	56.77	36.14	10.56	18	CCS-Pumpkin	N	N	N		213-244
6985	2	UFT	N	T	55.72	42.7	12.7	26.35	CCS-Pumpkin	N	N	N		213-244
6985	3	DEB	Y	-	49.85	37.88	15.62	31.55	CCS-Pumpkin	N	Y	N		213-244
6985	4	DEB	Y	-	53.56	37.11	12.52	22.25	CCS-Pumpkin	N	N	N		213-244
6985	5	DEB	Y	-	41.92	32.28	6.76	8.86	CCS-Pumpkin	Y	Y	N		213-244
6985	6	DEB	Y	-	55.6	38.66	10.22	14.83	CCS-Red	N	N	N		213-244
6985	7	DEB	N	L	36.11	30.877	3.48	3.49	VOL-Black	Y	N	N		213-244
6985	8	FK	N	T	29.06	43.32	7.98	9.32	CCS-Pumpkin	N	N	N		213-244
6985	9	BFES	N	T	38.66	30.16	9.75	13.13	CCS-White	N	N	N		213-244
6985	10	SN	N	B	47.27	30.06	7.38	9.867	QZT-Red	N	N	YR		213-244
6985	11	UFT	Y	-	62.68	27.17	6.23	10.37	QZT-Red	N	N	N		213-244
6985	12	UFT	N	B	51.25	49.29	15.58	22.56	CCS-Red	Y	Y	N	From same nodule as 6985.13	213-244
6985	13	UFT	Y	-	54.11	27.5	10.95	16.27	CCS-Red	Y	Y	N		213-244
6985	14	DEB	Y	-	49.29	25.37	6.78	6.9	CCS-Oil	N	N	N		213-244
6985	15	DEB	N	-	47.55	30.13	6.2	6.24	CCS-Red	Y	Y	N		213-244
6985	16	UFT	Y	-	49.16	18.9	5.27	4.45	CCS-Pumpkin	N	N	N		213-244
6985	17	UFT	Y	-	46.29	21.19	4.07	2.72	CCS-Pumpkin	N	N	N		213-244
6985	18	UFT	N	T	25.44	35.88	5.18	4.33	CCS-Red	N	N	N		213-244

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
6985	19	GR	Y	-	39.51	32.4	9.3	9.33	CCS-Pumpkin	Y	N	N		213-244
6985	20	DEB	Y	-	46.32	33.91	3.92	5.28	CCS-Pumpkin	N	N	N		213-244
6985	21	UFT	Y	-	35.65	31.73	6.57	5.29	CCS-Red	N	N	N	Utilized edge along entire width	213-244
6985	22	FK	N	L	34.7	20.77	5.06	3.17	CCS-Pumpkin	N	N	N		213-244
6985	23	DEB	N	T	42.21	18.57	3.14	2.41	CCS-Grey	N	N	N		213-244
6985	24	UFT	N	T	29.26	41.87	4.96	4.68	CCS-White	N	N	N		213-244
6985	25	DEB	Y	-	29.23	21.9	3.56	2.63	CCS-Pumpkin	N	Y	N		213-244
6985	26	DEB	N	L	39.71	23.49	4.45	4	CCS-Grey	N	N	N		213-244
6985	27	FK	N	B	12.25	23.28	3.94	1.04	QZT-Red	N	N	N		213-244
6985	28	UFT	N	M	20.43	16.24	2.84	1.41	CCS-Grey	N	N	YR	Beautiful gray banded material	213-244
6985	29	FK	N	L	22.38	18.35	3.92	1.53	QZT-Red	N	N	N		213-244
6985	30	UFT	N	M	15.05	19.79	2.62	1	CCS-Pumpkin	N	N	N		213-244
6985	31	UFT	N	L	35.85	28.1	4.78	3.18	CCS-Pumpkin	N	N	N		213-244
6985	32	BFLS	N	L	17.73	33.63	5.91	2.81	CCS-Pumpkin	Y	N	N		213-244
6985	33	DEB	N	B	39.09	20.55	5	3.69	CCS-Pumpkin	N	N	N		213-244
6985	34	UFT	Y	-	36.36	21.44	4.58	3.34	CCS-White	N	N	N		213-244
6985	35	BFES	N	T	18.72	31.33	8.8	4.31	CCS-Pink	N	N	N		213-244
6985	36	DEB	Y	-	42.11	17.62	5.87	2.81	CCS-Red	N	N	N		213-244
6985	37	DEB	N	B	23.97	17	4.65	2	CCS-Red	N	N	N		213-244
6985	38	BFLS	N	T	24.33	32.09	7.61	4.95	CCS-Red	Y	N	N		213-244
6985	39	DEB	Y	-	28.52	15.43	4.49	1.78	CCS-Red	N	N	N		213-244
6986	-	BP	N	B	11.04	17.08	6.2	1.24	CCS-Pumpkin	N	N	N	Heavily ground base, probably a pinto type owing to large thickness	213-244
6988	-	SN	Y	-	25.8	23	4.35	2.49	QZT-Tan	N	N	N		244-274
6989	-	BP	N	B	14.82	19.7	4.7	1.24	CCS-Pumpkin	N	N	Ind	Pinto split stem type, apparently. Edges ground and well worn; could	244-274

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
													also be a base going to an ear, well-worn, but appears to be a base.	
6990	a	UFT	N	B	15.58	25.44	5.98	2.39	CCS-Red	N	Y	N	May be a scraper, not enough edge to determine	244-274
6990	b	BFES	N	B	20	38.1	9.67	5.84	CCS-Red	Y	N	N		244-274
6990	c	FK	N	L	33.69	21.7	6.91	4.69	CCS-Red	Y	N	N		244-274
6990	d	FK	N	B	28.2	25.55	6	3.8	CCS-Red	N	Y	N	"Cortex" may be an interior FKaw, broken along this portion	244-274
6990	e	FK	N	B	30.3	30.5	4.22	4.48	QZT-Tan	N	N	N		244-274
6990	f	FK	N	T	33.99	25.64	5.6	4.77	CCS-Bluegrey	Y	N	N	Heavily burnt; backed knife with on edge finely FKaked	244-274
6990	g	BFLS	N	L	35.55	28.3	8.34	7.35	CCS-Red	Y	N	N	Heavily burnt	244-274
6990	h	BFLS	N	L	41.75	34.95	7.66	9.5	CCS-Pumpkin	Y	N	N		244-274
6990	1	BFES	Y	-	69.12	53.42	26.38	79.89	CCS-Transparent	Ind	Y	N	Rough biface, built on large spall of cobble agate	244-274
6990	2	UFT	N	B	45.75	56.54	15	40.33	CCS-Pumpkin	Y	Y	N	Utilized edge 55mm long, from platform to break. Contains cortex with snotty holes, and large grained purple grey quartzite-like material next to very fine pumpkin chert	244-274
6990	3	UFT	Y	-	67.79	46.76	14.8	31	CCS-Pumpkin	N	N	N	22mm of patterned unifacial scraper-like basal edge; utilized edge along 43mm of side	244-274
6990	4	UFT	Y	-	54.74	44.75	13.53	31.52	QZT-Bluegrey	N	Y	YR	Built on a FKake, edge slightly straightened; well-patterned FKaking only 3 long	244-274
6990	5	BFES	N	T	64.75	43.22	15.3	36.5	CCS-Pumpkin	Y	Y	N	Poorly made early biface, lots of bad FKake terminations and burning; likely a freeze cracked nodule to begin with. Broken edge looks like a platform, but it is not believed to be	244-274
6990	6	BFES	N	L	55.85	30	12.4	16.5	CCS-Bluegrey	Ind	N	N	Poorly made ; break along a pre-existing fault in material	244-274

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
6990	7	DS	Y	-	52.54	33.36	15.38	23.45	CCS-Pumpkin	N	N	N	Denticulations along nearly the entire edge	244-274
6990	8	UFT	Y	-	39.35	43.25	5.64	7.89	CCS-Pumpkin	Ind	N	N	Basic unmodified FKake save utilized edge, 40mm	244-274
6990	9	BFES	N	L	43.44	28.17	9	9.02	CCS-Bluegrey	Y	N	N		244-274
6990	10	UFT	N	L	49.27	20.97	5.28	4.98	CCS-Red	N	N	N	Utilized edge roughly 39mm	244-274
6990	11	UFT	N	L	62	31.75	8.75	16.7	CCS-Pumpkin	N	Ind	Y	Heavily patinated pumpkin chert, reworked roughly 8mm into central face, removing patination; patterned FKake removal roughly 60mm along edge to break	244-274
6990	12	DS	Y	-	38	32.38	5.43	7.34	CCS-Pumpkin	N	N	N	Unifacially worked notched FKake tool, one well-developed "spoke shave" portion	244-274
6990	13	FK	N	L	33.11	19.6	7.2	4.64	QZT-Grey	N	N	N	Edge well-straightened, ground/worn roughly 17mm, with unground/worn edge portion 17mm too.	244-274
6990	14	BFES	N	L	45.54	13.69	8.87	5.76	QZT-Pumpkin	N	N	N	Break along fault in material	244-274
6990	15	UFT	N	B	30	31.33	4.43	3.07	CCS-Pumpkin	N	N	N	2 utilized edge on both sides of bulb; may be unifacially worked into scraper-like edge on far distal edge, however the break obscures this.	244-274
6992		UFT	Y		46.87	21.2	7.03	6.62	CCS-Pumpkin	N	Y	N	Worked edge 37.28	30-61
6997	-	BFLS	Y	-	53.82	29.84	6.42	8.78	CCS-Red	N	N	N	Broken, but refit and glued	61-91
7000	1	FP	Y	-	22.94	15.22	3.25	0.86	CCS-Pumpkin	N	Y	N	Narrow corner notches, sharp shoulders, expanding convex stem	183-213
7000	2	BFLS	N	T	13.3	16.1	3.95	0.78	CCS-Transparent	N	N	N		183-213
7001	1	FK	N	B	47.11	56.5	13.17	40.56	QZT-Red	Ind	N	N	Broad; moderate wear	183-213
7001	2	BFLS	Y	-	60.44	35.61	9.1	18.61	CCS-Pink	N	N	N	May be a preform - edges not finished	183-213
7001	3	BFLS	N	T	55.92	50.5	7.25	17.76	CCS-Bluegrey	N	Y	N	Snot agate material	183-213
7001	4	BFLS	N	B	27.5	42.33	7	9.31	QZT-Red	N	N	N		183-213

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmts)
7002	-	UFT	Y	-	39.37	23	5.52	5.62	CCS-Red	N	N	N		183-213
7003	-	SN	Y	-	35.69	34.67	5.5	7.59	CCS-Grey	N	N	N	Although grey this is likely pumpkin chert - this is an idealized scraper	183-213
7140	-	BFLS	N	T	45.64	36.44	8.84	12.84	QZT-Tan	N	N	N	Mottled and banded quartzite	
7778	-	FK	N	B	38.9	32.2	7.22	8.34	CCS-Pumpkin	Y	N	N	Break in collection, but refits so measured as one. Mass of individual pieces are: .85g and 7.48	
7779	1	BP	N	B	33.34	31.4	7.79	8.74	QZT-Red	N	N	N	Square shoulders, convex base, slightly expanding stem shoulder notch. Thin, randomly FKaked, lenticular in cross section	
7779	2	BP	N	T	33.1	11.85	2.8	0.95	CCS-Red	N	N	N	Thin, narrow point, sharp tanged ears, no base	
1948.0 1.058		BP	N	T	27.42	21.91	5.89	3.01	CCS-Pumpkin	Ind	N	N	Nondiagnostic, straight converging edges	
1948.0 1.059	1	ANG	Y	-	43.5	26.5	19.6	12	CCS-Translucent	Y	N	N		0-50
1948.0 1.059	2	DEB	Y	-	51.5	23.3	6.86	5.1	CCS-Pumpkin	N	Y	N		0-50
1948.0 1.059	3	DEB	Y	-	26.1	18.4	5.48	2.1	QZT-Bluegrey	N	N	N		0-50
1948.0 1.059	4	DEB	N	T	17.26	17.6	2.75	0.57	CCS-Bluegrey	N	N	N		0-50
1948.0 1.063	-	UFT	Y	-	56.65	25.52	8.4	10.17	CCS-Translucent	N	N	N		
1948.0 1.063	-	UFT	Y	-	47.76	25.85	5.68	6.88	QZT-Red	N	N	N		
1948.0 1.063	-	BFES	N	L	45.56	27.3	9	12.06	CCS-Pumpkin	N	Y	N		
1948.0 1.063	1	DEB	Y	-	50.4	48.33	14.9	35.6	CCS-Pink	N	Y	N	River cobble cortex blueish and vitreous luster	
1948.0 1.063	2	DEB	N	T	54.52	46.42	6.85	9.76	OBS	N	Y	N	Thin cortex, buff grey	

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmbs)
1948.0 1.063	3	deb	n	b	24.16	41.52	10.46	8.23	CCS-Pink	N	Y	N	Very similar to core with this inventory number, cortex river polished	
1948.0 1.063	4	DEB	Y	-	40.89	23.33	4.23	2.6	CCS-Bluegrey	N	N	N		
6890.A	1	DR	Y	-	52.26	12.66	5.1	2.89	CCS-Red	Ind	N	YR	Long hafted type with shoulders and socket base	122-152
6890.A	2	DR	N	T	30.95	12.2	6.1	1.49	CCS-Red	N	N	YR		122-152
6890.A	3	BP	N	L	24.43	10.32	3.53	0.71	CCS-Red	Y	N	N	Corner notched, expanding stem; parallel collateral FKake	122-152
6890.A	4	FK	N	B	25.54	14.47	3.94	1.6	CCS-Red	N	N	N	May be a preform, round base, converging edges	122-152
6890.A	5	FK	N	T	37.38	14.19	5.23	2.37	QZT-Red	N	N	YR	May be drill tip, but very thin	122-152
6890.A	6	FP	N	B	17.21	14.52	3.62	0.75	CCS-Pink	Ind	N	N	Corner notch arrow point; large angular ear, expanding base (wide notches)	122-152
6890.A	7	BP	Y	-	17.8	8.76	3.12	0.38	CCS-Bluegrey	N	N	Ind	Expanding base, wide notches bow point	122-152

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmbs)
5113	-	BFES	N	B	27.28	35.05	9.4	8	CCS-Pumpkin	D	Y	N	Cortex orange and worn, river cobble	
5197	-	FK	N	B	32.52	19.98	5.46	3.16	QZT-Red	Y	N	N	May be a preform, long, slightly excurvate edges	
5198	-	BP	N	B	13.65	14.05	4.23	0.69	QZT-Red	N	N	Ind	Concave base, corner notch expanding stem (ear not present)	
5199	-	BP	N	T	24.63	11.72	4.5	1.1	CCS-Pumpkin	N	N	N	Ind. point with sharply converging edges	

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
5200	-	SN	N	L	13.84	18.54	3.58	0.86	CCS-Oil	N	N	N		
5201	-	FP	N	T	25.34	18.57	3.44	1.09	CCS-Pumpkin	N	N	Ind	Likely a mallory, again owing to point angle and thinness; ind.	
5202	-	BP	N	T	22.58	18.2	3.2	1.1	CCS-Pumpkin	N	N	Ind	Very similar to 5201; slightly serated edges	
5203	-	BP	N	M	20.67	17.9	5.15	1.85	CCS-Pumpkin	Y	N	YT	Broken tip reworked to scraper, <1	
5204	-	FP	N	T	14.43	11.87	3	0.51	CCS-Black	Y	N	Ind	Ind., poorly made but could be obscured by fire	
5205	-	BP	N	B	19.8	24.6	4.12	2.34	CCS-White	N	N	N	Elko Corner Notch, convex base, slightly serated edges	
5206	-	BP	Y	-	53.61	21.06	7.39	8.36	CCS-Pumpkin	N	N	YR	Resharpended, removal of patina; type is a side notched, slightly expanding base, convex; excurvate edges	
5207	-	FK	N	B	19.48	16.09	3.18	1.46	QZT-Grey	N	N	N	Likely a preform or used point, edges unground but well-finished	
5208	-	BP	N	B	18.42	19.49	7.66	3.07	QZT-Bluegrey	N	N	Ind	Side notch, expanding stem, very very thick	
5209	-	FK	Y	-	100	28.2	6.6	24	QZT-Grey	Y	N	YR	Stemmed knife, similar to paleoindian point types; slightly assymetrical; very heavy wear on edges	
5210	-	DR	Y	-	36.15	34.55	4.98	3.19	CCS-Pumpkin	N	N	YR	Well-used hafted drill; notch preserved	
5211	-	BP	Y	-	30.06	16	5.4	2.18	CCS-Oil	N	N	N	Shallow corner notches	
5212	-	FK	N	L	30.29	19.1	3.02	1.83	CCS-Red	Ind	N	N	Unsure about this one, may be a point, basally thinned; could also be oriented the other way. An undifferentiated biface, for sure.	
5213	-	BP	Y	-	41.22	20.3	7.41	5.7	CCS-Pumpkin	N	N	N	Side ntoch, convex base, excurvate edges	
5214	-	FK	Y	-	56.64	23.61	7.95	10.18	QZT-Red	N	N	N		
5215	-	BP	Y	-	49.81	27.48	5.38	5.77	QZT-Red	N	N	Y	Concave base, expanding stem corner notch; rounded ears and feet	

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
5216	-	BP	N	B	14.78	19.11	3.52	1	CCS-Translucent	N	N	N	Mallory-style	
5219	-	BP	N	B	31.47	29.67	6.69	7.7	CCS-Oil	N	N	N		
5220	-	BP	N	B	13.7	26.7	4.16	1.48	CCS-Bluegry	N	N	N	Mallory style base	
5221	-	BP	Y	-	45.28	21.2	4.89	3.74	CCS-White	N	N	N	Large square, concave, mallory-type. Edges unground, Side notched with long base, triangular; missing ~3mm of tip	
5222	-	BP	Y	-	38.8	25.2	6.67	7.51	QZT-Tan	N	Y	YT	Reworked tip to a scraper-like end; Side notched, slightly expanding base with cortex at most proximal end	
5223	-	BP	N	M	43.77	14.77	6.35	4.25	QZT-Tan	N	N	N	Long, lanceolate, split stem	
5224	-	FK	N	B	23.06	23.45	3.87	2.55	QZT-Mottled	N	N	N	Base of a preform or knife - squared biface	
5226	-	FP	N	M	23.05	18.48	3.48	1.6	CCS-Pink	Y	N	Ind	corner notched, contracting stem; broken at base and tip; neck with 7.8	
5227	-	BP	N	L	19.57	21.13	5.71	3	CCS-Grey	Y	N	N	Squared ear; ground stem	
5228	-	FK	Y	-	32	24.62	4.91	3.39	CCS-Red	N	N	IND	May have been reworked from elko PP	
5229	-	FK	N	M	20	14.34	4.08	1.36	QZT-Bluegrey	N	N	N	Squared razor size biface	
5230	-	SN	N	B	24.12	25.52	3.46	2.22	CCS-Pumpkin	N	N	YT	Likely rebuilt from a point, owing to corner notches; one edge reworked to large scraper angle	
5231	-	FK	N	B	12.85	21.54	3.67	1.39	CCS-Transparent	N	N	N	May be a point base, but no indication of notching/hafting	
5232	-	BP	Y	-	31.55	20.3	4.95	2.7	CCS-Pumpkin	N	Y	N	Side notch, rounded base, slightly rounded edges	
5233	-	BP	N	T	39.68	16.75	3.95	1.8	CCS-Mottled	N	N	N	Very finely FKkaed, comedial; one sharp ear	
5234	-	BP	N	T	19	9.6	2.73	2.2	CCS-Translucent	N	N	N	Corner notch, expanding base; both notches in tact, ears present, small and sharp	
5235	-	BP	N	B	29.7	24.24	4.2	3.77	QZT-Pumpkin	Y	N	N	Side notch, convex base, straight edges	

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
5236	-	BP	N	B	16.34	29.56	3.94	2.07	CCS-Pumpkin	N	N	N	elko Wide Corner notch, well-expressed ears, convex base expanding stem	
5237	-	BP	N	T	28.5	20	3.84	1.92	CCS-Pumpkin	N	N	N	Only tip, slightly excurvate edges	
5238	-	BP	Y	-	36.33	19.16	6.45	4.41	CCS-Bluegrey	N	Y	N	Side notch, slightly expanding base; built on FKake with cortex visible at most proximal edge	
5239	-	BP	Y	-	30.74	19.55	4.45	2.14	CCS-Pumpkin	N	N	N	Corner notch, sharp ears, thin stem (7mm)	
5240	-	FK	N	B	27	20.42	3.77	2.76	CCS-Mottled	N	N	N	May be a preform; edges feel ground	
5241	-	BP	Y	-	35.14	20.8	5.69	3.9	QZT-Pink	N	N	N	Side notch, expanding convex stem	
5242	-	UFT	N	B	18.39	24.83	6.6	2.95	CCS-Red	Y	N	N	Looks like a failed biface or knife; FKaking is non-intrusive	
5243	-	FP	Y	-	15.82	15.17	2.85	0.7	CCS-Red	N	N	YT	Mallory-like base, distal end apparently reworked to tiny point (~5mm notch-tip)	
5264	-	UFT	Y	-	32.6	46.51	8.18	8.5	CCS-Pumpkin	N	N	N	~42mm of cutting edge	
5265	-	BFES	N	T	53.25	40.15	13.45	24.69	CCS-Pumpkin	N	N	N		
5266	-	SN	N	T	35.77	42.95	11.54	16.93	CCS-Pumpkin	N	N	N		
5267	-	DEB	N	L	88	29.83	10.23	25.5	CCS-Oil	y	n	n		
5268	-	COR	Y	-	62.46	45.4	22.1	49.49	QZT-Bluegrey	IND	Y	N	Buff thin grey cortex	
5269	-	UFT	N	B	45	46.34	9.2	15.32	QZT-Red	N	N	N	~40mm of unifacial FKaking near bulb	
5270	-	BFES	Y	-	54.75	32.85	9.54	12.41	CCS-Red	Y	N	N	Heavily burnt, spalled an entire face off, nearly the entire edge intact	
5271	-	BFLS	N	B	36.3	52.78	11.41	24.62	CCS-Pumpkin	N	N	N		
5272	-	SN	Y	-	25.87	29.2	7.9	6.7	CCS-Pink	Ind	Y	N	Buff gray concrete-like cortex	
5273	-	BFLS	N	L	45.45	24.19	6.21	8.12	CCS-Pumpkin	Y	N	N		
5274	-	BFLS	Y	-	76.23	37.83	13.4	29.7	QZT-Red	N	N	YR	Retouch on tip; made by novice knapper owing to large mass at top	
5275	-	Core	Y	-	62.8	32.36	17.55	35.62	QZT-Red	N	N	N	Tested cobble	

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
5276	-	BFES	Y	-	52.61	43.2	9.5	22.73	CCS-GreyBanded	N	Y	N	Banded grey blue, buff orangish cortex, inclusions	
5277	-	FK	N	M	49.24	46	10.4	28.73	QZT-Red	N	N	N	Converging edges may suggest this is a point, but too massive and large	
5278	-	BFES	N	B	42.07	50.93	8.3	26.12	CCS-Oil	Y	N	N		
5279	-	BFES	N	T	35.5	33.84	11.5	14.1	CCS-Red	Y	N	N		
5280	-	BFLS	Y	-	53.38	37.81	10.46	20.47	CCS-Bluegrey	N	Y	N	Cortex is tan and buff; may be patination/oxidation as it appears over areas that appear to have been FKaked. Material has a buff luster	
5281	-	DEB	Y	-	57.74	30.2	4.8	6.888	CCS-Pumpkin	N	N	N	Contains patina on the dorsal side	
5282	-	BFES	N	B	19.33	33.18	7.57	5.11	CCS-White	N	N	N	-	
5283	-	DR	N	M	37.51	25.69	10.54	5.24	CCS-Pumpkin	N	N	N	Drill thickness 5.7mm - Expanding base, nonhafted	
5285	-	SN	N	T	38	32.5	13.25	12.5	CCS-Red	Y	N	N	Heavily burnt, 17.5mm if scraoer edge at distal end	
5286	-	BFLS	N	T	31.74	46.33	9.53	16.53	CCS-Bluegrey	N	Y	N	Cortex tan buff	
5287	-	DS	N	L	44.75	20.7	9.85	8.17	CCS-Oil	N	N	N		
5288	-	DEB	N	L	42.24	32.9	8.14	10.98	QZT-Transparent	Ind	N	N	May be an agate or similar chalcedony, somewhat coarse grain; also shows several failed percussion blows	
5289	-	BFES	N	L	31.71	36.72	10.75	14.27	CCS-Pumpkin	N	N	N		
5290	-	BP	N	T	41.8	32	10.7	11.22	CCS-Red	N	N	N	Very thick, sharp point, roughly finished edges	
5291	-	BFES	Y	-	60.89	34.43	14.5	23.58	QZT-Tan	N	N	N		
5292	-	BFLS	N	M	55.1	46.73	6.35	18.32	CCS-Pumpkin	Y	N	Y		
5293	-	BFES	N	T	19.75	22.72	6.93	3.01	CCS-Pumpkin	Y	N	N		
5294	-	BFLS	N	L	58.25	37.06	11.06	22.77	CCS-Banded	N	N	N	Petrified Wood	
5295	-	SN	N	T	28.63	27.75	5.6	5.21	CCS-Pumpkin	Y	N	N	Heavily burnt, ~3mm of working edge	
5296	-	BFES	N	T	22.3	32	8.84	7.78	CCS-Pumpkin	N	N	N		

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmbs)
5297	-	BFES	Y	-	47.56	45.5	20.3	40.12	CCS-Pumpkin	N	Y	N		
5298	-	FK	N	L	37.37	27.31	8.31	7.58	CCS-Pumpkin	Y	N	N	Well-worn edge	
5299	-	SN	N	L	40.2	46	5.86	11.78	CCS-Pumpkin	N	N	N	Heavily patinated with a white waxy layer. Only on one portion is this exteriorly opatinated bit remove	
5300	-	BFLS	Y	-	38.1	27.3	6.84	6.1	QZT-Grey	N	N	N		
5301	-	FK	N	T	27.34	18.53	5.18	2.81	CCS-Pumpkin	N	N	N		
5302	-	BFES	N	L	29.3	33	14.14	12.16	CCS-Bluegrey	Y	Y	N	Buff thin grey cortex	
5303	-	BFLS	N	B	31.78	41.27	5.77	9.56	CCS-White	N	N	N		
5304	-	BFES	N	L	35.3	12.83	10.95	4.07	CCS-Red	Y	N	N		
5305	-	DEB	N	L	18.22	16.66	4.2	1.04	CCS-Red	N	N	N		
5306	-	BFES	N	M	35.3	26.86	6.56	7.06	CCS-Red	Y	N	N		
5307	-	SN	N	T	42.34	38.67	9.32	18.12	CCS-Pumpkin	N	N	N		
5308	-	FK	N	B	28.83	21.21	5.19	3.56	CCS-Red	Y	N	N	May be a preform	
5309	-	BFLS	N	T	59.56	40	11.1	23.83	QZT-Red	N	N	N		
5310	-	DEB	Y	-	52.36	26.178	6.56	8.55	CCS-Pumpkin	N	Y	N		
5311	-	DEB	Y	-	38	26.19	7.19	7.43	CCS-Red	Y	N	N		
5312	-	UFT	Y	-	39.29	25.45	6.44	5.54	CCS-Red	N	N	N		
5313	-	DEB	Y	-	58.78	34.5	7.66	10.38	CCS-Pumpkin	N	Y	N		
5314	-	FK	Y	-	31.39	14.21	4.92	2.04	CCS-Pumpkin	Ind	N	YR	An exhausted knife, may be worn which suggests hafting	
5315	-	UFT	Y	-	97	29.7	9.86	23.97	QZT-Orange	N	Y	N	Black cortex; mottled material; very similar to a formal blade, struck from a core; if late may suggest use of increased core technology!!!!	
5316	-	BFES	N	L	19.75	34.88	6.55	4.24	CCS-Pumpkin	IND	N	N		
5318	-	FK	Y	-	41.46	18.98	4.69	3.02	CCS-Red	N	N	YR	An exhausted knife	
5319	-	DEB	N	B	26.29	32	9.18	5.83	CCS-Oil	ND	N	N		

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
5320	-	BP	N	T	18	20.33	4.41	1.18	CCS-Pumpkin	N	N	N		
5321	-	BFES	N	B	16.65	26.42	7.31	3.57	CCS-Mottledred	Y	N	N		
5322	-	FK	N	T	29.9	39.11	4.3	6.26	CCS-Pumpkin	N	Y	N		
5323	-	BP	N	T	25.75	12.7	2.76	0.48	CCS-Red	N	N	N	Finely made point tip	
5324	-	SN	N	T	38.5	41.23	10.6	21.65	CCS-Tan	N	N	N	A classic snubnose, very large, represents ~1/2 of the total tool	
5325	-	DEB	Y	-	35.95	32.33	2.7	2.1	OBS	N	N	N		
5326	-	BFES	N	L	37.1	22.37	11.85	7.59	CCS-Pumpkoin	Y	N	N		
5327	-	FK	N	B	23.7	17.5	4.75	2.18	CCS-Bluegrey	N	N	N		
5328	-	FK	N	L	41.3	28.66	4.36	5.33	CCS-Pumpkin	Y	Y	N	Cortex is a buff grey - these	
5329	-	FK	N	L	35.56	15.51	4.18	2.69	QZT-Tan	N	N	N		
5330	-	SN	Y	-	29.93	24.73	4.7	3.53	CCS-Pumpkin	N	N	N		
5331	-	UFT	N	B	20.38	18.7	2.75	1.22	CCS-Mottled	N	Y	N	Patinated, probably FKaked from an old FKake with patina	
5332	-	BFLS	N	T	41.53	38.21	9.25	14.66	QZT-Tan	N	N	N		
5333	-	Chi-tho	Y	-	59.19	52.85	7	36.1	Sandstone	N	N	N	FKaked around entire edge, a small stream cobble. Dorsal face worn likely from leather work	
5334	-	UFT	Y	-	34.93	30.22	3.55	4.52	CCS-Red	N	N	N	BEautifully banded material, red with black concentric ciercles	
5335	-	SN	Y	-	29.5	25.86	3.04	3.59	CCS-Tan	N	Y	N		
5336	-	UFT	N	T	17.34	21.6	4.6	1.98	CCS-Translucent	N	N	N		
5337	-	BFES	N	L	39.7	15.67	7.82	4.02	CCS-Bluegrey	N	N	N		
5338	-	BFES	N	L	50.81	20.6	10.5	9.66	CCS-Pumpkin	N	N	N		
5339	-	FK	Y	-	43.98	18.12	6.24	5.1	QZT-Grey	N	N	YR		
5340	-	BFES	N	L	47.12	24.65	8.78	10.93	CCS-Pumpkin	N	N	N		
5341	-	GR	N	L	35.42	27.94	7.6	9.63	CCS-Oil	N	N	N		

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmts)
5342	-	FK	N	L	50.33	23.61	9.6	9.09	CCS-Red	N	Y	N		
5343	-	BFLS	N	B	14.36	23.22	5.3	1.95	CCS-Pumpkin	N	N	N		
5344	-	FK	N	L	27.27	19	3.72	1.57	CCS-Red	Y	N	N		
5345	-	UFT	N	L	42.1	25.48	6.6	5.31	CCS-White	N	N	N		
5346	-	BP	N	T	32.36	24.62	4.85	2.97	CCS-Grey	N	N	N	Unknown type, just a point tip	
5347	-	BFES	N	L	46.35	21.21	14	13.06	QZT-Pumpkin	N	N	N		
5348	-	BFLS	N	T	19	26.94	4.78	2.06	CCS-Pumpkin	N	N	N		
5349	-	BFLS	N	L	23.38	17.86	4.46	1.83	CCS-Red	Y	N	N		
5350	-	UFT	Y	-	28.68	21.33	7.98	5.22	CCS-Red	Ind	N	N		
5351	-	BP	N	T	16.5	17.5	3.56	0.87	CCS-Pumpkin	N	N	N		
5352	-	UFT	N	B	24.89	18.38	3.93	1.85	CCS-Red	N	Y	N		
5353	-	BFES	N	L	45.65	13.78	9.87	6.09	CCS-Red	IND	N	N		
5354	-	BP	N	T	36.77	16.2	3.9	2.04	QZT-Tan	N	N	N	Unknown type, just a point tip	
5355	-	DEB	N	L	22.06	16.7	5.06	1.76	CCS-Banded	N	N	N		
5356	-	FP	N	T	16.4	21.08	3.23	1.17	CCS-Pumpkin	N	N	N		
5357	-	BFLS	N	L	27.54	21.83	6.4	3.07	CCS-Red	Y	N	N		
5358	-	DEB	N	T	42.91	29.84	9.86	12.8	CCS-White	Ind	Y	N		
5359	-	BP	N	T	32.32	16.06	5.08	2.56	CCS-Grey	N	N	N		
5360	-	BFES	N	L	55.94	31.86	10.34	14.88	CCS-Pumpkin	Y	N	N		
5361	-	FK	N	T	37.8	25.53	7.44	5.96	QZT-Tan	N	N	N		
5362	-	DEB	Y	-	49.7	25.7	8.39	11.24	CCS-Pumpkin	N	Y	N		
5363	-	BP	N	T	34.43	19.91	5.05	2.67	QZT-Mottled	N	N	N		
5364	-	ANG	Y	-	25.67	17.14	7	2.5	CCS-Pumpkin	Y	N	N		
5365	-	DEB	N	M	24.9	51.21	5.09	7.54	CCS-Pumpkin	N	Y	N		
5366	-	BFES	N	L	31.64	17.78	9.09	4.39	CCS-Pumpkin	N	N	N		
5369	-	BFES	N	T	63.04	39.89	12.99	23.14	QZT-Grey	Y	N	N		

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmbs)
5370	-	BFES	Y	-	34.48	27.18	9.44	8.45	QZT-Tan	N	N	N		
5371	-	DEB	N	T	22	26.2	6.24	2.79	CCS-Pumpkin	N	N	N		
5372	-	SN	N	B	37.1	25.83	4.72	4.33	QZT-Red	N	N	N		
5373	-	FP	Y	-	29.95	18.54	5	1.88	CCS-Pumpkin	N	Y	N		
5374	-	FK	N	B	26.14	14.71	2.9	1.44	CCS-Pink	N	N	N		
5375	-	SN	N	B	27.91	21.04	5.46	3.07	CCS-Pumpkin	N	N	N		
5376	-	FK	N	L	18.46	16.27	3.28	1.06	CCS-Red	N	N	N		
5377	-	DEB	Y	-	38.63	28.22	4.57	4.72	CCS-Oil	N	N	N		
5378	-	BFLS	N	L	30.13	15.68	5	2.36	CCS-Oil	N	N	N		
5379	-	BFLS	N	M	12.96	16.94	5	1.07	CCS-Pumpkin	N	N	N		
5380	-	BP	N	T	22.22	13.22	2.77	0.79	CCS-Bluegrey	N	N	N		
5464	-	FK	N	L	43.1	18.81	4	3.46	QZT-Tan	N	N	YR		
5561	-	UFT	N	L	51.47	32.22	10.7	12.8	CCS-Pumpkin	N	N	N		
5562	-	DEB	Y	-	45.75	26.1	7.3	8	CCS-Pink	N	Y	N		
5563	-	Deb	Y	-	43.5	19.85	3.1	1.56	CCS-White	N	N	N	Beautiful multicolored chert	
5564	-	DEB	Y	-	40.44	23.33	4.3	3.3	CCS-Red	N	N	N		
5565	-	FK	N	T	64.26	44.59	8	20.8	QZT-Tan	N	N	N		
5566	-	UFT	Y	-	47.2	22	6.9	6.3	CCS-Red	N	N	N		
5567	-	COR	Y	-	64.37	40.24	20.67	42.6	QZT-Tan(Fossiliferous)	N	N	N		
5653		UFT	Y	-	85.05	43.13	8.5	21.56	CCS-Oil	N	N	N	Platform prep; Cutting edge along entire length, both edges	
5654		BP	N	T	44.68	30	5.46	5.07	CCS-Oil	Y	N	N	Heavily burnt; nondiagnostic tip	
6196	-	BFLS	N	M	13.89	7.83	2.07	0.26	CCS-Pink	N	N	N	May be a point or a drill, too incomplete to tell	
6521	a	UFT	Y	-	70.34	46.6	12.65	38.14	CCS-Pumpkin	N	N	N		0-50
6521	b	FK												0-50

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmbs)
6521	c	DEB	Y	-	44.13	47.52	13.66	26.81	QZT-Red	N	N	N		0-50
6521	d	UFT	Y	-	47.86	29.14	4.9	5.44	CCS-Pumpkin	N	N	N		0-50
6521	e	UFT	Y	-	31.58	13.42	3.35	1.45	QZT-Red	N	N	N		0-50
6521	f	BP	N	T	21.2	25.77	5.68	2.56	CCS-Pumpkin	N	N	N		0-50
6521	g	DR	N	B	31.14	26.22	6.11	3.59	CCS-Pumpkin	N	N	N		0-50
6521	h	FK	N	L	23.62	19.56	4.1	1.76	QZT-Tan	N	N	N		0-50
6521	i	FK	N	L	40.95	24.33	6.68	6.08	CCS-Pink	N	N	N		0-50
6521	j	FK	N	B	20.97	15.84	3.7	1.22	CCS-Pumpkin	N	N	N		0-50
6521	k	UFT	N	B	11.98	17.47	2.25	0.53	CCS-Pumpkin	N	N	N		0-50
6521	l	UFT	Y	-	46.03	25.29	7.2	6.69	CCS-Oil	Y	N	N		0-50
6522	a	UFT	Y	-	45.09	23.19	3.35	4	CCS-Pumpkin	N	N	N		50
6522	b	UFT	N	M	15.83	25.62	7.35	2.98	QZT-Red	N	N	N	15.78 mm worked edge on one side	50
6522	c	BFES	N	T	38.01	58.29	16.3	30.1	CCS-Red	Y	N	N		50
6522	d	BP	N	B	30.18	21.82	5.72	3.72	CCS-Red	Y	N	N	Slight expanding stem, broad corner notch	50
6522	e	FP	N	B	27.75	30.81	5.51	5.15	CCS-Oil	N	N	YT	Expanding FKat base, corner notch	50
6523	a	BP	N	B	28.54	24.76	5.9	4.19	CCS-Pumpkin	Ind	N	Ind	Corner notch, expanding stem, squared shoulders and convex base, base thin, unground	50-120
6523	b	SN	Y	-	27	28	6.23	4.3	QZT-Red	N	N	YT	Heavily reworked from a corner notch, expanding base point into a scraper - HEAVILY polished from use, edge entirely ground smooth and surface polished - very well-curved artifact, unbroken	50-120
6523	c	UFT	Y	-	35.21	21.25	3.5	2.34	CCS-Transparent	N	N	N		50-120
6523	d	UFT	Y	-	30.88	18.5	4.45	1.34	CCS-Pumpkin	N	N	N		50-120
6523	e	DS	N	B, L	26.61	16.71	2.4	1.25	CCS-Red	Y	N	Ind		50-120

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cms)
6523	f	BFES	Y	-	81.79	53.57	20.44	80.1	QZT-Orange	N	N	N		50-120
6523	g	BFES	N	T	21.94	21.93	7.24	3.35	QZT-Grey	N	N	N		50-120
6523	h	BFES	N	M	17.85	44.23	9	6.76	QZT-Red	Ind	N	N		50-120
6523	i	BFES	N	B	18.58	24.78	6.67	2.7	CCS-Red	Y	N	N		50-120
6523	j	FP	Y	-	24.67	12.46	2.79	0.83	CCS-Red	Y	N	YT	Reworked to drill-like tip, heavily burnt; sharp shoulders and contracting stem	50-120
6523	k	UFT	N	B	20.54	20.6	3.69	2	CCS-Pumpkin	N	N	N	Squared base	50-120
6523	l	BFLS	N	B	28.92	27	4.19	4.56	CCS-Red	N	N	N		50-120
6523	m	FK	N	T	34.73	24.6	6	3.98	CCS-Red	Y	N	N	Heavily burnt, backed type with one edge ground	50-120
6523	n	BFLS	Y	-	17.96	10.57	3.74	0.55	CCS-Transparent	N	N	N		50-120
6523	o	FP	N	B	23	17.14	3.62	1.49	CCS-Pumpkin	N	N	N	Corner notch, expanding shallow base, sharp shoulders	50-120
6523	p	BP	N	B	21.92	10.96	3.45	0.86	CCS-Pink	N	N	N	Corner notch, slightly expanding stem, wide corner notches	50-120
6523	q	BP	Y	-	38.3	24.24	6.55	5.8	CCS-Black	N	N	N	Wide Corner notches, expanding stem, convex base	50-120
6523	r	BP	N	T	22.86	10.88	2.13	0.38	CCS-Grey	N	N	N		50-120
6523	s	FP	N	T	15.78	10.73	2.14	0.38	CCS-Red	N	N	N		50-120
6523	t	FP	Y	-	23.5	10	2.64	0.5	CCS-Mottledgrey	N	N	N	Expanding stem, convex base, lightly touched along edge to shape	50-120
6523	u	FK	N	B	27.5	15.42	4	1.74	CCS-Pumpkin	N	N	N	Razor biface; preform?	50-120
6523	v	BP	Y	-	34.41	20.21	5.12	3.06	CCS-Mottledred	N	N	N	Unnotched triangular type	50-120
6524	a	FK	N	T	43.68	31	7.15	9.54	QZT-Red	N	N	N		50-120
6524	b	BP	Y	-	37.77	11.75	4.24	1.29	QZT-Tan	N	N	N		50-12
6524	c	FK	Y	-	17.5	11.43	2.84	0.53	CCS-Red	N	N	N		50-120

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmts)
6524	a	BP	Y	-	29.5	19.09	5.14	2.5	CCS-Bluegrey	N	N	N	Side notch, FKat base tapers to feet (like a corner notch), excurve edges and rounded ears	50-120
6524	e	BP	N	-	14.63	11.5	1.78	0.26	CCS-Red	Y	N	N		50-120
6524	f	BP	N	T	12.67	10.24	2.74	0.35	CCS-Red	N	N	N		50-120
6524	g	FK	Y	-	23.35	11.57	3.13	0.7	CCS-Pumpkin	N	N	N		50-120
6524	h	FK	N	B	24.64	11.68	3.66	1.26	CCS-White	N	N	N		50-120
6524	i	BP	N	T	23.21	12.07	2.93	0.76	QZT-Red	N	N	N		50-120
6524	j	FP	N	T	14.74	13	2.59	0.54	CCS-Red	N	N	N		50-120
6524	k	BP	N	T	21.22	14.19	2.85	0.89	CCS-Pumpkin	N	N	N		50-120
6524	l	BP	N	B	37.13	16.77	6.37	4.02	CCS-Pink	Y	N	N		50-120
6524	m	FP	N	B	22.73	16.84	3.35	0.95	QZT-Red	N	N	N		50-120
6524	n	FK	N	B	28.5	18.66	4.24	2.76	CCS-Pumpkin	N	N	N		50-120
6524	o													50-120
6524	p	FK	N	B	32.1	16.29	4.11	2.53	QZT-Red	N	N	N		50-120
6524	q	FK	N	B	34.21	22.69	4.21	2.95	CCS-Pumpkin	N	N	N		50-120
6524	r	UFT	N	T	37.63	25.62	8.23	7.09	CCS-Red	N	N	N		50-120
6524	s	UFT	Y	-	31.95	18.83	4.67	2.73	CCS-Transparent	N	N	N		50-120
6524	t	UFT	N	B	41.3	20.69	4.3	3.15	CCS-Pumpkin	N	N	N		50-120
6524	u	FK	Y	-	54.69	25.79	6.98	9.25	CCS-Bluegrey	Y	N	N		50-120
6524	v	BP	N	B	35	25.85	8.24	6.39	CCS-Bluegrey	Y	N	N		50-120
6524	w	DS	Y	-	47.06	30.52	12.9	16.47	QZT-White	N	N	N		50-120
6524	x	FK	N	T	63.14	26.36	7.31	14.38	CCS-Oil	N	N	YT		50-120
6524	y	UFT	Y	-	40.69	34.83	14.88	20.16	CCS-Red	N	Ind	N		50-120
6524	z	ANG	Y	-	32.44	23.56	7.72	6.85	CCS-Oil	N	Y	N		50-120

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
6525	a	BP	N	L	32.61	25.57	7.75	7.38	CCS-Pumpkin	Ind	N	N	May be a knife, however there appears to be a notch below the worked edge; similar to 6525.s.	50-120
6525	b	UFT	N	T	40.14	25.25	6.53	6.1	QZT-Tan	N	N	N	utilized edge (14.5mm)	50-120
6525	c	BFLS	N	B	25.57	24.3	5.64	3.34	CCS-Pumpkin	N	N	N	Squared biface; wear along one face	50-120
6525	d	FK	N	M	53.61	51.33	8.44	23.97	QZT-Orange	N	N	N	Large, edge retouch percussion	50-120
6525	e	BFES	N	B	34.64	25.41	6.09	6.63	CCS-Mottledtan	N	N	N	Squared biface with some wear on edges	50-120
6525	f	FP	N	T	23.88	12.88	2.2	0.53	CCS-Red	N	N	N	Finely FKaked point, unifacial primarily	50-120
6525	g	BP	N	T	20.86	16.09	4.3	1.07	CCS-Red	N	N	N		50-120
6525	h	BFES	N	T	35	12.51	5.01	2.51	QZT-Red	N	N	N	May be drill? Unlikely to be a point tip due to narrow width	50-120
6525	i	UFT	Y	-	43.82	22.05	8.58	6.23	CCS-Pumpkin	Y	Y	N		50-120
6525	j	UFT	N	M	17.32	14.76	2.77	1.23	CCS-Bluegrey	N	N	N	Unifacially worked; may be preform blank	50-120
6525	k	BFES	N	L	55	34.5	18.83	22.23	CCS-Pumpkin	Y	n	N	Angular breakage makes assesment difficult	50-120
6525	l	BP	N	T	37.26	20.83	5.21	3.71	CCS-Bluegrey	N	N	N	Nondiagnostic, straight converging edges; random FKaking	50-120
6525	m	FP	N	T	13.51	8.08	1.66	0.23	CCS-Red	N	N	N		50-120
6525	n	DR	Y	-	77.43	16.7	8.5	9.81	CCS-Bluegrey	N	Y	N	Handheld drill tool; shape suggests formal core technology	50-120
6525	o	FK	N	T	31	20.48	4.35	3.5	CCS-Pink	N	N	N	Has similar crescentic shape to other knives in collection	50-120
6525	p	FK	N	B	21.4	18.75	4.04	2.01	CCS-Pink	N	N	N	Squared biface type; so	50-120
6525	q	BP	N	T	26.57	20.87	3.82	2.11	QZT-Red	N	N	N		50-120
6525	r	UFT	N	B	42.41	15.87	2.74	2.53	CCS-Red	Y	N	N	Heavily burnt; shape suggests formal core, as with xxx.N	50-120
6525	s	BP	N	M	24.43	40.91	7.19	8.16	CCS-Pumpkin	N	N	N	Large point, broke above notches; notches appear perpendicular to orientation, but may be corner notched as well	50-120

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
6525	t	UFT	Y	-	39.1	20.07	4.28	3.26	CCS-Bluegrey	N	Y	N		50-120
6525	u	UFT	N	T	24.18	19.87	4.5	1.52	QZT-Bluegrey	N	N	N	Material too coarse to say confidently where modification has occurred	50-120
6525	v	BP	N	L	30.56	27.45	5.05	4.18	CCS-Bluegrey	Ind	N	N	May be transverse impact break at tip or result of burning	50-120
6525	w	DEB	Y	-	29.08	16.41	3.28	1.17	QZT-Orange	N	N	N		50-120
6525	x	GR	Y	-	43.13	16.04	8	4.5	CCS-Oil	N	N	N	Poor Flaking, wear on distal end suggests it may have been used as a graver/awl	50-120
6526	a	UFT	N	B	56.74	36.32	5.57	8.98	QZT-Red	N	N	N		12-24in
6526	b	UFT	Y	B	32.04	19.69	5.69	3.38	CCS-Pumpkin	N	N	N	Modified uniaxially on one edge, similar to denticulate	12-24in
6526	c	UFT	N	B	18.78	19.13	3.33	1.05	CCS-Red	Y	N	N	Heavily burnt	12-24in
6526	d	BFES	N	T	26.9	21.4	7.1	2.97	CCS-Pumpkin	N	N	N		12-24in
6526	e	UFT	N	T	30.71	33.47	11.81	11.7	CCS-Bluegrey	Y	Y	N	Moderately worked along distal end	12-24in
6528	a	BP	N	T	12.72	10.93	2.86	0.37	CCS-Pink	N	N	YR	Nondiagnostic tip	
6528	b	BFLS	N	B	22.29	21.85	5.86	3.47	CCS-Red	N	N	N		
6528	c	FP	Y	-	41.17	17.82	4.44	2.62	CCS-Pumpkin	N	N	YR	Expanding convex base, corner notch	
6528	d	BFES	Y	-	72.21	26.04	14.76	24	CCS-Bluegrey	N	N	YR	Patina forming; may be a borer or drill for large wood pieces, extensive where - somewhat denticulate along the edges	
6528	e	UFT	N	B	31.08	23.17	4.05	3.15	CCS-Red	N	N	N	EM along one edge entire length	
6528	f	FK	N	B	35.49	16.68	4.47	2.28	CCS-Red	N	N	N	May be a preform, long guitar pick shape	
6528	g	FK	N	T	24.23	20.09	5.67	3.09	CCS-Red	N	N	YR		
6528	h	FP	N	T	15.78	14.02	4.44	0.76	CCS-Bluegrey	N	N	N	Nondiagnostic tip	
6528	i	BP	N	L	33.58	16.37	5.87	2.24	CCS-Bluegrey	Ind	N	YR	Expanding convex base, corner notch	
6528	j	FK	N	T	30.12	16.63	3.54	1.78	CCS-Bluegrey	N	N	N	May be preform, point not well defined; no wear on edge	

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
6528	k	GR	N	B	28.93	11.58	4.53	1.45	CCS-Mottledred	N	N	N	Odd graver tip on a squared biface base, set at an angle to base	
6528	l	BP	Y	-	30.6	11.77	3.35	0.97	CCS-Grey	N	N	N	Corner notch expanding base	
6528	m	FK	N	T	55.6	43.6	8.34	20.67	QZT-Orange	N	N	YR	"Backed knife" crescentic shape	
6528	e	FK	Y	-	37.18	13.87	4.26	1.9	QZT-Red	N	N	N	Preform, built on FKake; labeled e, though e already logged for this number	
6529	a	UFT	Y	-	43.8	31.44	10.3	10.72	CCS-Pumpkin	N	N	N	Worked portion: 25.3mm and 38mm	50-85
6529	b	FK	N	B	24.23	19.9	6.85	3	CCS-Pink	N	N	N	Very thin along edge-"Squared biface" type; not heavily worn on edges	50-85
6529	c	BP	N	T	28.77	12.1	2.97	0.89	CCS-Red	N	N	N	Nondiagnostic, straight converging edges	50-85
6529	d	BFLS	N	T	18.65	16.3	3.46	0.92	CCS-Pumpkin	N	N	N	Nondiagnostic, straight converging edges	50-85
6529	e	BP	N	T	24.34	14.6	3.66	1.48	CCS-Pink	N	N	N	Nondiagnostic, straight converging edges	50-85
6529	f	FK	N	T	27.04	28.91	5.05	4.21	QZT-Tan	N	N	N	Same shape as those above - very patterned form	50-85
6529	g	BFES	N	L	25.4	11.08	5.28	1.26	QZT-Bluegrey	N	N	N	Too small to class well	50-85
6529	h	FP	Y	-	25.59	12.74	2.31	0.76	CCS-Red	N	N	N	Socket base, ears at 90 to stem	50-85
6529	i	FP	Y	-	29.59	14	3.65	1.37	QZT-Red	N	N	N	Likely a preform; guitar pick	50-85
6529	j	FP	N	T	15.92	10.32	2.55	0.39	CCS-Pumpkin	N	N	N	FKake point, nondiagnostic	50-85
6529	k	BP	Y	-	24	12.13	4.66	1.08	CCS-Pink	N	N	N	Stemmed point	50-85
6529	l	FK	N	B	14.5	15.05	4		CCS-Pumpkin	N	N	N	Deep red, squared biface type, moderate wear on edges. Well FKaked	50-85
6529	m	FK	N	L	40.84	22.32	6.84	5.74	CCS-Tiger	N	Ind	N	Incredible tiger- emf, very well worked edge	50-85
6529	n	UFT	N	B	35.71	19	5.3	4.29	QZT-Red	N	Y	N	Worked edge along both entire length	50-85

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmts)
6529	o	UFT	Y	-	33.65	17.37	5.25	2.51	CCS-Pumpkin	N	N	N	Utilized edge along entire length on one edge, 19.5m of modification on the other end	50-85
6529	p	UFT	N	T	34.8	24.52	6.92	5.84	CCS-Pumpkin	N	Y	N		50-85
6529	q	BFES	Y	-	42.86	30.36	13.56	18.53	QZT-Bluegrey	N	N	N		50-85
6529	r	BFES	Y	-	34.93	27.64	8.28	8.65	CCS-Red	N	N	N		50-85
6530	a	UFT	N	L	35.01	18.73	4.45	3.03	QZT-Red	N	N	N		85-120
6530	b	FK	N	B	19.74	11.19	3.66	0.89	QZT-Red	N	N	N		85-120
6530	c	FP	N	T	19.77	17.79	2.45	0.85	CCS-Pumpkin	N	N	N		85-120
6530	d	FK	Y	-	32.71	20.03	6.18	3.39	QZT-Bluegrey	N	N	N		85-120
6530	e	FK	N	B	24.1	10.84	3.24	0.83	CCS-Red	N	N	N		85-120
6530	f	FK	N	B	22.26	13	5.13	1.41	QZT-Bluegrey	N	N	N		85-120
6530	g	FK	Y	-	34.33	11.08	3.8	1.5	QZT-Red	N	N	N		85-120
6530	h	BFES	N	B	37.06	20.92	7.21	4.65	CCS-Red	Ind	N	N		85-120
6530	i	FP	N	B	25.25	12.57	2.46	0.72	CCS-Pumpkin	N	N	N		85-120
6530	j	UFT	Y	-	43.41	24.23	9.4	8.34	CCS-Pumpkin	N	Y	N		85-120
6531	a													85-120
6531	b	DS	N	T	29.36	30.86	8.14	7.1	CCS-Pumpkin	Y	N	N		85-120
6531	c	BFES	N	L	34.2	20.48	6.7	5.37	CCS-Black	N	Y	N		85-120
6531	d	BP	N	T	14.06	11.24	2.89	0.39	CCS-Red	N	N	YR		85-120
6531	e	FP	Y	-	33.74	13.6	3.16	1.05	CCS-Pumpkin				Sharp ears, corner notch, expanding base	85-120
6531	f													85-120
6531	g	BFLS	N	L	36	17.32	4.4	3.43	CCS-Oil	N	N	N		85-120
6531	h	FP	N	T	22.6	11.75	1.75	0.37	QZT-Red	N	N	N	Serrated tip	85-120
6531	i													85-120
6531	j	FK	N	B	34.33	23.41	5.42	4.72	CCS-Pumpkin	N	N	N		85-120

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmbs)
6531	k	FK	N	T	21.51	13.86	3.83	1	CCS-Pumpkin	N	N	YT		85-120
6531	l	BP	N	B	50.17	25.58	6.38	9.08	CCS-Pumpkin	Y	N	YR	Expanding stem, convex base, wide notches	85-120
6531	m	FK	Y	-	51.43	27.1	5.47	7.99	CCS-Bluegrey	N	N	N	Built on FKake, platform visible	85-120
6531	n													85-120
6531	o	BFLS	N	M	22.43	19.25	4.69	1.85	CCS-Red	Y	N	N	Very fragmentary along edge owing to burning; may be a projectile point but too broken to tell	85-120
6531	p													85-120
6531	q													85-120
6531	r	BP	N	T	20.71	12.58	3.34	0.78	CCS-Oil	Y	N	N	Corner notch on one piece, may be a knife	85-120
6532	a	UFT	Y	-	51.38	36.6	8.29	11.87	CCS-Bluegrey	N	N	N	Entire length, both edges	85-120
6532	b	DR	Y	-	58.8	20.66	12.98	11.81	QZT-Tan	N	N	N	Handheld borer/drill - worn at distal end	85-120
6532	c	FK	N	L	66.76	31.23	5.83	11.22	CCS-Red	N	N	YR		85-120
6532	d	BP	Y	-	45.41	19.95	5.23	4.07	CCS-Pumpkin	N	N	YR	Similar to x,y,l - Corner notched expanding convex base	85-120
6532	e	UFT	N	T	27.46	19.01	6.1	2.15	CCS-Mottledred	N	N	N	16mm worked edge	85-120
6532	f	BFLS	Y	-	42.1	19.47	3.9	4.06	CCS-Red	N	Y	N	Small inclusions on highs are presumed to be cortex; artifact may be a preform	85-120
6532	g	BFLS	N	B	28.92	29.99	4.44	3.85	CCS-Red	Y	N	N	May have been hafted with a broad base and shallow side notch - not patterned enough to say for sure	85-120
6532	h	DEB	N	B	13.64	19.29	2.5	0.66	QZt-Red	N	N	N		85-120
6532	i	BP	N	B	23.92	20.33	3.96	2.33	CCS-Bluegrey	Y	N	YR	Same as x&y, Corner notch, convex base	85-120
6532	j	BFLS	N	M	29.09	63.39	9.1	16.95	CCS-Red	Y	N	N		85-120
6532	k	BFES	N	T	49.69	38	7.77	10.53	CCS-Mottledtan	Ind	N	N		85-120

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6532	l	UFT	Y	-	46.4	31.6	3.98	4.71	CCS-Pumpkin	N	N	N	Entire length, one edge	85-120
6532	m	UFT	N	B	15.86	18.43	3.83	0.91	QZT-Red	N	N	N	Entire length, both edges	85-120
6532	n	FK	N	M	17.78	29.42	5.69	2.66	CCS-Pumpkin	N	N	N	May have been PP	85-120
6532	o	DEB	Y	-	31.42	28.04	6.92	4	CCS-Pumpkin	Y	N	N		85-120
6532	p	BFES	Y	-	38.52	30.81	11.78	15.55	CCS-Bluegrey	N	Y	N		85-120
6532	q	UFT	Y	-	29.66	20.21	4.44	3.24	CCS-Mottledred	Y	N	N		85-120
6532	r	UFT	Y	-	38.06	21.06	5.45	3.29	QZT-Red	N	N	N	Entire length, both edges	85-120
6532	s	UFT	N	T	41.29	20.35	5.82	4.43	CCS-Red	Y	N	N		85-120
6532	t	UFT	Y	-	38.49	31.74	9.47	7.75	CCS-Red	Y	N	N	Entire length, both edges	85-120
6532	u	BP	Y	-	36.34	17.99	5.96	3.71	CCS-Pumpkin	Ind	N	YR	Wide side notches, small shoulders, convex base	85-120
6532	v	UFT	Y		45.71	25.69	3.44	4.4	QZT-Red	N	N	N	Prepared platform; modified along entire length, both sides	85-120
6532	w	DR	N	T	22.67	9.12	5.15	1.07	CCS-Bluegrey	N	N	N		85-120
6532	x	BP	N	L	19.77	11	2.86	0.58	CCS-Bluegrey	N	N	YR	Corner notch - only ear present	85-120
6532	y	BP	N	L	35.82	19.12	3.41	2.02	CCS-Pumpkin	Y	N	YR	Corner notch, angular ear, convex base	85-120
6532	z	BFLS	N	L	24.05	23.15	5.39	2.57	CCS-Bluegrey	Y	N	N		85-120
6533	a	FK	N	B	77.9	59.26	10.03	47.02	QZT-Tan	N	N	Ind		85-120
6533	b	DS	Y	-	34.28	21.55	8.71	5.18	CCS-Red	N	N	N		85-120
6533	c	BP	N	T	19.16	12.31	3.34	0.76	CCS-Bluegrey	N	N	N	Nondiagnostic tip	85-120
6533	d	GR	Y	-	53.85	18.88	5.68	5.83	CCS-Red	Y	N	YR	Unifacial modification along entire circumference	85-120
6533	e	BFLS	N	B	24.18	15.76	3.93	1.78	CCS-Bluegrey	N	N	N		85-120
6533	f	DEB	Y	-	84.9	17.35	9.8	12.67	CCS-Pumpkin	N	Y	N	No modification or utilization of the end, this shows preparation of platforms and careful removal of blades from cores; corex is white, buff, and hard	85-120

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
6533	g	UFT	N	B	51.14	26.09	5.71	7.31	CCS-Bluegrey	N	N	N	34mm on one edge; 22mm	85-120
6533	h	DEB	Y	-	41.59	32.71	9.36	9.34	CCS-Pumpkin	N	N	N	Unmodified	85-120
6533	i	FK	N	T	29.64	26.72	4.53	3.04	CCS-Pink					85-120
6533	j	BFLS	N	B	35.98	35.44	8.69	10.79	QZT-Tan	N	N	N		85-120
6533	k	UFT	N	B	29.54	21.97	3.78	2.19	CCS-Pumpkin	N	N	N	Worked along entire edge, both sides	85-120
6533	l	BFES	Y	-	35.45	27	6.77	6.36	CCS-Oil	Y	N	N		85-120
6533	m	BP	N	M	24.49	12.67	4.17	1.1	CCS-Pumpkin	Y	N	N	Massively burnt - barbed ears downpointed, serated; no base or tip present	85-120
6533	n	FP	N	T	30.04	20.78	3.91	1.6	CCS-Pumpkin	Y	N	N	Barbed ear, slightly excurvate blade; only half of one notch present-contains needle point, apparently broken	85-120
6533	o	BP	N	T	15.9	18.62	2.98	0.87	CCS-Pink	N	N	N		85-120
6533	p	BP	N	B	49.8	18.67	8.69	8.2	Red QZT	N	N	N	Expanding base, wide side notched slightly expanding, slightly convex base; tip missing - broken from impact approx. 1 length missing	85-120
6533	q	BP	Y	-	26.2	16.95	4.2	1.75	CCS-Red	N	N	N	Corner notch, short ears, shallow notched, convex base, slightly expanding no feet	85-120
6533	r	DEB	N	B	16.22	19.72	3.23	1.03	CCS-Mottledred	Y	N	N		85-120
6533	s	BP	N	T	32.55	13.768	3.63	1.56	CCS-Grey	N	N	N	Nondiagnostic tip	85-120
6533	t	FP	Y	-	33.03	19.66	6.26	3.99	QZT-Red	N	N	N	Side notch, expanding convex stem; square shoulders, excurvate bladea	85-120
6533	u	UFT	N	T	15.28	14.11	3.55	0.68	CCS-Red	N	N	N	Utilized on one edge, entire length	85-120
6534	a	UFT	N	T	25.88	25.32	4.15	3.14	QZT-Tan	N	Y	N	Converging edges	120-170
6534	b	FK	N	B	19.39	12.68	2.62	0.74	CCS-Pumpkin	N	N	N	Razor biface; preform?	120-170
6534	c	UFT	N	T	19.2	11.74	2.69	0.59	QZT-Red	N	N	N		120-170

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cms)
6534	d	BP	Y	-	34.46	18.57	3.75	1.91	CCS-Red	N	N	N	Corner notch, expanding stem, convex base, sharp shoulders	120-170
6534	e	DEB	Y	-	28.26	12.84	1.46	4.17	CCS-Pumpkin	N	N	N		120-170
6534	f	FP	Y	-	25.4	10.7	2.67	0.5	CCS-Bluegrey	N	N	N	Rosegate	120-170
6534	g	BFES	Y	-	40.92	31.5	13.25	17.89	CCS-Red	N	Y	N	A tested cobble, bifacially worked	120-170
6534	h	BFES	Y	-	35.3	25.44	6.35	5.58	CCS-Bluegrey	N	M	N		120-170
6534	i	BFLS	N	B	31.36	31.43	7.15	6.75	QZT-Red	N	N	N	Built on FKake, platform visible	120-170
6534	j	FK	N	B	20	18	3.84	1.63	CCS-Red	N	N	N	Razor biface; preform?	120-170
6534	k	CH	Y	-	70.2	50.97	35.49	130.16	CCS-Red	N	Y	N	Heavily worn and hammered along edges, white material rubbed on high ridges - bone?	120-170
6534	l	FP	Y	-	23.27	12.62	2.98	0.67	QZT-Red	N	N	N	Corner notch, expanding stem, FKat base, sharp shoulders	120-170
6535	a	UFT	Y	-	54	55.65	10.55	29.14	QZT-Tan	N	Y	YR	All edges utilized, entire length and width	120-150
6535	b	DS	Y	-	93.7	62.64	18.89	117.76	QZT-Red	N	N	N	Well worn - type specimen of denticulate scrapers	120-150
6535	c	BFLS	N	L	69.45	26.5	8.81	16.52	CCS-Pumpkin	Ind	N	N	Well worn on edges	120-150
6535	d	FK	N	T	41.82	30.43	6.44	7.49	QZT-White	N	N	N	Well worn edges, may reFKect material quality and not use wear	120-150
6535	e	BFLS	Y		56.63	35.62	6.73	12.39	CCS-Pumpkin	N	N	YR	Glued	120-150
6535	f	BP	N	B	29.05	28.74	4.72	4.44	CCS-Pumpkin	N	N	N	FKat base, corner notch, prominent barbed ears	120-150
6535	g	BFES	N	L	33.47	23.68	8.78	5.67	CCS-Pumpkin	Ind	N	N		120-150
6535	h	BFES	Y	-	49.95	40.97	15.36	31.08	CCS-Red	N	N	N	Well worn	120-150
6535	i	UFT	N	B	33.18	29.49	10.22	12.15	CCS-Pumpkin	Ind	N	N		120-150
6535	j	BFLS	N	B	37.59	41.53	5.39	8.46	CCS-Pumpkin	Ind	N	N	Patina'd	120-150
6535	k	BFES	N	L	34.89	18.75	8.6	4.98	CCS-Red	Y	N	N		120-150
6535	l	BFLS	N	T	20.15	25.73	6.42	8.47	CCS-Pumpkin	N	N	YR		120-150
6535	m	BFLS	N	L	33.92	30.88	5.65	5.33	CCS-Red	Y	N	N	Massively burnt, transverse break	120-150

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6535	n	BP	N	T	34.45	21.05	7.47	4.43	CCS-Red	N	N	N	Nondiagnostic tip	120-150
6535	o	BFES	N	B	24.1	27.41	4.7	4.41	QZT-Tan					120-150
6535	p	DEB	N	M	22.77	20.24	5.22	2.56	QZT-Red	N	N	N	Nonutilized FKake segment	120-150
6535	q	FP	N	B	25.36	14.88	3.28	1.16	CCS-Pumpkin	N	N	YR	Corner notch, expanding base, convex bottom	120-150
6535	r	BFLS	Y	-	32.12	23.62	6.57	4.76	CCS-Pumpkin	N	N	N		120-150
6535	s	FP	N	B	18.84	11.81	3.21	0.6	CCS-Red	Y	N	Y	Corner notch, expanding base, convex bottom	120-150
6535	t	BP	N	B	23.52	20.32	3.71	1.98	CCS-Oil	Y	N	YR	FKat base, corner notch	120-150
6535	u	BFLS	N	M	17.68	14.08	3.96	1.064	CCS-Red	Ind	N	Ind	May be a preform, poorly thinned relative to others	120-150
6535	v	ANG	Y	-	19.95	14.73	4.4	1.41	QZT-White	Ind	Ind	N	May be noncultural	120-150
6535	w	FK	N	B	18.3	15.57	3.15	1.18	CCS-Red	N	N	N	May be a preform - shows similar breakage, though; could the 90 break in these be induced and relate to hafting?	120-150
6535	x	FP	N	L	23.67	11.78	4.11	0.88	CCS-Pumpkin	N	N	YR	Nondiagnostic blade portion - fine parallel retouch similar to most rosegate style	120-150
6535	y	Bp	N	M	15.95	12.51	3.85	0.76	CCS-Pink	N	N	YR	Nondiagnostic midsection; similar angle to rosegates	120-150
6535	z	BP	N	B	27.24	24.77	4.8	3.77	CCS-Grey	N	N	YR	Side notch, rounded edge on FKat base - Northern Side Notch style	120-150
6536	a	UFT	Y	-	65.39	56.6	12.18	14.7	CCS-Pumpkin	N	N	N	Unifacial FKaking around entire perimeter	120-150
6536	b	BFLS	N	B	57.74	36.91	8.64	22.67	CCS-Pumpkin	N	N	N	May be a preform, broken like other squared bifaces	120-150
6536	c	BFES	N	L	34.83	34.79	13.61	5.52	CCS-Red	N	N	N		120-150
6536	d	FK	N	T	33.97	33.26	7.7	7.24	CCS-Pumpkin	N	N	N		120-150
6536	e	BP	N	T	24.92	15.13	2.64	0.7	CCS-Grey	Y	N	N	Massively burnt	120-150
6536	f	BP	N	M	29.48	27.32	9.83	3.59	CCS-Mottledred	N	N	N	Barbed ear, straight blade, corner notch	120-150

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6536	g	BP	N	B	36.6	18.4	6.99	4.33	CCS-Pumpkin	N	N	YR	Slightly excurvate blade, side notches, slightly barbed shoulders, convex base	120-150
6536	h	FK	Y	-	47.13	25.26	2.96	3.49	CCS-Pumpkin	N	N	N	May be a preform; large kite shaped blade (missing portion to side)	120-150
6536	i	FK	N	T	57	45.24	5.92	15.13	CCS-Pumpkin	N	N	N	Backed knife; dull point, likely used for multitool	120-150
6536	j	BFES	N	T	39.68	27.46	5.87	6.66	CCS-Pumpkin	Y	N	N	Massive burning	120-150
6536	k	BP	N	B	26.85	19.51	3.85	2.02	CCS-Red	Y	N	N	FKat base, corner notch, sloping shoulders	120-150
6536	l	BFLS	N	B	30.84	32.02	10.21	4.98	CCS-Pumpkin	N	N	YR		120-150
6536	m	FP	N	T	22.76	13.59	2.35	0.54	CCS-Pumpkin	N	N	N		120-150
6536	n	BFLS	N	M	12.78	21.3	5.28	1.6	CCS-Transparent	N	N	Ind		120-150
6536	o	DEB	N	B	16.51	21.55	4.83	1.56	CCS-Red	N	N	N		120-150
6536	p	BFLS	N	T	26.75	16.73	7.5	3.47	QZT-Red	N	N	N		120-150
6536	q	BP	N	T	20.97	16.18	2.38	,6	CCS-Pumpkin	N	N	N		120-150
6536	r	BFLS	N	B	16.89	10.64	2.4	0.37	CCS-Red	Y	N	N	Fragmentary, difficult to assess	120-150
6536	s													120-150
6536	t	BP	N	T	20.47	22.04	3.27	1.09	CCS-Pumpkin	N	N	N		120-150
6537	a	FK	Y	-	89.51	40.54	8.32	32.23	CCS-Pumpkin	N	N	N		140-170
6537	b	BFES	Y	-	103.69	36.34	16.61	65.69	QZT-Red	N	N	N		140-170
6537	c	FK	N	T	32.52	41.63	6.84	10.765	QZT-Red	N	N	YR		140-170
6537	d	BP	N	B	34	21.13	4.92	3.215	CCS-Pink	Ind	N	N	Serrated corner notch, concave base with sharp tangs	140-170
6537	e	BP	N	L	21.2	18.62	4.48	1.56	QZT-Tan	Y	N	N	Corner notched, eared - very coarse material	140-170
6537	f	BP	N	M	18.6	27.16	4.89	3.05	QZT-Tan	N	N	N	Corner notched, non diagnostic	140-170
6537	g	BP	N	B	21.51	18.64	5.29	2.34	CCS-Pumpkin	N	N	YR	Expanding stem, rounded corner, convex base , corner notch	140-170

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
6537	h	FK	N	L	21.24	21.15	4.6	1.8	CCS-Pink	N	N	N		140-170
6537	i	BFLS	N	B	34.12	27.74	6.32	5.89	CCS-Pumpkin	Y	N	N		140-170
6537	j	FK	N	B	29.8	30.17	7.03	7.04	QZT-Tan	N	N	Y		140-170
6537	k	UFT	N	B	53.67	44.22	14.12	38.72	QZT-Red	N	Y	N		140-170
6537	l	FK	Y	-	44.06	24.33	4.75	4.22	CCS-Red	N	N	Y		140-170
6537	m	BFLS	N	B	45.12	35.21	9.76	18.48	CCS-Pumpkin	N	N	N		140-170
6537	n	FK	N	B	41.5	36.05	5.2	9.27	CCS-Oil	N	N	N		140-170
6537	o	DR	N	M	19.7	30.83	5.49	2.99	QZT-Tan	N	N	N		140-170
6537	p	BP	N	B	16.22	22.9	3.86	1.63	CCS-Pink	N	N	N		140-170
6537	q	BFES	Y	-	40.27	26.41	7.48	7.75	CCS-Red	Y	N	N		140-170
6537	r	FK	N	T	30.8	41.69	7.34	8.07	CCS-Pink	N	N	N		140-170
6537	s	BP	N	T	27.32	30	5.07	3.65	CCS-Pumpkin	N	N	N		140-170
6537	t	BP	N	T	30.86	25.85	4.27	2.83	CCS-Pumpkin	N	N	N		140-170
6537	u	DR	N	T	29.38	8.04	4.67	0.955	CCS-Pink	N	N	N		140-170
6537	v	FK	N	B	27.72	22.94	6.3	4.5	CCS-Bluegrey	N	N	N		140-170
6537	w	FK	N	B	15.5	28.23	4.56	1.87	CCS-Red	N	N	N	Ground on one	140-170
6538	a	DEB	Y	-	71.14	38.88	11.63	26.16	QZT-Red	N	N	N	Blade-like FKake with central dorsal ridge	140-170
6538	b	DS	N	T	51.08	39.77	10.08	18.53	CCS-Oil	Y	N	N	Massively burnt	140-170
6538	c	BFLS	Y	-	71.35	44.75	6.59	24.81	CCS-Pumpkin	N	N	N		140-170
6538	d	BP	N	-	25.36	23.54	5.11	3.19	QZT-Tan	N	N	N		140-170
6538	e	BFLS	N	T	68.58	39.54	14.27	30.34	CCS-Pumpkin	N	N	N		140-170
6538	f	BFLS	N	L	40.09	23.83	6.41	6.48	CCS-Pumpkin	Y	N	N		140-170
6538	g	Deb	N	B	17.8	31.02	8.15	4.85	CCS-Red	Ind	N	N		140-170
6538	h	UFT	N	B	35.25	36.87	7.25	8.91	QZT-Bluegrey	Y	Y	N		140-170
6538	i	BFES	N	T	28.54	39.75	9.51	7.32	CCS-Red	Y	N	N		140-170

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6538	j	BP	N	T	22.08	20.17	3.45	1.21	QZT-Red	N	N	N		140-170
6538	k	FK	N	T	30.03	30	5.33	4.7	CCS-Oil	N	N	N		140-170
6538	l	BP	N	B	10.21	16.42	3.6	0.59	CCS-Red	N	N	N	Basally thinned convex base, corner notched	140-170
6538	m	FK	N	T	30.34	14.65	3.42	1	CCS-Pumpkin	N	N	Ind		140-170
6538	n	BP	N	T	23.05	22.17	4.42	2.13	CCS-Pumpkin	N	N	N		140-170
6538	o	DEB	N	L	24.3	21.19	3.2	1.62	Slate	N	N	N		140-170
6538	p	BP	Y	-	40.39	19.16	6.13	3.02	CCS-Pumpkin	N	N	N	Basally thin expanding base, corner notch with prominent tangs	140-170
6538	q	UFT	Y	-	49.79	25.8	9	12.33	CCS-Pumpkin	Ind	Y	N		140-170
6538	r	BP	N	T	21.5	13.6	3.28	0.65	CCS-Transparent	N	N	N		140-170
6538	s	FK	N	L	29.41	25	5.46	4.12	CCS-Pink	N	N	YR		140-170
6538	t													140-170
6538	u	FK	N	B	28.72	34.33	5.23	6.27	CCS-Red	N	N	N		140-170
6538	v	BP			33.3	20.2	4.4	2.53	CCS-Red	N	N	YR		140-170
6538	w	BFES	N	L	44.08	25.65	6.4	7.67	CCS-Red	Y	N	N		140-170
6538	x	BFLS	N	M	30.24	30.9	6.12	5.28	CCS-Pumpkin	Y	Ind	N	Heavily burnt	140-170
6538	y	FP	N	M	26.35	21.15	3.94	2.63	QZT-Tan	N	N	N	Corner notch, expanding base - too fragmentary for more id	140-170
6538	z	FK	N	T	20.92	20.66	3.27	1.1	CCS-Pink	N	N	YR		140-170
6539	-	Chi-tho	N	L	72.11	53.8	10.74	56.28	SS	N	N	N	Like a Cthi Ro, heavily worn scraper	140-170
6540	a	FK	N	B	34.63	20.12	3.97	2.86	VOL-Black	N	N	N		170-200
6540	b	BFLS	N	B	39.36	32.32	6.35	10.76	CCS-Black	N	N	N		170-200
6540	c	FK	N	L	26.24	20.5	3.95	1.87	CCS-Red	N	N	N		170-200
6541	a	BFES	N	B	28.59	28.79	4.86	4.08	CCS-Pumpkin	Y	N	N		140-170
6541	b	BFES	N	T	40.45	30.7	4.82	5.74	CCS-Pumpkin	Y	N	N		140-170

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cbs)
6541	c	BP	N	T	27.26	15.57	3.92	1.24	CCS-Grey	N	N	N		140-170
6541	d	FK	Y	-	26.15	16.72	3.18	1.4	CCS-Oil	N	Y	N		140-170
6542	a	FK	N	B	53.5	49.5	10.65	30.8	CCS-Pink	N	N	N		170-200
6542	b	BP	N	T	35.14	25.5	6.43	4.8	CCS-Pink	Y	N	YR		170-200
6542	c	fk	n	L	15.63	12	3.18	0.63	CCS-Pink	Y	N	IND		170-200
6542	d	BFLS	N	M	37	37.7	7.77	9.2	CCS-Pink	Y	N	N		170-200
6542	e	BFES	N	T	47.15	30.9	10.63	12.2	CCS-Oil(Fossiliferous)	Y	Y	N	Built on river cobble	170-200
6542	f	UFT	Y	-	41.77	27.41	6.27	7	CCS-Pumpkin	N	N	N		170-200
6542	g													170-200
6542	h	BFLS	Y	-	60.76	41.5	11.4	30.5	QZT-Red	N	N	N		170-200
6542	i	BP	N	T	26.54	23.83	4.45	2.2	CCS-Red	Y	N	IND		170-200
6542	j	BFES	N	T	36.74	44.31	8.7	14.4	CCS-Tiger	N	N	N		170-200
6542	k	BFLS	N	T	15	25.53	7.72	2.8	CCS-Pumpkin	N	Y	N		170-200
6542	l	BP	N	T	29.67	16.34	2.33	1	CCS-Pumpkin	Y	N	N		170-200
6542	m	BP	N	B	13.97	20	4.4	1.43	CCS-Red	Y	N	N	Expanding base corner notch - FKat base	170-200
6543	a	FK	N	B	14.3	23.38	4.33	1.6	CCS-White	N	N	N		170-200
6543	b	BP	N	T	31.69	14.64	3.92	1.8	CCS-Bluegrey	IND	N	N	Rosegate - sharp ear fine parallel FKaking ; slight seration	170-200
6543	c	BFLS	N	T	35.52	35.7	7.28	8.8	QZT-Red	Y	N	N		170-200
6543	d	BP	N	T	33	27.66	3.49	2.9	CCS-Pumpkin	Y	N	N	Nondiagnostic; random FKaking, wid	170-200
6543	e	UFT	Y	-	43.53	23.14	5.92	6.4	CCS-Pumpkin	N	N	N		170-200
6545	a	BP	Y	-	39.33	24.4	5.12	4.68	QZT-Red	N	N	2	Mallory-type, shallow side notches; squared concave base	
6545	b	BP	Y	-	40.6	28.4	5.45	6.6	QZT-Pumpkin	N	N	N	Pinto split base	
6546	a	BFLS	N	L	27.22	26.35	5.17	3.97	CCS-Amber	Y	N	N	Massively burnt, obstructs surface	350-380

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6546	b	BP	N	T	19.5	19.2	4.33	1.32	CCS-Pumpkin	N	N	N		350-380
6546	c	BP	N	T	28.89	221.6	3.92	1.71	CCS-Amber	N	N	N		350-380
6546	d	UFT	Y	-	65	40	8.2	18.2	CCS-Red	N	N	N	Crescentic shape	350-380
6547	s	FK	N	B	35.4	15.63	8.26	5.46	CCS-Pumpkin	N	Ind	N	Heavily worn squared biface, may be a drill, unsure	170-200
6547	a	BFLS	N	B	26.2	21.3	5	3.9	CCS-Red	Y	N	N		170-200
6547	b	FK	N	L	40	22.34	7.2	6	CCS-Pumpkin	Y	N	N		170-200
6547	c	UFT	N	D	47.46	34.27	5	9.2	CCS-Pumpkin	Y	N	N		170-200
6547	d	FK	N	L	30.23	16.09	5.89	2.6	CCS-Red	Y	N	YR		170-200
6548	t	Chi-Tho	Y	-	57.16	55.28	9.24	45.69	SS (?)	N	Y	N	ChiTho- scraper built on cobble spall; well worn and polished	0-50
6565	a	UFT	N	L	42.59	43.27	15.3	29.4	QZT-Bluegrey	Y	N	N		0-50
6565	b	UFT	Y	-	50.46	20.05	5.61	4.37	CCS-Pumpkin	Ind	N	N	Worked edge entire length on one side, 35.2 mm on other	0-50
6565	c	BFES	N	L	38.88	19.4	8.1	6.95	CCS-Pumpkin	Y	N	N		0-50
6565	d	UFT	N	T	43.7	20.5	4.95	4.42	CCS-Red	N	T	N	Working edge entire length on one side, 26.8mm on other	0-50
6565	e	FK	N	B	37.3	16.1	4.1	2.3	CCS-Pink	N	N	N	Preform	0-50
6565	f	UFT	Y	-	29.05	17.83	5.85	2.13	CCS-Pumpkin	N	Y	N	Worked edge 15mm	0-50
6565	g	UFT	Y	-	19.62	8.23	1.79	0.27	CCS-Red	N	N	N	Worked edge entire, both edges	0-50
6565	h	DEB	Y	-	26.44	18.59	4.4	1.92	CCS-Bluegrey	Y	Y	N		0-50
6565	i	FP	N	M	22.57	13.21	3.37	0.85	CCS-Mottledtan	Ind	N	N	Nondiagnostic, straight converging edges	0-50
6565	j	BFLS	N	T	18.24	14.42	3.61	0.93	CCS-Pumpkin	Ind	N	Ind		0-50
6565	k	BP	N	M	29.84	35.79	7.04	6.61	CCS-White	N	N	Ind	Very small ear and notch (3.8mm) present on one face, converging edges	0-50
6565	l	UFT	Y	-	48.41	40.05	10.45	16.08	VOL-Black	N	Ind	N		0-50
6565	m	DS	Y	-	39.32	26.61	14.35	12.97	CCS-Oil	Y	Y	N		0-50

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmts)
6567	a	UFT	Y	-	68.22	42.42	16	51.5	QZT-Pink	N	Y	N		120-170
6567	b	UFT	Y	-	83	51.75	16.69	61.87	QZT-Pink	N	N	N	43mm utilized edge, shaped to a point, unifacially	120-170
6567	c	UFT	Y	-	81.11	45.85	12.55	44.9	QZT-Pink	N	Y	N		120-170
6567	d	BFLS	Y	-	79.55	50.38	13.28	54.48	QZT-Pink	N	N	N		120-170
6567	e	UFT	Y	-	75.05	38.12	13.75	33.15	QZT-Pink	N	N	N		120-170
6567	f	UFT	Y	-	65.05	48.41	10.15	34.8	QZT-Pink	N	N	N		120-170
6567	g	BFES	Y	-	74.93	50.34	14	53.65	QZT-Pink	N	N	N		120-170
6567	h	DEB	Y	-	70.1	57.13	17.7	80.06	QZT-Pink	N	Y	N		120-170
6568	a	BFLS	N	T	52.7	57.1	14.66	42.4	CCS-Pumpkin	N	N	N		170-200
6568	b	BFES	Y	-	75.5	48.17	18.6	57.1	CCS-Pumpkin	N	Y	N		170-200
6568	c	BFES	Y	-	76.84	54.77	24	93.4	CCS-Pumpkin	N	N	N	Tan form of pumpkin chert	170-200
6568	d	BFES	Y	-	67	57.71	19.5	67.09	CCS-Pumpkin	Y	N	N		170-200
6568	e	DEB	Y	-	75.28	62.75	20	94.9	CCS-Pumpkin	N	Y	N		170-200
6568	f	DEB	Y	-	64.77	52.77	18	74-69	CCS-Pumpkin	N	N	N	A package of heavy spalls and rough bifaces - total weight in grams in comments	170-200
6569		BP	N	L	32.26	17.24	2.92	1.27	CCS-Red	N	N	N	Concave base, narrow corner notches, slightly excurvate blade	120-170
6570	a	DEB	N	B	47.3	36	9.66	17.6	CCS-Translucent	Ind	N	N		170-200
6570	b	SN	N	L	37.62	25.8	7.4	8.1	CCS-Pumpkin	Y	Y	Ind	Buff cortex	170-200
6570	c	BFES	N	T	40	51.75	13.3	30.4	QZT-Pumpkin	N	Y	N	Buff cortex; river cobble-worn	170-200
6570	d	FP	N	B	25.72	27.8	2.7	2.63	CCS-Oil	N	N	YR	ELKO Very thin corner notched point, FKat wide base, shallow corner notches; one ear missing, the other appears reworked to obscurity	170-200
6570	e	BFLS	N	T	35.32	35.28	8	9.6	CCS-Pumpkin	Y	N	N		170-200
6572	a	FK	N	T	45.1	54.94	8.4	19.8	QZT-Red	Y	N	YR		170-200

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6572	b	FK	N	L	36.55	29.65	7.54	5.666	QZT-Red	N	N	YR		170-200
6572	c	ANG	Y	-	55.15	33.55	15.42	16.3	CCS-Pumpkin	Y	N	N		170-200
6573	-	BP	Y	-	40.49	22.32	4.47	2.97	CCS-White	N	N	N		170-200
6574	-	BFES	Y	-	43.35	36.06	9.64	16.87	CCS-Translucent	N	Y	N		140-170
6575	-	BP	Y	-	25.29	15.51	3.77	1.46	CCS-Oil	N	N	N	Low corner notch, similar to Avonlea; made of material that looks an awful lot like KRF	140-170
6576	a	BFLS	N	L	63	35.1	9.1	17.91	CCS-Pumpkin	N	N	N		170-200
6576	b	BP	Y	-	37.53	24.96	4.89	3.39	CCS-Pumpkin	N	N	N	Split base Pinto style - FKaring shoulders, corner notched	170-200
6577	-	BFES	Y	-	102.35	61.24	18.35	114.57	CCS-Red	N	Y	N	Largely unifacially worked, platform preparation around edges	170-200
6578	a	FK	Y	-	40.24	28.47	7.38	9.28	CCS-Whitemottled	N	Y	N	Backed knife, built from cobble FKake with cortex visible bipolarly	120-170
6578	b	FK	Y	-	37.84	29.91	7.47	9.36	CCS-Oil	N	Y	N	Backed knife, built on cobble with cortex at back	120-170
6578	c	BP	N	B	45.72	25.9	6.97	7.56	CCS-Bluegrey	Y	N	N	Expanding convex base, side notched; massively burnt - reglued	120-170
6578	d	FK	N	M	19.5	33.73	4.89	3.36	QZT-Red	Ind	N	N	Small midsection, well FKaked edges-likely heat treated	120-170
6578	e	BFES	Y	-	66.22	44.57	12.79	42.6	QZT-Bluegrey	N	Y	N		120-170
6579	-	UFT	N	T	43	28.54	8.53	8.59	CCS-Mottled	N	N	N		140-170
6580	a	FK	N	B	43.17	43.56	8.48	20.4	QZT-Grey	N	N	N	Another squared biface, sharing the break, but on a much larger scale; edges are worn.	200-230
6580	b	FK	N	L	45.39	30.49	5.7	5.53	CCS-Pumpkin	Y	N	N	Finely FKaked, too burnt to determine much	200-230
6581	c	BFES	N	L	32.76	40.73	7.2	10.6	CCS-Pumpkin	Ind	N	N		170-200
6581	a	BFES	Y	-	63.62	43.32	8.8	36.5	CCS-Pumpkin	N	Y	N	Tabular chert, orange cortex, knapped around perimeter, little intrusion of FKaking	170-200

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
6581	b	DEB	N	B	49.83	39.38	11.3	20.64	CCS-Pumpkin	Y	Y	N	Cortex river rounded red patina, crystal band inclusions	170-200
6581	c	FK	N	L	31.73	32.22	5.79	5.9	CCS-Red	Y	N	YR	"Backed knife" built on FKake with thick portion (bulb) thinned with edge prep - reverse edge is ground smooth	170-200
6581	d	BP	N	B	22.45	23.65	4.89	3.3	CCS-Pumpkin	N	N	Ind	5746-5749	170-200
6581	e	BFLS	N	T	45.88	49.6	8	11.7	CCS-Translucent	N	N	N		170-200
6581	f	BFES	N	T	30.2	50.5	9.5	14.4	CCS-Red	N	N	N		170-200
6581	g	DEB	Y	-	42.47	62.6	10	23.3	QZT-Bluegrey	N	Y	N	Cortex tan, thin, not river worn - primary	170-200
6581	h	BP	Y	-	36.3	26.37	4.87	3.5	ccs-pUmpkin	N	N	N	Pinto split base, ear broken	170-200
6581	i	BP	Y	-	25.5	14.35	4.22	1.6	CCS-Pink	N	N	N	Small triangular/lanceolate point, indented base	170-200
6581	j	DEB	N	T	30.93	49.79	9.05	10.9	CCS-Banded(Oil/Tiger?)	N	N	N		170-200
6581	k	UFT	N	T	27.53	23.97	3.97	3.1	CCS-Red	N	N	N		170-200
6581	l	FK	N	L	27.72	12.75	5.6	1.6	QZT-Mottled	Y	N	IND		170-200
6581	m	BP	N	T	40.95	24.37	8.44	6.5	CCS-Bluegrey	Y	N	N	IND	170-200
6581	n	BP	N	B	23.14	24.14	4.9	2.2	CCS-Pumpkin	Y	N	N	Pinto split base	170-200
6581	o	FK	N	T	35.78	18.74	5.6	4.1	CCS-Pumpkin	N	N	Y	Base missing, likely less than 7mm	170-200
6582	d	BFES	N	T	43.82	35.55	7.53	15.95	CCS-Pumpkin	Ind	N	N		170-200
6582	a	UFT	Y	-	71.77	59.89	17.5	63.4	QZT-Tan	N	N	N		170-200
6582	b	UFT	N	T	30.67	42.13	12.88	16.7	CCS-White	N	N	N		170-200
6582	c	FK	N	T	36.9	45.75	8.77	15	CCS-Pumpkin	N	N	YR		170-200
6582	d	FK	N	T	62.78	30.2	10	14.1	QZT-Red	N	N	N	Well-worn	170-200
6582	e	BFLS	N	T	29.64	37.28	7.62	7.7	CCS-Pumpkin	N	N	N		170-200
6582	f	DEB	Y	-	38.6	33.6	12.68	16.2	QZT-White	N	Y	N	Built on river cobble	170-200

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6583	e	BP	N	B	22.08	21.25	4.1	2.27	CCS-Oil	N	N	N	Mallory - no concavity at base, all squared with side notches	200-230
6584	f	BP	N	B	19.34	25.04	4.5	2.15	CCS-Pumpkin	Y	N	N	Heavily burnt Mallory - concave base "rabbit ears"	170-200
6585	g	FP	N	B	27.8	17.2	3.9	1.71	CCS-Bluegrey	N	N	N	Expanding base stemmed	200-230
6587	a	UFT	N	T	48.08	41.86	10.8	19.42	QZT-Tan	N	N	N	Carbonates across entire surface	200-230
6587	b	FK	N	M	27.5	45.1	6	8.03	CCS-Pumpkin	Ind	N	N	Apparently crescentic shape, too, but no tip present;	200-230
6587	c	Fk	N	T	42.9	23.28	5.24	3.6	CCS-Mottledtan	N	N	N	May be heat treated based on luster	200-230
6587	d	BP	N	B	18.64	25.64	3.87	2	CCS-Pumpkn	N	N	N	Mallory base	200-230
6587	e	BP	N	M	15	21.13	3.69	1.18	CCS-Oil	N	N	N	Stemmed, side notched or shouldered	200-230
6587	f	BFES	N	L	19.21	23.28	5.45	1.92	CCS-Pumpkin	Ind	N	N		200-230
6587	g	BP	N	T	27.93	15.23	4.92	1.82	CCS-Rootbeer	N	N	N	Missing base; MOST LIKELY EXPANDING STEMMED	200-230
6587	h	FK	N	T	38.7	33.3	6.24	7.84	QZT-Tan	Ind	N	N		200-230
6587	i	BP	N	B	19.53	29.73	4.34	28.4	CCS-Mottledtan	N	N	N	Corner notch, prominent ears, expanding base	200-230
6588	1	BFES	N	T	37.06	39.63	8.81	13.34	CCS-Bluegrey	N	N	N		230-260
6588	2	BFES	N	M	33.47	36.3	7.91	11.94	CCS-Whitepink	N	N	N		230-260
6588	3	FP	N	B	16.31	19.12	4.29	1.6	CCS-Bluegrey	N	N	N	Side notch, FKat base	230-260
6589	a	UFT	Y	-	66.25	78.9	20.72	85.44	QZT-Tan	N	Y	N	Buff cortex, used along this edge which is equivalent to width	230-260
6589	b	UFT	N	L	62.74	30.34	6.65	12.64	QZT-Pink	N	N	N	Utilized edge (45mm)	230-260
6589	c	UFT	Y	-	32.18	32.06	6.08	5.37	CCS-Pumpkin	N	Ind	N	Utilized edge (26mm)	230-260
6589	d	FP	N	T	31.89	23.66	5.63	3.37	CCS-Pumpkin	N	N	N	May be a preform as edges are not retouched; converging to sharp point	230-260
6589	e	BP	N	B	14.64	26	3.15	1.13	CCS-Oil	Y	N	N	Mallory base	230-260
6590	a	BFLS	Y	-	48.51	29.62	8.99	13.34	QZT-Bluegrey	N	N	N		260-290

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6590	b	SN	Y	-	42.32	34.1	10.29	16.39	CCS-Pumpkin	N	N	N		260-290
6590	c	BP	N	T	25.21	18.43	4.14	1.8	CCS-Red	N	N	N		260-290
6591	a	FP	N	T	33.32	16	3.67	1.12	CCS-Mottledred	Y	N	N	Heavily burnt with a large transverse break at base; notches not present, may be a preform, however edges finely retouched and point neele thin	290-320
6591	b	SN	Y	-	36.29	34.39	5.82	7.33	CCS-Pumpkin	N	N	N	Classic snub nose, if a bit thin	290-320
6591	c	BP	N	B	30.68	25.1	3.4	4.4	CCS-Pumpkin	N	N	N	Corner notch, shallow and narrow, FKat base sharp feet	290-320
6591	d	BFLS	Y	-	71.16	34.35	14.25	29.122	CCS-Mottledtan	Y	N	Y	One edge obliterate by battering and subsequent heat spalling; high lustre	290-320
6591	e	FP	N	M	12.35	16.83	2.91	0.72	CCS-Pumpkin	N	N	N	Corner notch, barbed ears	290-320
6592	a	BP	N	B	6.61	22.18	2.28	0.26	CCS-Rootbeer	N	N	N	Similar to Chaco, Bonito, Camelback style base - barbed feet-	290-320
6592	b	GR	Y	-	51.77	29.2	7.2	7.45	CCS-Pumpkin	Y	N	N	Multifunction bifacial blade; graver tip	290-320
6592	c	DS	Y	-	48	26.05	14.42	16.13	CCS-Pumpkin	N	N	N	Expedient	290-320
6592	d	BFLS	N	T	31.36	28.31	4.24	4.52	CCS-Mottledred	Y	N	Ind		290-320
6592	e	UFT	N	L	32.23	24.93	4.82	3.85	CCS-Red	Y	N	N		290-320
6592	f	BP	N	B	19.13	23.4	4.58	2.23	CCS-Oil	N	N	N	Corner notch expanding base-prominent barbed ears	290-320
6592	g	UFT	N	T	18	18.96	2.88	1.15	CCS-Red	Ind	Y	Ind	Entire edge utilized	290-320
6593	a	FP	N	B	16.95	22.97	4	1.7	CCS-Oil	N	N	N	FKat base corner notch, sharp feet	350-380
6593	b	BFES	N	B	38.95	43	8.71	16.5	CCS-Red	Y	N	N		350-380
6594	a													50-120
6594	b	BFES	N	T	28.53	48.25	14.2	19.56	CCS-Pumpkin	N	Y	N	Poor chunky piece	50-120
6594	c	UFT	Y	-	38.62	43.66	6.9	11.92	CCS-Tan	N	Y	N	24mm utilized edge	50-120
6594	d	UFT	Y	-	64.86	48.92	15.94	54	CCS-Pumpkin	N	Y	N	34.46mm utilized edge	50-120
6594	e	UFT	N	L	23.07	20.64	7.77	3.84	CCS-Pumpkin	Y	Y	N	Patina'd	50-120

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmts)
6595	-	BP	Y	-	20.73	16.67	3.47	1.43	CCS-Oil	Ind	N	YT	Reworked edge - expanding base side notch, feet on base; distal end entirely reworked	320-350
6606	1	ANG	Y	-	35.7	29.27	9.12	8.4	CCS-Pumpkin	N	N	N		440-470
6606	2	Deb	Y	-	43.34	28.19	5.4	5.3	CCS-Pumpkin	N	N	N		440-470
6606	3	Deb	Y	-	36.2	33.83	6.16	5.36	CCS-Pumpkin	N	Y	N		440-470
6606	4	Deb	Y	-	41.65	27.89	4.6	3.04	CCS-Pumpkin	N	N	N		440-470
6606	5	Deb	Y	-	24.28	21.95	6.15	3.79	CCS-Grey	Y	N	N		440-470
6606	6	ANG	Y	-	31.27	23.5	9.95	5.48	CCS-Pumpkin	N	N	N		440-470
6606	7	Deb	Y	-	33.38	19.26	3.35	1.93	CCS-Pumpkin	N	Y	N		440-470
6606	8	Deb	Y	-	16.5	29	6.6	2.28	CCS-Pumpkin	N	N	N		440-470
6606	9	Deb	Y	-	39.65	22.9	3.28	2.1	CCS-Pumpkin	N	N	N		440-470
6606	10	Deb	Y	-	19.15	24.86	6.53	2.2	CCS-Grey	N	N	N		440-470
6606	11	Deb	Y	-	23.29	27.7	3.83	2.29	CCS-Pumpkin	N	N	N		440-470
6606	12	Deb	Y	-	32.37	17.7	7.68	2.94	CCS-Pumpkin	N	Y	N		440-470
6606	13	Deb	N	B	16	19.33	3.3	1.06	CCS-Pumpkin	N	N	N		440-470
6606	14	Deb	Y	-	25.47	17.89	3.56	1.1	CCS-Pumpkin	N	N	N		440-470
6606	15	Deb	N	B	16	17.63	3.65	1.08	CCS-Pumpkin	N	N	N		440-470
6606	16	Deb	Y	-	19.84	15.34	2	0.59	CCS-Pumpkin	N	N	N		440-470
6606	17	Deb	N	B	19.63	22.51	3.73	1.9	CCS-Pumpkin	N	N	N		440-470
6606	18	Deb	N	T	20.97	22.76	2.31	0.94	CCS-Pumpkin	N	N	N		440-470
6606	19	Deb	Y	-	20.57	19.06	2.87	0.73	CCS-Pumpkin	N	N	N		440-470
6606	20	Deb	Y	-	14.8	28.44	3.58	0.9	CCS-Pumpkin	N	N	N		440-470
6606	21	Deb	Y	-	15.87	22.46	3.07	0.69	CCS-Pumpkin	N	N	N		440-470
6606	22	Deb	Y	-	16.2	20.16	3.54	0.76	CCS-Pumpkin	N	N	N		440-470
6606	23	Deb	N	M	26.26	8.82	4.12	0.84	CCS-Grey	N	N	N		440-470

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmts)
6606	24	Deb	N	B	13.19	18.53	2	0.43	CCS-Pumpkin	N	N	N		440-470
6606	25	Deb	N	T	11	11	1.85	0.15	CCS-Pumpkin	N	N	N		440-470
6606	26	Deb	Y	-	20.27	16.22	1.43	0.6	CCS-Pumpkin	N	N	N		440-470
6628	a	UFT	N	B	41.89	38.34	6.69	9.68	QZT-Orange	N	N	N		0-40
6628	b	ANG	N	-	42.32	21.71	12.68	11.57	QZT-Bluegrey	N	N	N		0-40
6630	a	BFES	Y	-	43.21	27.48	11.05	11.02	CCS-Oil	N	N	N		40-125
6630	b	DEB	Y	-	49.95	48.9	15.5	31.94	CCS-Pink	N	N	N		40-125
6630	c	UFT	Y	-	39.08	17.16	7.27	3.29	CCS-Pumpkin	N	N	N		40-125
6630	d	DEB	N	-	14.51	19.55	4.38	1.4	CCS-Pink	N	N	N		40-125
6630	e	DEB	Y	-	34.32	21.27	2.69	1.8	CCS-Pink	N	N	N		40-125
6630	f	DEB	Y	-	54.73	47.93	15.85	32.81	CCS-Pumpkin	Y	N	N		40-125
6630	g	DEB	Y	-	37	29.3	9.55	10.19	CCS-Pink	N	Y	N		40-125
6630	h	BFES	Y	-	49.66	38.65	15	27.44	CCS-Pink	N	N	N		40-125
6630	i	ANG	Y	-	55.94	37.38	12.1	26.4	QZT-Red	Y	N	N		40-125
6630	j	DEB	Y	-	37.49	12.71	3.35	1.14	CCS-Oil	Y	N	N		40-125
6630	k	BP	N	M	36.5	27.2	4.85	4.61	QZT-Red	N	N	N		40-125
6630	l	BFES	Y	-	47.39	24.65	11.58	13.21	QZT-Bluegrey	N	N	N		40-125
6630	m	DEB	Y	-	44.04	21.09	10.55	11.31	QZT-White	N	Y	N		40-125
6630	n	FK	N	T	39.04	25.33	4.33	4.76	CCS-Pink	N	N	N		40-125
6630	o	BP	N	T	19.61	18.61	4.15	1.32	CCS-Oil	N	N	N		40-125
6630	p	DEB	Y	-	43.65	20.5	5.98	4.97	CCS-Pink	N	N	N		40-125
6630	q	FK	Y	-	38.57	21.44	4.44	3.63	CCS-Red	N	N	N		40-125
6630	r	BP	N	T	28.59	21.92	4.33	2.88	QZT-Red	N	N	N		40-125
6630	s	BP	N	M	18.8	12.47	3.21	0.844	CCS-Pumpkin	N	N	N		40-125
6630	t	FK	N	B	16.03	25.33	4.62	2.2	CCS-Pink	N	N	N		40-125
6630	u	DR	N	B	27.9	21.53	6.6	3.46	QZT-Red	N	N	N		40-125

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmts)
6630	v	SN	Y	-	22.66	21.62	5.1	2.64	CCS-Transparent	N	N	YT		40-125
6630	x	FK	N	T	52.25	40.9	5.92	10.22	QZT-Tan	N	N	N		40-125
6630	y	FP	N	B	18.67	10.95	2.69	0.47	CCS-Pumpkin	N	N	N		40-125
6631	a	BFES	N	T	31.53	31.73	6.95	7.49	CCS-Pumpkin	Ind	N	N		125-195
6631	b	UFT	N	B	40.39	29.35	9.76	10.42	CCS-Pumpkin	N	N	N		125-195
6631	c	UFT	N	L	59.52	22.02	8.69	9.21	CCS-Red	Y	N	N	Clearly patterned edge retouch, like a side scraper, along 33mm of edge	125-195
6631	d	FK	N	M	29.28	70.61	9.25	17	CCS-Pink	Ind	N	N	25mm of preserved edge	125-195
6631	e	UFT	N	T	41.05	21.5	8.7	7.39	CCS-Oil	N	N	N		125-195
6631	f	UFT	Y	-	46.23	31.29	3.48	5.72	QZT-White	N	Y	N	Roughly 2 of utilized edge	125-195
6631	g													125-195
6631	h	BFES	N	L	15.96	28.57	8.55	3.69	CCS-Red	N	N	N		125-195
6631	i	FP	Y	-	19.76	11	3.02	0.55	CCS-Oil	N	N	Ind	Small expanding stem, corner notched with squared ears	125-195
6631	j	UFT	Y	-	46.3	30.66	6.86	7.98	CCS-Oil	Y	N	N	Built on a blade, entire edge utilized	125-195
6631	k	UFT	N	L	41.13	21.07	12.44	8.63	QZT-White	N	N	N		125-195
6631	l	BP	N	T	30.63	20.23	3.97	2.87	QZT-Red	N	N	N	Shallow side notch, ovate excurvate edges	125-195
6631	m	FP	N	B	20.57	21.21	4.36	1.46	CCS-Bluegrey	Ind	N	N	Basally thinned, corner notched, prominent ears ; Pelican Lake?	125-195
6631	n	DEB	N	T	51.54	37.7	10.77	19.88	QZT-White	N	Y	N		125-195
6631	o	BP	N	L	19.1	8.47	3.58	0.52	CCS-Bluegrey	N	N	N	Long ear, unground and rounded at edge; wide rounded notch	125-195
6633	a	BFES	N	L	42.43	32.22	12.31	10.8	CCS-Pumpkin	Y	N	N	Massively burnt, obstructs surface	195-270
6633	b	BFLS	N	L	38.68	22.73	4.29	4.1	CCS-Pumpkin	N	N	N		195-270
6633	c	ANG	Y	-	42.47	31.18	8.17	10.06	CCS-Bluegrey	Y	N	N	Massively burnt, obstructs surface	195-270
6633	d	BFLS	N	M	44.8	26.4	9.77	10.55	CCS-Amber	Y	N	N	Massively burnt, obstructs surface	195-270

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cms)
6633	e	UFT	Y	-	39.2	37.37	6.33	5.92	CCS-Pumpkin	N	N	N		195-270
6633	f	ANG	Y	-	30.52	8.4	6.8	2.06	CCS-Pumpkin	Y	N	N		195-270
6633	g	Deb	Y	-	39.85	34	9.65	10.48	QZT-Tan	N	N	N		195-270
6633	h	Deb	Y	-	37.18	27.54	7.81	4.76	CCS-Black	N	Y	N	Built on cobble	195-270
6633	i	UFT	Y	-	54.36	23	5.04	5.96	CCS-Pumpkin	N	N	N		195-270
6633	j	BP	N	M	17.97	11.18	3.09	0.57	CCS-Black	N	N	N	Side notched, serated edges	195-270
6633	k	BFLS	N	L	17.77	10.79	4.12	0.74	CCS-Pumpkin	N	N	N		195-270
6752	1	Core	Y	-	56.65	51.6	38.66	120.48	CCS-Black	N	N	N	Less than 4 apparent FKakes removed; river cobble	0
6752	2	UFT	Y	-	24.42	31.97	7.87	4.91	CCS-Pumpkin	N	N	N		0
6752	3	UFT	Y	-	41.44	38.13	10.5	14.16	CCS-Bluegrey	N	N	N		0
6752	4	Deb	Y	-	30.5	36	13.8	11.95	CCS-Pumpkin	N	N	N		0
6752	5	UFT	Y	-	63.41	48.71	13.97	44.67	CCS-Transparent	N	N	N	One edge utilized on entire face; 60mm	0
6752	6	DEB	Y	-	38.74	57.17	16.05	42	QZT-Bluegrey	N	Y	N	FKake made on a cortical FKake, built from a tumbled river cobble	0
6752	7	UFT	N	M	31.61	25.21	7.85	5.89	CCS-Pumpkin	N	Y	N		0
6752	8	UFT	N	-	35	19.6	11	5.2	CCS-Red	N	Y	N		0
6752	9	FK	N	B	34.25	29.05	6.14	5.65	QZT-Red	N	N	N		0
6752	10	UFT	Y	-	39.17	24.62	12.57	9.27	CCS-Red	N	N	N		0
6753	1	SN	Y	-	41.48	31.92	5.48	6.84	CCS-Pumpkin	N	N	N	Classic snub nose	0-50
6753	2	SN	Y	-	46.26	38.19	10.42	22.88	CCS-Pumpkin	N	N	YR	Classic snub nose	0-50
6753	3	BFLS	N	B	34.11	29.61	6.33	6.822	CCS-Bluegrey	Y	N	N		0-50
6876	1	UFT	Y	-	50.72	31.74	9.21	14.86	CCS-Bluegrey	N	N	N	Full length utilized on both edge	61-91
6876	2	UFT	Y	-	50.19	31.33	17.42	27.73	CCS-Pumpkin	N	Y	N	May be more akin to tested cobble, however one edge approximately 27mm across shows patterned unifacial FKaking - Cortex suggests it was a river cobble	61-91

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6876	3	UFT	Y	-	35	23.03	8	7.39	CCS-Bluegrey	N	Y	N	Cobble spall with cortex across one entire surface, both lengths utilized	61-91
6876	4	UFT	Y	-	42.33	22.55	12.37	9.16	CCS-Red	N	Y	N	Cobble spall with cortex across one entire surface, both lengths utilized	61-91
6876	5	UFT	N	T	31.59	29.63	7.45	6.98	CCS-Red	Y	Y	N	2 edges utilized: 17mm and 23mm	61-91
6876	6	UFT	Y	-	42.73	22.42	5.04	3.56	CCS-Pumpkin	N	N	N	Single dorsal ridge, may indicate core technology with prepared platform; max length on both sides	61-91
6876	7	SN	Y	-	35.34	18.21	6.76	5.6	CCS-Pink	N	Y	N	Built on cobble spall	61-91
6876	8	DEB	N	L	39.25	26.85	6	5.05	CCS-Pumpkin	Y	N	Ind	Very hard to make out original morph - too badly burnt and fragmented	61-91
6876	9	BFLS	N	T	34.66	13.81	3.87	1.7	CCS-Pumpkin	Y	N	N		61-91
6876	10	UFT	Y	-	49.32	32.34	5.2	5.76	CCS-Pumpkin	N	N	N	Distal end 28 mm, 38 mm on lateral edge	61-91
6876	11	UFT	N	T	59.2	33.72	8.56	12.08	QZT-Orange	N	N	N	Entire edge utilized	61-91
6876	12	UFT	Y	-	44.16	19.04	6.14	4.63	CCS-Pumpkin	N	Y	N	30mm worked edge; 23mm on other edge	61-91
6876	13	UFT	N	B	36.43	25.59	5.97	5.2	QZT-Orange	N	Y	N	Two 25mm worked edges	61-91
6876	14	UFT	Y	-	27.92	36.87	10.34	10.63	CCS-Bluegrey	N	N	N		61-91
6877	1	FK	Y	-	35.57	17.01	4.41	2.35	CCS-Pumpkin	N	N	N	Expanding base corner notch	61-91
6877	2	BP	Y	-	31.6	16.69	4.67	2.02	CCS-Mottledtan	N	N	N		61-91
6877	3	BFES	N	B	23.24	17.82	4.03	1.8	CCS-Bluegrey	N	N	N		61-91
6877	4	FK	N	B	17.94	18.07	3.27	1.4	CCS-Tan	N	N	N		61-91
6877	5	BP	Y	-	24.84	15.04	4.3	1.3	CCS-Transparent	N	N	N	Expanding base corner notch	61-91
6877	6	FK	N	B	18.94	18.69	3.16	1.28	CCS-Bluegrey	N	N	N		61-91
6877	7	BP	Y	-	32.37	13.08	3.68	1.27	CCS-Pumpkin	N	N	N	Expanding base, shouldered	61-91
6877	8	BP	N	T	22.08	14.89	3.82	1.21	CCS-Red	N	N	N		61-91
6877	9	BP	N	M	19.95	17.71	3.27	1.21	CCS-Red	N	N	N		61-91

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6877	10	BP	Y	-	25.76	16.4	3.41	1.093	CCS-Tiger	Y	N	N	Expanding base corner notch	61-91
6877	11	BP	N	T	23.52	13.29	3.26	0.9	CCS-Mottledtan	N	N	N		61-91
6877	12	BP	Y	-	26.97	13.05	2.96	0.84	CCS-Oil	N	N	N	Expanding base corner notch	61-91
6877	13	FP	Y	-	28.5	12.63	2.35	0.72	CCS-Pumpkin	N	N	N	Corner notch	61-91
6877	14	FK	N	M	14.37	12.88	2.93	0.67	CCS-Black	Y	N	N		61-91
6878	1	BFES	N	B	32.74	24.51	9.74	6.3	CCS-Pumpkin	Ind	Y	N		61-91
6878	2	BFES	N	B	37.14	23.43	6.25	6.23	CCS-Pumpkin	Ind	Y	N		61-91
6878	3	BFES	N	T	27.39	34.96	5.31	5.59	CCS-Pumpkin	Ind	N	N		61-91
6879	1	FK	N	T	66.36	24.68	10.39	17.8	QZT-Grey	N	N	N		91-122
6879	2	FK	N	T	51.55	23.23	8.93	6.94	CCS-Red	Y	N	N	Similar morphology to above	91-122
6879	3	BP	N	T	34.46	18.58	3.47	2.17	CCS-Pumpkin	N	N	N	Beautifully FKaked point tip	91-122
6879	4	BP	Y	-	31.43	17.65	4.44	1.5	CCS-Transparent	N	N	N	Corner notch, missing one portion of base	91-122
6879	5	BP	N	B	22.22	11.66	4.18	0.8	CCS-PinK	N	N	N	Expanding stem, shouldered	91-122
6879	6	BP	N	T	32.19	16.87	3.9	1.84	CCS-Bluegrey	N	N	N	Nondiagnostic tip	91-122
6879	7	BP	N	T	25.73	10.94	3.54	0.95	CCS-White	N	N	N	Nondiagnostic tip	91-122
6879	8	BP	N	M	19.39	11.2	3.14	0.63	CCS-Bluegrey	N	N	N	Nondiagnostic tip	91-122
6879	9	BP	N	T	19.58	12.57	2.6	0.58	QZT-Tan	N	N	N	Nondiagnostic tip	91-122
6879	10	BP	N	T	20.12	15.1	3.6	0.96	QZT-Orange	N	N	N	Nondiagnostic tip	91-122
6879	11	BP	Y	-	40.2	18.46	6.14	4.37	CCS-White	N	N	N	Archaic looking; thick rounded base, stemmed with shoulders	91-122
6879	12	BP	N	B	37.59	28.89	5.22	7.15	CCS-Oil	Y	N	N	Large archaic dart point or blade	91-122
6880	1	FK	N	B	16.16	12.5	2.98	0.65	QZT-Red	N	N	N	Razor biface; preform?	91-122
6880	2	UFT	Y	-	29.73	17.48	3.55	1.59	CCS-Red	Y	N	N		91-122
6880	3	BFES	N	B	28.49	18	5.41	2.59	CCS-Black	N	N	N		91-122
6881	1	FK	N	T	23.1	22.39	4.86	2.57	CCS-Pumpkin	N	N	N		91-122

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6881	2	BFES	N	B	24.94	25.42	7.43	5.06	CCS-Pumpkin	Ind	N	N		91-122
6881	3	BFES	N	B	15	25.91	3.6	1.57	CCS-Pumpkin	N	N	N		91-122
6882	1	UFT	Y	-	24.67	22.4	4.1	2	CCS-Pumpkin	N	N	N		91-122
6882	2	UFT	N	M	21.52	26.88	6.6	4.05	CCS-oil	Y	N	N		91-122
6882	3	BFES	N	L	49.15	29.87	8.7	14.43	CCS-Oil	Y	N	N		91-122
6883	-	DR	Y	-	40.16	15	6.1	3.17	CCS-Pumpkin	N	N	N		91-122
6887	-	UFT	N	B	19.55	33.96	6.52	4.47	CCS-Red	Ind	N	N		30-61
6888	-	CH	Y	-	59.23	49.53	23.52	82.36	QZT-Bluegrey	N	N	N	Impact fractures along edge, bifacially worked; well worn and "backed"	61-91
6890	1	DS	N	B	56	30.66	7.15	14.04	CCS-Bluegrey	N	N	N	Unifacial modification along entire circumference	61-91
6890	2	UFT	N	B	37.39	31.5	9.13	11.63	CCS-Tiger	N	N	N		61-91
6890	3	FK	N	L	27.25	20.63	3.7	3.14	CCS-Pumpkin	N	N	N	Well patterned FKakes along entire intact edge (27.5mm)	61-91
6890	4	UFT	N	L	55.7	25.8	6.14	6.14	CCS-Red	N	N	N	Lateral portion worked (40mm); base worked (20.5mm)	61-91
6890	5	UFT	Y	-	44.78	33.57	4.65	6.34	CCS-Pumpkin	N	N	N	Utilized along entire perimeter; very thin and straight FKake	61-91
6890	6	UFT	N	B	30.05	26.11	7.15	7	CCS-Tiger	Y	N	N		61-91
6891	1	FK	N	T	27.8	26.32	5.1	3.66	CCS-Pink	N	N	N		122-152
6891	2	FK	N	T	22.9	23	4.19	2.52	QZT-Bluegrey	N	N	N		122-152
6892	1	BFLS	N	B	22.06	34.35	4.8	4.59	QZT-Tan	N	N	N		122-152
6892	2	BFLS	N	T	15.63	30.74	4.32	1.72	QZT-Red	N	N	N		122-152
6892	3	BP	N	B	15.7	28.7	4.81	2.83	QZT-Tan	N	N	N	Base thinned and ground - no apparent basal thinning FKakes, ground edges	122-152
6893	1	UFT	N	M	48.82	25.31	5.75	6.15	CCS-Pink	N	N	N	25mm utilized on either opposite edge	122-152
6893	2	SN	Y	-	26.63	23.55	6.27	4.03	CCS-Pink	N	N	N		122-152

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6893	3	UFT	N	B	25.17	32.86	6.82	5.69	CCS-Pink	N	Y	N	Cortex white buff, hard	122-152
6893	4	UFT	N	T	33.13	23.98	3.95	3.36	CCS-Red	N	N	N	Utilized along entire length	122-152
6893	5	UFT	N	M	34.6	18.64	3.87	3.12	CCS-Pumpkin	N	N	N	Utilized along entire length	122-152
6893	6	UFT	Y	-	37.55	16.04	5.55	2.32	CCS-Bluegrey	N	Y	N	Utilized along entire length; cortex tan, buff, hard	122-152
6893	7	UFT	Y	-	24.64	15.14	2.97	1.51	CCS-Oil	N	Y	N	River cobble; cortex buff otherwise same as interior; utilized 22.71 across face	122-152
6893	8	UFT	Y	-	39.43	29.41	3.33	3.26	CCS-Oil	Y	N	N	30mm of worked edge	122-152
6895	-	SN	N	L	76.42	51.15	24.15	79.1	CCs-Red	N	N	N		122-152
6896	-	BFES	Y	-	57.15	41.8	16	28.82	CCS-Pumpkin	N	N	N		122-152
6897	-	UFT	Y	-	34	16.12	5.77	3.24	QZT-Bluegrey	N	Y	N		122-152
6902	-	BFES	Y	-	87.65	45.36	21.7	83.23	QZT-Bluegrey	Y	Y	-	Lister's classic "Chopper" type - supported by wear along long edge; however the flaking is pretty rudimentary and angles not large enough on edge for me to consider it a chopper	91-122
6903	1	BFLS	N	T	35.19	48.11	10.9	19.26	CCS-Pink	N	N	N		152-183
6903	2	BFES	Y	-	48.48	29.73	8.66	14.56	CCS-White	N	Y	N		152-183
6903	3	FK	N	B	27.19	30.97	4.87	4.39	QZT-Red	N	N	N		152-183
6904	1	UFT	Y	-	52.5	38.98	10.94	18.09	CCS-Red	N	N	N		152-183
6904	2	UFT	Y	-	38.35	23.56	7.04	5.88	CCS-Bluegrey	Y	N	YR		152-183
6904	3	FK	N	B	16.36	16.25	4.5	1.51	CCS-Grey	N	N	N		152-183
6904	4	FP	N	T	22.99	12.68	1.55	0.34	CCS-Red	Y	N	N		152-183
6905	1	BFES	N	M	35.86	37	6.67	9.96	CCS-Black	Ind	N	N		152-183
6905	2	FK	Y	-	47.76	29.65	6.53	9.53	QZT-Tan	N	N	N	Base notch and stem	152-183
6905	3	BFES	N	T	25.31	32.06	6.9	5.03	CCS-Pumpkin	N	Y	N		152-183
6906	1	UFT	N	B	51.81	39.33	4.67	7.55	CCS-Red	Y	N	Ind	Massively burnt	152-183

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cbs)
6906	2	BFES	N	T	10.38	22.85	4.64	0.86	CCS-Bluegrey	N	N	N		152-183
6906	3	FK	N	T	29.81	12.2	3.63	0.98	CCS-Bluegrey	N	N	N	May be a preform tip, built on a FKake	152-183
6906	4	UFT	Y	-	41.95	31.61	10.1	12.65	CCS-Bluegrey	N	Y	N	25mm utilized edge	152-183
6906	5	UFT	Y	-	32.93	19.48	2.1	1.47	CCS-Red	Y	N	N		152-183
6906	6	SN	N	T	24.18	22.51	6.91	3.97	CCS-Red	Y	N	N	Massively burnt	152-183
6906	7	DS	N	T	38.51	21.1	6.04	4.11	CCS-Pumpkin	N	N	YR	Side scraper on back end of denticulate section	152-183
6907	1	SN	Y	-	29.13	21.95	3.49	2.93	QZT-Pink	N	N	YT	Reworked from a projectile point, missig one ear, expanding, concave base	152-183
6907	2	BP	N	T	30.45	22.85	4.75	3.16	QZT-Black	Ind	Y	YR		152-183
6907	3	FK	N	T	37.84	28.51	5.51	6.25	CCS-Pumpkin	N	N	YR	Resharpener on only one edge, "backed" knife, ground on opposite edge	152-183
6907	4	BFLS	N	B	38.25	21.33	4.96	5.63	CCS-Oil	N	N	N		152-183
6907	5	UFT	Y	-	37.36	21.31	3.71	2.55	CCS-Red	N	N	N	Sharpened along edge, no grinding or hafting elements present - Knife or preform?	152-183
6907	6	UFT	Y	-	23.94	12.84	2.89	0.86	CCS-Pink	N	N	N	Heavily patinate, similarly worked around edge, though here the tip is the bulb; is this a knife or a preform?	152-183
6907	7	BP	N	B	14.13	19.8	3.86	1.08	CCS-Pink	N	N	Ind	Elko Convex base, basally thinned, corner notched	152-183
6907	8	BP	N	B	18.22	18.91	4.36	1.2	CCS-Pink	N	N	Y	Elko Basally thinned, convex base, corner notched	152-183
6907	9	FK	N	B	15.05	20.66	3.43	1.42	CCS-Bluegrey	N	N	Ind	May be a preform - razor blade sized blank	152-183
6907	10	BFLS	N	T	25	20.33	5.67	2.77	QZT-Red	N	N	N	Roughly made	152-183
6907	11	BP	N	T	18.34	12.04	4.02	0.67	CCS-Pink	N	N	N		152-183
6908	-	DR	N	M	21.22	20.67	4.74	1.85	CCS-Black	N	N	N		152-183

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6912	1	UFT	N	B	50.42	27.67	11.06	14.95	QZT-Red	N	Y	N	Single dorsal ridge, may indicate core technology with prepared platform; max length on both sides	183-213
6912	2	UFT	N	B	56.38	19.33	8.58	7.72	CCS-Pumpkin	N	N	N	Prepared platform, single dorsal ridge; max length on one edge	183-213
6912	3	UFT	N	B	37.25	67.71	8.81	12.9	CCS-Pumpkin	Ind	N	YR	Similar to scraper uniface morphology, however FKake is irregular; patterned FKaking located along platform/bulb and distally along one side 46.81mm	183-213
6912	4	UFT	Y	-	54.52	27.35	4.31	7.67	CCS-Pumpkin	N	N	YR	Roughly 70mm edge modified length-very similar to scraper, but unifacial patterning not limited to one edge, but across nearly entire perimeter	183-213
6912	5	UFT	Y	-	57.71	22.24	6	6.64	CCS-Oil	N	Y	N	33mm and 21mm worked edge	183-213
6912	6	UFT	Y	-	44.58	23.67	4.95	4.45	CCS-Red	N	N	N	Entire length, both edges	183-213
6912	7	UFT	y	-	49.02	33.7	10.18	10.2	CCS-Mottledtan	Ind	N	N	An overshot FKake that removed a large portion of core mass - utilized along 30mm of edge, distal end may have been end of a scraper but too fragmentary to tell	183-213
6912	8	UFT	Y	-	51.11	29.1	7.17	10.02	CCS-Pumpkin	N	N	N	Core-prepared platform FKake; utilized along entire length	183-213
6912	9	UFT	Y	-	34.96	27.15	4.32	2.52	CCS-Pumpkin	N	N	N	Utilized along entire length	183-213
6912	10	UFT	Y	-	33.02	34.16	6.52	5.14	CCS-Red	Ind	N	N	40mm utilized edge	183-213
6912	11	UFT	Y	-	35.75	26.09	3.83	3.04	CCS-Pumpkin	N	N	N	24mm	183-213
6912	12	UFT	N	B	21.49	33.79	5.95	4.93	CCS-Pumpkin	N	N	N	Busted up, difficult to asses	183-213
6912	13	UFT	N	B	34.34	21.72	6.92	4.48	CCS-Pumpkin	N	Y	N	44mm utilized edge	183-213
6912	14	BFES	N	B	29.2	38.59	7.27	8	CCS-Pumpkin	N	N	N		183-213
6912	15	UFT	N	M	45.4	35.6	8.52	15.25	CCS-Red	Y	N	Ind	26mm worked edge, unifacial similar to end scraper	183-213
6912	16	BFES	Y	-	13.54	35.61	7.04	13.53	CCS-Mottledtan	Y	N	N		183-213

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
6912	17	UFT	N	L	57.07	36.87	24.58	28.88	CCS-Red	Ind	N	N	36mm worked edge	183-213
6912	18	SN	N	T	32.82	37.79	8.06	8.18	CCS-Pumpkin	Ind	N	N		183-213
6912	19	UFT	N	L	50.6	28.69	5.38	5.57	CCS-Pumpkin	N	Y	N	30mm worked edge	183-213
6912	20	UFT	N	T	24.65	28.69	5.48	3.47	CCS-Pumpkin	N	N	N	Entire length, both edges	183-213
6912	21	FK	N	T	16.8	27.49	3.36	1.26	CCS-Grey	Y	N	Ind	Massively burnt	183-213
6912	22	UFT	Y	-	39.89	27.9	9.85	8.9	CCS-Tiger	Ind	n	N	Prepared platform, single dorsal ridge; max length on one edge	183-213
6912	23	SN	N	L	33.26	16.61	8.06	4.01	CCS-Pumpkin	Y	Y	N		183-213
6912	24	UFT	Y	-	43.1	31.85	14.07	15.16	CCS-Pumpkin	N	Y	N	Covered in cortex on one face - chalky yellow	183-213
6912	25	BFLS	N	L	28.9	13.18	5.65	1.55	CCS-Red	Ind	N	N		183-213
6912	26	UFT	N	L	44.76	21.69	7.75	7.69	CCS-Pumpkin	N	Y	N	Actual coverage of patina, not cortex; suggests this may be a reused tool form earlier occupations based on cultural scarring beneath patina and fresher removals lacking patina	183-213
6912	27	UFT	N	L	34.64	16.2	2.3	1.53	CCS-Red	Ind	N	N		183-213
6912	28	BFES	N	L	40.6	21.23	7.96	4.97	CCS-Red	Y	N	N		183-213
6912	29	ANG	Y	-	21.75	13.51	6.41	1.73	CCS-Pumpkin	N	Y	N		183-213
6913	1	BFES	Y	-	68.18	41.16	17.35	43.79	CCS-Pumpkin	N	N	N		213-244
6913	2	BFES	N	B	36	31	7.32	11.27	CCS-Oil	N	N	N		213-244
6913	3	FP	N	T	27.38	13.49	3.74	1.11	CCS-Pumpkin	Y	N	N		213-244
6913	4	UFT	Y	-	50.23	37.56	6.27	1.29	CCS-Pumpkin	N	Y	N	Built on cobble, worked edge ~43mm	213-244
6913	5	BFLS	N	T	43.24	24	10.02	8.94	QZT-Bluegrey	Y	N	N		213-244
6914	1	FK	Y	-	59.67	43.18	8.67	22.12	CCS-Oil	N	N	N	Base, has a notch which may be for hafting; wide compared to others, but roughly crescentic in form	213-244
6914	2	BFLS	N	L	31.14	30.4	5.14	6.23	CCS-Oil	Y	n	N		213-244

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cbs)
6914	3	FK	N	T	28.36	28.45	6.45	4.77	CCS-Mottledtan	Ind	N	N	Edge not straightened, but otherwise morphology and wear suggests use as knife	213-244
6915	1	BP	Y	-	35.48	22.68	5.18	2.71	CCS-Oil	N	N	N	Split base, needle point, eared	213-244
6915	2	BP	Y	-	20.66	16.11	5.21	1.78	CCS-oil	N	N	YT	Split base, reworked to scraper type of tool	213-244
6915	3	BP	N	B	22.53	22.65	4.45	1.87	QZT-Red	N	N	N	Socket base, eared	213-244
6915	4	BP	N	B	26.41	25.55	5.32	3.82	CCS-Pumpkin	N	N	N	Split base, shallow, square ears	213-244
6915	5	BP	N	B	15.11	19.16	5.68	1.45	QZT-Bluegrey	N	N	N	Mallory-type; squared base with concave base, side notches	213-244
6915	6	BP	N	B	24.08	28.01	5.13	2.77	QZT-Red	Y	N	N	Split Base corner notched	213-244
6915	7	BP	N	T	37.24	27.74	3.91	3.21	CCS-Pumpkin	N	N	N	Wickedly fine needle point	213-244
6916	-	DR	N	M	44.3	35.23	9.34	11.33	CCS-Mottledtan	N	N	N	22.9mm worked edge along proximal edge	213-244
6917	-	SN	Y	-	37	25.55	4.56	4.96	QZT-Bluegrey	N	N	N	Classic snub nose	213-244
6918	-	BFLS	Y	-	60.87	34.15	16.13	27.65	CCS-Bluegrey	N	N	N		183-213
6922	-	FK	Y	-	148.85	27.29	7.64	47.5	QZT-Grey	N	Y	N	A tabular quartzite	244-274
6923	1	Deb	Y	-	48.52	25.26	4.96	5.7	QZT-Tan	N	N	N		213-274
6923	2	DEB	Y	-	44.5	21	5.24	3.85	CCS-Pumpkin	N	Y	N		213-274
6923	3	DEB	Y	-	40.13	26.3	3.96	2.94	CCS-Pink	N	N	N		213-274
6923	4	DEB	Y	-	38.94	25.7	7.75	5.33	CCS-Pink	N	N	N		213-274
6924	1	BP	N	B	35.39	30.25	3.54	4.1	CCS-Pumpkin	N	N	IND	Pinto split base	213-274
6924	2	FP	Y	-	36.42	19.63	3.94	2.8	CCS-Bluegrey	N	N	N	split base lanceolate, built on a cured FKake, snub ears, needle point	213-274
6924	3	BP	N	T	28.8	15.28	4.29	1.5	CCS-Pumpkin	N	N	IND	Very finely FKaked, diamond in cross section, parallel comedial FKakes	213-274
6924	4	BP	Y	-	29.85	13.85	4.72	1.5	CCS-Pumpkin	Y	N	N	contracting stem, sharp ears	213-274
6925	1	FK	Y	-	74.95	45.67	9.88	35.46	CCS-Pumpkin	N	N	YR	Large leaf shaped hand blade, plainly used and retouched across 6.5 of edge	213-274

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmts)
6925	2	FK	N	M	20.46	26.5	4	2.34	CCS-Pumpkin	Y	N	Ind		213-274
6926	-	FP	N	B	13.23	25.88	4.42	1.58	CCS-Pumpkin	N	N	N	Mallory type base	274-335
6930	1	BFES	N	T	42.9	43.75	13.3	30.3	CCS-Pumpkin	N	N	N		244-274
6930	2	BFES	N	T	33.07	42.66	10.73	18.5	CCS-Bluegrey	Y	N	N		244-274
6930	3	BFLS	N	T	32.33	43.78	9.78	14.3	CCS-Pumpkin	N	Y	N		244-274
6930	4	BFLS	N	T	46.21	29.1	7.77	10.4	QZT-Tan	N	N	N		244-274
6930	5	BP	N	T	41.35	31.4	5.55	4.5	CCS-Pumpkin	N	N	N		244-274
6930	6	BP	N	T	29.98	28.39	4	3.7	CCS-Red	Y	N	N		244-274
6930	7	DEB	N	B	28.8	28.03	7	6.44	CCS-Green	N	Y	N		244-274
6930	8	BFLS	N	T	26.59	35	7.4	8.3	CCS-Pumpkin	N	N	N		244-274
6931	-	DR	Y		50.03	16.83	7.22	3.53	CCS-Pumpkin	N	Y	N	Expanding base	244-274
6932	1	BP	N	B	17.93	16.66	3.67	1.09	CCS-Pumpkin	Y	N	Ind	Mallory-type, very narrow notches, large base; ear more medial than shoulder, may suggest resharping; this and the other in this lot are VERY thin	244-274
6932	2	BP	N	T	18.5	17.38	2.62	0.666	CCS-Pumpkin	Ind	N	Ind	Ind. but very thin, likely a mallory as well, assuming this lot was found closely associated. These two artifacts show, roughly, the range of CCS Pumpkin	244-274
6933	1	UFT	N	L	43.44	16.64	4.08	3.46	CCS-Grey	N	N	N		244-274
6933	2	UFT	N	T	28.76	22.57	2.8	2.55	CCS-Red	N	Y	N		244-274
6933	3	UFT	N	B	25.74	26.02	4.04	2.9	CCS-Pumpkin	Ind	N	N		244-274
6933	4	FK	N	T	22.84	23.2	3.8	1.73	CCS-Pumpkin	N	N	N		244-274
6933	5	FK	N	T	31.8	19.46	8.46	3.81	CCS-Pumpkin	Y	N	YR		244-274
6934	1	COR	Y	-	69	54.12	23.7	68.7	CCS-Red	N	Y	N	Obviously a river cobble, approx. 30% of surface covered in cortex	0-305
6934	2	DEB	Y	-	47.2	39.7	17.4	19.9	CCS-Pumpkin	IND	N	N		0-305

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmts)
6934	3	ANG	Y	-	45.5	31.8	15	21	CCS-Pumpkin	Y	N	N	Heavily burnt	0-305
6934	4	DEB	Y	-	34.14	43.5	7.8	7.6	CCS-Pumpkin	N	N	N		0-305
6934	5	DEB	N	T	37.77	18	5.3	4.6	QZT-White	N	N	N	Exotic quartzite	0-305
6934	6	UFT	Y	-	45.1	29.4	6.3	9.5	QZT-Red	N	N	YR		0-305
6934	7	DEB	Y	-	48.3	27.9	4.38	2.8	CCS-Pumpkin	N	N	N		0-305
6934	8	DEB	Y	-	47.4	19.3	11.4	7.1	CCS-Pumpkin	N	N	N		0-305
6934	9	DEB	Y	-	51.4	20	4.3	4.3	CCS-Oil	N	N	N		0-305
6934	10	DEB	Y	-	40.54	24	2.92	3.2	QZT-Red	N	N	N		0-305
6934	11	DEB	Y	-	36.72	20.22	5.3	2.9	QZT-Red	N	N	N		0-305
6934	12	DEB	Y	-	50.77	31.95	4.34	6	QZT-Red	N	N	N		0-305
6934	13	DEB	Y	-	38.26	20.58	2.52	2.5	CCS-Pumpkin	N	N	N		0-305
6934	14	DEB	Y	-	33.16	23.11	3.2	2.2	QZT-Orange	N	N	N		0-305
6934	15	DEB	Y	-	32.5	27	5.15	2.7	CCS-Pumpkin	N	Y	N		0-305
6934	16	DEB	Y	-	29.83	19.2	3.56	1.4	CCS-White	N	N	N		0-305
6934	17	DEB	Y	-	26.8	24.42	7	3.4	VOL-Black	N	N	N		0-305
6934	18	DEB	N	T	30.5	39	3.78	2.4	CCS-Oil	N	N	N		0-305
6935	1	FK	N	L	50.5	21.24	7.67	8.2	CCS-Pumpkin	Y	N	N		0-305
6935	2	UFT	N	B	24.11	29.95	5.5	5.71	CCS-Pumpkin	N	N	N		0-305
6935	3	FK	N	L	38.38	21.9	5.85	4.68	CCS-Red	Y	N	N		0-305
6935	4	BFES	N	T	27.78	25.57	7.2	4.81	CCS-Mottledtan	N	N	N		0-305
6935	5	BFES	N	T	22.46	22.32	4.94	2.55	CCS-Pink	Y	N	N		0-305
6935	6	BFLS	N	T	24.5	27.3	7.36	3.98	QZT-Red	N	N	N		0-305
6935	7	UFT	N	L	32.4	26.14	6.95	6.57	QZT-Red	N	N	N	Shape like a lateral edge of a crescent - oriented with this as lat, but point may be tip	0-305
6935	8	FK	N	T	29.73	29.1	5.75	5.55	CCS-Pumpkin	N	N	N	Shaped same as above, however here it was oriented as tip	0-305

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cbs)
6935	9	FK	N	T	23.4	18.41	5.93	2.09	CCS-Red	Ind	N	N	Shaped same as above, however here it was oriented as tip	0-305
6936	-	DR	N	B	68.31	28.42	6.86	11.7	CCS-Pink	N	N	N		0-305
6937	-	COR	Y	-	61.6	55.5	25.15	91.54	CCS-Pumpkin	N	Y	N	Noted as chopper in inventory - inaccurate, no corroborating use wear	213-274
6938	-	BFLS	N	L	67.19	42.7	7.4	14.2	CCS-Pumpkin	Y	N	N	Massively burnt	213-274
6939	1	BFES	Y	-	57.05	44.64	12.66	34	CCS-Bluegrey	N	N	N		213-274
6939	2	UFT	N	B	75.42	35.9	9.62	23.06	QZT-Grey	N	N	N	Blade-like FKake with central dorsal ridge	213-274
6940	1	UFT	N	L	41.77	22.19	7	5.82	CCS-Red	N	Y	N		335-366
6940	2	UFT	N	L	36.38	27	6.83	6.33	CCS-Red	N	Y	N		335-366
6941	-	BP	N	T	39.19	23.84	3.71	3.17	CCS-Bluegrey	N	N	N	Elko Corner notch, sharp shoulders	335-366
6944	1	SN	N	T	38.86	50.56	9.08	21.77	CCS-Pumpkin	N	N	N		274-305
6944	2	SN	N	T	19.82	28.41	4.19	2.83	CCS-Red	N	N	N		274-305
6945	-	FP	N	B	43.87	36.96	7.25	11.64	QZT-Red	N	N	N	Side notch;	274-305
6946	-	BP	N	B	24.73	26.12	4	2.52	CCS-Pumpkin	N	N	N	Mallory style	274-305
6964	-	Core	Y	-	145	104.45	53.15	740	QZT-Tan	N	N	N	Banded quartzite	274-305
6972	1	BFLS	N	T	49.33	38.97	8.33	21.34	CCS-Pumpkin	Y	N	N		
6972	2	BFLS	N	B	34.23	41.68	9.26	16.59	CCS-Pumpkin	N	N	N		
6972	3	UFT	Y	-	57.8	36.12	9.68	18.92	QZT-Red	N	N	N		
6972	4	BFLS	Y	-	33.4	23.88	6.75	5.23	QZT-Bluegrey	N	N	N		
6972	5	BFLS	N	L	32.92	29.64	8.7	6.76	CCS-Pumpkin	Y	Ind	N		
6972	6	BFES	N	L	38.97	14.5	9.37	4.34	QZT-White	Y	N	N		
6972	7	UFT	N	B	34.67	32.66	6.23	4.25	CCS-Oil	N	N	N		
6973	1	BP	N	B	29	21.22	5.85	3.31	CCS-Bluegrey	Y	N	Ind	Pinto split base, wide shoulders	
6973	2	FK	N	B	20.45	20.86	3	1.67	CCS-Red	N	N	N	Razor biface; preform?	

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
6973	3	BP	N	M	14.11	9.8	2.77	0.43	QZT-Red	N	N	Ind	Corner notch sharp shoulders expanding base	
6973	4	BP	N	M	15.05	19.18	4.3	1.39	CCS-Pink	N	N	N	Indeterminate	
6974	1	UFT	N	B	45.65	41.92	8.3	16.7	QZT-Red	N	Y	N	No retouch but use wear across entire length, both edges; cortex is rough with little to no patination	49-Spill
6974	2	BFES	Y	-	62.75	36	12.36	25.35	QZT-Bluegrey	N	Y	Y	Cortex is orange buff	49-Spill
6974	3	SN	Y	-	50.15	35.5	10.8	16.6	QZT-Red	N	N	YR		49-Spill
6974	4	ANG	Y	-	24.86	24.5	12.24	8.2	QZT-Bluegrey	N	Y	N	Patinated cortex is glossy orange	49-Spill
6974	5	BFES	N	L	37.44	39.7	7.2	11	QZT-Tan	N	N	Ind	Looks to be hafted with a pointed ear and notch present; the edge is steep and well worn suggesting use as a scraper	49-Spill
6974	6	BFES	N	T	42.3	21	6	4.47	CCS-Pumpkin	N	Y	N	Likely a FKake point preform broken in production, given the converging edges	49-Spill
6974	7	BP	N	M	26.59	20.69	4	1.8	CCS-Mottledpink	N	N	N	A beautiful point with mottled blacks purples and pinks; no diagnostic elements, though quite thin	49-Spill
6974	8	FP	N	T	29.3	15	3.6	1.25	CCS-Pumpkin	N	N	N	Nondiagnostic, but narrow; FKaking random	49-Spill
6974	9	SN	N	B	28.16	19.75	5.64	3.5	CCS-Oil	N	Y	N	Cortex is striated tan, similar to p-wood bark	49-Spill
6974	10	DEB	N	B	13.15	21	4.15	1.33	CCS-Red	N	N	N		49-Spill
6975	-	FK	N	T	77.6	44.64	6.6	28.82	QZT-Grey	N	N	N	Very smooth, may have been ground at one point and FKaked to resharpen	
6979	-	FK	Y	-	65.22	35	8.08	20.81	CCS-Pumpkin	N	N	N		427-457
6980	1	BP	N	T	32.13	21.81	5.24	2.83	CCS-Black	N	N	N	Corner notch	
6980	2	BP	N	M	23.92	29.22	4.23	2.56	CCS-Pumpkin	N	N	N	Split stem	
6980	3	FP	N	M	13.84	22.82	3.08	1.43	CCS-Bottle brown	N	N	N	Corner notch	

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmts)
6980	4	FP	N	B	8.64	13.48	1.91	0.25	CCS-Red	N	N	N	Convex base, side notch	
6981	1	UFT	Y	-	53.89	37.03	10.1	9.17	QZT-Red	N	N	N		91-122
6981	2	UFT	Y	-	51.84	39.66	11.93	22.67	QZT-Bluegrey	N	Y	N		91-122
6981	3	UFT	Y	-	52.65	27	4.63	6.99	QZT-Red	N	N	N	Unifacially FKaked along one edge	91-122
6981	4	UFT	N	T	44.47	30.24	10.77	12.88	QZT-Red	N	N	N		91-122
6981	5	UFT	Y	-	45.08	34.2	19.44	29.71	CCS-Oil	N	Y	N		91-122
6981	6	FK	Y	L	46.97	47.18	8.95	16.27	CCS-Oil	Ind	N	N		91-122
6981	7	UFT	N	B	43.15	30.66	4.32	5.91	CCS-Red	N	N	N		91-122
6981	8	DEB	N	-	45.08	35	9.44	12.62	CCS-Pumpkin	N	N	N		91-122
6981	9	UFT	Y	-	51.34	25.63	8.22	8.9	CCS-Pumpkin	N	Y	N	Patterned edge 36mm	91-122
6981	10	UFT	Y	-	56.72	18.87	4.62	4.84	QZT-Red	N	N	N	Classic blade with dorsal ridge	91-122
6981	11	UFT	N	M	31.89	23.67	3.05	3.13	QZT-Tan	N	N	N		91-122
6981	12	UFT	Y	-	40.26	16.5	4.57	2.53	CCS-Red	N	N	N		91-122
6981	13	UFT	N	T	46	20.2	10.12	5.47	CCS-Oil	N	N	N		91-122
6981	14	UFT	N	M	23.68	23.4	8.53	4.47	CCS-Pumpkin	N	N	N		91-122
6981	15	UFT	Y	-	45.56	27.25	4.24	3.89	CCS-Red	N	N	N		91-122
6981	16	BFLS	N	B	26.78	29.94	6.05	5.26	CCS-Banded	N	N	N		91-122
6981	17	FK	N	T	35.03	34.21	5.94	8.18	CCS-Transparent	Y	N	N		91-122
6981	18	DEB	Y	-	41.28	33.85	8.61	8.93	CCS-Pumpkin	N	N	N		91-122
6981	19	UFT	Y	-	37.51	21.57	2.75	2.34	CCS-Pumpkin	N	N	N		91-122
6981	20	UFT	Y	-	42.9	22.5	4.82	4.52	CCS-Pumpkin	N	N	N		91-122
6981	21	UFT	N	B	29.33	22.39	3.14	2.12	CCS-Pumpkin	N	N	N		91-122
6981	22	UFT	N	B	36.38	20	4.48	2.62	CCS-Red	N	N	N		91-122
6981	23	UFT	N	B	14.68	22.36	3.07	1.3	CCS-Pumpkin	N	N	N		91-122
6981	24	UFT	Y	-	20.11	23	3.15	1.56	CCS-Pumpkin	N	N	N		91-122

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmts)
6981	25	UFT	N	B	31.27	17.39	3.58	1.79	CCS-Red	N	N	N		91-122
6981	26	DEB	N	L	19.76	19.86	5.78	1.44	CCS-Red	N	Y	N		91-122
6985	1	UFT	Y	-	56.77	36.14	10.56	18	CCS-Pumpkin	N	N	N		213-244
6985	2	UFT	N	T	55.72	42.7	12.7	26.35	CCS-Pumpkin	N	N	N		213-244
6985	3	DEB	Y	-	49.85	37.88	15.62	31.55	CCS-Pumpkin	N	Y	N		213-244
6985	4	DEB	Y	-	53.56	37.11	12.52	22.25	CCS-Pumpkin	N	N	N		213-244
6985	5	DEB	Y	-	41.92	32.28	6.76	8.86	CCS-Pumpkin	Y	Y	N		213-244
6985	6	DEB	Y	-	55.6	38.66	10.22	14.83	CCS-Red	N	N	N		213-244
6985	7	DEB	N	L	36.11	30.877	3.48	3.49	VOL-Black	Y	N	N		213-244
6985	8	FK	N	T	29.06	43.32	7.98	9.32	CCS-Pumpkin	N	N	N		213-244
6985	9	BFES	N	T	38.66	30.16	9.75	13.13	CCS-White	N	N	N		213-244
6985	10	SN	N	B	47.27	30.06	7.38	9.867	QZT-Red	N	N	YR		213-244
6985	11	UFT	Y	-	62.68	27.17	6.23	10.37	QZT-Red	N	N	N		213-244
6985	12	UFT	N	B	51.25	49.29	15.58	22.56	CCS-Red	Y	Y	N	From same nodule as 6985.13	213-244
6985	13	UFT	Y	-	54.11	27.5	10.95	16.27	CCS-Red	Y	Y	N		213-244
6985	14	DEB	Y	-	49.29	25.37	6.78	6.9	CCS-Oil	N	N	N		213-244
6985	15	DEB	N	-	47.55	30.13	6.2	6.24	CCS-Red	Y	Y	N		213-244
6985	16	UFT	Y	-	49.16	18.9	5.27	4.45	CCS-Pumpkin	N	N	N		213-244
6985	17	UFT	Y	-	46.29	21.19	4.07	2.72	CCS-Pumpkin	N	N	N		213-244
6985	18	UFT	N	T	25.44	35.88	5.18	4.33	CCS-Red	N	N	N		213-244
6985	19	GR	Y	-	39.51	32.4	9.3	9.33	CCS-Pumpkin	Y	N	N		213-244
6985	20	DEB	Y	-	46.32	33.91	3.92	5.28	CCS-Pumpkin	N	N	N		213-244
6985	21	UFT	Y	-	35.65	31.73	6.57	5.29	CCS-Red	N	N	N	Utilized edge along entire width	213-244
6985	22	FK	N	L	34.7	20.77	5.06	3.17	CCS-Pumpkin	N	N	N		213-244
6985	23	DEB	N	T	42.21	18.57	3.14	2.41	CCS-Grey	N	N	N		213-244
6985	24	UFT	N	T	29.26	41.87	4.96	4.68	CCS-White	N	N	N		213-244

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmts)
6985	25	DEB	Y	-	29.23	21.9	3.56	2.63	CCS-Pumpkin	N	Y	N		213-244
6985	26	DEB	N	L	39.71	23.49	4.45	4	CCS-Grey	N	N	N		213-244
6985	27	FK	N	B	12.25	23.28	3.94	1.04	QZT-Red	N	N	N		213-244
6985	28	UFT	N	M	20.43	16.24	2.84	1.41	CCS-Grey	N	N	YR	Beautiful gray banded material	213-244
6985	29	FK	N	L	22.38	18.35	3.92	1.53	QZT-Red	N	N	N		213-244
6985	30	UFT	N	M	15.05	19.79	2.62	1	CCS-Pumpkin	N	N	N		213-244
6985	31	UFT	N	L	35.85	28.1	4.78	3.18	CCS-Pumpkin	N	N	N		213-244
6985	32	BFLS	N	L	17.73	33.63	5.91	2.81	CCS-Pumpkin	Y	N	N		213-244
6985	33	DEB	N	B	39.09	20.55	5	3.69	CCS-Pumpkin	N	N	N		213-244
6985	34	UFT	Y	-	36.36	21.44	4.58	3.34	CCS-White	N	N	N		213-244
6985	35	BFES	N	T	18.72	31.33	8.8	4.31	CCS-Pink	N	N	N		213-244
6985	36	DEB	Y	-	42.11	17.62	5.87	2.81	CCS-Red	N	N	N		213-244
6985	37	DEB	N	B	23.97	17	4.65	2	CCS-Red	N	N	N		213-244
6985	38	BFLS	N	T	24.33	32.09	7.61	4.95	CCS-Red	Y	N	N		213-244
6985	39	DEB	Y	-	28.52	15.43	4.49	1.78	CCS-Red	N	N	N		213-244
6986	-	BP	N	B	11.04	17.08	6.2	1.24	CCS-Pumpkin	N	N	N	Heavily ground base, probably a pinto type owing to large thickness	213-244
6988	-	SN	Y	-	25.8	23	4.35	2.49	QZT-Tan	N	N	N		244-274
6989	-	BP	N	B	14.82	19.7	4.7	1.24	CCS-Pumpkin	N	N	Ind	Pinto split stem type, apparently. Edges ground and well worn; could also be a base going to an ear, well-worn, but appears to be a base.	244-274
6990	a	UFT	N	B	15.58	25.44	5.98	2.39	CCS-Red	N	Y	N	May be a scraper, not enough edge to determine	244-274
6990	b	BFES	N	B	20	38.1	9.67	5.84	CCS-Red	Y	N	N		244-274
6990	c	FK	N	L	33.69	21.7	6.91	4.69	CCS-Red	Y	N	N		244-274
6990	d	FK	N	B	28.2	25.55	6	3.8	CCS-Red	N	Y	N	"Cortex" may be an interior FKaw, broken along this portion	244-274

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cbs)
6990	e	FK	N	B	30.3	30.5	4.22	4.48	QZT-Tan	N	N	N		244-274
6990	f	FK	N	T	33.99	25.64	5.6	4.77	CCS-Bluegrey	Y	N	N	Heavily burnt; backed knife with on edge finely FKaked	244-274
6990	g	BFLS	N	L	35.55	28.3	8.34	7.35	CCS-Red	Y	N	N	Heavily burnt	244-274
6990	h	BFLS	N	L	41.75	34.95	7.66	9.5	CCS-Pumpkin	Y	N	N		244-274
6990	1	BFES	Y	-	69.12	53.42	26.38	79.89	CCS-Transparent	Ind	Y	N	Rough biface, built on large spall of cobble agate	244-274
6990	2	UFT	N	B	45.75	56.54	15	40.33	CCS-Pumpkin	Y	Y	N	Utilized edge 55mm long, from platform to break. Contains cortex with snotty holes, and large grained purple grey quartzite-like material next to very fine pumpkin chert	244-274
6990	3	UFT	Y	-	67.79	46.76	14.8	31	CCS-Pumpkin	N	N	N	22mm of patterned unifacial scraper-like basal edge; utilized edge along 43mm of side	244-274
6990	4	UFT	Y	-	54.74	44.75	13.53	31.52	QZT-Bluegrey	N	Y	YR	Built on a FKake, edge slightly straightened; well-patterned FKaking only 3 long	244-274
6990	5	BFES	N	T	64.75	43.22	15.3	36.5	CCS-Pumpkin	Y	Y	N	Poorly made early biface, lots of bad FKake terminations and burning; likely a freeze cracked nodule to begin with. Broken edge looks like a platform, but it is not believed to be	244-274
6990	6	BFES	N	L	55.85	30	12.4	16.5	CCS-Bluegrey	Ind	N	N	Poorly made ; break along a pre-existing fault in material	244-274
6990	7	DS	Y	-	52.54	33.36	15.38	23.45	CCS-Pumpkin	N	N	N	Denticulations along nearly the entire edge	244-274
6990	8	UFT	Y	-	39.35	43.25	5.64	7.89	CCS-Pumpkin	Ind	N	N	Basic unmodified FKake save utilized edge, 40mm	244-274
6990	9	BFES	N	L	43.44	28.17	9	9.02	CCS-Bluegrey	Y	N	N		244-274
6990	10	UFT	N	L	49.27	20.97	5.28	4.98	CCS-Red	N	N	N	Utilized edge roughly 39mm	244-274
6990	11	UFT	N	L	62	31.75	8.75	16.7	CCS-Pumpkin	N	Ind	Y	Heavily patinated pumpkin chert, reworked roughly 8mm into central face, removing patination; patterned	244-274

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cbs)
													FKake removal roughly 60mm along edge to break	
6990	12	DS	Y	-	38	32.38	5.43	7.34	CCS-Pumpkin	N	N	N	Unifacially worked notched FKake tool, one well-developed "spoke shave" portion	244-274
6990	13	FK	N	L	33.11	19.6	7.2	4.64	QZT-Grey	N	N	N	Edge well-straightened, ground/worn roughly 17mm, with unground/worn edge portion 17mm too.	244-274
6990	14	BFES	N	L	45.54	13.69	8.87	5.76	QZT-Pumpkin	N	N	N	Break along fault in material	244-274
6990	15	UFT	N	B	30	31.33	4.43	3.07	CCS-Pumpkin	N	N	N	2 utilized edge on both sides of bulb; may be unifacially worked into scraper-like edge on far distal edge, however the break obscures this.	244-274
6992		UFT	Y		46.87	21.2	7.03	6.62	CCS-Pumpkin	N	Y	N	Worked edge 37.28	30-61
6997	-	BFLS	Y	-	53.82	29.84	6.42	8.78	CCS-Red	N	N	N	Broken, but refit and glued	61-91
7000	1	FP	Y	-	22.94	15.22	3.25	0.86	CCS-Pumpkin	N	Y	N	Narrow corner notches, sharp shoulders, expanding convex stem	183-213
7000	2	BFLS	N	T	13.3	16.1	3.95	0.78	CCS-Transparent	N	N	N		183-213
7001	1	FK	N	B	47.11	56.5	13.17	40.56	QZT-Red	Ind	N	N	Broad; moderate wear	183-213
7001	2	BFLS	Y	-	60.44	35.61	9.1	18.61	CCS-Pink	N	N	N	May be a preform - edges not finished	183-213
7001	3	BFLS	N	T	55.92	50.5	7.25	17.76	CCS-Bluegrey	N	Y	N	Snot agate material	183-213
7001	4	BFLS	N	B	27.5	42.33	7	9.31	QZT-Red	N	N	N		183-213
7002	-	UFT	Y	-	39.37	23	5.52	5.62	CCS-Red	N	N	N		183-213
7003	-	SN	Y	-	35.69	34.67	5.5	7.59	CCS-Grey	N	N	N	Although grey this is likely pumpkin chert - this is an idealized scraper	183-213
7140	-	BFLS	N	T	45.64	36.44	8.84	12.84	QZT-Tan	N	N	N	Mottled and banded quartzite	
7778	-	FK	N	B	38.9	32.2	7.22	8.34	CCS-Pumpkin	Y	N	N	Break in collection, but refits so measured as one. Mass of individual pieces are: .85g and 7.48	
7779	1	BP	N	B	33.34	31.4	7.79	8.74	QZT-Red	N	N	N	Square shoulders, convex base, slightly expanding stem shoulder	

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/Comments	Depth (cmbs)
													notch. Thin, randomly FKaked, lenticular in cross section	
7779	2	BP	N	T	33.1	11.85	2.8	0.95	CCS-Red	N	N	N	Thin, narrow point, sharp tanged ears, no base	
1948.0 1.058		BP	N	T	27.42	21.91	5.89	3.01	CCS-Pumpkin	Ind	N	N	Nondiagnostic, straight converging edges	
1948.0 1.059	1	ANG	Y	-	43.5	26.5	19.6	12	CCS-Translucent	Y	N	N		0-50
1948.0 1.059	2	DEB	Y	-	51.5	23.3	6.86	5.1	CCS-Pumpkin	N	Y	N		0-50
1948.0 1.059	3	DEB	Y	-	26.1	18.4	5.48	2.1	QZT-Bluegrey	N	N	N		0-50
1948.0 1.059	4	DEB	N	T	17.26	17.6	2.75	0.57	CCS-Bluegrey	N	N	N		0-50
1948.0 1.063	-	UFT	Y	-	56.65	25.52	8.4	10.17	CCS-Translucent	N	N	N		
1948.0 1.063	-	UFT	Y	-	47.76	25.85	5.68	6.88	QZT-Red	N	N	N		
1948.0 1.063	-	BFES	N	L	45.56	27.3	9	12.06	CCS-Pumpkin	N	Y	N		
1948.0 1.063	1	DEB	Y	-	50.4	48.33	14.9	35.6	CCS-Pink	N	Y	N	River cobble cortex blueish and vitreous luster	
1948.0 1.063	2	DEB	N	T	54.52	46.42	6.85	9.76	OBS	N	Y	N	Thin cortex, buff grey	
1948.0 1.063	3	deb	n	b	24.16	41.52	10.46	8.23	CCS-Pink	N	Y	N	Very similar to core with this inventory number, cortex river polished	
1948.0 1.063	4	DEB	Y	-	40.89	23.33	4.23	2.6	CCS-Bluegrey	N	N	N		
6890.A	1	DR	Y	-	52.26	12.66	5.1	2.89	CCS-Red	Ind	N	YR	Long hafted type with shoulders and socket base	122-152
6890.A	2	DR	N	T	30.95	12.2	6.1	1.49	CCS-Red	N	N	YR		122-152
6890.A	3	BP	N	L	24.43	10.32	3.53	0.71	CCS-Red	Y	N	N	Corner notched, expanding stem; parallel collateral FKake	122-152

CUMNH Object #	Sub #	Class	Complete	Portion	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	Material	Burning? (Y/N/Ind)	Cortex?	Reworking	Type/ Comments	Depth (cmbs)
6890.A	4	FK	N	B	25.54	14.47	3.94	1.6	CCS-Red	N	N	N	May be a preform, round base, converging edges	122-152
6890.A	5	FK	N	T	37.38	14.19	5.23	2.37	QZT-Red	N	N	YR	May be drill tip, but very thin	122-152
6890.A	6	FP	N	B	17.21	14.52	3.62	0.75	CCS-Pink	Ind	N	N	Corner notch arrow point; large angular ear, expanding base (wide notches)	122-152
6890.A	7	BP	Y	-	17.8	8.76	3.12	0.38	CCS-Bluegrey	N	N	Ind	Expanding base, wide notches bow point	122-152

Ground stone artifact datasheet 1

UCM Object #	Sub #	Class (OH, TH, HR, HM, NS, MT, MS)	Complete? (Y/N)	Portion (B, T, M, L)	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)	# of Used Surfaces	Material	Color	Shape	Burning? (Y/N/Ind)	Residues? (N or Color)	Comments	Provenience
5217	-	MS	N	L	30.64	26	4.2	2.9	0	Slate	Black		Ind	N	Typed as gaming piece in collection, but little to differentiate sides if meant as dice; stone blank much like #5367	0
5218	-	MS	Y	-	21.85	17.45	4.3	1.75	0	Slate	Black		Ind	N	Typed as gaming piece in collection, but little to differentiate sides if meant as dice; stone blank much like #5367	0
5225	-	MS	Y	-	23.5	22	5.4	2.6	0	Slate	Black		Ind	N	Typed as gaming piece in collection, but little to differentiate sides if meant as dice; stone	0

																blank much like #5367	
5244	-	MS	Y	-	24.34	21.4	5.35	3.1	0	Slate	Black		IND		Brown (Sediments)	Typed as gaming piece in collection, but little to differentiate sides if meant as dice; stone blank much like #5367	0
5245	-	MS	N	L	17.43	11.79	1.57	0.28	0	Slate	Black		IND	N			0
5367	-	MS	N	L	30	14	2.7	1.2	0	Slate	Black	Half circle	IND	N		Pendant/stone blank for bead probably, maybe whorl	0
5368	-	MS	Y	-	29.29	21.96	8.79	10.3	0	Granitic pebble	Grey with tan bands		N	N		-	0
5667	-	MS	Y	-	13.56	12.77	1.9	0.4	0	Slate	Black	Bead	IND	N			0
5857	-	MS	N	T	39.26	30	29.15	35.9	NA	Hard alabaster/calcite - crystalline and slightly banded	White	Conical tube	N	N		Pipe/cloud blower	0

6527	a	HR	Y	-	47.8	40.14	29.6	80.4	-	Granite	Grey	Spheroidal	N	N	Hammerstone/ball - largely unmodified	50-85
6527	b	IND HS	N	-	52.6	32.2	29.4	41.4	1	Qzt	Red	Pyramidal	Y	N	Handstone	50-85
6602	-	TH	Y	-	100	152.3	71.2	1577.9	2	Granitic cobble	Pink	Egg, FKattened on one face	Y	Black, white carbonates on ventral	For corn, heavily repected, polished on top from use	50-120
6604	1	NS	N		248	175	89	643	0	SS	Orange	Tabular dish	N	N	Broken in three pieces, unmodified	160-170
6605	-	OH	Y	-	92.6	127.5	44.4	865	2	SS	Grey	Elipsoid column	Y	White and blackening	Handstone	213.36-274.32
6606	-	HR	Y	-	77.4	75.25	56.6	458.1	1	Quartzite	Grey	Spheroidal	Ind	N	Nearly a stone ball, river cobble with light percussion use around entire edge	440-470cm
6618	-	MS	Y	-	49.5	23.15	10.8	7.7	0	Slate	Black	Unmodified	Ind	N	Unmodified	140-170cm
6626	a	HR	Y	-	107.6	59	23.5	247.8	1	QZY	Tan	Elipse	N	N	Lightly used hammerstone	140-170cm

6626	b	TH	N	M	63.1	89	54	573	4	Sandstone	Grey	Loaf	Y	N	Mano	140-170cm
6626	c	TH	N	L	62.9	115	50.2	568.2	3	Quartzite	Tan	Loaf	Y	White	Mano	140-170cm
6636	-	OH	Y	-	56.7	58.6	48.1	201.9	1	Granitic cobble	Grey	Spheroidal	Y	White and blackening	Stone ball - one heavily worn edge suggests use as handstone	0
6889	-	MS	Y	-	48.1	42	20.7	78.6	0	Iron	Black	Triangular	IND	IND	Heavily worn/polished iron concretion	60.96 - 91.44
6894	-	MS	Y	-	69.1	27.15	14.8	40.6	1	Quartzite	Grey	Ovoid	N	N	Barely modified on very distal tip; likely non-cultural	121.92 - 152.4
6901	1	MS	Y	-	23.3	23.3	8	6	3	Sandstone	Tan	Columnar	Y	N	Disk, roughly quarter size	91.44 - 121.92
6901	2	MS	Y	-	52.76	17	8.4	10.3	-	Quartzite	Darkgrey	Teardrop	N	N	Burnishing stone, well polished across entire surface	91.44 - 121.92
6919	-	MS	Y	-	69.18	36.3	20.54	81.7	0	Basalt (?) pebble	Black	Burnishing stone?	Ind	N	For hides or ceramic	60.96 - 91.44

6951	-	MS	Y	-	70. 9	22	11. 5	27.4	2	Quartzite	Grey	Teardrop	N	N	Burnishing stone, well polished; edges taper with two faces worn across	0
6956	1	HR	Y	-	77. 2	77	37	304. 8	1	Quartzite	Tan	Trapezoid	N	N	Hammerstone	60.96 - 91.44
6957	1	MS	Y		97. 8	62	12	116. 9	0	QZT	Grey	Tabular Teardrop	N	N		60.96 - 91.44
6958	-	TH	Y	-	90. 7	175	48. 8	1278 .8	6	QZT	Pinkish grey	Loaf	Y	N		121.9 2- 152.4
6960	-	MS	Y	-	160	98. 5	38. 5	895. 3	0	SS	Grey	Ovoid	Ind	Red ochre, charcoal staining	Like a palette - unmodified except perhaps some flaking on one edge, the object is covered in	121.9 2- 152.4
6961	1	TH	N	L	76. 45	42. 75	49	150. 9	1	SS	Grey	Waxing moon	Y	N		243.8 4- 274.3 2
6961	2	TH	N	L	89. 3	55	52	304	1	QZT	Pink	Half circle	Y	N		243.8 4- 274.3 2
6962	1	HR	Y	-	67	36. 2	19. 5	60.9	1	QZT	Tan	Teardrop	N	N	May be burnishing stone, but low polish; distal tip has	243.8 4- 274.3 2

																	percussion blows	
6962	2	HM	N	L	50.6	52.73	50.9	172.9	1	SS	Black/Orange	Dome	Y	Orange/Black			Hammerstone with one well surface. The material appears black on gross examination, however low spots on artifact are orange - glow in d-stretch. This could be residues from use (ochre or just sediments getting into low points) or could reveal material's actual color without the blackening from fire.	243.84-274.32
6963	1	OH	N	-	50.1	97.1	46.6	198.8	3	SS	Tan	Angular	N	N				274.32-304.8
6963	2	OH	Y	-	102.4	119.9	48.9	978	2	SS	Pink	Columnar	N	N				274.32-304.8

6965	1	HR	Y	-	100.4	86.7	53.5	623.7	0	SS	Grey	Circular	N	N	Percussion modification around entire edge	304.8 - 335.28
6966	1	OH	Y	-	66.8	94.9	39	318.7	2	ss	gREY	Ovoid	N	N		304.8 - 335.28
6966	2	OH	Y	-	64.4	84.4	33.6	265.2	1	SS	Grey	Ovoid	N	N		304.8 - 335.28
6966	3	OH	Y	-	62	64.85	30.1	162	2	SS	Grey	Circular	Y	N		304.8 - 335.28
6966	4	OH	Y	-	67	70.25	27.8	215.7	2	SS	Grey	Circular	N	N		304.8 - 335.28
6966	5	OH	Y	-	72.3	72.6	36.8	262.5	2	SS (With concretions)	Grey	Circular	Y	N		304.8 - 335.28
6966	6	OH	Y	-	55.1	65.3	34.3	155.3	2	SS	Greyish green	Circular	N	N		304.8 - 335.28
6967	-	HM	Y	-	115	126	52	977	2	Sandstone	Grey	Circular	N	N	One handed mano, egde used as hammerstone lightly	304.8 - 335.28
6968	-	OH	N	-	97.1	108.8	53	688.7	1	QZT	Grey	Elipsoid	IN	N		304.8 - 335.28
6976	1	OH	Y	-	88.7	112.5	58.6	871.5	1	QZT	Grey	Ovoid	N	N		91.44 -

																		121.9 2
6978	1	MS	Y		67	31. 8	10. 8	35	0	QZT	Grey	Ovoid	N	N				91.44 - 121.9 2
6978	2	MS	Y		79. 9	36. 9	15. 4	66.4	0	QZT	Grey	Ovoid	N	N	Worn to a point on one edge			91.44 - 121.9 2
6978	3	MS	Y		71. 25	46. 5	22. 4	114. 9	0	QZT	Orange	Ovoid	N	N				91.44 - 121.9 2
6978	4	MS	Y		87. 8	49. 9	16. 3	89.2	0	QZT	Grey	Teardro p	N	N				91.44 - 121.9 2
6978	5	MS	Y		79	41. 7	13. 2	76.9	0	QZT	Grey	Teardro p	N	N				91.44 - 121.9 2
6978	6	MS	Y		81. 2	41. 5	17. 9	87	0	QZT	Tan	Teardro p	N	N				91.44 - 121.9 2
6978	7	MS	Y		82. 7	69. 5	19. 5	137. 7	0	SS	Orange	Teardro p	N	N				91.44 - 121.9 2
6978	8	MS	Y		80. 5	45. 7	10. 9	61.6	0	SS	Grey	Tabular ovoid	N	N				91.44 - 121.9 2
6978	9	MS	N		75. 3	53. 6	8.6	54.4	0	SS	Tan	Tabular Bell	N	N				91.44 - 121.9 2
6978	0	MS	N		65. 7	46. 5	17. 3	73.5	0	SS	Grey	Tabular	N	N				91.44 -

																	121.92
6978	11	MS	N		106.5	64.3	14.2	176.1	0	SS	Grey	Tabular	N	N			91.44 - 121.92
6983	1	OH	Y	-	82.4	98.9	45.7	566	2	Quartzite	Pink	Triangular	Y	Brown/White concretions	Simple handstone, well-worn with no apparent re-roughening marks		91.44 - 121.92
6983	2	OH	Y	-	104.7	120.9	48.6	802.7	1	Sandstone	Pink	Ovoid	Y	Black/White concretions	One handed mano, rocking motion owing to tapered face		91.44 - 121.92
6984	-	OH	Y	-	70.7	62.4	12.8	90.5	2	SS	Tan	Round	N	N	Likely for hides,		91.44 - 121.92
6987	1	HM	Y	-	90.4	111.8	54	879.9	3	Sandstone	Pink	Puck ovoid	Y	Charcoal	Mano		152.4 - 182.88
6987	2	OH	Y	-	94.3	74.3	38.3	325.2	1	Sandstone	Orange	Puck ovoid	Y	Black on reverse	Handstone		152.4 - 182.88
6987	3	HR	Y	-	71.8	73	22	168	0	Sandstone	Grey	Puck ovoid	Y	N			152.4 - 182.88

6987	4	OH	Y	-	71. 4	71. 5	45. 3	304	1	SS	Pink	Dome	Y	Orange sediment	Handstone	213.3 6- 274.3 2
6991	-	OH	Y	-	80. 75	113 .3	50. 3	612. 5	1	SS	Tan	Elipsoid	N	N		213.3 6- 274.3 2
1948.01. 059	-	MS	Y	-	30. 15	16. 5	16	15.5	N A	Rizcretion ?	Grey	Conical tube	N	N	Probably an unmodified fossil/concret ion	213.3 6- 274.3 2
	2	TH	N	L	52. 7	64. 6	51. 1	243	1	SS	Grey	triangul ar prism	N	N		213.3 6- 274.3 2
	3	TH	N	L	60. 7	76. 6	44. 4	305. 5	1	SS	Grey	triangul ar prism	N	White etching		335.2 8- 365.7 6
	4	OH	Y	-	86. 5	104 .5	43	619	2	SS	Grey	Squircle	N	N	Handstone	0-50

Ground stone artifact datasheet 2 (faces)

UCM Object #	Sub #	Face	Complete	Length (mm)	Width (mm)	Wear (Heavy, Moderate, Light)	Type of Mod. (Pecking, Grinding)	Residues (Y or Color)	Burning ? (Y/N/Ind)
6967	-	1	Y	87.6	60	M	Grinding	N	N
		2	y	82	62	L	G/P	N	N
6901	1		y	23	23	H	G		
6983	1	1	y	54.5	79	M	G	N	Y
6983		2	y	55.2	77.25	M	G	Brown/White	Y
6983	2	1	y	100	77.6	H	G/P	White casrbonate etching	Y
6962	2	1	n	26.9	22.7	M	G	N	Y
6626	b	1	N	41.8	81.8	H	G	N	N
6626	b	2	N	49.3	85.6	H	GP	N	N
6626	b	3	N	33.2	92.6	H	G	N	N
6626	b	4	N	29.6	86	H	G	N	N
6626	c	1	N	45.2	82	H	GP	White	Y
6626	c	2	N	42	77	H	GP	N	Y
6626	c	3	N	30.5	57.5	M	GP	N	Y
6987	1	1	Y	53.66	66.86	H	GP	N	Y
6987	1	2	Y	63.66	83.4	H	GP	Charcoal	Y
6987	1	3	Y	36	24.75	M	GP	N	Y
6987	2	1	N	58.3	60.1	L	G	N	Y
6987	4	1	Y	40	40	M	GP	N	N
6605	-	1	Y	80.3	104.8	H	GP	White	N
6605	-	2	Y	73	105.3	H	GP	Black	Y
6991	-	1	Y	63.25	90.7	L	GP	N	N
6968	-	1	N	72	86.4	H	GP	N	N
6976	1	1	Y	66.8	80.3	H	GP	N	N
6976	2	1	N	47	60.8	H	G	N	N
6976	3	1	N	58.6	75.4	H	GP	N	N
6976	4	1	Y	81.5	96.4	H	GP	N	N
6976	4	2	Y	63.7	76.2	H	G	N	N

UCM Object #	Sub #	Face	Complete	Length (mm)	Width (mm)	Wear (Heavy, Moderate, Light)	Type of Mod. (Pecking, Grinding)	Residues (Y or Color)	Burning ? (Y/N/Ind)
6963	1	1	N	42.3	55	H	G	N	N
6963	1	2	N	18.7	60.9	H	G	N	N
6963	1	3	N	96.2	31.6	H	G	N	N
6963	2	1	Y	86.7	92.5	H	GP	N	N
6963	2	2	Y	80.8	92.6	H	GP	N	N
6984	-	1	Y	58.6	53.1	M	G	N	N
6984	-	2	Y	48.6	48.5	L	G	N	N
6602	-	1	Y	86.4	144.8	H	GP	White (Carbonates?)	Y
		2	Y	58.3	72.2	M	G	Black	Y
6636	-	1	Y	34.9	38	H	G	Black	Y
6966	1	1	Y	38.4	72.2	H	G	N	N
6966	1	2	Y	47	64.1	M	G	N	N
6966	2	1	Y	43	61.7	L	G	N	N
6966	3	1	Y	32.3	40.5	H	G	N	N
6966	3	2	Y	32	36.5	M	G	Y	N
6966	4	1	Y	47.2	51.2	H	G	N	N
6966	4	2	Y	37.5	37.6	M	G	N	N
6966	5	1	Y	44.6	52	H	G	N	N
6966	5	2	Y	46.5	50	M	G	N	N
6966	6	1	Y	32	44	M	G	N	N
6966	6	2	Y	32.9	43	L	G	N	N
6966	6	3	Y	31	16.5	L	G	N	N
6961	1	1	N	62.45	39.2	H	G	N	N
6961	2	1	N	53.7	31.4	H	GP	N	N
6958	-	1	Y	86	160	H	GP	N	N
6958	-	2	Y	55	150	M	G	N	N
6958	-	3	Y	134.5	26.7	M	GP	N	N
6958	-	4	Y	57.7	29.2	M	GP	N	N
6958	-	5	Y	140	31	M	GP	N	N
6958	-	6		37.5	19	L	GP	N	N

APPENDIX V – ARTIFACT CLASSIFICATION DETAIL

This section will explain the classification schemes used in artifact assessment. These explanations will primarily be in reference to the datasheets in Appendix IV – Datasheets produced during lab analysis. As discussed in Chapter 6, two classification schemes were devised for the chipped stone artifacts: a general scheme used for diversity analyses and a more specific scheme meant to be used by CUMNH and future researchers in classifying this assemblage. The specific categories are nested within the more generalized schemes, and to save space they are therefore not included in the datasheets in Appendix IV – Datasheets produced during lab analysis

Chipped Stone Classification

Below are the tool classifications that will be used. Thirteen classes fairly characterizes differences in the artifacts in the assemblage without being too exclusionary. These classes are meant to be descriptions on morphology, and do not necessarily indicate that the artifact was used for this specific function or this specific function only.

- **Angular debris (ANG, n=14)** are chipped stone artifacts with square or irregular edges and similar dimensions of length, width, and thickness. These may be produced by burning or trampling and can also result from impurities in stone or errors during manufacture.
- **Bifaces** are chipped stone tools exhibiting intrusive bifacial flaking across their entire surface and flakes removed from their entire circumference. Here they were classified in this assemblage as either **early-stage (BFES; n=122)** or **late-stage (BFLS, n=101)**. The distinguishing characteristic of these categories is the size of the deltas (ridges between flake scars); in late stage bifaces, the edge will show straightening, perhaps using

pressure flaking or edge modification, whereas in early stages the deltas may remain in place. In some cases these tools were used as knives and in others they likely served as cores. This tool type is found across excavated contexts to 304 centimeters below the surface.

- **Bifacial points (BP, n=196)** are hafted bifacial tools, usually lenticular or diamond in cross section, with edges converging to a point. They may be notched, stemmed, or lanceolate in form. It is probable that some examples were multifunctional and not used solely as projectiles. Significantly, these types are also frequently reworked. These are found in levels up to 380 bs.
- Two “**choppers**” are also in the assemblage (**CH**). These are relatively large bifacially worked, blunt edged tools which show evidence of percussive use wear.
- **Cores (COR, n=7)** are nodules of raw material which show many flake removal scars across their surface. In a few cases, these contained enough cortex to recognize them as river cobbles. One of these was recovered from the surface, and two others from depths exceeding two meters; the only other one with provenience came from a wall fall event.
- **Debitage (DEB, n=124)** is chipped stone debris that exhibits a flat cross section, a smooth ventral face, and may contain a bulb and feathered edges. These were a small portion of the collection relative to the numbers recovered by excavators. These materials came from all excavated cultural horizons.
- **Drills (DR, n=16)** are tools with a long protrusion which is flaked along its entire surface; frequently these tools have hafting elements and are sometimes asymmetrical and suggest multifunctional tools. These were recovered primarily in the upper portion of the site, although some examples were recovered in levels as deep as 275 bs.
- **Denticulate scrapers (DS, n=13)** are tools which are mounded in cross section and contain flaking along their entire distal edge. This flaking includes serrations or denticulations along the perimeter and on the unifacially sharpened edge. These tools were found up to 3 meters below the surface.
- **Formal knives (FK, n=166)** are late stage bifaces which show fine edge modification and straightened cutting surfaces. In some cases, these bifaces were asymmetrical and showed evidence for being hafted. Preforms, broken point fragments without tips, and knives are all expected to fall into this class and “knife” is not meant to suggest function. Found across horizons, as deep as 274bs.
- **Flake points (FP, n=55)** are modified flake with apparent hafting elements and edges converging to a point; they are modified unifacially or through nonintrusive bifacial edge

modifications. Ventral flake faces are present and they may be asymmetrical along their frontal (dorsal/ventral) plane. Found in levels as deep as 3.8 meters below the surface.

- **Gravers (GR; n=6)** are likely multifunctional tools distinguished by a protruding spur. These may be unifacially built. In one example, the graver was on a bifacial knife (U# 6592). These were found in levels 48-2 (50-120bs), 48-8(290-320bs), and 49-8 (213-244bs).
- **Snub nosed scrapers (SN, n=34)** are classic, unifacially worked flake tools. In cross section they are flat ventrally and mounded dorsally; their distal margin is unifacially worked at a steep angle for scraping hides. The proximal end may be thinned or show other evidence for hafting. They were recovered across excavated depths to 3 meters.
- **Utilized flake tools (UFT, n=218)** are those edge modified flakes which exhibit patterned flaking or wear along more than 25 mm of edge. These include fragmented flake tools that are otherwise unidentifiable to well patterned unifacially worked flakes and blades with utilized edges. They occurred throughout deposits to a depth of 3 meters.

Other CS Recording Notes:

All chipped stone will be recorded for completeness and then portion. Portion may be base, tip, midsection, or lateral.

Reworking will also be measured as: No reworking, Yes total, and Yes resharpening. Yes total refers to tools that are apparently reworked well beyond their initial morphology, suggesting a reuse of older tools in the area, perhaps by later groups. This is expected to be more frequent in earlier, more mobile levels. Resharpening does not change the overall morphology of the artifact, but, again, is expected to occur more frequently in the more mobile levels owing to a degree of conservatism in tool use not expected for more settled forager farmers.

Ground Stone Classifications

Ground stone was given its own classification scheme, although these were only used for calculating “richness”—that is, the number of unique categories of tools.

- **One handed manos (OH, n=19)** are small hand stones which are less than 12 wide. These were recovered up to depths of 366bs.
- **Two handed manos (TH, n=78)** are wider hand stones, meant to be used with two hands. These were recovered as deep as 275bs.
- **Hammerstones (HR, n=7)** showed little evidence of shaping by grinding but did contain battering wear marks along the edges.
- **Hammerstone manos (HM, n=3)** are ground hand stone tools which show evidence of use for percussion.
- **Nether stone (NS, n=1)** is a term meaning the passive or stationary part of a ground stone tool kit. The only example in the assemblage is a grinding slab broken into three portions, though others were reported as coming from the site.
- **Miscellaneous ground stone (MS, n=31)** is the most abundant class. This category includes ground slate artifacts such as beads, polished burnishing stones, pipe fragments, stone balls, and pendants.

Other GS Recording Notes:

Ground stones were recorded first in a general form and then recorded for face metrics.

This ground stone face data included degree of wear (heavy [H], moderate [M], or light [L]), mechanism of modification (grinding [G], pecking [P], or mixed [G/P]), and residues.

APPENDIX VI – UNIVERSITY OF GEORGIA RADIOCARBON ANALYSIS REPORT

The University of Georgia

Center for Applied Isotope Studies

February 24, 2023

UGAMS#	Sample ID	Material			C/N	¹⁴ C age, years BP		pMC	
63526	1948.01.065	collagen	-18.88	5.39	3.34	1540	20	82.59	0.22
63527	1949.01.042	collagen	-19.12	4.43	3.34	890	20	89.51	0.24
63528	6898	colla en	-19.61	6.21	3.32	1230	20	85.84	0.22
63529	1948.01.092	collagen	-18.71	4.12	3.38	3050	20	68.41	0.19
63530	1949.01.013	collagen	-18.94	4.42	3.27	2810	20	70.47	0.19
63531	1949.01.048	collagen	-18.96	4.54	3.29	3010	20	68.78	0.20
63532	1949.01.024	collagen	-19.39	4.45	3.29	3580	20	64.00	0.18
63533	1949.01.002	collagen	-18.67	4.18	3.30	3690	20	63.19	0.18
63534	1949.01.01 1	collagen	-18.74	4.77	3.30	4410	20	57.76	0.17
63535	1948.01.091	colla en	-18.85	4.93	3.29	4670	25	55.94	0.16
63536	6612	charcoal	-10.48	n/a	n/a	970	20	88.58	0.23
63537	6610	charcoal	-11.53	n/a	n/a	1 1 10	20	87.06	0.23
63538	6900	charcoal	-10.75	n/a	n/a	1 140	20	86.76	0.23

Spencer T. Little
Colorado State University
Fort Collins, CO 80521

Dear Mr. Little,

Enclosed please find the results of ^{14}C Radiocarbon analyses and Stable Isotope Ratio $\delta^{13}\text{C}$ analyses for the samples received by our laboratory on February 8, 2023.

The charcoal sample was treated following the acid/alkali/acid (AAA) protocol involving three steps: (1) an acid treatment (IN HCl at 80°C for 1 hour) to remove secondary carbonates and acid-soluble compounds; (2) an alkali (NaOH) treatment; and (3) a second acid treatment (HCl) to remove atmospheric CO_2 . Sample was thoroughly rinsed with deionized water between each step, and the pretreated sample was dried at 105°C . For accelerator mass spectrometry analysis the cleaned samples were combusted at 900°C in evacuated / sealed ampoules in the presence of CuO.

The bone sample was treated with IN HCl at 4° . The residue was filtered, rinsed with deionized water and under slightly acid condition (pH=3) heated at 80°C for 12 hours to dissolve collagen and leave humic substances in the precipitate. The collagen solution is then filtered to isolate pure collagen and dried out. The dried collagen was combusted at 575°C in evacuated/sealed Pyrex ampoule in the presence of CuO.

The resulting carbon dioxide was cryogenically purified from the other reaction products and catalytically converted to graphite using the method of Vogel et al. (1984) Nuclear Instruments and Methods in Physics Research B5, 289-293. Graphite $^{14}\text{C}/^{13}\text{C}$ ratios were measured using the CAIS 0.5 MeV accelerator mass spectrometer. The sample ratios were compared to the ratio measured from the Oxalic Acid I (NBS SRM 4990).

The sample $^{13}\text{C}/^{12}\text{C}$ ratios were measured separately using a stable isotope ratio mass spectrometer and expressed as $\delta^{13}\text{C}$ with respect to PDB, with an error of less than 0.1‰ .

The quoted uncalibrated dates have been given in radiocarbon years before 1950 (years BP), using the ^{14}C half-life of 5568 years. The error is quoted as one standard deviation and reflects both statistical and experimental errors. The date has been corrected for isotope fractionation.

Sincerely,



Alexander Cherkinsky, Ph.D.
Senior Research Scientist

120 Riverbend Road • Athens, Georgia 30602-4702
Telephone 706-542-1395 • Fax 706-542-6106 • www.cais.uga.edu
An Equal Opportunity/Affirmative Action Institution

Calibrations reported by UGAMS. Note this document dropped the final digit of UCMNH numbers. UGAMS numbers should be referenced instead.

RADIOCARBON CALIBRATION PROGRAM*

CALIB REV8.2

Copyright 1986-2020 M Stuiver and PJ Reimer

*To be used in conjunction with:

Stuiver, M., and Reimer, P.J., 1993, Radiocarbon, 35, 215-230.

1948.01.06

63526

collagen

Radiocarbon Age BP 1540 +/- 20

Calibration data set: intcal20.14c

% area enclosed cal AD age ranges

Reimer et al. 2020

relative area under probability distribution

68.3 (1 sigma)	cal AD	481- 492	0.113
		537- 574	0.887
95.4 (2 sigma)	cal AD	436- 464	0.114
		475- 500	0.141
		509- 516	0.014
		530- 594	0.731

Median Probability: 547

1949.01.04

63527

collagen

Radiocarbon Age BP 890 +/- 20

Calibration data set: intcal20.14c

% area enclosed cal AD age ranges

Reimer et al. 2020

relative area under probability distribution

68.3 (1 sigma)	cal AD	1055- 1057	0.026
		1158- 1181	0.500
		1186- 1212	0.475
95.4 (2 sigma)	cal AD	1049- 1081	0.199
		1134- 1137	0.003
		1152- 1219	0.798

Median Probability: 1173

6898

63528

collagen

Radiocarbon Age BP 1230 +/- 20

Calibration data set: intcal20.14c

% area enclosed cal AD age ranges

Reimer et al. 2020

relative area under probability distribution

68.3 (1 sigma)	cal AD	707- 723	0.183
		773- 775	0.024
		787- 828	0.681

		859- 870	0.112
95.4 (2 sigma)	cal AD	692- 694	0.004
		704- 740	0.219
		773- 776	0.017
		783- 880	0.760

Median Probability: 804

1948.01.09

63529

collagen

Radiocarbon Age BP 3050 +/- 20

Calibration data set: intcal20.14c

Reimer et al. 2020

% area enclosed	cal AD age ranges	relative area under probability distribution
-----------------	-------------------	--

68.3 (1 sigma)	cal BC	1381- 1342	0.489
		1308- 1268	0.511
95.4 (2 sigma)	cal BC	1397- 1332	0.453
		1327- 1257	0.502
		1246- 1228	0.045

Median Probability: -1315

1949.01.01

63530

collagen

Radiocarbon Age BP 2810 +/- 20

Calibration data set: intcal20.14c

Reimer et al. 2020

% area enclosed	cal AD age ranges	relative area under probability distribution
-----------------	-------------------	--

68.3 (1 sigma)	cal BC	988- 927	1.000
95.4 (2 sigma)	cal BC	1012- 905	1.000

Median Probability: -963

1949.01.04

63531

collagen

Radiocarbon Age BP 3010 +/- 20

Calibration data set: intcal20.14c

Reimer et al. 2020

% area enclosed	cal AD age ranges	relative area under probability distribution
-----------------	-------------------	--

68.3 (1 sigma)	cal BC	1284- 1216	1.000
95.4 (2 sigma)	cal BC	1380- 1346	0.116
		1304- 1196	0.847
		1173- 1163	0.017
		1142- 1131	0.019

Median Probability: -1252

1949.01.02
 63532
 collagen
 Radiocarbon Age BP 3580 +/- 20
 Calibration data set: intcal20.14c # Reimer et al. 2020
 % area enclosed cal AD age ranges relative area under
 probability distribution

68.3 (1 sigma)	cal BC	1951- 1892	1.000
95.4 (2 sigma)	cal BC	2019- 1996	0.088
		1979- 1882	0.906
		1835- 1832	0.005

Median Probability: -1930

1949.01.00
 63533
 collagen
 Radiocarbon Age BP 3690 +/- 20
 Calibration data set: intcal20.14c # Reimer et al. 2020
 % area enclosed cal AD age ranges relative area under
 probability distribution

68.3 (1 sigma)	cal BC	2134- 2082	0.687
		2058- 2034	0.313
95.4 (2 sigma)	cal BC	2190- 2183	0.015
		2142- 2022	0.953
		1994- 1982	0.033

Median Probability: -2088

1949.01.01
 63534
 collagen
 Radiocarbon Age BP 4410 +/- 20
 Calibration data set: intcal20.14c # Reimer et al. 2020
 % area enclosed cal AD age ranges relative area under
 probability distribution

68.3 (1 sigma)	cal BC	3092- 3052	0.487
		3037- 3010	0.301
		2979- 2964	0.114
		2948- 2936	0.098
95.4 (2 sigma)	cal BC	3098- 2925	1.000

Median Probability: -3029

1948.01.09
 63535
 collagen
 Radiocarbon Age BP 4670 +/- 25
 Calibration data set: intcal20.14c # Reimer et al. 2020

% area enclosed	cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal BC 3512- 3488	0.265
	3469- 3426	0.533
	3408- 3397	0.096
	3383- 3373	0.105
95.4 (2 sigma)	cal BC 3517- 3482	0.251
	3477- 3371	0.749

Median Probability: -3448

6612
63536
charcoal

Radiocarbon Age BP 970 +/- 20
Calibration data set: intcal20.14c # Reimer et al. 2020

% area enclosed	cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal AD 1030- 1047	0.320
	1083- 1095	0.196
	1102- 1125	0.374
	1140- 1148	0.110
95.4 (2 sigma)	cal AD 1024- 1052	0.277
	1078- 1156	0.723

Median Probability: 1099

6610
63537
charcoal

Radiocarbon Age BP 1110 +/- 20
Calibration data set: intcal20.14c # Reimer et al. 2020

% area enclosed	cal AD age ranges	relative area under probability distribution
68.3 (1 sigma)	cal AD 896- 923	0.473
	951- 979	0.467
	984- 989	0.061
95.4 (2 sigma)	cal AD 892- 934	0.438
	938- 991	0.562

Median Probability: 943

6900
63538
charcoal

Radiocarbon Age BP 1140 +/- 20
Calibration data set: intcal20.14c # Reimer et al. 2020

% area enclosed	cal AD age ranges	relative area under probability distribution
-----------------	-------------------	--

68.3 (1 sigma)	cal AD	885- 899	0.221
		918- 958	0.702
		967- 973	0.078
95.4 (2 sigma)	cal	AD 775- 784	0.037
		833- 845	0.023
		877- 979	0.927
		983- 989	0.012

Median Probability: 929

References for calibration datasets:

Reimer P, Austin WEN, Bard E, Bayliss A, Blackwell PG, Bronk Ramsey C, Butzin M, Edwards RL, Friedrich M, Grootes PM, Guilderson TP, Hajdas I, Heaton TJ, Hogg A, Kromer B, Manning SW, Muscheler R, Palmer JG, Pearson C, van der Plicht J, Reim Richards DA, Scott EM, Southon JR, Turney CSM, Wacker L, Adolphi F, Büntgen U, Fahrni S, Fogtmann-Schulz A, Friedrich R, Köhler P, Kudsk S, Miyake F, Olsen J, Sakamoto M, Sookdeo A, Talamo S. 2020. The IntCal20 Northern Hemisphere radiocarbon age calibration curve (0-55 cal kB Radiocarbon 62. doi: 10.1017/RDC.2020.41.

Comments:

* This standard deviation (error) includes a lab error multiplier.

** 1 sigma = square root of (sample std. dev.^2 + curve std. dev.^2)

** 2 sigma = 2 x square root of (sample std. dev.^2 + curve std. dev.^2)

where ^2 = quantity squared.

[] = calibrated range impinges on end of calibration data set

0* represents a "negative" age BP

1955* or 1960* denote influence of nuclear testing C-14

NOTE: Cal ages and ranges are rounded to the nearest year which may be too precise in many instances. Users are advised to round results to the nearest 10 yr for samples with standard deviation in the radiocarbon age greater than 50 yr.

APPENDIX VII – MULTIVARIATE ANALYSIS OF 1940 AND 1947 FIELD SEASONS

Because of the limited sample size and low resolution of 1940 and 1947 excavations, they were not considered in the multivariate analysis of occupation from Chapter 6. Below are the results of those unit’s multivariate ranking.

Table 16 - Multivariate analysis results for 1947 excavations. Note these data were not included in the rankings of 1948 and '49

Analytical Unit	CS Tools	/m ³	% Rank	Chipped Stone Diversity	% Rank	Flake Tools	/m ³	% Rank	Ground Stone Tools	/m ³	% Rank	G Stone Richness	% Rank	Projectile Points	/m ³	% Rank	% PP Complete	% Rank	Bone Tools	/m ³	% Rank	Mean % Rank
1947 Lvl 1	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00	0.00%	0.00	0	0.00	0.00	0.00
1947 Lvl 2	15	12.68	0.73	0.70	0.89	2	1.69	0.70	0	0.00	0.00	0	0.00	5	4.23	0.84	0.00%	0.00	4	3.38	0.92	0.51
1947 Lvl 3	9	12.78	0.76	0.00	0.00	2	2.84	0.78	0	0.00	0.00	0	0.00	4	5.68	0.97	25.00%	0.76	0	0.00	0.00	0.41
1947 Lvl 4	7	10.05	0.68	0.00	0.00	2	2.87	0.81	0	0.00	0.00	0	0.00	1	1.44	0.62	0.00%	0.00	2	2.87	0.86	0.37
1947 Lvl 5	0	0.00	0.00	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0	0.00	0.00	0.00%	0.00	0	0.00	0.00	0.00

Table 17 - - Multivariate analysis results for 1940 excavations. Note these data were not included in the rankings of 1948 and '49.

Analytical Unit	CS Tools	/m ³	% Rank	Chipped Stone Diversity	% Rank	Flake Tools	/m ³	% Rank	Ground Stone Tools	/m ³	% Rank	G Stone Richness	% Rank	Projectile Points	/m ³	% Rank	% PP Complete	% Rank	Bone Tools	/m ³	% Rank	Mean % Rank
1940, all	140	17.14	0.89	0.63	0.73	13	1.59	0.68	10	1.22	0.78	2	0.78	42	5.14	0.89	28.57%	0.84	2	0.24	0.49	0.76