Recent Research on the Roberts Buffalo Jump (5LR100), Northern Colorado

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In the late 1600s, American Indian hunters and their families coordinated their efforts to drive a herd of bison over a 15 m (50 foot) high cliff in what is now northern Larimer County. At this site, known as the Roberts Buffalo Jump (5LR100), at least 19 bison were killed and butchered, providing thousands of pounds of meat and other products that were vital to the survival of hunter-gatherer groups during this period. Bison jumps are most common in the northwestern Plains, with the primary concentration in northern Wyoming, Montana and southern Alberta. The Roberts Jump is one of the southern-most known examples of Late Prehistoric bison jumping on the Plains and provides important data on the life-ways of hunter-gatherer groups in northern Colorado at the precipice of contact with European traders and explorers.

The site is located at the foot of the northern Colorado hogback valleys, about 25 kilometers (15 miles) south of the Wyoming border. It is on a narrow strip of land between the cliff and the North Fork of the Cache La Poudre River, with open short grass prairie extends for miles south of the cliff. The site was first documented in 1966 by members of the Colorado Archaeological Society's Denver Chapter. Their excavation was followed by excavations in 1969 and 1970 by Colorado State University, with a summary of all three field season reported in 1971 as a master's thesis by Max Witkind. In 2012, I began a re-analysis of the collection for my master's thesis at CSU. My analysis utilizes new methods and research not available in 1971 to update the bison bone analysis, provide the first ever radiometric dates for the site, provide context for the different artifact classes such as projectile points and pottery, and explore site structure and spatial patterns of artifacts using GIS.

Radiocarbon dates on bone collagen, along with projectile point styles and pottery all indicate the site dates to the late seventeenth or early eighteenth century. Data also indicate the kill happened during the early to mid winter. The bison herd is almost entirely females and juveniles, with one older adult male. This is a typical cow-calf herd which forms after the fall rut and stays together throughout the winter and spring. Eight fetal bison are also in the assemblage. The gestational age of the fetuses (between 5-7 months) further indicates a winter season of death. Many historical accounts show that fetal bison were considered a great delicacy, and were often consumed immediately after the kill.

The bone element composition points to a bulk utility strategy where high utility elements (such as front and rear limb bones like the humerus and tibia) were more heavily processed. Other carcass portions were also butchered, but less intensively so. The element composition also indicates most of the butchery and processing took place near the kill, with few (if any) major butchery packages removed from the site for processing elsewhere.

The stone and bone tool assemblage is dominated by butchery and processing tools, including hafted end scrapers, knives, flake tools, and bone scraping or fleshing tools. At least 19 arrow points (primarily un-notched triangular and tri-notched) are in the assemblage, some of which have impact fractures indicating the impact from the fall did not kill all of the animals. Two different styles of pottery are at the site. One, classified as Uncompahgre Brown Ware, is commonly associated with Ute groups. Another, classified as Intermountain Ware, is commonly associated with Shoshone groups. These two styles being at the same site is rare; it could represent trade and exchange or perhaps intergroup cooperation. The assemblage also contains bone bead manufacturing debris as well as unfinished arrow points, indicating that butchery and processing was not the sole task being carried out.

Spatial analysis of the bone and other artifacts show distinct task areas within the site. Two
primary bone concentrations (with different element compositions) suggest primary butchery and secondary processing occurred in two discrete areas of the site. The secondary processing area contains a significantly greater number of higher utility elements, and is surrounding by flaking debris and stone tools related to butchery. Much of the pottery, burned bone, bone bead manufacturing debris and fetal bison bone are upslope of the main butchery and processing areas, which is also the flattest area of the site. This indicates another task area, where the group likely congregated to enjoy the fruits of their labor, including consuming portions of the kill such as the fetal bison.

The analysis of the Roberts Buffalo Jump provides valuable data on Late Prehistoric communal bison hunting in northern Colorado. Unlike many of the jump sites in the northwestern Great Plains, the evidence suggests the Roberts site was only used once. However, the people who used this site were intimately familiar with the landscape and bison behavior, even constructing a short line of cairns to help herd the bison to the intended jump point. Even though the people who used this site may not have been culturally related to their neighbors to the north, the methods are strikingly similar.

During the Early Ceramic period (approximately A.D. 150-1150), hunter-gatherer groups in northern Colorado were largely semi-sedentary. They lived in more permanent structures, like seen at the Kinney Spring site (5LR144), just east of the Roberts Jump. They were more logistically mobile, meaning they utilized resource patches around a semi-permanent base camp, and there is little evidence for mass bison kills. After the Early Ceramic period, people adopted a more residentially mobile strategy, meaning entire groups moved between resource patches. Then, around the 1500s, mass bison kills begin to re-emerge in the area. Many of these sites are only partially documented or only known from extensive artifact collections. The Roberts Jump is the best preserved and studied of these communal bison kill sites and provides important information and data about American Indians on the cusp of contact with European traders and explorers.

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Overview of the 1970 excavation. Note the disturbed sediment in the center of the frame, showing the location of the 1969 test trench leading to the base of the cliff and the 1966 excavation. Photo courtesy of Max Witkind.
View from the top of the cliff of the 1970 excavation and the North Fork of the Cache La Poudre River. The 1969 test trench was located on the lower part of the frame, running from the river to the cliff. Photo courtesy of Max Witkind.
Selected stone tools. Side notched arrow point (a); tri-notched arrow points (b-c); un-notched arrow points (d-f); unfinished arrow point (g); two sides of alternate beveled knife fragment (h); and parallel-oblique “Shoshone” knife fragment (i).
Selected ceramic artifacts from the Roberts assemblage. Intermountain Ware (a-b); Uncompahgre Brown Ware (c-d); refit portion of a circular and smoothed pendant-like artifact (e); and heavily polished and abraded ceramic artifact (f).
Plan map showing plotted flaking debris (gray points) relative to bone concentrations. Note the high frequency of flaking debris around concentration 2, which also has more higher utility bone than cluster 1.