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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BOARD ANNOUNCEMENTS:

Membership: The Board would like to extend a warm welcome to our new members, and to thank existing members for their membership renewals! Should you wish to contact board members, information is located on the last page of this newsletter.

The Bylaw Revision Vote: The recommended bylaw revisions presented by the Board have been accepted by membership via an email vote. A big thank you to board member, Amy Gillaspie for all her hard work to review the bylaws and to draw up the recommended changes

Help Wanted: The board is seeking a new *All Points Bulletin (APB)* editor. If you are interested in filling this position, please contact Stacy Greenwood at stacygreenwood@comcast.net.

UPCOMING DC-CAS LECTURE:

Monday, May 9th - We are pleased to announce that we will be returning to in-person meetings at the Emery Archaeology Lab at History Colorado starting on Monday, May 9th at 7:00 pm. History Colorado is located at 1200 North Broadway, Denver 80203. Those folks planning to attend in person, please enter the building through the afterhours security entrance located on Lincoln Street. The Emery Archaeology Lab is located on the third floor. There will be someone available to give directions to the lab. For those who wish to remain remote, we will send out a Zoom link. As the hybrid technology is new to us, please be patient if the virtual portion contains a few bugs!

Our May 9th speaker will be Gene Wheaton, Professor of Anthropology at Community College of Denver. The title of his presentation is, *Chaco Style Great Kivas and Intersite Visibility*.

Abstract - As the major lunar standstill approaches, we will examine Chaco style great kivas and the common design criterion that was applied in order to be able to view solar and lunar events. We will review how this traditional architectural form

during the Chaco era acted as a mechanism to coordinate seasonal ceremonial activities by observation of astronomical events. Evidence that this common design criterion involved an orientation of building elements to the summer and winter solstice sunrise and sunsets is reviewed. In the La Plata River Valley, several Chaco-era communities are revisited with an eye toward inter-site visibility and shared site attributes that indicate integrated community structure. This integrated community structure incorporates Chaco style great kiva architectural features and natural landscape elements.

Biography: Gene Wheaton is a Professor of Anthropology at Community College of Denver and a professional archaeologist who provided technical support in inventory and management of cultural resources under the jurisdiction of the Park Service at Aztec Ruins National Monument and the Forest Service at various positions throughout the American Southwest. Professor Wheaton recently completed an excavation of the Wootton site on the Auraria campus and is currently working on an archaeological project at the Ninth Street Historic District Park on the Auraria campus. The main focus of these projects is to foster student and community involvement in archaeology.

OPPORTUNITES TO GET INVOLVED: The board is currently working on setting up archaeological field opportunities, field trips and classes/workshops for our members. If you have any suggestions, please contact Stacy Greenwood at stacygreenwood@comcast.net.

ERO Resources – Jonathan Hedlund, Senior Archaeologist/Associate has reached out to the Denver Chapter with an opportunity for members to work on a small cave site in Douglas County from May through July 2022. If you are interested, please contact him at jhedlund@eroresources.com. Hedlund provides the following project information:

Douglas County and ERO Resources Corporation (ERO) is seeking volunteers to assist in an excavation located in Douglas County, Colorado. Douglas County is proposing to excavate a small rock shelter (5DA3991) located on Douglas County property. Archaeological testing was completed by ERO in early 2021, indicating that the rock shelter contains buried cultural material including debitage, stone tools, ground stone, and hearths. Radiocarbon dates indicate that the archaeological deposits in the upper sediments date to about 900 years ago (Early Ceramic/Middle Ceramic periods) while the deeper material dates to around 4000 years ago (Middle Archaic period). Older deposits exist below, but they have not been exposed yet. The significance of this shelter cannot be overstated. The deposits have unique potential to provide valuable insights into thousands of years of Native American occupation of the area.

Volunteer expectations:
Volunteers will assist in the excavation in variety of ways: artifact screening, bag labeling, note taking, sketch map production, and hand excavation. Due to the size of the rock shelter, only one or two volunteers can be accommodated at a time. ERO anticipates needing volunteers in late May through July, depending on Tribal consultation and weather.

Hours: Typically 7:45 am to 4 pm – flexible schedules can be accommodated.
Access: 0.5 mile hike with 100-ft-elevation gain from parking location if you have 4WD. Volunteers with vehicles without 4WD may have to hike in about 1 mile with a 200 ft elevation gain if ERO cannot arrange alternative transportation.
Restrooms: Not on site, but porta-potty will be provided at vehicle access point.
Meals: Not provided.

Requirements: Volunteers will be required to be CAS members and adhere to the Colorado Archaeological Society Code of Ethics. Photography is allowed, but geolocated photos are not permitted due to the sensitivity of the resource.

Cherokee Ranch - Members will have an opportunity to do fieldwork at Cherokee Ranch, Douglas County. Dates are currently being finalized. An email will be sent out when additional information has been received.

Paleocultural Research Group – PCRG have two upcoming projects with open volunteer opportunities (https://paleocultural.org/participate/). Please consult the following web pages for requirements: https://paleocultural.org/participate/being-a-volunteer/ and https://paleocultural.org/participate/volunteer-information/.

History Colorado – A field trip to the Office of the State Archaeologist and the Emery Archaeology Lab has been scheduled for Friday, June 3rd at 10:00 a.m. The tour will be led by Todd McMahon, Staff Archaeologist/State Curation Coordinator. We will also be meeting Shawn Faucett, the new Preparator/Emery Archaeology Lab Coordinator. Volunteer opportunities will also be discussed. History Colorado Center is located at 1200 Broadway, Denver. We will meet at the Security Entrance located on Lincoln Street. If you would like to join us, kindly RSVP to stacygreenwood@comcast.net.

PAAC Classes – Classes are currently on hiatus. They are tentatively set to resume in the Spring of 2023. We will provide updates when they become available. You may visit https://www.historycolorado.org/paac for updates, to learn about the PAAC program, and to see the offered classes.

Classes on Museum Basics – Curatorial Services and Collections Access at History Colorado is offering fee-based virtual classes on Museum Basics. Classes are designed for those who currently work or volunteer at cultural institutions and for graduate students interested in doing so. Upcoming classes are Programming & Collection Activation (May 11th), Objects as Teaching Tools (July 13th), Patron Services (Sept. 14th, and Digitization & Metadata (Nov 9th). Please visit https://www.historycolorado.org/insights-inperson for further information.

BLAST FROM THE PAST: A new feature to the APB, which looks at the rich 75-year history of the Denver Chapter.

This Quarter in DC-CAS History -

January: 1957 – The first *Denver Chapter News* newsletter was written and published by President, Wallace McBride. **1962** – Former Member, Bob Hetu, while with the armed forces in Europe, reported he was having a great time digging with Dr. Adam Treganza at Agrigento, Italy. The wide variety of ruins were as early as Fourth Century Greek.

February: 1964 – A naming contest was held for a new DC-CAS publication. Names submitted for consideration were *Are Key O Gee*, *Facts and Artifacts*, *Art 'N Fact*, *Flint Pickers*, *Lost and Found*, and *All Points Bulletin*. The following month, the first *All Points Bulletin* (*APB*) was published. **1967** – The *APB* announced that Dr. L. S. B. Leakey would be speaking at University of Colorado at 7:30pm on February 6th. The title of his talk was, *The Evidence for Evolution of Man and His Ancestors in Africa.*

March: 1959 – Mr. Richard A. Scott, Paleobotanist for the U.S. Geological Survey was the speaker for the March 18th DC-CAS General Meeting. The title of his talk was, *Dinosaurs Had Hay Fever.* **1961** – The *APB* announced the Annual Banquet would be held on April 19th at Luby's Cafeteria in the Lakeside Shopping Center. Roast Beef was the main dish. The cost was $2.50 for adults and $2.00 for children. Useful and interesting door prizes were to be awarded to lucky attendants. Mr. Dallas Bordeaux of Pueblo was to give a talk on, *The Secret and Sacred Ceremonials of the Sioux Indians*.

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Articles from the Past – For the Denver Chapter of the Colorado Archaeological Society, the relationship between advocational and professional archaeologists has long been an important one. The following is a reprint of an article written by a past Denver Chapter member which speaks to the importance of advocational archaeologists. It was originally published in the *All Points Bulletin* Newsletter in May 1964 (Vol. 1, No. 4, p.2):

The Role of the Amateur in American Archaeology
By Larry Nelson

Chances are if you are reading this, you are involved with amateur archaeology to some extent, since it is published in the Denver Chapter Newsletter. Your involvement may range from attendance of lectures and meetings, to active

pursuit of artifacts in the field. As it is with all avocations, a person not interested may inquire, "What benefit is derived from this pastime?". Here is my answer to that questions. Perhaps you can think of additional points.

Archaeology is a true science, according to Webster, but is a science that suffers from its own peculiar handicap; it is not a vital industry. For this reason, funds available for archaeological research are limited. Thus, the amateur can be of considerable value with his donated time and energy. While pursuing an exhilarating pastime, he also contributes directly to the fund of human knowledge. It would be impossible to find professional archaeologists in such quantities as the amateurs who "hit the trail" on vacations and weekends. It is also a certainty that professionals could be no more enthusiastic. In fact, it is his enthusiasm that the amateur must be careful to control. It is his duty to report finds suspected to be significant, and never to destroy information through haste or carelessness. Examples of careful observations by amateurs are abundant. Two notable ones are the work of the Wetherill Brothers in what is now Mesa Verde National Park, and the discovery of the Folsom type location in New Mexico by a lone cowboy. In the first case, amateurs saved information that might have been destroyed by looters; and in the second, a valuable site was reported that might otherwise have gone unnoticed.

So, it might be said that everyone benefits from properly conducted amateur archaeology. The cause of science is helped by donated efforts. As far as the benefits to the individual are concerned, I could go into a long discourse about fresh air and exercise, about an inexpensive hobby in which every member of the family can participate, and so forth. But I won't. If you've ever experienced the thrill off finding a beautiful artifact nestled in the sand, unseen by human eyes since the Indian left it, you'll understand what I mean.

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From the Denver Chapter Vintage Poetry Corner –

An Amateur
By Lorraine Hagar, Denver Chapter Member

I stood on a gentle windswept hill,
Encircled by towering mountain sentinel,
Enraptured of dancing aspen drenched in sun,
Enthralled in a world my imagination spun.

Entranced by a small shiny chipped stone,
So precise, so delicate, so skillfully done.
I cupped in my hand a tiny bit of history,
Held a precious bit of unsolved mystery,
My search had been fruitful at long last
And dredged up images from my Country's past.

What of the warrior who once stood this ground,
How did he use what I'd just found,
How did he live, how did he 'cope',
What were his sorrows, what was his hope,
Where should I look, what could I see,
How to connect his life with me?

And so that day with my first arrowhead find
I became an archaeologist, the very amateur kind.

Originally published in the *All Points Bulletin* in June 1967 (Vol.4, No.6, p.4)

ARCHAEOLOGY IN THE NEWS: A selection of articles which may be of interest to members

From Popular Archaeology

December 29, 2021 - ***Nits on ancient mummies shed light on South American ancestry*** (https://popular-archaeology.com/article/nits-on-ancient-mummies-shed-light-on-south-american-ancestry/) Researchers have found viable DNA can be recovered from nits found in the hair of Peruvian Mummies. Original article - https://academic.oup.com/mbe/article/39/2/msab351/6481551?login=false

March 21, 2022 – ***Ice-Free corridor opening and peopling of the Americas*** (https://popular-archaeology.com/article/ice-free-corridor-opening-and-peopling-of-the-americas/) The Ice-Free Corridor model has long viewed the opening between the Cordilleran and Laurentide ice sheets as the primary migration route from Beringia into the Americas. New dating research of ice sheets suggests that this route was not available to the earliest migrants, and that initial migration occurred along a coastal migration route. Original article - https://www.pnas.org/doi/abs/10.1073/pnas.2118558119

From Colorado Department of Transportation– January 11, 2022 – ***CDOT documentary depicts new era of archaeology*** (https://www.codot.gov/news/2022/january/new-era-archaeology-documentary) CDOT announce the release of their documentary, ***Durango 550 – Path of the Ancestral Puebloans***. The documentary shows how CDOT worked with archaeologists and regional Native American tribes to study and share their discoveries unearthed near Durango. The informative thirty-minute documentary is available to view until January 1, 2023 on Rocky Mountain PBS - https://www.pbs.org/video/durango-550-path-of-the-ancestral-puebloans-vhgyoe/

From Science Daily –

February 1, 2022 – ***Did comet's fiery destruction lead to downfall of ancient Hopewell?*** (https://www.sciencedaily.com/releases/2022/02/220201143951.htm) Researchers have found evidence of a "cosmic outburst" at eleven Hopewell archaeological sites in three states. Original article - https://www.nature.com/articles/s41598-022-05758-y

March 7, 2022 – ***Collectors in the prehistoric world recycled old stone tools to preserve the memory of their ancestors*** (https://www.sciencedaily.com/releases/2022/03/220307113131.htm) A new study from Tel-Aviv University examines flint tools from one layer at the 500,000-year-old site of Revadim, located south of Israel's Coastal Plain. Original article - https://www.nature.com/articles/s41598-022-06823-2

March 17, 2022 – ***New computer predictive model useful in identifying ancient hunter-gatherer sites*** (https://www.sciencedaily.com/releases/2022/03/220317163625.htm) Archaeologists at the Max Planck Institute and Simon Fraser University examine the use of computer predictive modelling to locate sites in the landscape. Original article - https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0265597

March 23, 2022 – ***Migrants from south carrying maize were early Maya ancestors*** (https://www.sciencedaily.com/releases/2022/03/220323101209.htm) Excavations and DNA analysis at two rock shelter sites in the remote Maya Mountains, Belize indicates the inhabitants were originally from South America, and were critical to the spread of maize. Original article - https://www.nature.com/articles/s41467-022-29158-y

DC-CAS JANUARY 10, 2022 GENERAL MEETINGMINUTES

The DC-CAS January General Meeting was held online on Monday, January 10, 2022 at 7:00 pm via the Zoom platform. Craig Dengel opened the meeting. Stacy Greenwood announced proposed bylaw changes had been sent out to membership, and she asked members to review the changes. A vote to accept these changes would be held during the February General Meeting. Craig then turned the meeting over to Kayla Bellipanni.

Kayla notified the audience that the evening's speaker, Athena Van Overschelde was not able to attend the meeting due to a medical emergency. Fortunately, Van Overschelde was able to forward a previously-recorded presentation on the scheduled topic. Van Overschelde is a recent Master's graduate of the Rosentiel School of Marine and Atmospheric Science at the University of Miami. She is currently at the South Carolina Institute of Archaeology and Anthropology. As part of her underwater archaeology thesis work, Van Overschelde looked at the use of historical documentation and developing technology in online interpretive materials related to the underwater cultural resources located in Biscayne National Park (BISC). BISC is located twenty miles south of Miami, Florida in the northern Florida Keyes. The park area totals 270.3 square miles (700 square kilometers), and is comprised of Biscayne Bay, Elliott Key, and associated offshore barrier reefs.

The title of Van Overschelde's presentation was, *Maritime Heritage Trail Histories and Public Engagement in Cultural Resource Management: Biscayne National Park.* Van Overshelde provided a brief overview of the BISC. As part of the National Park Service (NPS), BISC shares the values of the NPS system, and is dedicated to the conservation of the natural and cultural resources for present-day and future generations. BISC was first established as a national monument in 1969, and was expanded into a national park in 1980. It is the largest marine park in the NPS system. BISC contains seventy-five documented submerged historic ships, six of which are part of the Park's Maritime Heritage Trail (https://www.nps.gov/bisc/learn/historyculture/maritime-heritage-trail.htm). Of interest to this presentation are the six vessels located along the Maritime Heritage Trail identified as the *Arratoon Apcar* to the north and to the south, the *Lugan*, the *Mandalay*, the *Erl King*, the *Alicia*, and an unidentified 19th century sailing vessel.

After Hurricane Irma hit the area in 2017, the NPS needed to re-establish a baseline data set for each of the sites. As part of this work, developing technologies were incorporated to document the sites in detail. Van Overschelde's research provided BISC with historical information on the five identified vessels, from their launching to their wrecking event, culled from historical newspapers, letters, court records, and military documents. The historic documentary resources gave insight into the life of the now-submerged vessels. For example, it was learned that the *Erl King* played a part in a major turning point in shipping history. Van Overschelde noted that during the late 19th century, it was popular to have clipper sailing ships race from China to London with the latest teas. The winner of these races was able to sell their tea cargo at a premium price as it was the freshest shipment, a quality most desired. In 1866, eight sailing ships loaded with tea departed from China for London. The *Erl King*, a steamer ship, also departed at the same time, but it was not participating in the race. The *Erl King* beat the racing sailing ships back to London by a full two weeks, thereby securing steam's future over sailing in the shipping industry. In another example, historic documentation also provided dating information on the Spanish steamer ship, the *Alicia* which wrecked upon the Ajax reef in April 1905. Calls for salvage bids and advertisements for public excursions to visit the shipwreck site were found in local newspapers. These historic materials are being incorporated with other new interpretive materials to update the BISC website, so that the information is accessible to those who do not snorkel as well as those who are unable to visit BISC in person.

In July 2019, BISC and the Submerged Resources Center Branch of the NSP began a project utilizing three-dimensional (3-D) photogrammetry multi-camera array to collect high resolution photographs of the wrecked vessels on the Maritime Heritage Trail (see *SeaArray* - https://marineimagingtech.com/imaging-systems-home/sea-array/). Thousands of photographs were taken and stitched together to create a 3-D photogrammetric map of each vessel. The maps will be uploaded to an online ArcGIS StoryMap and will be incorporated with historic research and documentation. When completed and uploaded onto the BISC website, there will be Story Maps for each vessel, their histories and 3-D interactive features (for examples of ArchGIS StoryMaps , see https://doc.arcgis.com/en/arcgis-storymaps/gallery/). The photogrammetric map for the *Erl King* will highlight eight features that can be clicked upon and a brief explanation will appear. Van Overschelde noted that the use of 3-D imaging provided evidence of an undocumented hole cut into the *Erl King*. It was thought the hole was from a salvage job at the time of the sinking or as part of a scrap iron salvage effort during WWII. As this hole had not been documented before, the technology showed the potential for new information to be collected. There are also plans to add more images to the record of the vessel, *Mandalay* utilizing the *Sea-Thru* algorithm to greatly reduce image distortion caused by water. *Sea-Thru* algorithm was developed by Dr. Derya Akkaymak, mechanical engineer and oceanographer at Harbor Branch Oceanographic Institute (https://www.deryaakkaynak.com/sea-thru). The *Mandalay* will be the first use of this algorithm on a submerged archaeological site, and it has the potential to be useful in the development of underwater monitoring programs at the remaining sites. Van Overschelde thought that it would be interesting to show the public what an underwater archaeology site would look like if it were on land.

The Covid-19 pandemic has shown the importance of online access to resources, and Van Overschelde's work has also focused upon what BISC was doing to bring archaeology online. She researched how other parks and sanctuaries were using online technologies to engage with the public. For example, the Channel Islands National Park had to adapt early to teaching and learning online due to its remote location off the coast of California. In partnership with the website, *Explore.org*, the park developed a program called *Live Dives* (https://www.nps.gov/chis/planyourvisit/channel-islands-live-nps.htm or https://explore.org/livecams/channel-islands-national-park/channel-islands-national-park-live-adventures). Outfitted with full-face communications, the divers are able to talk live about what they are seeing and to answer questions from the audience, be it students in a classroom or people at the visitors' center. It was noted that after the park added *Live Dives*, their viewership jumped to 50,000 views. At the moment, it is difficult to implement a similar program at other marine parks and sanctuaries as divers have to be physically connected to the land to be able to stream live video. *Explore.org* is currently investigating new ways to broadcast

from deeper water and further from land. Another example is the Thunder Bay National Marine Sanctuary, whose cultural resources include one hundred shipwrecks at depths ranging from ten feet to one hundred and eighty-five feet (https://thunderbay.noaa.gov/). The sanctuary provides a variety of interpretive materials to in-person and virtual visitors including 3-D models of seven shipwrecks along with ArcGIS StoryMaps of each vessel's location and history. Also, visitors are able to view a virtual dive gallery of fourteen vessels via computer, smartphone or virtual-reality headset. Additionally, there are stationary 360° images for twelve different vessels. The sanctuary recently added a virtual dive of the vessel, *D.M. Wilson* in which a diver swims slowly over and through the wreck, while a voice-over provides a history and an explanation of the features seen. Finally, Lloyd's Register Foundation has a short virtual-reality program called *Ship Surveyor Through the Ages*, which is available for free download through various game companies (https://hec.lrfoundation.org.uk/whats-on/ship-surveyor-through-the-ages). Using a virtual-reality headset or console computer, viewers can virtually explore a 19th century clipper ship, a 20th century steam composite vessel, and a modern-day vessel to learn what a marine surveyor would look at when conducting a vessel inspection.

In conclusion, Van Overschelde stated that, considering the long-range impact that Covid-19 has had, it will be increasingly important for archaeologists to utilize advancing technology as a means to bring archaeology to the public. Some parks and museums are already being pushed in this direction to provide online access to their interpretive materials to a wider audience. As technologies improve and new ones become available, their application to archaeology is an effective way to bring sites and artifacts to the public, who might not otherwise have access to these cultural resources. In some places, ArchGIS StoryMaps and 3-D photogrammetry imaging is already being implemented. The *Sea-Thru* algorithm can be applied to 3-D images and videos to enhance viewer experience of an underwater vessel without the distortion normally caused by water. The use of virtual-reality platforms should also be considered, especially as virtual-reality headsets become cheaper and more widely available. With improvements in underwater live broadcast technology currently underway, more underwater parks and sanctuaries will be able to conduct live dive interactions with the public, both virtually and from park visitor centers. At the conclusion of the recorded presentation, members expressed their enjoyment of the interesting presentation, and asked Kayla to pass on their thanks to the speaker. A stimulating discussion then ensued amongst members, which touched upon wide-ranging but related topics such as site documentation, protection and preservation, cultural resource management, and tourism and climate impact. Also discussed were philosophical issues relating to a physical interaction with a site versus a virtual interaction, as well as ethical issues relating to access to sacred artifacts and sites. The meeting ended with the announcement of Samantha Murphy (CU-Denver) as the February 14th General Meeting Speaker. The topic of Murphy's presentation will be on her bioarchaeology research on Middle Horizon and Late Horizon Peruvian burials.

A recording of Athena Van Overschelde's presentation is available on the DC-CAS YouTube Channel (https://www.youtube.com/watch?v=EmM3MUee3uc)

The meeting adjourned 8:09 pm. Submitted by Stacy Greenwood, Secretary for DC-CAS

DC-CAS FEBRUARY 15, 2022 GENERAL MEETING MINUTES

The February General Meeting was held online on Tuesday, February 15, 2022 at 7:00pm via the Zoom platform. Craig Dengel opened the meeting, and announced the Bylaw Revision vote would be held after the speaker's presentation had concluded. Stacy Greenwood announced that the Board was in search of a volunteer to be editor for the APB newsletter.

Kayla Bellipanni introduced the evening's speaker, Samantha Murphy, a Bioarchaeology Master's student at the Department of Anthropology, Colorado University–Denver. She received her undergraduate degree in Archaeology at Clemson University in South Carolina. The title of her presentation was, *Relating Status to Access to Healthcare in Pre-Contact Peru During the Middle and Late Horizon Periods.* Murphy began her presentation with a brief definition of relevant geographical and chronological terms. The *Andes* refers to Bolivia, Ecuador and Peru as a geographical area with shared religious, political and cultural features. The chronological term, *Horizon Period* refers to empire-level centralized control and high social stratification, with resources heavily divided between classes. In contrast, the chronological term, *Intermediate Period* refers to local city-state power and control. Murphy's research focused upon determining if access to healthcare in the pre-contact Andes was restricted by status. Her research was influenced by the work of Dr. Lorna Tilley, whose writings provided a framework of theoretical concepts and methodological standards for retrieving evidence of care from the archaeological record[i]. Tilley noted that the practice of care is a uniquely human feature. It has been present for at least 10,000 years, and may have been key to human evolution. Though there does appear to be evidence of other primates displaying the practice of care, it is rare. While

biological responses to disease and trauma have little variation, cultural responses to the obligations and costs of caregiving are more variable. It is the differences between cultures which researchers can examine. These obligations and costs are not restricted to medical treatments. It also includes the energy expended towards daily care and procurement of food, water and other resources for the recovering and/or disabled patient. With respect to definitions for health and disability, Murphy followed the World Health Organization's (WHO) guidelines. According to the WHO, health is, "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". Disability is defined as, "the results from the interaction between individuals with a health condition such as cerebral palsy, Downe syndrome and depression, with personal and environmental factors including negative attitudes, inaccessible transportation and public buildings, and limited social support".

Due to travel restrictions during the Covid-19 pandemic, Murphy was unable to carry out direct data gathering from skeletal material. As an alternative, Murphy searched for sizeable Andean skeletal collections which had research notes and data remotely accessible. She identified two such sources located in the Bandelier Collection at the American Museum of Natural History in New York City, New York and The Hiram Bingham Collection at the Yale Peabody Museum of Natural History in New Haven, Connecticut. Both collections were excavated during the late 1800s/early 1900s. The Bandelier Collection was analyzed by Doug Ubelaker in 1989, and his work contained information on age, biological sex, and life history. The Bingham Collection data also contained age and biological sex information. However, it did not contain specific life history data other than if trepanation had occurred. For her research, Murphy planned to look for surgical intervention such as trepanation, recovery from trauma, provision of resources, and assistance in day-to-day activities. She noted that trepanation is found worldwide, and evidence of its practice is found as early as the Neolithic Period. It continues to be used in medicine today. Trepanation was widely practiced in the pre-contact Andes using obsidian tools. John W. Verano's analysis of trepanation in Peru, and elsewhere in the Andes, found that trepanation was fairly accessible across age and gender[ii]. It also had a high success rate, 75% to 80% in some cases. This success rate was higher than during the U.S. Civil War. Murphy also noted there was evidence within her study collections of surgery for deviated septum. Using random sampling, Murphy selected a sample group of one hundred and twenty-seven individuals to analyze. The sample consisted primarily of adults along with some sub-adults and children. The sample from the Bandelier Collection was comprised of fifty-two individuals from the Sacred Valley, Peru dating from the Early to Middle Incan Period (1430-1530 CE), and fifty-three individuals from the Lake Titicaca Region of Bolivia dating to the Tiawanaku Period (500-1000 CE). From the Bingham Collection, the sample consisted of twenty-two individuals from the Sacred Valley, Peru dating to the Incan Period. As any grave goods which could have indicated status were no longer associated with their burial contexts, Murphy selected nutritional markers as proxies for status with the assumption that those with better nutrition will have a higher status. Other studies have indicated that nutritional markers, especially teeth, are quite reliable indicators of status. For example, those with lower nutritional markers will have higher numbers of caries and antemortem tooth loss due to low animal protein consumption. Dental caries and high antemortem tooth loss is indicative of a high carbohydrate diet. Other nutritional markers used were criba orbitalia, enamel hypoplasia and porotic hyperostosis. Criba orbitalia is pitting of the bone under the eye socket. Enamel hypoplasia is indicated by the presence of stress lines formed in the enamel of developing teeth. Porotic hyperostosis is pitting in the back of skull.

Murphy found a large amount of evidence of poor nutrition, and a high number of low-status individuals. However, it was not clear if low nutrition was present across the board within the larger population. Several conditions were found including anemia/low iron, dental abscesses, tooth loss, arthritis, dental wear and porotic hyperostosis. If individuals had been hurt, there was evidence of surgical intervention regardless of age and biological sex. There was also plenty of evidence to indicate those individuals also recovered from their trauma and surgeries. Chi-Square analysis indicated a low association between status and trauma recovery. Status and surgical recovery also had a low association, though slightly higher than that between status and trauma recovery. There may have been some kind of association between status and recovery from surgery. However, it was not found to be statistically significant. Overall, there appeared to be minimal association between status and access to healthcare. This was unexpected as historic records from the post-conquest period indicated that Incan society was highly stratified, and resources were heavily restricted to certain individuals. Yet, regardless of status, individuals were accessing healthcare and recovering from surgery and trauma. Murphy wondered if perhaps religious resources were considered more important than material resources. What did this mean regarding individual value within a community compared to other societies? Murphy noted that some individuals had lost all of their teeth prior to death, but lived for a substantial amount of time. Even those with low nutrition were recovering from surgical procedures. This could have only happened if someone was helping to provide food and care for such individuals. Murphy concluded her presentation by stating that healthcare doesn't always mean the same thing to everyone. Modern bias has influenced how we view some procedures in the past. She stated there was lots of opportunity to compare healthcare in different archaeological populations. The audience thanked Murphy for an interesting presentation and asked her several questions.

A recording of Samantha Murphy's presentation is available on the Denver CAS YouTube Channel - https://www.youtube.com/watch?v=4pJW1UXbAw0

Please note, the vote to accept the recommended bylaw revisions could not be held after the talk due to technical issues. It was decided the vote would be held via email. Voting would be open for one week. The meeting adjourned at 8:22 pm. Submitted by Stacy Greenwood, Secretary for DC- CAS.

[i] Tilley, Lorna. 2015. *Theory and Practice in the Bioarchaeology of Care,* Bioarchaeology and Social Theory Series, Debra L. Martin, Editor. Switzerland: Springer International Publishing, 1st edition (August 28, 2015). Hardcover ISBN: 978-3319188591, Softcover ISBN: 978-3319361475, e-Book ISBN: 978-3319188607. Also available as a pdf download at https://www.researchgate.net/publication/315804448_Theory_and_Practice_in_the_Bioarchaeology_of_Care.

[ii] Verano, John W. 2016. *Holes in the Head: The Art and Archaeology of Trepanation in Ancient Peru*, Dumbarton Oaks Pre-Columbian Art and Archaeology Series 38. Washington, D.C.: Dumbarton Oaks Research Library and Collection (June 13, 2016). Softcover ISBN: 978-0884024125. Also available as a pdf download at https://www.researchgate.net/publication/319428154_Holes_in_the_Head_The_Art_and_Archaeology_of_Trepanation_in_Ancient_Peru_John_W_Verano_ed_Washington_DC_Dumbarton_Oaks_2016_352_pp_6995_paper_ISBN_9780884024125.

DC-CAS MARCH 14, 2022 GENERAL MEETING MINUTES

The March General Meeting was held online on Monday, March 14, 2022 at 7:00 pm via the Zoom platform. Stacy Greenwood opened the meeting and announced the Board was planning to organize some field trips. Some possible places for field trips included History Colorado, Denver Museum of Nature and Science (DMNS), Hell's Gap and Lamb Springs. She encouraged members to contact her with any other locations they would like to visit.

Kayla Bellipanni introduced the evening's speaker, Deb Bollig, a DC-CAS member currently serving on the Board as Membership Secretary. Bollig is an avocational archaeologist retired from a career as an information systems manager, college instructor and software engineer. She currently devotes her time to archaeological research and volunteering for various archaeological projects, such as the P3 Project. She also teaches archaeology classes at the Osher Life-long Learning Institute at University of Denver, and is an advocate for making archaeology more accessible to the public. The title of her presentation was, *New Science and Old Stones: Latest Research Findings on Stonehenge.* Prior to beginning her talk, Bollig noted that she had the opportunity to visit the *Stonehenge: Ancient Mysteries and Modern Discoveries* Exhibit recently held at the DMNS (March 2021-August 2021). She also indicated the British Museum was currently hosting the first major United Kingdom (UK) exhibit on Stonehenge called, *The World of Stonehenge* (February 17 to July 17, 2022).

The Stonehenge World Heritage Site is located in southwestern England in the County of Wiltshire, 9.3 miles (15 kilometers) north of the city of Salisbury. It includes the Stonehenge monument, the Carpark monument, the Cursus, Durrington Walls, Normanton Down Barrows, Woodhenge and Vespasian's Camp. Several modern investigations have been undertaken which have greatly expanded the knowledge of the site. Four investigations were coordinated by Dr. Michael Parker Pearson, Professor of British Later Prehistory, Institute of Archaeology, University of London. These projects were the Stonehenge Riverside Project (2003-2009), the Feeding Stonehenge Project (2010-2013), the Stonehenge Hidden Landscape Project (2010-2014), and the Stones of Stonehenge Project (2011-2021). Dr. Parker Pearson has worked at Stonehenge for over 20 years, co-authored several papers and produced several informative videos available on YouTube. One interesting theory postulated by Parker Pearson is that wood monuments were for the living, while stone monuments were for the dead. Bollig noted the Stonehenge Hidden Landscape Project utilized the latest technology, such as magnetometry, ground-penetrating radar, and 2-D and 3-D photogrammetry imaging to reveal the area's use over millennia. Hundreds of new features were identified including hengeform sites, new data was obtained from Durrington Walls and Woodhenge, seventeen new ritual monuments were identified, and additional information was retrieved from burial mounds. Another investigation was carried out at the site of Blick Mead by David Jacques, University of Buckingham (formerly of the Open University). Excavations began at Blick Mead in 2005 and continue today.

Bollig noted the earliest known monument at the Stonehenge World Heritage Site is the Carpark Monument. It was discovered in 1966 during a parking lot expansion. Three large intact postholes and one disturbed posthole were found oriented on an east-west alignment. The postholes were thought to once hold large timber posts. Radiocarbon analysis dated the post holes to the Mesolithic Period (8,000 BCE), a time during which the UK was still joined to Europe, a landmass referred to as *Doggerland.* Another early site discussed by Bollig was Blick Mead, located near the site of Vespasian's Camp and the town of Amesbury. Blick Mead was first excavated in 2005 by Dr. David Jacques. The site is in close proximity to the Avon River, and was once heavily wooded. Tens of thousands of flint tools of various forms have been recovered. There is also an

abundant supply of flint nodules. Interestingly, some flint nodules found along the spring line are tinted pink due to a rare alga (*Hildenbrandia rivularis*) in the water. Pink flint is found in other parts of the world, but it hasn't been found elsewhere in Great Britain. Thousands of faunal remains have also been recovered, especially that of aurochs, wild pig and red deer. A tooth from a domesticated dog was radiocarbon-dated to 5,000 BCE. Stable isotopic analysis indicated the dog originated from the Vale of York, 250 miles (402 kilometers) away. The site was thought to be used for major feasting events. Blick Mead has had a long occupation with radiocarbon dates ranging from the late Mesolithic to the early Neolithic (approximately 8,000 BCE to 3,300 BCE).

Bollig also discussed another Mesolithic monument known as the Cursus, or the Greater Cursus, first identified in 1723 by William Stukeley. Stukeley thought the monument was a Roman chariot race track. Bollig described cursus monuments as very long and relatively narrow, rectangular enclosures with rounded or squared-off ends. She noted the Cursus is 1.9 miles (3 kilometers) long and has a width of between 330 feet (100 meters) and 490 feet (150 meters). During the 1940s, a red deer antler was found in the chalk with an estimated date of 2,890 BCE to 2,460 BCE. In 2007, another red deer antler was recovered during the Stonehenge Riverside Project which dated between 3,632 BCE and 3,375 BCE. It is thought the Cursus may have been used as an animal trap due to its near-continuous interior boundary and an exterior boundary with a few breaks thought to be causeway entrances. Bollig stated many burial monuments were placed along the length and ends of the Cursus. They begin to appear at the time of the construction of the Cursus, and continued well into the arrival of the Beaker People around 2,400 BCE. She also noted the Cursus was aligned with Woodhenge, at the Avon River, and that it was oriented along the midsummer sunrise.

Bollig then turned her attention to the Stonehenge monument. The Stones of Stonehenge Project conducted analysis to determine the origin of the bluestones located in the innermost part of the structure. Geochemical analysis of zircon and radioactive uranium indicated a matching signature to the Preseli Hills outcropping in Wales. Presli Hills quarry sites, Carn Goedog and Craig Rhos-y-felin provide evidence of quarrying dating to approximately 3,000 BCE. In 2019, the Preseli Hill stone circle site of Waun Mawn, was dated between 3,400 BCE and 3,200 BCE using optically stimulated luminescence analysis of soil from holes where stones once stood. Parker Pearson has postulated some of the Waun Mawn bluestones were transported to the Bluestonehenge site on the Avon River, then later moved to Stonehenge. In addition to examining the bluestones, the Stones of Stonehenge Project investigated the Sarsen stones located around the exterior of the Stonehenge monument. A date of approximately 2,500 BCE has been determined for the addition of the Sarsen stones to the monument. Geochemical analysis of previously-cored Sarsen stone samples indicated that fifty of the fifty-two stones originated from the West Woods area near the Marlborough Downs, located 15 miles (24 kilometers) away.

The Stonehenge Riverside Project re-excavated a circle of fifty-six chalk pits known as the Aubrey Holes, which are located outside the Sarsen stone circle of the Stonehenge monument. Initially discovered in 1666 by John Aubrey, the Aubrey Holes were later excavated in 1919-1920 by Colonel William Hawley. Cremains and unburnt bones were found buried in the holes. It is thought the site was the largest known cemetery in Britain at the time. It is believed the Aubrey Holes date to the earliest construction phase of the Stonehenge monument (3,200 BCE), and were used for burials during the first remodeling phase (2,900 BCE). In 1935, Hawley placed all of the cremations and bones into one bag, and reburied them in one of the pit holes. During the Stonehenge Riverside Project, the individual cremains and unburnt bones were exhumed and analyzed. The Stonehenge Riverside Project also investigated the site of Bluestonehenge, located on the Avon River, 1 mile (1.6 kilometers) from the Stonehenge monument, at the end of the Avenue. The site was thought to originally contain twenty-five bluestones, and may have been part of a ceremonial procession route. It is tentatively dated to between 3,000 BCE and 2,400 BCE.

Next, Bollig talked about the Feeding Stonehenge Project, which examined the faunal remains recovered during the Riverside Stonehenge Project. She focused upon work done at Durrington Walls, a late Neolithic residential site for workers involved in the construction of Stonehenge. It is located near the Woodhenge monument. Researchers estimate that up to one thousand families occupied the site for less than forty-five years, possibly for only twelve years, based upon household middens. Recovered items indicate a large amount of feasting during the solstice. Animal bones and teeth were primarily from pigs and domesticated cows. Organic remains indicated a diet of vegetables, fruits, cheese and grains. Isotopic analysis on faunal remains found residents came from all over Britain with their animals. Recently, more than twenty shafts with postholes have been found encircling Durrington Walls and Woodhenge. The shafts are eight meters in diameter and five meters deep.

Finally, Bollig discussed the Beaker People, who arrived in approximately 2,400 BCE. DNA analysis indicates the Beaker People originated from the Yamnaya peoples located in the steppes north of the Black and Caspian Seas. DNA also revealed that 90% of the Neolithic farmer population was replaced by the Beaker People. The presence of the Beaker People at the Stonehenge World Heritage Site is highlighted by the burial of a Beaker warrior in the Normanton Down Barrows, known as the Bush Barrow Horde. Other burials in the burrows also contained gold, bronze and copper artifacts. The arrival of the Beaker People marks the start of the Early British Bronze Age, as there is no evidence of metal working prior to their arrival. Bollig concluded her presentation with a discussion of plans for a tunnel project on the A303 Highway, which passes

through the Stonehenge World Heritage Site. Critics of the project warn of irreparable damage to the site. UNESCO warned that Stonehenge and other UK sites could lose their world heritage status if the project continued. On July 30, 2021, the High Court ruled against the tunnel project proceeding as it found the government's approval of the project was made on unlawful grounds. Despite the court ruling, the government is once again trying to resurrect the project. The audience thanked Bollig for a very informative presentation and asked her many questions.

No recording is available for this presentation. However, Bollig provided links to informative videos:

- Presentations by Dr. Michael Parker Pearson https://www.youtube.com/watch?v=NDHmQkFaEAw and https://www.youtube.com/watch?v=XMMeM_hlYa8

- Hidden Landscapes Project - https://www.youtube.com/watch?v=uwNHats-1CU

- Blick Mead site - https://www.youtube.com/watch?v=NcF6KRNrmYQ

- The 1919-20 Aubrey Holes excavations - https://www.youtube.com/watch?v=tyN6lSb0GB4

- The Yamnaya - https://www.youtube.com/watch?v=rXsNKNZtdM0

The meeting adjourned at 8:03 pm. Submitted by Stacy Greenwood, Secretary for DC-CAS

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.

DENVER CHAPTER OFFICERS

President: Craig Dengel (craig.dengel@usda.gov)

Vice President: Kayla Bellipanni (bellipanni1990@gmail.com)

Secretary: Stacy Greenwood (stacygreenwood@comcast.net)

Treasurer: Michele Giometti (michgio@msn.com)

Membership Chair: Deb Bollig (debbollig@msn.com)

CAS Representative/PAAC Coordinator: Amy Gillaspie (amy.gillaspie@ucdenver.edu)

Directors: Reid Farmer (trfarmer60@gmail.com), Josef Garrett (josef.garrett@colostate.edu), Michael Kolb (mkolb5@msudenver.edu), Teresa Weedin (weedin@comcast.net)

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Suggestions for book reviews should be sent to the editor. Books for review should be sent to: Denver Chapter CAS, P.O. Box 100190, Denver, CO 80250-0190

Interim APB Editor: Stacy Greenwood stacygreenwood@comcast.net

WEBSITES: Denver Chapter: www.cas-denver.org Colorado Archaeological Society: www.coloradoarchaeology.org