Newsletter

Of the

South Dakota Archaeological Society

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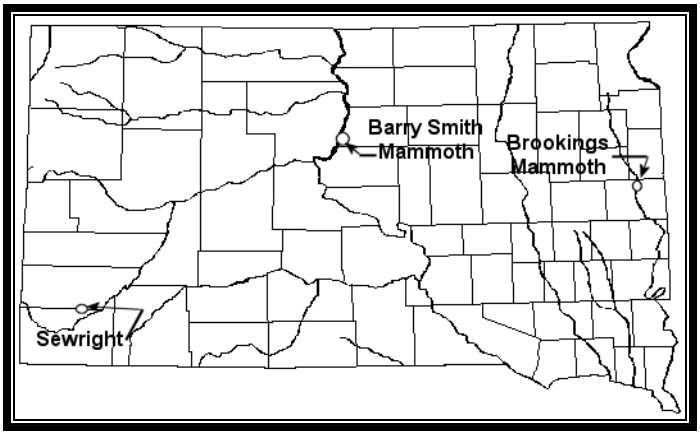
From the editor: This Newsletter contains some of the research projects in which SDAS members played an important role. Two of these are highlighted in this volume; one is two mammoths on the Missouri River and the second is a mammoth locality on the Big Sioux River where cultural material was found. Also in this volume is a new site currently being researched through a Department of Transportation project by James Donohue. For the sake of redundancy, I include a map showing the location of all of the sites discussed in this volume…. Newsletter Editor.



Current Research

A Preliminary Report on Excavations at the Brookings County Mammoth Locality, South Dakota

Michael Fosha, State Historical Society, Archaeological Research Center
April Woodside, Siouxland Heritage Museums, Sioux Falls

During a late summer canoe trip in 2001, Bill Huser, Ron Foster and Jason Foster found a section of a mammoth skull along the Big Sioux River in Brookings County, South Dakota. The skull was located in a portion of a slump block that was in imminent danger of being lost by the upcoming spring due to ice scouring and rising waters. Fortunately, Dr. Scott Pedersen (SDSU, Assistant Professor of Biology) gave his services in the recovery efforts. Following the discovery of the skull, a mandible was found in the water slightly upstream from the skull and a rib was found *in situ* in the cut bank. The skull was cast and moved to South Dakota State University, along with the mandible and rib.

Almost two years to the day of the salvage of the mammoth skull (a delay caused by a law suit in which ownership of the remains was trying to be established), a team of volunteers from the South Dakota Archaeological Society joined sponsoring members of the archaeological investigations, the Siouxland Heritage Museums and State Historical Society, to begin archaeological investigations at the site. The goal of the project was to determine in which geologic layer the mammoth bone occurred in and if there was any cultural material associated with the mammoth or if any culturally modified mammoth bone was present.

Figure 1. View to the north of the Brookings County Mammoth locality.

The current investigations were conducted early this September for five days. The first day was reconnaissance of the project area and cleaning off sections of the cut bank to determine the local stratigraphy. The project area consists of a Pleistocene/Holocene age terrace remnant of the Big Sioux River that abuts a low hill or glacial feature (Figure 1). A

cursory examination of the region failed to identify similar age terrace fill, suggesting that the adjacent hill may have protected this terrace remnant by impeding stream channel migration at this location for thousands of years.

Figure 2. View of the stratigraphy of the cut bank in Test Unit 1 (Matt Woodside is holding a rule 2 m in length).

The stratigraphy at the site (Figure 2) consists largely of alluvial/colluvial and aolean fill. Loess is a major component of the soils but it is not clear to what extent this includes a primary loess deposit or whether it is entirely derived from alluvial deposits. The most striking feature of the soil column is the very dark paleosol (lowest soil in the column) that rests upon a bed of sand. The soil shares many of the characteristics of what has been defined for the Northern Plains as the Leonard Paleosol which may date this soil to approximately ca. 11,900 to 8,500 B.P. (years before present) [see Fosha and Holen this volume for an explanation of the Leonard Paleosol and its temporal and environmental significance.]

Fragments of mammoth bone were observed in a small pile along the stream edge at the base of the stream bank in the approximate area the skull was removed two years previous. These were identified as pelvis fragments. An underwater search of the stream bottom located a large section of pelvis as well. A graver was found while cleaning a surface of the cut bank. While it was not found *in situ*, it was felt that it may have come from the Leonard Paleosol (Figures 3 & 5a) suggesting a Paleoindian age component.

Additional profiling a few meters away did identify a flake *in situ* (Figure 4) near the lower part of this soil close to the location of the mammoth skull find. While no mammoth bone was observed in the profile, it was understood that a Paleoindian component was present and decided to investigate this further. The investigations began by removing the overburden above the two finds of lithics and began excavating two 1 x 2 m units through the paleosol. A small number of additional flakes were recovered and it was decided to open up a larger area that incorporated the two units within a 15 m linear section of the cut bank. Numerous flakes and limited bison bone were recovered from the excavations. Tools included a biface and a unifacial stone tool (Figure 5, b & c). The biface is made of Knife River Flint (as are several of the flakes recovered from the excavations) and resembles an Agate Basin preform that failed during initial stage manufacture (see Fosha 2002 for additional information on Agate Basin points).

Figure 3. Darrel Denhe holding a graver found while exposing stratigraphy.

Figure 4. Doyle Crume pointing with a trowel to the location of the *in situ* flake.

Near the base of the paleosol, larger stone fragments, a pit feature, and what appears to be a stone filled pit (Figure 6) were encountered. Flotation of the basin fill resulted in the recovery of a few, very small fragments of burned bone. Profiling the possible stone filled pit resulted in the discovery of a section of mammoth bone.

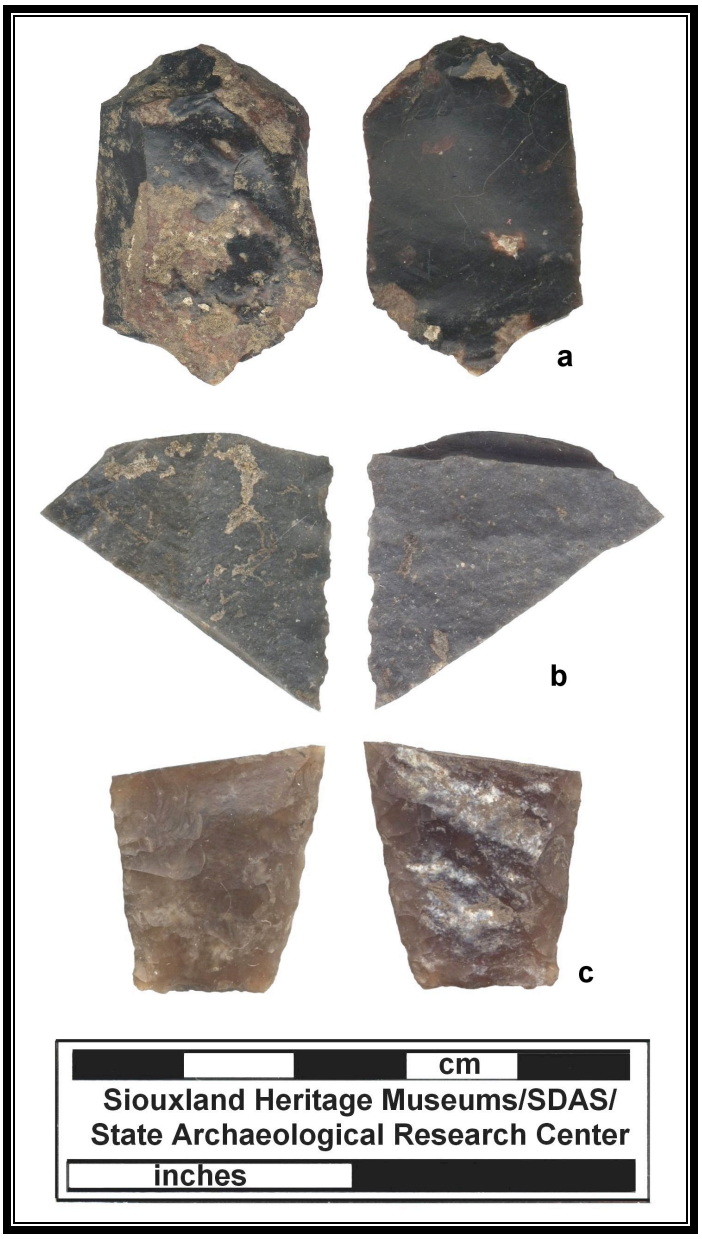


Figure 5. Selected tools recovered from the excavations.

The primary question surrounding this site concerns the relationship of the cultural component to the mammoth remains. Several possibilities exists concerning this question. First of these is that there are two components, one associated with a population making Agate Basin points (ca. 10,000 – 10,500 B.P.), while the other is a population which dates to the Clovis period (ca. 12,000 – 11,200) or an earlier population. At the present time, the Agate Basin component is highly speculative, based only on the shape of a single biface or preform fragment, and the fact that many Agate Basin assemblages in this part of the Plains include tools made of Knife River Flint. The features and occasional large stone fragments were identified near or at the base of the paleosol while many of the flakes, charcoal and bone fragments were recovered above the base of the paleosol which opens the possibility for two components. It is also possible that the mammoth bone at the site was present at the time of occupation and some of the bone was incorporated into the feature identified at the site. Recently, a charcoal sample was submitted for a 14C determination which will either clarify the possibilities or muddy the waters even more. Additional excavations are planned for the fall of 2004 to gain further insight into the geology and site development processes at this location.


Figure 6. View of basin and stone cluster at the base of the Leonard Paleosol.


Figure 7. Parting shot of 2003 investigations (left to right: Matt Woodside, Harlan Olson, April Woodside, Dick Axelson, June Axelson and Bob Wright.

The Siouxland Heritage Museums and the South Dakota State Historical Society wish to thank the following individuals who shared in the project: SDAS Members, Dick and June Axelson, Del Compaan, Elmer Compaan, Doyle Crume, Darrell Dehne, Rick Janssen, Chris Leatherman, Lyle Parks, Mike Pedersen, Matt Woodside and Bob Write. Soon to be SDAS Members: Harlan Olson, Scott Pedersen, Ron Foster, Jason Foster, Bill Huser and Richey Huser.

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2004 The Barry Smith Mammoth Site 39PO77, Two Mammoths on the Missouri River, Potter County, South Dakota. *Newsletter of the South Dakota Archaeological Society, Vol.*33, No. 2 & 3.

Fosha, Michael
2003 A Paleoindian Find in the Fort George Archaeological District, Stanley County, South Dakota

The Barry Smith Mammoth Site 39PO77, Two Mammoths on the Missouri River, Potter County, South Dakota

Michael Fosha, State Historical Society, Archaeological Research Center
Steve Holen, Curator of Archaeology, Denver Museum of Nature and Science

During the spring of 2002, mammoth and bison bone remains were discovered on the Missouri River by Barry Smith, Pierre Chapter member of the SDAS. In the spring of 2003, the site was visited by Barry, Richard Harnois of the U.S. Army Corps of Engineers (USACE) and Michael Fosha of the State Historical Society (SARC). Two separate mammoths were discovered on the beach of Oahe Reservoir including the one Barry reported. The bone segments that Barry had initially observed were now in very poor condition. Limited subsurface examination found broken bone fragments with spiral fracturing in well preserved condition.

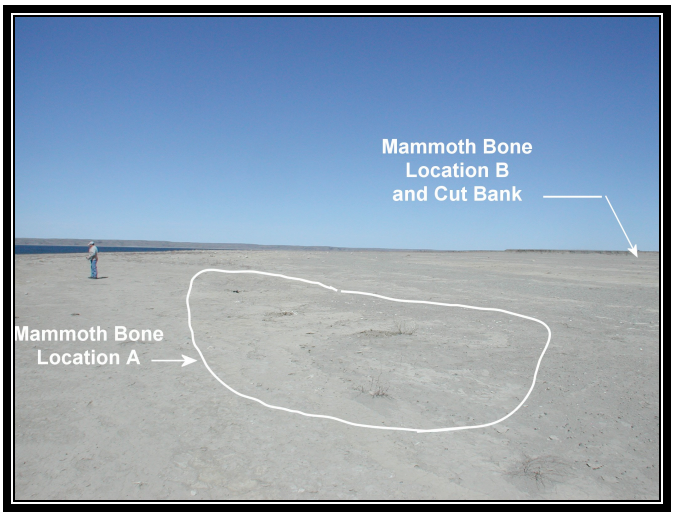

Figure 1. View of Location A and Location B at the Barry Smith Mammoth Locality, 39PO77.

Fragments of a second mammoth were observed near the terrace edge above the beach. This included small fragments of ivory, a bone section that appears to have been formed by direct percussion during bone modification, and unidentified fragments. The sediments observed in the adjacent terrace cut bank suggest Late Pleistocene fill is preserved that may contain more elements of the mammoth. It was decided that the mammoth and bison remains would require further investigations to understand the geologic and potential cultural setting of the remains.

In July, the U.S. Army Corps of Engineers, the Denver Museum of Nature & Science and the South Dakota Historical Society combined efforts to uncover additional data on these two mammoths. Conducting the investigations were Richard Harnois, and Amy Rubingh, USACE, Dr. Steve Holen, Curator of Archaeology, Denver Museum of Nature & Science, and Michael Fosha, SARC. Investigations included a survey of the project area, the hand excavations of several 1 x 1 meter test units and limited backhoe excavations near the terrace edge.

To understand the geologic setting of the mammoth, it is important to first understand the major Late Pleistocene geologic events occurring when mammoth lived along the Missouri River. Beginning around 12,500 years ago, the ice sheets that covered a portion of eastern South Dakota and aligned the east shore of the Missouri River began to melt very rapidly. With constant local and distant melt water moving rapidly southward, the Missouri River would have been a raging torrent for many years and would have flushed out any previously existing sediment. The local glaciers deposited large quantities boulders (known as glacial erratics), sand and gravel at the glacial margins (called end moraines). As these glaciers melted, large outwash plains of this sediment would have been created. Outwash plains not removed by stream action or erosion would have been buried by wind blown sediments (loess) and stream transported deposits (alluvium) which would have started accumulating near the end of the glacial melt possibly around 12,000 years ago, forming stream terraces of Late Pleistocene age fill. During periods of optimal stability, plant growth would have flourished and paleosols would have developed.

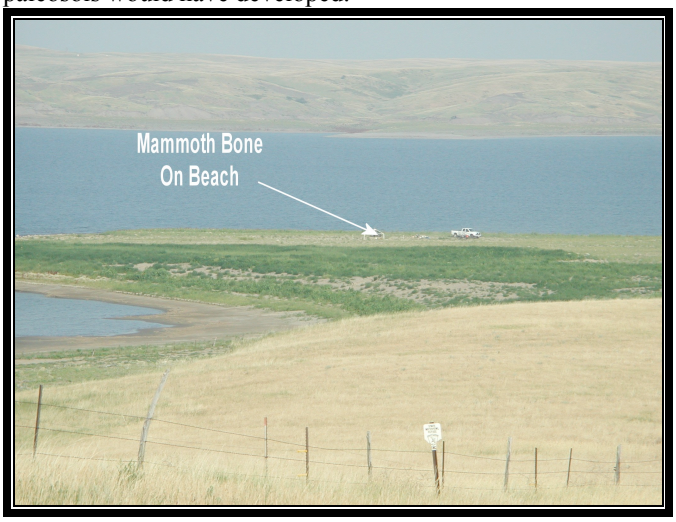

Figure 2. View of 39PO77 and location of mammoth bone on beach.

Through time, the river migrated across the valley floor and began to down cut, abandoning these terrace surfaces. Loess continued to accumulate on these surfaces up to the present day at various rates. Rapid burial indicates periods of sustained drought (lighter colored soils) while deposition may have been much reduced during periods of optimal conditions for plant growth (darker soils or paleosols).

The Barry Smith Mammoths are located on one of the high terraces of Pleistocene age outwash deposits located approximately 2.9 km east of the glacial end moraine. This terrace, the highest along this stretch of the Missouri River, has a mantle of a rather impressive soil column and continues for several miles along the east shore of the reservoir in this region.

A profile of the cut bank was excavated by backhoe to determine if mammoth bone was present within the sediments and to determine the relationship of the soil remnants present on the beach to those known to be

undisturbed in the soil column. The study of the sediments is an important aspect of any archaeological endeavor. Soils can be viewed as natural, three dimensional bodies of unconsolidated or non-lithified material bodies which constitute a medium for plant growth and form at the intersection of the lithosphere, biosphere, and atmosphere. The soils result from the complex interaction of factors of climate, organisms, relief (topography), parent material, and time (Donohue 2000 modified from Soil Taxonomy, 1975). This process is termed pedogenesis, which results in the formation of a series of soil horizons which, described together, constitute a soil profile (Donohue 2000). The study of the soil profile, or pedology, generates data on the environmental history of a site. Since many of the soil horizons reflect well-dated environmental episodes, these can be used in a limited way to get relative dates to cultural horizons within the soils.

The soil most pertinent to this study is described as the Aggie Brown Member of the Oahe Formation [ca. 13,000 to 8,500 B.P. (years before present)]. Clayton et al. (1976) describe the Aggie Brown Member as having two submembers, the lower is usually a light brown silt "conspicuously redder than any other part of the Oahe Formation". The uppermost submember is typically very dark and is identified as the Leonard Paleosol. The Leonard Paleosol has been radiocarbon dated at numerous locations in South Dakota. The closest to this site comes from 39PO61 approximately 6 km distant, and in the adjacent Ziebach County from a location on the Moreau River (Donohue 2000). The radiocarbon ages from the base of the paleosol date the inception of the Leonard Paleosol to 11,860 B.P. and 11,670 B.P. Collectively, these dates, as well as other supporting dates from the state, suggest that the Leonard Paleosol began to form approximately 11,900 years ago in South Dakota.

The soil that contained intact mammoth bone on the beach (Location A) was located in sediments that are assumed to predate those suggested for the Leonard Paleosol (Figure 3) and may relate to the lowest submember of the Aggie Brown Formation which may have begun to form 13,000 B.P. The bone was located approximately 70 cm below what is assumed to be the Leonard Paleosol in a dark reddish brown sandy silt/clay loam. While portions of the upper soil column, including the Leonard Paleosol still covers portions of the beach 300 m distant, only the lower portion of the second paleosol remained intact in the area where mammoth remains were excavated on the beach while the mammoth remains near the cut bank (± 30 m) was out of context.

The creation of Oahe Reservoir and its subsequent wave action has removed much of the overlying deposits in this area, exposing an extensive beach of glacial outwash, covered in some locations with remnants of the overlying post-glacial sediments. It is in these sediments that portions of one of the mammoths are located and where the majority of work was conducted this July.

Excavations took place near bone exposed on the surface. Much of the surface bone had been subject to rapid deterioration in the year between discovery and the present investigations. The sub-surface bone located in the post-glacial sediments was found to be in good condition and was stabilized in the field and cast for transport to the Denver Museum of Nature and Science where the bone was removed from the casts and preserved.

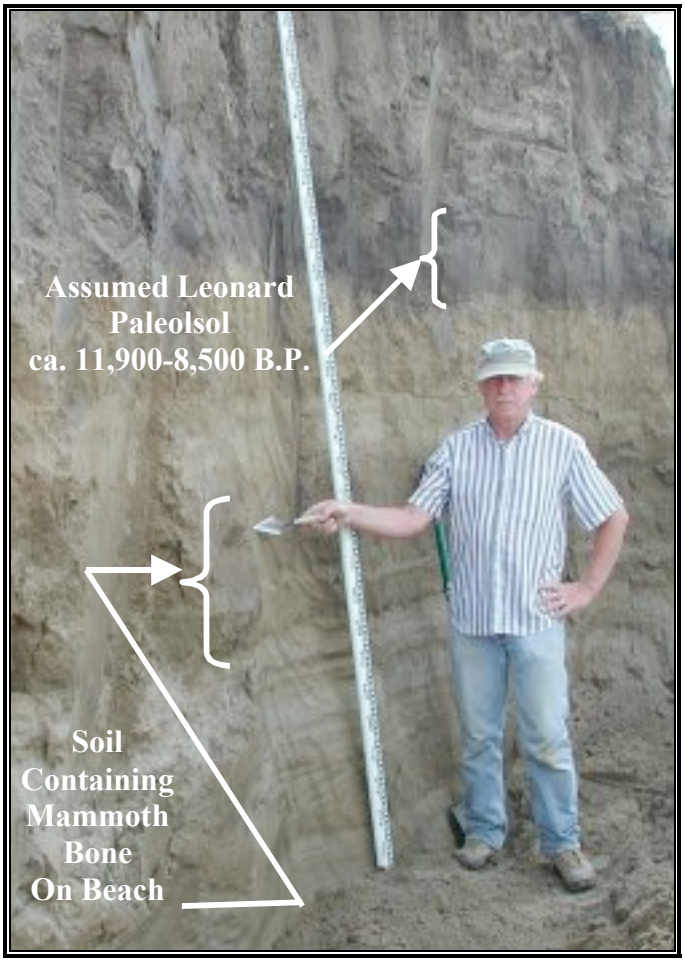

Figure 3. Dr. Steve Holen pointing to the soil containing mammoth bone on the beach at the cut bank profile at 39PO77.

One of the goals of the investigation was to identify if the mammoth was in its original context. The findings suggest that while the bone observed and excavated is in a soil which dates to the occurrence of mammoth in this region, the bone is not in its original post mortem location. The excavated mammoth bone appears to represent some of the lighter skeletal elements such as the pelvis. The pelvis of a mammoth is very large with a thin cortex. It is lighter weight in comparison to other limb bone and as such is more subject to movement through stream processes. Since none of the more dense bone, for example limb bone, was located in the area of excavation, it is assumed that this lighter bone had been moved from the remaining elements by stream action sometime prior to 12,000 years ago. The location of additional elements would require stripping the surface with a road grader or other form of earth-moving equipment. As mentioned above, the second set of mammoth remains are out of context and will not receive any additional work. However, bone fragments found in this location have many of the characteristics that are observed in mammoth bone processing. It is hoped that additional elements from the mammoth at Locality A will be located and that future investigations are possible.

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The Sewright Site (39FA1603): A Possible Goshen/Plainview Occupation on the Southeastern Flank of the Black Hills of South Dakota

James Donohue, State Historical Society, Archaeological Research Center

The Sewright site, 39FA1603, was recorded by SARC staff archaeologist Roger Williams in 2001 during a South Dakota Department of Transportation funded survey of the proposed expansion of SD 79 Highway. The site was first recorded as a lithic scatter consisting of four orthoquartzite flakes found along a cut bank of Elm Creek and one orthoquartzite flake found 70 m northeast of the cut bank in the back dirt of a prairie dog den. The site is situated on the T-2 terrace of Elm Creek, an intermittent tributary of the Cheyenne River in Fall River County, South Dakota. Elm Creek drains a segment of the southeastern Hogback Ridge of the Black Hills, and the site is situated some 1400 m southeast of Elm Creek's water gap in the Hogback.

The proposed road construction could impact a segment of the site approximately 245 m long by 35 m wide. Consequently, crews from the SARC, under the direction of Ned Hanenberger, initiated National Register evaluative test excavations at the site in 2003. To date, four 1 x 1 m test units and 32 50-cm-diameter shovel tests have been excavated at the Sewright site. These test excavations ranged in depth from 40 to 300+ cm below surface. The site surface exhibits a complex, undulating topography, and many of the test excavations were located at different elevations, making the correlation of potential components and site stratigraphy difficult. These correlation analyses have just been initiated, and the data are not complete. However, it does appear that the site has at least two cultural components and that packages of the natural strata have been removed by erosion in certain areas of the site.

Test Unit 2 was excavated near the highest elevation point on the T-2 terrace. This unit exhibited the most intact soil stratigraphy at Sewright. A preliminary description of the profile resulted in 16 soil horizons being defined, including two buried A-horizons (these former top-soils being designated the 2Akb and the 3Akb horizons, Figure 1). The 2Akb1 and 2Akb2 horizons may be distinct soils that have welded together. They could separate as more extensive site soil profiles are exposed.

Test Unit 2 also yielded hundreds (463) of cultural artifacts that exhibit a bimodal frequency distribution that clearly indicates the presence of at least two components (Figure 1). The near-surface component(s) is found in the upper 30 cm of the A horizon, and another very rich component was found from 120 to 170 cm below surface (Figure 1). Minor increases in artifact frequencies between 60 and 90 cm below surface may indicate the presence of additional components at these depths. However, the artifacts found from 30 to 120 cm below surface may be re-deposited due to bioturbation by the numerous animal burrows. Artifacts found in the various alluvial C horizon laminated sands between 2 m and 2.7 m below surface are almost undoubtedly secondary deposits that were either washed in or derived from bioturbation (Figure 1). Nevertheless, the investigators consider it to be highly probable that more than two components are represented at Sewright. Artifacts and faunal remains have been found to depths exceeding 3 m below surface, including flakes and faunal elements that appear to be elk and bison that were recovered from the 3Abk horizons and may indicate a cultural component in these horizons.

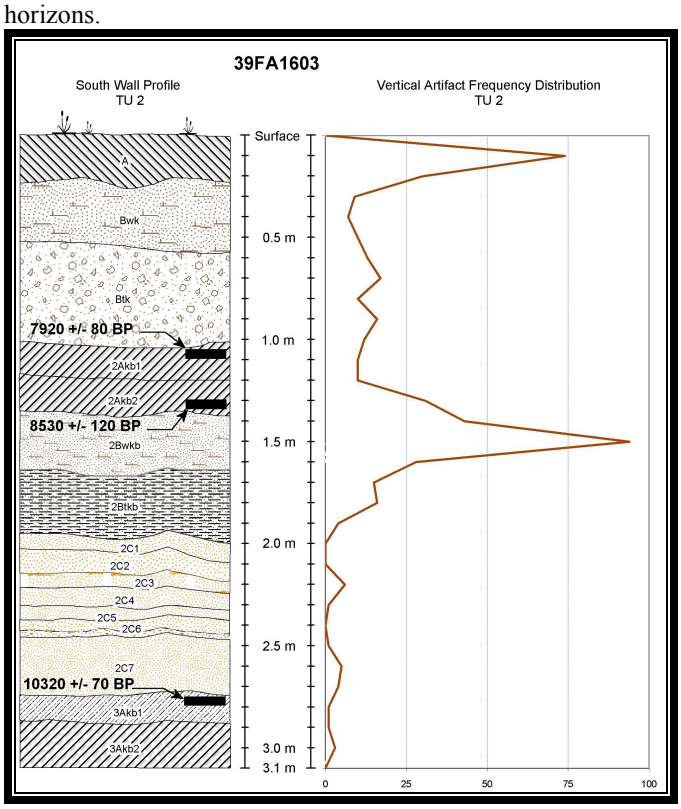

Figure 1. Soil profile at 39FA1603 showing artifact density and location of sediments submitted for ^{14}C determination.

The near-surface component(s) at Sewright were found primarily in the modern A horizon (topsoil) from 0 to 30 cm below surface (Figure 1). No temporally diagnostic artifacts have been recovered from this component, and the temporal and cultural affiliations, as well as the integrity of the surface and near-surface component(s), have yet to be determined. Based on the preliminary results of other ongoing test excavations along Highway 79, the components in the A horizon may date to the Plains Village/Late Prehistoric periods and, possibly, to the Late Plains Archaic period. There is a potential that the artifacts found in this A horizon represent multiple components in a compressed or mixed stratigraphy.

The second dense cultural component was found from 120 to 170 cm below surface in the 2Akb2 horizon. This component yielded a projectile point base found at the bottom of the 2Akb2 horizon that is remarkably similar to Goshen point bases recovered from the Jim Pitts site (Figure 2). The Jim Pitts site, 39CU1142, is a Goshen/Plainview camp site found in the southwestern Black Hills. At Jim Pitts, the Goshen/Plainview component dates to 10,160 RCYBP (Donohue and Sellet 2002). The recovery of one point base is not conclusive evidence for a Goshen/Plainview Paleoindian component at Sewright; however, the recovery of a spurred scraper (Figure 3) and large unifacial edge-modified flakes that are also similar to those recovered from Jim Pitts further supports a Paleoindian temporal affiliation for the deeply buried component at 39FA1603. This component also yielded large quantities of debitage and processed bison bone. The diversity in tool types, processed bone, and high densities of debitage suggest that the site functioned as a residential camp, as was the case with Jim Pitts.

Figure 2. Possible Goshen/Plainview point base from 39FA1603 (left) and a Goshen point base from the Jim Pitts site, 39CU1142 (right).

Bulk soil samples were taken from the 2Akb1, 2Akb2 and 3Akb1 horizons for bulk low carbon radiocarbon analyses of these horizons (Figure 1). The 2Akb1 sample (Beta-182720) yielded a conventional radiocarbon age of 7920 +/- 80 B.P., with a 2 Sigma (95% probability) calibrated calendar dates of B.C. 7095 to 6590 (calibrated B.P. dates of 9015 to 8540). The 2Akb2 horizon sample (Beta-182721) yielded a conventional radiocarbon age of 8530 +/- 120 B.P., with a 2 Sigma calibrated calendar dates B.C. 7795 to 7335 (2 Sigma calibrated B.P. dates of 9745 to 9285). The 3Akb1 horizon sample (Beta-182722) yielded a conventional radiocarbon age of 10,320 +/- 70 B.P., with a 2 Sigma calibrated calendar dates of B.C. 10,840 to 10,760 (2 Sigma calibrated B.P. dates of 12,790 to 12,700). These radiocarbon dates are internally consistent and do not appear to have been contaminated.

These radiocarbon data indicate that the possible Goshen/Plainview component at Sewright has a minimum conventional radiocarbon age of 8530 B.P. The point base was found at the bottom of the 2Akb2 horizon, and most of the artifacts from this component were recovered from below this horizon in the 2Bwkb horizon, thus the actual age of the component is very likely to be older than 8530 BP. There are 130 cm of sediment and 1,790 conventional radiocarbon years between the bottom of the 2Akb2 horizon and the top of the 3Akb1, dated to 10,320 B.P. The 75 cm of C horizons could have been deposited in a relatively short period of time. The 2Bwkb and 2Btkb horizons undoubtedly took a longer time to develop. At this point, based on sedimentation rates, the investigator estimates that the actual age of the possible Goshen/Plainview component is around 8,750 to 9,000 conventional radiocarbon years old. This age is quite young for Northwestern Plains Goshen/Plainview sites such as Mill Iron and Jim Pitts. However, it is not out of line for Plainview sites found in the Southwest. If the fauna remains and artifacts found in the 3Akb horizons are indicative of a cultural component, it dates to at least 10,320 conventional radiocarbon years B.P.

Figure 3. A scraper and spurred scraper from 39FA1603.

The cultural and natural stratigraphy at Sewright is complex. Additional test excavations are being conducted utilizing arbitrary 5-cm levels with intensive artifact piece-plot mapping being conducted in the Paleoindian levels. The more intensive work is being conducted in order to clarify the cultural stratigraphy at 39FA1603 as well as to better assess the integrity of the components at this site. It is hoped that actual charcoal samples will be recovered from the cultural components allowing for more precise radiocarbon dating of the occupations. The completion of these investigations should yield a clearer picture of the cultural and natural stratigraphy and characterize the integrity of the various components found at 39FA1603.

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REGISTRATION FORM
South Dakota Archaeological Society

This is the second and third issue of the 2003 SDAS *Newsletter*. The SDAS *Newsletter* is published in March, June, September and December. Membership in the Society is from January 1 through December 31. Membership provides a quarterly newsletter, an annual journal, as well as irregular announcements, free participation to some archaeological digs and voting rights at the annual meeting. Annual meetings generally include field trips, workshops, reports on South Dakota archaeological activities, and a keynote speaker at the banquet. Currently four local chapters, Sioux Falls, Northern Black Hills (Sturgis & Rapid City), Vermillion, and Middle Missouri (Pierre) exist and hold monthly meetings. Other chapters may be formed. The meeting usually includes a business session plus a guest lecture or slide show.

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