

ALL POINTS BULLETIN



Colorado Archaeological Society-Denver Chapter

...in the future, as in the past, the gathering of information will depend to a great extent on cooperation between avocational and professional archaeologists. ~ H.M. Wormington, 1978

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Community Archaeology at The Astor House, Golden, Colorado

By Amy Gillaspie



Dr. Michele Koons of Denver Museum of Nature and Science excavates a charcoal lens in the backyard at the historic Astor House in Golden, Colorado, June 2021

In June and July this summer, a special project dug into the backyard at the historic Astor House in downtown Golden. The Astor House, still standing at its original location at Arapahoe and 12th Streets has been a hotel, a boarding house, and a museum in the long years since it opened in 1867. Built and opened by Seth Lake, it was originally named The Lake House in his name. He ran and renovated the hotel for 20 years, changing its name to The Astor House

to conjure up the grandeur of the Astor House in New York City. Seth Lake eventually sold the building in 1887 and moved away from Golden. The hotel changed hands a few times before being purchased by a German widow, Ida Goetze, who ran it as a boarding house with her daughter-in-law until 1956. Again, changing hands, the boarding house continued in this capacity until 1971 (Frank 2013; Noel 2013). Considered a blight, the Astor House was slated for destruction to make way for a parking lot for downtown businesses to utilize. Instead, the community came together and formed the Golden Landmarks Association, purchasing the building and saving it from destruction. It was the Golden Landmarks Association that renovated and turned the building into a vibrant period museum that was open for guests to learn about Golden's history until 2015 (Frank 2013). The building is now being leased from the City of Golden by Foothills Art Center, with plans to use the space as classroom, gathering, and gallery space for their artists.

It was Foothills Art Center that hosted this summer's Astor House Community Archaeology Project in a special partnership with Metcalf Archaeological Consultants and the Denver Museum of Nature and Science. Archaeologists researched and excavated the adjacent backyard of the Astor House that has been unexcavated over the past 154 years. This project took place partially in anticipation of the upcoming building extension to the Astor House, and was in part a space for scientists and community members to ask about the lives of the people who visited, stayed at, or worked in the Astor House through its long history. One question the project seeks to answer is, "What does this project tell us, through research and excavation, about the evolution of Golden over the past 154 years that the Astor House has stood?"

The physical excavation, guided by Amy Gillaspie, M.A., and Dr. Michele Koons of Denver Museum of Nature and Science, began June 21 and concluded on July 12. This project was unique in that it brought together a multitude of

community partners for a variety of project tasks, including Statistical Research, Inc., Colorado School of Mines, the City of Golden, Golden Landmarks Association, Golden History Museum, Denver Museum of Nature and Science, Metcalf Archeological Consultants, Inc., Community Connections LLC, History Colorado, State Historic Preservation Office, and Local Businesses. Paramount to the project was the volunteer crew: the amazing and wonderful workforce who represented Colorado State University, University of Colorado, Colorado School of Mines, University of Denver, Metropolitan State University of Denver, Community College of Denver, and multiple CRM firms. These volunteers excavated nearly 12 cubic meters of dirt in three quick weeks, all while meeting the public visiting the site and sharing about archaeology with them.



Katie Sage and Talle Hogrefe screen for artifacts, July 2021



Tucker Parks, Sequoia Stark, Amy Gillaspie, Alex Pelissero, Ryan Cline, and Michele Koons backfill excavation Unit 6, July 2021.

There were 20,299 individual artifacts dug up in the excavation units in the Astor House yard. These artifacts are currently being analyzed by artifact class. Artifact classes most recovered from the Astor House yard include broken glass shards, ironstone ceramic sherds (some with British maker's marks), butchered bone (representing cuts of beef, chicken, and fish), and metal (i.e. nails). Additionally, many personal items were recovered, including combs, buttons, coins, and buckles (for belts and suspenders). Analyses are currently being conducted on the metal, bone, ceramics, and some of the personal items. Once analysis is complete, these artifacts will be given to Golden History Museum and Foothills Art Center. Curators at Golden History Museum will decide which items will be added to the museum's permanent collections. Any items Golden History Museum does not curate will be given to Foothills Art Center as supplies for art projects, with talks of glass mosaics or other interesting installments to be made and place inside The Astor House.

Let's return to the question, "What does this project tell us, through research and excavation, about the evolution of Golden over the past 154 years that the Astor House has stood?" While we are still performing analyses and piecing together the evidence, we do know that some of the early histories of the location can be discussed. Coins were recovered, including a Ching Dynasty Chinese coin minted in the early 1800s. The presence of this coin could possibly speak toward the long history of Chinese laborers who worked and traveled through the United States in the 1800s. Other artifacts recovered across different excavation units in the yard are related to the Civil War. A Grand Army of the Republic fraternal order lapel pin, with the years 1861-1866 on it, was found early in excavations. A double-sided lice comb, produced by the India Rubber Comb Company and given out to civil-war soldiers in grooming kits, was also recovered. Suspender clamps and buckles have patent dates on them from the 1850s and 1860s. These items can possibly tell us about those who visited or stayed at the Astor House.

On the other hand, the ceramic sherds and bone remains recovered tell us about those who ran the Astor House daily. The ceramic sherds that have maker's marks show that these ceramics came overwhelmingly from a small area of England and were produced in the 1870s. Looking through historic records, we can hypothesize which owner purchased these uniform white ceramics for use in the hotel/boarding house. The bones recovered show a high propensity for butchering, including nice cuts of beef. By analyzing these faunal remains and researching historic documents again, we can hypothesize the menu served to the public of Golden and the guests of The Astor House. This also tells us about those who bought, cooked, and served these meals to these guests.



Left: Ching Dynasty Chinese coin c.1800-1850; Center: Ironstone china from England c. 1870; Right: Civil War era Grand Army of the Republic lapel pin c. 1861-1866.

As the project neared the end of excavations, a rewarding and exciting weekend took place on July 10th and 11th during Foothills Art Center ARTSWEEK. Community Connections, LLC. led public tours through the Astor House yard and building, showcasing the excavation units, an artifact table, and then the interior of the Astor House itself. Just over 200 people toured the site and old building during ARTSWEEK weekend, and countless other guests stopped by during the three weeks of excavations to say “hi” and see what we were doing. Early survey data asking tour guests about their experience show high satisfaction with Community Connections work and calls for more community archaeology projects and tours around town.

The project would like to thank everyone who was able to visit and speak with us or take a tour. We are proud to have worked on this project in Golden and to share it with the community and our partners! Additionally, we thank our volunteers who made this project successful! Stay tuned to find out more about the results of the artifact analyses in 2022!

Sources Cited:

Frank, Nichelle
2013 Architectural Survival in a Dynamic Western Town. In *Inside the Astor House*, edited by Golden History Museum, pp. 5-22. Golden, Colorado.

Noel, Tom
2013 Introduction. In *Inside the Astor House*, edited by Golden History Museum, pp. 1-3. Golden, Colorado.

Amy M. Gillaspie, M.A., is an archaeologist who has excavated in Colorado, North Dakota, Belize, and France. Interested in understanding community behavior and ritual, and with a background in historic archaeology most recently at the Wootton Site on the Auraria Campus, Amy enjoys working on ventures like the Astor House Community Archaeology Project, both for what the archaeological findings tell us and for the chance to share Archaeology with the community. If you would like to reach out to Amy or have any questions about the Astor House Community Archaeology Project, please email her at amy.gillaspie@ucdenver.edu.

Follow the project for insider updates on Instagram at [@astorhousearchaeologyproject](https://www.instagram.com/astorhousearchaeologyproject), and follow Dr. Michele Koons at [@dr.michele.koons](https://www.instagram.com/dr.michele.koons).



AHCAP Project Volunteers: Ryan Cline, Katie Sage, Monica Eckels, Clinton Rothschild, Artemis King, Donny Rowe, and Alex Pelissero, first day of the project, June 2021

Getting Involved: Classes, Lectures, and Other Opportunities

The 2021 Annual CAS Conference and Member Meeting

The CAS Chipeta Chapter in Montrose will be hosting the 2021 Annual Conference and Member Meeting on October 8-10, 2021. Please check the website of the [Colorado Archaeological Society](#) or the [Chipeta Chapter](#) website later this Spring for more details.

Denver CAS Monthly Meeting – Guest Speaker Dr. Brandi Bethke, Monday, October 11

Brandi Bethke serves as the Lab Director for the Oklahoma Archeological Survey, University of Oklahoma. Dr. Bethke will be presenting on recent zoological investigations at the Boarding School Site in Glacier County, Montan. Dr. Bethke will discuss her analysis of the faunal assemblage recovered from the excavations, and how these finds relate to the use of the site in the past, and the present.

Archaeology in the News

Digging for History at Golden’s Astor House

<https://coloradocommunitymedia.com/stories/digging-for-history-at-goldens-astor-house,382556>

Archaeology isn’t all holy grails and temples of doom — there’s also community archaeology, which focuses on members of the community exploring the stories of people who lived their lives in the same places they do. And it is a particular interest for Dr. Michele Koons, who recently co-led an investigation into a Golden landmark — The Astor House.

A Hopi Archaeologist Reflects on the Discipline

https://www.moabsunnews.com/get_out_and_go/article_6369feec-2246-11ec-a69a-03063f85a261.html

Though Western archaeology typically treats Indigenous ancestral sites as an anachronism, these places embody a living culture and presence for Hopi archaeologist Lyle Balenquah.

Thousand-year-old Artifacts Coming Loveland at Stone Age Fair

<https://www.reporterherald.com/2021/09/23/thousand-year-old-artifacts-coming-to-loveland-at-stone-age-fair/>

Jason LaBelle, associate professor of anthropology at Colorado State University...will present findings from the Lindenmeier Site, a dig in the northern part of Larimer County and one of the most important archaeological digs in the United States. Lindenmeier is a critical location for determining exactly how far back human occupation of the area goes.

CAS Denver Chapter General Meeting Notes

DC-CAS JUNE 14, 2021 GENERAL MEETING MINUTES

The DC-CAS June General Meeting was held online on Monday, June 14, 2021 at 7:00 pm via the Zoom platform. Lynn Hoy opened the meeting with an announcement that she would be resigning from her position as President, effective July 31st, as she was to be moving out of state. Vice-President, Craig Dengel agreed to step into the President position until a new President was elected in the Fall. Lynn also noted there would be no general meeting held in July. Meetings would resume in August with the DC-CAS chapter hosting the annual joint meeting of the Egyptian Studies Society and DC-CAS.

Craig Dengel introduced the evening’s speaker, Ray Sumner, PhD student at Colorado State University. The title of Sumner’s presentation was, “The Days After Colorado’s Darkest Days: Unearthing and Defining the Julesburg Campaign”. Sumner’s research pertains to the Early Indian Wars at Julesburg and along the Colorado river during a six-week campaign in 1865.¹ Specifically, he focused upon what had happened to the Cheyenne and the Arapaho after the Sand Creek Massacre, and the subsequent involvement of the Lakota during the later conflicts. This period of warfare has not been studied, and related battlefields have been looted. Sumner felt that it was important to understand the Early Indian Wars from a military view point, and applied his previous military experience to analyze the available historic materials and archaeological evidence. He referred

to the post-Sand Creek Massacre period as the Forgotten Period. Tribal officials and historians indicated there are no oral traditions which recount this time, nor is it spoken about amongst tribe members. Tribal information relating to post-Sand Creek Massacre times come from Tribal Historian John Stands in Timber and Father Peter J. Powell, adopted member of the Northern Cheyenne Council of Forty-Five. In both cases, Stands in Timber and Powell relied heavily upon an account written by George Bent, of the Northern Cheyenne (son of William Bent and Owl Woman). Bent participated in the battle with the Cheyenne, Arapaho and Lakota. A review of government oversight of Indian Wars Historic Sites indicated the battlefields of Julesburg (1865) and Summit Springs (1869) do not have national recognition, although they have received local markers. In the case of Beecher Island, near Wray, a local museum was built.

Military reports and newspaper accounts from that time period gave the impression the tribes were on an indiscriminate rampage seeking revenge for the Sand Creek Massacre. However, Sumner's initial research from a military perspective would indicate the attacks and raids were a planned and organized response. Missions were carried out specifically to supply and to support the Sand Creek survivors so that they could get through the winter. To understand precisely what happened during this period, it was key to understand the decisions made by the leaders of both sides, and how they viewed their battlefield. To do so, Sumner applied multiple military tactical lines of inquiry which are as follows:

- (1) Strategical Level of War which consists of researching the historic record.
- (2) Operation Level of War which entails obtaining information on the physical geography and spatial analysis using tools such as ARCGIS.
- (3) Tactical Level of War - (Upper Level) which is comprised of a synthesis of both the archaeological and historic records using ARCGIS, and (Lower Level) examination of the archaeological record with tools such as ARCGIS, VR Battlefield and OMEKA Artificial Database.
- (4) Military Analytic Tools which include a) Strategy: Diplomatic, Information, Military and Economic Elements of National Power, b) Operational: Political, Military, Economic, Social Infrastructure and Information, c) Tactical #1: Intelligence and Preparation in the Battlefield Terrain relating to battle planning, and d) Tactical #2: Key Terrain Observation, Cover and Concealment, and Obstacles and Avenues Approaches.

Sumner assumed the actions of the Cheyenne, Arapaho and Lakota were strategically coordinated, as opposed to being independent and unrelated. He also considered the goals of both sides in relation to their actions. During the 1860s, the U.S. military was dealing with areas of insurgency in the West, areas of stability in the East, and areas of rebellion in the South. As such, there was not much interest in the issues in the western part of the country. Instead, the U.S. Government focused on maintaining a stable supply chain to fight the wars. To understand the U.S.

Government perspective, Sumner consulted military records and fort plans to identify the U.S. military leaders and to determine where troops were stationed in the Department of Kansas. To gain insight into the Native Americans' goals, Sumner felt that it was important to understand the relationship between native groups outside of their interaction with the U.S. Government. It was important to consider the diversity amongst the Cheyenne, Arapaho and Lakota rather than to view them monolithically. Also, to understand the movement of native peoples over time, Sumner felt it was useful to ascertain who was competing for resources, who was working with whom, who was at war with whom, what were the winter counts, and what events were important to understand. To make this evaluation, Sumner consulted historic maps and ethnographic resources. Archival newspaper articles and interviews provided information on where native groups were operating. Sumner has also contacted band leaders and cultural resource managers. Sources for identifying the Native American leaders are rare, with the exception of that written by George Bent. Using ethnographies and ethnohistoric and historic resources, Sumner identified every native leader who was an active participant in the Colorado Indian Wars. An important resource was tribal ledger art by various tribes and bands, some of which recorded events of the Battle of Julesburg.

After a detailed review of the events which led up the Indian Wars, Sumner presented his post-Sand Creek Massacre reconstruction. The Cheyenne and Arapaho sent out runners to other Cheyenne and Arapaho bands, and sent war pipes to the Lakota asking for their support. A war council was convened at the end of December 1864 on Cherry Creek near St. Francis, Kansas. On January 7, 1865, the tribes attacked Julesburg and raided warehouses to resupply Cheyenne and Arapaho survivors of the Sand Creek Massacre. They also attacked wagon trains and stage stations down to Sterling and almost into the North Platte area. After a wagon train was attacked within two to three miles of Camp Rankin (later Ft. Sedgewick), Col. Samuel W. Summers (Commander, Sub-District Eastern Nebraska and 7th Iowa Cavalry), Capt. Nicholas J. O'Brien (Commander, Camp Rankin), and forty-five 7th Iowa Cavalry soldiers set off in pursuit of the tribes. Summers and O'Brien soon found themselves surrounded by fifteen-hundred warriors and had to retreat to a nearby ranch. The soldiers and civilians later made their way back to Camp Rankin after O'Brien provided cover with two Howitzer cannons he had retrieved from the Camp. A total of fifteen soldiers and four civilians died during the battle. The tribes then took wagons, horses, mules and oxen and returned to their camp at St. Francis, Kansas. The following week, additional attacks were carried out on every ranch and stage station between Sterling and Ft. Morgan, the only survivor being Godfrey Ranch (renamed Ft. Wicked post-battle). A week later, the tribes carried out another attack on ranches and stage stations closer to Julesburg including Valley Station, the only station with cavalry soldiers present. The soldiers were unable to engage due to warriors firing upon the station. The tribes then split up to carry out attacks from

Antelope Station down toward Valley station. This was accomplished by having the Cheyenne attack towards the Denver area, the Arapaho attack in the Julesburg area, and the Lakota attack eastward into Nebraska. By the end of January 1865, Julesburg was isolated. At this time, the tribes moved their camp up to the border of Logan and Sterling Counties. On February 2, 1865, warehouses in Julesburg were raided and set afire. Avoiding Camp Rankin, the tribes then set fire to every stage station they encountered as they made their way into Nebraska, where they set up a new encampment. Lt. Col. William O. Collins (Commander, Ft. Larimer and Sub-District Western Nebraska) followed and engaged the tribes in battles at Mud Springs (February 4-5, 1865) and Rush Creek (February 8-9, 1865). In continued pursuit, Collins encountered a large village, which he chose not to attack. The Cheyenne, Arapaho and Lakota then took the opportunity to make their escape into the Badlands to wait out the winter.

Sumner noted that very little was known of the precise locations of the individual events at the Battle of Julesburg. It was his goal to create a battle map for Julesburg as the only map available was created by George Bent forty years after the battle. Sumner used ARCGIS to digitize primary and secondary source historic maps to recreate a georectified 1860s landscape from Rawlins, Wyoming to Fort Kearny, Nebraska, west to east, and from Casper, Wyoming to the Arkansas River, north to south. USGS and State LiDAR information for four miles on either side of the South Platte River corridor has also been incorporated into the data. Future plans are to upload the data into the Unity gaming platform where modern features, such as I-70 and I-80, can be removed from the landscape and to create an interactive way to explore the terrain.² He planned to use terrestrial LiDAR to scan historic buildings preserved from this period and to place them into position as indicated in historic records. During the summer, Sumner and a student carried out drone LiDAR scans along the South Platte River. The scans were taken from various perspectives, including laying on the ground on a bluff, standing in the open and while on horseback. It was hoped that Viewshed Analysis in ARCGIS of the data points would help to understand terrain use. Sumner noted receipt of funding from the CAS Alice B. Hamilton Award, which enabled him to purchase the drone and computer programs to process his LiDAR data. He thanked the Committee for supporting his research. Various historic records have been used to inform Sumner's field research such as maps, federal deprivation claims, and architectural blueprints of Camp Rankin (later Ft. Sedgewick). Sumner planned to use Geophysics and Remote Sensing to locate features such as telegraph poles, fence posts, privies, trash pits, wells and building foundations. He also hoped to conduct Thermal and Multi-Spectral research via drone equipment. In addition to these techniques, Sumner planned to put in excavation units and shovel test pits, as well as core sampling. He also partnered with local metal detector groups. To date, 2,500 artifacts have been recovered at the stage station. Future metal detector work will be used to determine the boundary of the stage station. Sumner has also examined available private

and public artifact collections. He noted that artillery analysis had enabled him to identify the location of troops, and to place the Howitzer cannons in the battle. However, he did note there was potential difficulties to identify some artifacts as battle related due to their long temporal use. Sumner has tested the use of portable X-ray Fluorescence (XRF) to analyze lead bullets and artillery fragments, and plans to do further testing on known period ammunitions held in museum collections. Upcoming research will be to conduct high-definition photography, thermal scanning and multi-spectral imagery to locate features and structures. Also, Ground Penetrating Radar will be used to confirm all graves in the military post cemetery had been relocated to Ft. McPherson in the late 1890s. Finally, Sumner will create a digital repository of the recovered artifacts and those held in museum collections using the OMEKA Collection Management System platform.

In closing, Sumner emphasized the importance of telling the story so as to understand the past and to educate the future. The events of the Julesburg campaign were important firsts for Native Americans in their ability to plan and execute a successful winter, multi-phase offense against the U.S. military. The Julesburg research has opened the door to additional in-depth research into the period. It can be incorporated into modern native and non-native societies with respect to commemoration, education, heritage tourism. Sumner took a number of questions from the audience. Craig Dengel thanked him for presenting an excellent talk. A recording of Sumner's talk is available on the DC-CAS YouTube Channel (<https://www.youtube.com/watch?v=VmG-DsHvGg>).

The meeting adjourned at 8:30 pm. Submitted by Stacy Greenwood, Secretary for DC-CAS

1. For those interested in the project, please visit <https://www.facebook.com/CampRankin1865/>. If you have any questions, Sumner may be reached at rvsumner@colostate.edu.

2. For those interested in the use of virtual gaming information platforms for archaeological use, please visit the University of Nebraska-Lincoln Mud Springs Virtual Reconstruction at <https://www.unl.edu/plains/mud-springs-virtual-reconstruction>

DC-CAS/ESS GENERAL MEETING AUGUST 9, 2021

The annual DC-CAS/ESS General Meeting was held online on Monday, August 9, 2021 at 7:00 pm via the Zoom platform. Craig Dengel opened the joint meeting and welcomed all attendees from DC-CAS and the Egyptian Studies Society. He noted that he was now acting President for DC-CAS upon the departure of Lynn Hoy.

Craig Dengel was the guest speaker for the evening. He is the current State Cultural Resources Specialist for the USDA-Natural Resources Conservation Service in Colorado. The title of his presentation was, "Spaceborne and Aerial Remote Sensing: Archaeological Applications, Methods, and Critiques". Dengel began his talk with a

general discussion of how technology (such as C¹⁴ dating, personal computers and the Global Positioning System or GPS) had changed how archaeologists carry out their work, both in data gathering and analysis. The increased data gathered through technological innovations have also influenced research directions and theoretical developments. More recently, archaeological research has begun to incorporate remote sensing technologies developed for satellite and aerial imagery. Dengel presented examples of archaeological uses for the newly available aerial remote sensing technologies along with a discussion of the benefits and drawbacks of such technologies. One of the older and most common aerial remote sensing technologies is Google Earth. Developed in 2005, Google Earth has enabled archaeologists to remotely search for sites and to engage the public in archaeology.¹ Satellite aerial remote sensing technologies accessible to archaeologists include color, black and white, near-infrared, and thermal imaging. These forms of imaging are also available to archaeologists by way of aircraft and unmanned aerial vehicles (UAVs or drones), which also have the added ability to produce images by light detection and ranging technology (LiDAR). The use of remote aerial information gathering has a long history starting in the 1780s/1790s via balloons, and continued during the American Civil War and WWI. Although aerial photographic imaging was also conducted during WWI, large technological advancements in aerial photography occurred during WWII. It was also at this time that archaeologists were beginning to explore the use of aerial photography to locate and record archaeological sites.² Within the last few years, UAVs (drones) with black and white and color photography have become more affordable for the public, and program applications have been developed to process a wide range of photographic data. LiDAR, thermal and near-infrared UAV (drone) applications are also available, but they are more expensive than standard black and white and color photographic technology. The use of LiDAR, thermal and near-infrared technologies on a large-scale basis is often cost prohibitive for most archaeological projects. However, these types of large-scale image data can often be accessed via projects and studies for other purposes carried out by private entities and government agencies.

Dengel noted the new technologies have created a geo-spatial revolution in archaeological mapping which has enabled archaeologists to visualize and interpret sites in new ways. For example, at the site of Tannis in Egypt, Google Earth satellite photographic imagery was able to pick up large structures at the site. However, when Dr. Parcak added LiDAR and near-infrared imaging to the area, she was able to detect the presence of smaller residential structures amongst the large structures. The combined use of thermal and near-infrared imaging enabled archaeologists to detect the Nazca Pyramid at the site of Cahuachi in Peru by color mapping differences between both heat and vegetative moisture signatures. At the site of Caracol in Belize, the LiDAR project has made not only structures visible, but also roads and pathways into the site. Gathering large amounts of LiDAR data enables

researchers to develop Bare Earth or Digital Elevation Models (DEM). In turn, detailed topographical maps can be extracted from the DEMs. Dengel also discussed the use of these technologies in his own research in the U.S. and Peru. At the site of Tyndall Air Force Base in northwestern Florida, he was able to use LiDAR to relocate Woodland period burial mounds which had been lost over time to site overgrowth since their discovery in the early 1900s. He noted that domestic ring structures were typically located by using traditional ceramic density mapping and shovel test pits. However, burial mounds are more difficult to identify with these methods due to low artifact accumulation. Applying LiDAR technology, Dengel was able to produce DEM topographic maps of the ground surface in which darker colors denoted higher elevations while lighter colors denoted lower elevations. Larger burial mounds are taller than domestic rings, and were made highly visible as darker shapes on the landscape. Interestingly, Dengel noted that LiDAR was also able to identify the location of smaller burial mounds by making their barrow pits visible as white shapes on the landscape. Similar results were found when he applied LiDAR technology to locate burial mounds at the site of Bird Hammock, near St. Mark's, Florida. While investigating river valley sites in Central Peru, Dengel used UAV (drone) Photogrammetry and 3-D Modelling to map structures at the sites of Sechin Alto, La Galgado, Lacamarca, Tres Monticulos, and Casma. Dengel explained that the UAV's flight grid pattern and altitude were automatically controlled through a program application uploaded to a smart phone. Both the flight grid pattern and altitude follow the Principles of Photogrammetry and Stereoscopic Parallax.³ Two-dimensional images can be stitched together to create a single image like a panoramic photograph. Two-dimensional images can also be converted into three-dimensional images, which can be viewed from multiple directions. This technique was developed during WWII to create two-dimensional panoramic photographs and three-dimensional models of bombing targets to establish their elevations. Today, software programs allow archaeologists to create these types of imagery digitally.

At a practical level, these aerial remote sensing technologies can aid archaeologists in gathering detailed data in a cost-effective manner. However, as with all technology, there are pros and cons one should be aware of. In the case of using large scale imagery from private entities or government agencies, images may not have the resolution needed for archaeological purposes. It was noted by Dengel, while using Google Earth to search for sites in the Santa River Valley, image quality was variable with some sites clearly visible while others were difficult to see. Another Google Earth example he cited was an image of an anthropomorphic petroglyph in Peru. The satellite image was not crisp. Dengel was able to obtain a more detailed image of the figure using a UVA (drone). He cautioned relying on these remote technologies without follow-up investigations on the ground. For example, while LiDAR imagery from the sites of Poverty Point, Marksville and McGuffee in Louisiana all produce similar evidence of ring

mounds, LiDAR technology cannot determine chronological variance. Despite looking the same, the Marksville and McGuffee ring mounds are 1,200 years younger than those found at Poverty Point. Dengel also pointed out that LiDAR is usually focused upon large architecture and it can miss smaller sites. This can skew research towards a State-level focus without consideration of the impact of smaller domestic sites. Similarly, thermal and near-infrared technologies tend to focus upon larger features that are easily seen while ignoring areas that contain deeper or smaller things. As such they can only speak to the most recent occupation of a multi-component site or those with a single occupation. Finally, the use of Google Earth satellite imagery to engage the public in archaeology can also have its own difficulties. Dengel noted that a crowdsourcing project to locate the tomb of Genghis Khan produced 1.2 billion hits with less than fifty of those hits being an actual archaeological site.

From a theoretical perspective, critics note that aerial remote sensing technology can create a God's Eye or disconnected view of archaeological sites. It can remove sites from the context of how they were meant to be viewed by the original builders. Remote viewing also separates a site from the local community, who may have a different interpretation of the site's meaning and significance from that of the archaeologist. These differences may have an impact on those local communities. While keeping these limitations in mind, Dengel felt that these new aerial remote sensing technologies do have value and add to the archaeologist's tool box. Aided by increased computer processing capability, large amounts of data collected by aerial remote sensing technologies can provide detailed three-dimensional mapping, which archaeologists can manipulate and view from new perspectives. It could also lead to a revival of regional analysis with increased site sampling to compare and contrast multiple sites. Dengel concluded his informative presentation by taking several questions from the audience. Dengel's talk is available for viewing on the Denver CAS YouTube (<https://www.youtube.com/watch?v=BIIH-EqGcXk>).

The meeting adjourned at 8:33 pm. Submitted by Stacy Greenwood, Secretary for DC-CAS.

1. See Dr. Sarah Parcak's website, <https://www.globalexplorer.org/about>

2. For example, see Dr. Maxine McBrinn's May 10, 2021 DC-CAS presentation - <https://www.youtube.com/watch?v=WDAFAerSfs0>

A history of archaeological aerial photography is available in the book, *History of Aerial Photography and Archaeology: Mata Hari's Glass Eye and Other Stories*, by Martyn Barber (2011), Historic England Publishing, ISBN-10:1848020368, ISBN-13:9781848020368

3. Principles of Photogrammetry – “The Fundamental principle used by photogrammetry is triangulation. By taking photographs from at least two different locations, so-called “lines of sight” can be developed from each camera to points on the object.” (<https://www.geodetic.com/v-stars/what-is-photogrammetry/#:~:text=The%20Basics%20of%20Photogrammetry&text=The%20fundamental%20principle%20used%20by,to%20points%20on%20the%20object>)

Stereoscopic Parallax – “The change in position of an object with height, from one photograph to the next relative to its background, caused by the aircraft's motion.”

(<http://www.edc.uri.edu/nrs/classes/nrs415/Lectures/415WK302052009.pdf>)

DC-CAS SEPTEMBER 13, 2021 GENERAL MEETING MINUTES

The DC-CAS September General Meeting was held on Monday, September 13, 2021 at 7:00 pm via the Zoom platform. Craig Dengel opened the meeting and welcomed attendees. Stacy Greenwood announced a call for candidates for the upcoming November Elections. Open Board positions were Vice-President (1-Year term), Membership Secretary (1-Year Term) and Director (2-year term). A volunteer was also sought for the non-board position of APB Newsletter Editor. Anyone interested was to contact Stacy Greenwood.

Craig Dengel introduced the evening's speakers, Dr. Kim Munro (Anthropology and Archaeology, Otero College-La Junta) and Mark Korbitz (Earth and Space Science, Otero College-La Junta). The title of their presentation was, *Archaeology Along the Chacuaco Creek – 5 LA 22, Medina Site*. The Medina Site is located along Chacuaco Creek on the J. E. Canyon Ranch, near Trinidad, Las Animas County. The 50,000-acre ranch is south of the Comanche National Grasslands, and borders the Piñon Canyon Maneuver Site to the west. Once owned by the Nature Conservancy, the ranch is now in private ownership. The site consists of a curvilinear rock overhang created out of the Jelm Sandstone Formation (225 million years ago), between the Chiele Equivalent Conglomerate and the Triassic Undifferentiated layers. The site was well preserved and undisturbed due to its remoteness. It was first excavated in the 1960s by Dr. Robert Campbell for his PhD thesis. Campbell subsequently published a summary of his work in 1963 in *Southwestern Lore*.¹ Campbell recovered numerous organics and artifacts such as corn cobs, plum seeds, sandalwood, yucca twined fiber, wood and bone artifacts. Campbell considered the site to be comprised of three separate areas (Sector A, B and C), which dated to 7000 BCE (1140 AD). Initially, Munro and Korbitz focused their excavation work in Section A based upon Campbell's artifact findings. As Campbell had not reached sterile ground, Munro and Korbitz wanted to document the stratigraphy and reexamine the site's place within the regional chronology. During a review of Campbell's work, it was discovered the field notes and reports were missing. However, Munro and Korbitz were able to reconstruct the site information with the aid of Campbell's *Southwestern Lore* article, the artifact collection and direct consultation with Campbell. Between 2017 and 2019, a number of lithic surface finds were recovered from around the area. A Bridger Basin “Zebra” Chert projectile point was found in the northern part of the canyon, near Bruno Canyon. A modified projectile point was found in Lockwood Canyon, southeast of Piñon Canyon. Another projectile point was encountered upstream of the

Medina rock shelter on the east side of Chacuaco Creek. A banded projectile point was located near Chacuaco Creek. Finally, a patinated lithic was found in the middle of the road along Alejandro Creek.

Munro and Korbitz put in two excavation units at the site. Unit 1 was placed in Sector A near Campbell's original unit, the location having been estimated from a photograph in the *Southwestern Lore* article. The precise location was confirmed when they encountered Campbell's unit peg. The 2x2-meter unit and extensions were excavated to a depth of 80 centimeters. The soil was easy to excavate and presented varied stratigraphy. Three hearths and a pit were encountered. Recovered organics included corn cobs, plum seeds and squash seeds. Artifacts included projectile points, a bone awl, a fire starter, a mano (inside one hearth), and a stone knife with a salt pebble placed on top of it. Also, a wooden post, with 67 growth rings, was found in situ in Level 3. The materials indicated a domestic use for the area. A radiocarbon date of 1018±24 BP (976-1115 AD, 95%, 1080 BP) was obtained from a hearth in Level 6. A second 2x2-meter unit, Unit 2, was placed in Sector B and excavated to a depth of 110 centimeters. The soil was compact clay and difficult to dig through in comparison to Unit 1 in Sector A. Small pieces of charcoal and bone beads were recovered as well as micro flakes and projectile points. Lithic material included chalcedony, brown obsidian, smokey quartz, and quartzite. The artifact finds indicated this area was used as a work space. A radiocarbon date obtained from a charcoal sample in Level 7 dated to 1287±25 BP (667-770 AD, 95%). It was noted the radiocarbon dates from Units 1 and 2 were not as old as was hoped, but they were within the range of Campbell's dates. Near Unit 2, a bison long bone was found 2.9 meters below surface in the alluvial stratified deposits of an embankment. The alluvial soil was quite loose and contained large boulders. A number of small bone fragments were also found nearby. A sampling of the bison long bone produced a radiocarbon date of 2221 BP (363-200 BCE, 95%). Another radiocarbon date obtained from additional bone was 2227 BP (381-204 BCE, 95%). It was believed that a large flood event occurred 2,300 years ago which deposited heavy clay in parts of the canyon. The bones may have been be part of the event as the flooding would have churned and disturbed the stratigraphy in the canyon, thereby mixing material together. At the west side of the canyon, north of the rock shelter, a young bison jaw with teeth was encountered at the Sheep Pen confluence with Chacuaco Creek. The jaw was found 3.5 meters below the surface of the alluvial deposit. There is intermixed rock art throughout the canyon, including a snake panel associated with the Ute. The rock art is from different time periods, but generally date to around 1000 AD.²

During his work at the Medina Site, Campbell identified seven different sites in the canyon. Munro and Korbitz

believe these sites should be considered a single site with sectors used at the same time or at varying times of the year. For example, the Bison Bone rock shelter (also known as Piute Rock Shelter) is located one mile from the Medina Site. It is shaded and protected by a 2-to-3-meter berm of rock and soil with a permanent water source close by. Sand plum and elderberry bushes are available on the nearby embankment. In contrast, the Medina rock shelter is very open and exposed to sunlight during the entire day. During excavations in later part of May and beginning of June, Munro and Korbitz monitored the temperature within the canyon and found that they varied widely. At the east-facing Unit 2, the temperature was 41.2°C. In the southern portion of the canyon, the north-facing temperature was 13.5°C, while the south-facing temperature was 48.3°C. There are plans to excavate the Bison Bone rock shelter to test the seasonality hypothesis. As their excavations did not reach sterile soil, Munro and Korbitz hope to continue their work at Unit 1, in Sector A. Work at Unit 2 in Sector B will be discontinued as there are no discernable layers, and the soil contained homologous material of micro flakes and small pieces of charcoal. They hope to collect cores and more soil samples for alluvial and environmental chronologies, C¹⁴ dating, and pollen analysis. Future work will also focus upon stratigraphy to establish better site integrity and cultural chronology for the canyon. Work on establishing a dendrochronology for the area will be carried out. Ponderosa pines, juniper and Piñon pines are found on the J. E. Canyon Ranch as are historic posts and beams. Cores may also be obtained from large juniper trees located in a protected side canyon off Plum Creek. Munro and Korbitz are currently working to establish relationships with other ranchers in the area. And, work is underway to locate sources of public and private surface artifact collections, both local and regional.

In closing, Munro and Korbitz outlined logistical problems pertaining to future work such as Covid-19 restrictions and restricted access to the ranch during hunting season. Weather is also a factor as rain and thunderstorms can make travelling to and working at the site dangerous. Munro and Korbitz answered several questions from the audience. Dengel thanked them for an informative talk.

The meeting adjourned at 8:16 pm. Submitted by Stacy Greenwood, Secretary for DC-CAS.

1. See Campbell's article, Test Excavations of Medina Rock Shelter, Chacuaco Creek Canyon in the CAS publication, *Southwestern Lore*, December 1963, Volume XXI, Number 3, p53-60

2. Some of these rock art images were documented by Dr. Larry Loendorf in the 1990s.

DC-CAS BOARD MEETING MINUTES AND FINANCIAL STATEMENTS:

Please note that the monthly Board Meeting Minutes and the quarterly Financial Statements will no longer be published in the All Points Bulletin. These documents are available to all Chapter members upon request. Please contact us should you wish to view them.

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