

TWO TO FOUR INCHES OF LIME DIRT: PUBLIC ARCHAEOLOGY AND THE DEVELOPMENT OF OLD AND NEW INTERPRETATIONS AT THE CASTLE A SITE, MONTEZUMA CASTLE NATIONAL MONUMENT

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ABSTRACT

This paper addresses recent archaeological work at the Castle A site (AZ O:5:95 [ASM]), located within the Montezuma Castle National Monument boundary. Initially excavated and stabilized in 1933 and 1934 by National Park Service archaeologists Earl Jackson and Sallie Pierce, the project is a historically significant event in the development of Verde Valley archaeology. Based on Jackson and Pierce's interpretation of stratigraphic evidence, they believed a catastrophic fire destroyed the site long after abandonment, an interpretation that has persisted for over 80 years. A recent reanalysis of field data coupled with archaeomagnetic dating questions this interpretation. Instead, new evidence points to a large fire resulting in the destruction and abandonment of the site at the end of the 14th century.

This paper discusses the reanalysis of archaeological data and briefly examines the development of a historic interpretation explaining the abandonment of the Castle A site (AZ O:5:95 [ASM]). Originally excavated in 1933-1934, explanations of events at Castle A were based entirely on the discovery of two to four inches (5.08 to 10.16 cm) of sediment on room floors (Jackson and Van Valkenburgh 1954). Specifically, this interpretation held that the Castle A site burned in a large fire long after its abandonment. This paper presents a revised interpretation of excavation data, osteology and ceramic analysis, as well as new archaeomagnetic dates to argue the Castle A site burned while occupied in a violent event occurring at the end of the 14th century.

CASTLE A, CULTURE HISTORY, AND THE VERDE VALLEY

The Castle A archaeological site is located in the Verde Valley of central Arizona along Beaver Creek, a

tributary of the Verde River. The site is part of Montezuma Castle National Monument established in 1906 to protect and preserve the Montezuma Castle cliff dwelling. Montezuma Castle and Castle A are part of a larger group of sites which include culturally modified caves (cavates), cliff dwellings, alcoves, pit structures and freestanding masonry architecture within the national monument boundary (Powers and Pearson 2008; Wells and Anderson 1988). Castle A is one of hundreds of sites throughout the Verde Valley representing the Southern Sinagua archaeological culture originally defined by Harold S. Colton (1946).

Castle A consists of cavates, natural alcoves and open air masonry architecture. Existing viga sockets and wall alignments suggest Castle A was at least five stories tall and consisted of as many as 45 rooms (Jackson and Van Valkenburgh 1954:9; Wells and Anderson 1988:28). The site contains walls composed of unshaped limestone and mud mortar. Large rectangular rooms, some with floor ridges and jacal dividers, were constructed on natural limestone ledges overlooking Beaver Creek. Beam sockets carved into the soft limestone bedrock attest to an ingenious and complex blueprint wherein much of the dwelling was tied to the surrounding cliff face (Figure 1).

Since Colton defined the Southern Sinagua culture, our understanding of prehistoric life in the Verde Valley has grown. Today, studies discuss the establishment and abandonment of villages like Castle A (Hartman 1976; Pilles 1996; Pilles and Wilcox 2001; Powers and Pearson 2008; Whittlesey 2002; Wilcox and Holmlund 2006). In the early 1930s however, very little archaeological work had been conducted in the Verde Valley. Descriptive inventories by Mindeleff (1896), Fewkes (1896, 1898a, 1912) and Gladwin and Gladwin (1930) organized sites into characteristic

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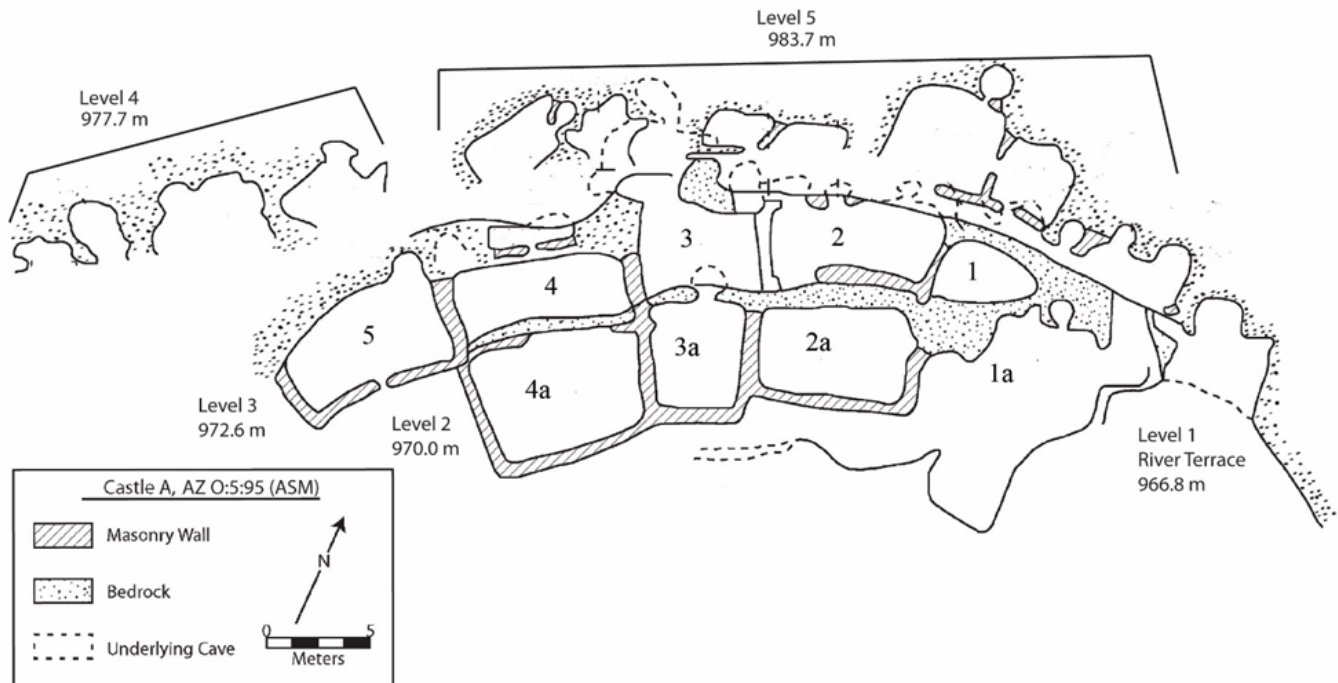


Figure 1. Plan map of Castle A showing room numbers (Reproduced from Wells and Anderson 1988: Figure 2.5).

types. Other studies investigated sites and associated features in more detail (Fewkes 1898b; Manning 1875; Mearns 1890; Morris 1928). Descriptive studies were typical of the early 20th century and are commonly referred to as culture history, where material culture is used to inductively arrive at large scale archaeological patterns (Lyman et al. 1997; Willey and Phillips 1958). By the 1930s, culture history included the culture area concept. This paradigm organized archaeological patterns into discrete geographic areas representing specific cultures and was widely adopted throughout the American Southwest (Lyman et al. 1997:18).

The 1933-34 excavation of Castle A is one of the earliest systematic archaeological projects undertaken in the Verde Valley. The detailed information and archaeological interpretations in the report are exceptional for the time. However, conclusions were reached without the well-developed chronology eventually proposed by Harold Colton. During the Castle A project, Earl Jackson and Sallie Pierce¹ focused primarily on the categorization of architecture and artifacts. New theoretical paradigms and analytical techniques create opportunities to reassess existing information and develop new interpretations of the site. This is particularly important at Montezuma Castle National Monument, where over 400,000 visitors come to learn about archaeology and Native American history each year.

CIVIL WORKS ADMINISTRATION (CWA): 1933-1934

Between December 1933 and April 1934, Jackson, Pierce and 10 CWA workers excavated nine rooms and several test trenches around Castle A (Jackson and Van Valkenburgh 1954). Additionally, the crew stabilized standing wall sections, reconstructed a room on Level 2, and made improvements to the surrounding landscape (Figure 2). They discovered a total of 28 human burials and many well-preserved artifacts (Jackson and Van Valkenburgh 1954; Kent 1954). The primary objective of the CWA excavation at Castle A was to recover artifacts for display in the Montezuma Castle National Monument museum and create a comparative artifact collection representing Verde Valley prehistory.

The excavation recovered evidence of a catastrophic fire that caused Castle A to detach from the surrounding cliff face and collapse onto itself. Jackson and Pierce cite evidence of fire in the form of burned roof material in seven of nine (78%) rooms excavated. Burned roofing and underlying sediment provide the main evidence for an interpretation of the site. Jackson and Pierce concluded that,

Castle A fell from the cliff as the result of a great fire which razed the structure from top to bottom. It was



Figure 2. Overview photograph of Castle A during excavation, ca.1934 (Courtesy of National Park Service).

at first believed that this fire was the cause for the abandonment of the building; research here has shown this not to be the case. The weight of evidence, as seen in the silt accumulations underneath the charred ceilings, shows the ruin to have been abandoned, perhaps for a considerable time, before the firing occurred [Jackson and Van Valkenburgh 1954:49-50].

Jackson and Pierce explain a post abandonment fire with stratigraphic evidence. At least two to four inches (5.08 to 10.16 cm) of sediment found on top of occupational floor surfaces, but below burned roofing in three rooms is cited as evidence of a long period between the abandonment of the site and the burning of the pueblo. Underlying sediment within rooms is variously described as "lime dirt", "sand" and "soil" but also as "stratified", "mixed", "washed", and "rain-or flood-washed" (Jackson 1933b; Jackson and Van Valkenburgh 1954:12-18). Brief descriptions of each deposit exist within the report and field notes, although there are no associated stratigraphic maps, detailed soil descriptions or photographs. Descriptive labels used for each deposit suggest several possible explanations for formation processes within each room. In contrast to Jackson and Pierce's original interpretation, information in field notes and the

1954 report suggest rooms at Castle A have different occupational and depositional histories (Table 1).

Ethnographic and archaeological evidence suggest that individual pueblo rooms are often subject to dynamic processes encompassing use, repair, abandonment and reuse during their occupation (Cameron 1999). To investigate rooms at Castle A, descriptions in existing field notes and the 1954 report were reassessed. Whole ceramic vessels or unbroken (usable) objects such as ground stone and bone tools described as being found "on the floor" were considered as floor assemblages. Artifacts found in "fill" and consisting of pot sherds or other tool fragments were considered as secondary refuse deposits. Artifacts described without a clear association to the floor surface or to a fill deposit were considered inconclusive. A total of nine rooms were reassessed (Table 1). Second story spaces described above Rooms 4 and 3a were not considered because of a lack of existing information. Although this approach is simplistic and does not fully address the complexities likely encountered by excavators in each room, it did provide the best way for assessing the limited information available.

A reassessment of artifacts found within rooms suggests a number of different depositional processes. For instance, stratigraphy in at least one room may indicate room abandonment, neglect, reoccupation and abandonment. Jackson and Pierce report

Table 1. Information on Room Deposits noted in Jackson and Van Valkenburgh (1954).

Room	Sediment Noted on Floor Surfaces	Burned Roofing	Floor Assemblages	Trash Deposits
2*	None noted.	"charred stump of a large post upright" (11).	None noted.	None noted.
3	None noted.	"burned ceiling rested directly on floor" (11).	Ceramics, ground stone, bone/stone/wood tools.	Inconclusive.
4	"Stratified sand and lime dirt" (12).	None noted.	None noted.	None noted.
5	"Stratified sand and lime soil, mixed...to a depth of 3 inches" (13-14).	"slightest traces of a burned ceiling" (14).	Ceramics, ground stone.	None noted.
1a	"Two to 4 inches of sand and lime dirt" (15).	None noted.	None noted.	"fill above the floor" containing broken ground stone and ceramics (14).
2a	"Two to 4 inches of water-washed sand and lime dirt" (16).	"scattered and charred ceiling fragments lay about a foot above the floor" (16).	Ceramics, ground stone.	None noted.
3a	None noted.	"charred ceiling...directly on the floor...second story ceiling, also charred...15 inches above" (17).	Ceramics, ground stone, bone/antler tools, basketry, human remains.	None noted.
4a	"stratified sand and lime dirt...rain-or flood-washed" (18).	"burned ceiling material...was 2 ½ feet above the floor" (18).	None noted.	Inconclusive.

*George Boundey conducted excavations within Rooms 1 and 2 in 1927. Jackson and Pierce note disturbances caused by this work in their report. Descriptions of Room 1 contained no useful information for reanalysis.

that Room 1a had two surfaces; a bedrock floor overlaid with two to four inches of compacted "sand and lime dirt". Above that, a layer of "fill" containing pottery sherds and trash (Jackson and Van Valkenburgh 1954:15-16). Stratigraphic layering in Room 1a suggests that the room was abandoned, subjected to the accumulation of sediment, briefly reoccupied and used as a trash dump. In this way, the accumulation of two to four inches of lime dirt is indicative of the disuse of the room, not the abandonment of the entire site.

Furthermore, Jackson and Pierce report artifacts found directly on the floor surfaces of Rooms 5, 3, 3a and 2a. For instance, in Room 3a, Jackson and Pierce describe the following,

Four feet south of the firebox a crack in the ledge had provided a sizeable hole, in which were found most of the pieces of a large plain olla. In the northeast corner was found a large olla, shattered but complete. By the side of this olla was a large metate, one end propped up on a stone, in position as it had evidently been

used...in addition to those already described, were: one round basin metate; one antler, badly rotted; three manos; two bone awls; parts of several stone hoes. From the second story came one grooved stone pick and one grooved axe. Near the west wall on the bottom floor was found a large section of charred and rotted basketry [Jackson and Van Valkenburgh 1954:17-18].

A similar suite of domestic artifacts including three stone axes, five metates (one with a mano resting inside), 12 manos, one intact ceramic bowl, two bone awls, one bone dagger, a spindle whorl and a bone needle were also found on the floor of Room 3. Room 5 contained three metates, four manos and two large ceramic ollas, one resting over a stone lined hearth. Room 2a contained many ground stone artifacts including two metates and eight manos as well as a ceramic bowl.

All four rooms contain *de facto* refuse, or objects abandoned in their original use location (Lightfoot

1993; Schiffer 1985). Interestingly, Rooms 5 and 2a also contained layers of sand and lime soil directly on floor surfaces (Jackson and Van Valkenburgh 1954:13-14, 16). In Room 5, Jackson and Pierce report that most burned roofing on the floor had been removed by “action of water” (Jackson and Van Valkenburgh 1954:14). This suggests a post depositional process wherein the burned roofing was carried away by erosive flooding. This same process likely resulted in the deposition or mixing of sediments within the room. Without additional information, a more in depth interpretation of sediment deposition in this room is inconclusive. Room 5 does, however, further illustrate the dynamic nature of stratigraphic deposits described by Jackson and Pierce.

Similarly, sediment in Room 2a is described as water-washed, but may also indicate a period of time after the abandonment of the room and before the fire. The appearance of *de facto* refuse and no sediment in Rooms 3 and 3a, however, may indicate a hasty abandonment. This is consistent with what might be expected during a catastrophic fire wherein inhabitants do not have time to collect their belongings (Diehl 1998:619).

At the very least, Jackson and Pierce’s descriptions of stratigraphy and floor assemblages within individual rooms at Castle A raises questions regarding their original post abandonment fire hypothesis. The two to four inches of lime dirt found on top of floor surfaces and below burned roofing in three rooms does not support abandonment of the entire site, as Jackson and Pierce concluded. Instead, the appearance of *de facto* refuse suggests the site, or at least two rooms within it, were occupied or in use at the time of the fire. To further investigate this new hypothesis I will discuss other lines of evidence including osteology, ceramics and archaeomagnetic dates in the following section.

ARCHAEOMAGNETIC DATING AND THE DEVELOPMENT OF NEW INTERPRETATIONS

Archaeomagnetic dating began as an early form of chronometric geochemical analysis (Tarling 1975). In the last 40 years, this technique has developed into a reliable method of dating archaeological materials (Eighmy 1990; Tarling 1975). Archaeomagnetic dating relies on earth’s magnetic field to determine date ranges for specific thermal events containing undisturbed archaeological features with ferromagnetic (iron) particles. When heated to the Curie Point (580-680° C), iron enters a state of flux and on cooling aligns with the prevailing direction of magnetic north (Cox 2011:2; Tarling 1975:186). The remnant

magnetism of a sample is compared with a known record of changes in the earth’s magnetic field, known as a virtual geomagnetic pole (VGP). Similarities in the magnetic orientation of the sample and the VGP provide date ranges associated with the last thermal event.²

Successful archaeomagnetic dating requires four specific elements. First, samples must contain ferromagnetic particles. Second, sample material must be sufficiently heated for particles to reach flux and realign upon cooling. Third, samples must remain undisturbed after heating or exist on a stable substrate. If samples move from the location where thermoremnance occurred, dates will be compromised. Fourth, field specimens must be carefully extracted and recorded (Cox 2011:2; Hodsdon 2006:2).

Two sets of 10 samples each were collected from Room 2 in 2011 and 2013. Each set of 10 samples was used for a single chronometric determination. Sample locations at Castle A met all four criteria for successful dating. Mortar used at the site was acquired from local soil containing naturally occurring hematite. Iron content for soil used in mortar is 4 parts per million (.0004%) by measure (IAS Laboratories 2012). Jackson and Pierce reported the discovery of a burned support beam within the room (Jackson and Van Valkenburgh 1954:11). Similarly, scorched and fractured bedrock as well as oxidized mortar indicates a sufficiently high temperature needed to reach thermoremnance. The sampled mortar was located on an immovable bedrock ledge and was securely attached. Finally, Thomas Windes, an archaeologist known for chronometric studies at Chaco Canyon, assisted with the collection of samples. Detailed field forms, photography and digital video recorded the location, orientation and appearance of each sample. Windes submitted samples to the Archaeomagnetic Dating Laboratory at the New Mexico Office of Archaeological Studies (OAS).

Archaeomagnetic Results

All samples were analyzed using the OAS laboratory methodology and were compared against the Wolfman and Eighmy/Lengyel SWCV 2000 (SWCV) VGP curves (Cox 2011, 2014). The 2011 archaeomagnetic set (ADL 1353) produced three alternate date ranges on the Wolfman Curve; A.D. 945-1020, A.D. 1330-1365 and A.D. 1375-1415. Comparisons with the SWCV curve produced four date ranges including A.D. 935-1010, A.D. 1295-1350, A.D. 1370-1475 and A.D. 1630-1700. The 2013 set (ADL 1367), of which two samples were removed from consideration, produced one date range obtained from comparison with the Wolfman curve; A.D. 1370-1395. Comparison with the SWCV curve produced a date range of

Table 2. Results of Archaeomagnetic Sampling in Room 2, Castle A (from Cox 2011: Table 1, 2014: Table 1).

Set	Site	Feature	Inc. (°)	Dec. (°)	VGP Lat. (°)	VGP Long. (°)	α_{95} (°)	δp	δm	N	De-mag level (Oe)	Wolfman Curve	SWCV2000
1353	AZ O:5:95 (ASM)	Room 2, North Wall	58.45	358.577	85.313	234.532	1.674	1.838	2.481	10 of 10	100	A.D. 945-1020 A.D. 1330-1365 A.D. 1375-1415	A.D. 935-1010 A.D. 1295-1350 A.D. 1370-1475 A.D. 1630-1700
1367	AZ O:5:95 (ASM)	Room 2, North Wall	62.512	354.81	79.92	226.283	0.634	0.774	0.991	8 of 8	150	A.D. 1370-1395	A.D. 1335-1375

A.D. 1335-1375. It is important to note that ADL 1367 produced an extremely small α_{95} value of 0.634°. This value indicates high precision and a strong thermoremanence relevant to providing an accurate date range associated with the fire event at Castle A. Table 2 reports the results of archaeomagnetic sampling at Castle A.

The Wolfman curve is generally considered to be more robust than the SWCV from A.D. 1000-1450 (Cox 2011:3). Based on decorated ceramics found at Castle A, occupation of the site was estimated at approximately A.D. 1125-1400 (Wells and Anderson 1988:28). For this reason, comparisons with the Wolfman curve are considered more appropriate for analysis at Castle A. Because both samples are from Room 2, date ranges are reasonably assumed to represent the fire event noted by Jackson and Pierce. Dates compared from both sample sets suggest the fire at Castle A occurred in the interval from A.D. 1375-1395, the period of overlap for archaeomagnetic determinations on the Wolfman curve. Results of ceramic reanalysis presented below support this date range.

Ceramic Analysis

Jackson and Pierce report decorated ceramics representing the Honanki and Tuzigoot phases (A.D. 1125-1400) at Castle A. In January 2012, the author conducted a reanalysis of all ceramics recovered from Castle A. The intent of this reanalysis was to provide a basis for understanding and confirming archaeomagnetic dates acquired in 2011. All ceramics collected during the CWA excavation are stored at the Western Archeological and Conservation Center (WACC) in Tucson.

Diagnostic ceramics analyzed in 2012 consist of Little Colorado White Ware, Tsegi Orange Ware, Tusayan White Ware, Winslow Orange Ware, Roosevelt Red Ware, Jeddito Yellow Ware, and White Mountain Red Ware. All of these were also noted by Jackson and Pierce during analysis of the Castle A assemblage. The ceramics found and collected in

1933-34 are wares expected of a typical Honanki and Tuzigoot phase archaeological site.

For the purposes of this paper, only Tuzigoot phase (A.D. 1300-1400) ceramics will be discussed. A total of 205 Tuzigoot phase sherds were analyzed in 2012, compared with 124 reported in 1954 (Table 3). Higher counts noted in 2012 include sherds originally removed from the site by National Park Service worker George Boundey in 1927.³ Additionally, type designations such as Awatovi Black-on-yellow and Los Muertos Polychrome were not available to analysts in 1934. The artifact counts and type designations recorded in 2012 are therefore different than those reported in 1954.

The archaeological provenience of artifacts determines the human activities and behaviors they date (Christenson 1994). For instance, cross-dated ceramics lying directly on the floor of a room may provide a date range for the room's last use. Although many plain ware sherds and vessels were noted within excavated rooms, only two well-dated vessels, both Jeddito Yellow Ware bowls were reported on the floors of Room 2a and 3.⁴ Decorated sherds described as Jeddito Black-on-yellow and Gila Polychrome were also noted on the floor of Room 3a

Table 3. Castle A Ceramic Types Analyzed in 1954 and 2012.

Type	Percentage (count) 1954	Percentage (count) 2012
Awatovi Black-on-yellow	N/A*	7.8% (16)
Bidahochi Black-on-white	0.8% (1)	0.5% (1)
Bidahochi Polychrome	0.8% (1)	0.5% (1)
Fourmile Polychrome	0.8% (1)	0.5% (1)
Homolovi (Winslow) Polychrome	11.3% (14)	16.6% (34)
Gila Polychrome	N/A*	2.9% (6)
Jeddito Black-on-orange	N/A*	0.5% (1)
Jeddito Black-on-yellow	75.0% (93)	61.0% (125)
Los Muertos Polychrome	N/A*	1.5% (3)
Tonto Polychrome	11.3% (14)	1.9% (4)
Tuwiuca Black-on-orange	N/A*	6.3% (13)
TOTAL	100% (124)	100% (205)

*Types not reported in Jackson and Van Valkenburg 1954.

Table 4. Referenced Dates for Ceramics Found at Castle A.

Type	Ware	Date	Reference
Awatovi Black-on-yellow	Jeddito Yellow Ware	A.D. 1300-1375	Bernardini 2013
Bidahochi Black-on-white	Tusayan White Ware	A.D. 1325-1400	Wilson 2013
Bidahochi Polychrome	Jeddito Yellow Ware	A.D. 1315-1400	Bernardini 2013
Fourmile Polychrome	White Mountain Red Ware	A.D. 1300-1390	Neuzil 2008
Homolovi Polychrome	Winslow Orange Ware	A.D. 1275-1375	Hays-Gilpin 2013
Gila Polychrome	Roosevelt Red Ware	A.D. 1300-1450	Lyons and Clark 2012
Jeddito Black-on-orange	Jeddito Orange Ware	A.D. 1250-1350	Adams et al. 1993
Jeddito Black-on-yellow	Jeddito Yellow Ware	A.D. 1350-1700	Bernardini 2013
Los Muertos Polychrome	Roosevelt Red Ware	A.D. 1390-1450	Lyons and Clark 2012
Tonto Polychrome	Roosevelt Red Ware	A.D. 1340-1450	Lyons and Clark 2012
Tuwiuca Black-on-orange	Winslow Orange Ware	A.D. 1260-1350	Laurila 2005

(Jackson 1933b). Based on these descriptions, at least three rooms were occupied during the Tuzigoot phase, the period in which Jeddito Yellow Wares and Gila Polychrome overlap (Table 4). Unfortunately, Jackson and Pierce do not report proveniences for most ceramic material found at the site. Available information suggests that a majority of ceramics were found in mixed contexts including secondary refuse deposits and room spaces.

The lack of provenience information makes dating any event at the site difficult. To account for this problem, all late Tuzigoot phase ceramics were considered. The wide range of ceramic dates creates a baseline against which to assess archaeomagnetic date ranges. Late dated ceramics recovered from the site fit well within the ranges provided by archaeomagnetic sampling and analysis.

Jackson and Pierce present compelling evidence that Castle A burned in a large catastrophic fire and this paper argues the fire resulted in the site's abandonment. Late dated Tuzigoot phase ceramics and archaeomagnetic dates are reasonably determined to represent the abandonment of the site sometime in the interval from A.D. 1375-1395. Osteological evidence including the presence of an unburied body and injuries associated with violent trauma suggest the fire at Castle A was an intentionally violent event.

Evidence for Violence at Castle A

The discovery of unburied bodies or skeletal remains with evidence of trauma, especially in association with large catastrophic fires, may indicate past violent behavior (LeBlanc 1999:85). Jackson and Pierce discovered an articulated human skeleton lying under burned roof debris in Room 3a. According to Jackson and Pierce, "No burial artifacts were found, and no indication that a grave had been dug for the body. Whether this body was buried on the floor after the ceiling fell, or was lying on the floor at the time of the fire, or was buried under the clay

floor of the second story cannot be determined" (Jackson and Van Valkenburgh 1954:18). A review of existing field notes and excavation photographs clearly indicate the body was lying directly on the floor at the time of the fire. In fact, field notes describe the body as "flat on floor" (Jackson 1933b). Along with possible de facto refuse found on the floor of Room 3a, this evidence suggests the room was occupied immediately before the fire. Furthermore, human remains with evidence of physical trauma and burning suggest violence was associated with the fire.

Jackson and Pierce note human remains representing two individuals with evidence of violence in Cist Graves 4 and 5, a single burial shaft containing the remains of four individuals located immediately west of the site. According to Jackson and Pierce,

One peculiar feature about the skull fragments was that each of two male skulls showed, on the posterior portion of the right parietal bone, several straight, ragged cuts, such as could have been caused by a blunt stone axe. One had been broken entirely through. Acts of violence were evidently not unknown at Castle A [Jackson and Van Valkenburgh 1954:25].

Evidence for violence and burning on skeletal remains representing three individuals found at Castle A were reanalyzed by the Arizona State Museum, two of which were described by Jackson and Pierce above. All three individuals, each male, were found within Cist Graves 4 and 5. Cut marks and fractures are located across the cranial vault and there is evidence of burning on the interior portion of each fracture consistent with the singeing of live bone. (James Watson, personal communication 2012). Ethnographic data suggests that cranial vault fractures are com-

mon indicators of violence in the American Southwest and result from close combat fighting with clubs or other blunt objects (Nado 2013).

It is important to note that the only human remains with evidence of violent trauma found at Castle A are located in the same burial context. Similarities in the type of trauma and burning found on each skull suggest individuals in Cist Graves 4 and 5 were killed in a distinct and simultaneous event associated with the fire at Castle A. Archaeological evidence therefore strongly suggests the Castle A site was destroyed in a large fire with associated violence. Many archaeologists argue social change and violence appear together in areas throughout the Southwest, including the Verde Valley (Haas and Creamer 1997; LeBlanc 1999; LeBlanc and Rice 2001; Wilcox et al. 2001; Wilcox and Holmlund 2006). Violence at Castle A may therefore fit with evidence for social stress found throughout the Verde Valley in the 13th and 14th centuries.

Evidence for Violence in the Verde Valley

Cross-cultural studies conclude that the causes of prehistoric violence are variable (Ember and Ember 1992; Thorpe 2003). Interpreting the motivation for violence is difficult, although larger regional patterns noted in the archaeological record may suggest that communities were aware of social conflict or afraid of violence. During the 14th century, population aggregation accompanied by large scale abandonment has led archaeologists to speculate about political organization and social interaction within the Verde Valley. During the Tuzigoot phase, populations coalesced into larger and concentrated settlements along the Verde River and its tributaries (Pilles 1996; Powers and Pearson 2008). Hill top forts with line of site and aggregated pueblos with defensive features such as roof entries, loop holes and perimeter walls are commonly cited as evidence of fear of violence (Pilles 1981; Wilcox et al. 2001; Wilcox and Holmlund 2006). Perhaps the events at Castle A were related to increasing social stress throughout the Verde Valley. Future research is needed to investigate this premise in more detail.

Past Archaeological Interpretations of Violence

Evidence of fire and violence are noted in earlier archaeological reports throughout the American Southwest, though these reports were often short and largely undeveloped by contemporary standards (Haas and Creamer 1997:235; LeBlanc and Rice 2001:9; Wilcox and Haas 1994:213). These reports look outside the pueblo world for attackers, usually settling on groups such as Athabaskan and Yuman

speakers (Jackson and Van Valkenburgh 1954:50; LeBlanc 1999:25; Wilcox and Haas 1994:214). In his 1933 Master's thesis Earl Jackson speculates that overpopulation and social stress resulted in the construction of defensive architecture throughout the region. He rejects the popular notion that non-Puebloan groups drove out occupants and briefly discusses the role that intra-cultural conflict may have played within the Valley (Jackson 1933a:101). Jackson's interpretation of Verde Valley prehistory is incorporated into the Castle A report.

Jackson and Pierce conclude that Castle A burned in a fire occurring long after the site's abandonment. This paper presents an interpretation of evidence that is very different than Jackson and Pierce's penultimate conclusion. New techniques such as archaeomagnetic dating supplement existing information and provide new avenues for understanding the site. Despite this, it is important to briefly consider factors influencing their interpretation. In their conclusion, Jackson and Pierce cite stratigraphic evidence as proof of a post abandonment fire at Castle A. Their report also acknowledges evidence for a large fire, evidence for violent trauma on human remains, social stress and fear of violence in the area as well as defacto refuse within several rooms. Why then, did they only use stratigraphy as a basis for interpreting the site?

Jackson and Pierce refer to the prehistoric inhabitants of Castle A as the "peaceful ones" (Jackson and Van Valkenburgh 1954:50). This follows the popular 1930s notion that all Pueblo society was egalitarian and peaceful (Benedict 1930, 1934). This also suggests that their interpretation of site abandonment may have been affected by the widely held belief that violence and warfare among ancestral pueblo people was unlikely.

Additionally, in the 1930s very little was known about the prehistory of the Verde Valley. The inductive approach of professional archaeology advocated for the construction of geographic culture areas over site-specific research questions. Jackson and Pierce were focused on descriptions of artifacts and architecture applicable to larger regional classifications of prehistory. They consider several possible explanations for the abandonment of Castle A including violence, drought, and disease, but do not settle on any. As they write, "No single satisfactory reason for the abandonment, in the fifteenth century, of the Castles and of other Verde Valley sites can be offered at the present" (Jackson and Van Valkenburgh 1954:50). The value of Castle A, it seems, was in its ability to provide explanations for the abandonment of the Verde Valley as a whole. With a general lack of support for archaeological interpretations of violence

and no evidence of violence or fire at other sites, Jackson and Pierce may have chosen to focus solely on stratigraphy as a means of explaining the abandonment of Castle A.

SUMMARY AND CONCLUSIONS

Jackson and Pierce's work at Castle A is an important milestone in the development of archaeology in the Verde Valley. Although their interpretation has been questioned, the excavation is historically important. Site information reported by Jackson and Pierce helped to develop the Southern Sinagua archaeological culture area, a unit that continues to be used by archaeologists today. In the 80 years following the excavation, new scientific techniques and theoretical paradigms supplement existing information and create new opportunities for reinterpreting the site to visitors. Despite this, additional work is needed to refine the preliminary interpretations presented in this paper.

Future Research Needs

Native American oral history often provides an accurate reconstruction of past events and insights into larger social processes (Ferguson and Colwell-Chanthaphonh 2007; Teague 1993). The National Park Service is currently working with culturally associated tribes to develop appropriate ways of collecting and presenting oral histories about the Castle A and Montezuma Castle sites. Recently collected histories from Hopi, Yavapai and Apache representatives supplement the conclusions presented here by recounting a violent attack and the destruction of the site by fire. More work is needed to develop an interpretation of prehistoric events that incorporates archaeological data and traditional knowledge in a defensible and culturally appropriate way.

The preliminary results presented here also raise several new questions about the site's relationship with the Montezuma Castle cliff dwelling. De facto refuse within two rooms at Castle A suggests the site was at least partially occupied at the time of the fire. An ongoing architectural study at the Montezuma Castle cliff dwelling is investigating the construction sequence and history of occupation at the site. This study may provide important information regarding the social impacts of the Castle A fire. For instance, was Montezuma Castle also abandoned after the fire, or did the remaining inhabitants from Castle A move into the cliff dwelling. It is exciting to consider how additional work incorporating a combination of archaeological methods and traditional knowledge will provide possible answers to these questions.

Notes

1. Van Valkenburgh is the married surname of Sarah (Sallie) Pierce. Ms. Pierce was unmarried during the Castle A excavation, but subsequently wed before the publication of the report in 1954. Her married name therefore appears on the final publication.

2. Archaeomagnetic analysis dates the last thermal event producing temperatures at or above the Curie Point for hematite (580-680° C). Subsequent temperatures below the Curie Point will not result in datable thermal events.

3. George Boundey was an avocational archaeologist and National Park Service employee hired to excavate the Castle A site in 1927. He collected artifacts from many of the rooms within the site, including Rooms 1 and 2.

4. A Jeddito Black-on-yellow bowl from Room 3 is listed in the WACC collections as MOCA-82, Accession 02. A "Brown-on-yellow" bowl is reported for Room 2a in Jackson and Van Valkenburgh (1954:16), although no matching provenience is listed for this bowl in the current WACC collections.

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