

UNCOVERING HISTORY:

THE LEGACY OF ARCHEOLOGICAL INVESTIGATIONS AT THE
LITTLE BIGHORN BATTLEFIELD
NATIONAL MONUMENT, MONTANA



BY
DOUGLAS D. SCOTT

United States Department of the Interior
National Park Service
Midwest Archeological Center
Lincoln, Nebraska

2010

UNCOVERING HISTORY:
THE LEGACY OF ARCHEOLOGICAL INVESTIGATIONS
AT THE LITTLE BIGHORN BATTLEFIELD NATIONAL
MONUMENT, MONTANA

BY
DOUGLAS D. SCOTT

Midwest Archeological Center
Technical Report No. 124

NATIONAL PARK SERVICE
Midwest Archeological Center

United States Department of the Interior
National Park Service
Midwest Archeological Center
Lincoln, Nebraska
2010

This report has been reviewed against the criteria contained in 43CFR Part 7, Subpart A, Section 7.18 (a) (1) and, upon recommendation of the Midwest Regional Office and the Midwest Archeological Center, has been classified as

Available

Making the report available meets the criteria of 43CFR Part 7, Subpart A, Section 7.18 (a) (1).



EXECUTIVE SUMMARY

The archeological overview and assessment of Little Bighorn Battlefield National Monument describes some relic collecting efforts and the professional archeological investigations that have been conducted in the park since the battle took place in 1876. The Little Bighorn battlefield became an archeological site the moment the battle ended, although it took the evolution on the field of anthropological archeology over the next 100 years before the necessary theoretical and methodological means were at hand to tease information from the context of the fight's debris.

The monument has a prehistoric as well as historic legacy in its archeological record. There are ten archeological sites in the boundary. Two are prehistoric lithic scatters and eight are isolated prehistoric finds. The prehistoric materials and sites have been deemed not eligible to the National Register of Historic Places. The tenth site is the battlefield itself is on the NRHP under multiple criterion, including D, potential to yield information.

Serious study of the battlefields physical evidence began in the 1940s under the general leadership of the first park superintendent, Edward S. Luce. The first formal archeological investigations occurred in 1958 following on the first metal detecting work by park historian Don Rickey and J. W. Vaughn. There was a significant hiatus of archeological work after that until the range fire of 1983 denuded the Custer battle unit. Since that time the archeological projects, using metal detecting transects, have inventoried over 1900 acres of land in and around the park. The park itself consists of 765 acres, all inventoried in 1984 and 1985. In subsequent years over 1200 acres outside the park boundary have been inventoried. Over 5000 battle-related artifacts have been collected, analyzed, reported, and cataloged.

The overview also assesses the role of volunteers to the successful outcome of many of the recent projects, and it discusses the public attention the 1980s archeological efforts engendered and its effect on park visitation and interpretation. Recommendations are made for dealing with human remains that turn up from time to time on the property. For human bone that is found within the park boundary documentation, mapping the location, and reburial on the spot is encouraged unless the area is subject to erosion or is in a high visitor traffic area. Then the bone should be collected and held until a qualified physical anthropologist can examine it and recommend appropriate disposition. Human remains found in the valley and off park land should not automatically be considered to be associated with the battle. The remains could be prehistoric or historic Native American as easily as they could be soldiers' remains. The Big Horn County Coroner should be contacted and his advice followed concerning those remains to be in concert with state law.

Finally the assessment offers a series of eighteen recommendations for potential future studies employing archeological methods and techniques. Suggested studies range from additional metal detecting inventories to excavations of some features in the park to underwater survey of the Little Bighorn River channel focusing on

LITTLE BIGHORN

areas used during the battle. Time and cost estimates are offered in 2010 dollars for each recommendation.

The Battle of the Little Bighorn archeological work added significantly to the theory of the anthropology of war, and was a signal event in the development of new methods to study battlefields and fields of conflict. The archeological work at Little Bighorn has developed and influenced new theoretical constructs that are now a part of battlefield archaeology and conflict archaeology studies worldwide.

ACKNOWLEDGEMENTS

The development of this archeological overview and assessment was made possible by a number of people. I would like to thank the entire staff at Little Bighorn Battlefield National Monument for their assistance and patience through the years of our work at the site. I am particularly indebted to former Chief Park Historians and Superintendents Douglas McChristian, Neil Mangum, and current Chief Park Historian John Doerner for their aid and insight into the various projects. Each worked tirelessly to make sure the projects got off the ground and each spent their time on the ground with the archeological teams. I would also like to thank curator Sharon Small and GIS specialist Melana Stichman for their assistance and comments. Without them and the work of former Superintendents James Court, Dennis Ditmanson, Barbara Souteer, Gerard Baker, Darrell Cook, and current Superintendent Kate Hammond none of these projects would have come to fruition. Thomas Thiessen formerly of the Midwest Archeological Center, Peter Bleed of the University of Nebraska, and historians Douglas McChristian and Jerome Greene not only reviewed earlier drafts, but provided advice, and acted as a sounding board on many occasions, for which I express my deepest gratitude. Jim Bradford, Archeologist for the Intermountain Region, was instrumental in seeing this effort as a priority for the park are more than appreciated. Charles Haecker, of the Intermountain Regional Office, Santa Fe provided many useful comments on earlier drafts of the work. As always, his comments and observations are very much appreciated. Bob Reece and the Friends of Little Bighorn provided a generous donation to the park to fund the completion of the overview which was begun in 2006, for which I am extremely grateful. Mark Lynott, manager, Midwest Archeological Center, National Park Service (MWAC), Jill Lewis, and Allan Weber facilitated the completion of the overview at MWAC, and it could not have been done without their assistance. I would especially like to thank Richard Fox, Jr., friend and colleague, for his review of the earlier draft of this overview and assessment. Without his initial assessment of the battlefield after the 1983 fire, and his constructive approach, and our work together during the mid-1980s fieldwork the projects would not have had the detail or depth of interpretation that made the work so valuable for over twenty-five years. Melissa Connor, as always, provided a variety of support and encouragement during the work on the Overview and Assessment.

This overview and assessment draws heavily on previously published works and unpublished reports related to the archeological investigations of the Little Bighorn Battlefield National Monument. Several of the previously published works summarized and interpreted specific elements of the story, but none have pulled together the full array of the archeological investigations of the battlefield. This archeological overview and assessment assembles the complete story as of March, 2010. I would like to thank the authors and co-authors of the earlier reports and publications who have contributed to the Little Bighorn archeological story over the years, and have allowed me to draw upon their combined work and knowledge to produce this comprehensive review of the state of the archeological knowledge of the Battle of the Little Bighorn. Their works are duly cited and acknowledged throughout the report and in the references cited and comprehensive bibliographic sections.

LITTLE BIGHORN

TABLE OF CONTENTS

Executive Summary.....	i
Acknowledgements.....	iii
Table of Contents	v
List of Figures	vii
1. LITTLE BIGHORN BATTLEFIELD: ARCHEOLOGICAL BEGINNINGS	1
2. ENVIRONMENTAL BACKGROUND AND REGIONAL ARCHEOLOGICAL CONTEXT.....	7
Environment	8
Regional Archeological Context.....	9
Early Prehistoric.....	9
Middle Prehistoric or Plains Archaic Period.....	9
Late Prehistoric or Plains Hunters	11
Protohistoric or Plains Equestrian Tradition	11
Historic Period	12
Military Period	12
Farming, Ranching, and the Modern Era	14
Prehistoric Sites at Little Bighorn Battlefield	14
3. BRIEF HISTORICAL OVERVIEW OF THE BATTLE	17
4. HISTORY OF ARCHEOLOGICAL RESEARCH AT LITTLE BIGHORN BATTLEFIELD	21
The Era of Souvenirs and Trophies.....	21
Early Physical Evidence Documentation Efforts	24
The Advent of Battlefield Archaeology.....	35
Compliance with Law	39
Informing the Public	40
Devising Archeological Investigation Methods.....	45
Evaluation of Inventory Methods	50
5. CHRONOLOGY OF LITTLE BIGHORN BATTLEFIELD PROFESSIONAL ARCHEOLOGICAL INVESTIGATIONS	53
Narrative Description of Archeological Investigations by Area.....	55
Custer’s June 23 Camp	55
Reno’s Valley Fight	56
Reno’s Retreat to the Bluffs	62
Reno-Benteen Defense and Weir Point Episodes	63
Medicine Tail Coulee Episode	72
Deep Coulee to Calhoun Hill Episode	74
Greasy Grass Ridge and Calhoun Hill	76
Calhoun Hill to Keogh and Last Stand Hill.....	78
Last Stand Hill and Custer Ridge Extension.....	78
Deep Ravine	84
Reno-Benteen Equipment Dump Site and the Horse Bone Grave Site.....	85
Geomorphology of the Little Bighorn Battlefield	89

LITTLE BIGHORN

Other Uses of the Archeological Evidence 91
 Evidence for Clothing and Equipment 92
 Weapons at the Battle of the Little Bighorn..... 96
Summary of Archeological Investigations..... 103

6. BONES ON THE BATTLEFIELD..... 105
 Indiscriminate Bone Collecting and Recovery..... 105
 The Reno-Benteen Skeletons..... 128
 Custer Field Marker Test Excavations 133
 The Reno Retreat Remains 144
 Miscellaneous Remains 146
 Summary of Human Remains Studies..... 149

7. RECOMMENDATIONS FOR FUTURE
ARCHEOLOGICAL INVESTIGATIONS..... 153

REFERENCES CITED 165

APPENDIX: Bibliography of Reports, Monographs, and Publications
Related to Little Bighorn Archeology 183

LIST OF FIGURES

Figure 1. General view of the rolling hills and northern plains grassland vegetation.	7
Figure 2. Plesiosaur fossil remains found in the National Cemetery.	8
Figure 3. Locations of prehistoric sites and isolated finds noted a Little Bighorn.	15
Figure 4. Map of the 1876 campaign and the site of the Little Bighorn battlefield.....	17
Figure 5. Norris' 1884 map of the battlefield overlaid on the modern aerial photograph.	23
Figure 6. An iron arrowhead transfixing a human cervical vertebrae.	25
Figure 7. A McClellan saddle possibly associated with the Little Bighorn collected from Indians.	26
Figure 8. Superintendent Edward Luce was the first person to attempt to document find locations.....	27
Figure 9. J. W. Vaughn and Don Rickey's soldier and warrior positions taken from a 1954 aerial photograph.....	30
Figure 10. Approximate locations of the Don Rickey find spots and Robert Bray 1958 excavations.....	33
Figure 11. Areas inventoried by metal detector between 1984 and 2004.....	36
Figure 12. One of the first group of volunteers who assisted on the Little Bighorn project.....	37
Figure 13. The 2004 Tour Road investigation archeologists and volunteers.	38
Figure 14. Excavations at the marble markers not only found human remains but captivated the public's imagination.....	39
Figure 15. Dr. P. Willey, University of California-Chico, a project volunteer is being interviewed.	41
Figure 16. Douglas Scott being interviewed by Australian Broadcasting Company.....	44
Figure 17. A typical metal detecting transect line at work.	44
Figure 18. Former park historian Douglas McChristian and volunteer Conrad Angone excavate a target.....	45
Figure 19. Former MWAC employees Harold Roeker and Carl Carlson-Drexler display the GPS unit.	46

LITTLE BIGHORN

Figure 20. The first artifact distribution maps used FastCad..... 47

Figure 21. All artifacts found or plotted on the park and on private lands and the areas formally inventoried between 1984 and 2004 with all data transferred to GIS 48

Figure 22. The analytical power of Geographic Information Systems is shown here as a weapons..... 49

Figure 23. Monument and area of Custer’s command’s June 23, 1876 evening layover or campsite. 58

Figure 24. A .45-55 fired cartridge case, a general service button back, a trouser button, and a spoon recovered at the Seventh Cavalry June 23, 1876 camp site..... 59

Figure 25. Deer Medicine Rocks is a prominent landmark and Indian sacred site 60

Figure 26. Finds made by Jason Pitsch and mapped in 1993 , plotted on the modern aerial photograph..... 60

Figure 27. Metal detected .45-55 cartridges and cartridge cases found at the Reno-Benteen defense site. 66

Figure 28. Distribution of Indian fired .44-caliber cartridge cases and bullets at the Reno-Benteen Defense Site. 66

Figure 29. Distribution of Indian fired .50-caliber cartridge cases and bullets at the Reno-Benteen Defense Site. 67

Figure 30. Distribution of Indian fired miscellaneous caliber bullets at the Reno-Benteen Defense Site..... 67

Figure 31. Distribution of Army fired .45-55-caliber cartridge cases and bullets at the Reno-Benteen Defense Site. 68

Figure 32. Distribution of Army fired .45 Colt-caliber cartridge cases and bullets at the Reno-Benteen Defense Site. 68

Figure 33. Distribution of Army and Indian artifacts found on and around Weir Point 71

Figure 34. Artifacts found in and around Medicine Tail Coulee..... 77

Figure 35. Artifact distribution of .44-caliber Indian fired weapons, including Henry rifles, Model 1866 and Model 1873 Winchesters at the Custer Battlefield..... 79

Figure 36. Distribution of the Indian fired .50-caliber firearms at the Custer battlefield 79

Figure 37. Army and Indian fired .45-55 caliber cartridge cases and bullets at the Custer Battlefield.....	80
Figure 38. Distribution of the few Army and Indian fired .45-caliber Colt revolvers at Custer Battlefield	80
Figure 39. Lt. Col. Elwood Nye whose interests in the Little Bighorn story helped stimulate work on the horse bone grave	87
Figure 40. The crude excavations of the horse bone grave	88
Figure 41. Robert Nickel employs ground penetrating radar unit in the initial search for the horse cemetery.	89
Figure 42. Excavation and recording of the horse bone grave pit.....	90
Figure 43. A stone marker that commemorates the horses lost in the battle.	91
Figure 44. Interpretive panel featuring the archeological investigations and historical accounts of the horse grave pit.	92
Figure 45. Tack buckles, saddle plates, staples, and harness rivets.	95
Figure 46. Examples of .44 and .45-caliber bullets from the battlefield.....	97
Figure 47. Examples of .44-caliber, .45-Colt, and .45-55-caliber cartridges and cartridge cases	98
Figure 48. Examples of .45-55 cartridge cases.....	99
Figure 49. A .50-caliber bullet with bone embedded in the body.	100
Figure 50. Four of the twelve iron arrowheads found during the archaeological investigations.	101
Figure 51. Lt. Crittenden’s grave as seen about 1892.....	106
Figure 52. This photograph of Last Stand Hill taken by Stanley Morrow depicts the nature of the battlefield in 1879	107
Figure 53. The Keogh area marker cluster, seen here about 1892	108
Figure 54. This skull of soldier found originally in 1903	119
Figure 55. A typical excavation plan map of the archaeological finds.	136
Figure 56. The Indian Memorial completed in 2003	158
Figure 57. Known modern human cremations that have been clandestinely placed on the battlefield	159

LITTLE BIGHORN

Figure 58. A Native American rock cairn locale near the Reno-Benteen
Defense Site..... 160

Figure 59. Detail of the rock cairn..... 160

1. LITTLE BIGHORN BATTLEFIELD: ARCHEOLOGICAL BEGINNINGS

It might be argued that the Little Bighorn battlefield became an archeological site the moment the battle ended, or perhaps when the burial parties left the field, leaving nature to take its course on the debris of war left behind from the fight. However, it seems unlikely that anyone in June 1876 or the remainder of the nineteenth century even remotely considered that possibility. That they were a part of an event that had historical import was not lost on the participants, and some even used the distribution of the dead and clusters of fired cartridge cases to make deductions about what may have happened. Though the importance of physical evidence was not lost on these individuals, preservation of the debris of war and the context in which those artifacts were associated likely never entered their minds. It would take time and the evolution of the field of anthropological archeology over the next 100 years before the necessary theoretical and methodological means were at hand to tease information from the context of the fight's debris to build an increased understanding of the multitude of individual actions that is the Battle of the Little Bighorn.

Interest in the physical evidence of the battle is not new. It began with the victorious warriors who took war trophies, with the soldiers who buried the dead and commandeered souvenirs, and with later visitors to the site who wished to have a tangible reminder of their sojourn on the hallowed ground. Souvenir collecting on battlefields has a long history, and the Little Bighorn battlefield is no exception to that story. Most early collection efforts are undocumented and if an item surfaces today in private hands or at a public institution its association with the battle is often little better than hearsay. Those relics are of interest, but they are not the main concern of this archeological overview and assessment. This work is intended to pull together the story of how the battle's physical evidence came to be regarded, not as mere relics or souvenirs, but as artifacts and data that can aid in understanding the events of the past in greater and more precise detail. That insight did not begin with the first professional archeological studies in the late 1950s by Robert Bray, or with the opportunity presented by the range fire in August 1983; it began with researchers of the 1930s, like Lieutenant Colonel Elwood Nye, Joseph Blummer, R. G. Cartwright, and Edward S. Luce. Their efforts to find, document, and interpret relics of the fight were incipient archeological investigations, although not performed by trained archeologists. At the time, Monument Superintendent Edward Luce was well aware he needed professional archeological assistance to aid his endeavors. He requested it as early as 1943, but it was not forthcoming until 1958. Even then the work of Don Rickey and archeologist Robert Bray did not engender a wellspring of interest beyond Little Bighorn enthusiasts. It took the range fire of 1983 and project funding by private donations to conduct the first comprehensive professional archeological investigation of the Little Bighorn Battlefield National Monument (then Custer Battlefield National Monument). The professional archeological work that began with Richard Fox in August 1983 continued on a sporadic, but annual basis until 2005.

The number of words and reams of paper resulting from these investigations is impressive, but they do not begin to convey the whole story of what was found nor how

LITTLE BIGHORN

profoundly traditional interpretations of the battle were affected and revised as a result of the discovery and careful recordation of thousands of pieces of physical evidence of the fight between the Lakota and Cheyenne and the Seventh US Cavalry on June 25 and 26, 1876. The archeological projects have varied from the broad level inventory to some that have focused on answering specific questions. In terms of the battle sequence the projects were not undertaken in chronological order or in any particular sequence. Rather each was done as park needs or funding permitted. This has resulted in a large number of reports and documents, some published and others with only limited distribution. Putting it altogether, however, yields a substantial body of new information about the battle and its aftermath. In the course of the archeological projects there has been the opportunity to study the Custer fight, the Reno-Bent defense, movements to and from Weir Point, the fight in Medicine Tail Coulee, the actual remains of some of the soldiers who fought the battle, and one of the Seventh's pre-battle camps.

On another level, the archeological investigations and the broad public interest in the work became a signal event in the history of American archeology. The project results were quickly published and widely disseminated, and in a short time they had world-wide influence. The Little Bighorn archeological work became the focal point for the rise of a new field of archeological investigation, battlefield archeology. Now a well established discipline, battlefields around the world are being archeologically investigated with new insights to the past being revealed almost daily. The field and analytical methods, as well as the theoretical underpinning of battlefield archaeology were pioneered at the Little Bighorn. Today conflict archeologists investigate sites of prehistoric conflict, classical conflict like the destruction of three Roman legions by the Germans in 9 AD; historic conflict and war, such as Coronado's entrada into the American southwest, the 1745 crushing of the Jacobites at Culloden Scotland, the 1861 Battle of Manassas or Bull Run, the World War I battlefields of the Somme and Flanders, the Ardennes sites of World War II; as well as recent conflicts like human rights and war crimes investigations in El Salvador, Rwanda, Croatia, Bosnia, and Iraq. They employ or have adapted to their specific site or situation the basic theoretical and methodological constructs developed at the Little Bighorn. It all began with a grass fire in August 1983.

The earliest documentation of items actually collected from the Battle of the Little Bighorn are those made by a medical doctor, Assistant Surgeon Robert W. Shufeldt, who visited the battlefield in late June, or possibly early July, 1877. At that time he collected a human skull, not as a souvenir, but as a medical specimen. Surgeon Shufeldt was with a party of Sioux scouts under the command of Captain Calbraith Rodgers of the Fifth Cavalry who were conducting cavalry patrols in the area in June and July 1877 (Hardorff 1984:57-8). Within a few days of Shufeldt's visit Philetus W. Norris arrived on the field, on a personal mission to recover the skeletal remains of his friend Charley Reynolds for reburial in the East. Norris' party met Rogers' Fifth Cavalry scout as he returned to Post No. 2, soon to become Fort Custer, on July 6 (Norris 1884).

Norris, a colorful individual who had traveled widely through the American West, first visited Last Stand Hill where he picked up army carbine cartridge cases, a fired Henry .44-caliber cartridge case, a fired lead ball, and a tack decorated stock and breech of a Sharps carbine. Later that day he found the bones of his friend Charley Reynolds and removed them from his burial site in the Reno Valley fight area. Norris'

checkerboard career included experience as a businessman, soldier, legislator, writer, poet, explorer, second superintendent of Yellowstone National Park, traveler, and a field archeologist for the Smithsonian Institution (Chittenden 1900:303-305; Binkowski 1995; Scott et al. 2006). Shufeldt and Norris may not have been the first persons to take away relics from the Battle of the Little Bighorn but they appear to be the first to have documented their collection efforts.

Throughout the ensuing years scores, if not hundreds of people, scavenged the field of battle for souvenirs of the famed 1876 fight, some picking up a single cartridge case or some other relic of the event, others undoubtedly taking many more. Until the beginning of the twentieth century relic collecting activities were legal and even encouraged by the site caretakers. Even so, there were voices that decried the loss of this heritage and tried to bring these activities to the conscience of the American public (New York Times, February 16, 1908). Such concerns were the nascent voice of early preservationists, and one of the first to be able to do something about both natural cultural resource preservation was President Theodore Roosevelt. He advocated laws to protect important historic and archeological sites, and in 1906 Congress passed and Roosevelt signed the Antiquities Act which protected any archeological resource over 100 years of age (Lee 1970; Waldbauer and Hutt 2006). The Little Bighorn was then but a 30 year old memory and its resources did not yet fall under the Antiquities Act. Nothing further was done until late in the second quarter of the twentieth century when a different perspective to the site's use arose, one of interpretation, preservation and protection beginning with the site's administration by the National Park Service. The first National Park superintendent, Edward S. Luce, began a long tradition of compiling and documenting battle relic find locations, and seeking additional evidence of the battle not recorded in the historic documentary record (Greene 2008). While many of Luce's and his fellow researchers' finds made their way into the park collections, many were kept by individual discoverers with Luce's blessing as well. Luce, among others, soon realized that indiscriminate relic collection would soon destroy the very physical evidence he wished to find, document, and interpret. Luce was the first superintendent to halt collection on the park property and to seek professional archeological assistance. Luce and other early researchers learned to appreciate that physical evidence of the battle was important and deserved preservation, and they did their best to document their field efforts. Unfortunately, others did not share their attitude and over the years many persons, some under cover of night, were illegally stealing America's shared heritage from the park and Crow Tribal lands.

National Park Service archeologist's Robert Bray's 1958 work at the Reno-Benteen defense site began an era of professional archeological research at the Little Bighorn Battlefield that now has a history of over 50 years of professional investigations. However, it was the wildland grass fire of 1983 that spurred the most intense archeological studies of the park and its surrounding lands. Since Richard Fox, Jr. first walked the burned ridges and swales of the Little Bighorn Battlefield National Monument conducting the initial post-burn archeological assessment, there have been four major inventories, two major excavation projects, and over a dozen cultural resource management and small research projects completed in the park and on the lands surrounding the monument.

LITTLE BIGHORN

The goal of this overview and assessment is to document the history of the archeological investigations of the Little Bighorn Battlefield National Monument. National Park Service guidelines define an archeological overview and assessment as the fundamental component of a park's archeological resources management program. It is intended to "describe and assess the known and potential archeological resources in a park area" (National Park Service 1997:25). Therefore, this document is an assessment of past archeological excavations and investigations and is used to determine the needs and designs of future archeological studies for research, interpretation, or park management purposes. The document serves as a source of information for General Management Plans, other related management documents such as the Cultural Landscape Report and the Park Fire Management Plan, as baseline data for an Archeological Base Map of known resources, and is intended as baseline data on park archeological resources for use in creating or updating the Comprehensive Interpretive Plan, as well as defining potential research needs relevant to the park's mission.

This document describes and assesses the previous archeological excavations and investigations conducted at Little Bighorn Battlefield National Monument. Where records or documentation exist, the work of relic collectors is also described and assessed relative to the professionally conducted archeological investigations. The professional archeological work is well documented and that documentation is in the form of trip, project, training and technical reports, as well as published monographs and books. Discussions of these investigations are presented chronologically by project date and year and in narrative format that describe the investigations and results by subject and spatial area. Finally, recommendations are made for future study that may aid the management and interpretation at Little Bighorn.

A variety of records were consulted to assess the archeological resources at Little Bighorn Battlefield. These consist of field notes and completion reports collected from 1958 to the present that are currently housed at the park and the Midwest Archeological Center (MWAC). Other relevant information consulted includes project specific memoranda contained in the park museum collections and in the administrative files under file headings H-22, cultural resource studies and research, and H-24, archeological and historical data recovery programs. A file search was also conducted with the Montana State Historic Preservation Office to insure no other archeological resources are recorded in their system that are not known to the Park.

There are ten archeological resources recorded in the park. One is the battlefield itself, designated 24BH2175 in the Montana trinomial system, which is listed on the National Register of Historic Places. The National Register of Historic Places form lists one of the contributing factors to its significance as its potential to yield information employing archeological techniques. The national significance of Little Bighorn Battlefield National Monument has long been established under Criteria A, B, and C. The results of the archeological investigations (Fox 1983; Scott and Connor 1986; Scott and Fox 1987; Scott et al. 1989) of the battlefield documented an added dimension of the site's national significance and supported its inclusion on the National Register under Criterion D.

The other eight archeological sites found within the park boundary are prehistoric sites or isolated finds that are discussed in the Chapter 2. Copies of the archeological project records will be found in the following Midwest Archeological Center museum property accessions: 207, 319, 541, 552, 565, 870, 871, 1071, and 1077. All original project records and artifacts are now in the park collections. Copies of all project reports will be found in the MWAC library and files and the park library and files.

In summary this document assesses, lists, and describes previous archeological investigations that have occurred in and around the park, following the general format prescribed for National Park Service archeological overview and assessments. Following the summaries of archeological remains, specific recommendations are made for archeological resource management of the site and its environs. Interpretive potential of archeological remains and park research priorities are suggested. To enhance park management efficiency and support the interpretative focus of the park, a program of additional archeological work is recommended. In part, the archeological overview and assessment should be viewed as a companion volume to the park's administrative history (Greene 2008).

LITTLE BIGHORN

2. ENVIRONMENTAL BACKGROUND AND REGIONAL ARCHEOLOGICAL CONTEXT

Little Bighorn Battlefield National Monument is located in Big Horn County, southeast Montana, on the right bank (east side) of the Little Bighorn River, about fifteen miles east of Hardin, and comprises 765.34 acres (Figure 1). The acreage is divided into two separate parcels of land: Custer Battlefield, which has been designated Custer Battlefield Historic District 1 that includes Last Stand Hill, the Indian Memorial, the visitor center/museum, Custer National Cemetery, the Stone House/White Swan Library, and the NPS Mission 66 buildings and housing area; and Historic District 2 which encompasses the Reno-Benteen defense site located about five miles south consisting of 162 acres. The land between the two battlefields is under private ownership. A right-of-way for the battlefield tour road, also known as Route 10, connects the two battlefields. The right-of-way was originally granted to the War Department, which maintained jurisdiction of the site from 1877 to 1940, on June 28, 1938 by the respective landowners for public purposes. The entire monument lies within the Crow Indian Reservation, one of seven Indian reservations in Montana. The battlefield consists of natural hills and hogback ridges cut by ravines and coulees which lead to natural fords of the Little Bighorn River. Outside of these natural fords the river on the east (battlefield) side is lined with steep bluffs. The vegetation is mainly native grasses, sagebrush, yucca, and prickly pear cactus, with chokecherries in the ravines and cottonwoods in the riparian zone.



Figure 1. General view of the rolling hills and northern plains grassland vegetation that predominates at the Little Bighorn Battlefield National Monument.

ENVIRONMENT

The Little Bighorn battlefield lies within the Central Grasslands vegetative zone (Payne 1973) and in the geological formations of late Cretaceous sandstone and shale (Alt and Hyndman 1986). The soils range from sandy and gravelly along streams and rivers to heavy alluvial clays with a grayish brown topsoil on the upland areas. The Monument has two distinct ecological and topographic zones, the dry uplands and the Little Bighorn River floodplain, with an elevation range of 3,000 to 3,400 feet. The uplands are formed from the Bearpaw and Judith River formations. The floodplain is a Quaternary alluvium.

Climatically, the park is characterized by a dry continental type of extreme fluctuations in temperature and moisture. The topography is rolling plains that feature a variety of grasses and sagebrush. Silver sagebrush is the predominate specie with Western snowberry, chokecherry and wild rose commonly found in better moisture conditions such as coulee bottoms. Common grasses and shrubs are Sandberg bluegrass, green needlegrass, bluebunch wheatgrass, northern reedgrass, prairie junegrass, mountain muhly, prickly pear cactus, fringed sagewort, and rabbit grass.

Animal species were once quite diverse, before the Euro-American ranching era. Today horses and domestic cattle dominate the grazing species. At one time the area supported bison, bear, elk, deer, rabbit, fox, coyote, badgers, pronghorn antelope, and the ubiquitous prairie dog among other species. Small mammals are regularly seen in the park as are deer, the northern grasshopper mouse, thirteen-lined ground squirrel, and northern pocket gopher. A variety of birds are regularly seen in and around the park, including the western kingbird, American goldfinch, western meadowlark, and Golden and Bald eagles. The park forms a small wildlife refuge in the midst of the intensely grazed Crow Reservation.

Although technically outside the purview of an archeological overview, it should be noted that the park has yielded a significant paleontological resource. In November 1977 park maintenance staff was excavating a grave in the National Cemetery when backhoe operator Clifford Arbogast partially disturbed a fossilized bone deposit. Robert Stops and William Hartung notified Superintendent Richard Hart, who in turn contacted Alan Tabrum of the University of Montana's Department of Geology. Tabrum (1978) excavated the remains and determined them to be a relatively complete example of a short-neck plesiosaur (*Dolichorhynchops osborni* Williston), a Mesozoic reptile and perhaps the first one found in Montana. The fossil (Figure 2) was later transferred to the Smithsonian



Figure 2. Plesiosaur fossil remains found in the National Cemetery during routine work.

Institution, National Museum of Natural History where it was on display during the 1980s. It is currently in the collections as USNM Specimen 419645.

REGIONAL ARCHEOLOGICAL CONTEXT

Little Bighorn Battlefield National Monument is located in the prehistoric cultural subarea known as the Northwestern Plains. The immediate area surrounding the park has not been the subject of extensive investigation. Only two sites, both historic bridges (24BH2427 and 24BH2247), are recorded in the vicinity of the park, although the park has nine sites recorded within its boundaries.

Walker-Kuntz and Walker-Kuntz (1999:4.1-4.8) presented a review of the regional archeological data associated with the park. This regional cultural summary draws heavily on their work. The Northwestern Plains range from central Alberta, Canada to southern Wyoming and from western North Dakota to western Montana. For at least the last 12,000 years American Indians occupied the area and practiced a semi-nomadic hunting and gathering economy. Initially their livelihood focused largely on now extinct Pleistocene fauna. Around 10,000 years ago, the modern bison replaced the mega fauna as the main prey species. Although a single economic adaptation persists throughout prehistory, slightly different environmental adaptations and different tool types do serve to differentiate cultural period and phases. The prehistory of the region is divided into four major traditions; Early, Middle and Late Prehistoric periods, and the Protohistoric period. The historic period begins with the introduction of early Euro-American explorers and written documentation in the area.

Early Prehistoric

Paleoindian groups are documented as living in the region in post-glacial periods that are usually characterized as cool, moist and conducive to expansion of forests (Bryson et al. 1970). Pollen profiles from Paleoindian sites, such as Mill Iron in southeastern Montana, indicate the presence of a cool but dry sage-brush steppe environment (L. Scott 1987) in contrast to the forested view. In general, the forests probably extended lower into the foothills and further upstream into tributary valleys than they do today, and it appears that upland locations consisted primarily of grasslands or more arid sagebrush steppes.

Most Paleoindian sites in Montana are located in foothill settings and none are identified in the immediate area around the park. Paleoindian sites are reported in the southern flanks of the Bears Paw Mountains (Davis 1976), the foothills of the Limestone Hills (Davis et al. 1980), the Pryor Mountains (Loendorf 1969), and on old terraces of the Missouri River, particularly in the area south of Great Falls (Shumate 1965).

Middle Prehistoric or Plains Archaic Period

The early part of the Middle period occurred during a relatively dry climatic episode (Atlantic, Hypsithermal or Altithermal) roughly 8500 years ago. Archeological evidence of human occupations suggests people generally concentrated in protected

LITTLE BIGHORN

and humid locations such as mountains, foothills and major river valleys during the Atlantic climatic episode (Husted 1969). The Middle period is defined by a noticeable change in subsistence economies as the emphasis on big game hunting gave way to a more diversified plant and animal usage. Hunter-gatherers appear to have relied on a wide range of small animals and birds, but with little use of the bison herds (Beckes and Keyser 1983; Lahren 1976).

Projectile points of this age include the Bitterroot/Mummy Cave Complex of large side-notched points. Local lithic materials were emphasized, with evidence of more recycling and conservation than during the Early period (Reeves 1990).

During the middle part of the Middle period, groups began to adopt increasingly specialized subsistence and settlement strategies. The McKean complex (4500-3100 BP) roughly corresponds with a cool and moist climatic episode, basically reflecting modern conditions. These climatic conditions likely led to increased resource availability which in turn probably led to two distinguishing McKean complex characteristics, population growth as reflected in a dramatic increase in the number of sites (Deaver and Deaver 1988; Frison 1991; Gregg 1985) in the region, and a wider geographic distribution of sites. McKean materials are found throughout Montana, Wyoming, the Dakotas, northern Colorado, western Nebraska, Alberta, Saskatchewan and Manitoba (Gregg 1985). Topographically, these sites are found in foothill-mountain areas, river valleys (Davis 1976), intermontane basins and the open plains/prairies (Deaver and Aaberg 1977). Artifacts of this age, Oxbow, McKean and Duncan/Hanna points, have been recovered in greater numbers than Early or early Middle types (Deaver and Deaver 1988).

The settlement pattern for southern Montana McKean sites appears to have been based on an archaic lifestyle, one that maintained a broad spectrum subsistence economy based on the exploitation of seasonally available resources. Loendorf (1973) posits this lifestyle was practiced by native populations in the Pryor Mountains from approximately 7000 BP until several hundred years ago.

The middle of the Middle period is defined by the archeologically recognized evidence of stone boiling and bone grease extraction techniques in the Northwestern Plains. This activity is represented by pit features filled with rock and bone, fire-cracked rock and large quantities of singed or burned bone and piles of bone. The end result of bone grease extraction was the production of pemmican, a new meat preparation and storage technology that permitted an increased surplus of stored food. Greater attention was devoted to bison hunting, resulting in increasingly regular movement across open prairie settings.

The final part of the Middle period is marked by further adaptations toward upland living and the exploitation of open prairie resources. Groups continued to occupy river valley and foothill settings, while also devoting greater time and attention to the prairies. This change is archeologically interpreted as the adoption of cooperative hunting techniques and the development of the tepee, a specialized structure suited for open plains habitation. Complexes identified include Pelican Lake and Sandy Creek.

Late Prehistoric or Plains Hunters

The Late Prehistoric period is seen as an increasing specialization toward upland living and the utilization of open prairie resources, most importantly bison. The vast majority of Late Prehistoric sites occur in open prairies. The major complexes associated with the Late Prehistoric are Besant, Avonlea and Old Women's.

Frison et al. (1996:25) state "Besant peoples were without question the most sophisticated pedestrian bison hunters to occupy the North-western Plains." Besant sites are common across the Northern Plains. The Besant complex is the earliest known archeological unit within the Northern Plains region where ceramics have been found. During the Avonlea period, the use of the bow and arrow becomes widespread, as does an increased use of bison as a primary resource (Reeves 1990). The Avonlea projectile point is characterized by its thinness, extreme symmetry and excellent manufacture.

The final complex associated with the Late period is Old Women's. Most sites investigated from this complex reflect bison procurement or processing activities. The jump and pound or corral was employed through most of this complex.

The diagnostic projectile points of this phase, which are the predominant artifact type found at these sites, are the Prairie Side-Notched and Plains Side-Notched points (Kehoe 1973; MacNeish 1958).

Many styles of ceramics are found in association with Old Women's occupations. They are commonly dark gray to brown, with cord-roughened and smoothed, fingernail or fabric impressed, grooved-paddle stamped, or other simply-decorated exteriors (Forbis 1962; Roll and Deaver 1980).

Protohistoric or Plains Equestrian Tradition

The Protohistoric marks the transition between the Prehistoric period and the Historic period. The Protohistoric period is marked by the introduction of Euro-American trade goods (Deaver and Deaver 1988; Duke 1991) with specific adaptations within Native American groups to accommodate the expansion of trade networks. Of all trade items, the introduction of the horse had the greatest impact on native cultures. With the introduction of the horse, new methods of bison procurement developed – the horse-mounted chase. Bison could be followed more efficiently and quickly. The horse could also be used as a pack animal for the transportation of shelter materials and food (Ewers 1980). The horse, in combination with the bow and arrow, resulted in an increased efficiency in bison killing previously unseen on the plains. By 1800, even marginal hunter-gatherers had become specialized bison hunters (Ruebelmann 1983).

The horse offered an increased mobility that no longer relegated Plains groups to upland living for their primary subsistence focus. Larger winter villages in lowland areas were a direct result of this mobility. While larger groups were able to congregate, the ability to pursue bison via horseback resulted in a decline in the communal bison drives, which characterized earlier pre-historic populations. The horse also allowed the

LITTLE BIGHORN

location of herds to be reported more quickly with the result of a quicker response time by the hunters.

The appearance of guns on the Northwestern Plains occurred by the early 1700s (Ewers 1958). During this time, projectile points made from stone were slowly replaced by metal points. Protohistoric sites are not common or at least easily recognized archeologically on the Northwestern Plains.

Historic Period

The history of the region can be divided into three general periods. The exploration era includes the period between the first documented case of Euro-American exploration and the final government-funded river surveying expedition. The military era describes the activities surrounding the military presence in the area, including the Battle of the Little Bighorn and the establishment of Fort Custer. The final era concerns farming, ranching and modern transportation.

The explorers credited with the most important explorations of the lands around the Big Horn and Little Bighorn Rivers are Francois Laroque and John Colter. Between 1807 and 1808 these two men traveled widely in the area and came into contact with several bands of Crow (Brown 1961). Colter and George Droulliard, veterans of Lewis and Clark's expedition, worked with Manuel Lisa who brought a keelboat of supplies up the Missouri from St. Louis (Malone et al. 1991). The party followed the Yellowstone to the mouth of the Bighorn River and established the first permanent structure built by Euro-Americans in Montana, Fort Manuel Lisa also known as Fort Raymond (Malone et al. 1991). George Droulliard is also credited with an 1808 exploration of the Little Bighorn River (Brown 1961).

Little other officially sponsored survey or exploration was attempted in the ensuing years. In 1856 a government authorized survey was undertaken by Lieutenant Gouverneur K. Warren. Three years later an expedition led by Captain W. F. Reynolds mapped the Yellowstone and Bighorn rivers (Brown 1961). Reynolds' survey effectively ended government funded exploration of the Bighorn River.

Military Period

Civilian travel to and from the west did not cease with the beginning of the Civil War, but the Federal government withdrew its regular troops from the frontier for service in the eastern theaters of the war. Volunteer troops, most from the west, soon replaced the veteran frontier regulars at western posts. Although there were small raids and conflicts throughout the Civil War period in Montana and Wyoming, they did not become prominent until 1865. Events that led to out and out conflict are myriad and include the Dakota War or Minnesota Uprising in 1862 where many Santee fled the state and moved into the Dakotas and northern plains. Subsequent punitive expeditions led by General Alfred Sully and Colonel Henry Sibley made no distinctions between Sioux division causing tensions with the military to rise. A significant factor was the late November 1864 Sand Creek Massacre in Colorado inflamed an already volatile

situation and the Cheyenne and Lakota struck back at homesteaders, ranchers, telegraph stations, and even military posts all along the overland trails in Colorado, Wyoming, and Nebraska. Now termed the Indian War of 1865, McDermott (2003) framed the widespread conflict as an area embroiled in a “circle of fire.” Several military expeditions attempted to bring the conflict under control, but none were particularly successful due in part to the War Department’s focus on the Civil War (McChristian 2009). This legacy of unresolved conflict between the Cheyenne, Lakota, and Arapahoe carried over into the post-war years, and on the Northern Plains culminated in the Sioux War of 1876.

Following the Civil War, the United States increased its military presence in Montana Territory as a direct result of the development of the Bozeman Trail. Fort C. F. Smith was established on the Bighorn River, and Fort Phil Kearny near Sheridan, Wyoming. Army occupation and trail traffic increased an adversarial relationship with the Lakota tribes that resulted in open warfare that was not settled until 1877 in the region. A variety of treaties that were aimed at halting raiding and open warfare did little to resolve the situation. The Fort Laramie Treaty of 1868 created a reserve for the Sioux that included the Black Hills (Malone et al. 1991). The same treaty effectively reduced Crow lands from 38 1/2 million acres to 8 million.

Although a few groups of Sioux, including Sitting Bull’s band, refused to be forced onto the reservation, the Laramie Treaty of 1868 was partially successful as many bands of Sioux agreed to stay on their reservation in present-day South Dakota. However, George A. Custer and the Seventh Cavalry led a survey expedition into the Black Hills in 1874. One result was the report of the presence of gold. The 1868 treaty was ignored and prospectors poured into the area despite army attempts to halt them. The Government changed its mind and ordered the Black Hills opened to mining and homesteading exacerbating an already tense situation between the Lakota and white settlers. The Lakota, both individuals and band units, who had agreed to stay on the reservation left to join the defiant bands in the Bighorn and Powder River country (Malone et al. 1991). In December 1875 and January 1876, the US Government issued orders to all Indians to return to the reservations and declared those who refused “hostiles” (Malone et al. 1991). In the spring of 1876 three columns of US military moved into the region, led by Brigadier General George Crook, Colonel John Gibbon, and Brigadier General Alfred H. Terry, and included over 2000 men. Terry’s column included the 700 man Seventh US Cavalry commanded by Lieutenant Colonel George A. Custer. That spring, the three units advanced into Montana Territory reaching closer to the Bighorn River. On June 25, 1876, the Seventh US Cavalry engaged the Sioux and their allies on the Little Bighorn River. The cavalry suffered a decisive defeat.

Less than three weeks after the Little Bighorn Battle, plans began for a memorial to commemorate Custer’s fallen soldiers (Rickey 1967; Greene 2008). On January 29, 1879, the Secretary of War authorized the creation of Custer Battlefield National Cemetery. The cemetery was initially administered by the War Department. Administration was provided by the commanding officer of Fort Custer. Later, resident superintendents administered the grounds. In 1940, the National Cemetery administration was transferred to the Department of the Interior under the auspices of the National Park Service.

LITTLE BIGHORN

Public outcry over the defeat at the Little Bighorn led to the nearly immediate establishment of Fort Custer at the confluence of the Bighorn and Little Bighorn rivers in 1877 (Polka 1994). In 1884, the US government renegotiated the terms of the 1868 treaty with the Crow tribe. The land containing the original Crow agencies near Livingston and Absorakee became ceded lands open to settlement by non-Indians. The current Crow Agency was built at this time, and became the focus of tribal administration.

Today, the Little Bighorn area comprises a portion of the Crow Reservation. From an ethnographic perspective, the Battle of the Little Bighorn is a significant symbolic event for two major cultural groups (Indians and Non-Indians) seeking to maintain their respective values and life ways in the face of cross-cultural contact and conflict. These diverse groups each visit Little Bighorn and reflect upon the battle fought here in their own unique way. Indian visitors remember this battle as their greatest victory over the U.S. Army (west of the Mississippi River) and the high point of their traditional way of life, while also remembering the sacrifices and losses resulting from the battle

Farming, Ranching, and the Modern Era

While Fort Custer was in operation, the major non-military economy in the area was supported by travel and hauling freight by riverboat, train and stage. The Chicago, Burlington and Quincy Railroad line was opened on the reservation in 1893. Cattle ranching developed in the region, first as support for Fort Custer, but by the time the railroad was built the beef industry was flourishing.

A homesteading boom in southeastern Montana began in 1909 (Malone et al. 1991). The various homesteading acts (Carstensen 1968:481), including the original act of 1862, the Desert Land Entry Act of 1877, the 1904 Kincade Homestead Act, the Enlarged Homestead Act of 1909, and the 1916 Stockraising Homestead Act, as well as advertising by railroads and land speculators began and made dry land farming attractive. This was especially true after the beginning of the twentieth century when new homesteading laws increased acreages up to a square mile of land that could be patented.

The marginal agricultural environment was always a challenge for the late nineteenth and early twentieth century settlers. By 1917 economic hard times befell the farmers and ranchers in Montana, and this was followed by the Great Depression of the 1930s where both economics and the environment exacerbated each other. Eastern Montana saw a population decline, but federally funded work projects aided in the economic recovery of the area. Changes in farming and ranching practices after World War II as well as the expanding national economy allowed a generally settled agrarian life-style to become well established for the region.

PREHISTORIC SITES AT LITTLE BIGHORN BATTLEFIELD

The archeological sites currently recorded in Little Bighorn National Monument are representative of the human activities that have taken place there for the last 10,000 years. Those who visited the area followed a hunting and gathering subsistence which resulted in primarily low visibility sites, i.e., small scatters of discarded tools and the remains of limited maintenance activities.

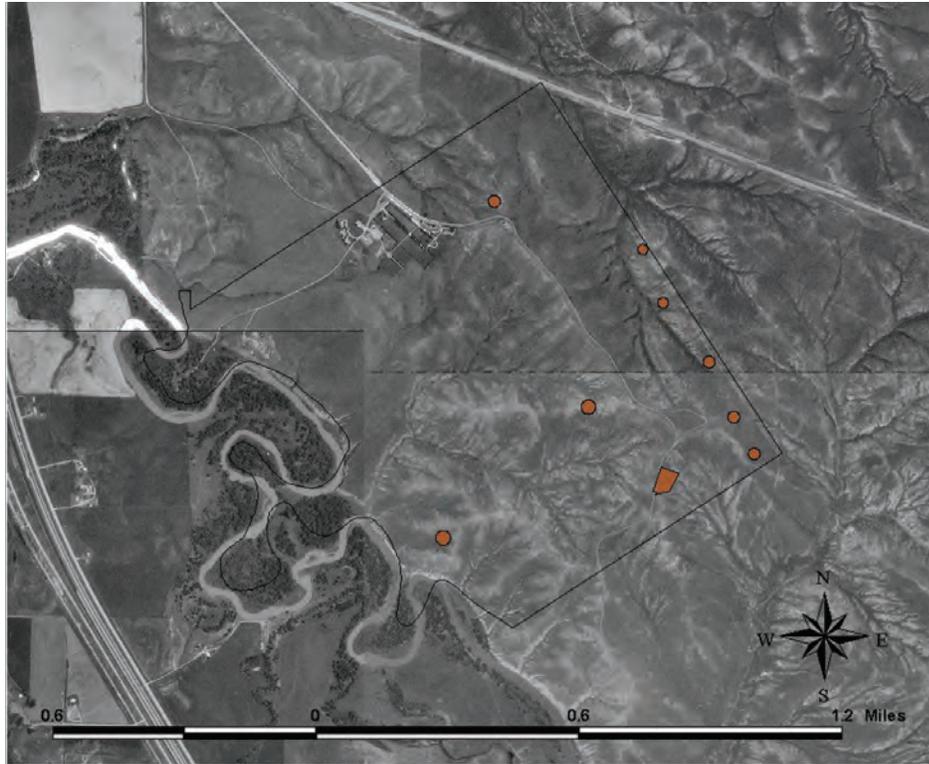


Figure 3. Locations of prehistoric sites and isolated finds noted a Little Bighorn.

The 1984 and 1985 inventory projects not only recovered 1876 battle-related artifacts, but identified several prehistoric sites and a number of isolated projectile points (Figure 3). These were documented by Scott (1987a) in an inventory report. Two lithic scatters and seven isolated finds were located on the Custer Battlefield. No prehistoric resources were found at the Reno-Benteen Defense Site.

The Custer sites are both small lithic scatters composed of secondary lithic debitage. Diagnostic materials were recovered from one site. Site 24BH2466 (location 33) is on a hillock several hundred meters east of Deep Ravine. Four secondary flakes of basalt, agate, and porcellanite were seen and collected in a 20 by 20 meter area. The site appears to be a small, sparse, surface scatter. It may have been a tool maintenance location.

Site 24BH2467 (location 32) is a sparse lithic scatter located west of Calhoun Hill and parallel to the south side of the tour road. The site lies adjacent to battlefield marble markers 138, 139, 140, 141, and 142. The site covers an area of 100 meters by 20 meters. It contained nine secondary flakes of chert and quartzite. Two corner notched projectile points (one each of quartzite and porcellanite) were also recovered. The site may have been truncated by the road construction, and it may have been impacted by the 1876 battle, and later visitation. The site appears to be surface, and may date to the Middle to Late Archaic period.

LITTLE BIGHORN

The isolated finds were:

24BH2465 - FS056 - secondary porcellanite flake

24BH2468 - FS280 - utilized secondary flake of porcellanite

24BH2469 - FS607 - tip of translucent agate projectile point

24BH2470 - FS666 - large corner notched biface of red porcellanite

24BH2471 - Location 28 - corner notched projectile point of Knife River Flint. The point is Late Archaic to Early Prehistoric in style.

24BH2472 - FS188 - corner and basally notched quartzite projectile point. The point is Early to Middle Archaic in style.

24BH2473 - FS091 - tip of chert projectile point

The two prehistoric sites were evaluated by testing in 1989 and found to be not eligible to the National Register (Scott 1989a). For management purposes these isolated find sites and the two prehistoric lithic scatters do not require special resource management proscriptions. While it may be prudent to minimize any effects to the two lithic scatters, it is not required as they are neither significant nor eligible to the National Register of Historic Places. Neither are the isolated find sites, and since the isolated finds were collected and documented, the locations of the finds have no significance or other values.

3. BRIEF HISTORICAL OVERVIEW OF THE BATTLE

The history of the battle is well documented in a hundreds of books, monographs, articles, and a variety of other publications (cf. Gray 1976; 1991; Kuhlman 1951; Utley 1988; Graham 1953). None needs to be repeated here except to provide the historic context for discussing the battle's archeological resources.

In the spring of 1876, a three-pronged campaign was launched to shepherd the Sioux and Cheyenne back to the reservation (Figure 4). The first column, under Colonel John Gibbon, marched east from Fort Ellis (near present-day Bozeman, Montana). The second column, led by General Alfred Terry (and including Custer) headed west from Fort Abraham Lincoln near Bismarck, North Dakota. The third column consisted of General George Crook's men moving north from Fort Fetterman, Wyoming (near modern Douglas) into Montana. These three columns were to meet near the end of June in the vicinity of the Little Bighorn.

Unknown to Terry and Gibbon, Crook encountered the Indians near Rosebud Creek in southern Montana, and was defeated by them about a week before Custer's battle (Vaughn 1956; 1987a). After this, his force withdrew to Wyoming, breaking one side of the triangle. Meanwhile, Terry was moving west up the Yellowstone River to the Little Bighorn. The Seventh Cavalry, under Custer, was to scout ahead and departed Terry's command on June 22. On the morning of the 25th, the Seventh Cavalry was at the divide between the Rosebud

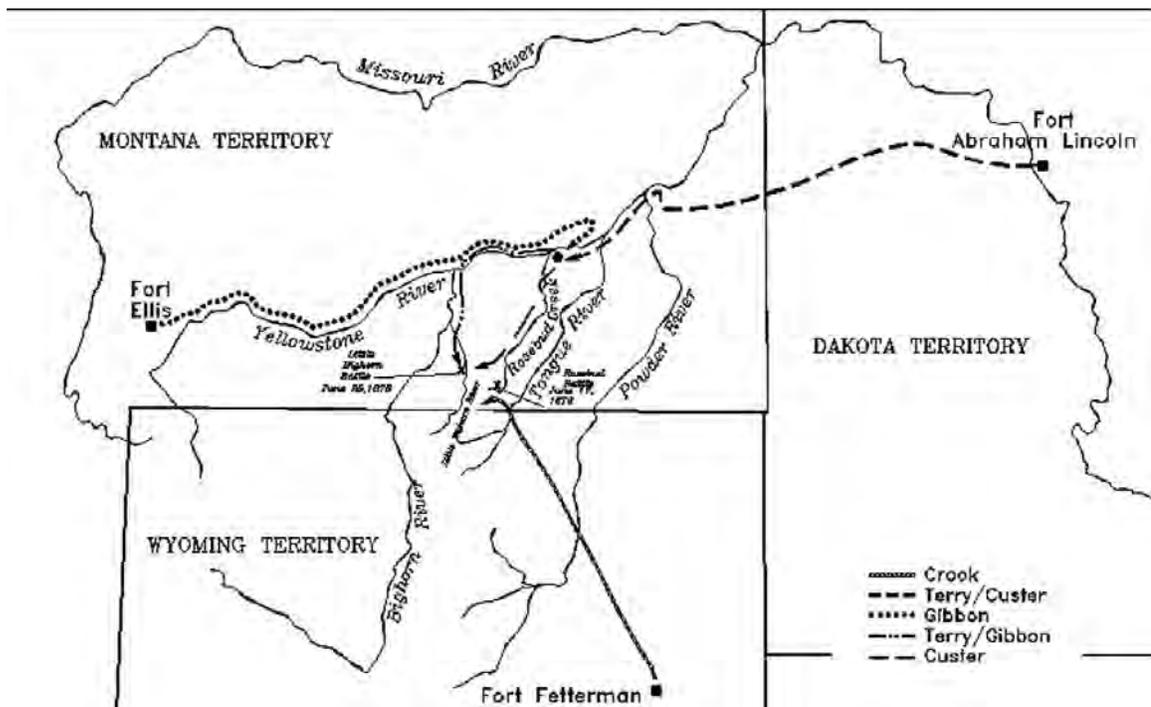


Figure 4. Map of the 1876 campaign and the site of the Little Bighorn battlefield.

LITTLE BIGHORN

and the Little Bighorn Rivers. From a spot known as the Crow's Nest, army scouts observed a large Indian camp.

Worried the Indians might escape, Custer decided to attack and descended into the valley of the Little Bighorn. Captain Frederick Benteen was ordered to travel southwest with three companies to search for Indians and block a possible southern escape route. A few miles from the Little Bighorn, Custer again divided his command, as Major Marcus Reno was ordered to advance with three companies along the river bottom and attack the Indian village on its southern end. The remaining five companies would follow Custer in support of Reno.

Custer took the remaining five companies along the east side of the river to an ephemeral tributary of the Little Bighorn. He must have finally realized the gravity of the situation as the north end of the village came into view. From here, he sent a message back to Benteen: "Benteen, Come on. Big village, be quick, bring packs. P.S. Bring pacs [sic]. W.W. Cooke." The messenger, Trumpeter John Martin, was the last soldier to see Custer and his command alive.

Custer and five companies rode to their fate. Custer apparently further divided his command in the lower reaches of Medicine Tail Coulee sending one wing of two companies to the ford at the mouth of the coulee where it debouches into the Little Bighorn River. Custer and the other three companies held higher ground to the east, now known as Nye-Cartwright Ridge. Whether due to increasing warrior pressure on the wing at the mouth of Medicine Tail Coulee or because of pressure on his wing, Custer apparently ordered a withdrawal from the coulee with the five companies rejoining at the southern end of what is now called Custer or Battle Ridge and Calhoun Hill. There Custer evidently deployed Lieutenants James Calhoun and John J. Crittenden with two companies of soldiers to hold the position while he rode to the north with the remaining three companies. Custer's goal may have been to move further north and cross the river with the intent of attacking the village from the north and relieving the pressure on Reno's command. Custer likely deployed Captain Myles Keogh about 300 yards in the rear of Calhoun and Crittenden's position while he moved on to the north with two companies, E and F. Some of Custer's command seemingly did move to the northwest along a spur of land or an extension of Custer or Battle Ridge, now just outside the park boundary, but at some point was forced back to take positions at Last Stand Hill. The command was under attack by increasing numbers of Cheyenne and Lakota warriors who soon outnumbered, outgunned, and outfought Custer and his men, destroying the command to a man by late that Sunday afternoon.

In the meantime, Indian warriors had forced Reno and his men to retreat across the river and up the bluffs to a defensible position. Reno and the men on the hilltop were joined by Benteen's forces and the pack train, both following

along Custer's line of march in order to bring up the ammunition packs. The Indians pinned down all until June 27th, when the village broke up into small groups that withdrew as Terry's and Gibbon's combined column arrived. For that day and a half, Reno, Benteen and the men fought to keep their defensive position and wondered when Custer would relieve them. Reno sent two men to meet the advancing column, and they found Terry and Gibbon near the abandoned Indian village. Here, a scout brought the news. Custer and his men lay dead on a ridge above the Little Bighorn.

LITTLE BIGHORN

4. HISTORY OF ARCHEOLOGICAL RESEARCH AT LITTLE BIGHORN BATTLEFIELD

THE ERA OF SOUVENIRS AND TROPHIES, 1876-1940

Relics of the Little Bighorn battle have been of interest to the general public almost since the day after the battle. Cartridge cases, arrows, and other items were collected immediately after the battle (du Mont 1974; Hutchins 1976). One of the most colorful figures and earliest visitors to collect on the Little Bighorn battlefield was Philetus W. Norris. Born in the state of New York in 1821, Norris acquired a large tract of land near Detroit, Michigan, following the Civil War. There he established the town of Norris, where he published a newspaper, the *Norris Suburban*. Norris is perhaps best known to history as the second superintendent of Yellowstone National Park (1877-1882) and as the recoverer of the remains of the famous scout, "Lonesome Charley" Reynolds, from the Little Bighorn battlefield (Gray 1963).

Norris traveled widely through the West (Binkowski 1995), making observations on natural history and even archeological resources that he encountered. In the early 1880s and nearly to the time of his death in 1885 he was employed as a field archeologist by the Smithsonian Institution investigating a variety of prehistoric sites in the upper midwest and southeast.

Through a column entitled "The Great West" in his newspaper, the *Norris Suburban*, and a book, *The Calumet of the Coteau, and Other Poetical Legends of the Border*, published in 1884, less than a year before his death, Norris published a great deal of information about his travels. However, his romantic disposition typically infused both his prose and poetry to the extent that even contemporary Victorian-era critics regarded his writing style as florid and tortuous at best. An anonymous editorial about his book in *The Word Carrier* issue of November-December, 1886 (page 3), concludes that "no publisher in his sober senses would undertake the bringing out of such a collection" of writings.

Although they are not as factual as might be desired, it is fortunate that many of Norris' writings appear to have survived. The *Norris Suburban* was in existence for only three years (1876 to 1878; see Binkowski 1995:9, endnote 8). A number of clippings from his "The Great West" column have also been preserved in a notebook at the Huntington Library at San Marino, California. These clippings are published versions of letters written by Norris during his travels. He arranged and annotated them in the notebook, evidently in anticipation of publication in book form, but died in 1885 before this could be accomplished. One of the more extensive notations is a lengthy note that starts: "The following is the heretofore unpublished portion of the above letter to the New York Herald which was lost." This handwritten section describes his visit to the Little Bighorn battlefield while he was on his way to assume the duties of Yellowstone National Park superintendent. His intent to visit the battlefield was to recover the bones of his friend Charley Reynolds for eventual reburial back East. He arrived at Fort Custer after Michael Sheridan's expedition to recover the officers' bodies had completed its work and returned to what soon became Fort Custer. Norris was denied official permission

LITTLE BIGHORN

to visit the field, but enlisting the aid of Collins J. Baronett, George Herendeen, possibly former scouts Curly and Half Yellowface, and perhaps in the company of the battlefield's first photographer, John Fouch, they traveled seemingly clandestinely to the battlefield. There Norris reported in his annotation that he traveled:

“Thence to the north abrupt terminus of the Coteau where Custer fell and the bones of many whom he led there still remain. There was little evidence of a prolonged struggle but an exploded Henry cartridge shell, a battered old style round bullet, and the broken britch of a Sharps rifle with brass nail marks of Indian ornaments which I found within twenty yards of where Custer fell proved the Indians had a diversity of arms and used at least some of them in close conflict. I brought away the broken britch, bullet, and fully one hundred carbine cartridge shells. . . .”

“I found the scout Gerard [‘s] sketch of the field mainly correct and from it found where the famous friendly Indian Bloody Knife the half breed Cherokee [sic] Lt. McIntosh and my bosom friend Charley Reynolds Chief of scouts fell.”

“Bloody Knife went down as he fought in a willow thicket on the right flank in advance the others and many more in the smooth open valley during the retreat. Although there was far less grass than in the lower part of the village still it so delayed our search that it was nearly sunset before I had with throbbing heart and vengeance aroused to rather court than shun a fight that the remnant of his [Reynolds] bones and well known auburn hair were found and strapped to my saddle and we retraced the wagon trail down the valley.”

A further account of the recovery of Reynolds remains is found in the *New York Herald*, of Sunday, July 15, 1877:

“Barronette [sic] and the writer went in search of the remains of the gallant scout Charley Reynolds.... We were aided by a rough but accurate map made by Major Reno's scout, Gerard, who saw Charley fall. All that we could find were a few small bones, which were but partially covered with earth, the bones of his horse, fragments of his hat and clothing, a few tufts of his well known auburn hair which clung to the earth after wolf or ghoul had removed the skull.”

“The hair, small bones and fragments of clothing were gathered in a large handkerchief the only mortal relics of the once most accomplished scout and finest shot on the plains, were brought carefully away for decent burial in a Christian land. . . . after Colonel Sheridan and the train had left the field part of the company and scouts remained hunting up and covering the scattered bones and gathering relics, especially carbine cartridges in the lofty basin where Calhoun fell.”

“By rough map of the scout Gerard who saw him fall, I found where my gallant comrade of the preceding season - Charley Reynolds - fell, and brought away

all that wolf and ghoul had spared of his mortal remains for decent burial in a Christian land.”

“A thorough view and map there drawn, of the fields, and ruins of the old Indian village with accurate notes of all saw and heard, from many both white and Indian participants in these various events are retained for use at a proper occasion.”

A handwritten note following the column adds – “As the letter and map sent the New York Herald, is supposed to have been captured by the Indians, and the copy of the map loaned General Gibbons, was lost in his fight with them, I supposed all trace of both were lost until I recently found rolled around some specimens the first pencil sketch of both, and commenced publication...” This map is undoubtedly the map published by Norris in 1884 in his *Calumet of the Coteau* and discussed by Donahue (2008:250-253). It appears to be a revision of the Maguire map and may be one of the more accurate maps of the nineteenth century that depicts the battlefield and the meanders of the Little Bighorn River as they appeared just one year after the battle (Figure 5).

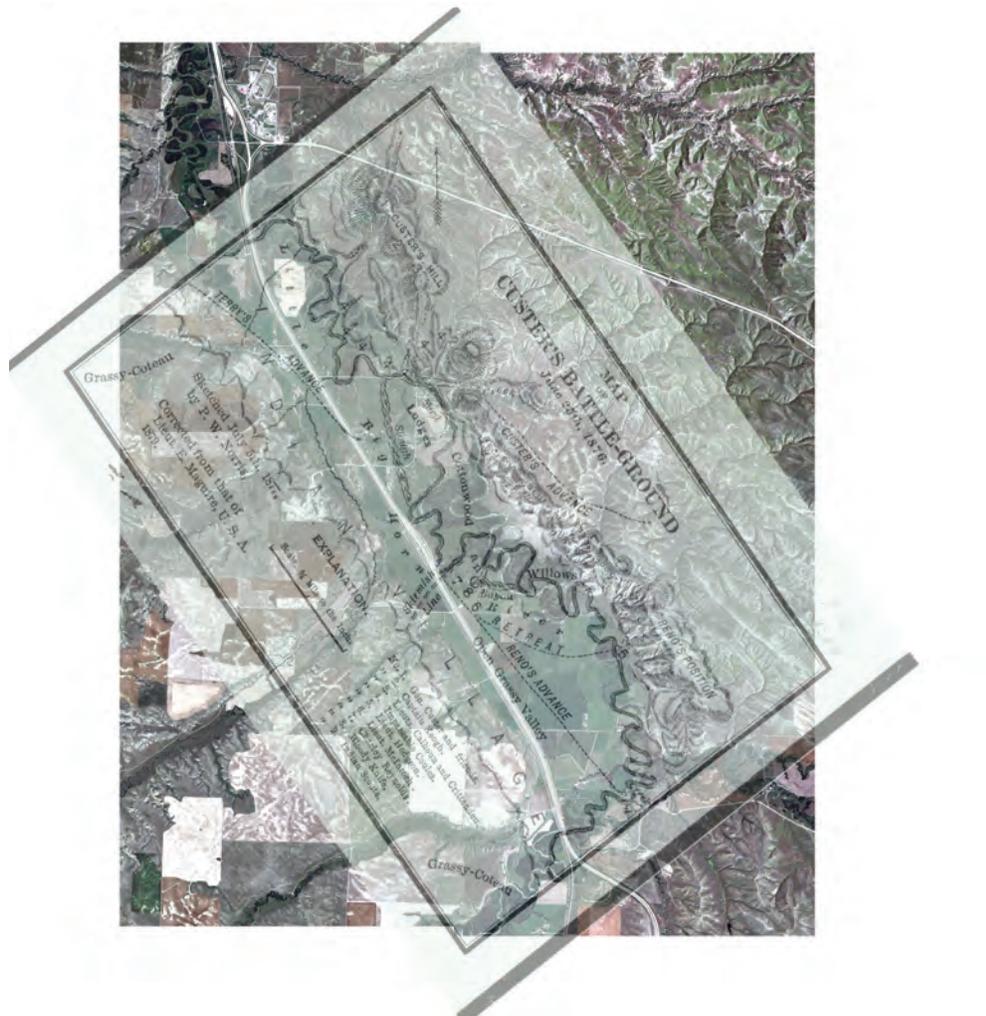


Figure 5. Norris' 1884 map of the battlefield overlaid on the modern aerial photograph. Note the significant changes in the river meanders.

LITTLE BIGHORN

Norris' exaggerated and florid writing style as well as his tendency to diverge into romantic descriptions of places and events tends to make analysis of his work difficult at best. In addition to his writing style is the issue that he appears to have written in a stream of consciousness manner as well. A careful parsing and vetting of his work yields some gems of historical import. Norris noted that Sheridan's recovery group collected cartridge cases and other relics from the Calhoun Hill area, and that he collected the Sharps rifle or carbine action, probably a lead ball, and over 100 army carbine cartridge cases on or near Last Stand Hill. This is the earliest reliable non-human bone relic collecting information for the battlefield. The recovery of Reynolds bones is interesting and important, but the collection and removal of over 100 firearms related relics from the vicinity of Last Stand Hill and an undetermined number of relics from Calhoun Hill is an invaluable bit of history that has been overlooked by researchers over the ensuing years. This information has important implications as will be seen in a later section. Norris did not specifically state what he did with the relics collected from the Little Bighorn but he did record in an earlier column (*Norris Suburban* February 18, 1876) that he secured specimens for the "present and future interest and value to myself, my friends, and the Scientific Association of Detroit." On the chance that Norris may have donated some of his Little Bighorn relics to the Scientific Association of Detroit, which morphed in the late nineteenth century into the Detroit Arts Institute, the curator of collections was contacted, but no Norris or Little Bighorn-related objects repose in their collections.

As with the Norris collections, and with one or two exceptions, these relics have unfortunately disappeared into the mists of time and their locations are unknown. At least two other reasonably documented early Little Bighorn relics are part of Smithsonian Institution's Museum of American History collection. One is a human cervical vertebrae transfixated by an iron arrowhead (Figure 6) which Lieutenant George S. Young, Seventh Infantry, collected, during a trip to the battlefield in 1878 or 1879. He picked up a .45-55 cartridge case, an iron arrowhead, and the vertebra. The items were retained by Young's family for many years and were donated to the Smithsonian Institution in 1967 (correspondence relating to accession 275426, Smithsonian Institution). The second relic in the Museum of American History was collected by Dr. A. M. Hawes. It is an army McClellan saddle (Figure 7) that has been modified, presumptively by Indians, and was collected from them around 1882. Some of the saddle straps and the stirrups have been modified from army configuration. The saddle leather is stamped at one location with **M7C**, and is presumed to mean Company M, Seventh Cavalry. The assumption is that this was a saddle captured at the battle (files and correspondence related to catalog number 59741, accession 11523).

EARLY PHYSICAL EVIDENCE DOCUMENTATION EFFORTS, 1940-1970

While there was no lack of interest in the Little Bighorn story during the Army's administration of the battlefield, it was not until the National Park Service assumed control of the site that any attempt at a coordinated research agenda was even considered (Greene 2008:75-80). The first NPS superintendent, Edward S. Luce, was appointed in 1940. He had a long and serious interest in the story, was himself an ex-cavalryman, a published author (Luce 1939), and an acknowledged authority on the battle. Luce was acquainted with many of the battle participants and researchers of the day, and he had walked much of the battlefield with other researchers long before his appointment to



Figure 6. An iron arrowhead transfixing a human cervical vertebrae found by Lt. George Young about 1878 or 1879 at the Little Bighorn Battlefield and now in the Smithsonian Institution collections.

the National Park Service. Along with his active interest in the subject, he almost literally served as a rallying point and sometimes lightning rod for research on the field. Luce, along with a number of active Little Bighorn researchers, including Elwood Nye, Ralph G. Cartwright, and local rancher Joseph Blummer, began an intense, if sporadic, study of the ground beyond the Custer field in an attempt to find the route Custer's command followed in approaching the battlefield. Luce's shortcoming in his research was that he tended to focus almost exclusively on the Seventh Cavalry, their route, positions, etc. to the exclusion of Lakota and Cheyenne combat positions or movements. Regardless, Luce and other researchers of the era were interested in the physical evidence as a means to refine the battle story and place events more precisely on the landscape. They used the finds as a means to support their theories of movements and refine their understanding of history. Although this "handmaiden to history" approach is now passé in anthropological archaeology (Fox 1996:87-88), it was very much the standard at the time Luce began his data collection efforts.

As early as the 1920s Blummer (manuscript dated 1959 on file, A-123 C5188x, Little Bighorn Battlefield National Monument) discovered cartridge cases on a ridge top about one mile southeast of the battlefield (Greene 2008:194-195). Luce learned of Blummer's finds, and he and his researcher friends realized that physical evidence could aid them in sorting out Custer's route and other issues related to the battle. Luce, along with Custer researchers R. G. Cartwright, Joseph Blummer, and Elwood Nye, had a strong interest in locating the precise locations where Custer and his men fought and died, the routes of travel to the battlefield, and many other elements of the story. They searched for and found various kinds of physical evidence as they literally walked the battlefield ground and the areas surrounding it.

LITTLE BIGHORN

R. G. Cartwright compiled notes on his finds on the Custer Battlefield, Custer's route to the battlefield, the Reno-Benteen defense, and the Valley fight in 1941 (Ms entitled Custer's Advance toward the Battlefield, Little Bighorn National Monument, Accession 278, Field Research Notes. Hereinafter cited as Acc. 278, Field Research). Cartwright included a description of his finds keyed to a map with letters indicating where he found or observed items. He noted finding human remains near the Custer field as well as in the Reno Valley fight area, and he recalled finding in 1938 well over 100 cartridge cases grouped in threes along a ridge south of Custer field. With additional cartridge case finds and other battle-related items made by Luce and his fellow researchers in 1943 (Memorandum from Superintendent, Custer Battlefield to Superintendent, Yellowstone NP, dated September 6, 1943, Acc. 278, Field Notes) the locale took on



Figure 7. A McClellan saddle possibly associated with the Little Bighorn collected from Native Americans in 1882 by Dr. A. M. Hawes and now in the Smithsonian Institution collections.

the name of Nye-Cartwright Ridge (Greene 2008:195). Luce was perceptive enough to engage experts in other fields, like Colonel Calvin Goddard of the U.S. Army Ordnance Department, to identify Custer era cartridge cases and bullets that he and his colleagues recovered from their battlefield searches (Luce to Goddard, letter dated September 6, 1943, Acc. 278, Field Notes). The artifact finds compelled Luce to write his supervisor at Yellowstone National Park asking for the aid of an archeologist in conducting a study of the battlefield. (Luce to Coordinating Superintendent, Yellowstone NP, Sept. 28, 1943, Acc 278, Field Notes; and Sept. 30, 1943; RG 79 National Park Service, Central Classified file, 1933-1949 National Monuments, Custer Battlefield – 120, Box 2129, File 2, NARA). Luce’s appeal for archeological aid went unheeded until 1958.

Luce’s interest in the physical evidence was not limited to finding relics of the battlefield, but in recording them. He was the first person to attempt to consolidate the relic finds of various researchers on to a map. He prepared an enlarged map of the battlefield, based on the 1891 USGS topographic map, first published in 1908 (Figure 8). From the boundary of the park he created a grid across the area encompassing Deep Coulee, Medicine Tail Coulee, and Weir Point. The grids were numbered west to east 1 through 28 and lettered north to south A through X. At the enlarged map scale the grids were approximately 375 feet on a side. Luce then roughly plotted the finds made up to that point, denoting them as a series of x’s.

Luce distributed the map as part of a mimeographed item he entitled “Bulletin No. 1, Enlarged Map of Custer Battlefield National Cemetery Area and Surrounding Country.” The bulletin was sent to fellow researchers, and aside from the map contained some text attributing the finds by grid to individuals. He noted finds in Grids 5F, 6E, 7E,



Figure 8. Superintendent Edward Luce was the first person to attempt to document find locations when he and other early researchers like R. G. Cartwright, Joseph Blummer, and Elwood Nye walked the area in search of Custer’s route to the final battlefield. Here Luce’s map, based on the 1908 USGS topographic map is shown overlaid on the modern aerial photography.

LITTLE BIGHORN

8E, 11E, 12E, 13E, 14C, and 14D to Elwood Nye and R. G. Cartwright. Fred Johnson, Assistant Superintendent, Yellowstone N.P. is credited with a September 16, 1943 find in Grid 13D; Luce himself with finds in Grids 5F, 6E, 7E, 8E, 11E, 12E, 13D, 14C, 14D, 15D, 13G, 13D, and 7E. Local residents George Oston, Verne Johnson, and Charles Gatchell found items on December 19, 1943 in Grids 6E, 7E, and 8E. Finally First Lieutenant Gerald Nelson found items in Grid 4H. The bulletin further identifies several numbers on the maps. The numbers generally correlate with the find location, but appear to provide some explanation or interpretation of the “X marks the spot” approach. According to the bulletin No. 1 indicates empty cartridge cases found at intervals about 9 feet apart; No. 2 signifies about 150 cartridge cases found in small groups and in a linear pattern suggesting to Luce that perhaps 40 men had fought a dismounted action at that location; No. 3 was a cavalry spur and buckle found by Fred Johnson; No. 4 empty cartridge cases found 9 to 10 feet apart, suggesting to Luce a mounted action; No. 5 a McKeever style cartridge box and part of a cartridge belt; No. 6 indicted the area of fighting around Weir Point; No. 7 was a group of 17 cartridge cases, to Luce’s thinking likely representing a vidette location; No. 8 an incomplete horse skeleton, some leather fragments, and 3 brass saddle rings; and No. 9 was a Henry rifle found in 1936 by Lieutenant Nelson. Luce also noted that the find locations were marked by wooden stakes that were driven into the ground. Some of these find areas appear to have been formally surveyed on November 24, 1943 by Surveyor Philip Hohlbrandt (field survey notes for November 23 and 24, 1943 on file, Little Bighorn Battlefield National Monument). Using the northeast corner of the park fence Hohlbrandt plotted four separate locations of cartridge case finds and the location of a cavalry spur. His notes mention he plotted the sites of 135 cartridge cases and the spur. These surveyed locales are likely some of the same locations mentioned in Luce’s Bulletin No. 1. Some of those stakes survived until the 1990s before they disappeared due to the ravages of time and the range fires (Donahue 2008:340).

Luce’s stated plan was to update the map as new finds were made and to distribute those updates to interested researchers. No subsequent bulletins have come to light, however. Regardless, the Luce map, as Michael Donahue (2008:337-340) aptly notes was the first effort to document physical evidence findings by mapping the find locations. The map has limited research value today since the find descriptions cannot be linked to specific artifacts in personal or park collections, thus modern identification methods and current analytical techniques cannot be applied to test Luce’s assumptions regarding their origin. Nevertheless the map and descriptions are an important, if rudimentary, legacy in the attempt to document artifact distributions that aid in interpreting the Little Bighorn battle events.

World War II. and NPS funding reductions during that era certainly contributed to the lack of response for professional archeological assistance, but there were other larger issues that likely played a part in the decision as well. American archaeology was almost entirely the purview of academics at that time, and their interest focused on the prehistoric past. The field of historical archaeology was in its nascent beginnings in the late 1930s and early 1940s (Orser 2004:28-55), largely spearheaded by NPS archeologists J. C. “Pinky” Harrington and John Cotter, but their efforts were centered in Colonial American sites like Jamestown and Washington’s Fort Necessity. The post-war era, and the 1950s in particular, witnessed a change in not only NPS management attitude, but

that of the archeological profession as well, setting the stage for cooperation between historians and archeologists on an unprecedented scale.

Luce was innovative in his thinking about the use of metal detectors to find artifacts associated with the Little Bighorn battle. He first mentioned the idea of metal detector use, which he referred to as “a radio metal finding machine” in 1943 (Luce to Elwood Nye, October 11, 1943, Acc 278, Field Notes), but World War II continued to disrupt his plans. Luce did not lose interest in finding further physical evidence, and encouraged by the continuing development of the mine detector during World War II, he experimented with one in 1947 (Rickey 1967:126) to find relics of the battle. The effort was a failure as he believed the machine capable of only finding iron objects. It is possible the system tested by Luce was of limited capability, but it is also conceivable that given the complexities of tuning the World War II era machines that it was either improperly tuned or most likely not sensitive enough to find small items like cartridge cases or bullets. It would be another decade before metal detectors were found to be a useful discovery tool at Little Bighorn.

Don G. Rickey, one of the doyens of Indian Wars history became the park historian in July 1955 (Greene 2008:92). Probably spurred by Superintendent Luce, but propelled by his own long-seated interest in the physical evidence of history, Rickey soon began a formal collaboration with Jesse W. Vaughn, an attorney and avocational historian and archeologist from Windsor, Colorado. Vaughn (1966:145-166) was aware of the advances in metal detector technology and had been using one on his research at other Indian War sites with some success. Rickey and Vaughn began an attempt at systematically metal detecting the battlefield in 1956 (Greene 1986:23). They worked various areas between 1956 and 1959 (Jesse W. Vaughn Research Notes, Acc 278, Field Notes; Rickey and Vaughn nd). Their first effort was a metal detector survey of the Reno-Benteen defense site in 1956. They found and marked with wooden stakes a variety of artifacts, although most were army carbine cartridge cases found in linear arrangements along the presumed army perimeter. Rickey and Vaughn also located nails and what they believed were pieces of human bone.

Rickey and Vaughn continued their collaborative effort that year by extending their metal detector search to the ridge tops south and east of the Reno-Benteen defense site. There they discovered a variety of cartridge cases indicating combat positions used by the warriors during the battle, totaling eight separate warrior fighting areas, and they collected nearly 600 cartridge cases from these positions (Rickey 1956). In reporting the finds, Rickey (1956) called for a park boundary expansion to include these previously unknown Lakota and Cheyenne fighting positions. He also noted that the find locations were mapped, and a copy of the map was attached. Unfortunately, such a map has not been relocated, and carbon file copies of the report do not include the map. However, there is a hand-annotated copy of the 1954 aerial photograph (Figure 9) of the Reno-Benteen area in the park files that does appear to generally denote the find areas mentioned by Rickey. It also generally locates two new warrior positions, 9-9 and 10-10 discovered in 1969 by Park Historian B. William Henry, Jr. Although the map is not attributed it appears that the locations were plotted by Henry.

LITTLE BIGHORN

Rickey and Vaughn continued their metal detector efforts in 1957, 1958 and 1959, confirming the work of Luce on Nye-Cartwright ridge, and locating a previously unknown fighting area near the mouth of Medicine Tail Coulee (Jesse W. Vaughn Research Notes, Acc 278, Field Notes; Rickey and Vaughn nd; Green 1986:21-25). Rickey and Vaughn made what they thought was an exciting find during their 1957 metal detector work. One of the cartridge cases recovered contained paper inside the case. Hoping this might be a note related to one of the burial spots of Custer's men, they had the cartridge case sent to an NPS museum preservation specialist (Rickey to Director, NPS, Sept. 17, 1957, Acc 278, Field Notes). A response was quickly received (Preservation Specialist Nitkiewicz to Superintendent LIBI, Nov. 13, 1957, Acc 279, Field Notes) identifying the paper as a cardboard roll. Although not realized by the museum personnel, the paper was a cardboard tube used by the Frankford Arsenal as liner to reduce the diameter and powder capacity of the cartridge case for cavalry carbine rounds, which used 55 grains of black powder instead of the 70 grains for infantry rounds. The two types of rounds used the same size cartridge case.

J. W. Vaughn (1966:145-166) continued his metal detector use in his research efforts after Rickey left the park in 1960, and in 1964 he walked over and metal detected the presumed area of Major Marcus Reno's first skirmish lines in the Little Bighorn River valley. Jerome A. Greene (1986) later scoured the park files and interviewed Rickey and recorded his recollections of his finds as part of his effort to document relic collecting efforts on and around the battlefield.

Rickey did not just find artifacts and have them mapped, he used the artifact locations to significantly revise the interpretation of the Reno-Benteen defense site.

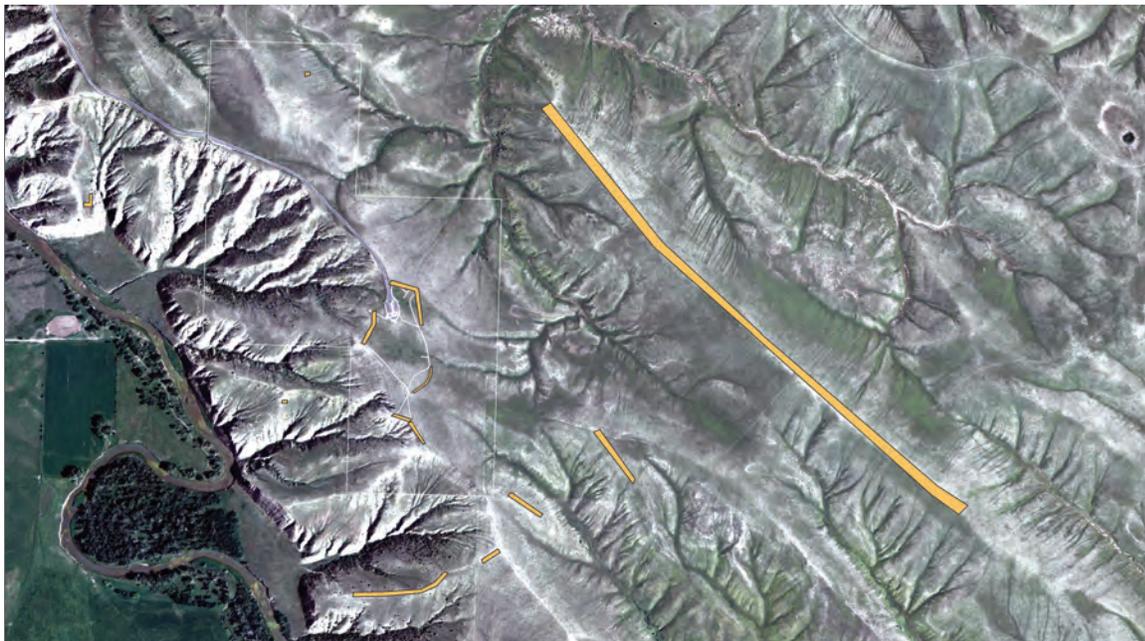


Figure 9. J. W. Vaughn and Don Rickey's soldier and warrior positions taken from a 1954 aerial photograph and replotted on modern aerial photography. These same areas have yielded large number of cartridge cases, bullets and other items to other collectors and professional archaeological investigations.

He used the archeological information to not only revise interpretive text, but he used that information in placing wayside exhibits more accurately on the defense perimeter, determining the route of the new interpretive walking trail, incorporating two newly restored rifle pits as part of the walking trail, and he used the archeological data to locate and mark the site of Dr. Henry R. Porter's field hospital. He also employed the find information to create a Reno-Benteen defense site brochure and experimental self-guiding trail guide; although subsequently revised several times, it is still used on site today. Rickey's contribution to the early and effective use of archeological data has been somewhat underappreciated. Rickey's artifact collections appear to be present in the park collections, but they were unfortunately later lumped for cataloging purposes and proveniences were lost or not recorded during the cataloging process, thus further obscuring the real value of his and Vaughn's documentation efforts.

The first professional archeological investigation that took place in the park was in response to a cultural resource management issue, the construction of a visitor footpath at the Reno-Benteen defense site, essentially today's walking tour route. Initially the work was to be funded by NPS, but priorities shifted and the funds were reallocated to another park in the region. At the last minute the Custer Battlefield Historical and Museum Association came to the rescue and donated funds to secure the work (Rickey 1996:58-59), beginning a long tradition of support of archeological research and investigation in the park.

Archeologist Robert Bray (1958), then associated with the Midwest Regional Office, mapped many of Rickey's finds at the Reno-Benteen defense site, and with Rickey and locally hired day laborers excavated several features that were determined to be soldiers' rifle pits. Bray also excavated several test trenches through the presumed hospital area. Rickey's earlier human bone finds led Bray to recover three incomplete soldier burials. These were not formally examined at the time, but simply reinterred in the National Cemetery in August 1958. They were exhumed in 1986 (Connor 1986) in preparation for reburial of additional soldier remains that had been discovered since that time (Pieters and Barnard 1986).

Robert Bray was one of the few archeologists of his era to advocate the use of metal detectors in studying historic sites. He was exposed to the value of metal detecting in archeology in 1958 during his work with historian Don Rickey and J. W. Vaughn at the Little Bighorn battlefield (Bray 1958; Connor and Scott 1998). His experience with Rickey and the near ideal detecting conditions present at the Little Bighorn including good soil conditions, shallowly buried artifacts, and little modern trash, led Bray to employ metal detectors at many other historic sites he worked during his years with the University of Missouri, especially at Wilsons Creek National Battlefield (Bray 1967:10-11). Unfortunately, his recovery rate was generally very poor. Developed in World War II as a device for finding buried land mines and booby traps, by the 1960s metal detectors were not much more than sophisticated electronic tools meant to be used to find large buried iron or utility and sewer lines. Their application to relic collecting was just beginning and manufacturers were only beginning to recognize the need to refine their

sensitivity to find smaller and more discrete targets. Bray's advocacy of the use of metal detectors makes him a leader in the area of their archeological use, but he was ahead of his time given the limitations of the technology.

Bray's map of the Rickey and Vaughn finds within the Reno-Benteen defense perimeter exists in several files as blueprint copies. The map was made using a plane table and alidade, a common archeological mapping technique of the era, with the excavation trench locations denoted, the rifle pits, human remains burial sites, and a number of other features. Bray also mapped the earlier cartridge case find locations that they had marked with wooden stakes (a few of those stakes were relocated and mapped during the 1985 archeological project, but these were subsequently lost to the 1991 range fire). Normally it would be a simple matter, using Bray's control datum to transfer his information to modern aerial and topographic maps, as well as combine the information with the 1985 and later archeological mapped data. Unfortunately, there is a cumulative error in Bray's map that make it difficult to more than approximate his plotted finds on a modern map (Figure 10). The source of the error has not yet been ascertained.

Park staff, led by Seasonal Park Technician Frank Norris, attempted to restake the Rickey find locations in the summer of 1981 (Norris 1981) for interpretive purposes. They employed the compass and tape method, but found significant errors between the few remaining original stakes and the locations derived from measured angles and distances taken from the Bray map. Norris was unaware of the cumulative error on the Bray map and was unable to reconcile the differences between his effort and that of Bray. The Bray 1958 map was scanned for this effort and a layer created in the GIS to overlay on the modern aerial photography and topographic maps. The Bray map was georeferenced and rectified to modern map scales. The results show that there an unresolved error with the map. Bray's 1958 archeological map should be used as representational only, and not for precise or detailed measurements.

Bray's notes were left with the park, where they reside today. His notes and plan drawings of the rifle pit excavations as well as of some of his trenching efforts contain information that was not included in his report. The plan view of the two rifle pit excavations and his notes indicate there were at least six cartridge cases in the fill of the pit and along the western berm or parapet of the western rifle pit or Trench A as he designated it. Also found in the fill were horse bones (locations not specifically recorded), metal fragments probably from tin cans, and at least seven glass bottle fragments. The glass was not saved according to his notes, so it not now possible to determine the container type or even if these were 1876 era bottle fragments. Bray believed they were fragments of liquor or wine bottles. The eastern rifle pit, Trench B, contained a similar artifact assemblage and with similar numbers represented. Bray recovered at least six cartridges and cases (three unfired, two fired .45-caliber, and one fired .50-caliber), four pieces of clear glass, nine fragments of blue glass, five fragments of amber glass, a part of a tin can, a canteen cork, and fragments of a piece of blue cloth. In each excavation artifactual material was found near the surface to a depth of 20 inches, which he considered the bottom of the original pit. Such depths are consistent with what the army called hasty entrenchments or rifle pits during the nineteenth century (Mahan 1861).



Figure 10. Approximate locations of the Don Rickey find spots and Robert Bray 1958 excavations. There is an unidentified error in Bray map, and it cannot be accurately correlated to the modern maps, but a reasonable approximation possible using modern GIS georeferencing techniques.

LITTLE BIGHORN

Bray's barricade area trenching effort located the upper torso and skull of a skeleton, with army buttons still in place running the length of the torso. A number of horse bones were found in the trenching efforts as was an isolated human humerus. Another excavation site, termed rifle pit No. 1 (Rickey map point 8), located northeast of the current parking lot, yielded little evidence and the trenching effort could not clearly refine the size or edges of the pit, if indeed it was one. Rifle pit No. 2 (Rickey map point 9) was also tested with similar results, although two fired army cartridges cases were found in the fill about 12 inches below the surrounding ground surface.

Bray continued his excavations by trenching in the presumed hospital area. The work there was extensive, yielding a tin can, a pistol cartridge case, a "hostile bullet" otherwise unidentified, an animal vertebrae, and some unidentified bone fragments. The final Bray excavation area was Rickey's map point 25, or the so-called L-shaped entrenchment. Bray recovered at least 13 army blouse and iron trouser buttons in the excavation, as well as small cut nails, evidence of a fire at the northeast end of the rifle pit, a cartridge, and the disarticulated remains of a partial human skeleton.

Bray was unsure if the L-shape was a real feature or the result of his artifact discoveries. He was sure that a packing crate or similar box had been burned at the site, and the location served as a resting place for one of the soldiers killed during the Reno-Benteen defense.

No NPS personnel undertook other, or at least documented inventory efforts, after Rickey was transferred until 1969. In June of that year and in 1970 Park Historian B. William Henry conducted several metal detecting surveys of warrior positions on private lands around the Reno-Benteen defense site. He metal detected Rickey and Vaughn's previously located warrior positions 4-4, 7-7, and discovered two new positions which he designated 9-9 and 10-10. Henry recovered 496 cartridge cases in many different calibers and four bullets (B. William Henry research notes dated Oct. 5, Nov. 8, 1969 and June 1970, Acc 278, Field Notes).

Historian Jerome Greene (1986) was the first professional researcher since Don Rickey and Robert Bray's, work, as well as that of B. William Henry to take a serious interest in plotting and analyzing the distribution pattern of many of these relic finds. Greene interviewed many collectors and local ranchers, and he combed the park files and archives for notes, letters, and memoranda related to finds by many of the early Little Bighorn researchers, first publishing his work in 1973, with subsequent editions in 1978, 1979, and 1986. His work used relic finds coupled with documentary evidence and Indian testimony to reevaluate the traditional view of the battle. Greene's analysis of the relic finds was insightful, and he developed probable routes for Reno's advance in the valley as well as his subsequent retreat to the bluffs. Likewise Greene built on Luce's work and using information from collectors and other sources refined the Custer column movements to Medicine Tail Coulee and along Nye-Cartwright Ridge, thence to the main battlefield.

Greene (1986:47-51) was the first person to offer a critique of some of the early Little Bighorn researchers like Kuhlman and Graham who had nearly ignored Indian testimony regarding the battle. Greene noted these early researchers often lacked a sense

of the terrain on which the fights took place, and they did not understand how to use Indian testimony employing cross-cultural approaches to analysis. Greene's argument for appropriate analysis and use of oral history went largely unheeded until Fox's anthropological approach (1988; 1993) to Lakota and Cheyenne testimony rigorously tested against the archeological data brought the value of Indian accounts to the center of Little Bighorn research. Greene's work, along with that of Rickey and Bray's, were important foundations for developing the research designs for the archeological investigations that began in 1983.

One other avocational collector has published his interpretations of the battle based on his relic finds (Weibert and Weibert 1985; Weibert 1989). Henry Weibert began researching the battle in the 1940s, although his earliest find was the bones of a soldier that he and his father discovered while doing culvert work in 1925 or 1926. Henry Weibert began collecting relics from Little Bighorn, Fort Custer, and other frontier related sites in the late 1950s. Weibert was a local rancher and had a solid knowledge of the land around the battlefield, and became acquainted with many of the researchers of the mid to late twentieth century. He began his serious collecting efforts about the time J. W. Vaughn and Don Rickey began their metal detecting efforts to locate evidence of the battle. Weibert worked the same area as Vaughn and Rickey, but expanded the search to most lands surrounding the Reno-Benteen defense site, Weir Point, Nye-Cartwright Ridge, and the ridges around the Custer battlefield. As a rancher and lessee he had access to more land than NPS employees. He used his contacts to enable him to search far and wide for battle evidence. He worked with friends and family members for many years, and repeatedly scoured lands outside the park for decades, but he does not appear to have been spurred to document his findings until the success of the mid-1980s professional archeological investigations (Weibert and Weibert 1985; Weibert 1989). Since much of the documentation was done from memory the precise location and types of finds in the many areas relic collected must be carefully vetted when using the compiled information.

THE ADVENT OF BATTLEFIELD ARCHAEOLOGY, 1977-2005

Robert Bray's 1958 archeological work was the first professional archeological investigation within the park, and it was not until 1977 that another professional archeological survey was undertaken at Little Bighorn. Connie Bennett (1977) from the Midwest Archeological Center in Lincoln, Nebraska (MWAC) conducted a visual survey of a waterline alignment at that time, but found nothing. No further archeological investigations were done at the site until a range fire in August, 1983 burned the vegetation of Custer battlefield. Richard Fox, Jr. was contacted by park Superintendent James Court to conduct a field reconnaissance to determine if relics and features related to the battle were visible. Fox (1983) did find artifacts and several features, and he recommended that a full-scale inventory project be implemented. Without James Court's strong support for Fox and his findings it is unlikely further action would have been taken by regional park personnel.

Such a project was commenced in 1984 under the co-direction of Douglas Scott from MWAC and Richard Fox, then a Ph.D. graduate student at the University of Calgary, Canada. The project, and much of the subsequent work at the battlefield,

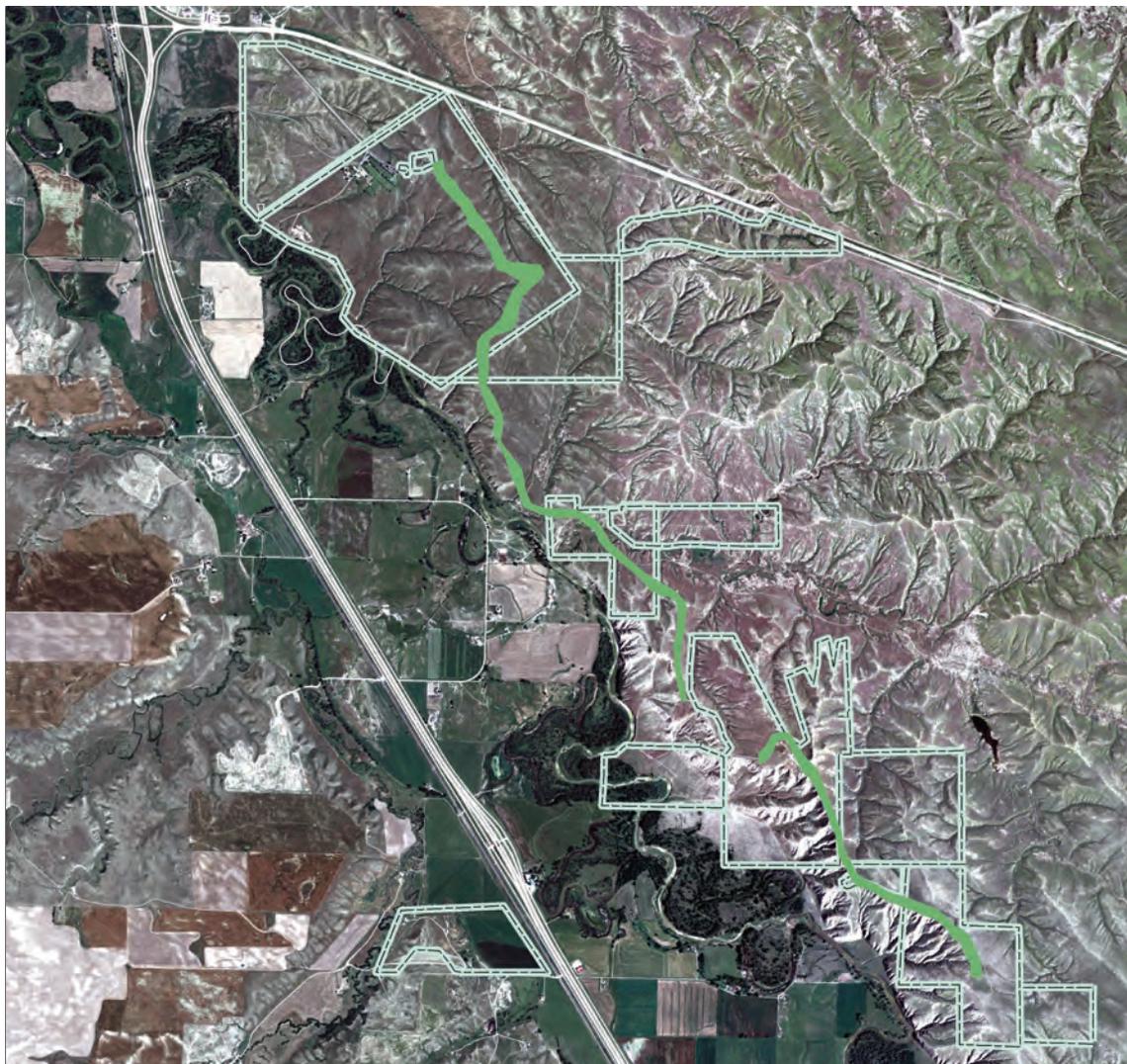


Figure 11. Areas inventoried by metal detector between 1984 and 2004.

was funded by the Custer Battlefield Historical and Museum Association (Figure 11). The 1984 project included a metal detecting inventory of the Custer battlefield and selected testing at several marble markers under the direction of Melissa Connor (Scott and Fox 1987). The marker testing yielded several human remains assemblages that all proved to be soldier related. Following on the footsteps of the 1984 investigations the project was expanded in 1985 to inventory the Reno-Benteen defense site and conduct a stratified random sample excavation at 15% of the markers to determine which ones were incorrectly placed. The results of that work and a reassessment of the 1984 work was later published (Scott et al. 1989). Subsequent to the 1984 and 1985 projects a variety of other research and cultural resource management investigations have taken place in and around the park. The entire range of the projects is listed in the project chronology section and discussed in the narrative description section.

The archeological projects were supported by donated funds from 1983 through 1994. The Custer Battlefield Historical and Museum Association and the Southwestern

Parks and Monuments Association donated over \$107,000 to support archeological work over the years. National Park Service funds and Federal Lands Highway Improvement Funds totaled over \$77,000 between 1994 and 2005 that were specifically used to conduct cultural resource management projects done for compliance with the National Historic Preservation Act, as amended, within the park. The total funds expended on Little Bighorn archeological work is about \$195,000 in public and private funds as of 2010. The funding covered travel costs and some staff time to clean and analyze the artifacts. The project director's salary was paid from MWAC base funds through 1996, then as part of project costs thereafter. The projects were extensively supported, almost literally, by an army of volunteers (Barnard 1985). Without their help the work could not have been as well or productively accomplished. From 1984 through 2005 there were 271 different volunteers who contributed 12,600 hours to the various projects (Figures 12, 13). Using the standard 2005 NPS volunteer hourly rate equivalent of \$17.55 per hour this amounts to a contribution of \$220, 990.00 in time and expertise, more than doubling the actual funded amounts.

The volume of paper generated to document that work is significant, including two master's theses, one Ph.D. dissertation, four books, three monographs, twenty-five published articles or book chapters, and thirty-six short Park Service internal reports. One result of the archeological work was the development and publication of an archeological model of battlefield behavior (Fox and Scott 1991) based on the Little Bighorn



Figure 12. One of the first group of volunteers who assisted on the Little Bighorn project. Back row: Murray Klobberdanz, Mike Parks; Middle row: Al Herem, Jess Schwidde, Ed Smyth, John Craig; Front row: Jim Lafollette, Richard A. Fox, Jr., Stanley Hart, Marlin Howe, Bob Johnson, and Douglas D. Scott.



Figure 13. The 2004 Tour Road archeological team. Left to right, Thomas Sweeney, Dick Harmon, Chris Adams, Douglas Scott (in rear), Larry Ludwig, Carl Carlson-Drexler (in rear), Charles Haecker, Brooks Bond (in rear), Derek Batten, Conrand Angone (in rear), Dave Thorn, Dennis Gahagen (in rear), Larry Gibson, Phil Whitlow, Dave Powell, Tom Frew (in rear), Mike Clark, Harold Roeker (in rear), Anne Bond, and Douglas McChristian.

investigations that became an internationally recognized standard of methodology and theory of the emerging field of battlefield and conflict archeology.

Also springing from the Little Bighorn archeological investigations were two more in-depth studies of specific issues. First, the analysis of the human remains caught the public attention (Figure 14). Two sets of remains were identified (Scott et al. 1989; Scott and Connor 1986; Scott 2004), and as a result of that attention additional remains, collected from the field in the nineteenth century, were located in the Smithsonian Institution and Armed Force Institute of Pathology collections. These were analyzed and reported (Scott and Owsley 1991). The interest that effort generated led to a proposal to exhume seven graves in the National Cemetery that contained purported soldier remains found on the battlefield between 1903 and the 1940s (Scott 1992).

The other research spin-off that resulted from the archeological project was identification of actual firearms used at the battle. Firearms identification procedures were applied to the study of weapons in public and private collections that had a reliable chain of evidence that suggested they could have been used in the battle. Several firearms were positively identified (Scott and Harmon 1988a; 1988b; 2004). Some of this spin-off



Figure 14. Excavations at the marble markers not only found human remains but captivated the public's imagination.

research was funded by the Winchester Gun Museum of Cody Wyoming through several Kinnican Arms Chair Grants.

COMPLIANCE WITH LAW

The National Historic Preservation Act of 1966 (as amended) (NHPA) is the basic cultural resource legislation that the National Park Service and other public entities are guided by when dealing with archeological or historic properties. Fox's (1983) initial post-fire assessment was initiated by the park as an emergency response to determine the effect of the fire on archeological materials, but was done without the park filing any compliance documents or research designs with either the Rocky Mountain Regional Office or the Montana State Historic Preservation Officer, and under the circumstances was understandably overlooked. The archeological research design for the 1984 inventory work, developed by MWAC (Scott 1984) for the park and regional office took into account that the NHPA and National Park Service cultural resource guidance (then NPS 28 and now designated as DO 28) noted that archeological inventories of historic properties required an approved research design to comply with Section 110 of the act. Section 110 advocates for the full archeological and historic inventory of properties. The 1984 investigations were undertaken with this philosophy in mind.

Almost at once some NPS officials as well as other interested parties became concerned that the archeological investigations, specifically the use of metal detectors, were in violation of Section 106 of the NHPA. Section 106 requires that any Federal undertaking be reviewed by the State Historic Preservation Officer and potentially the staff of the Advisory Council on Historic Preservation (ACHP) to insure there are no significant impacts to a National Register property, or those impacts are properly mitigated. A brief meeting was held with NPS Washington office Cultural Resource Program leader Jerry Rogers in late May 1984 to provide information on the ongoing field operations and to suggest that Section 106 did not apply to the situation, and that the work should fall under Section 110 as a park-wide inventory effort.

LITTLE BIGHORN

The 1985 efforts built upon the success of the 1984 field work followed the same approach, in that the investigations were to concentrate on the Reno-Benteen defense area to complete the archeological inventory of the park, test some burial marker locations, and test the Deep Ravine. Once again the research design, reviewed by park and regional office staff, took the approach that the work fell under Section 110, which regulations not only allowed for inventory, but limited archeological testing of properties. Renowned and retired NPS historian Robert Utley (1986; 2004) added fuel to the fire by disagreeing with the value of the 1984 investigations. Utley, coming from a strict constructionist view of historic preservation, voiced his concern that the battlefield, like all national parks, are preserves of archeological data and should never be used for research. He further espoused the view that only sites that were threatened in some manner should be archeologically studied or mitigated. Utley's eminence in the field of historic preservation had a profound effect on the 1985 field work. The work started in early May, but the Montana State Historic Preservation Officer and the Advisory Council staff in Denver became concerned that the project did not comply with Section 106 review requirements. They rejected the concept the project was a Section 110 undertaking that did not require as stringent a review process. Their concerns shut the project field work down for several days until a compromise could be worked out among the entities. NPS agreed that they would revise and resubmit the review documents under Section 106, primarily because the use of metal detectors and the recovery of artifacts found by metal detecting was such a new, and in state's and Council's view, unproven technique. With the passage of time and the extensive use and proven value of metal detectors as an inventory tool on battlefields as well as other sites, the technique is now routinely accepted as part of standard survey methods and the metal detector is now a recognized and standard tool of historical archeologists.

INFORMING THE PUBLIC

The public has been especially captivated by the archeological investigations at Little Bighorn and this widespread interest led to developing an archeology public relations campaign. Fox's initial work generated a great deal of interest, and it was recognized during the formulation of the research designs during the winter of 1984 that the media and public interest would continue. From its inception, the project research plan included a specific element that addressed the need to effectively deal with the public's unflagging interest.

The original plan called for a spokesperson to coordinate activities (Scott 1987b). Also acting as press contact, this individual would handle their telephone inquiries and meet with and brief them on the project's status. When field operations actually began in 1984, the park superintendent assumed the duties of coordinator. In response to overwhelming public interest, a literal media blitz descended on the park. Because nearly 40 percent of the superintendent's time was devoted to this special project—time taken away from his normal press of business—a professor of journalism and project volunteer, Warren “Sandy” Barnard, took over as full-time coordinator during the 1985 fieldwork (Barnard 1985; Mangum 1987b).

Daily early morning briefings were proposed and proved to be very valuable. Each evening, archeologists reviewed the results of the day's findings; planned the next day's assignments and work areas; and determined what interpretations would be given



Figure 15. Dr. P. Willey, University of California-Chico, a project volunteer is being interviewed by a reporter during the 1989 project. Media interest was intense during the 1984 and 1985 field season, and continued for all of the field work efforts although generally limited to local media in subsequent years.

to the coordinator the next morning. The coordinator thus received the latest details on important discoveries, current project status, and the location of fieldwork. The coordinator, in turn, prepared press releases; posted information at the entrance of the Visitors Center; and furnished the park's interpreters and staff with copies of all information for public use. This kept the information fresh and uniform, and helped avoid the dangers of off-the-cuff comments and interpretations.

Questions from the public directed to park interpreters and accessible field archeologists set the tone for the interpretation (Figure 15). The public was most interested in what types of artifacts were being found and how—not if, but how—was the archeological

study changing history. In response to the public's demands, the team implemented several approaches to what was termed field interpretation. First and foremost was the daily briefing posted at the Visitors Center entrance and distributed to the interpreters. The briefing statements contained information on the types and quantities of artifacts found. The briefing also attempted to insure that any informational statements placed the finds in context. If the archeological work was focusing on the so-called Last Stand Hill, then the briefing included the historical information relevant to that element of the battle. If the archeological data appeared at odds with the traditional interpretation, this was pointed out. No conclusions were made, but the briefings stressed that future planned, detailed analysis of all the project data would help resolve discrepancies.

A temporary display was also established in the Visitors Center. The display contained a few traditional archaeology tools, a variety of artifacts found during the investigations, a few photographs of fieldwork in progress, and text to briefly explain the process. This display drew a significant amount of attention and generated numerous questions. The staff interpreters used the display not only as a means to tell the archeological story, but to discuss the varying historical theories on the battle. They could then point out that archaeology could help accept or reject one or more of those opinions.

A third level of interpretation scheduled during the project was small group tours for in-field interpretation by the archeologists. At the location, usually the site of an excavation for human remains, the archeologist would present an overview of the project and a summary of findings. The primary focus of the 15- to 20-minute presentation was the work actually being conducted before the visitors. Every effort was made to stress the roles of both historical archaeology and analytical laboratory techniques in the study of historic sites. In essence, the presentation was an attempt to inform the public about the process of archaeology.

LITTLE BIGHORN

When the archeologists were working in accessible areas, visitors tended to congregate to watch the investigators. An archeologist was assigned to provide impromptu interpretations about the locations and answer the torrents of questions. In numerous cases, the interest was so great that a single interpretive event often ran to nearly an hour.

The staff interpreters were well versed in the event's history and most had some interest in the material culture of the battle. Thus, a natural feedback system developed between the archeologists and park interpreters, which kept the information flowing in a positive, two-way loop. Archeological interpretations of specific elements of the battle were literally changing daily, and the interpreters were able to share these changes with the public within 24 hours.

Early in the project a means was devised to help the public understand the archeological process. The approach, which met with great success, involved comparing the archeological investigation to a crime scene investigation. Most people could easily relate to the analogy of historians as detectives interviewing victims, suspects, and witnesses; and archeologists as the forensic personnel gathering the physical evidence for a more detailed analysis. Visitors readily accepted the concept that oral accounts could be suspect—for example, someone did not remember correctly, did not see part of the action, or was opinionated. Archeological data, or the forensic analyses, provided a more complete picture of the situation than oral accounts could alone. As physical evidence, artifacts do not have opinions, and they are the actual remnants of the battle, although their position and context (provenience) had to be interpreted. It was stressed that the archeological artifacts, as they were found, were deposited as a result of a decision made in the past. Perhaps neither that decision nor the process of making it could be reconstructed with the artifacts and their provenience, but the result of that decision could be interpreted.

From the archeologist's point of view, the opportunity to conduct public interpretation was invaluable. On the one hand, it was enlightening to witness firsthand the public's perception of what archaeology is and how it contributes to understanding the past. On the other hand, it gave archeologists the opportunity to explain field and laboratory techniques to the visitors. Most archeologist-to-visitor interpretation took place at one of the many marker sites that dot the field and purport to identify where soldiers died in battle. The visitors' fascination with the recovery of human remains at these excavations provided an ideal opportunity to explain why the study of the bones is important and what a variety of detailed scientific examinations can tell the archeologist about the people who died in the battle. In no case did a visitor voice an opinion that the excavation of marker sites was improper. In fact, descendants of the soldiers killed at the battle visited the excavations and expressed their approval of the investigations.

There were pitfalls to the interpretive effort, as is the case with any project. First, the amount of time project archeologists devoted to interpretation was not adequately planned for in the project schedule. Field adjustments had to be made and a great deal of planning went into maximizing the archeologists' exposure to the public without jeopardizing the project mission. Second, the public demanded that immediate conclusions be made in the field. It took a great deal of thought and constraint to answer

questions when the data required detailed analysis before arriving at conclusions. It was also recognized that not all the questions were possible to answer. It was important to help the public realize that much more behind-the-scenes work was required to formulate conclusions.

Just as there were pitfalls, there were benefits. The positive personal interactions between the archeological team, the staff interpreters, and the visitors, as well as the project's public visibility, are credited with a 20 percent increase in park visitation. A bonus of the increased visitation and project publicity was a 150 percent increase in sales at the Association bookstore. Association membership also tripled in the same time period. Since the Association funded the majority of the archeological investigations, the archaeology was, in a sense, paying for itself. The Custer Battlefield Historical and Museum Association ceased to be a National Park Service cooperating association in 1993. The new cooperating association, Southwest Parks and Monuments, continued the tradition of support for park archeological investigations with the study of adjacent private lands in 1994 (Scott and Bleed 1997), and they continue to offer the various archeological publications in their on-site sales outlet.

Archaeology of the Little Bighorn has continued to engender public interest and during the 1980s and early 1990s the park developed an archeological slide show and a short documentary film, entitled 'Brushing Away Time: The Story of Archeology at the Little Bighorn' that was shown in the visitors center on a regular schedule. During the 1980s and 1990s the results of the archeological work was included in personal interpretive programs, park literature, and in temporary and later permanent museum exhibits. In 2003 two wayside exhibits were created that are oriented to the archeological discoveries. One is located on Last Stand Hill and interprets the Seventh Cavalry horse grave that was discovered there in 2000 and is now commemorated by a white stone marker similar in design to the soldier's markers. The second wayside exhibit is located near the head of Deep Ravine Trail and it focuses on the role that archaeology has had in the park. In addition, other interpretive wayside exhibits were installed at various points along the park tour road at the same time. Those interpretive panels, while not mentioning the archeological finds specifically, incorporated the latest historical discoveries and archeological findings to provide an integrated interpretation for the visiting public of the battle sequence and events.

Another public legacy of the archeological investigations is the number of television and other documentaries made between 1985 and 2009 that featured the archeological work in some form or another. At least fourteen made for television documentaries (Figure 16) were filmed that focused on the archeological work or that used the archeological information as part of the program. The documentaries were shown on U.S. Public Television, The History Channel, Arts and Entertainment Network, The Discovery Channel, The Archaeology Channel, Smithsonian segments, ZDF (German) television, Italian television, Granada (English) Television, BBC (English) Television, and the Australian Broadcast Company television among others. Such global exposure of the archeological work is nearly unprecedented in North American archaeology.



Figure 16. Douglas Scott being interviewed by Australian Broadcasting Company for a documentary on the archeology of the battle. At least fourteen such documentaries have been made and aired world-wide since 1985.



Figure 17. A typical metal detecting transect line at work. The team is at work in 2004, courtesy of John Doerner.



Figure 18. Former park historian Douglas McChristian and volunteer Conrad Angone excavate a target during the 2004 tour road project. The individuals in the background are discussing a recent find. Courtesy of John Doerner.

DEVISING ARCHEOLOGICAL INVESTIGATION METHODS

Since 1984 all archeological inventory projects conducted in and around the park by the National Park Service and the Midwest Archeological Center have followed the same general methodology (Figures 17, 18). Each project applied the methods with some modification of mapping technology or other methodological adaptations, but each modification was predicated on advances in method and theory that enabled better data collection and analysis.

The Little Bighorn Battlefield National Monument data was initially recorded using optical transits, then with electronic distant meters (EDM), then with total station transit technology, and beginning in 2004 data were collected using Global Positioning Systems (GPS). Initially, in 1984, a grid system was established by a professional contract land surveyor, on the Custer field, that was divided into 100 meter squares (Scott and Fox 1987), which was done to facilitate the recording of artifacts. The grid was established so that its arbitrary origin (0,0) was near the nearby Garryowen post office, and the grid was oriented with the fence line of Custer battlefield, about 39 degrees west of true north. The grid numbers were higher moving north and east. The southeast fence corner on Custer battlefield was established as North 6400 meters and East 3000 meters (N64E30).

When the same surveyor set the grid for the Reno-Benteen defense site in 1985 he inadvertently numbered the east to west line the reverse of the 1984 scheme. The easting

LITTLE BIGHORN

numbers are higher as one moves grid west or opposite the Custer numbering system. During the 1985 field work the numbering system was not corrected. The 1989 (Scott 1991) field investigations required establishing of a series of one meter square units within the larger 100 meter square units. The excavation units were established and numbered in the correct order - easting numbers increasing west to east.

With the advent of Global Positioning System technology the project used GPS units to record field data (Figure 19). The 1984 through 2003 investigations relied on computer aided design technology to produce project maps acquired from the transit field data. Initially Fastdraft© (Figure 20) was used then AutoCad© in its various permutations allowed detailed and accurate data plotting and analysis. Sokkia Map© was used as the initial field data processing software from 1989 through 2003. In 2003 ArcView's© geographic information system was employed, and in 2005 all earlier CAD data was transferred to GIS format (Figure 21). The first attempt to transfer the earlier CAD data was made by Major Christopher Benson and a class in GIS at the U.S. Air Force Academy (Benson 2005). The effort also included an attempt at employing the Track Analyst function to see if new insights into the battle could be obtained. Subsequently Michael Athanson, a PhD student at Oxford University, used the distribution of fired bullets to test the validity of some of the interpretations of troop movement. He employed external ballistic simulation coupled with target visibility obtained using GIS view shed analysis (Athanson 2006:1-7). His results correlated well with the postulated soldier and



Figure 19. Former MWAC employees Harold Roeker (retired) and Carl Carlson-Drexler, then a University of Nebraska-Lincoln graduate student, display the GPS unit used in mapping features and artifact finds during the 2004 tour road project.

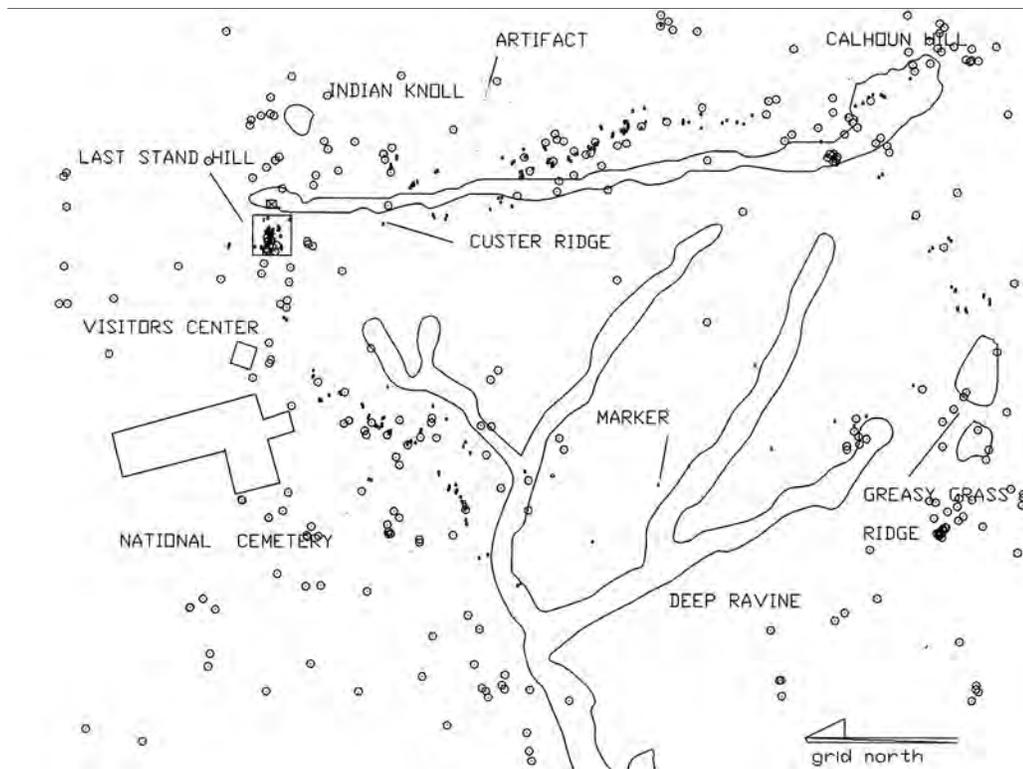


Figure 20. The first artifact distribution maps used FastCad and early versions of AutoCad to create figures for the reports. Here distributions of army related cartridge cases are shown.

warrior positions and the original data analysis (Scott et al. 1989). The archeological GIS dataset was edited and updated to meet current Park Service metadata standards in 2009 (Figures 21, 22).

Essentially each investigation followed a set of general field investigation methods. Fieldwork consisted of metal detecting and visual inventory using the transect method. Transect widths, and thus sampling intensity, was determined by each project's requirements. Much of the work was done using a sampling level or detector spacing of about 3 to 5 meters (10 to 15 feet) to achieve an approximately 35% sampling of the park and the surrounding areas. Detailed or more intense detecting work, such as was done prior to construction of the Indian Memorial, used metal detector spacing of 2 meters (6 feet) with transects run across the project area in one direction then another set perpendicular to the first to insure as full an artifact recovery as possible.

Standard archeological data recording methods were used in each phase of the operations. Individual artifacts, spatially discrete clusters of identical specimens, or associated dissimilar specimens received unique Field Specimen (FS) numbers. Field notes and standardized Midwest Archeological Center forms were used to record field data. Selected in-place artifact specimens and topography were photographed and recorded in black and white film, by color slides, and later in digital format.

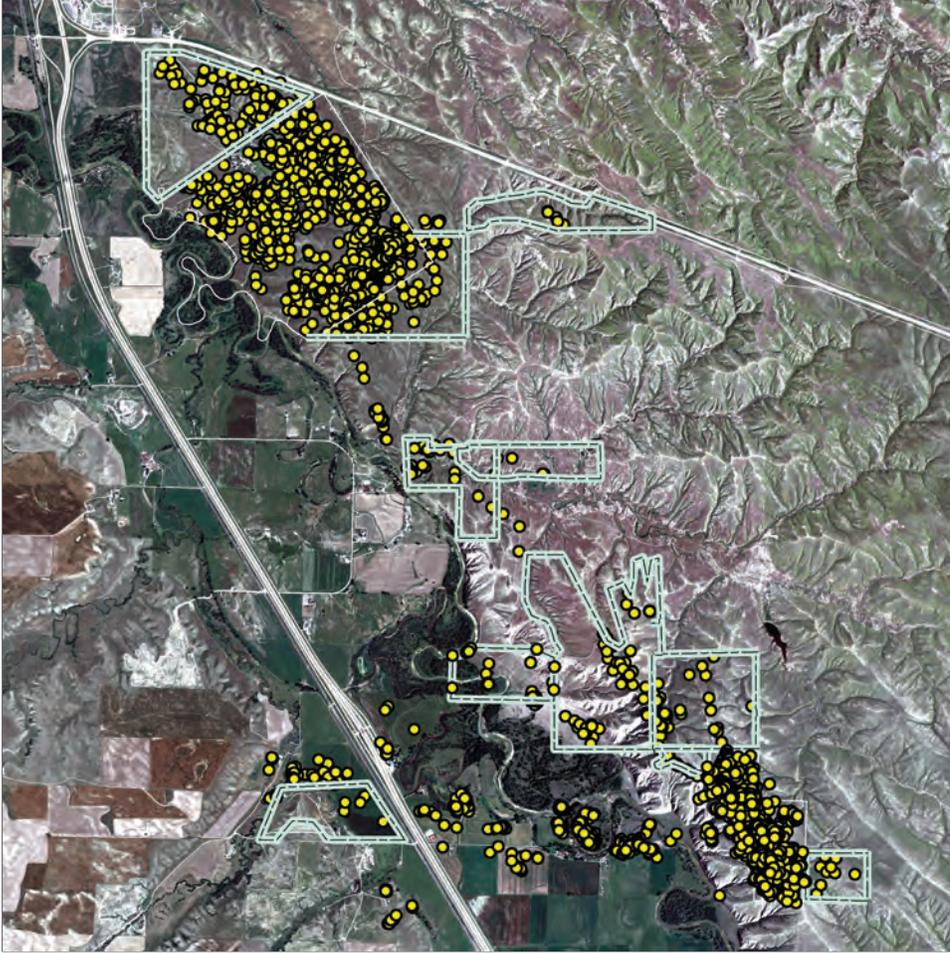


Figure 21. All artifacts found or plotted on the park and on private lands and the areas formally inventoried between 1984 and 2004 with all data transferred to GIS.

Inventory work included three sequential operations: survey, recovery, and recording. During survey the crew located and marked artifact finds. The recovery crew followed and carefully uncovered subsurface finds, leaving them in place. The recording team plotted individual artifact locations using an optical transit, an EDM transit, a Sokkia Total Station transit, or a Trimble Pro XL global positioning system depending on the technology available at the time of the field investigations. The recovery recording team assigned field specimen numbers and collected the specimens.

Metal detecting operations were designed to locate subsurface metallic items with the use of electronic metal detectors. Visual inspection of the surface was carried out concurrently with the metal detector survey. Various brands of metal detectors were employed during the field work. The standardization of machines (i.e., all one brand), though perhaps methodologically desirable, was highly impractical during the 1980s. Like models operated on the same frequency, causing interference at close intervals. Thus the metal detectors alternated different brands of machines on the line to ensure adequate survey coverage and minimize electronic interference.

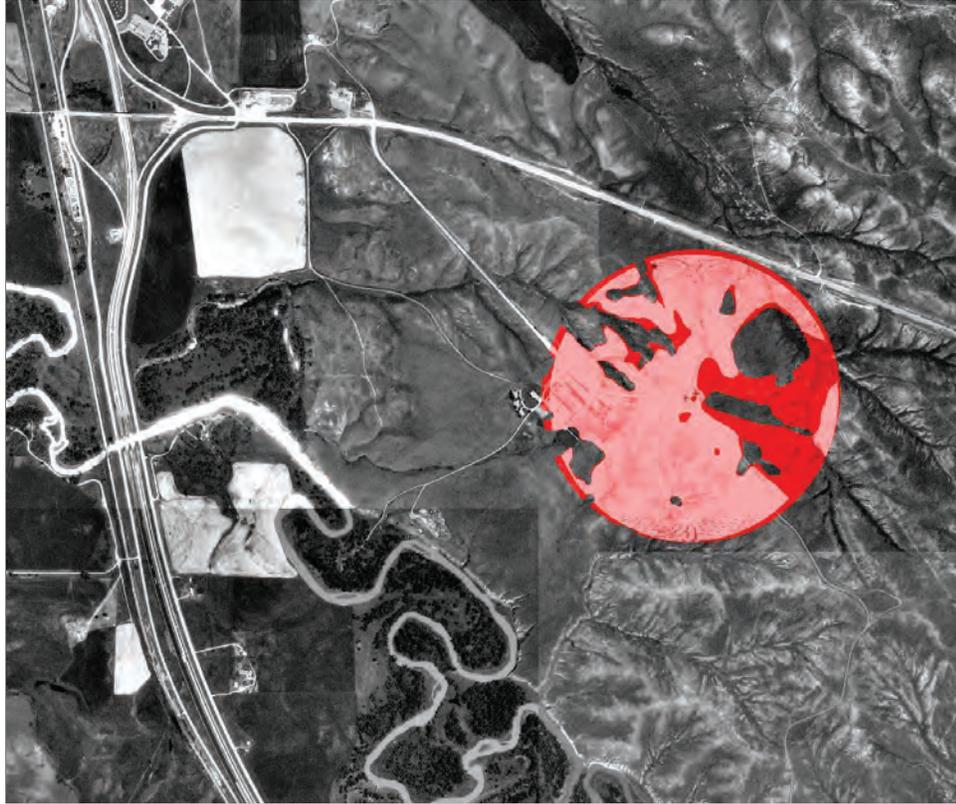


Figure 22. The analytical power of Geographic Information Systems is shown here as a weapons fan or viewshed analysis of what the soldiers on Last Stand Hill could see shown in color, and what they could not see up to 600 meters, the effective carbine range. This analysis clearly shows blind spots, mostly low areas that the warriors could and did exploit to get within effective firearm range to destroy the surviving Seventh cavalrymen.

Once the collected materials were returned to MWAC they were cleaned, sorted, and analyzed. The methods employed in cleaning the artifacts are the standard laboratory procedures of the Midwest Archeological Center. Essentially they consisted of washing the accumulated dirt and mud from each artifact and then determining the condition of the artifact to see whether it required further cleaning or conservation. For analysis and identification purposes some metallic items required a treatment with e-z-est© (a commercial coin cleaner found to be very effective in removing verdigris and not harmful to the underlying metal) to remove oxides that built up on them during the years in which they were in the ground. Other objects were subjected to electrolytic reduction preservation methods, and dilute glycolic acid was used to clean cartridge cases and bullets during the first two years of the project. After cleaning and stabilization each artifact was rebagged in a self-sealing clear plastic bag with its appropriate Field Specimen (FS) number and other relevant information on the bag. The artifacts were then identified, sorted, and analyzed.

The identification, sorting, and analysis consisted of dividing the artifacts into classes of like objects and then sub sorting the artifacts into further identifiable discrete types. Sorting and identification of the artifacts was undertaken by personnel experienced with artifacts of this period, who compared the artifacts with type

collections and with standard reference materials. Firearms identification procedures followed established analytical standards (Harris 1980; Hatcher, Jury, and Weller 1977; Scott and Fox 1987; Scott et al. 1989).

Excavation methods employed during the testing of the selected marble markers and at the prehistoric sites followed standard procedures of the Midwest Archeological Center. Individual units were usually 2 x 2 meters (Figure 14) and were excavated using shovels, trowels, and smaller hand tools as required. All excavated material was screened through ¼ inch wire mesh screens. Artifacts were mapped using standard practices and bagged according to provenience. Post-excavation processing followed the same basic procedure as the metal detected materials. All excavations were backfilled by hand following documentation and recording of the unit. No soil samples were collected. Natural plant succession was maintained after backfilling operations.

EVALUATION OF INVENTORY METHODS

In 1985 Richard Fox (Scott et al. 1989) designed and implemented an evaluation phase to test the validity of the metal detecting procedure used throughout the project. The evaluation was a simple one. Seven previously inventoried 100 meter square units were selected and reinventoried, using a more detailed procedure. The selected units represented areas on the Custer field that had yielded a large quantity of artifacts (grid unit N6500 E3000), a moderate quantity (grid units N7100 E2700 and N7500 E2400), a small quantity (grid units N6600 E2200 and N7300 E2000), and two areas at Reno-Benteen defense site, one (grid unit N2400 E2400) representing an Indian position and the other (grid unit N2000 E2300) representing an army position. The relative quantity of artifacts was a subjective judgment of the archeologists. The reinventory procedure divided the units into a series of transects two meters wide. The metal detector operators were lined up, and each walked the area very slowly, sweeping it with his or her detector in an arc one and five tenths to two meters (four to six and sixteenths feet) wide. When one transect was completed, the crew supervisor pivoted the group to the next set of transects, and a new sweep began. The project procedures for pin flagging and artifact recording were used.

Each reinventoried 100 meter square yielded about twice the number of artifacts that had been recovered during the initial detector sweeps. Statistically this is a thirty to thirty-five percent sample of all the artifacts. From a statistical point of view this sample size is well above a minimum necessary to assess and interpret patterns and spatial distributions. The artifacts were cross tabulated by the number of artifact classes, and types of artifacts initially recovered against those found in the evaluation phase. In evaluating the data, it was determined that the artifacts were truly representative of the metal detected artifact population and that a valid sample for interpreting the patterns of artifact distribution was recovered using the project methodology.

Subsequent mitigation work on the Indian Memorial site and along the tour road (Scott 1998a ; Scott 2006) used detailed metal detecting with transect spacing of two meters or less and additional transects run perpendicular to the first set. Both mitigation project results reinforced the validity of the original sampling design and artifact

recovery. The number of artifacts in the various classes and types are also representative of all the artifacts on the battlefield and are also a valid sample of the metal in the ground.

An aside on the inventory work is in order. During the 1984 field work about eight individuals approached the park offering to find the human remains in Deep Ravine and elsewhere on the battlefield by dowsing for bone. Each individual was allowed to walk over portions of Deep Ravine that were under investigation and areas along the Deep Ravine Trail. Each dowser used some form of wire rod that either crossed or separated when they believed they found buried bone. One individual had small alligator clips soldered to his rods to which he clipped bone that he brought with him, as he believed the rods were then sensitized to the type of item he was trying to find. The archeological team later validated a sample of the locations. In each case the dowsers were found to be 100 percent in error. No human remains or other archeological materials were discovered at any location identified by any dowser.

LITTLE BIGHORN

5. CHRONOLOGY OF LITTLE BIGHORN BATTLEFIELD PROFESSIONAL ARCHEOLOGICAL INVESTIGATIONS

This chapter provides a chronological listing and a narrative summary of the previous archeological investigations undertaken in or around the park by professional archeologists. Please refer to the appendix, Bibliography of Reports, Monographs, and Publications Related to Little Bighorn Archeology, for the complete citation of the various references noted below.

Date	Investigator	Location and Work Accomplished
1956-1959	Robert Bray Don Rickey	The first formal investigations conducted at the battle-field. Metal detecting and excavations were confined to the Reno-Benteen entrenchment area. A number of artifacts and three human burials were recovered (Bray 1958).
1977	Connie Bennett	A preconstruction inventory of the battlefield. No resources were identified (Bennett 1977).
1983	Richard Fox	A reconnaissance survey of the battlefield conducted after the 1983 range fire. Some artifacts were located and a number of possible cultural features were identified (Fox 1983).
1984	Douglas Scott	Metal detector survey of the Custer battlefield and testing of several marble marker locations. Fox's possible features were tested and found to be natural features (Scott and Fox 1987; Bozell 1985; Scott 1984a; 1984b).
1985	Douglas Scott	Continuation of investigations of the battlefield in 1984. A metal detector inventory was completed at the Reno-Benteen Defense Site. Stratified sampling of the marble markers was undertaken and an inventory of prehistoric resources was completed (Scott et al. 1989; Bozell 1989; Haynes 1989; Heinz 1989; Phillips 1989; Scott 1987a, 1987b; 1987c; 1987d; Scott and Connor 1986; Snow and Fitzpatrick 1989; Fox 1983; Scott and Harmon 1988a; 1988b; Scott 1990; 2002a; 2002b). A coincidental study of cremated remains was also undertaken (Scott 1987a).
1986	Melissa Connor	Exhumation of a grave in the National Cemetery containing battlefield remains in preparation for the reburial of all human remains (Connor 1986; Scott and Connor 1988; Scott, Connor and Snow 1988; Pieters and Barnard 1986).
1989	Douglas Scott	Evaluative testing of two prehistoric sites with negative results (Scott 1989a).
1989	Douglas Scott	Investigation of a find of human remains near the Reno Retreat Crossing (Scott and Snow 1991b).
1989	Douglas Scott	Mitigation of the Reno-Benteen equipment disposal site (Scott 1991a, 1991b; Connor 1991; Haynes 1991; Heinz 1990). Mitigation of a marker on Custer battlefield (Scott and Snow 1991a).
1992	Douglas Scott	Seven graves in the National Cemetery were exhumed. At least ten individuals thought to be 7th Cavalry soldiers were exhumed from the seven graves (Scott 1992a; 1992b; 1992d; 1992e; Scott, Willey, and Connor 1998; Willey 1993; Scott and Owsley 1991). Also a small re-inventory of the site of the Deep Ravine overlook was conducted (Scott 1992c).
1993	Douglas Scott	Mapping of the Reno Attack and retreat lines. General artifact find locations on private property in the Little Bighorn River valley were recorded to help refine the actual lines (Scott 1993a). A visual inventory was also conducted of the Reno-Benteen walkway removal prior to laying of a new concrete walking trail. No archeological features or artifacts were noted (Scott 1993b).
1993	Melissa Connor	Exhumation of a disturbed burial site on the Pitsch property (Connor 1994).
1994	Douglas Scott Peter Bleed	Metal Detecting inventory of 1000 acres of private land adjacent to the battlefield (Scott and Bleed 1997).
1994	Douglas Scott	Walk over of burned area. A grass fire occurred in August burning about 200 acres. No artifacts were exposed or effected. No damage was observed to the markers (Scott 1994).

LITTLE BIGHORN

Date	Investigator	Location and Work Accomplished
1995	Douglas Scott	Observing remote sensing test and inventory of soil percolation test area for new sewage system (Scott 1995).
1995	Idaho National Engineering Lab	Testing of a Rapid Geophysical Suveryor in Deep Ravine, at Reno-Benteen, at selected Markers, and in Cemetery Ravine (Josten and Carpenter 1995).
1996	Douglas Scott	Metal detecting of portions of the Farron Iron property located in Cedar Coulee and Sharpshooter Ridge near the Reno-Benteen defense site. A number of artifacts confirming the line of movement to Weir Point were recovered (Scott 1996).
1996	Coleman Research	Coleman Research (1996) and Applied Imaging (1996) conducted geophysical remote sensing studies in Deep Ravine, Cemetery Ravine, and at Reno-Benteen in an attempt to locate buried features. An anomaly was identified in Deep Ravine that is consistent with historical accounts and geomorphology suggesting a possible site for the burial of the purported 28 missing men.
1998	Douglas Scott	A detailed visual and metal detector inventory of the proposed Indian Memorial site was undertaken. Battle-related artifacts were located (Scott 1998a). Additional inventory was undertaken on the Iron's property and the Stops property in the Little Bighorn valley with the recovery of a few additional artifacts (Scott 1998b).
1999	Douglas Scott	The site of a new water gauging station on the Little Bighorn River below the park housing area was inventoried with negative results (Scott 1999b). Selected areas adjacent to the Reno-Benteen defense site and private lands in the river valley were inventoried and a variety of artifacts collected (Scott 2000a). The site of Custer's June 23 campsite on the Rosebud River was inventoried with positive results (Scott 2000b).
1999	Patrick Walker-Kuntz and Sundry Walker-Kuntz	Walker-Kuntz and Walker-Kuntz (1999) conducted a visual inventory along the park boundary where it joins highway 212 as part of a Montana Highway project. The results were negative.
2002	Douglas Scott	Geophysical investigations to locate the horse burial pit from 1881 were undertaken by Robert Nickel (2002a, b) and Steven De Vore (2002a, b). Mitigation excavations of the horse pit were undertaken to document the site during construction of a walkway to the new Indian Memorial (Scott 2002).
2002	Steven De Vore	During reconstruction of the parking lot at Last Stand Hill human remains were discovered. Steven De Vore (2002c) investigated the discovery and determined they were bones overlooked during exhumation of the Fort Phil Kearny cemetery for relocation to Custer National Cemetery.
2004	Douglas Scott	Detailed metal detecting of the tour road in order to mitigate potential effects of road rehabilitation. The entire road from Last Stand Hill including the Reno-Benteen parking lot and 20 meters either side of the road were inventoried as well as the Calhoun Hill loop. Over 300 artifacts were found (Scott 2006). The visitor center grounds were also inventoried in anticipation of planning activities that might call for the expansion of the VC. The area is highly disturbed and no battle era materials were found (Scott 2005)
2005	Steven De Vore	Geophysical investigations of the Reno-Benteen parking lot area and adjacent land to determine if buried rifle pits might be impacted by the tour road rehabilitation. Two anomalies, consistent in size with rifle pits, but both outside the area of impact were recorded (De Vore 2005).

Legally the Little Bighorn archeological inventory areas lie within Townships 3 and 4 South all within Range 35 East of the US cadastral survey system. The Custer Battlefield Historic District boundary is delineated by an irregular rectangle delineated by UTM reference points located in Zone 13N: A - 310750E 5049540N, B - 311640E 5048110N, C - 310560E 5047400N, and D - 309440E 5048610N. The boundary follows the National Monument fenced boundary. The Reno-Benteen site is delineated by

an irregular shaped area delineated by UTM reference points located in Zone 13N: A - 313880E 5044200N, B - 314270E 5044200N, C - 314280E 5043800N, D - 314630E 5043780N, E - 314640E 5043370N, F - 314610E 5043360N, G - 314600E 5042960N, H - 314220E 5042980N, I - 314250E 5043390N, and J - 313840E 5043390N. The boundary follows the National Monument boundary fence.

The entire park property was inventoried, the Custer field lying in those portions of Section 17, 18, 19, and 20 R35E T3S and the Reno-Benteen defense site lying in those portions of Section 31 R35E T3S and Section 3 R35E T4S. Private and Crow Tribal property inventoried include those lands adjacent to the park in portions of the SW ½ NW1/4 Section 17, E1/2 Section 18, S1/2 S1/2 Section 20, R35E T3S. Other areas include in R35E T3S, S1/2 Section 28, W1/2 NW1/4 and N1/2 NW1/4 Section 28, NE1/4 NE1/4 Section 29, S1/2 S1/2 Section 32, N1/2 NW1/4 and NE1/4 Section 33, NW1/4 Section 34, and in R35E T3S NW1/4 Section 3 outside the Reno-Benteen boundary.

NARRATIVE DESCRIPTION OF ARCHEOLOGICAL INVESTIGATIONS BY AREA

The chronological listing provides a simple laundry list of investigation efforts and results, but it does not convey a full sense of how much of the battlefield, nor of the specific elements of the story, has been investigated. This narrative description is organized by battle events with an ensuing discussion of the results of the archeological investigations of those events. Following the battle event discussion is a synopsis of what has been learned about the battle from studies of the artifacts recovered during the investigations. Since 1984 the archeological projects, using metal detecting transects, have inventoried over 1900 acres of land in and around the park. The park itself consists of 765 acres, all inventoried in 1984 and 1985. In subsequent years over 1200 acres outside the park boundary have been inventoried (Figure 11). Over 5000 battle-related artifacts have been collected, analyzed, reported, and cataloged.

Custer's June 23 Camp

Frank Anders (1983) and Laudie Chorne (1997) have charted the Seventh Cavalry route from Ft. Abraham Lincoln through the Camp of June 22, 1876 when Custer left the Yellowstone River valley and began his fateful march into history. The only Custer column campsite to be archeologically investigated to date was done in the fall of 1999 (Scott 2000) when initial archeological reconnaissance was conducted at the site of Custer's June 23rd camp on Rosebud Creek (Figure 23). Landowner Jack Bailey allowed access to about 50 acres of land located north of Lame Deer. Only a handful of artifacts (Figure 24) were recovered, a .45-55 cartridge case, the back of a General Service button, a trouser button, a broken mess spoon, a crushed camp boiler, a badly rusted one-gallon can that may have held roasted coffee beans, a Burden horseshoe, and the tips of several horseshoe nails found near a firepit. Taken together, these artifacts are the lost bits of the Seventh's camp equipment from a thirteen-hour overnight stay by over 600 men. The fired cartridge case suggests that the no-firing orders were not rigorously enforced in some element of the command, and the firepit and clipped horseshoe nail tips suggest that some farrier probably reshod at least one horse before he turned in for the evening. The findings, while limited in number, are consistent with relic finds recovered from Seventh

LITTLE BIGHORN

Cavalry campsites associated with the 1874 Black Hills expedition and documented by Horsted et al. (2009).

Located near the June 23 campsite is the site of the Lakota Sundance where Sitting Bull had a vision of the upcoming victory by seeing soldiers falling upside down into the camp. Also nearby is Deer Medicine Rocks (Figure 25), an important prehistoric and historic sandstone feature that has rock art from many different ages carved and pecked into its surface. Deer Medicine Rocks is not only highly significant to the Sioux War era, but has been and continues to be an Indian sacred site. The Deer Medicine Rocks has been nominated as National Historic Landmarks.

Reno's Valley Fight

The next set of physical evidence relates to Major Marcus Reno's deployment and attack on the Indian village. Jason Pitsch metal detected his family's land and some adjacent landowners' property for several years (Figure 26), developing a private museum near Interstate 95 where it intersects Reno's first skirmish line. The museum was designated the Reno Battlefield Museum. Pitsch plotted his finds on maps and aerial photographs, and kept his artifacts organized by find area. In 1993 Scott (1993a) mapped the location of many of Pitsch's finds, including evidence of Reno's skirmish lines in the valley, elements of the timber fight, and the retreat to the river. Perhaps more exciting, in some ways, was the opportunity to see and map Pitsch's finds in Sitting Bull's camp circle, located just north of the Garryowen store, and a recently discovered Indian camp on the east side of the river. Mr. Pitsch found the campsite and extensive evidence of warriors firing at the bluffs and Weir Point before the story of Spotted Tail's disaffected warriors became generally known to present day researchers. Lieutenant Oscar Long (Brust 1995) learned of the story from a group of young disaffected warriors of Spotted Tail's band and reported it to his superiors. The Spotted Tail warriors set up an essentially all male camp on the east side of the Little Bighorn just north of Weir Point and across the river from the Lakota camp circles. When Reno's attack began, these young men joined the fray by rushing up the ravines that led to Weir Point and along the east side of the river where they fired on the soldiers. That story and a map of the events were unknown to most Little Bighorn researchers until it was published in the 1995 issue of *Greasy Grass*. The map shows the camp to be on the east side of the river in a location consistent with that found by Jason Pitsch.

Artifacts recovered in the camp areas are highly diverse. Due to the fact that the sites had been plowed, and one area leveled for irrigation, the identified perimeters were mapped as concentrations rather than individual find sites. The artifacts from the camp sites are typical of camp debris. They include cooking vessel fragments, beads, firearms parts, individual decorative items, and other basic camp furniture. The village sites have yielded large quantities of trade goods to Mr. Pitsch's metal detector. The debris is scattered over a broad area.

In addition Mr. Pitsch located numerous Indian associated fired cartridge cases on a bench just east of the east bank camp site. The presence of those Indian associated cartridge cases as well as a few army bullets suggest this may have been the site of a group of warriors who fired on the soldiers who were at Wier Point.

Mr. Pitsch found eleven .45-55 cartridge cases in the fields west of the Garryowen Post Office. These cases are in a roughly linear alignment from northwest to southeast. Presumably these cases identify Reno's first skirmish line. The angled alignment is more in keeping with an attack on the village site at Garryowen than an east-west alignment as postulated by Vaughn (1966). A due east-west alignment would cause the soldiers to face obliquely away from the now-identified camp sites. The archeological data suggest the village was near the river and as the river flows to the northwest the various camp circles would follow along its contour, thus logic dictates the attack lines would be angled to meet the enemy. The skirmish line cases were found in a field that is subject to cultivation, thus some cases may be out of context. The fact that such a linear alignment as present strongly suggests pattern disruption by agricultural practices is minimal.

Supporting the supposition that the linear case alignment represents Reno's skirmish line are the presence of .44 Henry, .50 Spencer, and .50-70 cases on a bench to the west of the line. These cases, about 25 in number, indicate firing positions occupied by the opposing forces. The location is consistent with the fact that Reno's line was outflanked and forced to fall back. Nine additional cases were also recovered at the west edge of the fields several hundred meters to the south, essentially below an old gravel quarry.

In addition to the .45-55 cases on the presumed skirmish line, Mr. Pitsch has recovered 7 cases on a terrace above the Hunkpapa village site. These cases are intermixed with 7 .44 Henry cases, 5 .50-70 cases, 1 Spencer case, and a round ball. The mixing may be indicative of several episodes of use by both combatant groups. The .45-55 cases may represent soldiers or Ree scouts gaining the ground and firing into the village as is reported in Libby (1920). The .50-70 cases may also be associated with this incident. Conversely all the cases may represent Sioux warrior positions utilizing a mixed variety of weapons. In any event there is no alignment of any of the cases and all are clustered on the terrace. Such a disposition pattern is consistent with the Native American fighting pattern. The bench also yielded glass trade beads (seed beads), bovid bone, and charcoal stains identified as possible fire hearths.

Other .45-70 cases were recovered in the areas Vaughn identifies as Reno's second skirmish line, the timber area, and a large number on the land circumscribed by the abandoned river meander. At least 17 were recovered there. They are clustered suggesting a tactical disintegration occurred here, which is consistent with Reno's disorganized retreat from the timber. However, the possibility of Indian use of captured army guns is also a feasible alternative to consider.

The artifacts found in the vicinity of the second skirmish line and in the presumed timber area are also clustered. One location of numerous cartridge cases and other artifacts found by Mr. Pitsch was along a slough that was disturbed by heavy equipment in recent years. The perimeter of this area was mapped, but not individual artifact locations. If this is the timber fight area, and if Vaughn and others are correct that the so-called Garryowen bend was an active channel during the battle, then Reno's timber fight area was protected by the river on two sides. This may shed some light on comments by witnesses at the Reno Court of Inquiry (Nichols 1992) that the timber area was defensible, suggesting a skirmish line could have been extended from river bank

LITTLE BIGHORN

to river bank. The Court witnesses and the archeological evidence suggest this did not occur, thus requiring the retreat to the ford.

The Indian-related .44 Henry cases, .50-70 cases, Spencer cases, and other miscellaneous cartridge cases clustered in several areas. Several, at least 6, were found in the field areas where the Reynolds, McIntosh, and Dorman markers are located. Few army cases or other artifacts have been recovered in that area. These Indian cases also tend to group on and around the meander. Some are inter-mixed with the .45-55 cases, although most are spatially separate. A significant cluster of Indian cases of all calibers was recovered in the field adjacent to the Preservation Committee holdings that contain the retreat ford site. Again some army cases were found in this general vicinity, but the large number of Indian cases, at least 30, indicate Reno's retreat was under pressure. These data very accurately confirm the historic accounts.

Not surprisingly the bullets recovered by Pitsch tend to be found in association with the cases. Also of no surprise is the tendency for bullets from Indian weapons to be found among the .45-55 cases and army bullets among the Indian associated cases. Again these data confirm the impression of combat positions and movement and correlate well with the historic record. The same can be said for Indian associated arrowheads. They are found primarily among the assumed army positions.



Figure 23. Monument and area of Custer's command's June 23, 1876 evening layover or campsite. The area was tested by archeological metal detecting in 1999.



Figure 24. A .45-55 fired cartridge case, a general service button back, a trouser button, and a spoon recovered at the Seventh Cavalry June 23, 1876 camp site.

The miscellaneous artifacts, such as tin cans, percussion caps, cap tins, horse tack and equipment, as well as personal items, are associated with the appropriate class of combat material. Items usually associated with army personnel, including saddle parts, other tack, eye glasses, parts of equipment, etc. are clearly intermingled with the army cartridge cases and the Indian bullets.

A significant departure from the expected patterning is that of the firearms parts. About 30 items were mapped, of which all but four were found in and around a slough or abandoned river meander. This slough is situated on the north edge of Reno's retreat line and about midway between the Hunkpapa village site and the retreat crossing. The clustering is made up of a variety of firearm parts including many Colt and Springfield army weapon parts. Also intermingled in significant quantities are older gun parts as well as others that suggest an Indian association. While the deposit may reflect an immediate post-battle clean-up and firearm destruction effort, it is equally possible that the deposit post-dates the battle by a year or more. In any case such a disparate deposit of dissimilar gun parts suggests intentional disassembly of the weapons. This most likely occurred when press of battle was not imminent.

It is possible Mr. Pitsch's linear alignment of finds is the result of where he looked as opposed to a total artifact pattern. However, the lack of finds by other collectors (e.g., J. W. Vaughn) beyond the area in which Mr. Pitsch has made his finds makes it unlikely the pattern is completely fortuitous. Assuming the pattern represents a near approximation of the retreat route then the correlation with the historic record is excellent, and generally follows that postulated by Greene (1986) during his earlier relic find assessment efforts.

LITTLE BIGHORN



Figure 25. Deer Medicine Rocks is a prominent landmark and Indian sacred site and was so in 1876. Custer's command camped near the rocks on June 23, 1876, and passed by it on June 24.

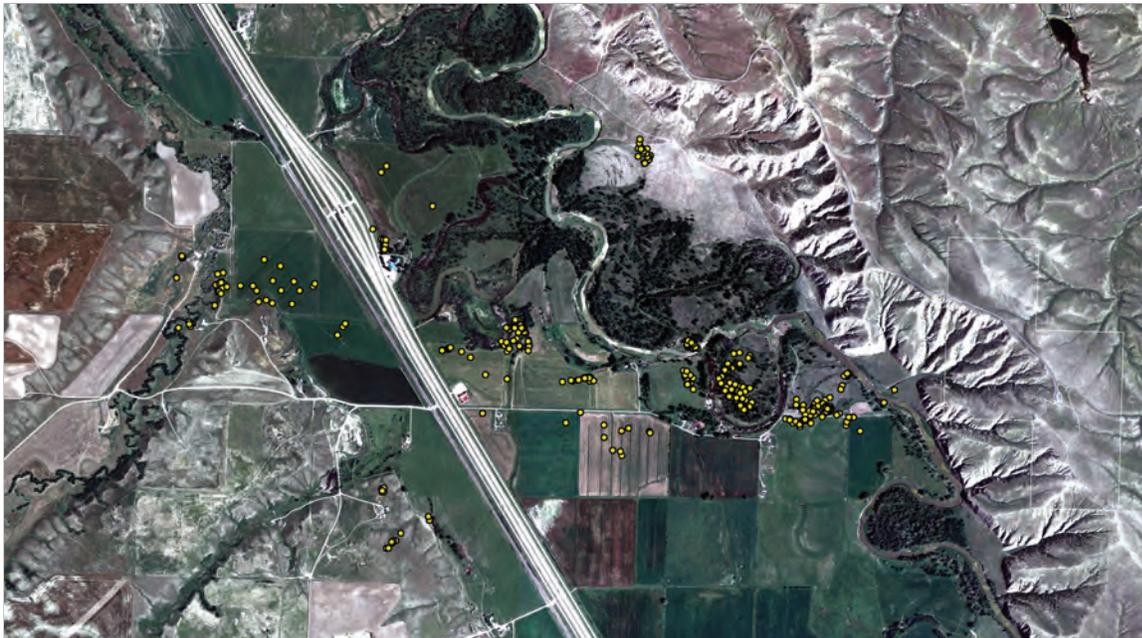


Figure 26. Finds made by Jason Pitsch and mapped in 1993, plotted on the modern aerial photograph.

While cleaning an irrigation ditch in the spring of 1993, Jason Pitsch spotted a large crumpled sheet of brass. It was roughly rolled and covered with heavy green patina, but he collected it and noted its location, which was amidst the location traditionally identified as the site of the Sioux camp circle occupied by Sitting Bull's band of Hunkpapa. Returning to his ranch house, Jason gently washed the dirt from the brass artifact. As he turned the item it caught the sun's rays in such a way as to expose some incised lines. Intrigued, he carefully unfolded the crumpled sheet to find the lines became a series of figures scratched into one face of a brass plate.

The figures (Scott et al. 1997) depict a scene of Indian warriors pursuing and shooting at a group of fleeing soldiers. All available evidence supports the conclusion that the brass plate is an authentic Indian representation of a specific confrontation between Indians and U. S. Army soldiers. The discovery context at the site of the Sioux camp at the Little Bighorn Battlefield is certainly significant and suggests that it was deposited no later than June 27, 1876. The plate's condition is entirely consistent with that interpretation. All of the elements portrayed on the plate--the horses, human figures, and Indian equipment--also fit conventions of the second and third quarters of the nineteenth century. The depictions of the soldiers' carbines is accurate enough to identify them as Springfield carbines, which have to date the inscribed image to sometime after 1874. As a unique artifact presenting a powerful image offered from the Indian perspective, this brass plate constitutes a truly important contribution to American frontier history, but the item was sold at auction to a private bidder when the Reno Battlefield Museum collections were sold to recover loan losses by the Small Business Administration.

Two other valley finds are of interest. Both are human skeletal assemblages. One was found in 1994 on Pitsch land and excavated by Melissa Connor and Dick Harmon with assistance from Jason Pitsch (Connor 1994). They proved to be the partial remains of more than one individual. In fact there were parts of two people (Scott, Willey, and Connor 1998). Those few bone fragments matched two partial sets of remains that had been recently removed from the Custer National Cemetery with the hopes of identifying the remains. As it turned out, Dr. P. Willey was able to determine that one set of remains were those that had been exhumed in 1928 by a National Cemetery superintendent. One partial set did indeed belong to a soldier, as yet unidentified. The other set of remains were those of an elderly Native American woman, probably buried many years after the battle. Those remains were repatriated to the Crow tribe (see Chapter 6 for a more complete description of the remains and recovery).

It is possible that these remains are the same ones originally found by local rancher Joseph Blummer about 1928. Blummer was guided to the site by Frank Bethune, and while they were digging up the remains Smokey Other Medicine is reported to have arrived on the site and stated that a woman and child were buried there, not soldiers (Joseph Blummer manuscript, Little Bighorn Battlefield National Monument; R. G. Cartwright compiled notes 1941, Acc 278, Field Notes). National Cemetery Superintendent Eugene Wessinger later removed all the remains for reburial in the national cemetery assuming they were soldiers, a fact only partially borne out by the archeological and osteological investigations.

LITTLE BIGHORN

Another partial skeleton was found eroding from the Reno Retreat Crossing in 1989 (Scott and Snow 1991; Scott, Willey, and Connor 1998). Dr. Clyde Snow was able to determine an age and height for the individual that compared favorably with four soldiers killed with Reno. With a bit of luck and some quick insight from Sandy Barnard a photograph of Sergeant Edward Botzer, one of the likely candidates, came to light (Barnard 1995). A photographic superimposition of the skull and photograph shows the remains are most likely to be those of Botzer. His remains are buried in the Custer National Cemetery as are all the soldiers' physical remains found on the battlefield during the archeological work.

Unfortunately the Jason Pitsch valley artifact collection was broken up and sold to private collectors upon the dissolution of the Reno Battlefield Museum. It is now nearly impossible to analyze Pitsch's data set for details beyond the gross distribution pattern, due to its dispersal. The Pitsch mapped data suggests some very interesting details regarding the location, duration, and intensity of the fight on the skirmish lines, the fight in the timber, and Reno's retreat, but these are now lost to posterity. Likewise, material recovered in the Sitting Bull campsite could have elucidated more about life in the camp and possibly something of the haste in abandoning the camp when the Indians became aware of Terry and Gibbon's column's approach on June 26. Their loss to researchers is inestimable, and only makes the Little Bighorn National Battlefield archeological collections of even more importance to our collective knowledge of the past. Fortunately much of the Pitsch land and other properties important to the Little Bighorn story, including Weir Point and parts of Medicine Tail Coulee, have been acquired by the Custer Battlefield Land Preservation Committee. The Committee is protecting and preserving these lands with the hope of someday transferring title to them to a public entity for long-term preservation.

Reno's Retreat to the Bluffs

When Major Marcus Reno's command made its unorganized movement from the timber in the valley to the bluffs, the first area it traversed after crossing the river were steep slopes and ravines of the river's east side. Reno's men were under fire during their movement up the slopes and a number of men were killed or wounded in the attempt to reach the heights (Stewart 1955). The available historical documentation notes the movement was somewhat random and perhaps on a broad front (Nichols 1992). The command may not have used any one locale or trail to climb to the bluff tops. The men appear to have scrambled up the slopes wherever they could. Dr. James M. DeWolf and his orderly went up a slope which angles to the east northeast and away from the defense site. They were warned by some members of the command that they were about to run into warriors above them. Before they could retrace their trail, both were killed by the warriors firing at them from above. White marble markers have since been placed on a bench of the slope where they were believed killed.

Archeologists have not formally investigated the Reno Retreat Crossing, although Retreat Ravine above the crossing, at least that portion within the park fence surrounding the Reno-Benteen defense site, was inventoried in 1985. Various relic collectors are known to have metal detected the retreat crossing and the route up to

the park fence. Only Henry Weibert (Weibert and Weibert 1985) made any effort to document his finds.

Evidence for Reno's chaotic retreat up to the defense site was abundantly clear in the archeological record. Bullets and cartridge cases (Figures 27-32) from both combatant groups were found along the route as well as some lost equipment and personal items. The lack of distinct patterning in the artifact distribution in the retreat ravine is consistent with the historical accounts of the disorganized endeavor. However, a group of army .45-55-caliber cartridge cases found at the head of the ravine and just below the park tour road (Scott 2006) suggests that some element of the command may have attempted to provide some covering fire to their comrades during their helter-skelter rush up the hill. The matching firing pin marks indicate the firing came from a mixed group with matches to finds in the traditional locations of Companies B, M, and H.

The Reno-Benteen Defense and Weir Point Episodes

When those of the command who survived the river crossing and the upslope climb to the bluff tops gathered, there appears to have been little attention given to organizing a defensive perimeter (Figures 27-32) Captain Frederick Benteen and his battalion arrived from the south about the time Reno's command gained the heights. Benteen was moving north in order to join Custer's command after receiving a communication from Custer via messenger. As Benteen joined Reno, some warriors situated in nearby ravines commenced firing into the command's position (Stewart 1955:391). Company D threw out skirmishers under Captain Thomas Weir and returned fire. With this, the Indian fire slackened. This skirmish line has not been identified archeologically.

A discussion ensued among several of the officers concerning the appropriateness of attempting to join Custer's command. Major Reno apparently decided not to attempt to find Custer until the pack train, carrying the command's extra ammunition, could join his command. That train had been following Captain Benteen's battalion. In the meantime Major Reno and several others attempted, unsuccessfully, to recover Second Lieutenant Benjamin Hodgson's body. Hodgson had been killed crossing the river.

Captain Weir, demonstrating a great deal of impatience, mounted his horse and set out to the north to determine the whereabouts of Custer. Second Lieutenant Winfield Edgerly, assuming Weir was under orders, mounted Company D and followed Weir. Captain Weir and Company D reached a high point about one mile north where they stopped to observe the country. The point is now known as Weir Point. Lieutenant Edgerly moved north with Company D about one-half mile before he was signaled to return by Captain Weir (Sills 1994:45-46). Lieutenant Edgerly testified at the Reno Court of Inquiry that Captain Weir signaled him to swing around to the right or east and return to Weir's position (Nichols 1992:444-445). Edgerly also testified that in the advance position his men fired individually at Indians who were within 150 to 200 yards of their position (Nichols 1992:446). It is unclear whether Edgerly is referring to the advanced Company D position or the firing from Weir Point proper.

LITTLE BIGHORN

When the pack train reached Reno's position, Reno sent Second Lieutenant Luther Hare to tell Weir that the rest of the command was about to follow him. Companies H, K, and M, under Benteen, joined Weir while Reno, and the rest of the command transporting the wounded, began to move north. Second Lieutenant Varnum also rode to Weir Point and he recalled that Weir's company was dismounted and firing at the Indians "who seemed to be coming out on the prairie and turning back. It was quite a long range, but there were a good many shots being fired at him and he was firing away, a slow firing, a shot now and then at quite a little distance" (Nichols 1992:144-145; Carroll 1987:117). In other testimony Varnum recalled that the ranges were 700 to 800 yards (Nichols 1992:161; Carroll 1987:143).

Pvt. Edward Pigford recalled, many years after the event, that he and two other Company M men advanced ahead from Weir Point to a small hill where they saw the last of the Custer fight. He also said that the other two soldiers were killed on the movement back to the hill (Stewart 1955:403-404). His information seems to be of questionable value since it is so inconsistent with other testimony and there is no other record of any men being killed forward of or on Weir Point. The only man lost was Farrier Vincent Charlie during the retrograde movement back to the Reno-Benteen defense site.

There is little doubt that the Indians began to move to the south from their victory over Custer. The soldiers at Weir Point saw this movement and began to withdraw to their first position. Companies M and D covered the rather unorganized withdrawal until a few hundred yards north of the first position. Second Lieutenant George Wallace testified at the Court of Inquiry that the movement back was under heavy fire (Nichols 1992:80). Near the present monument's gate on the tour road, Company K dismounted and deployed in skirmish order to cover the retreat. First Lieutenant Edward Godfrey and his men began to withdraw slowly to the south covering the other companies' retirement. The soldiers' fire slackened and they bunched up, but Godfrey re-established skirmish order and continued the withdrawal in good order until within a few yards of the defensive position when Godfrey told the men to make a dash for the lines.

Within a short time the command was under fire from all sides, as the warriors took cover on hilltops, in ravines, and wherever they could to shoot into Reno's position. It was on June 27 that the combined column of General Alfred Terry and Colonel John Gibbon arrived to relieve the besieged Reno.

The 1985 investigations took in the entire Reno-Benteen area owned by the National Park Service, including portions of Sharpshooter Hill (Scott et al. 1989). In 1994 and two subsequent years much of the land between Reno Benteen and Medicine Tail Coulee was also inventoried with metal detectors (Scott 1996; Scott and Bleed 1997; Scott 1998b). And an intensive metal detecting inventory was completed in 2004 along the entire tour road as part of a mitigation effort in preparation for rebuilding the failing asphalt tour road. The 2004 inventory was limited to 20 meters on either side of the tour road. At the Reno-Benteen defense site the inventory entailed work around the parking lot as well as along the road all the way to Last Stand Hill (Scott 2006).

There is archeological evidence for the Weir Point episode (Figure 33) that supports the Lakota and Cheyenne oral traditions as well as the statements made by the

officers and men. In addition the archeological data identifies the movement north of Weir Point, fighting around the Point, and the route of the retrograde movement back to the Reno-Benteen defense site. The archeological evidence is not extensive, but the limited data available are patterned.

The historical documents relating to the action at Weir Point suggest that until the retrograde movement began there was only intermittent firing at long ranges between the opposing forces. It is known that Companies M and D covered the retrograde movement until Company K formed a skirmish line and covered the final elements of that movement. Historical documents suggest the Company K covering fire began near Sharpshooters' Hill and there is ample archeological data (Figures 27-32) to support the Company K skirmishing efforts found during previous investigations (Scott et al. 1989).

The upper end of the coulee on the south side of Weir Point yielded, during a 1996 inventory, a curry comb, a spur and buckle, nine .45-caliber carbine bullets, two .50-caliber bullets, an unfired Colt .45 cartridge, and an unfired .45-55 Springfield cartridge, and an iron arrowhead. These items found on the west slope of Cedar Coulee and below the modern park tour road probably indicate the line of Weir's retrograde movement to the defense site. The bullets are the physical evidence of the covering fire of one of the companies, perhaps Company M during the retreat. The 2004 investigations (Scott 2006) found additional cartridge cases and bullets fired by the soldiers and warriors during the retreat episode from Weir Point to the defense site as well as an iron arrowhead.

The cartridges, spur, and curry comb suggest some of the haste inherent in the retreat. Although the artifacts may have all originated from a single individual it is more likely they represent discrete episodes of rearing and plunging horses disgorging a curry comb from an unsecured saddle bag, a dismounted man catching and losing his spur, perhaps in the haste of remounting, the discard of a carbine round after the bullet nose was deformed in a hurried attempt to reload a carbine, and a fumbled attempt to reload a revolver. All of this gives the impression that the soldiers passing along this side slope during the retreat, did so in haste. The bullet distribution also gives the impression that after the soldiers retreated the pursuing warriors also crossed the same ground, but under fire from the companies providing covering fire to the retreating soldiers.

Also in Cedar Coulee a single Colt cartridge, a carbine tool, and carbine bullet were found in proximity (Scott and Bleed 1997). The meaning of this pattern is not clear, but it leaves an impression of an event occurring at that location. One possible interpretation, but not necessarily the only interpretation, is that these artifacts may be associated with the wounding and or death of Farrier Vincent Charley. The fate of Charley is no longer in doubt. His remains were reported as having been dug up in 1903 and removed to the Custer National Cemetery. During the work to identify the 1903 and 1928 remains (Scott, Willey and Connor 1998) one set of bones was shown to be those of a robust male about 28 years old and about 5' 10" tall. A bullet wound to the right hip was evident in the bone, and it was in such a position that the bullet must have come from the back right. Abdominal wounds were so serious in the 19th century that over 80% of those with this type of wound died. Charley, a farrier, was 27 years old and 5' 10 ¼" tall when



Figure 27. Metal detected .45-55 cartridges and cartridge cases found at the Reno-Bentzen defense site.

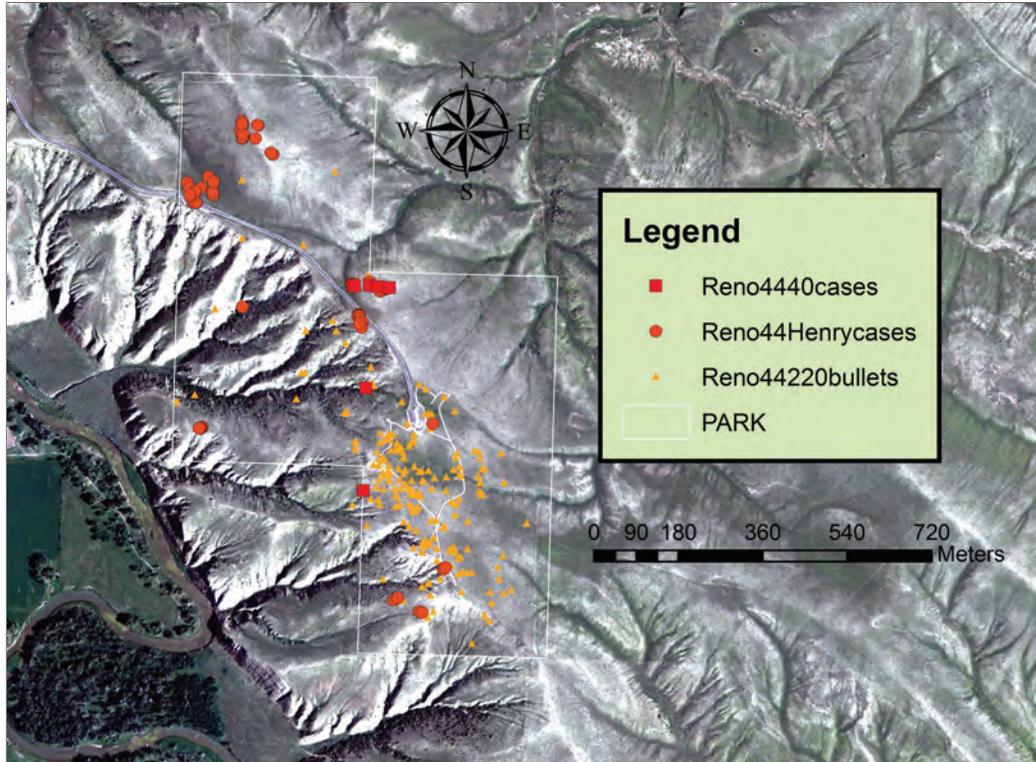


Figure 28. Distribution of Indian fired .44-caliber cartridge cases and bullets at the Reno-Bentzen Defense Site.

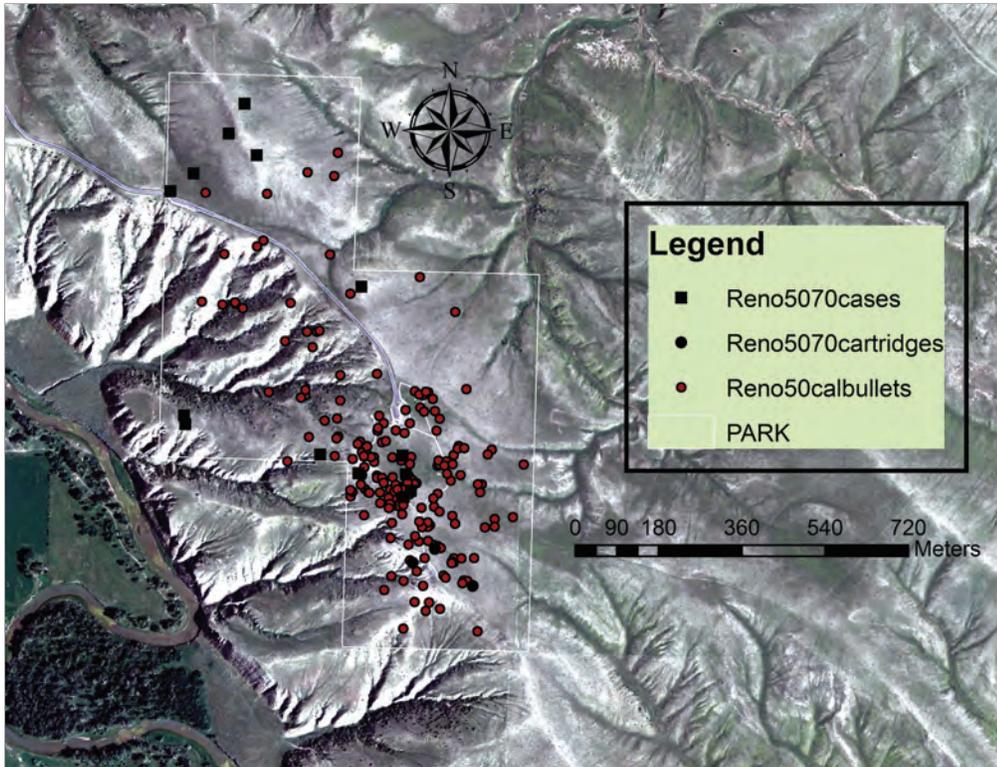


Figure 29. Distribution of Indian fired .50-caliber cartridge cases and bullets at the Reno-Benteen Defense Site.

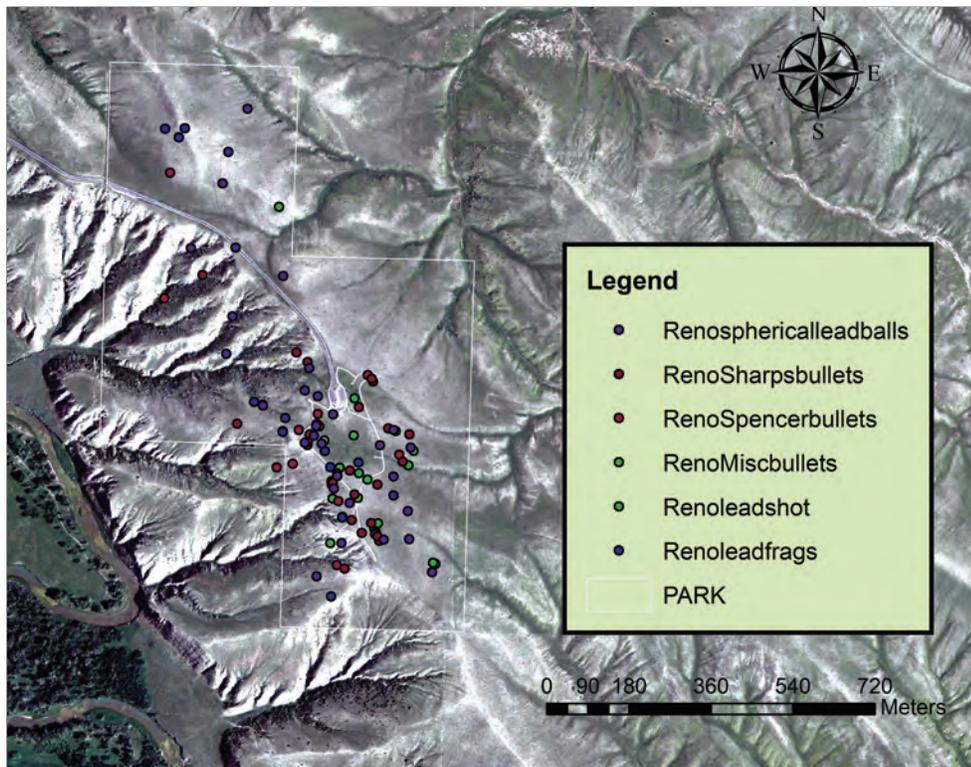


Figure 30. Distribution of Indian fired miscellaneous caliber bullets at the Reno-Benteen Defense Site.

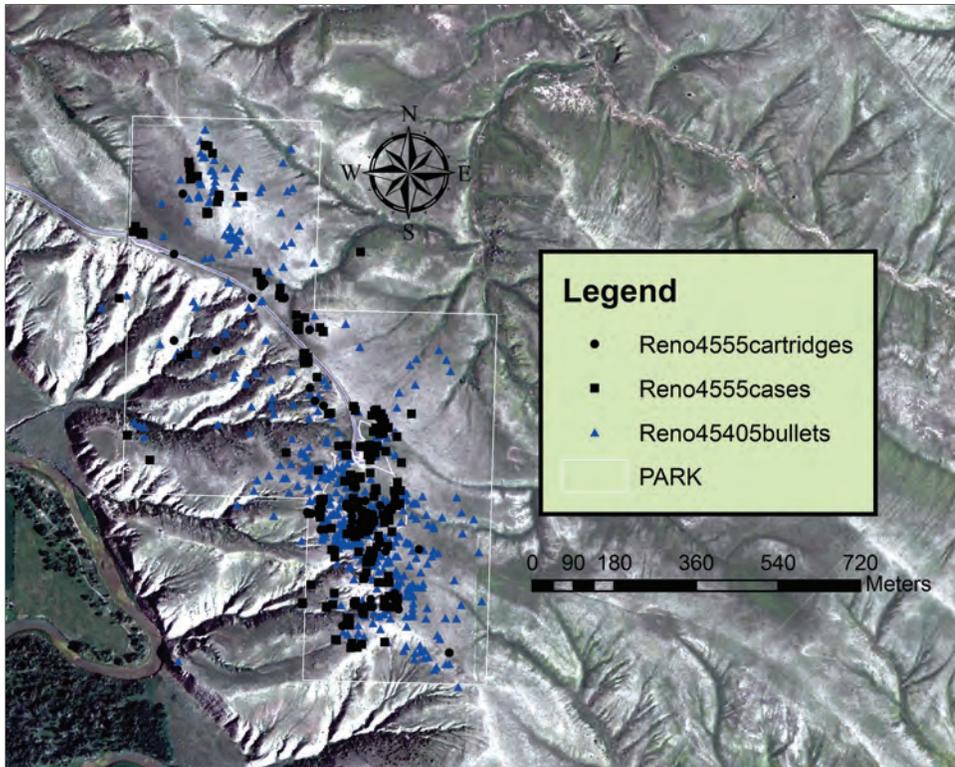


Figure 31. Distribution of Army fired .45-55-caliber cartridge cases and bullets at the Reno-Bentien Defense Site.

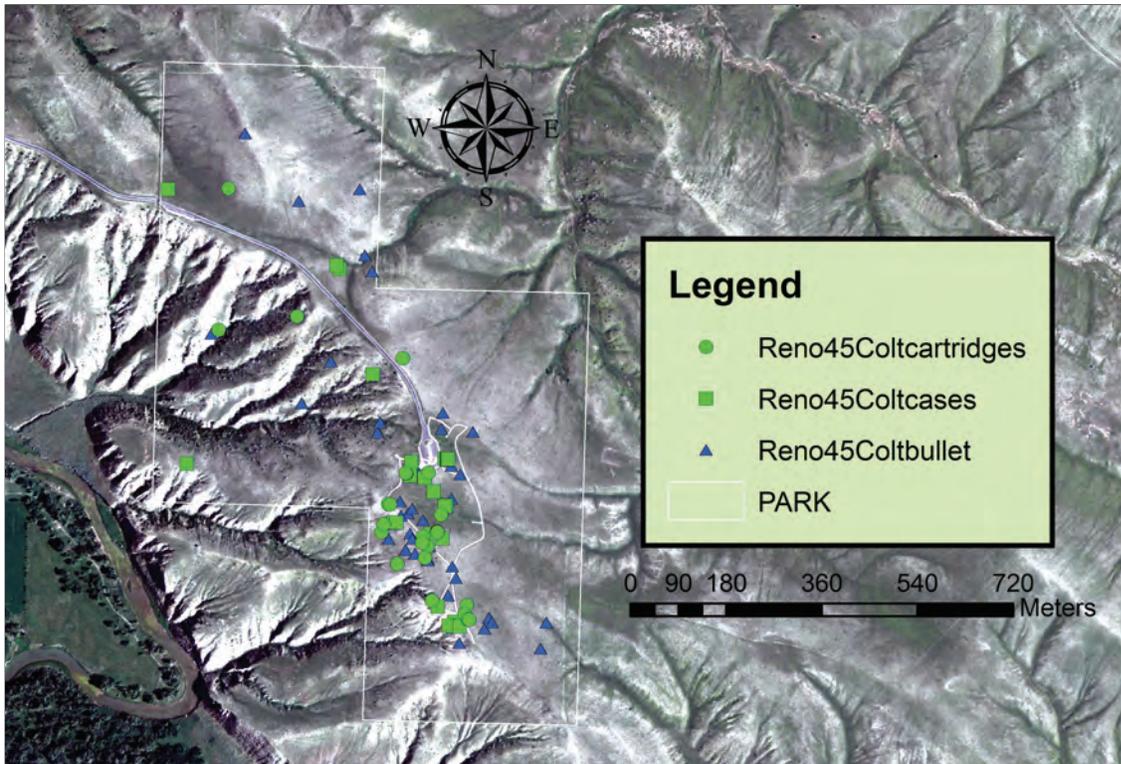


Figure 32. Distribution of Army fired .45 Colt-caliber cartridge cases and bullets at the Reno-Bentien Defense Site.

he died of a gunshot wound to the hip. In all likelihood the bones that we examined are those of Charley.

The finds along the west slope of Cedar Coulee as well as south of Sharpshooters' Hill within the park boundary clearly indicate the route of the retrograde movement from Weir Point to Reno-Benteen. They also indicate that the area was subsequently used by Indian warriors as they fired on the troops during that movement or while in the defense site. These data are entirely consistent with the analysis and results presented on the 1985 archeological investigations at Reno-Benteen (Scott et al. 1989).

The warriors used at least ten Sharps or Remingtons and one Model 1868 or Model 1870 Springfield rifle in .50-70-caliber firing on the soldiers during their retreat from Weir Point and after they returned to the defense perimeter. The .44-caliber cases represent at least sixty-one individual lever action repeating guns that were used in the fighting around Reno-Benteen. Four Model 1873 Winchesters have now been identified as having been used by the Indians against the soldiers at Reno, as well as at least one Joslyn carbine.

The .44-caliber and .50-70-caliber data indicate that the warriors did utilize Sharpshooter Hill, a small knoll located north of the defense perimeter, and the ravines south of the defense perimeter as firing positions. The cartridge case concentrations in these areas suggest that the warriors tended to take advantage of the same general locales, perhaps the best cover available. The isolated cases also indicate that almost every area of the battlefield was used. The distribution of Indian associated cartridge cases confirms the historical accounts that the warriors surrounded the command and poured a heavy fire into the defense perimeter. The cartridge case concentrations also indicate that the survivors' accounts of directions of fire are also accurate.

The Springfield carbine case distributional evidence is complicated, so it is perhaps best to begin with the least complicated portion. The ridges and bluffs surrounding the Retreat Ravine contained a few Springfield cartridge cases. The cases indicate, along with Indian associated bullets found impacted in the vicinity, that the retreat was under fire. The Springfield cases found along the ravine correlate with those found in the defense perimeter. The ravine cases match cases found in the B, D, K, and M Company positions.

The gross distribution analysis identified three discrete areas of Springfield carbine case concentrations north of the defense perimeter. These are located on the west flank of Sharpshooter Hill, between the hill and a low knoll, and in the vicinity of the knoll located about one-half the distance between the army defensive perimeter and Sharpshooter Hill. The carbine cases found on the flank of Sharpshooter Hill having firing pin marks that match cases found in the other positions and in the defense perimeter. The cases in the two concentrations between the hill and knoll also have firing pin imprints that match cases at the knoll and in the defense perimeter. This strongly suggests that the carbine cases found north of the defense perimeter are associated with the movement to and from Weir Point. Further corroboration is found by analyzing the specific defense perimeter match locations.

LITTLE BIGHORN

The majority of the carbine cases found north of the perimeter have firing pin imprints that match with cases found in the northeast perimeter area. Those cases found around the knoll and some to its immediate north correlate with the historically documented Company K position. It was Company K, commanded by Lieutenant Godfrey, which formed a skirmish line to cover the latter part of the retreat from Weir Point. The cases found near Sharpshooter Hill match cases found on the northwest part of the perimeter. This area was occupied by Companies B and D during the fight. They also covered the early part of the Weir Point retreat. In this situation it is not just one or two case matches, but evidence for the use of twelve different guns moving from Sharpshooter Hill then to the knoll, and finally to the Company K position in the perimeter.

The hilltop position was anything but secure when it was reoccupied by the troops falling back from Weir Point. The officers deployed their men in a roughly shaped oval around the lip of a large depression and along a ridgetop that became the Reno-Benteen defense site (Figures 27-32). There the Reno command was besieged by warriors employing the high ground and other advantageous cover around the soldiers' position. Throughout the siege, defenses were improvised by pilinghardtack boxes and saddles to form breastworks. Shallow trenches, formally called hasty entrenchments, or rifle pits were scooped into the hard Montana prairie with cups, boards and a few shovels. Dead animals also served as protection. Three of the rifle pits were excavated by Bray (1958) and restored as interpretive devices along the Reno-Benteen walking trail. During the tour road mitigation project, Steven DeVore (2005) of MWAC employed ground penetrating radar and electrical resistivity as remote sensing techniques to determine if any anomalies existed in the proposed right-of-way area around the Reno-Benteen parking lot and trail head. Several anomalies were noted. One is likely the original site of the Reno monument that was relocated sometime in the 1960s to its present position on the edge of the parking lot. DeVore (2005) also identified other anomalies on the north side of the parking lot. Two are relatively small and rectangular, and are postulated to be soil disturbances that may be associated with rifle pit locations. These locations have not been validated by archeological testing as they will not be impacted by the rehabilitation of the tour road, but their signature in the geophysical records suggests the techniques are viable for location other buried rifle pits in the Reno-Benteen defense site.

The abundant archeological evidence of the Reno-Benteen defense shows that it was a spirited fight (Figures 27-32). The Lakota and Cheyenne held the most advantageous positions surrounding the soldiers. These positions provided excellent cover and commanded an excellent field of fire into the soldiers' positions. Many cartridge cases were found on Sharpshooter Hill and in the swales, and behind the knolls that surround the army positions. Among some .44-caliber Henry cartridge cases at one knoll was a brass bracelet, probably lost by one of the warriors. The tip of a gold painted knife blade that once was part of a war club was found in another location.

Literally hundreds of bullets fired from the Lakota and Cheyenne guns, including many captured from the defeated Custer command, were found imbedded in the Reno-Benteen defense position. Relic evidence of those captured guns being used by the warriors was reportedly found on the long ridges located from 200 to 600 yards east of the park boundary (Vaughn 1956; Rickey 1956; Henry 1969; Weibert and Weibert 1985).

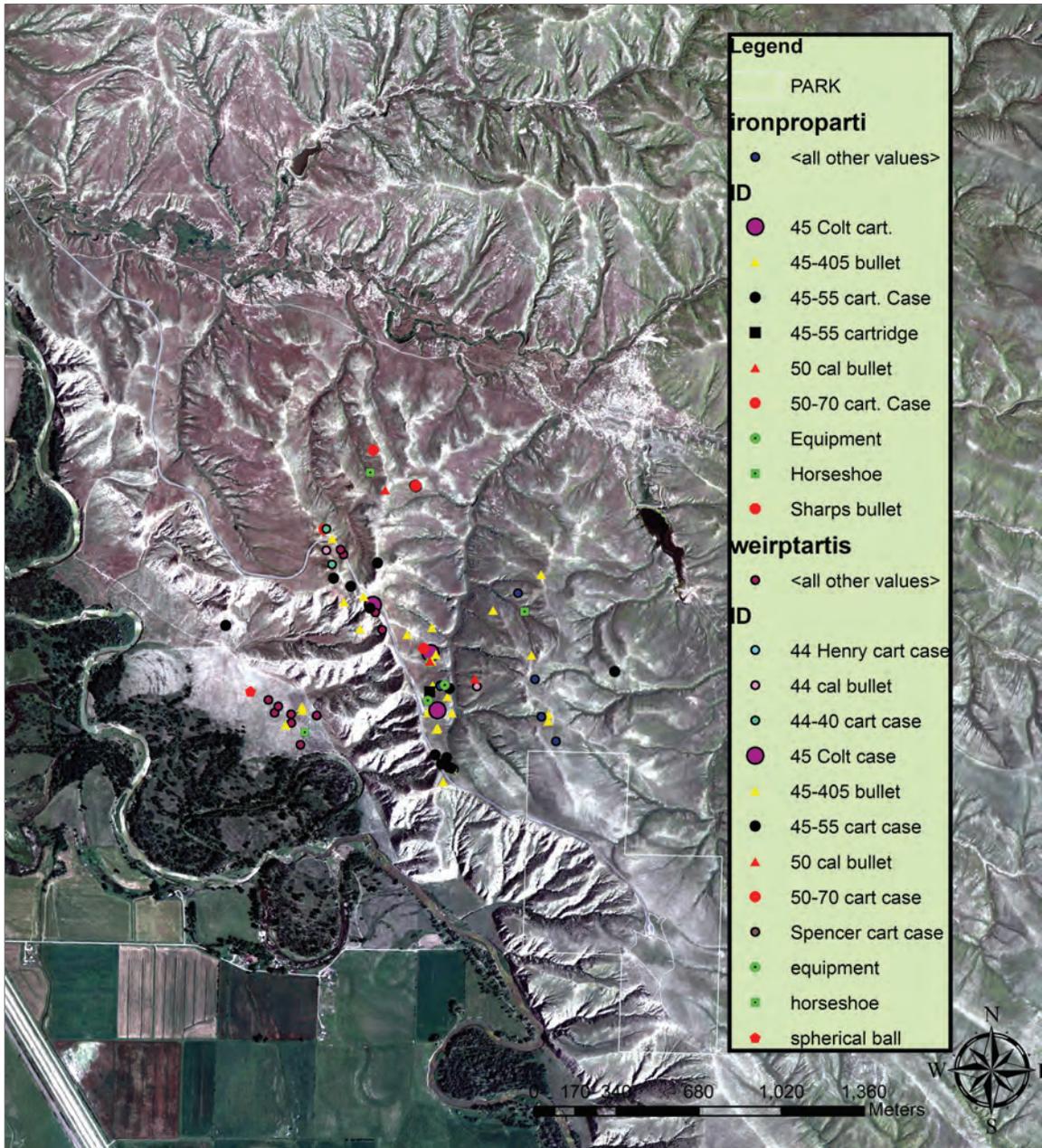


Figure 33. Distribution of Army and Indian artifacts found on and around Weir Point and the route of advance and retreat to the Reno-Benteen Defense Site.

These finds indicate that the warriors used the available high ground and associated cover to pour a plunging fire into the Reno-Benteen defense. Such a warrior position to the east also allowed them to see into the hospital area where the soldiers used dead mules, horse tack, and ration and ammunition boxes as barricades to protect themselves and the wounded. Ample evidence of the barricade is evident in the form of box nails, iron buckles from the horse tack, a picket pin, and even horse and mule bones found along the barricade line.

LITTLE BIGHORN

Among the more poignant reminders of the power of the missiles fired by the warriors into the Reno-Benteen defense perimeter are the remains of six of the men who died. One showed dramatic evidence of a gunshot injury to the head. His yet unidentified remains show that a tumbling bullet struck him on the right side of the head and passed through his skull, exiting on the left (Scott, Willey, and Connor 1998).

Another set of remains had a skull with many fillings of gold and tin in the teeth. His age and height are consistent with those of Corporal George Lell, but DNA analyses of blood samples from his maternal great grand nieces did not match. Either these remains are not Lell's or the genealogical information is incorrect (Scott, Willey, and Connor 1998; Willey et al. 2004).

The Medicine Tail Coulee Episode

There is essentially no evidence of Custer's movements until he arrives at Medicine Tail Coulee. In the lower reaches of Medicine Tail and at Nye-Cartwright Ridge, along Deep Coulee, and on to the north there is abundant evidence of the beginning of the final phase of the battle.

Battle events in Medicine Tail Coulee and the cavalry's movement to Calhoun Hill are some of the most difficult to reconstruct from the historical record. It is now fairly well agreed by various authors that Custer halted in Upper Medicine Tail Coulee and divided his command into two wings, a right wing consisting of Companies C, I, and L and a left wing composed of Companies E and F under the command of Captain George Yates (Gray 1991:360; Fox 1993). It is Gray's (1991:360-370) assumption that Custer's purpose in dividing the command was for the left wing to conduct a feint to the mouth of Medicine Tail Coulee while the remainder of the command moved along the ridges to the north in an attempt to ford the Little Bighorn and attack the north end of the village. Gray (1991:362-363) cites the R.G. Cartwright and Joseph Blummer cartridge case finds on Nye-Cartwright Ridge as well as cartridge case finds on Luce Ridge as support for this argument. He also uses other Cartwright and Blummer artifacts found along a line from Nye-Cartwright to Calhoun Hill and from Deep Coulee to Calhoun Hill as further evidence of the reconvergence of the two wings.

Crow Scout Curly (Gray 1991:360-372) describes Yates' wing as moving down Medicine Tail Coulee to its juncture with the Little Bighorn, where members of the command fired at Indians on the river's west bank. At one point Curly, who presumably observed the left wing movements from his position with Custer, suggests Yates' command dismounted and fired into the village on the opposite side of the river, while in another narrative he says Yates did not dismount but fired across the river while mounted, then turned to move up Deep Coulee and reunite with Custer's command.

Curly indicates two soldiers rode into the river but returned to the command before the movement up Deep Coulee. Curly also reported only light firing occurred at the Coulee's mouth. The Indians on the west bank fired at the soldiers who were apparently in column, with perhaps only the column's front ranks firing on the west bank. The historical accounts generally agree that the movement to the mouth of Medicine Tail Coulee was of short duration with only limited firing on either side. First

Lieutenant Oscar Long reported his Sioux informants mentioned only one man killed at the ford (Brust 1995:8). The Sioux identified him as an officer who had a compass and field glasses. Gray (1991) cited a burial party account indicating the man was a non-commissioned officer who was found on the west bank in un mutilated condition. His horse was found near the body. Long's informants also mentioned that to them it appeared one company near the river mounted on bay horses tried to run away, but were fired upon by their own men and forced to return to the command (Brust 1995:8). Perhaps this incident could also be interpreted as a company moving to the mouth of the Coulee and retiring with the support of covering fire by another company or group held in a reserve position.

As Yates' wing moved northeast, presumably along the west bank of Deep Coulee, to reunite with the right wing and Custer on or near Calhoun Hill, warriors crossed the river and got in the rear of Custer's command (Gray 1991:366) as well as on his right flank. Fox (1993:143) argues that Yates' wing made the movement dismounted, but this is at odds with Curly's statements regarding the Deep Coulee movement. White Cow Bull, a Sioux, reported that before the soldiers dismounted they delivered an intense fire that drove the Indians back (Fox 1993:144). Curly said (Gray 1991:366) by the time the command reunited near Calhoun Hill the Sioux and Cheyenne were in their front, in both ravines (presumably Deep Coulee and Calhoun Coulee) and a strong force in their rear. Gray (1991:370) and Wells (1989) reconstruct the reunion near the park's southern boundary fence and suggest that one or more companies dismounted and deployed in the vicinity of the so-called Finley Marker. There the soldiers tried to drive the warriors from a ravine in their front, but with men killed to their rear that attempt failed and the warrior advance was not checked. Fox (1993) places this event in Calhoun Coulee with Company C charging the warriors in the ravine. The charge failed in the face of overwhelming numbers of warriors and precipitated the collapse of the Company L position because First Lieutenant James Calhoun had to split his force to support the Company C retreat.

The 1994 (Scott and Bleed 1997) and 2004 (Scott 2006) archeological evidence for combat at the mouth of Medicine Tail Coulee is meager (Figure 34), but is definitely present. The area has been heavily collected as indicated by J. W. Vaughn (Vaughn to historian Andrew Loveless, July 3, 1965, Acc. 278, Field Notes) and by Greene's (1986) summary of previous collecting efforts. The area has also been the subject of many other uses. Its primary use is grazing land, but at least one movie (*Little Big Man*, 1970) was filmed along the tour road at the coulee's mouth. Archeological evidence of the movie making was recovered in the form of *5in1* movie cartridge cases (a blank cartridge designed for use in .44-caliber and .45-caliber firearms) and various other caliber blank cartridge cases. The Last Stand sequence was filmed on a cut bank east of the tour road at the mouth of Deep Coulee. Ample evidence of that scene's filming was recovered there including hairpins used to secure wigs to the actors' heads. The charge to the river was filmed at the mouth of Medicine Tail Coulee where it joins the Little Bighorn River, and movie debris was recovered there as well.

It is interesting to note that the locations used in the movie to represent battle sequences were in fact set on sites actually used in the battle. The area along the tour road where the Last Stand sequence was filmed yielded lead balls and Sharps' bullets

LITTLE BIGHORN

fired by the warriors and a .45-caliber carbine bullet probably fired by a soldier. These data alone indicate there was combat in this area. The Indian bullets were impacted in areas on the east side of Deep Coulee. They may represent shots fired in the direction of retreating soldiers or they may represent shots fired at Yates' wing as they moved to the mouth of the coulee during their movement toward the river. Many of the earlier collected relics location as compiled and mapped by Greene (1986) are distributed in the same area.

The mouth of Medicine Tail Coulee, at the ford, also yielded period artifacts during the 1994 investigations (Scott and Bleed 1997). There were also numerous .45-60 caliber cartridge cases found in this location, wholly intermixed with the battle period items. These cases are both headstamped and non-headstamped, but all were fired in Winchester Model 1886 firearms. These clearly post-date the battle. The reason for the clustering at the ford is not known, although they may be associated with one of the earlier reenactments or filming episodes.

However, the 1994 investigations did recover two pieces of a broken Model 1874 army mess knife, a period butcher knife of the type that might have been carried by a soldier or a warrior as a sheath or belt knife, a lead rifle ball, the cylinder pin to a Colt revolver, and a .30-caliber Remington Smoot revolver cartridge case. Don Rickey and J. W. Vaughn (Greene 1986:20-25) also report finding a few .45-caliber army carbine cartridge cases, some equipment and personal items, bullets, and Indian caliber cartridge cases at or near the ford. Greene's assessment of the earlier relic collection efforts and the 1994 archeological data are entirely consistent in type and quantity. Those data are also consistent with the historical accounts that a small action with only limited firing occurred at the ford. The finds of soldier equipment indicates some items were lost at or near the ford, and are consistent with the conclusion reached by Rickey and Vaughn (Greene 1986:23) that at least one cavalry horse may have been hit, and in plunging around, scattered items attached to the saddle. Rickey and Vaughn also noted that they recovered some split Berdan primed .45-caliber cartridge cases. Unfortunately, these are not available for examination, but they may well be post-battle .45-60-caliber cases like those found in 1994.

Deep Coulee to Calhoun Hill Episode

Rickey and Vaughn (Greene 1986:33-34) found cartridges, cases, bullets, and equipment pieces in their research around Deep Coulee. Greene's compilation of other finds also generally mirrors the archeological finds. The distribution of the earlier finds is along the south side of Deep Coulee and adjacent and parallel to the park's boundary fence from Greasy Grass Ridge to Calhoun Hill. This is essentially the same distribution as the 1994 and 2004 artifact finds.

The 1994 archeological investigations near Calhoun Hill were located in the upper portion of Deep Coulee in that area adjacent to the park's southeast corner (Figures 35-38). Artifact recovery consisted of 88 items, the majority of which are bullets and cartridge cases. Only two cartridge cases are .45-caliber army carbine, but there are four unfired cartridges. In contrast to the number of army cartridge cases, 28 .45-caliber bullets were recovered. There are 8 .44-caliber rimfire cases, 5 .44-caliber

bullets, 4 cartridge cases and 2 cartridges in .50-70-caliber, 11 .50-caliber bullets, 1 .40-caliber Sharps bullet, and one lead ball. Two .50-caliber bullets were fired in Sharps Sporting Rifles. Each was fired in a different gun. There were also several items of army equipment recovered including two brass spurs (one a regulation spur and the other an earlier model army spur), a picket pin, and a currycomb. A single iron arrowhead was also recovered as was an iron awl. One of the .44-caliber rimfire cases firing pin imprint matches to a case found in 1985 at the Reno-Bentzen defense site. Clearly that Henry or Winchester Model 1866 was used at both battlefields.

The artifact patterning and distribution gives the impression of soldiers moving up Deep Coulee toward Calhoun Hill (Scott and Bleed 1997). The expended army cartridge case distribution indicates there was some firing as the movement took place, but it appears light or at least limited in scope. The distribution of Indian caliber bullets also gives the distinct impression that the army movement was under fire. Most army bullets were found around the park's boundary fence near Calhoun Hill. The same is true of most of the cartridge cases attributed to the warriors (.44-caliber and .50-caliber, and others). This bullet distribution is consistent with firing by Companies C and L after their deployment at the south end of Custer or Battle Ridge. Some army caliber bullets (.45-caliber Springfield and Colt) were also found northeast of the fence corner. These may have been fired toward warriors on or near Henry Ridge. One of those warriors may have been Gall who stated he joined the battle at Calhoun Hill via a route through Henry Ridge (Fox 1993:143).

Although the cartridge case and bullet evidence suggests only limited fighting occurred during the movement from Medicine Tail Coulee to Calhoun Hill, the distribution of equipment in the Deep Coulee area indicates it did not occur without some loss (Scott and Bleed 1997). Spurs, picket pins, and a curry comb finds suggest enough haste occurred in the movement to cause the loss of items from the horse equipage or from individual soldiers. An alternative interpretation of these data is that they represent killed or wounded soldiers and/or horses. Some support for this supposition comes in the form of skeletal remains found in this general area. A soldier's skeleton was found by Frank Bethune in the Deep Coulee area in 1928. Dr. P. Willey (1993) examined that skeleton which had been reburied in the national cemetery. He found the remains to be those of a 35 year old white male about 5' 8" tall. He had a gunshot wound to the head, evidence of blunt force trauma, and at least 98 cut marks on the bones, indicating that the victorious Lakota and Cheyenne mutilated him. Evidence of this ritual mutilation was seen on many of the skeletal remains from the Custer battlefield. No identity has yet been established for this soldier.

In addition Cartwright and Blummer (Greene 1986:28) reported finding the skeletons of as many as four cavalry horses still partially outfitted with saddle gear near Deep Coulee. The horse remains could also represent wounded horses that got loose during the battle and died in this area as well.

In any event the archeological and relic evidence consistently point to a movement of soldiers to the mouth of Medicine Tail Coulee where a small and perhaps brief action occurred between the soldiers on the east bank of the Little Bighorn River and Indian warriors on the west bank. After this skirmish the cavalry withdrew and moved up the

LITTLE BIGHORN

east bank of Deep Coulee to reunite with the rest of the command at or near the park's south boundary fence. During the movement up Deep Coulee the cavalymen were under some fire, but perhaps not intense. It appears from the finding of human remains in 1928 that one or more soldiers may have been lost in this movement. Presumptively the movement represented by the artifacts is that of the left wing rejoining the remainder of the command as they passed from Nye-Cartwright Ridge to Calhoun Hill. The two wings apparently rejoined at or near the present park boundary fence, probably not far from where the modern tour road breaks the fence line. From there Custer deployed Companies C and L on Calhoun Hill where heavy fighting ensued. The warriors used Deep Coulee, Calhoun Coulee, Greasy Grass Ridge, Henry Ridge and other available cover to fire into the front and right and left flanks of the soldiers posted at Calhoun Hill.

Greasy Grass Ridge and Calhoun Hill

Upon gaining the ridge, Custer, or someone else in command, deployed a group of men on a line facing in a southerly direction. Traditionally the men deployed are assumed to have been from Company L and possibly some from Company C owing to the presence of identifiable remains of men of these two companies and their respective officers in this location after the battle. This includes ground at and surrounding the area traditionally known as Calhoun Hill. The soldiers on this line faced intense fire from Indians located south and east of their position. The deployment probably protected the southern end of Custer Ridge. There is evidence of at least fifteen Springfield carbines and three Colt pistols in use in the Calhoun position based on the analysis of the recovered cartridge cases and bullets. Historic and relic evidence presented by Greene (1986) and artifacts subsequently collected by Weibert and Weibert (1986) and other amateurs suggest that the warriors attacked from the south and southeast. These Indians found cover below the tops of ridges 100 to 800 yards away. Once the warriors advanced on the soldier position they were able to bring a diverse variety of firearms to finish off the surviving soldiers, including several .50-70-caliber rifles and carbines, at least one Joslyn carbine, and a number of .44-caliber Henry or Winchester 1866 rifles (Figures 35, 36).

Another area of heavy Indian fire came from south and west of the Calhoun position on a lower portion of Greasy Grass Ridge (Figures 35-38). The 2004 investigations (Scott 2006) added to the number of guns used on Greasy Grass Ridge by the warriors. At least thirty .44-caliber rimfire lever action weapons, one .44-77-caliber Sharps, one Smith and Wesson American .44-caliber revolver, sixteen .50-70-caliber guns, four Spencers, an unidentified .50-caliber rimfire, and two .44-40-caliber Model 1873 Winchesters were used in this area against the soldiers, a total of at least 55 different firearms. The heavy fire must have aided in the annihilation of Calhoun's men. From the cartridge case distribution matches, it appears that Calhoun's position was overrun by the same Indians who fired at the soldiers from Henry Ridge and Greasy Grass Ridge.

Two Springfield carbine cartridge cases found in the Medicine Tail Coulee area in 2004 had firing pin marks that matched cartridge cases found in the Finley-Finckle and Calhoun Hill areas. Custer's left wing that went to the mouth of Medicine Tail Coulee is presumed to have been composed of Companies E and F while the units

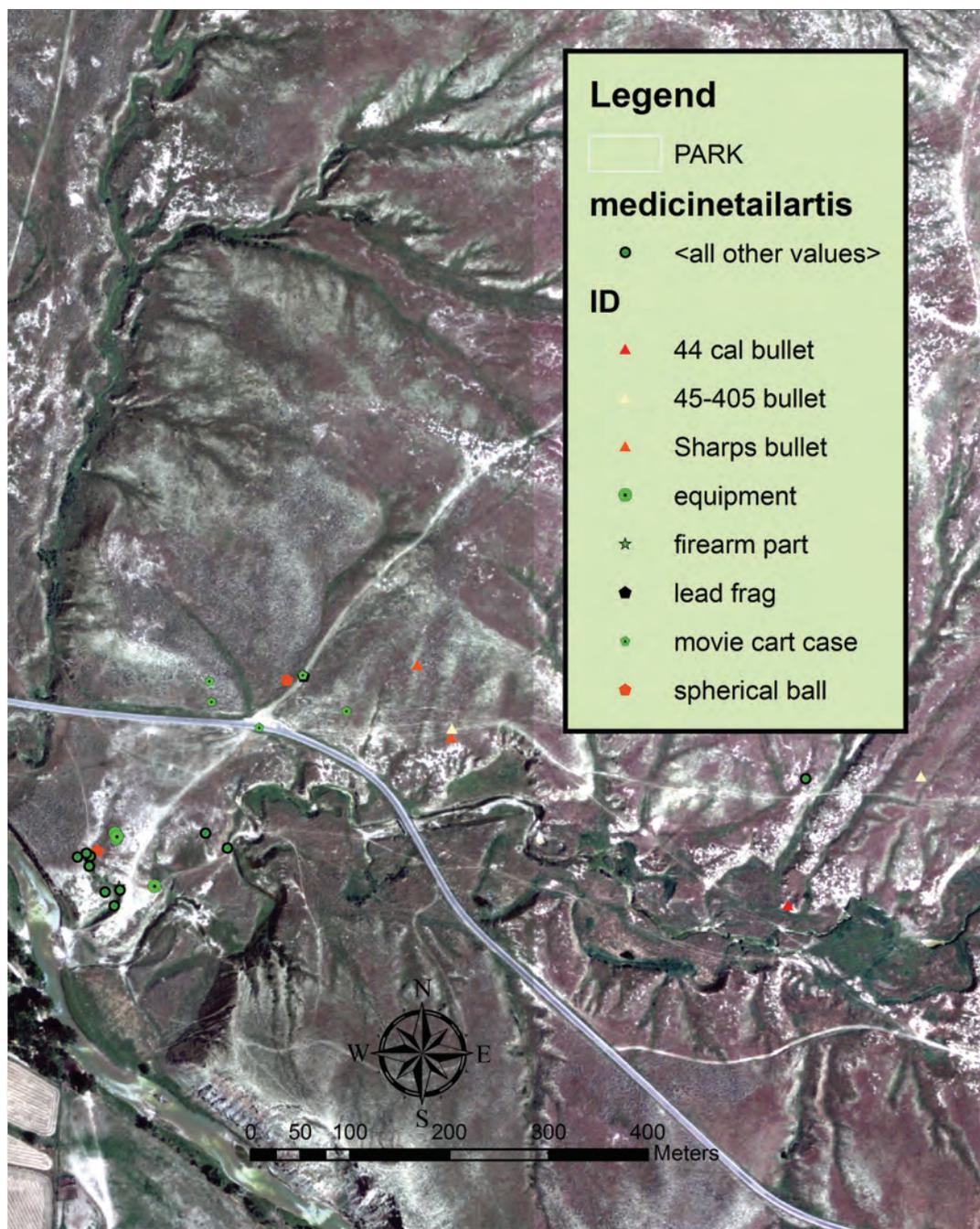


Figure 34. Artifacts found in and around Medicine Tail Coulee indicating a light action in the area, and the site of the filming of the Last Stand sequence of the movie Little Big Man.

known to have fought in the Finley-Finckle area and on Calhoun Hill are Companies C and L. The cartridge cases matches are inconsistent with the traditional historical view without alternative explanation. One explanation may be that members of Companies C and L were under fire in Medicine Tail Coulee before deploying to Nye-Cartwright Ridge. Alternatively members of Companies E and F returned fire as the command reassembled on Calhoun Hill before the deployment of Companies C and L by Custer

LITTLE BIGHORN

to hold the ground to the south while he took the remainder of the command further north. This second scenario seems to be the more plausible explanation, suggesting that the entire command was under some hostile fire as it gained the Finley-Finkle area and Calhoun Hill.

Calhoun Hill to Keogh and Last Stand Hill

Neither the mid-1980s (Scott and Fox 1987; Scott et al. 1989) archeological investigations nor the 2004 (Scott 2006) investigations recovered substantial numbers of cartridge cases or bullets from either side of Custer or Battle ridge adjacent to the current tour road. Only 28 artifacts were collected between the end Calhoun Hill loop road and the parking lot at Last Stand Hill (Figures 35-38). Five of these finds are post-battle items. A canteen stopper ring, a horse bone, and a possible Indian associated ball-shaped button constitute the personal items. Four .45-caliber 405 grain army bullets and four warrior bullets (.44 and .50-calibers), one .45-caliber Colt cartridge case, seven .45-55-caliber cartridge cases, and four Indian cartridge cases (Henry, 1871 Colt, and a Joslyn carbine) clearly demonstrate both soldier and warrior activity along the ridge line, but not in significant numbers. However, it must be remembered that Last Stand Hill, the Keogh area, and Calhoun Hill are among the most heavily trafficked areas and likely the most subject to uncontrolled individual collecting efforts over the years, so a conclusion must be carefully drawn.

Captain Myles Keogh and the men of Company I deployed below the ridge top on the east side of Custer Ridge. Perhaps they were being held in reserve, perhaps they were on their way to aid Calhoun, or perhaps they were positioned to cover Calhoun's withdrawal. In any event they were not sent along the ridge top, rather along Horse Holders ravine and the eastern slope of Custer Ridge. The archeological data do not support the theory that Keogh and his men were pushed from the ridge top to the base of the ridge where they were killed. The spatial distribution of army-related artifacts clearly indicates very few battle-related artifacts on either side of the ridge top above Keogh's position.

The Keogh position yielded ample evidence of combat in that area. Impacted warrior bullets, expended army cartridge cases, as well as soldiers' equipment and even human remains (Scott et al. 1989) all attest to the intensity of the fighting in the Keogh sector (Figures 35-38). Much of the warriors' gunfire probably came from the high ridges located east of the park boundary. That area has not been archeologically investigated, but has been relic collected. Greene (1986) and Weibert (1989) document large numbers of cartridge cases along the ridge tops and slopes that may well indicate warrior positions during the early phases of the fighting on Calhoun hill and in the Keogh sector.

Last Stand Hill and Custer Ridge Extension

Recent analysis of Lakota and Cheyenne accounts of the battle (Fox 1993:173-194) strongly suggest that the left wing under Yates with Custer and his staff moved from Calhoun Hill through the Keogh Sector past Last Stand Hill and continued in a westerly direction toward a river ford north of the village site. Fox (1993:176-194) argues that the left wing and Custer followed Custer Ridge beyond the present northern park boundary.

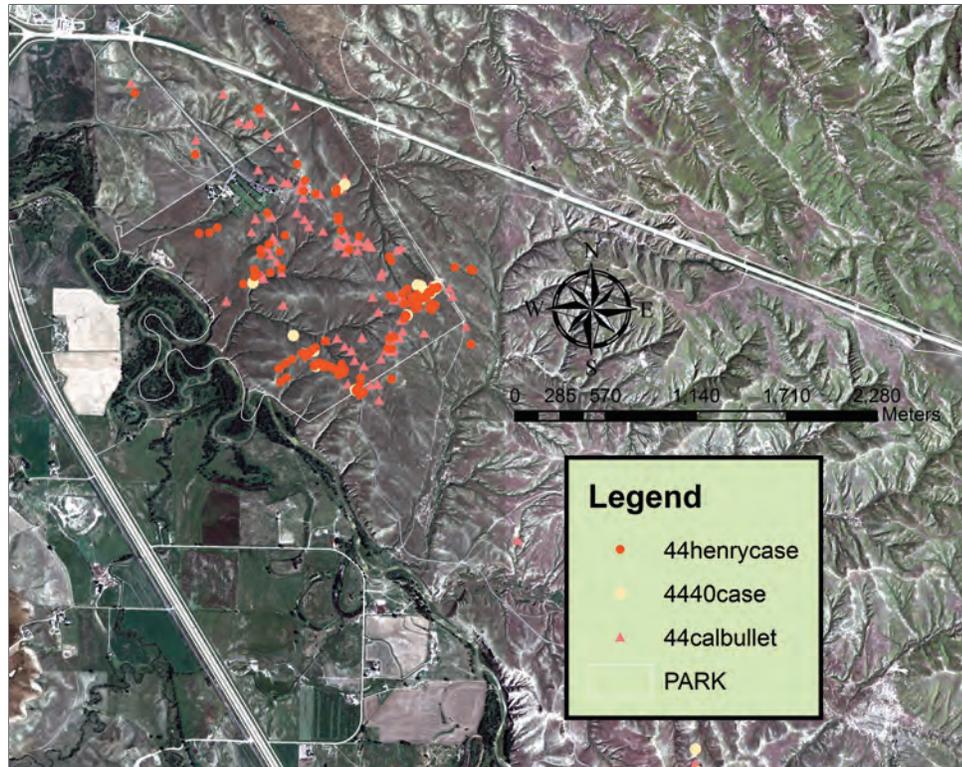


Figure 35. Artifact distribution of .44-caliber Indian fired weapons, including Henry rifles, Model 1866 and Model 1873 Winchesters at the Custer Battlefield.

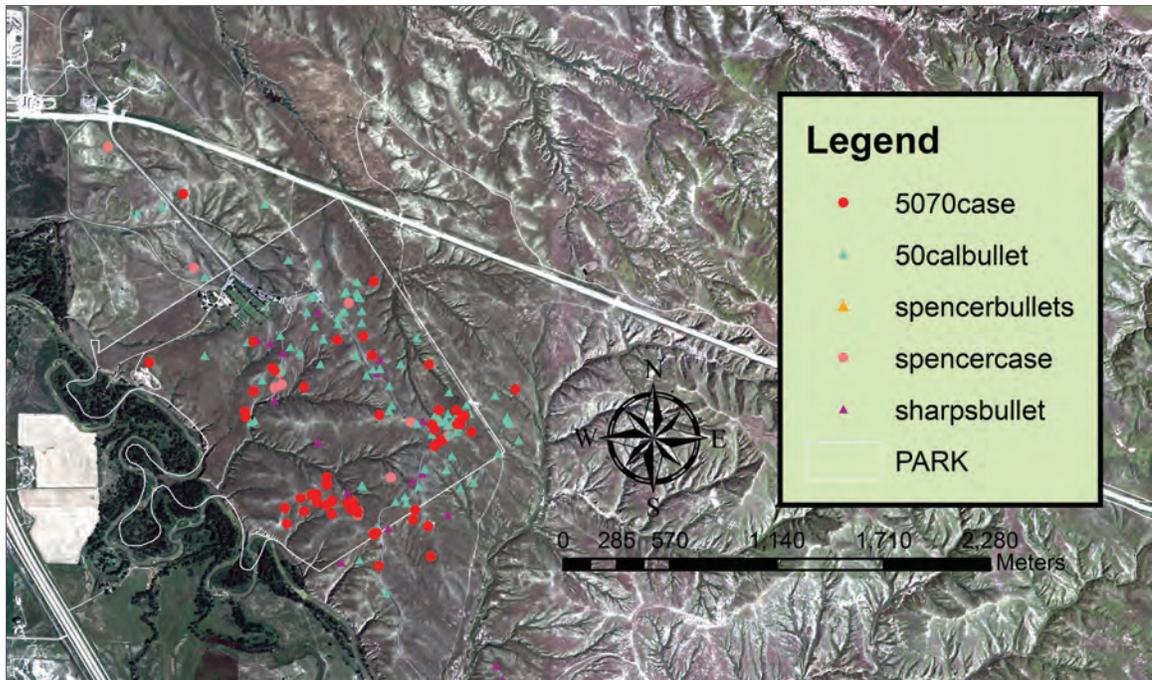


Figure 36. Distribution of the Indian fired .50-caliber firearms at the Custer battlefield.

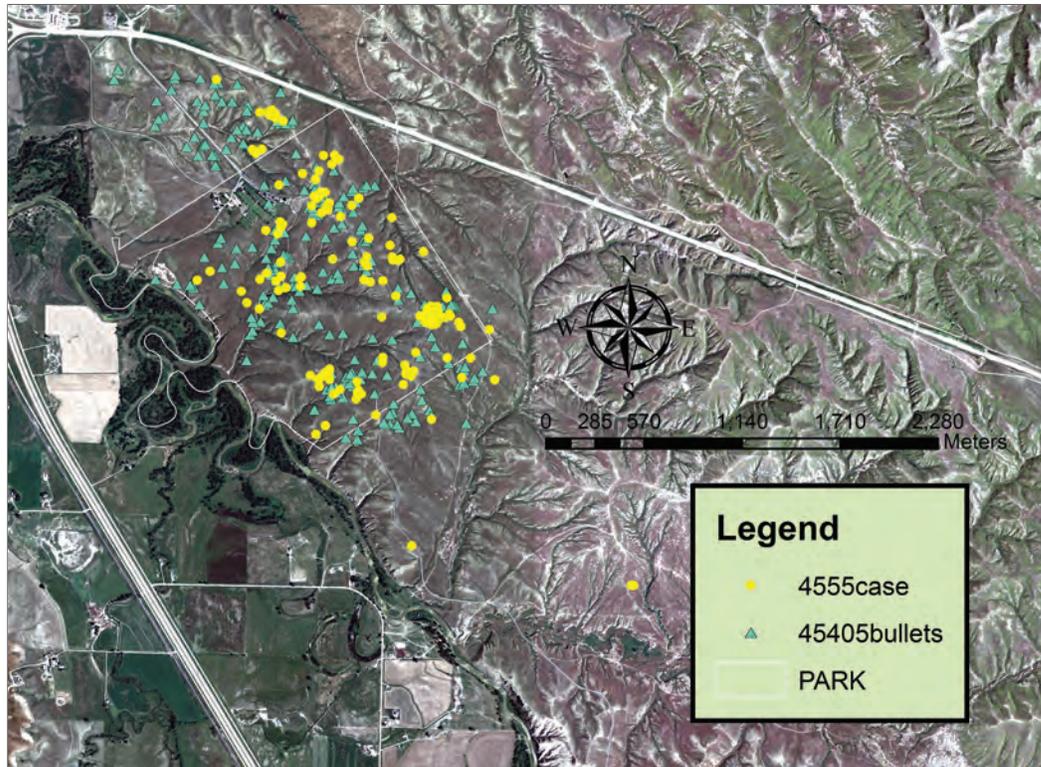


Figure 37. Army and Indian fired .45-55 caliber cartridge cases and bullets at the Custer Battlefield.

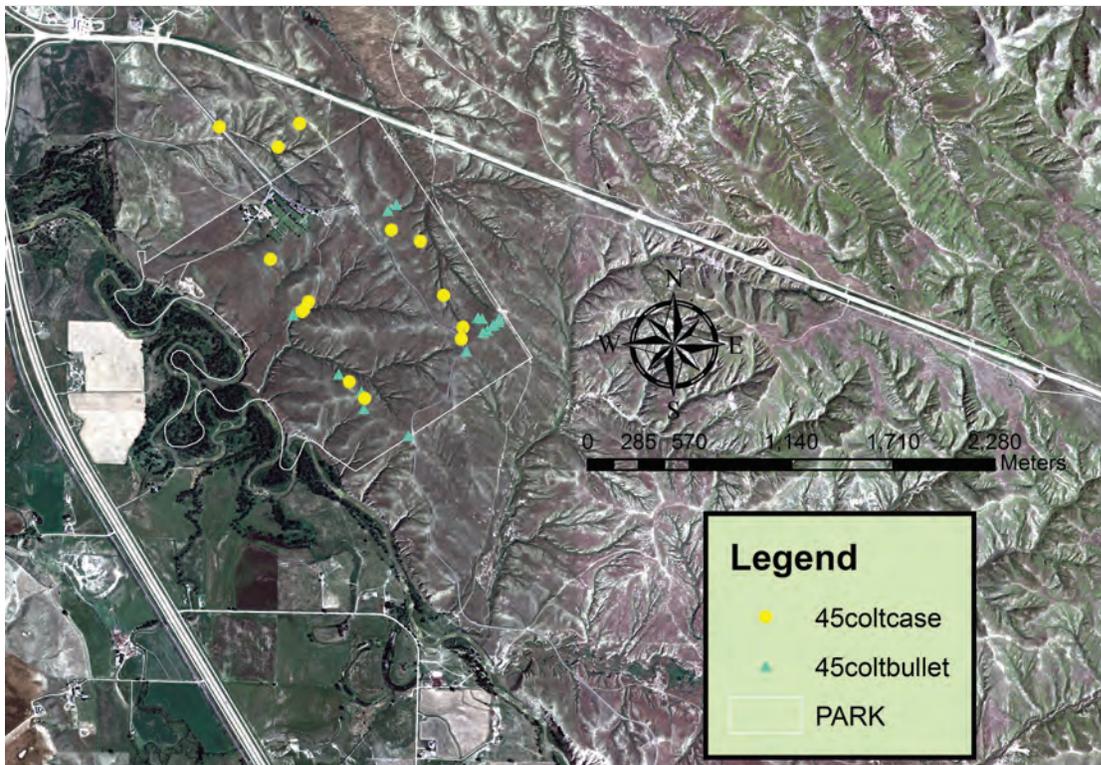


Figure 38. Distribution of the few Army and Indian fired .45-caliber Colt revolvers at Custer Battlefield.

Custer Ridge does not terminate at Last Stand Hill, but drops away to the northwest (Figures 35-38). Fox (1993:176) argues that the left wing followed this ridge until they were near present Highway 212 where the command turned in a westerly direction to move to the Little Bighorn River ford in what he terms the Cemetery Ridge episode. He cites a number of Cheyenne and Sioux accounts to establish this movement.

Simply stated, Fox argues that the left wing moved north to the far end of Custer Ridge, then westerly to the river. There they may have halted for a brief period. Then, perhaps under some fire, the left wing moved north once again, this time moving across the flats below the modern park housing area and, through that area to the vicinity of Custer National Cemetery. There the command halted for some undetermined time. Fox's (1993:180-184) analysis of Indian accounts allows him to argue that at the cemetery the command divided again. He places Company F in a shallow basin between the upper branch of Deep Ravine and Calhoun Coulee. He has Company E with Custer and his staff move back to Last Stand Hill where they were killed along with the remnant of the now nearly annihilated right wing.

Fox (1993) acknowledges there is little in the way of archeological evidence to support his arguments since so much of the area has been disturbed (the National Cemetery, Visitor Center, Maintenance Shop, and housing area) by park facility development. While the park development zone is too disturbed to yield archeological patterns, the privately held and Crow tribally owned lands between Highway 212 and the park boundary did yield archeological evidence of the battle (Scott and Bleed 1997). However, portions of this area were also impacted by later activities. Among the documented disturbances are the old park entrance road, now abandoned, which ran from near the present housing area to the old Highway 87; the present park entrance road running from north of the housing area to Highway 212; and a large quarry scar that nearly covers the western one-third of the lands northwest of the park boundary near the river. These disturbed areas did not yield any battle period artifacts. If they were ever present they are no longer there today due to the various earth-disturbing activities of the recent past.

Even though there has been some prior ground disturbance, the 1994 archeological investigations did yield patterned battle-related artifacts in non-disturbed areas. There is clear evidence for combat actions on the northern extension of Custer Ridge, in the ravines below the Custer Ridge Extension, and along an extension of Cemetery Ridge adjacent to the old park entrance road (Figures 35-38). There were over 40 .45-55-caliber cartridge cases, over 40 .45-caliber Springfield carbine bullets, a few Colt .45-caliber cartridge cases and bullets, a number of .44-caliber rimfire cartridge cases, 8 .44-caliber bullets, 2 Spencer cartridge cases, a few .50-caliber bullets, one .50-70 cartridge case, and an army curry comb found in this Custer Ridge extension.

All of the .45-55 carbine and .45-caliber Colt revolver cases were recovered north of the present park entrance road. Bullets of various calibers were found south of that road, but are generally limited to the Cemetery Ridge extension and its associated ravines. A large number of post-battle .45-70 cartridge cases were found along a ravine on the north side of the Cemetery Ridge Extension. Only two guns are represented by these later cases. The cases are dated and most post-date 1884.

LITTLE BIGHORN

If it is assumed that the majority, if not all, of the .45-caliber Springfield bullets were fired by the cavalrymen then it appears the two ridges were used by the Sioux and Cheyenne warriors. The orientation of the bullets, as recorded at the time of discovery, gives the impression that most were fired from the Last Stand Hill vicinity. In contrast, the distribution of the Indian caliber bullets (.44, .50, balls, etc.) is very widely distributed over the area and there are less than 15 artifacts altogether.

The distribution of Indian caliber cartridge cases follows a similar pattern (Figures 36, 37). They are few and they are widely distributed. The .44-caliber rimfire cases indicate three Henry or Winchester 1866 rifles were in use as well as one Ballard rifle and a Model 1872 Open Top Colt revolver. One .44-caliber Henry case matches to a cartridge case found on Calhoun Hill in 1984. This demonstrates movement of this firearm from Calhoun Hill to the Custer Ridge Extension during the battle. The two Spencer cartridge cases indicate one Spencer and one Ball carbine were used on these two ridges.

By far, the largest quantity of artifacts was army type cartridge cases. Colt revolver cases were found in two concentrations and one isolated case. At least 6 separate revolvers were represented as indicated by the firearms identification. One case matched to a case found in Calhoun Coulee in 1984 (Scott and Bleed 1997:72-75). The .45-55 carbine cases were concentrated along the ridge top of the Custer Ridge Extension. At least 10 carbines are indicated by the firearms identification. Four of these matched to cases found on Calhoun Hill in 1984, and cases representing one gun also came from the Keogh Area. The 1994 matches to the 1984 finds indicate movement of those firearms across a one mile area (Scott and Bleed 1997:72-75).

The archeological and historical evidence indicate that the army cases deposited on Calhoun Hill and in Calhoun Coulee were most likely deposited by members of Companies C and L. There is no historical evidence that any members of Companies C or L were part of the movement to the north, in fact, there is evidence to the contrary. It is generally accepted that Companies C and L were annihilated at or near Calhoun Hill while the remainder of the command was moving north. Assuming this to be the situation, then the cases found on the Custer Ridge Extension that match to those on the south end of the field probably represent army carbines, Colt revolvers, and ammunition captured by the Sioux and Cheyenne and turned on the left wing and Custer at the north end of the battlefield.

It appears reasonable to conclude that the left wing and Custer did move north through Last Stand Hill and northwesterly along the Custer Ridge Extension at least one-quarter mile. The presence of scattered Indian caliber bullets on the ridge and in adjacent ravines suggests the soldier's movement was under fire by a few warriors. One interpretation of this event is that Custer and the left wing attempted to move north and west to ford the river and continue the attack on the village from that direction, but as the movement on the Custer Ridge Extension began he was observed and was fired upon by several Indian warriors. This group may have been a small warrior group movement to the north that finally surrounded Custer's command. From positions at the Custer Ridge Extension some of those warriors may have used army weapons and ammunition captured on Calhoun Hill only a short time before. Traditionally (Stewart 1955) this

northern route has been presumed to be warriors led by Crazy Horse. Fox (1993:166) and Michno (1993) counter this argument by reconstructing Crazy Horse's movements up Deep Ravine through Calhoun Hill and then to the north. It is also well documented that Crazy Horse and many other warriors were involved in the valley fight with Reno and it is likely that some army firearms were captured there as well. Whatever route Crazy Horse took, it appears Custer's left wing movement met with opposition. It is possible that some of Custer's men returned fire and may have deposited a few of the army caliber cases found on the Custer Ridge Extension. Still the archeological context and association are a compelling argument for most of the cartridge cases being deposited by warriors using captured army weapons. Custer may have retraced his movements back along the ridge or perhaps swung to his left and across a ravine onto Cemetery Ridge and thence to Last Stand Hill after running into these warriors moving along the ridge and ravines outside the park boundary. The swing to Cemetery Ridge, perhaps near the National Cemetery, as is posited by Fox (1993) is supported by a variety of Indian oral testimony. Gall noted frontier photographer D. F. Barry during the battle's tenth anniversary ceremony in 1886 that a location down slope (near the modern visitor's center) was where Custer stopped before he came back to Last Stand Hill (notation in Barry's hand on the back of a photograph depicting Captain Frank Baldwin's Fifth Infantry company conducting firing demonstrations on the battlefield in 1886; original photograph in the possession of Douglas Scott).

Archeological evidence suggests that when Custer made the movement to Last Stand Hill numerous warriors gained the Custer Ridge Extension and began firing at the remaining members of the command. They used some Henry and Winchester rifles as well as many army carbines, revolvers, and ammunition just captured from the fallen men of the right wing. Custer's remaining men returned fire until they were overrun and killed. Much of Custer's fire must have come from Last Stand Hill. The bullet orientation strongly suggests this, even though there were very few corresponding army caliber cartridge cases found on Last Stand Hill during the 1984 investigations (Scott et al. 1989). It seems likely that one reason cartridge cases were not recovered in corresponding quantity is that they were souvenired from the field in the ensuing decades as this area was heavily visited. As noted earlier, P. W. Norris on his 1877 visit to the battlefield collected about 100 army cartridge cases from Last Stand Hill, likely beginning the relic collection of the area that continued for decades. Thus the absence of army cartridge cases and other artifacts on and around Last Stand Hill should not be construed as the lack of evidence of fighting, only that the area has been compromised by early relic collecting activities.

Richard Fox (1993) interprets this absence of army cartridge cases here and in the Keogh position as evidence of the command's reorganization and redeployment, but without tactical prescription, arguing there was no formal last stand as such. He suggests that tactical disintegration occurred as the command structure broke down during the battle. Tactical disintegration of the then surviving elements of the command most likely occurred. Fox's work is an excellent example of how analysis of archeological data, historical records, and Indian oral history can combine to provide new insights into past events. The caution is one of vetting data sources carefully. While the archeological record is important it too has been affected by indiscriminant collecting to some degree. There have been many people over many decades who walked that ground and picked

LITTLE BIGHORN

up cartridge cases and other relics. Care must be exercised in devising interpretations based on the presence or absence of cartridge cases alone. The data must be assessed holistically, such as including the distribution of impacted army bullets found on the Custer Ridge extension. The number of army caliber bullets found in the surrounding areas, particularly in the face of the slopes on the Custer Ridge extension is *prima facie* evidence that far more fighting occurred on and around Last Stand Hill than the cartridge cases recovered from that locale suggest.

Deep Ravine

Just what happened along the Deep Ravine Trail or South Skirmish Line is open to several interpretations. The archeological materials show that horses died there, men died there, and there was fighting along the trail where the white marble markers now stand. It was probably a breakout attempt as the Indian accounts suggest. The issue is whether it was organized or a helter-skelter event. The archeological evidence is not strong enough to refute or support either assumption (Figures 21, 35-38). The human skeletal remains do not appear to be from any E company men, although they are not definitively identified at this point. The bullets, cartridge cases, a rather poignant man's wedding ring, and some other personal items, as well as evidence of cut marks and crushing blows on the skeletal remains certainly indicate that the victorious Lakota and Cheyenne had time to utterly destroy those soldiers who ventured toward Deep Ravine.

The archeological evidence for combat is well established all along and in and around the marble markers that dot the length of the trail. While some marker locations are likely spurious, such as those found in pairs that have been investigated (Scott and Fox 1987; Scott et al. 1989; Scott, Willey, and Connor 1998), the vast majority likely represent a location where a soldier fell. The excavated markers, 2, 7, 9-10, 33-34, 42, and 52-53, all revealed human remains consistent with only one soldier at each marker or pair of markers. Over the ensuing years isolated exposures of human bone at other markers along the Deep Ravine trail indicate that far more than six men's remains were covered over in that area in 1876.

The question of the soldiers' remains in Deep Ravine itself remains an open question. The geomorphological work by C. Vance Haynes (1989) and subsequent geophysical investigations (Josten and Carpenter 1995) all point to one area of the ravine where there is a geophysical anomaly (see *Geomorphology of the Little Bighorn Battlefield* for a more detailed synopsis of this work). Whether this will prove to be the burial site of up to 28 men or some other feature is entirely open to question and future resolution. Regardless, the archeological evidence of combat and soldiers' resting places is compelling and clear all along the Deep Ravine trail. Michno's (1994) argument that Cemetery Ravine is the true Deep Ravine burial site is a misinterpretation of the documentary and archeological evidence. Michno ignores the absence of archeological materials in Cemetery Ravine as well as the geological and geomorphological data that Cemetery Ravine has not been an active erosional feature for several thousand years. Geophysical investigations (Josten and Carpenter 1995) in Cemetery Ravine revealed a few small near-surface magnetic anomalies that are likely iron artifacts and natural magnetically susceptible soils. But no anomalies that could be even remotely construed to

be burial sites were identified. The only anomaly consistent with such an interpretation is the one in Deep Ravine proper.

The gross distribution of army-related artifacts on the Custer field provides some idea of the combatant locations during the battle. The positions of cartridge cases, buttons, spurs, equipment, and human bone indicate that soldiers fought and died along the east side of Custer Ridge from Calhoun Hill to the Keogh position, and to Last Stand Hill. There was also fighting at the northernmost extent of the South Skirmish Line or the Deep Ravine Trail. These troop positions are further corroborated by the presence of impacted bullets from Indian-associated weapons.

At least seven discrete Indian positions can be discerned on the basis of the variety of cartridge case types (representing the variety of weapons used by the Indians) and government bullets impacted around these positions. Two positions are on Greasy Grass Ridge. Another is on Henry Ridge, where numerous .44 Henry cartridge cases were found southwest of Calhoun Hill. Yet another is a knoll 660 feet northeast of Last Stand Hill. In addition to a variety of non-government cartridge cases found at the knoll, also found were split .45-55 government cases, which probably represent captured government ammunition fired from .50 caliber weapons.

The Reno-Benteen Equipment Dump Site and the Horse Bone Grave Site

Aside from the extensive evidence of the combat that occurred at Little Bighorn, there is a wide variety of other archeological evidence relating to the aftermath of the battle. Some of that information is related to Army and National Park Service administration of the site, other artifacts relate to the untold thousands who have visited the site, as well as artifacts that evoke the various memorial and film-making activities that have taken place at or near the park. But three data sets illustrate what happened after the victorious warriors left the field. First are the remains of the men buried on Custer battlefield, in the valley, and at the Reno-Benteen defense site. They tell the tale of hasty, but not uncaring, burial in the face of uncertainty about when or if the Indians would return. They also tell the tale of the men's lives, the manner of their death, and the burials and reburials those remains have endured (Scott, Willey, and Connor 1998). These are discussed in more detail in Chapter 6.

Secondly, there is the Reno-Benteen equipment dump excavated in 1989 (Scott 1991). It may be but one of several equipment disposal areas. The investigations yielded evidence of the deliberate burning and destruction of ammunition and ration crates or boxes, some guns, and a large number of saddles and other horse tack. The army held the field of battle, but they had suffered an ignominious defeat, and they simply destroyed what equipment they could not salvage so as to render it unserviceable to the enemy.

Third is the horse bone grave. The Battle of the Little Bighorn resulted in the deaths of a number of soldiers and Indian combatants. In addition perhaps as many as 90 horses were killed during the battle or wounded and later destroyed by the troops burying the dead. Perhaps the most famous battle survivor is the horse, Comanche (Lawrence 1989). Badly wounded, Comanche was tenderly restored to health and pampered by the Seventh Cavalry until his death in 1891. Comanche became an enduring

LITTLE BIGHORN

symbol of the Seventh's defeat at the Little Bighorn, and its resurrection as a fighting force. Comanche's remains were stuffed and to this day evoke an emotional response from all who view him at the Dyche Museum at the University of Kansas. Comanche is a powerful symbol of all the horses killed at the Little Bighorn and today is the only known surviving physical set of remains of a post-Civil War cavalry horse.

Due to natural erosion and some human vandalism, human skeletal remains were exposed in the years following the first hasty burials in June 1876. Horse bone continued to litter the field as well giving rise to speculation of poorly treated and unburied human remains. In April 1879, Captain George Sanderson was ordered with his company of Eleventh Infantry from Fort Custer to rebury the exposed remains. He also constructed a cordwood memorial near the top of Last Stand Hill. Sanderson noted he believed the reports of unburied dead resulted from misidentification of horse bones for human remains. To forestall further problems he had the horse bones gathered together and placed in the cordwood memorial giving the field "a perfectly clean appearance, each grave being re-mounded and all animal bones removed" (Sanderson cited in Gray 1975:37).

In 1881, a detail of soldiers commanded by Lieutenant Charles Roe, Second Cavalry, was sent to disinter the remaining soldiers' remains and rebury them in a mass grave. He was also to erect a granite memorial shaft to commemorate those who had fallen in the battle. Lieutenant Roe moved the pieces of the monument to the site on sledges. He erected the granite shaft on the top of Last Stand Hill at the site of the Sanderson cordwood marker and then had his detail disinter the remains from around the field. A mass grave, ten feet wide, was dug surrounding the memorial shaft (Charles Roe letter, October 6, 1908 to W. M. Camp, Little Bighorn Battlefield National Monument files), which now lies under the sidewalk surrounding the memorial on Last Stand Hill. Roe made no mention of the horse bones that were in the center of the cordwood monument his men disassembled, but it is presumed that he had his men dig a pit and bury the horse bones not far from the site of the monument.

That was certainly Superintendent Edward Luce's assumption when the laying of a water discharge line from a large water tank on Last Stand Hill revealed a pit containing a large number of horse bones (Luce 1941a). Luce also thought he identified human bone co-mingled with horse bone when he inadvertently cut into the horse bone grave pit.

The water tank, of 20,000 gallon capacity, on Last Stand Hill was the primary water reservoir for the National Cemetery irrigation system and for potable water to the residences. The tank was installed on the northeast side of Last Stand Hill immediately east of the Seventh Cavalry monument placed by Charles Roe. The tank's date of construction is not precisely known, but it may have been around 1911 (Doerner 2002). Water was pumped to the tank from the Little Bighorn River. In turn water was delivered by gravity fed lines to the cemetery irrigation system, and to a hypochlorinator that filtered the water for the drinking fountain and residences (Hommon 1940).

Apparently the reservoir tank overflowed from time to time and in April 1941 Superintendent Luce installed an overflow drain on the tank and a drainage line that discharged to the east. During the digging of the trench for the drain line a large quantity

of horse bone was encountered. This prompted Luce to report the finds to his superior, the superintendent of Yellowstone National Park (Luce 1941a), and to the Quartermaster General of the Army (Luce 1941b).

The discovery of the horse pit during the overflow line trenching was excitedly reported by Luce (1941a) on April 9, 1941. On April 18, 1941, Luce (1941b), bypassing the normal National Park Service chain of command, wrote directly to the U.S. Army Quartermaster General to inform him of the discovery of human remains in the horse pit. Luce conducted an informal investigation of the pit at the time of its discovery and placed some of the recovered items in the museum collection where they remain today.

Luce's agenda in writing to both the Yellowstone Superintendent and the Quartermaster General appears to have been an attempt to generate interest and funding to excavate the horse pit for research purposes. He couched his request in terms of recovering and reburial of any associated human remains, but the broader purpose seems to have been to have Colonel Elwood Nye (Figure 39), one of the discoverers of Nye-Cartwright Ridge and an army veterinarian stationed at West Point, detailed to the

park to excavate the horse pit. Luce made that request to his superiors in a memorandum dated May 6, 1941 (Luce 1941c).



Figure 39. Lt. Col. Elwood Nye whose interests in the Little Bighorn story helped stimulate work on the horse bone grave

Luce was in routine correspondence with Nye concerning the issue of excavating the horse pit, for in a letter to Nye dated May 27, 1941 Luce (1941d) reported that the National Park Service lacked the funds to examine the horse cemetery at that time. He further expressed to Nye his desire for the study to proceed at some point in the future. World War II intervened and it was not until 1946 that the horse pit work again surfaced.

In July 1946 Elwood Nye, along with Luce and several local men, dug into the horse pit (Nye 1946). Photographs in the Park collections (Figure 40) indicate they dug a hole at least 4 feet in diameter, recovering a variety of horse bone, including ribs, vertebrae, and limb bones. Study of the available photographs does not show any readily identifiable



Figure 40. The crude excavations of the horse bone grave.

human bone comingled with the horse bone. The photographs show Luce and Nye examining the horse bones, a large pile of disarticulated bone elements, and an excavation scene taken from atop the 20,000 gallon reservoir tank, where there is clearly a group of horse bones being arranged in anatomical order.

During planning for the Indian Memorial sidewalk it became apparent that the sidewalk would be very near the presumed location of the horse pit. As the precise location was not well documented, nor could it be precisely verified with the available photographic evidence, it was determined to use archeological methods to locate the horse pit.

Steven De Vore (2002) undertook geophysical investigations using a magnetometer and electrical conductivity meter and Nickel (2002), used ground penetrating radar (Figure 41), both identifying anomalies within the suspected area. Most were interpreted to be associated with natural features and water runoff from the nearby Last Stand Hill parking lot. One was rectangular in shape and thought to be consistent with the horse pit location as seen in the 1941 and 1946 photographs. The size was somewhat smaller than Luce's 1941 description. It was about 5 meters (16 feet) long and 2 meters (6 feet) wide. The anomaly was located only 2 meters (6 feet) from the abandoned overflow drain outlet feature.

Subsequent archeological investigations did locate a pit (Scott 2002) containing disarticulated horse bone elements at the anomaly location (Figure 42). The feature is substantially smaller than the pit originally reported by Superintendent Luce in 1941.



Figure 41. Robert Nickel employs a ground penetrating radar unit in the initial search for the horse cemetery. Geophysical investigative techniques have good potential at Little Bighorn to find buried features such as rifle pits at the Reno-Bentzen defense site.

It is suspected that Luce only guessed at the size of the horse bone pit found during the trenching for the overflow drain line. It is also suspected that Luce may have exaggerated the pit's size and its contents to engender support for its investigation that never really developed. The discovered feature yielded evidence of one or more disturbances during the twentieth century as revealed by artifacts found mixed in the pit fill and the evidence of mechanical abrading and bone breakage. It is suspected that the most significant disturbance was not the 1941 finding of the pit, nor the 1946 digging, but an undocumented disturbance probably related to 1950's or 1960's era construction projects carried out on Last Stand Hill associated with construction work to support increased visitation.

The sidewalk construction that leads to the Indian Memorial from Last Stand Hill did not affect the horse bone pit location. The pit was bypassed and a marble marker commemorating the horses and their burial site was erected along with an interpretive panel (Figures 43, 44) discussing the horses and the pit excavation as part of the interpretive exhibits along the walk.

Geomorphology of the Little Bighorn Battlefield

During the 1984 field work Richard Fox supervised the excavation of several soil mounds and disconformities in Deep Ravine in the hopes of finding some of the soldiers thought to be buried there. The testing effort revealed only sterile deposits, and the



Figure 42. Excavation and recording of the horse bone grave pit with Thomas Thiessen and Harold Roeker at work on the feature.

mounds appeared to be natural slumping of soils from the nearby ravine banks (Scott and Fox 1987). He also used a power posthole digger or augur in an attempt to locate buried soils and remains in the lower reaches of Deep Ravine. The augur was unable to reach sufficient depth to insure all soil deposits were sampled. In 1985 Dr. C. Vance Haynes of the University of Arizona joined the team to conduct geological investigations in Deep Ravine (Haynes, 1989). Of particular interest were the bodies of a score or more of troopers reported in several historic accounts to be located in the steep-walled gully and buried where they had been found (Scott, et al., 1989). Soil auguring and trenching in Deep Ravine revealed five strata of Holocene alluvium separated by four disconformities, most of which are erosional. Of the stratigraphic units identified three are prehistoric in age and two units are less than a century old. The conformable contact at the base of unit F1 was the floor of Deep Ravine at the time of the 1876 battle, and was examined in six backhoe trenches placed across the ravine in 1985. Five other trenches exposed the erosional contact at the base of unit F2 and on top of unit C (of prehistoric age). An area, designated Unit X, was postulated to be the fill of a buried ravine headcut that could host the missing remains a few meters downstream of trench 11.

In 1989 Haynes (1991) tested the postulated Unit X area by placing three lines of auger holes across the floor of Deep Ravine near the lower trail crossing. The hand augering was hampered by a high water table in Deep Ravine, but did prove the presence of unit X, although no battle-related remains were found. Unit X was found to contain a clear geophysical anomaly when geophysical investigations of the area were undertaken in 1995 (Josten and Carpenter 1995; Applied Imaging 1996; Coleman Research 1996).

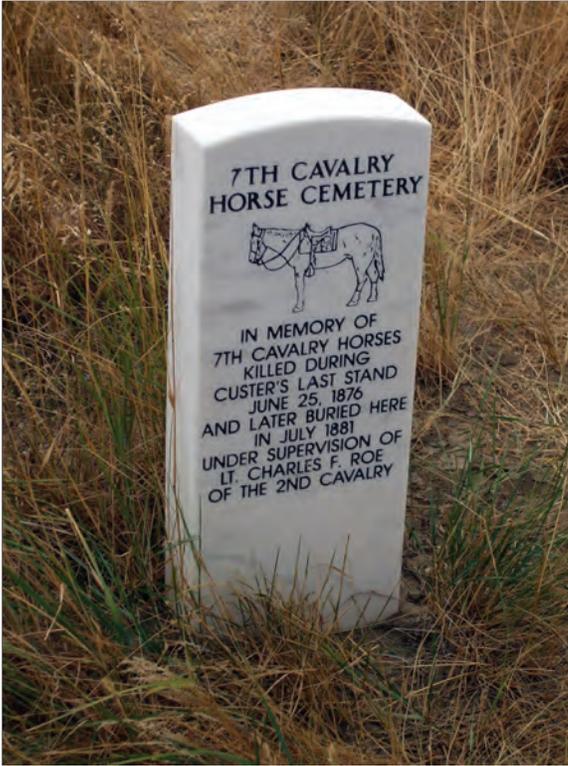


Figure 43. A stone marker that commemorates the horses lost in the battle. The stone was designed by Chief Historian John Doerner and placed on the site of horse grave pit.

The association of the anomaly with 1876 events cannot be proven without extensive and expensive excavations of the area.

In addition to the work in Deep Ravine three soil test pits up to 60 cm deep were placed in the vicinity of archeological excavations in the Reno-Benteen dump area (Haynes 1991). These were to determine the sedimentary substrate, evaluate slope processes, and relate these to alluvial processes in gullies such as Deep Ravine. The findings in the dump area are consistent with those of the 1984-85 archeological work (Scott et al., 1989). Cartridge cases from the 1876 battle showed no preferred orientation even on relatively steep slopes (up to 20 degrees) and no abnormal concentration in drainages as would be expected if significant slope washing had occurred. The conclusions were based upon a qualitative assessment of the cartridge case plots in relation to the topographic maps with a 2-foot contour interval.

Repeat photography also undertaken in 1989 showed no significant changes in vegetation type since 1877, the earliest photographs of the battlefield. These early photographs indicate slightly less dense grass and sagebrush and a few more eroded patches than today, suggesting slightly drier conditions at the time. The steepness of Water Carrier Ravine precludes typical fluvial aggradation as the origin of prehistoric units C and E. Their occurrence on the adjacent slopes as alluvial aprons and the occurrence of pebble lines was deemed compelling evidence for accumulation by washing from higher slopes during late glacial (Wisconsin) time. Essentially there is no evidence of significant erosion or aggradation of soils on the Little Bighorn Battlefield since 1876, except for in-filling and headward cutting in Deep Ravine, and in those active drainages such as Deep Coulee, Medicine Tail Coulee, and along the Little Bighorn River course.

OTHER USES OF THE ARCHEOLOGICAL EVIDENCE

Aside from allowing a great deal more to be inferred about the way the battle played out, the artifacts provide details about what was actually worn, carried, or used by the battle participants. The range and extent of what the artifact studies have shown about clothing, equipment, ornaments, and weaponry used at the battle was reported in detail in Scott et al. (1989) and further revised in Scott and Bleed (1997). The following summarizes that information.



Figure 44. Interpretive panel featuring the archeological investigations and historical accounts of the horse grave pit.

Evidence for Clothing and Equipment

The number of artifacts representing clothing and equipment used by the combatants is relatively small. This is not unexpected given the nature of the battle, and the historical accounts of scavenging the battlefield. The clothing worn by the battle participants has been the subject of several studies (Hutchins 1976; Reedstrom 1977). The archeological project recovered only a few Indian-associated personal items, and no clothing items whatever, so the question of Indian attire cannot be addressed with the archeological data. However, army clothing and equipment-related artifacts were recovered in moderate quantity.

Archeological evidence for the soldiers' clothing consists of General Service buttons, an Infantry "I" button, trouser and underwear buttons, cloth fragments, hooks and eyes, a chinstrap slide, a trouser buckle, a suspender grip, boots, and boot nails. The apparel artifacts support Hutchins' (1976) findings. Hutchins' analysis of contemporary and survivor accounts contain more detailed information on clothing than the archeological data. However, Hutchins' does not document the use of the forage cap, and the chinstrap slide found during the archeological investigations does suggest the forage cap was present at the battle.

A few personal items were recovered. Four five cent pieces, two dated 1869 and one each dated 1870 and 1876, were found. All four coins exhibit very little wear, which is consistent with their loss in 1876. Two of the five cent pieces were found in one of the

marker excavations, in association with human bone. Their position suggests they were in a trouser pocket or a bag.

A gold watch chain from the Calhoun position on Custer battlefield and an almost complete gold plated brass, imported Swiss, hunting case watch from Reno-Benteen attest to the presence of timepieces.

While no field glasses or compasses were recovered archeologically, the eyepiece to a telescope was found at the Reno-Benteen defense site. The eyepiece is very similar to that of French made telescopes of the era.

Tobacco was definitely present at the battle. The historic record documents that some Indian warriors recovered tobacco from the dead soldiers both at Reno-Benteen and Custer battlefields. The presence of tobacco is also documented in the archeological record. Three tobacco tags were found, two at Custer and one at Reno. Indirect evidence for pipe smoking is present in one set of human remains recovered. The teeth of the individual found at the Marker 33-34 excavation exhibited extensive wear. Tobacco stains were also noted on the teeth of several of the remains recovered (Scott, Willey and Connor 1998). A recent study (Vihlene 2008) of tobacco use by the Seventh Cavalry during the nineteenth century expands the archeological information and places army tobacco consumption in the context of tobacco use and smoking habits in the nineteenth century.

Perhaps the most poignant personal item recovered was a silver plated brass wedding band. The ring was found on the South Skirmish Line still encircling a joint of the left third finger. Over the years, other rings, like Second Lieutenant William Van Wyck Reilly's, were recovered and returned to the family (Hutchins 1976:17).

Four artifacts can be ascribed to the Indian combatants. One is a Hudson's Bay style trade fire steel. Two ornaments were also recovered. One from the Reno-Benteen defense site is a brass bracelet found in an Indian position and associated with a group of .44-caliber Henry cartridge cases. The other artifact is an ornament made from two cartridge cases and a piece of lead. Its purpose has not been identified. The fourth artifact are ball shaped brass buttons recovered during B. William Henry's 1969 metal detecting work and the 2004 Tour Road mitigation effort (Scott 2006), and are assumed to be Indian clothing ornaments as they were found in Indian positions at Greasy Grass Ridge and the Reno-Benteen defense site.

Soldier's Equipment

The average cavalryman carried a variety of equipment during a campaign. He, of course, carried weapons, but he also had a cartridge belt with a buckle, a holster for his revolver, and a carbine sling. He also wore spurs, and would have had a canteen, mess gear, and a haversack. Hutchins (1976:33-55) addresses the type of equipment carried by the Seventh Cavalryman in excellent detail.

LITTLE BIGHORN

The archeological evidence for equipment is limited in number, but is diverse. A number of firearms parts were found. Three screws are associated with the carbines used by the command, and a backstrap, a cylinder pin, and an ejector rod button are from three of the command's Colt revolvers, while lock retaining screws found in the Reno-Benteen dump indicate the presence of a .50-70-caliber rifle at that site. A trigger guard, tang screw, and a butt plate from a Springfield carbine were found in 1994 on the Custer Ridge extension. The other two parts represent Indian firearms. One is the loading lever from a Model 1858 New Model Army Remington percussion revolver, and the other is a trigger from a shotgun.

Several army issue brass 1859 pattern spurs were recovered as well as three iron spur strap buckles. The iron buckles suggest that the 1859 or Civil War period spur and strap were used on the campaign. A single brass private purchase spur was found at the Reno-Benteen defense site. Another equipment item recovered was the carbine sling snap swivel. Two were found, one each at Custer and Reno.

There is direct and possibly some indirect evidence of the use of belts. An adjustment hook for a Model 1851 waist belt was recovered on the Custer battlefield. A small fragment of black buff leather was also found. The leather is the style that was used in manufacturing the Model 1851 waist belt. The fragment is too small to be positively identified, however. Indirect evidence for a thimble belt may also exist. Two unusual .45-55 Springfield carbine rounds were found on Last Stand Hill. Both rounds were unfired but each had been damaged when struck by a bullet. The rounds were found near one another on the ground, suggesting they may have been in the same thimble belt when struck.

A few mess items were recovered at the Reno-Benteen defense site. An iron spoon was found in the June 23 camp, an iron-handled three-tined mess fork was found in the Reno-Benteen June 27th camp area below the defense site, as was a fragment of a non-issue three-legged cast iron cooking pot. One nearly complete and one fragmentary issue tin cup were also found. The nearly complete cup was crushed flat and appears to be the 1874 pattern cup, although no U.S. stamp was present on the handle. Three crudely scratched block letters (KKK) were noted on the cup's bottom. The letters' association has not been determined. Several canteen stopper rings have been recovered, and could be from either the Model 1858 canteen or the Model 1874 canteen.

Miscellaneous Equipment

A few equipment items were recovered from the battlefield. A sectional tent pole ferrule was found at the Reno-Benteen defense site. Other tent related artifacts, also found at Reno, are grommet stiffeners. The presence of these items confirms the presence of tents with the command during the battle.

Another group of items with exclusive Reno-Benteen affiliation are the ammunition box nails and screws and ration box nails. These artifacts were recovered in large quantities near the barricade area and in the camp of June 26-27, as well as in the excavated equipment dump site (Scott et al. 1989; Scott 1991). These nails and screws indicate where these boxes were discarded or broken up for fuel. Their presence helps

to define the barricade and camp areas more precisely than has been possible in the past even with the available survivor accounts.

Horse-related Equipment

Artifacts related to horses, saddles, bridles, and other equipment were found in larger quantities than the soldier- related equipment (Figure 45). A poorly preserved Model 1859 carbine socket was found at the Reno-Benteen defense site. Several buckles of the size found on carbine sockets were also recovered. This buckle size was also found on other horse related equipment.

Other horse-related equipment found at Reno included a hand forged hoof pick and several Model 1859 picket pins or parts. Horseshoes and horseshoe nails were found on both battlefields. Saddle parts included brass saddle plates, foot rings, and foot ring staples from Model 1859 McClellan saddles or the 1872 modification. Halter and bridle buckles were found on both battlefields as were other buckles in sizes used on harness and other equipment as well. Several sizes of girth rings were recovered at Reno-Benteen. The context of recovery suggests they were associated with the pack animals' saddles and harness.

A few tack items were recovered that indicate that some of the command's horse-related tack met the specifications of 1874. A brass staple was found at the Reno-Benteen defense site as was a iron girth ring for the near side. Two side-line (hobble) snap hooks were also found at Reno. This indicates that the new model items had reached Custer or that the company saddlers were making up items to meet the new specifications.

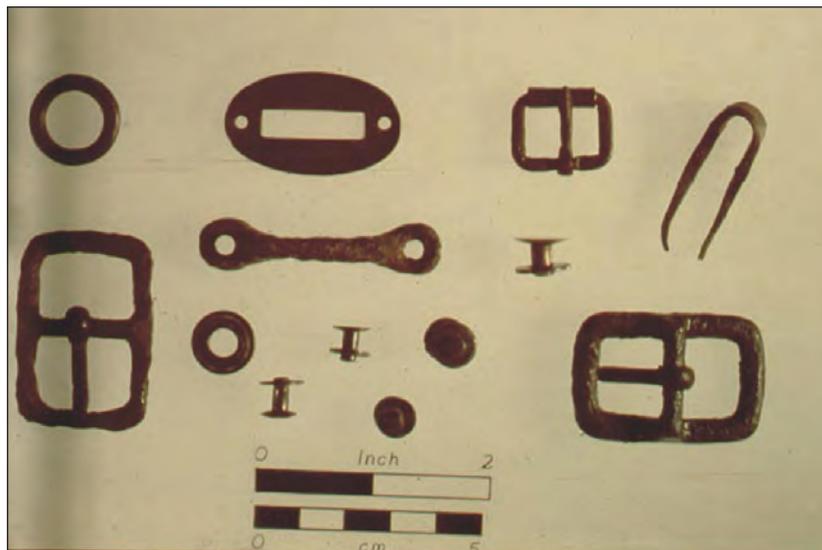


Figure 45. Tack buckles, saddle plates, staples, and harness rivets all aided in the identification of the army saddles used at the battle as McClellan types models 1872 and 1874. It is artifacts like these that are the physical evidence of the event that go beyond the battle itself to tell the story of the individuals who participated in the battle.

LITTLE BIGHORN

Some non-military but battle-associated horse-related materials were also found. A nickel or tinned buckle may indicate an officer's private purchase bridle or possibly an army experimental buckle. A large iron girth ring may also represent an officer's private purchase or a company saddler's modification of an issue saddle to accept a horse-hair cinch. Finally a small iron ring from Custer battlefield may represent either a civilian's saddle rigging or the rigging from an Indian pony.

Weapons at the Battle of the Little Bighorn

Bullets, cartridges, cartridge cases, arrowheads, and knives are the direct evidence of the weapons used during the battle. During the archeological investigations the Little Bighorn battlefield was viewed as a crime scene. By employing forensic techniques such as studies of firing pin marks on cartridge cases and rifling marks on bullets (Fox 1984; Scott 1989b; Scott and Haag 2009), it was possible to determine the variety of weapons used by the various participants. Firearms examiners at the Nebraska State Patrol Criminalistic Laboratory in Lincoln were instrumental in mentoring project personnel in the techniques of cartridge case and bullet identification and comparison. By combining firearms identification methods with the archeological constructs of spatial patterning and individual artifact analysis, it was possible to discover evidence for the movement of individual firearms over the field of battle, verify cavalry positions, and define previously unknown Indian fighting areas, which was an important advancement in battlefield interpretation. Prior to this time static distributions of artifacts, such as cartridge cases or bullets were used in concert with historic documents to reconstruct fighting positions and movements during a battle. With the application of firearm identification coupled with spatial patterning actual movements of firearms were shown on a battlefield for the first time, which led to a significant advancement in the interpretation of physical evidence independent of documentary or oral history evidence. By comparing the data sets a richer and more accurate understanding of the events were able to be reconstructed.

Firearms identification procedures applied to archeological evidence are the same as those applied to a criminal investigation. One archeological specimen is placed on one stage of a comparison microscope and another archeological case of the same caliber is, in turn, placed on the adjacent stage and visually compared. Two types of characteristics are identified during the process: class characteristics and individual characteristics. Class characteristics indicate that a given case was fired in a specific firearm type. If the class characteristics match then individual characteristics are examined. These included depth of firing pin mark, size of the mark, breech face marks, manufacturing tool marks, and other items like evidence of firing pin drag. Each firearm is unique in these characteristics and any case fired in a specific gun will retain microscopic evidence that is identical to another case fired in that gun. This technique of firearms identification has been used by law enforcement agencies since the early 1900s to prove a cartridge or a bullet was fired in a particular gun in legal circumstances.

The Little Bighorn firearms analysis has identified 47 different types of guns used by the Indian warriors. By using modern firearms identification techniques it was possible to discover how many individual weapons were represented in the archeological collection (Figures 46-49). The results have been nothing short of incredible. It is possible

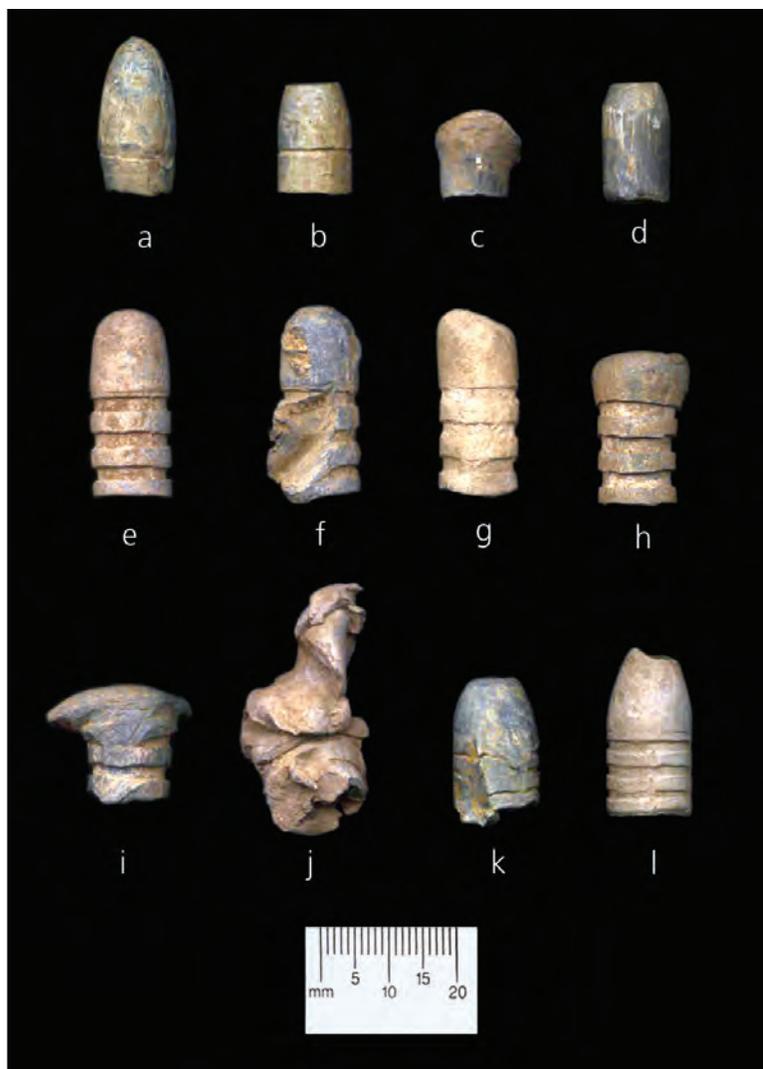


Figure 46. Examples of .44 and .45-caliber bullets from the battlefield. a. .44 Sharps, b. .44 Henry single crimping groove, c. .44 Henry deformed by impact, d. .44 Henry raised base variety, e. .45-405 Springfield, f. .45 Springfield with side impact damage, g. .45 Springfield with slight nose deformation, h. .45 Springfield with medium nose deformation, i. .45 Springfield mushroomed by impact, j. unidentified impact damaged bullet, k. .50-450 bullet with 3 land and groove rifling impressions, l. .50-450 bullet.

not only to identify the 47 different firearms types noted above, but the cartridge case and bullet analyses have demonstrated that there is evidence for the use of over 300 specific and individual firearms by the warriors at the battle. These figures are considered a minimum, as not all cartridge cases or bullets collected from the field of battle are available for comparison with the archeological sample.

This stimulating data also brought about, through a Kinnican Arms Chair Grant from the Winchester Gun Museum in Cody, Wyoming, an opportunity to search out and study actual firearms used in the battle. The effort required finding well-documented battle-attributed firearms from which firing pin impressions were



Figure 47. Examples of .44-caliber, .45-Colt, and .45-55-caliber cartridges and cartridge cases found during the inventory work. a. Smith and Wesson Russian bullet and case, b. Smith and Wesson American cartridge case, c. .44-40 cartridge case, .45-Colt misfired cartridge, d. .45-Colt cartridge case, e. .45-55 unfired cartridge, f. .45-55 unfired cartridge broken by oxidation and exposing the cardboard wads used to fill the case.

taken. Over 130 firearms were examined and firing pin impressions made with the archeological specimen cartridge cases. Sixteen firearms have now been documented as having seen service in the Battle of the Little Bighorn (Scott and Harmon 2004:289-324).

Non-firearms Weapons

Weapons other than firearms used at the Battle of the Little Bighorn are limited to cutting and crushing implements. These include knives, spears or lances, tomahawks or belt axes, and war clubs. The archeological evidence for the use of such items is pres-



Figure 48. Examples of .45-55 cartridge cases and .50-caliber cartridge cases, Benet primers, and .45-55 cartridge cases damaged when fired in .50-caliber firearms. All are believed to have been fired in warrior used weapons.

ent as both indirect and direct evidence. The numbers of non-firearms artifacts are few, particularly from the direct evidence, but the indirect evidence conclusively supports their use and corroborates the historical accounts.

Historical accounts indicate that the bow and arrow played a large role in the fight. The archeological evidence for the use of the bow is limited to twelve arrowheads (Figure 50). Indirect evidence of bow and arrow use is present on the human remains (Scott, Willey, and Connor 1998). At least two, and possibly three, bones from different bodies exhibit cut marks that could have been made by arrows. Knives, spears or lances, tomahawks or belt axes, and war clubs are also mentioned in the warriors' accounts. The archeological evidence for the use of tomahawks and war clubs is indirect. The



Figure 49. A .50-caliber bullet with bone embedded in the body after cleaning and conservation found on the Custer Field in 1984.

human remains bear the marks of crushing by heavy blunt instruments, such as war clubs, and at least one soldier was decapitated by a blow to the neck with a heavy edged instrument like a belt axe. There is direct archeological evidence of knives. Three blade fragments and three complete folding or pocket knives are the archeological examples that demonstrate the use of knives by the soldiers. There is also some indirect evidence too. Several .45-55-caliber cartridge cases retain evidence of having been pried from a carbine chamber by pointed instruments. Only one sheath knife fragment attests to the Indian use of knives in the battle. The blade fragment, found in an Indian position at Reno-Benteen, is a large butcher knife style. It is painted gold and closely resembles a Green River Russell trade knife. Blades of this type are also known to have been set into Sioux war clubs of this period. While this evidence is not striking, it does confirm the recollections of the battle participants.

Firearm Types

The different firearms types and their quantity, particularly those used by the Indian participants, has intrigued Little Bighorn enthusiasts for years (du Mont 1974). One of the first to use physical evidence to determine the type of firearms used in the battle was B. William Henry, Jr. He evaluated and described the variety of bullets and cartridge cases from Indian positions around the Reno-Benteen defense site and Custer battlefield. Henry's (du Mont 1974:55-6) analysis of 1672 artifacts identified thirteen different types of cases and bullets representing thirteen different battle-related firearm types. The archeological projects recovered 2665 cartridges, cartridge cases, and bullets. There are 166 cartridges of various calibers, 927 cartridge cases, and 1572 bullets. The .44-caliber Henry and Model 1873 Winchester cases represent about twenty-seven percent of the total, and .45-55 Model 1873 Springfield cases account for another fifty-four percent (Figure 46). Corresponding bullets were found in similar quantities with over seventeen percent and forty-six percent respectively. The Little Bighorn Battlefield museum collection also has similar quantities of .45-55 cases (1069) and .44 rimfire cases (222). The sheer number of these cases indicates the Model 1873 Springfield single-shot and the Winchester manufactured repeating firearms played a prominent role in the battle.

Firearm identification analysis has found evidence for at least 371 individual guns among the forty-seven firearm types used in the battle. The archeological data provides the direct physical evidence of the guns used on the battlefield site. Three other types: .44-caliber rimfire used in the Frank Wesson guns, the .44-caliber centerfire Colt, and .58-caliber muzzle-loaders, were identified by Henry from one artifact each, but these types were not seen in the archeological collections.

The cavalry utilized the .45-caliber Model 1873 Springfield Carbine and the .45-caliber Model 1873 Colt revolver. Some army participants are also known to have utilized personal firearms during the battle. Even taking these into account, the Indian warriors had at least forty-five firearm types at their disposal at the battle's beginning. As the battle progressed the warriors took carbines and revolvers from the dead soldiers so that they eventually utilized all forty-seven types against the cavalry.



Figure 50. Four of the twelve iron arrowheads found during the archaeological investigations.

Among the ammunition identified are shot from shotguns or other weapons firing shot, eleven types of non-metallic cartridge firearms types, with the remaining types being metallic cartridge firearms. The non-metallic cartridge and muzzle loading firearms include at least three types of revolvers, five types of long guns, and three unidentified types. The five long guns include at least three military types, Maynard, Starr, and Smith carbines. The other two types are the .58-caliber balls and the .577-caliber Enfield that could have been fired in either a military musket or a commercial weapon, such as a trade musket. The three unidentified types are the .44, .45, and .50-caliber balls. The rifling marks on these balls have not yet been identified, but may be from plains rifles or trade guns.

The thirty-three types of metallic cartridge weapons are represented by eight revolver types, fifteen single shot long gun types, four repeating long gun types, and eight as yet unidentified cartridge bullet types. Among the cartridge firearms identified are the Springfield Model 1866, Model 1868 or 1870 rifle (Figures 48, 49), Spencer carbine, Joslyn carbine, Ball carbine, Sharps .50-caliber, Sharps .44-77-caliber, Springfield Model 1873 carbine, Colt Model 1873 revolver, and the Remington .50-caliber rifle. The firearms are an impressive array of weaponry. This archeologically identified group can be compared to the list of weapons turned over to the army in 1877 when some Sioux and Cheyenne Indian bands returned to the reservation. These bands surrendered 410 guns (War Department 1879) including 160 muzzle loading guns. The rest were cartridge guns. While these guns may not have been used at the Battle of the Little Bighorn they do represent the variety of firearms available to the Indians of the Northern Plains. The archeological sample does not correspond to the surrendered guns one for one, but the comparability is excellent.

Issues of Extraction Failure

Some Indian accounts of the battle (Marquis 1976), as well as comments by Major Reno (Hedren 1973: 66), have suggested many of the soldiers' carbines jammed in the process of extracting the spent case. Some authors have even gone so far as to speculate the cause of Custer's defeat was, in part, due to the extraction failure problem (Graham 1953:146-147). There is no doubt that some carbines failed to extract their case properly, as the historical and archeological evidence clearly indicates. The archeological data

provides more direct evidence to further clarify the role of extraction failure. Hedren (1973) examined all of the available .45-55 carbine cases from the park and private collections in 1972. He found three cases out of 1625 he examined had evidence of extraction problems.

Evidence of case extraction problems is present in the archeological sample. The microscopic examination of the cases from the Custer battlefield identified two cases with scratch marks on the head. These could have been caused by prying the case from the carbine chamber with a knife. A third case has two gouges present in the rim, which could have been the result of prying the case from the chamber. All three cases were fired in different weapons. Six cases from the Reno-Benteen defense site exhibited extractor problems representing four different guns with two different ones exhibiting extraction failure at least twice each.

The number of cases exhibiting extraction failure amounts to two percent of the total number of archeologically recovered specimens (one and eight-tenths percent at Reno-Benteen and three and three-tenths percent at Custer battlefield). Taken with Hedren's data the extractor failure rate this amounts to six percent of all examined examples of .45-55 cases. The archeological cases represent sixty-nine different guns from the Custer battlefield and sixty-two different guns from the Reno-Benteen defense site. The extraction problems represent a four and three-tenths percent and five and sixth-tenths percent failure rate for both battlefields respectively. This yields an average of five percent as an overall failure rate. Since the cartridge cases represent 131 guns or about twenty-two percent of the carbines used by the army in the battle then a five percent failure rate would mean about thirty of the total battle carbines would have been involved (ten on Custer battlefield and twenty at Reno-Benteen).

If the army had extractor failure problems then the question arises as to whether the Indian warriors were faced with a similar problem. The archeological record contains data indicating about eight percent of the .50-70 and Spencer cases have pry or scratch marks on them. These figures exclude the .45-55-caliber army cases that were fired in .50-caliber arms. Those cases all exhibit extraction failure, as might be expected with a ruptured case. From the archeological data, the case extraction failure rate during the battle was about the same on both sides. This information on Indian extraction failure further reinforces the argument that extraction failure did occur, but not in large numbers. That extraction failure did occur is not debatable but it was not significant to the outcome of the battle.

Brass Cases and George Custer's Guns

For many years it has been assumed George Custer was the only person to have used .50-caliber brass cartridges during the battle. This unfortunate notion has crept into the literature on the battle, and has been used to reconstruct Custer's personal movements (Weibert and Weibert 1985). George Custer is known to have possessed a .50-70-caliber Remington sporting rifle that may have utilized a brass case (du Mont 1974). He also may have used one or a brace of Royal Irish Constabulary Pistols that used a brass case (du Mont 1974; Palmer 1975). Brass cartridge cases began to come into use in the 1870s and were commercially produced. In fact, the government bought several

million rounds for their .50-70 military models in 1874 and 1875 (Lewis 1972:19). Brass cartridge cases were also produced for a number of different weapons like the Model 1873 Winchester and the Evans Old Model.

Several dozen brass archeological cases were recovered on both battlefields. The archeological case types include the .44-caliber Evans and the .44-40-caliber Model 1873 Winchester cartridge cases. The only other brass cases found were in the .50-70-caliber. The Winchester-Millbank primed cases are brass, and were found on the Custer battlefield and Reno-Benteen defense site. A total of twenty-one brass .50-70 cases were recovered. Firearms identification analysis indicates they were fired in fourteen different Springfield, Sharps, or Remington manufactured guns. The distribution and context of the brass cases suggest an Indian association for those on the Custer battlefield, and both Indian and soldier use at the Reno-Benteen defense site. Clearly these brass cases cannot be associated with George Custer's Remington sporting rifle. Neither can the presence of brass cases in other contexts be the primary evidence to support the reconstruction of George Custer's personal movements.

The ability to identify individual weapons is an important achievement in the study of the Battle of the Little Bighorn. It helped to address questions on the numbers and armament of the Indians. But, coupled with the piece plotted data, locating precisely where cartridges and bullets were found, this capability became even more important by allowing tracing of individual movements during the battle, which in turn allows a reinterpretation of the chronology of events of that short span of time. When all the firearms data is taken into account, it becomes readily apparent that Custer and his men were outgunned by the warriors, if not in range or stopping power then certainly in firepower.

SUMMARY OF ARCHEOLOGICAL INVESTIGATIONS

Artifacts found on the field of battle and removed without context are just relics, curiosities that arouse romantic imaginations. However, when the recovery of those artifacts is accomplished in a systematic manner and the provenience and context properly recorded the data become a valuable new source of information on the battle. Recovered battlefield artifacts, as the physical evidence of the event, are useful for several purposes. At one level they are the tangible evidence of the event and can be used in the museum setting to interpret the event. The data contained in the artifact and in its context in the ground also provide a new and independent evidence source for detailed analysis of specific battle elements, such as combatants' attire, armament, deployment, and movements. The archeology of the Battle of the Little Bighorn has yielded thousands of artifacts, reams of notes and other records, and a pile of reports, monographs, and books. Those who participated in the project, whether as archeologist or as volunteer, know that not everything was found, nor has everything there is to know been learned. But, in more than twenty-five years of continuing archeological investigations many things were recovered that show the historical record is correct on many points, that Indian oral history and oral tradition likewise explain some details better than the army accounts, and archeological detective work has uncovered artifacts and their patterns of distribution that neither oral tradition nor documentary records mention. The Little Bighorn archeological record is not better than the others; rather it should be viewed as

LITTLE BIGHORN

another set of information to be compared, contrasted, and correlated with the other information sources. Archeological data is physical evidence of the battle, and as such is the very visible reminder of those past events that have come to play such a role in our lives. They and the information they convey are a very real part of the interpretation of the Battle of the Little Bighorn.

6. BONES ON THE BATTLEFIELD

Since the battle of the Little Bighorn there have been three major episodes of reburial of the soldiers' remains. In 1877, 1879, and again in 1881 burial details went to the field specifically to reinter remains exposed by the elements and scavengers. Fred Dustin (1953) has described the reburial details as well as John Gray (1975), and Richard Hardorff (1989) has presented the story of the reburials in detail. Human remains have been found, collected, or formally recovered from the battlefield beginning in 1877. No formal professional examination of any of the remains occurred until 1984. Since then there has been a concerted effort to find and analyze human remains associated with the Battle of the Little Bighorn. This was done in part to learn more about the lifestyle and manner of death of those who died in the battle. Another aspect of the human remains studies was to determine if any of the recovered human remains were of Native American ancestry, and if so, to insure they were repatriated to the appropriate tribe or group. Finally the human remains were examined with the intent to specifically identify the individual represented by the bones, which was partly successful. Studies of the human remains found on and around the battlefield were the subject of several reports (Snow and Fitzpatrick 1989; Willey 1993; 1997; Scott, Willey and Connor 1998). The following summary utilizes those sources and others to document the human remains and analysis efforts.

INDISCRIMINATE BONE COLLECTING AND RECOVERY

The first of the human remains recovery and reburial episodes began in the spring of 1877 when General Phillip H. Sheridan ordered his brother and aide to exhume the remains of the fallen officers and return them to the east for proper interment. Lieutenant Colonel Michael Sheridan reached Fort Abraham Lincoln on May 21, 1877 and soon started for the Little Bighorn escorted by Company I of the Seventh Cavalry. The expedition quartermaster was Captain Henry Nowlan who had, the previous year, staked the officer's graves and made a sketch map of their locations.

On July 3, Colonel Sheridan had his men exhume the bones of the identified officers and placed them in pine boxes with the exception of Lieutenant Crittenden (Figure 51). At the request of his father, Crittenden was re-interred on the field where he fell. A fatigue party also re-interred some exposed remains of the men. Apparently they removed what dirt had been placed over the bones and then heaped three feet of earth over the bones they uncovered. Sheridan in a *Chicago Times* account of July 15, 1877 stated very clearly that his men found only bones and all traces of flesh had disappeared.

Lieutenant Hugh Scott, a member of the detail, recalled years later that where he found bones exposed, he had the men gather them up into a small pile. He then had them buried in a hole dug for the purpose (Scott 1928). By noon on July 4 the officer's bones, in their boxes, were on their way back to Post No. 2 (soon to become Fort Custer) to await shipment downstream.

There was, at the time, and certainly since, a question as to whether the body of George Custer was correctly identified (Hardorff 1989). Apparently the first set of bones



Figure 51. Lt. Crittenden's grave as seen about 1892. Crittenden's body was buried on the field of battle at his father's request. It was moved to the National Cemetery in the mid-1930s during the construction of the park's first tour road.

uncovered was found with a corporal's blouse and was thought not to be those of Custer. A second grave was exhumed and those bones were assumed to be Custer's.

As previously discussed, the other 1877 human remains recovery effort was spearheaded by P. W. Norris who, in early July, found and removed Scout Charley Reynolds' skeletal remains. After Norris departed the battlefield with Reynolds' remains, a severe thundershower and hailstorm struck the site on July 6, and washed away much of the newly heaped up earth. Within two weeks General Sheridan arrived on an inspection tour and hunting trip. His party visited the battlefield and found the skeletons eroding out of their newly constructed graves. Sheridan ordered a police of the field, and 60 troopers spent four hours again reburying the dead.

Due to natural erosion and some human vandalism, bones became exposed again over the next two years. In one case a stage station operator, living near the site of the current Garryowen post office, was formally castigated in a letter from Fort Custer for removing a soldier's skull from the field. Apparently the station keeper had collected the skull for presentation to the director of the stage line.

Skeletal remains continued to become exposed and in April 1879, Captain George Sanderson was ordered with his company of Eleventh Infantry from Fort Custer to rebury the exposed remains once again. Sanderson reported he found very few exposed remains (Figure 52). He gathered together those remains consisting of



Figure 52. This photograph of Last Stand Hill taken by Stanley Morrow depicts the nature of the battlefield in 1879 with stakes marking soldiers' graves and scattered horse bones. The horse bones were collected and placed in a cordwood monument on the top of Last Stand Hill just after the image was taken. The cordwood monument was replaced by the granite Seventh Cavalry memorial in 1881 and the horse bones were reburied in a separate grave nearby.

parts of four or five bodies, by his estimate, and buried them on Last Stand Hill. He then proceeded to build a cordwood mound on that site. Sanderson noted he believed the reports of unburied dead resulted from misidentification of horse bones for human remains (Gray 1975:37 citing Sanderson). Stanley Morrow's famous photographs of the Keogh area graves (Figure 53), Crittenden's grave (Figure 51), and of the mound of horse bone (Figure 52) were taken at this time, and some were even attached to Sanderson's original report to his superiors.

In 1881, a detail of soldiers commanded by Lieutenant Charles F. Roe, Second Cavalry, was sent to disinter the remaining soldiers' remains and rebury them in a mass grave. He was also to erect a granite memorial shaft to commemorate those who had fallen in the battle. Lieutenant Roe moved the pieces of the monument to the site on sledges. He erected the granite shaft on the top of Last Stand Hill at the site of the Sanderson cordwood marker and then had his detail disinter the remains from around the field. A mass grave, ten feet wide, was dug surrounding the memorial shaft (Charles Roe letter, Oct. 6, 1908 to W. M. Camp, Little Bighorn Battlefield National Monument files).

It was not until 1890 that the marble markers which now dot the battlefield were placed to commemorate locations where soldiers fell, making the Little Bighorn



Figure 53. The Keogh area marker cluster, seen here about 1892, shows a concentration of markers, that is also reflected in the human remains found in the area during the 1984 and 1985 marker sampling study. Human bone is scattered, but currently buried across this area reflecting the years of human and natural disturbances as well as burial and reburial episodes.

battlefield unique in that it is the only battlefield in the world where markers denote where men fell or where found after the battle. The party to erect the headstones, under the command of Captain Owen Jay Sweet was supervised by Second Lieutenant Samuel Burkhardt, Jr. (Greene 2008:276n), arrived fourteen years after the battle, nine years after the soldiers' remains were reinterred in a mass grave.

A daily skirmish line searched over an area of about 2 square miles of the battlefield and the last of the 29 missing bodies were found and buried and the last headstone erected. During the search for [sic] bleaching skeletons of men were found and for some reason of neglect had remained unburied and with God's canopy alone to cover them for fourteen years..... On examination of the field it was found that the resting places of only 217 officers and men had been marked, exclusive of the places where Boston Custer and Arther [sic] (Autie) R. Reid [sic Reed] fell, a difference of 29 graves. Lieut. Porter's not inclusive. This necessitated additional and trying work in an attempt, if possible, to discover and verify the resting places of the 29 missing bodies (Official report of O. J. Sweet 1890, Little Bighorn Battlefield National Monument files).

Thus, in 1890, there were 246 markers on the field. It was Lieutenant Burkhardt's assumption that there should be 246 markers on the Custer field that led the men to search for missing graves. Burkhardt confused the number of men who died in the overall

battle with those who died under Custer's immediate command, and thus added the Reno-Benteen dead to the number on the main battlefield. In fact, of the 249 headstones the party was given to erect, only two were placed on the Reno-Benteen defense site.

...making a total of 246 officers and men over whom headstones were erected on the Custer field. Two headstones, one for Lt. McIntosh and the other for Dr. DeWolf being erected on the Reno field, and that of Lieut. Porter being returned to the post and turned over to the Post Quartermaster, accounts for 249 headstones.

(Official report of O. J. Sweet 1890, Little Bighorn Battlefield National Monument files).

Sweet's report and Burkhardt's observations also document another feature of the markers which students of the battle have discussed at length.

...all parts of the field show evidence of a large number of men who fell by two's or as comrades in battle...

(Official report of O. J. Sweet 1890, Little Bighorn Battlefield National Monument files).

There are, indeed, forty-three marker pairs scattered over the Custer battlefield. Explanations like Sweet's and Burkhardt's have been proffered, i.e., the pairs represent where 'bunkies', men who bunked together, fought and died together. An alternate explanation is that each pair represents only one soldier. In the original 1876 burials and probably during the 1877 and 1879 reburials, dirt was scooped up from either side of the deceased and piled on top. This left shallow indentations on both sides of the burial. Later burial parties, seeing a scatter of human bone and two shallow indentations, may have assumed that each indentation represented a burial, and placed two markers at that site.

The creation of the Custer National Cemetery in 1879 afforded a measure of protection to the Little Bighorn Battlefield that was unprecedented in the trans-Mississippi west in the era of westward expansion. It reflects a mix of cultural philosophies, that of memorializing fallen heroes and allowing them to rest in the securely enclosed confines of a national cemetery. The hasty burial of the dead at the Little Bighorn, when viewed in the context of the history of warfare, was not uncommon. The concept of military dead being treated with respect and being reverently buried grew out of the American Civil War experience, which was a very visible extension of the Victorian Era public mourning process and an extension of the secular and religious mores of that era (Scott, Willey, and Connor 1998).

Reburial, as revealed by the archeological investigations of 1958, 1984, 1985, 1989, and 1991, did not recover all the bones of the dead soldiers. Within a year after the battle, bones were recovered from the field. In the ensuing years, continuing to the present, bones of the dead soldiers have eroded to the surface and are exposed to the elements. Undoubtedly nature is more to blame than scavengers and relic collectors for

LITTLE BIGHORN

the exposed skeletal elements observed by visitors in the late 1870s and 1880s (Hardorff 1984; Taunton 1986).

There is no doubt that from time to time human skeletal remains were found on or near the battlefield. Some of these were collected by responsible persons and were reburied in the National Cemetery or in later years placed in the Monument's museum collection. Others were collected by mere relic seekers, were irresponsibly removed, and are lost to scientific investigation forever, and with some only recently repatriated for appropriate disposition. However, shortly after the battle, some remains were collected and documented to enhance the nineteenth century's scientific knowledge. During the third quarter of the nineteenth century medical science began a rapid advancement in the ability to diagnose disease, but lack of full understanding of the germ theory of disease and causes of infection led medical scientists, particularly the Surgeon General of the Army, to collect for study, examples of disease and infection in tissue and bone. Private Frank Braun (also listed as Baum and Brunn) of Company M, who was wounded in the face and left thigh on June 25 during the Reno engagement, posthumously contributed one of those examples to medical science (Scott and Owsley 1991) as explained below.

Braun was wounded while in a stooped position, the bullet entering the lower leg and after traveling a tortuous route up the thigh lodged in the head of the femur (thigh bone). He was treated by Dr. Henry Porter in the field hospital and transported on the steamer *Far West* to Fort Abraham Lincoln for further medical treatment in the post hospital. Private Braun died of his wounds on October 4, 1876. He was buried in the fort cemetery. When the fort was abandoned his remains were reinterred in Grave 571A at Custer National Cemetery.

Apparently, Dr. J. M. Middleton, the Fort Abraham Lincoln post surgeon, was intrigued enough with Braun's case to excise part of the dead man's wounded femur and innominate (hip) and send it to the Army Medical Museum (the repository of such specimens), where it remains today as a part of the extensive wound trauma specimen collection of the National Museum of Health and Medicine, Armed Forces Institute of Pathology.

Private Braun's contribution to medical science are the bones of his innominate (hip) and the femur head that still retains the ball that caused the wound. The specimen shows good progress in the healing of the wound, but the bone also shows necrosis, which means that the bone itself was affected to the extent that alteration of its structure began. Private Braun probably died of the effects of his wound, possibly the debilitating effects of the subsequent infection that resulted from it. Not only did medical science, at that time, lack understanding of the causes of infection but also the medication to stop its spread. Private Braun's bones testify to the state of medical science in 1876. At the same time, they are examples of physicians' attempts to learn the causes of the illnesses they faced, the way such illnesses affected the body, and the effective methods of treatment.

The earliest record of bone actually collected from the battlefield was made by a medical doctor, Assistant Surgeon Robert W. Shufeldt, who visited Custer battlefield in June 1877. He collected a human skull, not as a souvenir, but as a medical specimen. Shufeldt's regular report to the Surgeon General stated that he was the senior medical

officer with a battalion of the Fifth Cavalry in June and July 1877, and noted that he was with Company I scouting along the base of the Bighorn Mountains to the Custer battlefield during that time (Shufeldt to Surgeon General, Box 521, Papers of Medical Officers and Physicians, Adjutant General's Office, National Archives).

The skull and mandible Dr. Shufeldt collected were sent to the Army Medical Museum in Washington D.C. in July, 1881 (Army Medical Museum record 2120 on file at the National Anthropological Archives, Smithsonian Institution). According to Shufeldt the remains were pointed out to him by a Sioux Indian who had seen the man killed during the Battle of the Little Bighorn. Shufeldt's correspondence with the Army Medical Museum states the Indian reported the man was among the first killed in the charge on the Indian camp. After he was killed, the Sioux stated, the man's face was mutilated by a war club wielded by an Indian woman. Shufeldt presumed the man to be a bugler because of the double yellow stripes found on his rotting trousers, and further assumed him to be a trumpeter of Company M, killed in Reno's charge on the Indian camp. The basis for these assumptions is not indicated. Shufeldt (1910) describes the finding of the skull in a medical journal article, providing some additional information on the actual recovery site. Shufeldt described the general locale where he found the remains as: "This was where Reno lost his men, for I found the skeletons of the unburied dead, just where they had fallen, and everything on 'the hill' practically as the command had left it at the time of the arrival of the relief. At an easy pace for our ponies, my lone scout and I passed into the bottom at one end of which the enormous camp of Indian hostiles had been. We came opposite the bluffs where Reno threw up his entrenchments, below which we could see the winding river. Almost level, the great broad area over which we cantered, grew great patches of tall prairie grass. As we were passing through one of these, the Indian that was with me suddenly halted.He requested me to look down and note what I saw upon the ground, partly hidden in the tall grass. It was the skeleton of a soldier in a cavalry uniform" (Shufeldt 1910:123-124). Shufeldt clearly and unequivocally places the remains' location in the Reno valley position probably on the retreat line from the skirmish line to the timber. Shufeldt noted the remains were unburied when pointed out to him, and in fact, he removed one or more iron arrowheads from the body's chest cavity.

The double yellow trouser stripe for field musicians was not authorized until 1883, although some commanding officers did allow their use among band members. Custer apparently allowed such a deviation as Lieutenant Charles DuRudio testified during the Reno Court of Inquiry (Nichols 1992) that one trumpeter was identified "from the marks on the pants". An 1875 photograph of Seventh Cavalry soldiers shows a musician with the double stripes (McChristian 1996:65; 1995:64). It is also possible that a year's decay of a solid trouser stripe would allow it to appear as a double stripe to Shufeldt. Only officers, sergeants, and corporals were authorized to wear a trouser stripe, each of a different width.

Shufeldt donated the skull and vertebrae to the old Army Medical Museum, where it resided for over fifty years before it was moved to the Smithsonian Institution. In 1988 a request was made of Dr. Douglas Owsley of the Smithsonian's Physical Anthropology section to view and study the remains with the goal being to attempt to identify the remains. The skull and the two uppermost vertebrae are from a White male

LITTLE BIGHORN

with gracile features (Scott and Owsley 1991). He was between 27 and 35 years of age. He had suffered from dental problems. Three teeth were lost before death and caries were present in five molars. The skull exhibits blunt instrument trauma to the left frontal and temporal areas, and there is some evidence that a blow from a heavy sharp instrument was directed to the left cheek area.

The skull from the Reno-Benteen Valley Fight found by Shufeldt was sent to Sharon Long of ID Images, who specializes in facial reconstruction of forensic cases. It was hoped that another facial approximation might lead to a match with another soldier's photograph, and thus aid in the identification of the remains. The completed facial approximation was compared to known photographs of the men, but no similarities were noted. Based on age and the elimination of known photographed individuals there are twelve soldiers as candidates for the identity (Scott and Owsley 1991).

Little Bighorn researcher Walt Cross became intrigued with the story of the skull, and devoted a book-length treatment to the story of one of the officers, Second Lieutenant Henry Harrington (Cross 2006). Cross devotes a fair amount of his work to proving the skull is that of Lieutenant Harrington. He even illustrates a photographic facial superimposition of the skull over Harrington's photograph to prove his point. Cross ignored historical facts in creating his reconstruction of the identification of the skull as Harrington. He employs a classic conspiracy theory approach to suggest Shufeldt lied about where he found the remains, not at the Reno Valley fight area, but that it must have been farther north. The facial superimposition is likewise poorly done. The skull should not have been used for such a purpose until it could be properly reassembled by professional anthropologists. Such was suggested to Cross who refused to accept the fact that the remaining skull fragments are wired together, and it is clear from looking at the skull or an image of it that several pieces are incorrectly aligned, giving a false impression of the face. In addition a careful study of the published photographic superimposition clearly shows that several features on the skull do not align correctly with Harrington's image. Cross's conclusions are not supported by the physical evidence that indicates the skull recovered by Dr. Shufeldt has even a remote possibility of being Harrington.

Lieutenant George S. Young, Seventh Infantry, was another early collector of human bone at the battlefield. During a trip to the battlefield in 1878 or 1879, he collected a .45/55 cartridge case, an iron arrowhead, and a human cervical (neck) vertebra transfixated by an iron arrowhead. The arrow entered the vertebra at an angle that suggests the individual was shot from the front and above -- that he was lying on the ground at the time the arrow entered the body or was shot by a mounted assailant. The items were retained by Young's family for many years and were finally donated to the Smithsonian Institution in 1967 (correspondence relating to Accession 275426, Smithsonian Institution).

In another early case of recorded finds a party of five men, driving horses from Nevada to the Tongue River, passed by the battlefield on August 25, 1884. They came upon a human skeleton in a ravine about 400 or 500 yards southeast of the Monument, probably in the Keogh group area or in the vicinity of the ravine between the Keogh group and Calhoun Hill. According to a short article in the *Army and Navy Journal* (September 20, 1884:148) they collected the skull. Four of the teeth were filled with

exceptionally fine gold dental work. The teeth were examined by a Dr. C. S. Whitney who pronounced the individual to be between 35 and 40 years of age. The skull was thought to be that of an officer because it was assumed that the quality of dental work observed could not have been afforded by an enlisted man. The disposition of the teeth and skull are unknown, so unfortunately a modern examination of the remains cannot be made. However, these same teeth may have been examined by a dentist and forwarded to Dr. William Saunders who did the dental work on West Point cadets. A analysis of this story by Hyson and Whitehorne (1993) led them to believe these might have been the remains of Lieutenant Henry Harrington, one of the few unidentified officers.

Another find occurred in April, 1886 when Hospital Steward James Carroll of Fort Custer discovered an incomplete skull, which he donated to the Army Medical Museum in 1889 (National Museum of Health and Medicine, Armed Forces Institute of Pathology records relating to specimen 1001064). Hospital Steward Carroll discovered a skull cap in a ravine 2000 yards from the Last Stand Hill monument, probably Deep Ravine, in 1886 (Scott and Owsley 1991).

At the same time the Shufeldt skull was being examined this skull fragment was studied. The skull cap has extensive evidence of trauma including a large-caliber gunshot entry wound in the back of the head, with an exit wound in the middle of the forehead over the left eye. The size of the exit wound is much larger than the entrance opening in the occipital bone. In addition, there are cut marks on the top of the skull indicating the individual was scalped, and there is the tip of an iron arrowhead or knife embedded in the bone. The skull cap is of a 27 to 35 year old White male. Of the men who died with Custer, there are over 80 possible candidates that could fit this age range, so it is unlikely that, with the available information, he can be identified.

Since 1877 there have been at least 20 other documented discoveries of assemblages of human bone on the battlefield (Greene 1986:59), exclusive of the formal archeological investigations. In four separate episodes at least ten skeletons were found on the battlefield and reburied in graves marked "Unknown" in the National Cemetery. None of the remains received any scientific analysis before they were reburied.

Walter Camp recorded in an interview with battle survivor Henry Mechling (sometimes spelled Mecklin or Mechling) (Hardorff 1997:76) that he and National Cemetery Superintendent Andrew Grover uncovered several graves on Reno Hill. Four bodies were uncovered in one grave and were assumed by Camp to be Corporal George Lell, and Privates Thomas Meador, James Tanner (aka Jacob Gebhart), and Henry Voight.

Camp further noted that Grover and Mechling (Hardorff 1997:77) also found the presumed body of Vincent Charley in a swale between Weir Point and Sharpshooter Ridge. These remains were reinterred in the National Cemetery within a few days of their discovery. Custer National Cemetery records indicate that five bodies from the Reno-Bentzen site were interred in Section A Graves 453-456 and 458 in 1903.

An unidentified newspaper account in the Elizabeth Custer file at Little Bighorn Battlefield National Monument dated November or December 8, 1905, may refer to another recovery effort or perhaps one of the 1903 disinterments:

LITTLE BIGHORN

“Such was the case recently when one of Reno’s men was dug up, somewhere in the wild stretch of country between Custer hill and the bluffs where Reno’s command held their savage foes at bay. This man was a sergeant, a crack shot, who had been despatched by Reno to find out what had become of Custer and to carry news of Reno’s own desparte [sic] plight. The sergeant was caught midway between the two commands and was finally killed, but not until he had reckoned with many of his savage foes. When he was found his body was literally surrounded with shells and his comrades knew of the man’s ability as a shot to swear that every shell represented a casualty on the Indian side. A comrade who assisted in burying the man where he fell only a short time ago headed a party to the spot, and the remains were disinterred and brought to Custer Cemetery.”

Rickey (1967:72) believed the article referred to the recovery of Sergeant James Butler’s remains. However, the National Cemetery records do not indicate that any remains from the battlefield were interred in 1905. The only battle-related interments to occur in the 1895 to 1910 era were those in 1903. A review of the National Cemetery registers identified no battle participants registered at the site in 1905. However, Henry Meckling did visit the site on June 25, 1903. Meckling, a Medal of Honor winner, had been a Corporal in Company H and was with Captain Frederick Benteen during the battle. He had, in fact, assisted in the burial details at the Reno-Benteen defense site and on Custer battlefield.

It is quite probable that the newspaper article quoted above refers to the 1903 disinterments by casual reference to “recently.” It is also possible that Meckling did identify a burial location between the two fields as well as those on the Reno-Benteen defense site. If so, then as many as six individuals were buried in the five grave sites. Such an interpretation may explain why Grave 458 is separated from the others by a single intervening unassociated burial.

In May 1992, Douglas Scott of MWAC assisted by volunteer Dick Harmon, and park Historian Douglas McChristian, with the assistance of maintenance man Cliff Arbogast exhumed these skeletons with the intent to complete proper osteological examinations and attempt to identify the remains. The skeletons were analyzed (Willey 1997) and reburied in the same graves in the National Cemetery in August 1994.

The five graves dating to 1903 were the first excavated. The remains (Graves 453-456 and 458) were buried in a relatively consistent manner. Each grave contained a small wooden box which held the bones. The buried boxes were encountered at a depth of 30 to 34 inches below present ground surface. Army quartermaster reburial boxes or coffins for skeletal remains were prescribed as being 10 inches high, 12 inches wide, and 24 inches long (Colonel George S. Young, June 13, 1911, Walter M. Camp Collection, Henry Lee Library, Brigham Young University), and the rotten box remains found in the graves approximated these dimensions.

Grave 458 is separate from the other 1903 graves. The reason for the separation is unknown. It may have been a happenstance that Grave 457 was already occupied or it is possible that the bones were actually recovered and reinterred at a different time than

Graves 453-456. It is possible that this grave is related to skeletal remains found between the Reno-Benteen defense site and the Custer battlefield.

The remains, designated Burial 1, were a nearly complete, well-preserved skeleton. Many of the smaller bones of the wrists, hands, ankles and feet were absent, but all of the larger elements were present. Part of the bones of the right tibia and fibula (lower leg) were sun bleached and weather checked, indicating they had been exposed above ground, and this exposure may have led to the skeleton's discovery and reburial in 1903. The absence of other individuals' bones in the grave with these and the grave's discontinuous number suggested it was recovered separately from the rest of those exhumed and reburied in 1903.

There were numerous cuts on the bones. A cut on the left side of the skull suggested scalping, cuts near the right shoulder indicated arm dismemberment, and cuts in the pelvic area and thigh may have represented slashing mutilations. These and other cuts on the skeleton suggested severe mutilation, although surprisingly there were no indications of gunshot wounds or blunt trauma.

The skeleton was that of a White male about 68 1/2 inches tall and 20-25 years old. He had a stressful growth period. His dental health was poor, having lost nearly a quarter of his teeth before death and there being several active caries when he died. Brown stains on some teeth suggested coffee drinking and tobacco use. There were many indications of traumatic injuries before death and degenerative joint disease, the most notable being a possible healed shoulder separation and back problems. And there was a possible nasal passage lesion, perhaps resulting from snuff use. There were articular facets adjacent to the hip and lower leg ankle joints indicating hyperflexibility at those joints.

Considering the information gleaned from this skeleton and assuming that the individual fell on the Reno-Benteen fields, there are five possible identities for the skeleton. It seems likely, considering the number of cuts present on the skeleton, that the body came under the warriors' knives. If the man fell on the Reno-Benteen battlefield and with Burial 1's cuts in mind, the most likely identities are David Summers and John Meyers. Summers was reported falling in the Valley Battle (Blake in Hardorff 1989:145), where his body would have been vulnerable to being dismembered and disfigured. And Meyer died during Reno's Retreat, about halfway up the bluff toward the Hilltop Defense Area (Morris cited in Hardorff 1989:140). Both Summers' and Meyer's bodies (Slaper cited in Hardorff 1989:140, 145) were "in an awful state of mutilation." Either of these identifications, however, are far from certain.

While the Reno-Benteen association is likely, it is also possible that these remains may be from or near the Custer battlefield. If so, then there are numerous candidates for the identity of Burial 1. The extensive number of cut marks on the bone is consistent with the descriptions of mutilations seen on the bodies on Custer battlefield. If these bones were uncovered in a separate episode from those in the nearby cemetery graves, then a separate burial location seems a logical conclusion as well. These bones may be the remains referred to in the 1905 newspaper article describing the finding of a skeleton somewhere between the two battlefields.

LITTLE BIGHORN

There were parts of at least three individuals included in grave 453, designated Burial 2, the extra bones later associated with the individuals in Graves 454 and 455, although some elements cannot be associated with any of the other National Cemetery burials. Those unassociated elements may indicate other skeletal parts were exposed and were removed at the same time the other individuals were exhumed in 1903; some of the unassociated elements displayed possible canine chewing and considerable weathering, supporting this interpretation. A couple of elements belonging to the Burial 2 individual were located in the adjacent Grave 454. This mixing may have occurred during or immediately following the original exhumation, but before reburial in the National Cemetery.

Burial 2 was one of the most fascinating skeletons found on the Little Bighorn Battlefield. It consisted of a nearly complete, generally well-preserved skeleton, only missing some of the ribs, vertebrae, and smaller bones of the wrists, hands, ankles, and feet, as well as a few other bones. Unlike Burial 1, all of the nicks and cuts on the Burial 2 bones appeared to be from postmortem events, such as the 1903 exhumation. There were no indications of gunshot wounds or perimortem mutilations.

He was an older White soldier, probably between 30 and 35 years or perhaps even older. He was gracile, so gracile, in fact, that many of the skeletal sex indicators suggested a female. This gracileness was in part due to his small size, and this smallness is reflected by his stature. At 65.3 inches tall, he was among the shorter casualties. His size may have been caused, in part, by fairly numerous growth interruptions. There was an old, small, well-healed cranial fracture above his right eye. Numerous degenerative changes were present. The upper neck demonstrated arthritic changes, but, as the other National Cemetery specimens, the most marked joint changes occurred in the mid-to-lower spine. He had temporomandibular joint problems suggesting the possibility that he ground his teeth while sleeping.

Unlike the other National Cemetery specimens, Burial 2 had good oral health. With the exception of a lateral maxillary incisor, all of the teeth were present with few caries and slight periodontal disease. The left lateral maxillary incisor was unerupted and diminutive, most likely a congenital anomaly and was absent occlusally, but not lost through dental disease.

His dental health was surprising because he was an older member of the Seventh Cavalry, and oral disease, especially in those days, tended to increase with age--an accumulative process.

The most likely explanation for his healthy teeth was dental care. He had at least 6 fillings—a unique discovery among the specimens recovered archeologically from the Little Bighorn, although there are historic accounts of filled teeth being found in the 1870's and 1880's (see Hyson and Whitehorne 1993 and Glenner et al. 1994 for reviews).

These restorations provided a unique opportunity to examine dentistry techniques and materials during a formative period in the development of American dentistry. We were able to involve Dr. Richard Glenner, a historical dentist practicing in Chicago, who welcomed the opportunity to examine the fillings. Two tin foil fillings

occurred in the occlusal surfaces of the maxillary right first and left second molars. The other four fillings were gold amalgam or gold foil. Gold foil fillings were present in the occlusal surfaces of the maxillary left first molar and the buccal (“cheek”) surfaces of the mandibular first molars. The mandibular fillings were amazingly small and it was likely that the pits they filled were naturally occurring and non-carious. The gold amalgam filling was in the maxillary right third molar. There were also two teeth which appeared to have had fillings at one time but had lost at least a portion of them: namely, the occlusal surfaces of the maxillary right first and third molars.

The combination of tin and gold restorations in the same mouth are interesting. The poor and good materials together suggested that the dental work was performed in different settings, most likely at different times in this person’s life. Given the poor condition of the other troopers’ teeth, it is likely that Burial 2’s fillings were placed earlier in his life, before his military career commenced.

This individual’s excellent oral health occurred despite one nearly ubiquitous oral devastator of the cavalymen--tobacco consumption. His teeth displayed moderate staining, with particularly heavy brown stains on the right posterior teeth. The location of the stains and the associated dental wear indicated tobacco chewing.

The identity of this fascinating skeleton remains uncertain. Assuming that the skeleton came from the Reno-Benteen defense site, based on the historic data associated with its burial in the National Cemetery, and considering the information gleaned from the bones, there were six possible identities. The dental restorations suggested that the man had access to excellent medical care, either through being from a higher socio-economic group or being associated with a dental school or dentist. An additional two individuals, who fit both of the general skeletal parameters and would have had access to better dental care, were eliminated by photographic superimposition: namely, Lieutenant Benjamin Hodgson and Acting Assistant Surgeon James DeWolf.

There are six remaining possible identities for Burial 2. Considering the absence of perimortem injuries, the most likely possibilities are those who fell in or near the Reno-Benteen Hilltop. There are three: Sergeant DeWitt Winney who was born in New York and died in the Hilltop Fight (Godfrey in Hardorff 1989:1677), and Private Elihu Clear who was born in Indiana and died on the east side of the river at the foot of the bluffs (John Creighton in Hardorff 1997:71).

The third individual is George Lell who was born in Hamilton County, southwest Ohio, and enlisted in Cincinnati in 1873 (Carroll 1993:147). Cincinnati was the location of the second dental college in the world, where many of the most important figures of the day taught. Once enlisted, Lell quickly rose to the rank of corporal, his rank at the time of the battle. He was shot in the stomach during the first day of the Hilltop Defense and was taken to the field hospital, where he died the following day. Windolph (in Hardorff 1989:147) described Lell’s death.

“I will never forget Sgt. [sic] Lell. He was fatally wounded and dragged to the hospital. He was dying and knew it. “Lift me up boys,” he said to some of the men. “I want to see the boys again before I go.” So they held him up to a sitting

LITTLE BIGHORN

position where he could see his comrades in action. A smile came to his face as he saw the beautiful fight the Seventh was making. Then they laid him down and he died soon after.”

Lell's age was similar to Burial 2's skeletal age, and Lell's photograph matched Burial 2's skull and mandible. The only marked discrepancy was stature: Lell's enlistment record indicated he was 69 inches, but Burial 2's stature was 65.3 inches or perhaps even shorter. Subsequent research located two female descendents of Lell's sister who provided DNA samples for comparison to DNA derived from one of the skull's teeth. The two DNA sets did not match the skeletal DNA, and Lell is currently excluded as a candidate.

As with the previous grave, Grave 453, Burial 3, this one contained the remains of at least three individuals based on the presence of three left tibiae and other duplicated elements; a few of the extra bones belonged to Burial 2, most to Burial 4, and some to Burial 5. Parts of Burial 3 were found mixed with Burials 2 and 4. Also as in the previous grave, some elements in this grave did not belong with Burial 3 or any of the other assigned individuals.

The well-preserved skeletal remains of Burial 3 indicated a robust, medium-sized individual and included most of the major elements, except a portion of the right innominate. Many bones of the wrist, hand, ankle and foot were also missing, as well as some vertebrae and ribs.

There were some alterations to the bones, including cuts and stains. Most of the cuts were consistent with being made during the first exhumation, although a cut on the right navicular may have been made as a perimortem wound. A fabric pattern stain on the skull suggested burial in a rough-woven cloth, such as burlap, and there was a blue-green stain on a lumbar indicating that copper or brass had been in contact with the bone at one time.

He was a young, White adult male, about 18-23 years--most likely in the 19-21 range, and at 69 inches he was medium tall for the Seventh Cavalry casualties. The most striking injury was a gunshot wound to the head (Willey and Scott 1996). There was a rectangular entrance hole (28 mm x 14 mm) in the right parietal (Figure 54). The shape of the entry is unusual; usually they are round.

The rectangular entry wound suggests that the bullet was in yaw or tumbling when it struck the skull. There are a number of possible explanations for this lack of gyroscopic stability. The bullet may have hit something and passed through it or ricocheted off an object before penetrating the skull. Another possibility is that the bullet was improperly loaded which may have caused pivoting upon striking the skull. Also the bullet may have been fired from an unrifled gun or had gone its maximum distance losing its stability in the process. And a smaller bullet fired from a larger caliber gun is a final possibility. Because there was only a loose seal around the smaller bullet, they lacked the normal spin rifled barrels provide and they tended to tumble. The bullet may have been in mid-tumble when it struck the skull. Firing smaller bullets from larger rifles was recorded and has been demonstrated by archeological work on the

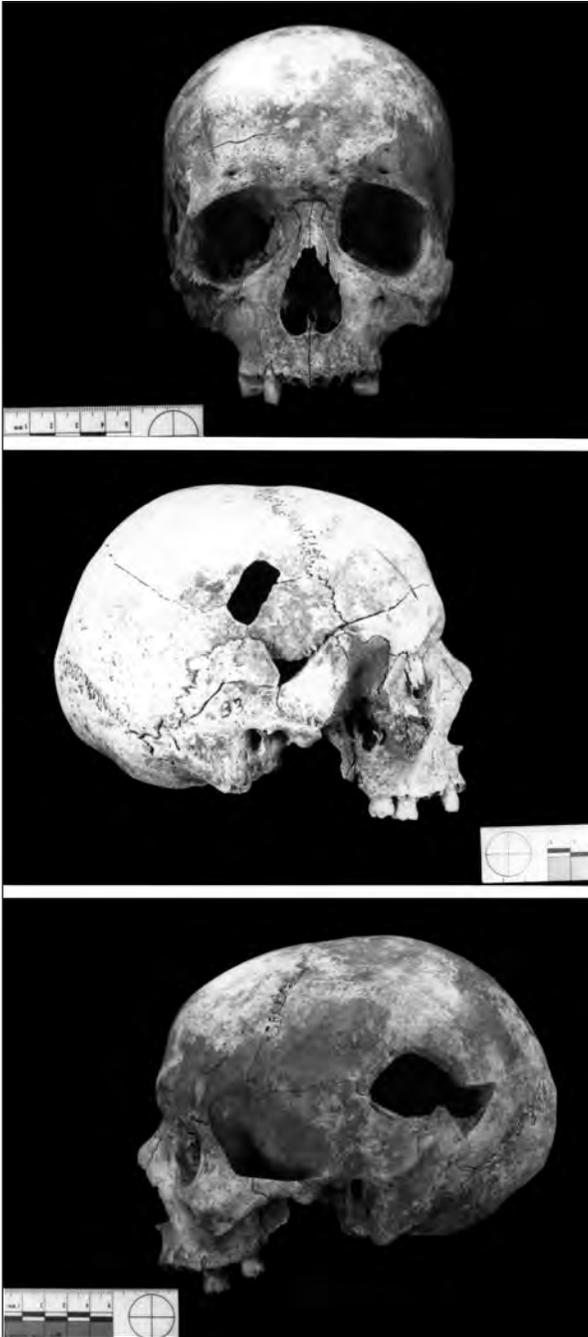


Figure 54. This skull of soldier found originally in 1903 and reburied in the National Cemetery in Grave 454, shows how one member of the Reno-Benteen defense died of a right to left through and through gunshot wound to the head. The bullet was unstable, or tumbling when it struck this young man.

Little Bighorn Battlefield (Scott et al. 1989).

Associated with the entrance wound were radiating and concentric fractures surrounding the hole. After entering the right side and passing through the brain, the bullet exited from the left side, leaving a “key-hole” shaped wound. The direction of fire, from the person’s right to the left, under other circumstances, would have been consistent with a suicide wound. However, to tumble, the bullet must have passed through an intermediate target or traveled a considerable distance, in neither case a muzzle-skin contact as expected in a suicide. The wound would have caused death quickly, assuming the person was alive when the shot occurred.

There were a number of behavioral alterations indicated by the skeleton. There were facets on the femoral necks and talocrual (lower ankle) joints indicating hyperflexibility at those joints. The big toe was deviated toward the outside of the foot. Degenerative joint changes (arthritic) were slight in the elbows and marked in the mid-spine. Jaw clenching was suggested by developed muscle markings.

Oral health was poor with before-death tooth loss, active carious lesions and alveolar resorption, and calculus present. Many teeth were stained, suggesting tobacco use. His growing years, however, were apparently healthy, at least as indicated by the absence of growth interruption lines.

Identification of the individual was attempted. Assuming that the person died on the Reno-Benteen fields, there were four possible identities based on the osteological data. The three most likely identities, considering the gunshot wound to the skull, are Packer Frank Mann, Private Richard

LITTLE BIGHORN

Dorn, and Private Patrick Golden. Mann was described as receiving a fatal head wound (Taylor in Hardorff 1989:168) or a temple wound (Roy in Hardorff 1989:168) on June 26th while in the Reno-Benteen Hilltop fight. According to Captain McDougall, Dorn was attempting to wake the captain when the private was struck in the head and killed (Schoenberger 1990:237). Golden received a fatal head wound the same day and in the same fight as Mann (Hardorff 1989:161-163). One of the observers (Thompson in Hardorff 1989:162) recounted that Golden received four wounds before being hit with the fatal head wound, although the skeleton showed none other than the head wound. Dorn, Golden, or Mann remain the most likely identities of Burial 3.

Grave 455, Burial 4, contained at least three individuals based on triplication of metatarsals. A few specimens in Grave 455 belonged to Burials 3 and 5, and some bones from Graves 453 and 454 belonged to Burial 4. In addition, there were other elements which did not belong to any of these skeletons and were unassigned.

Burial 4 was moderately well preserved, consisting of all of the larger bones and most of the smaller ones. Some of the bones of the wrist, hand, ankle and foot and some of the ribs and vertebrae were absent. Although there were many cuts on the bones, most appeared to be from the exhumations, and there was only one old cut from around the time of death in the iliac fossa which possibly might have been from a mutilation.

He was a large, robust, White young adult about 25-35 years old with the most likely age being 25-30. He was 70 $\frac{2}{3}$ inches, a rather tall stature for the casualties. Indications of behavioral alterations included articular facets on the femur neck, suggesting hyperflexibility of the hip, and the large toes turned toward the smaller ones. He did lack articular facets near the talocrural joints. There were numerous pathological lesions. He had a healed fracture of the radius midshaft and a possible healed fracture of a metatarsal. He had spinal problems, both degenerative disks and articular facet osteoarthritis. Even the atlanto-occipital (skull-neck) joint displayed degenerative changes. There was only one possible indicator of growth delay. A gunshot wound (hole 13 mm x 19 mm) was in the right ilium (hip). The bullet came from the back (posterior) right side, and assuming the person was alive when it occurred, the wound would have probably caused death, at least eventually. His oral health was particularly poor. Many of the maxillary posterior teeth were missing before death, alveolar resorption was extensive, carious lesions common, and calculus moderate. Two mandibular molars were lost a year or two before his death; perhaps they were diseased or impacted teeth which had been extracted.

Considering the skeletal assessments and assuming the body was on the Reno-Benteen fields, then there are five possible identities with a single most likely one. Of these five, the best fit is Farrier Vincent Charley (Scott and Willey 1996). Charley was born in Lucerne, Switzerland, immigrated to the United States, and his first enlistment began in Chicago in 1871. He was in his second enlistment at the time of the battle (Hammer 1995). A headstone was made with Charley's name and rank and placed on his grave after the remains were reinterred.

Burial 4's robusticity and healed injuries are consistent with the active life of a farrier. In addition to the similarities between the skeletal determinations and Charley,

particularly age and stature, the gunshot wound in Burial 4's innominate is in keeping with Charley. Charley, who was struck and abandoned while retreating from Weir Point, was described as being "Shot through the hips" (Harrison in Hardorff 1989:160) and "hit in the hips" (Winfield in Hardorff 1989:160). Charley was with his company during the retreat and Sergeant Thomas Harrison of Company D (Liddic and Harbaugh 1995:97) stated that Charley was shot about one-quarter mile south of Weir Point, but on the slopes above the ravine. Private John Fox, Company D, (Liddic and Harbaugh 1995:96) recalled that after Charlie was hit he implored his comrades not to be left behind, when Edgerly stopped to examine the wound and tell him to take cover until his comrades could return for him. When Edgerly and Harrison left Charley they reported they were followed by 200 warriors and they had to use their revolvers to extricate themselves from the body of warriors. As they looked back they saw warriors swarming over Charley, apparently finishing him off (Harrison in Liddic and Harbaugh 1995:97).

One historic source (Edgerly in Hardorff 1989:160) claimed that when troops returned to recover and bury Charley's body they found a "stick rammed down the throat." The skeletal evidence on this point, however, is ambiguous. A final point is that Charley was said to have been exhumed early in this century and Burial 4 was placed in the National Cemetery in 1903. All lines of evidence considered, Burial 4 is Charley.

Grave 456, Burial 5, contained at least two people based on duplication of the innominate. This duplicated element is not assignable to any of the other burials. There are parts of the main skeleton of Burial 5 in Graves 454 and 455. The Burial 5 skeleton was poorly preserved, most likely from the grave's proximity to a sprinkler head in the National Cemetery and the greater moisture retained there than the other graves. The poor preservation likely explained why the skeleton was partial and the elements present were more fragmentary than the other skeletons from the adjacent graves in the National Cemetery.

Most of the larger bones were present, lacking some lower arm bones and a fibula. Among the missing smaller elements were many ribs and vertebrae, and some bones of the wrists, hands, ankles, and feet. Of the bones that were present, a tibia may have had carnivore chewing and a clavicle had a blue-green stain suggesting contact with copper or brass.

Cuts were present. Although two of the cuts were probably from the 1903 exhumation, other cuts suggest mutilations. A cut on the cranial vault may have been associated with scalping, and three cuts near or on the femoral head suggested dismemberment of the thigh from the torso. In addition to the cuts, there were metal fragments in the proximal (upper) end of the humerus, which suggested a possible gunshot wound at or near that location.

He was a young adult White between 20-30 years, with a most likely age in the 20-25 range. At 69.5 inches tall he was a medium-to-tall Seventh Cavalry trooper. There were numerous indications of disease. Both tibiae had slight inflammations on the medial midshaft, suggesting the possibility of a low-grade body-wide infection. Many of the thoracics and lumbar had vertebral body degenerative lesions. There were numerous indications of growth interruptions. Dental health was good, but the poor preservation

LITTLE BIGHORN

made observations difficult. The femur head and the distal tibia had extra-articular facets, indicating hypermobility at those joints.

Using these skeletal determinations and assuming the skeleton was buried originally on the Reno-Benteen fields, there are nine possible identities. The most likely candidate, considering the mutilation cuts on the Burial 5 skeleton, may be Private William Meyer, who was killed retreating up the bluffs toward what would become the Reno-Benteen Entrenchment. Slaper (in Hardorff 1989:141) recounted that Meyer was “in an awful state of mutilation.”

It was not until 1926 that another set of unidentified human remains was reported. Human bone was found during excavation for a culvert or a borrow pit for construction of a road. According to Crow Agency Superintendent C. H. Asbury (letter to Custer Battlefield National Cemetery Superintendent Eugene Wessinger, May 28, 1926, Little Bighorn National Monument administrative files) a nearly complete human skeleton was uncovered in the valley about 500 or 600 feet from the McIntosh marker and in line with the Reynolds marker. The skeleton was thought to be essentially complete except for the skull. Two bullets were found with the remains, one in the hip region and one near the shoulder, and were thought to be the cause of death. Five or six buttons were also recovered and were thought to be trouser buttons. Henry Weibert (Weibert and Weibert 1985:134) disputes the circumstances of the finding of this unknown soldier. He says it occurred in 1925, when he and his father were putting in a culvert along the road to the Reno Retreat crossing. Weibert and Weibert (1985:134) claim the remains were found about one quarter mile east of the Garryowen store. Joseph Blummer recollected that the bones were found by a county road crew along the Reno retreat route (Joseph Blummer manuscript, 1959, Little Bighorn National Monument). The body was reburied in 1926 in a specially prepared cenotaph near the Garryowen store. It was reburied during an impressive fiftieth battle anniversary celebration (McChristian 1996). When the highway was realigned in the 1950s the cenotaph was removed to its present site near the Garryowen store. The bones buried in 1926 were exhumed and reburied under the cenotaph at that time (Little Bighorn Battlefield National Monument Administrative files, 0752-0764).

The year 1928 saw two more reburials in the National Cemetery. On October 3, Crow Agency Superintendent Asbury wrote a letter to the War Department Cemetery Section. In the letter (on file at Little Bighorn Battlefield National Monument) Asbury discussed the finding of a skeleton some two and one-half years earlier, presumptively the remains just discussed. He notes that he was recently taken to the same spot and found more human bones and thought he noted evidence of three other graves. He wanted the bodies removed to the National Cemetery. In a follow-up letter October 26, 1928, to the Quartermaster General) Custer Battlefield National Cemetery Superintendent Eugene Wessinger stated that on October 24 he went to the Reno valley fight area near the crossing and on unplowed land 300 feet from the river found one skeleton buried about one foot deep. Wessinger further remarked he had the skeleton exhumed and removed to the National Cemetery and interred as an unknown in the same grave as another unknown found close to Custer battlefield on August 1, 1928.

Indeed records for Grave 942 Section A of the National Cemetery note it held the burials of two unknowns. One was found 300 yards south of the Custer battlefield boundary fence and buried August 1, 1928, and the other consists of the remains found October 24 and buried on the 25th.

The remains found in October may be same as those initially discovered by J. A. Blummer in 1927 (letter to R. G. Cartwright from J. A. Blummer, July 18, 1927, on file at Little Bighorn National Monument). Blummer wrote:

Frank Bethune was here yesterday and I went with him to the Reno field he showed me the places that he says Goes Ahead told him that each place there was a soldier killed but I think they were buried All right but very shallow and the cyotes [sic] dug them up an[d] scattered the bones around Max Big Man told me when he was a boy there were three graves near the river on the side next to the store only close to the ford that Reno retreated on. so I took a shovel [a]long yesterday and dug one of them up. I found a pair of boots in it also the two leg bones the large ones. some ribs and a few other small bones I reburied the bones the boots I have here.

Blummer again wrote Cartwright on June 3, 1928, regarding the same burial (letter on file Little Bighorn National Monument):

... also some digging I wish to do at the same place where I dug up the body last year there were some students and other people here Decoration day and I showed them the boots I found they said they were childs boots, which of course they thought by them being shrunk up so after 51 years so I had to take them down and dig up the bones again there were several doctors with them and as soon as they saw the bones they knew they were human bones, and he was a big man at that...

Yet another burial is represented by the August 1 find, also located by Frank Bethune.

...the draw towards the Custer field from the Butler marker. Well Frank Bethune found a skeleton of a man in this draw...This body had a arrow sticking in the back bone Also a scabbard for gun with, R.D. on it. ... I forgot the body was found about 1/4 mile outside the fence. (J. A. Blummer to R. G. Cartwright, September 13, 1928; Custer Battlefield National Monument files).

Wessinger further elaborated on the Bethune find in a letter to Fred Dustin (Wessinger to Dustin December 17, 1928, on file Little Bighorn Battlefield National Monument Archives, #6075). Writing in response to a note from Dustin, Superintendent Wessinger indicated the skeletal remains were shallowly buried and were found just south of the present battlefield boundary in an area of active erosion. Wessinger, who saw the skeletal remains, also remarked on the iron arrowhead which had transfixed one of the spinal column's vertebrae.

LITTLE BIGHORN

A map in the Blummer files, in the Little Bighorn archives, shows the location of the body but also contains a note that states “body found by Frank Bethune also stirrup with J D on it.” At some point since the discovery the leather artifact has been interpreted as a boot upper, which was assumed to belong to Private John Duggan (Greene 1986:39).

The skeletal remains in Grave 942 consisted of two reinterments, one found in the Valley (Burial 6) and this one found outside the boundary fence (Scott 1993b). Burial 7 was in a wooden box buried in the same grave but below Burials 6A and 6B. One white, porcelain shirt or underwear button was found with Burial 7.

Burial 6A did not fit the profile expected of a trooper. It was not young, not White, and not male. It was none of those. She was a middle-aged or old Native American woman. Although not a member of the Seventh Cavalry, her inclusion in the National Cemetery is instructive for what it has to tell us about the battlefield and the value of skeletal analyses in interpreting the past.

Her National Cemetery remains consisted of a relatively complete, well preserved skeleton, although it was missing a few ribs, vertebrae and most of the wrist-hand and ankle-foot. A metacarpal and two cervical vertebrae, perhaps scattered by burrowing rodents, were found in the more deeply buried Burial 7. There were cuts and gouges on the skull and innominate, most likely made during the 1928 exhumation, and fabric stains on many bones, perhaps from a cloth bag that contained her remains when she was buried in the National Cemetery.

A coincidence happened during the analysis of the National Cemetery skeletons. Jason Pitsch, whose family has farmed the Little Bighorn Valley for decades, found military buttons near the timber and the Reno Retreat Crossing in 1993. Watching the spot carefully, later that same year he discovered human bones. The National Park Service sent Melissa Connor and Dick Harmon to excavate the remains of what was presumed to be a cavalryman. Assisted by then park historian, Douglas McChristian, they recovered metal buttons, glass beads and some smaller human bones, the sort of specimens which might have been easily overlooked during an exhumation. No large, major elements were found.

Thinking that there was the off-chance that what was dubbed the Pitsch Burial might be the left-behind parts of one of the National Cemetery specimens, the two sets of elements were compared. The kinds of elements, the general biological parameters--such as age and sex--the size and shape of matching bilateral elements, and the articular surfaces of adjacent bones were compared with the National Cemetery specimens. With a few minor exceptions, all of the characteristics of the Pitsch Burial matched those of the National Cemetery Burial 6A. They were from the same individual. The details of the Pitsch Burial recovery and the skeletal analysis are presented by Connor (1994) and Willey (1994). The reunited skeleton was returned to Montana in May 1994, and they were interred in a more appropriate cemetery on the Crow Reservation.

The important message of this story is that not all skeletons on the battlefield are troopers, not all burials necessarily date to the battle, and a skeletal analysis can help resolve these issues.

Unlike the other skeleton in this burial, Burial 6B was consistent with being from a trooper. Only a few bones, however, were present. Two upper and several lower limb long bones, two ribs, and one thoracic vertebra were present. These bones were generally more weathered than those of Burial 6A, suggesting that Burial 6B was partially exposed above ground at one time. This exposure may have led to their discovery and recovery, perhaps at the same time and from the same general location where Burial 6A was being exhumed.

The scanty remains made skeletal estimations less certain than they might have been had more elements been present for analysis. He was 20-35 years old and his stature was 70.2 inches--tall for the Seventh Cavalry casualties. Determining race was especially difficult because few definitive parts were present and those available were ambiguous. Using a discriminant function for postcranial measurements, he was classified as White, but his tibia-femur ratio suggested that he was Black. Although there are no indications he was Native American, race is otherwise uncertain and may be either White or Black.

A few behavioral and disease modifications were present. The femur head had an extra-articular facet suggesting hyperflexion of the hip. There were slight inflammations on the tibiae shafts indicating a possible infection. And there were growth interruptions. Considering the osteological conclusions and assuming that the skeleton was buried in the valley, then there are five possible identities. None of these can be considered the most likely.

There is a sixth possible individual, omitted from the list because neither his stature nor his age were recorded, although he is known to have been a middle-age adult. And that person is Interpreter Isaiah Dorman, who was the only Black to die in the battle. He was killed in the Valley Fight. There are accounts that his body was mutilated, including multiple gunshot wounds in the lower legs (Herendeen in Hardorff 1989:149) which Burial 6B lacked. The identification of Burial 6B as Dorman is extremely tenuous, but cannot be excluded.

Included with Burial 7 were several small bones which apparently were parts of Burial 6A and were included with that burial for the purposes of analysis and reburial. In addition, some human ribs included with Burial 7 apparently did not belong to Burials 7, 6A or 6B.

Burial 7 consisted of a partial skull and mandible, most of the axillary skeleton, and most of the limb bones. Few of the smaller bones of the hands and feet were present. These absences occurred despite the excellent preservation of the elements. A blue-green stain occurred on the mandible, perhaps left by a brass button or cartridge, and a fabric pattern was present on the skull, suggesting a rough-woven cloth was once included in the burial.

He was White, 25-45 years old, with a most likely age around 35--considerably older than most of the cavalry casualties. He was 68.4 inches tall. There were many indications of trauma. He had bony "spurs" on his right first finger, probably from an injury occurring long before his death. Trauma that happened around the time of death included a gunshot wound, blunt force trauma, and many cuts.

LITTLE BIGHORN

The gunshot wound entered the skull vault from the back, fractures radiated from the entrance, and the bullet exited near the nasal bridge. The trajectory indicated a back-to-front path. Blunt-force trauma occurred to the left side of the cranial vault, apparently after the gun shot. The blunt force may have been from falling, counting coup, a coup-de-grace or perhaps a mutilation, because the gunshot wound would have been sufficient to kill the trooper.

As a part of the mutilation process, there were many marks, at least 98 cuts on the bones which were present. The vertebral column displayed hacks, stabs, or jabs. There were cuts near the right shoulder, left elbow, left wrist and left hand which suggested dismemberment or at least dismemberment attempts. There were a multitude of cuts on the left innominate and femur which were consistent with thigh removal. And the innominate had cuts which suggested castration.

There were behavioral and degenerative modifications and dental problems. The femora had extra-articular facets, although the tibia displayed no "squatting" facets. Degenerative changes occurred in the shoulders, elbows, spine, and knees. Dental health was poor with several teeth missing before death and many of the remaining teeth had carious lesions. One of the carious lesions was so bad that it occupied nearly the whole crown and the root tip had an abscess. Calculus was prevalent on most of the teeth. There were dark stains on the teeth, consistent with smoking a pipe.

Based on the skeletal assessments and assuming that this is the body found in August 1928 by Frank Bethune near Deep Coulee, then there are many possible identities. Assuming that he was a member of Company C or L, then the number of possibilities is reduced to 10 individuals, none of whom have initials JD or RD, as reported on the piece of leather found with the skeleton. Based on the initials, some believe the remains to be those of Private John Duggan, but his enlistment records indicate he was somewhat younger (27 years old) and somewhat taller (69.5 inches) than the Burial 7 skeleton. No most-likely identity can be established.

One intentional recovery of human remains occurring about this same time was the excavation and removal of Lieutenant John Crittenden's remains. The *Sheridan Press* (September 20, 1931) reported the skeletal remains were found in a grave with the left temporal bone detached from the skull denoting he had been "tomahawked." His body was removed, under protest, from where it had lain on Calhoun Hill since 1876, to the National Cemetery. Ostensibly the remains were removed to make way for construction of the new tour road (Rickey 1967:75). The *Sheridan Press* stated the remains had to be removed as they lay in the line of the highway. Cemetery Superintendent Victor Bolsius reported to the Office of the Quartermaster General, Ninth Corps Area (letter of September 11, 1931) that Crittenden's remains were buried that day in the Custer Battlefield National Cemetery with full military honors "due his rank, supplied from the American Legion, of Hardin, Montana," and he further reported "I have also removed his private monument with his remains."

The next report of human remains comes from Superintendent Edward Luce (letter to Regional Director May 21, 1941, on file Little Bighorn National Monument) who thought he identified human bone co-mingled with horse bone when he

inadvertently cut into the horse cemetery near Last Stand Hill during a 1941 waterline trenching operation. A review of the photographs taken of the open trench and in the Little Bighorn Battlefield National Monument files failed to identify any human bones co-mingled with the horse bone. As late as the 1970s bones were reported found during the laying of a waterline between Crow Agency and the now abandoned Sun Lodge (King 1981:4-5). The whereabouts of those bones and associated artifacts are unknown.

The National Cemetery records indicate that two unknowns from the Custer battlefield area are buried in Grave 517A. The records cite an Office of the Quartermaster General Memorandum N-293 dated May 22, 1941. That memorandum has not been located. However, a letter from R. G. Cartwright to Superintendent Edward Luce (October 10, 1943, on file Little Bighorn National Monument) may refer to these remains. Cartwright says "One skeleton was found on the right bank of Medicine Tail proper. This you should find in your interment records for I believe it was placed in the Cemetery. I recovered a tibia of a human which jutted from the right bank of Medicine Tail. Marquis identified this as a human bone."

Grave 517, Burials 8 A and B, was the most shallow of those exhumed. The wooden box containing the remains was encountered only 10 inches below present ground surface. The grave contained at least two individuals based on element duplication. Both skeletons were incomplete, fragmentary, but otherwise well preserved.

Burial 8A elements present included a mandible with teeth, vertebrae, ribs, right clavicle and scapula, both forearms and innominates, sternum, and other smaller bones. This collection is an odd set of remains, but it provides many of the crucial bones for assessing the basic biological parameters.

He was a young adult male between 17 and 25 years with a most likely age around 19 years. And he was a short 65.9 inches. Race was undetermined. He was particularly healthy. Other than a few indications of slight spinal deterioration, there were no health problems, not even growth interruptions. This good health extended to his teeth, which, with the exception of a molar and an incisor, were present at death. Those that remained were caries free. Most of the teeth were stained brown, probably caused by tobacco consumption.

Based on the skeletal assessments and assuming that the person died on the Custer battlefield, there are nine possible identities and doubtlessly more individuals would be included if the misrepresentations of the youths' ages be known. Of these people, the most intriguing--although no more likely--one is Harry Armstrong Reed, the Custers' nephew and civilian guest. Reed's body was found near Custer Hill, buried in 1876 and was likely recovered around 1878 for reburial in Monroe, Michigan. There is, however, no single most-likely identity for Burial 8A.

The kinds of elements representing Burial 8B were similar to those in Burial 8A. Burial 8B's bones included a mandible and teeth, both clavicles, radius, ribs, vertebrae, innominate, sacrum, and a few bones of the wrists and hands. The duplication of Burial 8A and 8B's elements is interesting. Both specimens had mandibles, clavicles, vertebrae, ribs, radii, innominates, and bones of the hands. Both lacked skulls and bones from the

LITTLE BIGHORN

lower limbs. The only major elements that Burial 8A had which Burial 8B lacked were a scapula and part of an ulna. It is difficult to imagine that the similarities are due to chance alone. Presumably the similarities reflect the finders' identification and choice of parts, or perhaps the parts which had been left behind by a previous exhumation.

There was damage to some of the Burial 8B bones. A left rib and the radius had what may be old cuts associated with mutilation. There were also cuts and hacks from the exhumations. The x-rays displayed metal fragments on the left innominate, a thoracic vertebra, and a rib fragment. These metal pieces suggest a gunshot wound or wounds to the abdomen and thorax, or perhaps the adjacent areas. He was 30-45 years with a most-likely age of 35-40 years. He was a tall 71.28 inches. No race identification was possible with the remains present.

There were many indications of degenerative changes and trauma. There were two healed rib fractures. Slight degenerative joint disease occurred in the radius. The vertebrae had moderate osteoarthritis and osteophytosis, and the intervertebral disk deterioration was severe. Of all the degenerative changes, the most severe were in the mandibular condyles and ascending ramus. The temporomandibular joint degenerative changes were severe enough to reduce the height of the ascending ramus.

His dental health was also poor. Many teeth were missing before death and those which were present displayed much calculus and many carious lesions, especially at the gum level. One carious lesion was apparently so extensive that the tooth crown was destroyed and only the roots remained. The teeth displayed tobacco use. The left premolars had a "pipe stem" groove, indicating where a pipe had been habitually held. The teeth were also stained.

Based on the osteological conclusions and assuming that the person died on the Custer portion of the battlefield, then there were only four most likely identities. Being so tall and old effectively eliminated most of the dead from consideration. The most intriguing identity is none other than George Armstrong Custer himself. And the skeletal age, stature, and gunshot wound to the chest fit him as well as or better than any of the other casualties. There are contraindications, however, with this identification. The indications of tobacco use are inconsistent with Custer. He had apparently abstained from tobacco. However, it is possible that the groove and stains persisted from the time before his vow, through the decades until his death (R.A. Glenner and B. Reuben, personal communication, December 1993). Further, there are no accounts that he suffered from temporomandibular, dental or back problems. The identification of Burial 8B as Custer is tenuous, but the possibility cannot be excluded and deserves further consideration.

THE RENO-BENTEN SKELETONS

The Bray Excavations

In 1958, the National Park Service built walking paths for visitors at the Reno-Benteen defense site. The locations of these facilities were adjacent to areas where the historical record documented battle related features existed, such as the field hospital, a

barricade, and a number of rifle pits. Robert Bray, a National Park Service archeologist, was detailed to conduct investigations of the site prior to the commencement of construction, and in the process of his investigations, he did find human bones (Bray 1958). All of the remains discovered by Bray were buried in a single grave in the National Cemetery without the benefit of any analysis or any attempt at identification. As the grave was to be used to rebury the human remains from the 1984 and 1985 investigations, and other miscellaneous remains found over the years and that were in the park collections, the grave was exhumed by Melissa Connor and the remains given a formal examination (Connor 1986; Scott and Connor 1988; Scott, Connor and Snow 1988). The remains were reburied with a formal military funeral in June, 1986.

Barricade Burial

Bray found one skeleton in the area of the barricade east of the field hospital. The historical record (Gray 1976; Nichols 1992) indicates Company A was posted along this area of the barricade. After the battle, this barricade rifle pit depression had apparently been used as a grave for one of the fallen soldiers. The burial Bray found was badly disturbed. The left half of the body was almost totally missing, although a left humerus was found a short distance away mixed with some horse bones. The body was lying face up, and along the left side of the upper portion of the body was a line of nine uniform blouse buttons. Some were still attached to blue cloth. Bray also found a few other military buttons in the soil around the body and some small iron rings, which are probably grommet stiffeners from canvas tenting. At the time of the excavation, Bray thought that the poor condition of the burial was due to disturbance of the grave, relatively soon after the battle by rodents, dogs or wolves.

The analysis found the skull and mandible are both present as is the hyoid bone. The mandible is in good condition with most teeth present. The upper jaw lost many teeth before death, and at least three teeth have cavities (caries), and several teeth display hypoplasia (small grooves) that suggest he suffered some growth interruption during his youth, possibly a prolonged high fever. The result of the childhood problem manifested itself in the adult years with poor dental development and the early loss of teeth. The skull is elongated indicating scaphocephaly, which is considered a congenital defect.

The infra-cranial skeleton consisted of fifty-five individual bones including two vertebrae, both clavicles, several ribs, a complete right arm, and the left humerus found with the horse bone. The right and left humeri are the same size and of equal robustness. The left humerus probably belongs to this individual. The lower half of the body is represented by the sacrum (tailbone) and the right innominate (hip), a complete right leg and foot, and a left femur, and a few left foot bones. The axis vertebra and the sacrum have some minor osteoarthritic lipping. Otherwise the bones are from a moderately robust male of about 21 years old and the femur suggests a height of five feet seven and three quarters inches.

The archeological position of the bones of the Barricade Burial suggests the body was laid on its back at burial with the legs flexed and up over the chest area. The finding of several iron rings, which are probably grommet stiffeners, associated with the burial suggests the individual may have been wrapped in a piece of tentage at the time

LITTLE BIGHORN

of interment. As Bray (1958) noted, the right femur, sacrum, and innominate were out of place. They appear from Bray's photographs to have been placed on top of the other bones when only partially desiccated. The left humerus was also found associated with horse bones several meters away from the primary interment site. The overall condition of the burial suggests it was partially disturbed at one time and then the bones gathered and reburied. General Hugh Scott, a young lieutenant in 1877, helped to rebury the dead at the Reno-Benteen defense site. He recalled (Scott 1928:48) gathering a burial's exposed bone and covering it with earth from the grave. In addition Charles Roe, who removed many human bones from the battlefield to the mass grave in 1881, recalled finding a few skeletons at the Reno site and removing them as well (Hammer 1976:250). It is possible this burial was reburied by Scott in 1877, but missed by Roe in 1881.

L-Entrenchment Burials

To the south and a little east of the field hospital, and on the hill occupied by Benteen's Company H, is what Bray called the L-Entrenchment, named for its shape. This is the southernmost defense perimeter. Prior to Bray's arrival battlefield historian Don Rickey found several human hand and foot bones at this location, brought to the surface by rodent burrowing. Rickey's field notes state that he found three hand or foot bones, two trouser buttons, two military eagle buttons - one with a 'C' for cavalry in the center of the eagle's shield, a bone button - probably from underwear, and a .50-caliber bullet. This entrenchment proved to be the final resting place for two soldiers.

The first burial consisted of scattered bones - a skull, one tooth from the mandible, the hyoid, one cervical vertebra, the coccyx, left scapula, left humerus, left radius and ulna, three ribs, and the left femur. He was about five feet seven inches tall. The bones suggest an age of over twenty-five but under thirty. Bray also found bits of blue uniform cloth, seventeen buttons, some bits of leather, and a cartridge scattered through the excavation. The second burial was even more disturbed. Both lower arms and most of the hand bones were found in their correct anatomical positions, as were two vertebrae and four ribs. The burial was lacking the other large bones such as the legs and the skull. The bones indicate an adult male over 21 years of age with a height of about five feet seven inches.

The bodies comprising L-Entrenchment Burials 1 and 2 were extensively disturbed. But the disturbance left the remaining bones in nearly correct anatomical position. This suggests that the disturbance was after the flesh had completely decomposed and the bones could be individually pulled from the earth. This would not have been likely to have been done by Indians or predators even up to six months after burial. Some ligaments would still have been attached to the bone and more disruption to the anatomical order would have occurred. The remaining bones in both burials suggest a formal disinterment by untrained persons rather than random digging.

The burned wood, nails, and screws found in the entrenchment during Bray's 1958 work are identified as the remains of a packing box. The presence of large screws suggests the box was an empty ammunition box, which in that era not only used nails in the construction, but large screws to hold the bottom and top in place.

As the Reno-Benteen remains were to be reburied in 1986, along with the other archeologically recovered human remains from the battlefield, it was decided to have molds made of them before the reburial so they could be studied further and could be used for identification if additional historical information became available. With the help of Greg Brown from the Nebraska State Museum, molds and casts were made of each skull.

The casts allowed facial reconstructions of each skull to be made without having to use the actual skull. The intent was to use the facial approximations to determine if they might match a photograph, and thus aid in the identification of the remains, but if no identification was forthcoming at least there would be more portraits of the men who fought at the Battle of the Little Bighorn. Betty Pat Gatliff, who is a renowned expert in facial reconstruction (Gatliff 1984) was asked to complete the facial reconstructions.

Comparisons of the sculptures with the available photographs were made to a published collection of photographs of the men who were in the Seventh Cavalry in 1876. One photograph was unmistakably similar to the man shown in the bust sculpted from the Burial 1, L-Entrenchment skull. The man was Sergeant Miles O'Hara. A review of O'Hara's military record showed that he was five feet eight and one-quarter inches tall and twenty-five years and eight months old when he died. The osteological data made O'Hara a definite candidate for the identity of Burial 1.

O'Hara had not been considered a candidate before the photographic comparison, because the historic record reported him killed in the valley fight and not at the Reno-Benteen battlefield. The historic accounts place Sergeant O'Hara on the skirmish line in the Valley fight when he was shot. Walter Camp's (Hammer 1976) interviews with Privates Roman Rutten and James Wilber indicate O'Hara was shot in the breast and fell on the Valley skirmish line. However, Private Edward Pigford told Camp that O'Hara was shot on the skirmish line, but retreated with the others and was killed on the way to the timber. All accounts say O'Hara died or was wounded in the valley. There is no historic documentation of bodies from the valley being carried to the entrenchment for burial, with the exception of Lieutenant Benjamin Hodgson.

Further confirmation of O'Hara's identity was needed. A cast of the skull and the picture of O'Hara was taken to the Nebraska Educational Television studio for a photographic superimposition. It was an excellent match.

How, then should the position of O'Hara's remains in the Company H position on Reno Hill be reconciled with the historic accounts of his death in the valley? Sergeant John Ryan remarked to Walter Camp (Camp Notes Envelope 130) that he had looked for O'Hara's body but he could not find it, and assumed it had already been buried. It is possible that his body was recovered along with that of Lieutenant Hodgson and possibly others, then buried on the hill after the battle and just not noted by anyone who wrote down their battle recollections or was later interviewed by various battle researchers. Or, possibly, O'Hara was one of the wounded who retreated to the top of the bluffs and died in Dr. Henry Porter's make-shift hospital, and his body was subsequently buried on the hill. Either scenario is plausible and Ryan's observation to Camp could be interpreted either way, but without further historical evidence, both remain speculation.

LITTLE BIGHORN

Who does the other reconstructed face represent? This 21 year old, who was about five feet seven and three-quarters inches tall and suffered from bad teeth, is still nameless. Comparing the vital statistics of the known dead from the Reno-Benteen defense to the data on the Barricade Burial provides three possible candidates, if no one lied about their age at enlistment. First is Private James Drinan of Company A, who was about 23 years old and five feet seven and three-eighths inches tall. The second candidate is Private Richard Dorn of Company B who was also about 23 and five feet nine inches tall. The third candidate is Private James McDonald of Company A, about 23 and five feet six inches tall. If we critically examine the evidence and compare it to the historical record of enlistment we can see that all three are about the right age to be the Barricade Burial. However, both McDonald and Dorn are either too tall or too short to fit in the height range for the burial. This leaves Drinan as the most likely candidate. We do know that Company A did occupy the barricade line in the area where the burial was found. That adds strength to the argument it might be Drinan, but we have to consider that this location is also close to the hospital, and anyone who died there might have been buried at this site. Unfortunately there are no known photographs of Drinan, or the other possible candidates, with which to attempt a match. However, the facial approximation does not match any of the other individuals for whom there are photographs.

The second or incomplete burial in the L-Entrenchment is even more of an identification problem than that of the Barricade remains. The lack of a skull as well as most of the infra-cranial skeleton hampered the ability to accurately age the individual. All that can be reliably said is that he is a fully adult male over the age of 23 but probably under 35, and he was about five feet seven inches tall. He could be any one of the twenty-one men known to be in that age and height group who were killed with Reno. Excluding the men killed in the valley and the few known to have been buried under special circumstances that do not fit the excavation findings, the group can be narrowed to ten men.

There is one remote possibility that these may be the remains of Lieutenant Benjamin Hodgson. The historical and firsthand accounts of Hodgson's burial are vague, but they may suggest a burial site in the general vicinity of the L-Entrenchment. Lieutenant Charles Varnum (Hammer 1976:62) stated that Hodgson's body was buried up the bluffs from the site of the June 26th circular entrenchment location. "Up the bluffs" could be Benteen's Company H position. Captain Thomas McDougall (Hammer 1976:72) reported that Hodgson was buried above the position taken on June 26th - the area of the circular entrenchment. McDougall with two enlisted soldiers actually buried Hodgson. McDougall (Utley 1972:395) stated in the *Chicago Times* account of the 1879 Reno Court of Inquiry that "On the night of the 26th of June, 1876 I took privates Ryan and Moore of my company, and we went and got Lieut. Hodgson's body. We carried it up to my breastworks and kept it until the next morning. After sewing him up in a blanket and a poncho, we proceeded to a little knoll between my position and the works on the hill and those two men and myself dug his grave and buried him". Augustus DeVoto (Schoenberger 1990:70) stated in a 1917 letter to Walter Camp that he also helped to recover and bury Hodgson. DeVoto said that Hodgson's body was found about 20 feet from the water, naked and shot in the temple and groin. He further stated "We laid Lt. Hodgson's body across our carbines and carried it to camp. We dug a grave, wrapped his body in a blanket, and buried it on the hill. We planted a sapling there to mark his grave."

Saddler John Bailey of Company B told Walter Camp that Hodgson was buried 40 to 50 feet up hill from McDougall's entrenchment and under a little bush like tree (Liddic and Harbaugh 1995:81-88).

Hodgson's body was removed from the field in June 1877, by the reburial party, and transported to his family (Graham 1953). The 1877 reburial detail apparently recovered Hodgson's body from one of the rifle pits "though killed at the foot of the ravine, was buried within the most southern line of rifle pits" (*New York Graphic*, July 1877). This location, along with the recollections of those of Reno's men are consistent with the L-Entrenchment site.

Intriguing bits of corroborative evidence may support this thesis. Although they not conclusive, the 1958 finds of a military button with a "C" in the center of the eagle's shield and the possible shelter half grommet stiffeners at the site of this burial suggest the body was in uniform and wrapped in a shelter tent half or a rubber blanket. The only individuals authorized to wear the "C" button were cavalry officers, and the only officer buried known to be wrapped in a shelter half or rubber blanket, as well as being buried on the bluffs was Hodgson. This tenuous link might strengthen the argument, but for the fact that older pattern enlisted uniforms also utilized the button. Even though enlisted men were not authorized to wear the button in 1876, they did wear these older uniforms for field service. So the button could have come from one of those uniforms or been lost from another officer's coat. The grommet stiffeners might represent a tent fly that was used, along with a blanket, or perhaps instead of a blanket, as the shroud for Hodgson's body. There is little doubt the remains were disturbed, probably by one of the reburial parties, and that disturbance, like that on the Custer battlefield, is severe enough to make a positive identification most difficult without other lines of evidence. But the evidence that is available does not rule out Hodgson as the man who was buried in the L-Entrenchment with O'Hara.

CUSTER FIELD MARKER TEST EXCAVATIONS

One of the archeologists' jobs during the 1984 and 1985 investigations was to determine why there were more markers on the Custer field than soldiers killed in the battle, 252 markers versus 210 men. Two five-week field seasons were not nearly enough to excavate around all the markers on the main battlefield, although eight excavation units were completed during the 1984 field season. When planning the 1985 season, it seemed feasible to complete eighteen more units. This brought the total number of units excavated to twenty six, and yielded information from thirty-seven of the two hundred and fifty-two markers or about 15% of those on the main battlefield.

During the various nineteenth century reburial details, separate work parties apparently reburied or exhumed bodies on different areas of the field. The differences in their treatment of partial remains, particularly after the remains decayed to leave only bone and teeth, may mean that some work parties could have been responsible for differential clearing of the field. This in turn may have led the 1890 marker setting detail to erect more spurious markers in one area over another.

LITTLE BIGHORN

To help reduce variation caused by differences in how the remains in each area were originally treated and to ensure that some markers from each area were archeologically tested, the markers were divided into five spatially discrete areas to create a statistically valid sample of all markers on the field. These five areas were Calhoun Hill, the Keogh area, the South Skirmish Line, Last Stand Hill, and isolated markers, those widely scattered across the southwestern area of the battlefield. These groups are relatively discrete spatial clusters of markers around the field and are defined simply by breaks in the clusters as seen on the marker distribution map. For details on the original sampling strategy and excavation techniques see Scott et al. (1989: 57-59).

Calhoun Hill

...Each soldier (was) lying just where he had fallen, each with a small amount of earth thrown over him, with his head protruding from one end of the grave and his feet from the other. One very noticeable feature presented itself to me, the boot tops had been cut from the dead. Their skulls in many instances had been crushed and shot with pistol bullets after being killed. (Allen 1903: 67-68).

The historic documents positively identified only four of the men in the Calhoun position. The body of Calhoun himself was recognized by a filling in his teeth (Taunton 1987). Crittenden was reportedly found nearby. He had a glass eye, by which he was recognized, that was shattered during or following the battle. His body was also reported to have been riddled with arrows. Two sergeants from C Company, August Finckle and Jeremiah Finley, were identified south of the two lieutenants, on Greasy Grass Ridge.

Five areas on Calhoun Hill and Greasy Grass were archeologically investigated, encompassing a total of seven markers. An isolated marker to the west of Greasy Grass Ridge was also excavated. The archeological resources were badly disturbed by the construction of the present road along the top of the ridge and the loop on the top of Calhoun Hill that gives tourists an overview of the area. One case of disturbance is certain. At the request of his father, Colonel (Brevet Brigadier General) Thomas Crittenden, his son's body was not removed when the other officers were exhumed in 1877, but was left to lie on the field of battle. In 1931, however, with the construction of the road, the Army removed the body. It was reinterred in the National Cemetery without benefit of an osteological examination to determine if the body is, indeed, Crittenden. However, a *Sheridan Press* (September 21, 1931) account of the disinterment reported the skull exhibited a cut mark perhaps made by a tomahawk. The reporter thought the cut mark was consistent with the identity of Crittenden as he was supposed to have been found with his skull cleaved by a tomahawk.

Two excavation units, around Markers 153 and 131, were sterile excavations, they yielded no artifacts related to the battle. While these may be examples of spurious markers, it is more likely that they were originally in the path of the road and were moved to the side to make way for the road. The other three excavations each yielded a scattering of bone consistent with a single individual. In no case was there enough to determine the age, height, or identity of the individual involved. Paired Markers 152 and 155 did yield one interesting artifact find, whereas most of Calhoun Hill's excavations yielded only bone. The excavation at Markers 152 and 155 recovered a few links of an

elegant gold watch chain of a style consistent with the battle date. It is not possible to identify the owner with certainty, but an intriguing possibility is Lieutenant Crittenden. Crittenden's father, Colonel Thomas Crittenden, Seventeenth Infantry, described his son's watch and chain in a July 7, 1876 letter as "a chain made of gold coin, large, composed of several plates, and almost round" (Cecil 1995:38). The archeological find is a finely crafted double round link gold chain. Whether it is the chain described by Colonel Crittenden is only speculation. However, Indian warriors recalled (Marquis 1931; Graham 1953) finding and taking several watches from the dead. Certainly this chain represents one of those watches if not that of Crittenden.

The excavation at an isolated marker, Marker 128 (Figure 55), is the only one in this area that provided enough information for a detailed study of the remains. The bones at Marker 128 were an unusual find as most of the body was present, except for the skull. The body had been reburied sometime after the flesh decayed, probably by the 1877 or 1879 party, before the mass grave was constructed. Differential weathering of the bones indicates the left side was exposed at some time for several months.

The individual represented by the burial was a White male, about 19-22 years old and roughly five feet seven inches tall. Evidence for two gunshot wounds to the chest was found on the ribs. Both shots entered from the right side. A bullet fragment was also found embedded in the left lower arm. This may be a third gunshot wound or a fragment of one of the other two bullets. Both femora (thigh bones) showed three parallel cut marks near the proximal ends. Another cut mark was found on his clavicle (collar bone). And the few skull fragments indicate a forceful blow to the head (Snow and Fitzpatrick 1989:266-271).

The soldier suffered from a congenital defect of the lower spine - a portion of a lumbar vertebra had not closed properly. While this would have little to do with the battle, it is likely that the trooper suffered pains in his lower back frequently, and particularly when riding for long periods of time.

The individual appears to have been originally buried in his clothes, a regulation uniform, as buttons from his blouse and trousers were found as were several fragments of army issue underwear cloth, and hooks and eyes, possibly from his campaign hat. When excavated one leg was in correct anatomical position still encased in its boot, indicating it had probably not been moved since the original burial. However, the remainder of the body was in a jumbled pile that could only have occurred by redepositing the bones after the flesh had decayed. The shallow soil covering the June 1876 burial probably eroded away and by 1877 or 1879 the bones became exposed. One of the reburial parties, missing the lower right leg and foot, must have found the bones and gathered them together, and reburied them in a hole they dug for the purpose. Lieutenant Hugh Scott (1928) reported being detailed to bury exposed bones when he accompanied General Sheridan to the field in July, 1877.

The enlistment records identify nine individuals killed in Custer's command that meet the age and height criteria of the bones found at Marker 128. None of the four people actually identified in this area meet these criteria. Of those possibilities Nathan Short was purported to have been found some months later on Rosebud Creek, many

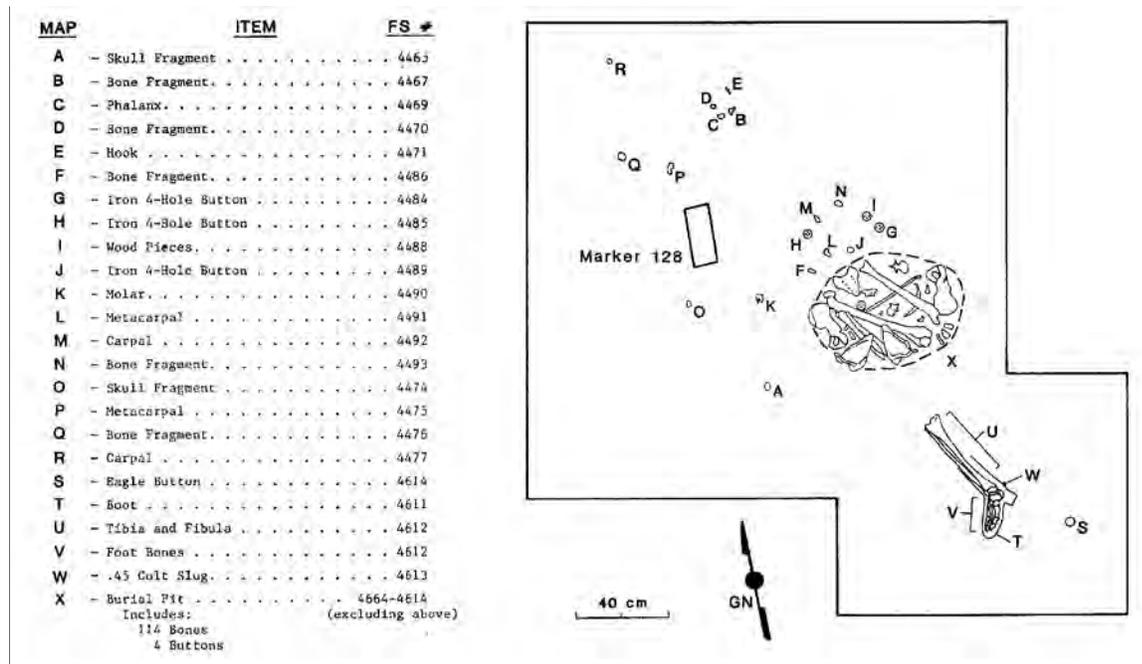


Figure 55. A typical excavation plan map of the archaeological finds located during the sampling of the marble markers. Here at Marker 128 an almost complete set of a soldier’s remains were found. The body was first covered over in 1876, then in 1877 or later parts of it may have been exposed due to weathering. At that time the visible bones were collected and buried in a shallow hole dug for the purpose. The excavations here told the story of the death of this soldier, his initial burial, exposure, and finally reburial.

miles away (Doran 1987). Francis Hughes, Huber and Donnelly are identified in Deep Ravine, although Francis Hughes was also identified on Custer Hill. Moonie, Babcock and four privates from Company C on the list also meet the age and height criteria with J. Thadus’ height matching the stature estimate. But, without further information, specific identification is impossible.

Fox (1993; 1988:200) suggests this young man was one of the Company C individuals who charged the warriors hidden behind Greasy Grass Ridge and in Calhoun Coulee. Fox’s scenario reckons that this soldier was killed in the charge or the subsequent retrograde movement. If this is the case the pursuing warriors may have come upon the badly wounded man and with a swift and extremely forceful blow to the head with a war club, dispatched him. The victorious warriors proceeded to slash the legs and perhaps shot an arrow into his shoulder. Again, if this scenario is true, then the man at Marker 128 would have been among the first to die and to suffer the mutilation that was so common among many of the dead soldiers.

Keogh Area

We went over the battlefield pretty thoroughly and located the spot where Captain Keogh and several of his men of Company I had followed Custer. Here was a slight depression in the ground. Evidently at one time it had been a buffalo wallow and the wind had blown out the dirt, forming a semicircular depression covering several yards. The graves were around this depression. The men were

buried where they fell, which clearly showed that their position had been taken for defense. (Wheeler 1923:185).

Lieutenant Winfield Edgerly, assisting in the burial of the dead three days after the battle, noted that "Capt. Keogh had evidently been wounded as we found that his leg was broken and the sergeants of his company had got around him and were killed with him. There were no regular lines, but still evidence that there had been" (Graham 1953:166). The identities of only seven bodies are noted in the historical accounts as being in the Keogh group. Keogh was identified and noted to have had a broken leg. As an aside, Keogh's horse Comanche survived the battle - he became known as the only survivor of the battle. Hardoff (1985: 50-51) suggests that Keogh was mounted during the battle, as information from the Camp manuscripts suggest that his leg was broken by a shot which struck his horse exactly where his leg would have been while sitting in the saddle. The wounded Keogh may have dismounted, or have been thrown, and his loyal non-commissioned officers gathered around to receive orders and help defend him. He was found reportedly surrounded by approximately 18 enlisted men.

The body of Trumpeter John Patton was identified and found lying over Keogh's body. He may well have stayed close to the wounded Keogh to relay orders to the men using his bugle. The sergeants identified around Keogh included Edwin Bobo, James Bustard, and Frank Varden. Private Charles Graham of Company L was found on a line between the Calhoun and the Keogh positions.

In the years after 1890, Keogh's marble marker was somehow reset in an incorrect location, possibly in the 1940s. Extensive research by Brian Pohanka, using photographs from 1877 and the 1890s, showed the marker to be in the wrong location compared to early twentieth century photographs of the field. In a field check of the area, Pohanka was able to find the brick base of the original marker. Keogh's marker was replaced in the correct location in 1981.

Five archeological units were excavated in Keogh's position. One unit was placed around Marker 178 - Keogh's marker, the site where Pohanka located it. The unit included a scatter of bone - a small piece of skull, one rib, a fragment of a wrist bone, a fragment of an ankle bone, and one toe bone. The only artifact found was a trouser button. Unfortunately, this is not nearly enough material to confirm the location of Keogh's interment. Someone was buried there, but the evidence is not conclusive as to whether it was Keogh. However, there was nothing recovered at this marker that would indicate it is not Keogh's grave. The original recovery team did a very thorough job.

Three of the other units (around Marker 200, Markers 201 and 202, and Markers 194 and 195) also exposed a light scatter of human bone and a few uniform related artifacts. Although the excavations are not extensive enough to examine the distribution of bone throughout the area, the finds leave the impression that there is a light scatter of bone throughout the Keogh area. In the Keogh area there are about 70 marble markers today. At least nineteen markers are in the area directly around Keogh's marker. If these bodies were poorly buried, it is likely that coyotes and other predators may have dragged pieces of the bodies around the area. At roughly 206 bones per body, plus horse bones, there would have been a substantial quantity of bone scattered

LITTLE BIGHORN

around the area. In no excavation was there evidence that more than one body was represented at any of those locations.

Excavations were also conducted around Marker 199. In an 1879 Sanderson photograph of Captain Keogh's marker there is a wooden marker labeled 'Wild I', probably indicating the location of the grave of Corporal John Wild of Company I in approximately the same location that Marker 199 occupies today.

An articulated arm was found immediately north of the marker. All the bones in the arm, from the shoulder down, were present. The arm was extended, the two lower arm bones crossed, as when the palm faces behind the body. About thirty centimeters from the articulated arm, lay a scatter of disarticulated bone representing most of the opposite hand. Found within and between these two concentrations of bone were a coccyx (tailbone), eight trouser buttons, and two five cent pieces. Also found in the excavation were fragments of skull, a mandible (lower jaw), teeth, and a scapula (shoulder blade) (Snow and Fitzpatrick 1989:264-265).

The bones found in this group did not have the ends fused with the shaft. When bone grows, the ends (the epiphyses) are separate from the shaft (the diaphysis) until the individual has completed growing. That the epiphyses are unfused on this individual means that the soldier was probably fifteen to seventeen years old, and almost certainly less than nineteen. Army enlistment records indicate Corporal John Wild was twenty-six at the time of his last battle. Either Wild was passing himself off as much older than he was, or, the more likely explanation, this individual is not Wild.

The only individual who died with Custer's battalion who claimed to be this young age is Autie Reed. Historic accounts firmly place his body elsewhere. The official enlistment age during the 1870s was twenty-one or eighteen with parental or guardian's permission, so the enlistment records show few soldiers under the age of twenty-one. Obviously, none of the bodies identified historically can be identified as this individual. It is unlikely that one so young, even by lying about his age, would have been a non-commissioned officer. Marker 199 appears to mark the remains of a young soldier so eager to go into service that he lied about his age when enlisting, a common ploy as established in looking at the actual ages of many of the enlistees.

One casualty is known to have lied about his age to enlist. Private Willis Wright of Company C was just seventeen when he died at the Little Bighorn. He was also five feet six and one-half inches tall. He fits the criteria well, but we must remember that there were probably many others who also lied about their ages and forfeited their lives in the process. Wright, besides, was reportedly identified on Last Stand Hill.

Deep Ravine Trail

...most of the soldiers, either singly or in groups, have a stake driven where they rest. They are not in graves, but lie with a sprinkling of earth upon each or in groups as they fell last year. More earth was heaped upon them. Some were found

this year that were not last... Of course, where the remains were partly uncovered, an indescribable odor arose (*New York Herald* July 18, 1877).

The South Skirmish Line or Deep Ravine Trail or whatever appellation a researcher chooses to apply to this line of markers running from below Last Stand Hill to Deep Ravine is subject to a great deal of controversy. Some theories (Kuhlman 1951; Fox 1993) hold that the line represents the attempted escape of some of the surviving soldiers, usually attributed to members of Company E. King (1981) argues the markers along this line are spurious, because they represent the men buried in Deep Ravine. Michno (1994), on the other hand, completely dismisses the concept that Deep Ravine holds any remains, rather that the deep ravine mentioned by burial parties is closer to the National Cemetery.

Estimates of the number of bodies scattered between Last Stand Hill and the head of Deep Ravine vary widely in the historical documents. Thomas McDougall told Walter Camp that there were less than a dozen men there and may not have been more than a half dozen (Hammer 1976b: 72). Richard Thomas told Camp there were nine or ten bodies (Hammer 1976: 248). In Deep Ravine, itself, there were a number of bodies reported, with estimates varying between 18 and 34. The problem is that there are no markers in Deep Ravine for men who were supposed to have been buried there.

Adding together the estimates for men killed in the area between Last Stand Hill and Deep Ravine and the estimates for Deep Ravine itself, we come up with ranges of 27 to 44 men. Today there are 53 markers on the South Skirmish Line.

There are only twelve men who were individually identified on the South Skirmish Line or in Deep Ravine. Only one identified soldier, Private Weston Harrington, is associated with the South Skirmish Line. His body was reportedly found near the top of the line below Last Stand Hill. Scout Mitch Boyer was not only identified in these recollections of those on the burial details as located in Deep Ravine, but he was also identified in the river at Medicine Tail Coulee, between Custer and Reno, and also several miles north of the battlefield.

Excavations in Deep Ravine are described in Scott and Fox (1987) and Scott et al. (1989). No human remains were actually found in the steep-sided gully known as Deep Ravine. A number of excavations were undertaken at the markers that lie between the ravine and Last Stand Hill, and human remains were found at all marker excavation units. In addition, two subsequent surface finds of human bone in 1993 and 1995 at Markers 25 and 35 indicate that more remains are still buried on the field. None of the skeletal evidence matched the age and height of the men supposedly buried there. Six excavations associated with markers were completed in 1984 and 1985 where human bone was recovered.

Marker 2 is on the southeast side of Deep Ravine. The marker stands isolated from many of the others. The excavations uncovered cranial and mandibular fragments, a tooth, and phalanx (finger bone) (Snow and Fitzpatrick 1989:260). The bones are consistent with those of a single individual between the ages of twenty-five and forty. The skull had been broken at or about the time of death, probably by a massive blow to

LITTLE BIGHORN

the head by a blunt object. Three trouser buttons were also found in the excavations, confirming the individual's probable identity as a soldier. Scattered around the marker were bullets from six different weapons. Scott et al. (1989) speculate that he was killed late in the battle, when there were fewer troopers remaining for the Indians to shoot.

Marker 7 was excavated in both 1984 and 1989. The marker is at the head of Deep Ravine. The additional excavations in 1989 became necessary as human remains were eroding out of the trail adjacent to the marker. In total, the bone assemblage consists of about 20 skull fragments, teeth, several cervical (neck) and thoracic (midback) vertebrae, a nearly complete lumbar vertebra, a sternal body (breast bone) fragment, and several unidentified fragments (Scott and Snow 1991; Snow and Fitzpatrick 1989:258). A few horse bone fragments were also recovered. The human bone assemblage is consistent with the remains of a single individual between the ages of twenty and thirty-six years old. As with many of the remains on the field, the skull appears to have been crushed with a blunt instrument sometime about the time of death. One cervical vertebra is from the lower portion of the neck and the right portion of the bone is gone. It was separated from the rest of the bone by a single cut that bisected the bone. This would be expected if the trooper had been decapitated in a single blow with a sharp instrument like an ax or tomahawk.

The artifact assemblage at this marker yielded a variety of items: a trouser fly button was found, a canteen stopper top, an iron-backed rubber comb, and an 1876 five-cent piece. These items all indicate something of how the man was dressed, what he carried in his pockets, and what equipment he carried. All would have been fairly typical of a soldier's accouterments. Something of how he died may be discerned from the bullets found near the bones. Two Colt .44-caliber pistol balls, one smashed flat on impact, were found adjacent to one another in the excavations. A Model 1873 Colt pistol bullet was close by and a .45-55-caliber Springfield bullet was nearly in contact with a cervical vertebra.

Paired Markers 9 and 10 are near Marker 7, also located near the head of Deep Ravine. Fragments of the skull, ribs, vertebrae, scapula, sternum (breast bone), hand bones, right foot bones, both humeri (upper arm bones), a left radius, and a left ulna (lower arm bones) as well as some smaller bones were found in the unit (Snow and Fitzpatrick 1989:259-260). He was between 30 and 40 years of age at death and was about 5' 10" tall. While the remains were jumbled across the unit, several of the skull fragments and both arms were in approximately the correct anatomical position. From the position of the arms, the trooper appeared to have been buried face down. There were cut marks on the sternum and one of the arm bones. In the thorax was a bullet from a .44-caliber Henry. In the area of the skull was a bullet from a .45-caliber Colt revolver. An iron arrowhead was also found adjacent to the excavation. Scattered through the excavations were eleven buttons, including trouser buttons, blouse buttons, and three white Prosser molded shirt buttons.

The single trooper represented by these two markers may have been either wounded or killed by the .44-caliber Henry bullet. When the Indians overran the skirmish line, one may have picked up a soldier's Colt revolver and shot this trooper in the head with it. Other Indians may have slashed his chest and arms in a form of ritual

mutilation. The possible identities for the man at these markers, based on age and height include George Custer and William Teeman, both reportedly found elsewhere on the field (Taunton 1986: 21), which leaves eleven possibilities. None of the possible names matches with the name of an individual identified in the historical record as being found either on the South Skirmish line or in Deep Ravine. And none of the possible candidates are from Company E. Statistically this is not likely as the historically identified men are primarily from Company E. Either this man is one of the few non-E Company men killed in or near the Deep Ravine or the men on the South Skirmish Line represent a greater mixture of companies than noted in the historical record.

Excavations at paired Markers 52 and 53 near the upper end of the South Skirmish Line yielded only a skull fragment with a bladed tool cut mark (Snow and Fitzpatrick 1989:261), a trouser button, a Benet primer from an Army cartridge, and a lead shot, only enough to say that a man had been buried there at one time.

Marker 42 yielded only a few hand bones (Snow and Fitzpatrick 1989:273), although a finger bone was found at this site in 1984. That bone still had a silver-plated brass wedding band encircling it, a reminder that widows and orphans were also a result of the battle.

The other excavation in this area that uncovered a bone assemblage was the excavation around Markers 33 and 34, located in the middle of the South Skirmish Line. The markers are adjacent to the trail and after the 1983 fire, Fox (1983) found human bone eroding from this area. Formal excavation in 1984 recovered a bullet from a .50-70-caliber weapon, a bullet fragment, and lead shot, demonstrating at least two weapons firing into this position. A rubber button, such as those found on non-regulation ponchos was found, as well as a mother-of-pearl shirt button, also non-regulation. These suggested European-style, but non-regulation, clothing. The bone found included fragments of a skull, teeth, cervical vertebra, wrist and hand bones, and a coccyx (tailbone). In all, they suggested an individual who was between the ages of about thirty-five and forty-five. The teeth were worn in such a manner to suggest the individual was a pipe smoker. Also interesting was the fact that the face bones of the individual indicate he was of racially mixed parentage, part White and part Indian (Snow and Fitzpatrick 1989:257-258).

There were only a few men with Custer that day who matched this description. Lieutenant Donald McIntosh was part European-Canadian and part Indian, but he was killed in the valley fight and not on the main battlefield. The only racially admixed individual known to have been killed with Custer's command is scout Mitch Boyer. Luckily, there is a photograph of Boyer, and using a video superimposition technique it was possible to overlay the photograph over the bone. The fit is excellent and it is probable that the remains are Boyer's (Scott, Connor, and Snow 1988).

Controversy has reigned concerning the location of Boyer's body. Private Peter Thompson (Magnussen 1974:257) stated he found the body on the left side of the river, and Sergeant Daniel Knipe (Hammer 1976:95) noted that Boyer was buried in the Deep Ravine. Whereas Colonel John Gibbon (1877:621) states "the body of our poor guide Mitch Boyer was found lying in the midst of the troopers slain, as the Sioux had several

LITTLE BIGHORN

times reported they had slain him in battle.” And finally Scout White-Man-Runs-Him (Magnussen 1974:259 footnote) states Boyer was found on a ridge.

These recollections suggest that either Boyer’s body was mistakenly identified by the various sources, or their memory, at the time of the interviews in the early 1900s, had dimmed after so many years. Boyer was found at Markers 33 and 34 just below the crest of a ridge that forms the north side of the primary drainage area of Deep Ravine. If this area was considered a part of Deep Ravine by the burial details, then this has important ramifications in reinterpreting the locations of those killed in or near Deep Ravine. However, it is possible that because of the crushed skull and the poor condition of the bodies, Boyer’s remains were confused with those of other individuals. The identification of Mitch Boyer on the South Skirmish Line agrees more with Gibbon’s and White-Man-Runs-Him’s accounts that Boyer was found among the slain troopers and on a ridge. The importance of the findings, however, is that the archeological data flatly contradicts some common interpretations of the historical accounts. Either the accounts, or their interpretations, are inaccurate. Since one of the places Boyer was identified was in Deep Ravine, this is interesting in the light of understanding what happened to the men in Deep Ravine.

South of the South Skirmish Line and across Deep Ravine are a few scattered markers that run in a rough line toward Greasy Grass Ridge. Four of these markers in three groups were excavated. Paired Markers 5 and 6, situated on the south edge of Deep Ravine, yielded nothing. In fact bedrock was encountered only a few inches below the surface. No one appears ever to have been buried here. Marker 252 likewise yielded nothing, but there may be a reason for this. The marker was not set in a brick base. A brick base was located a few yards away on the edge of a shallow ravine. The present marker probably represents a relocated marker.

Marker 257, also located several hundred yards south of Deep Ravine, did yield a few human bones. The bones of the hand and foot were badly eroded suggesting they had lain on the ground surface at some time in the past (Snow and Fitzpatrick 1989:266). While the bones can be identified only as adult human, this marker location is identified in the Camp notes and on his marker map (Taunton 1986) as the site where Company F’s Corporal John Briody’s body was found. According to Camp’s notes Briody was found with his leg severed from his body and placed under his head. The archeologically recovered bones were found in such an orientation that they could possibly be interpreted in this manner, but so few were found that no positive conclusion can be reached. That Marker 257 is the site of John Briody’s burial must remain speculation and an intriguing possibility.

Last Stand Hill

“The horses were killed and scattered all over the hill, and at the point where Custer lay [it] showed to be the last stand. There was not hardly any horses around where he was lying when found. The soldiers lay thick at this point, Custer was lying across two or three soldiers, just a small portion of his back touching the ground. There is no such thing as them arrange to corral their horses, or to make a fortification out of their horses, as there was nothing to show this. Custer

had no clothing on whatever, nor none of the soldiers. There was nothing left but a foot of a boot; the leg of this being gone, on Custer” (Kanipe to Camp 1908 in Hammer 1976:91-98).

Last Stand Hill is at the north end of Custer Ridge. Perhaps because most of the officers with Custer were on Last Stand Hill, the aftermath of the battle is better described here than elsewhere on the field. In this one place lay Custer with five officers and perhaps 40 men scalped and mutilated (Taunton 1987: 26).

There are 28 men whose bodies were documented as being on Last Stand Hill. These include 14 privates, two civilians, a surgeon, a trumpeter, four non-commissioned officers, and five commissioned officers. Within the currently fenced area of Last Stand Hill there are 52 markers, and five excavations were undertaken which included seven of those markers. Two excavations (around Marker 63 and Markers 86 and 88) revealed little material. Marker 63 yielded no human remains and Markers 86 and 88 yielded only the patella of an adult (Snow and Fitzpatrick 1989:271).

Marker 105 identifies it as the site where Lieutenant Algernon Smith fell. The excavation unit revealed a complete, and nearly articulated, lower left arm and hand, as well as other bones of the right hand, back, and foot. The remains represent an adult male between 30 - 40 years old and about five feet three inches tall. Lieutenant Smith was taller. The foot bones excavated showed that this individual had fractured his foot sometime before the battle, and that it had had time to heal. There was a cut mark on the vertebra which could have been caused by either a knife or an arrowhead (Snow and Fitzpatrick 1989:261-262). Also found in the excavations were two regulation buttons of the style used on trouser flies and suspenders. A .45-55-caliber cartridge and a .45-55-caliber bullet were also found in the excavations.

Based on the age and height information, there were nine men killed on the main battlefield to which the remains at Marker 105 could belong. None are officers. One trooper on the possible list was documented as actually being found on Last Stand Hill. This is Private Werner Lieman of Co. F. Private Lieman was 33 years old when he died and five foot five inches tall. Born in Bremen, Germany, Lieman had blue eyes, brown hair, and a light complexion.

The excavations at Marker 78 also uncovered human bone. There were several skull fragments, a tooth, almost all the bones of the left hand, a few of the right hand, three small bones from a foot, and the shattered lower third of the left ulna and radius. The ulna was shattered by a gunshot - lead fragments are still imbedded in the bone (Snow and Fitzpatrick 1989:272). Four regulation trouser buttons and a .45-caliber Colt bullet were also found. The bones are consistent with those of a single individual, someone between about eighteen and thirty years old at the time of death. There is not enough information to determine the individual's height, so there is not enough information to determine possible identities.

The area around paired Markers 67 and 68 was also excavated. It is at the top of Last Stand Hill, near the fence enclosing the area. The remains of two individuals were found in this area - one was a horse and the other a human. The human remains

LITTLE BIGHORN

include skull fragments, teeth, ribs, lumbar vertebrae, and a finger bone (Snow and Fitzpatrick 1989:272-273). One of the vertebrae has a collapsed body, a rib may have a gunshot wound, and the skull possibly received a massive blow. The human remains are consistent with those of a male between thirty-five and forty-five years old. These remains are not enough to determine the individual's height nor possible identification.

Another pair of markers (112-113) was excavated southwest of Last Stand Hill. These markers are isolated and like the others excavated revealed bones consistent with only one individual. The bones consisted of a tooth crown, a coccyx (tailbone), one finger bone, and two toe bones (Snow and Fitzpatrick 1989:266). All that can be said of these remains are that they are from a person approximately 35 to 45 years old. The few artifacts found include the soldier's trouser buttons, a Prosser molded shirt button, and a .44- or .45-caliber ball fired by the warriors.

THE RENO RETREAT REMAINS

The summer of 1989 took the archeologists and a group of volunteers back to the Little Bighorn Battlefield National Monument to conduct further investigations. The weather refused to cooperate the first week of work. During a "rain day" a special find was made (Scott and Snow 1991). Four volunteers decided to take a look at the Reno Retreat Crossing of the Little Bighorn River. Monte Kloberdanz, while wandering the river bank, spotted a human skull and two other bones eroding from the west river bank just across the river from the Hodgson marker. They reported their find to the archeologists and the Acting Park Superintendent Douglas McChristian. As the remains appeared to be a young White male with evidence of trauma of the type that could have been combat induced and were found in an area historically associated with the battle, the local coroner decided to appoint the acting superintendent and archeologists as official investigators.

All that was found at the site were the skull, a left humerus, and a right clavicle (Scott and Snow 1991). The bones were found in such a position to suggest that they had fallen out of their original context as a result of erosion of the river bank because of the high water that spring. The other bones probably washed away in the high water, leaving behind only these remains to be found. The bones were found in such a precarious position that another rain would have washed them away as well.

The humerus and clavicle indicated the individual was an adult about 68 inches tall. The skull indicated he was a White male between the ages of 30 and 40. The skull also indicated he had been ill at some time in his life with a high fever. Some of the back of the skull was remodeled due to this illness. His teeth were in good shape, although a few were lost after death. One molar had a small cavity and one third molar (wisdom tooth) was impacted. The other third molar had been pulled or lost not long before his death, based on the amount of bone regrowth in the old tooth socket. The skull displayed evidence of trauma suffered about the time of death.

The right canine and premolars were broken off at the roots and there is a horizontal fracture running across the face just below the nose. This class one LaForte fracture is indicative of blunt force trauma. About the time of death he was struck across

the mouth by a blunt object, such as lance or a gun barrel, with enough force to fracture the bone and break off the crowns of three teeth. If he was on horseback trying to reach the river, such a blow would have unseated him and as he fell he may have struck his face on a rock, log, or other such object. No other injuries were evident on the bones.

With the knowledge that the man was 68 inches tall and between 30 and 40 years of age, a list of casualties in that age and height range was constructed. Concentrating on those men with Reno who were killed in the Valley fight or in the Retreat and adding those whose location of death was not known yielded six possible candidates. Of these six, two are considered highly probable because the historical documentation places them in the area of the retreat crossing. These two are Sergeant Edward Botzer and Private William Moodie. Hammer (1976:134) places Botzer as being killed near the river during the retreat. Augustus De Voto recalled in 1917 (Schoenberger 1990:70) during the recovery of Lieutenant Hodgson's body that "Nearby were several dead members of G Troop. One I remember was Sgt. Botzer." This may imply that Botzer was on the east side of the river as that is where Hodgson's body was found. Moodie was reported to have been buried on the west bank of the river at the retreat crossing (Hardorf 1989).

Unfortunately there were no known photographs at the time of any of the candidates so a superimposition was not possible. A facial reconstruction was completed to provide a face from the past, one of the men killed during Reno's retreat. In another case of serendipity common to much of the research at Little Bighorn, a television special, *Custer's Last Trooper*, produced by the late Bill Armstrong, featured the finding of the Reno Crossing remains. It aired in early 1990 and was viewed by a mother and daughter who thought the facial reconstruction bore a resemblance to a progenitor, Rudolph Batzer. Mr. Batzer had emigrated from Germany during the late 1860s about the same time as Botzer. A comparison of a family photograph of Rudolph to the facial approximation demonstrated an uncanny resemblance, possibly a family association, implying the skull was a relative of Rudolph Batzer. An attempt was made to extract DNA from the bones, to no avail, so a comparison with Rudolph's descendants' DNA could not be made.

A major breakthrough occurred in the identification process five years later, in early 1995. As a popular part of the Custer Battlefield Historical and Museum Association's journal, the *Greasy Grass* presents portrait photographs of the battle participants. While assembling the 1995 issue, the editor, Sandy Barnard (1995), was contacted by a Tacoma, Washington, photograph collector who had a portrait attributed to Sergeant Botzer. The portrait showed a uniformed soldier, wearing a forage cap and sporting a small goatee, and penciled on the back of the print was Sergeant Botzer's name. The collector was interested in having it included in the *Greasy Grass* and authenticated, so we had an opportunity to do this as well as lend support to the identification of the Reno Crossing skull as Sergeant Botzer.

Then Little Bighorn park historian, Douglas McChristian, conducted an analysis of the photograph. He concluded the picture was taken sometime in the late 1860s or early 1870s. Armed with this information a photo superimposition was attempted with the skull and photograph. A copy of the portrait and a cast of the Reno Crossing skull were forwarded to Dr. P. Willey for superimposition. Although we cannot be sure that

LITTLE BIGHORN

either the photograph or the skull are Botzer's, the two images coincided, lending credence to both claims--that the photograph and the skull are Botzer.

MISCELLANEOUS REMAINS

Over the years other bones have been found on the Monument proper by park staff and custodians. They were placed in the Monument's museum collection. These bones were given a complete examination in 1985 by Dr. Clyde Snow (Snow and Fitzpatrick 1989) as a part of the archeological project. Subsequent discoveries and repatriated remains were studied by Willey (1995) and Owsley (1994).

In the course of the osteological examination, Snow and Fitzpatrick found that some of the bones listed in the Museum accession records as "human" were, in fact, animal bones. Also, in several cases, bones correctly identified as human were incorrectly identified anatomically (e.g., bones of the hand recorded as foot bones and vice versa). When these mistakes were rectified, the collection was reduced to thirty-seven human bones and a single tooth. Examination of the bones and the available records shows that the collection can be subdivided into sixteen assemblages, each representing a separate individual. Four of these assemblages were found on the Custer battlefield and five on the Reno-Bentzen defense site; of the remaining seven, two were found in another area and the records of five contain no indication of where they were found.

Near the marker of George Custer on Last Stand Hill, a right hamate (wrist) bone was found in 1956. It is that of an adult male with no evidence of pathology or trauma noted. Another Last Stand Hill assemblage consists of four foot bones and a cranial fragment which are described as having been found near the grave marker of Lieutenant W. W. Cooke. The date of the find is not given in the museum records. The cranial fragment margins display the abrupt fracture lines indicative of perimortem blunt force trauma. The foot bones, based on size and morphology, were identified as those of an adult male.

The third assemblage consisted of four hand bones and a left tibia found "near drain on Custer Hill" in 1941, and may be associated with the horse bone grave found that year. The leg bone was missing its proximal end but whether this loss occurred at the time of death or some years later was not determined. Although the damage precluded an exact measurement, stature was estimated to be approximately 66 to 67 inches and the age was judged to range between 18 and 35. The four hand bones of this assemblage were noted as having been found in a boot. They are adult in size and morphology and display no pathologies or signs of perimortem trauma.

The final Last Stand Hill bone is a single sternal fragment of a ninth right rib. It shows evidence of an old healed fracture. It was found among the marble markers below the granite monument on the hill, although the exact site and date of recovery are unknown.

Another bone assemblage, consisting of a right radius and ulna were found in 1942 near the grave marker of Mark Kellogg, the civilian newspaper correspondent. Stature was estimated to be 65.75 inches. Kellogg's stature is unknown. Kellogg did

break an arm or wrist during a fall a year or two before his death (Warren Barnard, personal communication 1985). However, the extent of the injury and the exact location of the fracture site are not known. These bones displayed no evidence of old injury. In all probability the marker for Kellogg (Marker 247) is not in the location where his body was originally found. Today, Kellogg's marker is situated on the east side of Last Stand Hill, but Kellogg's body was found by Colonel John Gibbon several hundred yards to the west of Last Stand Hill (Moore and Donahue 1991). The skeletal evidence indicates someone was buried at the site of Kellogg's marker, but it was probably not Kellogg.

In 1993 John Doerner found a much weathered adult left mandibular fragment (condyle) near Marker 25 near Deep Ravine Trail. Two years later, in 1995, while conducting remote sensing surveys for the troopers in Deep Ravine, an adult left wrist bone (greater multangular, also called a trapezium) was found near Marker 35. There are marks on the bone which may be cuts but more likely were caused by plant roots etching the bone surface.

Also among the miscellaneous assortment of bones accumulated in the museum collection at the battlefield were a few attributed to the Reno-Benteen area. One item was a single tooth, a right maxillary lateral incisor that was found by a visitor in 1959. It was found in the vicinity of the Benteen counterattack or charge. It lacks any depression or shoveling on the lingual (tongue) surface which is characteristic of American Indians; therefore, it is probably from one of the troopers. One soldier, Private Tanner was killed in the charge and left behind until he could be recovered later.

Another assemblage was found by Don Rickey in 1956, which consists of three foot bones and a finger tip bone. An unprovenienced wrist bone (left lunate) was found in 1954 by two individuals identified as only Woodward and Shick. The final bone is a left humerus which was found in the gulch below Reno Hill in 1934. The proximal epiphysis is fused, indicating that the individual was over 20 years old. There is a very faint transverse cut mark on the midshaft. This may be a mutilation mark. The individual's stature was between 68.5 and 72.1 inches tall. The museum catalog card notes the bone was found not far from where Lieutenant Hodgson was supposed to have been killed. The only individual of that stature known to have been killed on the bluffs is Private William Meyer of Company M. Private William Morris (Hammer 1976:131) in an interview with Walter Camp, noted Meyer was killed where the bluffs become steep. Other individuals known to have been killed in this vicinity are Private Henry Gordon who was 66 inches tall, Private Elihu Clear who was 66 1/2 inches tall, and Corporal Henry Cody (AKA Scollin) who was 67 inches tall. Hodgson's body was not buried where he was killed but moved to the top of the hill for burial. While it is tempting to identify this bone as belonging to Meyer, we must consider that there are at least nine other candidates in that height range who were killed at Reno-Benteen. Although Meyer is the only one to meet both the criteria of height and location for where the bone was found, we cannot dismiss the others. A single bone is rarely enough to make a positive identification.

A left first metatarsal (foot bone) was found in 1988 in the Reno-Benteen Entrenchment Area, although a more precise location is not available. It is from an adult and displays alterations consistent with much weathering and exposure (Willey 1995).

LITTLE BIGHORN

A left parietal fragment (skull), reportedly from North Medicine Tail Coulee, exhibits linear fracturing indicative of perimortem blunt force trauma. It was found in 1957.

Six other assemblages are known, but their discovery location and date are undocumented. One is a fifth metacarpal (hand) bone with a perimortem fracture to the lower third of the shaft. Another is a complete set of five right metacarpals and a single proximal phalanx bone. A set of five wrist bones is also present. Several single bones were also examined. They included a normal left adult rib, a normal adult third right metatarsal, and a normal adult third left metatarsal, although these may be the bones found near Tom Custer's marker by Edward Luce in 1941 (Luce to Charles Khulman, April 2, 1941, Charles Khulman Papers, RG12.14-23, University of Nebraska Special Collections, Love Library). Little can be said of these bones because of the lack of association with a specific location and their non-diagnostic nature.

While many of the National Cemetery specimens were being analyzed in 1992, another specimen, presumed to be from the battlefield, emerged. The specimen, consisting of the top of a cranial vault and a tooth, had been in a Pennsylvania man's artifact collection, and following his death, the specimen was sent to the Little Bighorn National Monument, arriving with the morning's mail shortly before Christmas (McChristian 1993). Although the origin of these battlefield specimens is questionable, there are some indications that at least the skull vault may be authentic.

Preservation of the skull fragment was in keeping with other Little Bighorn specimens. Pencil words on the vault have been interpreted as indicating the bones were found in a draw in November 1941. The specimen was consistent with a cavalryman. It was a young adult or possibly an older adolescent. And probably, based on the single measurement possible, it was a White male. The most convincing indicator of its Little Bighorn affiliation is a gunshot wound. The bullet entered the right side of the vault, exiting through the left side of the vault. This pattern is typical of right-handed suicide victims, although homicides may display similar wounds, as seen in the National Cemetery Burial 3 skull. Given the uncertainty of the specimen's provenience and the sketchy osteological conclusions, there are a multitude of possible identities. None can be considered any more likely than another.

In 1994 four specimens were returned to the Little Bighorn Battlefield National Monument from the Sioux City Public Museum in Iowa. The Museum's registrar, Patricia Martin, came across the specimens while inspecting their collection, and she sent the bones to the Battlefield. A penciled note with the elements reads

"Bones from Custers [sic.] Battle Field June 26-76 [sic.]

Found by F. Todd July 1900"

The date attributed to the battle is interesting. If the June 26th date is correct, then the death must have happened in the Reno-Benteen Entrenchment area. Fighting occurred only there that day. Fighting had ended on the Custer field the previous day.

It is likely, however, that the date is simply an error. The four bones included a parietal or frontal fragment, an adult right navicular, and a lunate (wrist bones) as well as a bone from a large nonhuman mammal (Willey 1995). The wrist bones have slight arthritic changes. All of the human remains are consistent with those of troopers, but little else can be concluded.

Also in 1994 another specimen surfaced, but in a different manner. This is a single middle phalanx with arthritic changes (Owsley 1994). This bone, apparently found near Marker 174, was looted from the battlefield in the early 1980's, and recently returned to the Park at the culmination of a lengthy and successful law enforcement investigation.

One other bone assemblage was recently studied. A purported human finger bone necklace, the fingers allegedly taken from dead soldiers at the Little Bighorn was found at the Dallas Historical Society, Texas. An examination of the bones determined they were not human, but artiodactyl (families which include cattle, sheep, and pigs) (Shafer 2008). The necklace is clearly a piece meant to defraud, and is a reminder of the gullibility of many individuals and museums who often suspend their disbelief and accept an item based on inexpert opinion or downright fraudulent testimony.

SUMMARY OF HUMAN REMAINS STUDIES

Among the many legacies of the Battle of the Little Bighorn are the skeletal remains of those who died in the fight. In the intervening years some of those remains became exposed and were collected for reburial in the Custer National Cemetery (CNC), while others were discovered during the formal archeological investigations. One element of the Little Bighorn archeological investigations was to ascertain if the marble markers were accurately placed on the field in 1890. The archeological investigations did determine that most markers are indeed correct, but that the paired markers are most likely mark only a single interment. The recovery of human bone at many of the markers indicates that the 1881 reburial team did a good, but not complete, job of recovery of the dead.

Among the research questions raised during the archeological studies were those related to the study of human remains. These research questions were designed to gather data from any available skeletal remains to identify them with individual battle casualties, if possible, through proper and complete skeletal examination. The study was also intended to examine evidence that might add information on the health, status, wound trauma, and general lifestyle of the soldiers killed at the Little Bighorn.

The archeological and physical anthropological data on the skeletal sample has added a new scope of information on the men of the Seventh Cavalry. In the realm of the sciences, data on the skeletal remains is presented as a series of identifications and interpretations. These interpretations woven together provide clues to the lives represented by the remains. While individual identifications cannot often be made, the composite data provides a glimpse into life ways of the men who made up the Seventh Cavalry and who died on the battlefield. There is now a sizable body of information, gleaned from the skeletal series on ages, stature, diet, and health which is more fully reported in Scott, Willey, and Connor (1998). The Little Bighorn human skeletal evidence

LITTLE BIGHORN

has wider value than just telling the story of the soldiers who fell during the battle. One example of its value to science is that the data was used in a broader study of the effects of nineteenth century lifestyles on those in military service as seen in surviving skeletal elements (Sledzik and Sandberg 2002).

The marker excavations yielded partial remains of 21 individuals, a ten percent sample of those killed during the battle. The National Cemetery exhumations yielded thirteen nearly complete skeletons. In addition to the excavated remains, surface material found by the archeological crew, by visitors, and by park staff yielded partial remains of another thirteen individuals. This provides a group of remains representing forty-seven of the soldiers who died at the Little Bighorn (roughly an eighteen percent sample).

The human remains examined exhibited substantial evidence of perimortem trauma. The osteological data clearly demonstrate that some of the men were mutilated about the time of death. To what extent the bodies were mutilated cannot be precisely determined because of the lack of tissue and typically many are missing some skeletal elements, but a relative impression of the type and extent of the injuries can be suggested based on the osteological analysis.

Many contemporary accounts of the June 27, 1876 burials note that mutilation was prevalent among the dead. The most common type of mutilation mentioned was the crushed skull. The archeological evidence for incised wounds, those made by knives, arrows, and hatchets, occurred in about 21 percent of the remains from Custer battlefield and in only one case from the Reno-Benteen defense site. Wounds related to knives or arrows are seen in eleven percent of the Custer individuals and hatchet related injuries were noted in ten percent of the Custer sample. It must be remembered that not all injuries are likely to have affected the bone, thus the sample only reflects those injuries that cut to the bone. Nevertheless, it appears that a significant percentage of the soldiers killed must have been shot with arrows, cut with knives, or struck with hatchets about the time of death.

Blunt instrument trauma to the skull appears as the most prevalent perimortem feature in the contemporary accounts, and the archeological evidence supports this. There are fourteen cases in the Custer battlefield archeological record where skull fragments are present. All cases exhibit blunt instrument trauma. This group accounts for 41 percent of the Custer battlefield individuals represented archeologically and all of those cases where skull fragments were present. This direct physical evidence suggests that blunt force trauma to the skull was common.

The incomplete nature of the skeletal remains recovered limits the quantification of the amount of mutilation at the Custer battlefield. Qualitatively, it is obvious from the archeological evidence, that mutilation was common. This is in concert with the historical record. But the cause of mutilation must be placed in a cultural context. Most of our current perspective of mutilation is derived from the Victorian view that mutilation is barbaric. That viewpoint has been perpetuated in much of the literature about Indian "atrocities". However, it is more appropriate to view mutilation from the cultural context of the Sioux and Cheyenne, rather than the Victorians. One of the most

common themes in Indian explanations of mutilation is one that pervades human nature - a sense of rage and revenge. White Necklace, Wolf Chief's wife, had found her niece decapitated after the Sand Creek massacre and in revenge she decapitated a soldier at the Little Bighorn with her belt axe (Powell 1969). While revenge may have been the most obvious motivation for mutilation, there are also deeper cultural meanings ascribed to the practice. General Henry B. Carrington (1973) interviewed a member of Red Cloud's band as to the reason for the mutilation of the dead at the Fetterman fight. Carrington reported the key to understanding the mutilation was an understanding of the Indians' own view of life after death. He noted:

Their idea of the spirit land is that it is a physical paradise; but we enter upon its mysteries just in the condition we hold when we die. In the Indian paradise every physical taste or longing is promptly met...In the light of this idea, those tortured bodies had a new significance. With the muscles of the arms cut out, the victim could not pull a bowstring or trigger; with other muscles gone, he could not put foot in a stirrup or stoop to drink; so that, while every sense was in agony for relief from hunger or thirst, there could be no relief at all.

In this context, mutilation, in the view of the Sioux and Cheyenne participants, was a part of their culture. It must be viewed as a normal cultural expression of victory over a vanquished foe. That expression has two levels. The first level is the overt and obvious level of rage and revenge. The second level is symbolic or religious; a level where mutilation is a means to insure that an enemy cannot enjoy the after-life in the fullness that the victor might anticipate. Thus the mutilated dead at the Little Bighorn become symbols of victory to the culture that defeated them.

The men with Custer died may have died in 1876, but their bones tell a detailed story of their lives and deaths. The physical anthropologists have determined not only their age, stature, and probable cause of death; but have discovered new information on their lifestyle that cannot be garnered from the historic record alone. Perhaps most revealing is the harsh and rugged life led by these relatively young men as seen in the extent to which their lifestyle as cavalymen on the frontier restructured and remodeled their bones. Clearly reflected in their bones is evidence of horseback riding and tobacco use. Equally important, are correlation of the historical records with the physical anthropological data that has resulted in the probable identification including Miles O'Hara, Edward Botzer, Vincent Charley, and the possible identity of two others. Facial approximations of other skulls have added potential likeness of five, as yet unidentified, battle participants to the gallery of those who served in the Seventh Cavalry.

The tools of modern physical anthropology, while not solving every possible question of interest about the men, add to a growing historical and anthropological database. Of real significance is the identification of one set of remains as a Native American female, possibly a Crow. This elderly woman's remains were discovered in 1928, and without benefit of any analysis at that time, were buried in the National Cemetery as an unknown soldier. Such an error underscores the value of thorough and complete scientific investigation of human remains found on the field of battle. Thus it becomes apparent that researchers should not a priori assume that human remains found on or near the battlefield are those of a soldier. Other peoples have lived on and

LITTLE BIGHORN

utilized the site for thousands of years. Our single-event focus on the Little Bighorn site requires expansion to appreciate the whole history of the place.

7. RECOMMENDATIONS FOR FUTURE ARCHEOLOGICAL INVESTIGATIONS

Archeological Project Recommendations

The following recommendations are based on the archeological information available for the park and the requirements specified in DO-28, National Park Service Cultural Resource Management Guidelines. They are provided to assist the park manager in planning to meet the requirements of federal historic preservation legislation and policies as well as the National Park Service's standards and guidelines. The following archeological recommendations for Little Bighorn National Monument address specific areas of concern relevant to the archeological resources that may aid in resolving a variety of questions of interest to various researchers.

The project recommendations are based on securing a comprehensive understanding of the archeological record associated with the Battle of the Little Bighorn. As such these recommendations are not limited to park-owned and managed lands exclusively. It is recognized that NPS funds are usually not used to examine or evaluate properties and resources outside of park-owned lands. In this case the long history of private funding donated for archeological investigations at Little Bighorn is recognized, and as such are assumed to be a viable source of funding from time to time to complete some of the recommended projects. One goal of the recommendations is to complete a systematic and comprehensive inventory of areas not previously surveyed around the park, if land owner permission can be obtained. These areas are outside the park-managed lands. Some are on privately owned land, some on Crow Tribal lands, and some on Custer Battlefield Land Preservation Fund-owned property. Other projects are recommended within and around the park to gain a fuller understanding of the battle-era use of the landscape and terrain, and to build up on the efforts of Luce, Rickey, and other earlier researchers who laid such an important foundation for the finding, study, and analysis of the physical remains of the battle and its aftermath.

Each project recommendation includes a brief description of the work that can be done. The amount of field time, laboratory and analysis time, and report production time are estimated, and cost in terms of 2010 dollars is also estimated. It is fully recognized that should any given project be given priority for funding, new estimates of field, laboratory and analysis, and report production time, as well as costs should be made at that time, as there will be advances in archeological methods, theory, and equipment over the years that cannot be reasonably anticipated by the current recommendations. Such changes and advancements will undoubtedly affect both time and cost estimates.

The following recommendations are not in priority order.

A. The area of the Reno skirmish line in the valley, the skirmish in the timber, and the retreat to the river should be professionally investigated and an attempt made to correlate any new and properly recorded findings with that of the work of collector Jason Pitsch. Property owner permission would need to be obtained. Field time 15 days, laboratory and reporting time 4 to 6 months. Cost estimate \$35,000

LITTLE BIGHORN

B. The Reno retreat crossing and the lower reaches of the retreat ravine outside the park boundary should also be systematically metal detected. Property owner permission would need to be obtained. Field time five days, laboratory and reporting time 30 to 60 days. Cost estimate \$12,000

C. The lower reaches of Water Carriers' ravine, that portion outside the park boundary, should also be systematically investigated. Property owner permission would need to be obtained. Field time five days, laboratory and reporting time 30 to 60 days. Cost estimate \$12,000

D. The lands on the south and east side of the Reno-Benteen defense site that are presumed to be warrior positions should also be systematically reinvestigated and collected data compared to earlier collectors efforts. Property owner permission would need to be obtained. Field time 10 days, laboratory and reporting time 90 to 120 days. Cost estimate \$25,000

E. Other potential equipment dump sites, outside the park boundary, should be tested to determine their content and extent. Full excavation is not warranted unless they are in danger of looting or loss due to erosion or other causes. Property owner permission would need to be obtained. Field time 15 days, laboratory and reporting time 120 to 180 days. Cost estimate \$37,500

F. The area of Nye-Cartwright ridge and Luce or Warrior ridge as well as surrounding areas that have not been inventoried should be metal detected and the data compared to the work of earlier collectors. Property owner permission would need to be obtained. Field time 15 days, laboratory and reporting time 120 to 160 days. Cost estimate \$37,500

G. The area near the iron bridge and on the east side of the river should be inventoried to ascertain the presence or absence of evidence of the fight at Custer battlefield. Property owner permission would need to be obtained. Field time five days, laboratory and reporting time 30 to 60 days. Cost estimate \$12,000

H. The village or encampment sites should be inventoried and tested to determine their extent and level of preservation. Property owner permission would need to be obtained. Field time 60 days, laboratory and reporting time one year. Cost estimate \$125,000

I. Non-intrusive geophysical investigations of the Reno-Benteen defense site should be undertaken to locate anomalies consistent with buried rifle pits. The geophysical investigations would include multi-instrument surveys of the Reno-Benteen defense perimeter to better define anomalies that are consistent with buried rifle pits. The data could be used by the park to more effectively mark and interpret the likely number and location of rifle pits at Reno-Benteen. Field time five days, laboratory and reporting time 30 to 60 days. Cost estimate \$17,500

K. Excavations of and around the marble markers at Reno-Benteen and on the Custer battlefield could be considered in order to recover soldiers' human remains. Human bone is constantly found around the markers due to bioturbation and will continue to be found due to the natural processes of soil erosion, the freeze-thaw process, and rodent activity. Previous sampling work demonstrated the reburial parties were only partially successful in recovering the skeletal remains. Many of the soldiers' skeletal parts were overlooked and continue to be found nearly every year. If recovery work is undertaken it should be done by professional archeologists supported by physical anthropologists that can analyze the materials before reburial and attempt identifications as well as obtain full post-mortem information on each individual. Field time 330 days, laboratory and reporting time two years. Cost estimate \$250,000

L. Investigation of the Deep Ravine anomaly to determine if any human remains are present. Due to the deep excavation requirements, the potential for resource damage, and major safety issues involved, any investigations should only be undertaken if there is an overwhelming and compelling management need. It is suggested that such an investigation be limited to discovering whether human remains are buried in Deep Ravine or not. As such a testing protocol can be used, although it must be an innovative process such as coring or very limited excavation. Any work in the ravine will be very costly due to the many constraints that must be reasonably imposed to protect the natural resources, the ravine hydrology, and the safety of the crew. Field time 30 days and 120 days laboratory and report production time. Cost estimate \$350,000

M. Locate and investigate the sites of other Custer column campsites used prior to the Battle of the Little Bighorn. This work will require obtaining permission of private landowners to search for and locate the campsites. As these campsites or rest areas were occupied for only a few hours the potential to yield information on short-term camp or rest stops by defining an archeological signature of this camp type is excellent, and is needed in the field of historical archaeology. The Custer-related sites are of known duration and the number of men and animals who occupied the sites is also known, which will result in an archeological model of short-term campsite occupation that will aid the profession as a whole. Property owner permission would need to be obtained. Field time 20 days, 90 days laboratory and analysis time, and report production. Cost estimate \$25,000.

N. 1876 Little Bighorn River channel and Underwater survey of the Little Bighorn River from above the Reno retreat crossing to the lower or north ford at the north end of the park boundary. Given that the river has meandered and changed channels in the last 140 years, historical research of the 1876 river channel may allow some areas to be eliminated from the underwater survey. Research into the 1876 river channel location should employ not only historical research but hydrologists and geomorphologists to assess the likely 1876 river channel alignment. Once the 1876 channel is reasonably identified an underwater survey of the remaining channel can be undertaken to determine if battle-era artifacts such as firearms, ammunition components, or personal items remain. Ownership of the river bottom will need to be determined and appropriate permissions acquired to conduct the underwater survey. Current technology, such as underwater magnetometers, is not adequate to locate small items. It is recommended that one or more small boats with divers using pulse induction underwater metal

LITTLE BIGHORN

detectors be used to conduct the survey. The survey should employ an appropriate grid or transect method of underwater survey to insure the appropriate channel bottom areas are adequately surveyed. Property owner permission would need to be obtained. River channel research: Field time 15 days and analysis and report production 120 days. Cost estimate \$40,000. Underwater survey: Field time 15 days, 120 days laboratory and analysis time, and report production time. Cost estimate (assumes substantial artifact conservation efforts will be required) \$75,000.

O. There are reports of human remains being discovered east of the battlefield. Chief Historian John Doerner has a working file on these reports. The sites should be investigated to determine if the remains are human, and if they are, make a determination of ethnic affiliation. Should they be determined to be Native Americans then the regulations related to NAGPRA would be invoked. If they are determined to be white and associated with the battle, the remains should be given full osteological examinations, attempts made at personal identification, and the remains then be reburied in the National Cemetery. Property owner permission would need to be obtained. Field time 20 days, laboratory and analysis time and report production 180 days. Cost estimate \$60,000 (assumes NAGPRA consultation will be required).

P. Consideration should be given to conducting geophysical remote sensing around the Seventh Cavalry monument on Last Stand Hill to determine the nature and size of the mass grave that surrounds the monument. Certain geophysical instruments can penetrate asphalt and may be able to provide some basic information on the size and depth of the mass grave. Field time 5 days, analysis time and report production time 30 days. Cost estimate \$10,000

Q. Consideration should be given to the exhumation and osteological examination of selected graves associated with the Fort Phil Kearny and Fetterman Battle burials. Historical records associated with the men who died there and the exhumation and reburial records suggest that several of the non-commission officers might be identifiable. The graves containing those remains could be exhumed, the remains give a full osteological examination, and comparisons made to the enlistment and other historical records with the goal of identification in mind. The remains would then be reburied in the same graves, and new markers placed on the graves if identifications are successful. Field time 7 days, laboratory and analysis time, and report production 120 days. Cost estimate \$25,000.

R. There are reports, maintained by Chief Historian John Doerner, of battle-related firearms still in the hands of descendents of the Lakota and Cheyenne who fought in the battle and used or captured the weapons. It is recommended, that if family permissions can be obtained, that the guns be examined and documented, that if their condition warrants it a firing pin imprint be obtained, and comparison to the archeologically recovered cartridge cases be undertaken to see if any of the specimen guns match to the archeological cartridge cases. Such an examination has the potential to expand the knowledge base of the firearms used or captured in the battle and enhance understanding of both soldier and warrior movements. Examination, documentation, and sampling time 8 days, firing pin imprint comparison and report production 20 days. Cost estimate \$5,000.

Issues and Recommendations for Dealing with Human Remains

Bones from the battle dead are likely to continue to be found as isolates or as overlooked burials in the coming years. Natural erosion as well as changing land uses are likely to cause human remains to become exposed. Custer's men were hastily buried following the battle in shallow graves marked with crude markers made from tepee poles from the abandoned Indian village. Natural decomposition processes, soil erosion, animal activity, and human disturbance caused some of the remains to become scattered. The following year Custer, ten officers and two civilians were transferred to eastern cemeteries, and in 1881 the remaining Seventh Cavalry dead were placed in a mass grave on Last Stand Hill, or at least some bones from most of the army dead. In 1890 white marble markers replaced the original Seventh Cavalry burial stakes leaving a unique record of where the soldiers fell on the field that provides a visual understanding of the battle absent from most battlefields. The need to care for the fallen men also led to the designation of the site as a national cemetery, and subsequent reinterments from Indian wars forts and burials from U.S. wars fill the cemetery.

Lakota and Cheyenne laid their casualties to rest in some of the camp's abandoned tepee's as well as on burial scaffolds, or they were interred along hillsides or sandstone outcroppings in the Little Bighorn valley. Some families of the Indian dead later erected stone cairns at some of the casualty sites to preserve the location where their loved ones died or were mortally wounded. Because of the important cultural associations of the battle beginning immediately after it occurred, the battlefield has also been the site of cultural disputes, especially by Native Americans demanding more recognition. Beginning in 1999, Chief Historian John Doerner began erecting red granite markers for Cheyenne and Lakota warrior casualties from the battle based on oral traditions related to the various known stone cairns denoting warrior causality locations. After a long debate, planning, and funding process the Indian Memorial was dedicated in 2003 (Figure 56). These two historically significant changes are important and powerful additions to the park's cultural landscape and provide an interpretive balance as well as visual representations to differing cultural perspectives of memorialization and commemoration that the site lacked for over 120 years. Little Bighorn Battlefield National Monument now acknowledges the Cheyenne and Lakota sacrifice and loss that occurred during the battle, and provides a new interpretive balance to the story for park visitors.

For management purposes, the discovery of human remains on either the Custer battlefield or the Reno-Benteen defense site should presume they are most likely associated with soldier dead from 1876, based on the recovery of human skeletal remains to date. It is recommended that isolated bones and remains be mapped, but reburied at their find location unless the site is an active erosional area or associated with an area of high visitor traffic. In those cases the remains should be mapped, collected, and stored with other collections until such time as a qualified physical anthropologist can fully examine the recovered elements to determine stature, sex, and ethnic affiliation. Once they have been properly analyzed by a qualified physical anthropologist appropriate measures for their final disposition can be undertaken.



Figure 56. The Indian Memorial completed in 2003 that commemorates all tribes participation in the Battle of the Little Bighorn.

Human bone found in the river valley should not immediately be assumed to be soldiers' remains. The Reno skirmish line, timber fight, and retreat areas may yield additional human bone associated with the battle. Due to agricultural practices over the years the probability of complete and undisturbed soldiers' remains being recovered in these areas is unlikely. Any remains are likely to be scattered and broken, unless they were buried deeper than the plow zone in the valley bottom. Given the long term, both prehistoric and historic, Native American use of the valley lands no assumption as to ethnic identity should be made regarding human remains from the valley area unless definitive artifacts are associated with the remains. The probability of the remains being an Indian or a soldier are nearly equal, and human remains found in the valley should automatically invoke the appropriate requirements of the Native American Graves Protection and Repatriation Act, as well as relevant portions of Montana State law concerning human remains.

Another management concern related to human remains is the proliferation of the number of both legal and clandestine cremated human remains being deposited on and around the battlefield (Figure 57). A number of individuals who have an association or strong feelings about the site wish to be laid to rest on the battlefield. With the fact the National Cemetery is full, even those entitled to burial there cannot be accommodated, which leads to clandestine deposition of human cremated remains at various locations on the park lands. The cremains study that began in the 1990s shows that the burned crushed bone being deposited on the field as cremated ashes is different than soldiers' remains that are found from time to time (Willey and Scott 1999). However, some of those remains are large enough to be potentially confusing to the untrained eye. Where possible cremains



Figure 57. Known modern human cremations that have been clandestinely placed on the battlefield.

should be deposited in a designated spot associated with the National Cemetery as is the current practice. When clandestine cremains scatters are located by staff, they should be mapped and noted on the park GIS and other maps so they are not later confused with a historic burial site.

A final management challenge is research and identification of historic stone cairns and other rock clusters that were or are being placed by warrior families or their descendents to commemorate approximate sites of fallen warriors or to memorialize war deeds. It is clear that the Lakota and Cheyenne believe it is important that their sacrifices and bravery be remembered and commemorated. The historically known cairns were identified over many years (Figures 58, 59), but most families did not erect memorial cairns. Of concern are the small gravel sized rocks that are slightly clustered being identified as cairns, marking the spot as an Indian warrior site. In 2006 the pin flagged locations along the Deep Ravine Trail that were marked by Lakota tribal members as potential rock cairn sites were examined (Memorandum, Douglas Scott to



Figure 58. A Native American rock cairn locale near the Reno-Benteen Defense Site, marking the site of an event that took place during the battle.



Figure 59. Detail of the rock cairn. A number of cairns like this are known on the battlefield, and legitimate rock cairns denoting warrior events or death sites should resemble this type.

Little Bighorn Superintendent Darrell Cook, August 7, 2006). These locales are believed to be previously undiscovered sites of rock piles or cairns placed to memorialize warrior fighting or death sites related to the battle.

All of the locations checked are located on ridge crests or side slopes just below the ridge crest. At each location visited, the only thing observed was decomposed and eroded Parkman formation sandstone chips and pieces scattered over the surface. The Parkman sandstone comprises the bedrock stratigraphy of the park and is Upper Cretaceous in date. The bedrock naturally outcrops on ridges and side slopes over certain areas of the park, especially that area west of Battle Ridge. The Parkman material observed at each flagged location was part of a continuous layer of exposed eroded parent material and is completely natural in origin and source. The decomposition of the bedrock was likely accelerated by the 1990s range fires that caused the stone to become more friable and subject to fracturing and breaking into small pieces. These areas were inventoried in 1984 and some areas again in 1985 and no clusters of sandstone piles were noted during the earlier archeological inventories. There is no evidence that any of the exposed material originated or had been modified by human processes.

With all due respect to the individuals who placed the pinflags at the locales, and acknowledging their very strong beliefs and opinions regarding the landscape over which they walked, and the sites they marked, and further acknowledging that the flagged sites may well mark locations that are recalled from their oral tradition, the locations flagged are natural rock outcrops that have eroded due to long exposure to natural weathering processes. There is no evidence that any material had been intentionally gathered, placed, sorted, or modified by people. These are completely natural occurrences of local sandstone bedrock. They are not consistent with other ethnographically confirmed rock cairn sites that have been known for decades on the battlefield. Those sites are made up of larger, harder stone brought from the river to create a clearly definable rock pile, and not eroded parent bedrock.

It is suggested these new locations be recorded using a GPS and placed on the park's GIS as an information layer. Additional research and consultation with Lakota, Cheyenne, and Arapahoe may reveal more information on warrior casualties. If corroborative information can be found in the historical records, other oral histories from more contemporary sources, or confirmed by other physical evidence then more credence could be given to the locales. While there is no doubt that Lakota families believe these small stone clusters denote a site a warrior was killed or wounded and then removed from the battlefield thus constituting memorials to fallen warriors, however at present, the opinion that these constitute memorials to fallen warriors cannot be sustained by the physical evidence.

Conclusions

The recommendations for further archeological investigations of the Little Bighorn battlefield, especially those focused on areas outside the current park boundaries will be useful to the park in determining the nature and extent of individual battle areas and features as contributing or non-contributing resources to the significance of the Little Bighorn Battlefield. Knowledge of the features and areas

LITTLE BIGHORN

of significance is in turn critical to making informed management decisions when even small scale construction and/or development activities must be undertaken to provide visitor services such as new trails, enhancement of the viewshed through vegetative manipulation, and other activities. Given the extent of the known features, such as the soldiers' marble markers, the warriors stone cairns, or recently placed red marble markers located on both the Custer field and the Reno-Benteen defense site, and the rifle pits located on the Reno-Benteen defense site, as well as the presence battle-related artifacts across the entire landscape, almost any ground disturbance activity at most locations in the park will technically constitute an undertaking in terms of historic preservation legislation compliance. Park staff is exemplary in implementing all aspects of compliance with the Historic Preservation Act as amended. They should continue to routinely engage the Section 106 compliance process in order to seek concurrence from the State Historic Preservation Officer or develop a park-specific programmatic memorandum of agreement to define categorical exclusions for routine work.

Many Little Bighorn visitors and battle enthusiasts are fascinated with the archeological work and finds. One outcome of additional inventory and study is the potential for working with related sites in nearby areas that would continue to allow development of a more complete understanding of the prehistory and history of land use in the area through time as well as the battle story itself. Volunteers have been a valued, and important and economically advantageous aspect of most of the archeological projects undertaken to date. Interested volunteers not only provide real and valued assistance to a project, they also function as unofficial good will ambassadors for the site and its long term preservation and study. However, their efforts must continue to be directed and supervised by qualified professional archeologists to insure all professional standards are met or exceeded in any work in which volunteers are used.

The visiting public's interest in archeology and history can be addressed in a variety of means. Interpretation of any in-progress archeological projects can be included in park tours and/or announcements at the visitor contact areas. The artifacts resulting from archeological investigations may very well aid in presenting a more complete picture of the history to the visitor by presenting the physical evidence to them. In turn, data generated by archeological work can be used by park interpreters to enhance the site interpretation through a number of different methods (i.e., exhibits, personal presentations, brochures, and publications).

The archeology of the Battle of the Little Bighorn has yielded thousands of artifacts, reams of notes and other records, and a pile of reports, monographs, and books. Those who participated in the project, whether as archeologist or as volunteer, know the research designs were successfully implemented and a rich and valid sample of what lies in the ground was recovered. The analyses and reports resulting from that work have allowed for confirmation of some of the battle's interpretations, while other data has required reinterpretation of some sources and events. It is also clear that we have not learned everything there is to know. But, the archeological investigations have found many things that show the historical record is correct on many points, that Indian oral tradition likewise can explain some details better than the army accounts, and archeological detective work has uncovered artifacts and their patterns of distribution that neither oral tradition nor documentary records address. The Little

Bighorn archeological record is not better than the others; rather it should be viewed as another set of information to be compared, contrasted, and correlated with the other information sources. Archeological data is physical evidence of the battle, and as such is the very visible reminder of those past events that have come to play such a role in our lives. The artifacts do not just set on shelves in the park vault. A variety of researchers study some aspect of the data set nearly every year. And some of artifacts, including some very poignant ones, are on display in the museum, aiding in bringing the battle story to life for the visitor. They and information they convey are a very real part of the interpretation of the Battle of the Little Bighorn.

The archeological evidence of the Battle of the Little Bighorn contributed much to understanding the particulars of the fight, and added to the historical significance of the battle and its aftermath. Clearly the remaining archeological deposits, which are substantial, are likely to yield additional significant information about the battle and the individual participants which will further refine understanding of the events of June 25-26, 1876. Beyond the particularistic results is the significance of the archeological study of the battlefield within the context of anthropological theory.

At one level the result of the archeological studies at the Little Bighorn have shown that individual and unit movement and composition can be revealed in the most chaotic of human endeavors, a pitched battle. Opposing force deployment can be discerned and the flow of the battle followed. Details lost to history can be discovered and interpreted in respect to the cultural conditioning and training received by the opposing forces. The Little Bighorn archeological investigations generated a model of battlefield behavior that was based on empirical evidence and has subsequently been tested in other situations. That model was predicated upon an axiom basic to archeological investigation. Human behavior is patterned. Behavioral patterns are expressed through individual behaviors constrained by the norms, values, sanctions and statuses governing the group within which the individual operates.

War tactics, which represent patterned behavior, include establishment of positions and the deployment and movement of combatants. The residues of tactics in warfare; artifacts, features and their contextual relationships, have been shown to be patterned and reflect details of battlefield behavior. The Little Bighorn Battlefield National Monument archeological investigations were the first battlefield study to be reported that went beyond the particularistic and placed the results of a hostile cultural conflict situation in the context of a theoretical model of anthropological behavior. The Battle of the Little Bighorn archeological work added significantly to the theory of the anthropology of war, and has become a signal event in the development of new methods to study battlefields and fields of conflict, and in turn the work has developed and influenced new theoretical constructs that are now at the heart of battlefield archaeology and conflict archaeology studies worldwide.

LITTLE BIGHORN

REFERENCES CITED

- Allen, William A.
1903 Adventures With Indians and Game. A. W. Bowen, Chicago.
- Alt, D. and D. W. Hyndman
1986 Roadside Geology of Montana. Mountain Press Publishing, Missoula, MT.
- Anders, Frank L.
1983 The Custer Trail: A Narrative of the Line of March of Troops Serving in the Department of Dakota in the Campaign Against Hostile Sioux, edited by John M. Carroll. Arthur H. Clark, Glendale, CA.
- Athnason, Michael
2006 Modelling Bullet Trajectory on Historic Battlefields using Exterior Ballistic Simulation and Target-oriented Visibility. Archaeological Computing Newsletter 65:1-7.
- Barnard, Warren E. "Sandy"
1985 Volunteers Crucial in Custer Battle Dig. CRM Bulletin 8(5):2-3.
- 1995 Edward Botzer: Was He Custer's 'Last Trooper?' Greasy Grass 11:2-4
- Beckes, M. R. and J. D. Keyser
1983 The Prehistory of the Custer National Forest: An Overview. US Department of Agriculture, Custer National Forest, Billings, MT.
- Bennett, Connie
1977 Preconstruction archeological investigations at Custer Battlefield National Monument. Memo report on file, National Park Service, Midwest Archeological Center, Lincoln, NE.
- Benson, Christopher
2005 A GIS for the Little Bighorn Battlefield National Monument. Professional Papers 338, <http://gis/ersi.com/library/userconf/proc00/professional/papers/PAP338/p338.htm>.
- Binkowski, Don
1995 Col. P.W. Norris: Yellowstone's Greatest Superintendent-America's Early Environmental Champion (1877-1882). C & D of Warren, Warren, MI.
- Bray, Robert
1958 A report of archeological investigations at the Reno-Benteen site Custer Battlefield National Monument June 2 - July 1, 1958. Ms on file Midwest Archeological Center, Lincoln, NE.

LITTLE BIGHORN

1967 An Archeological Survey and Excavations at Wilson's Creek Battlefield National Park, Missouri. Manuscript on file, National Park Service, Midwest Archeological Center, Lincoln, NE.

1996 Archaeological Investigations at the Renon-Benteen Defense Site, Little Bighorn Battlefield, Montana. *Missouri Archaeologist* 57:58-95.

Brome, Jeff

2009 *Custer into the West with the Journal and Maps of Lieutenant Henry Jackson*. Upton and Sons, El Segundo, CA.

Brown, M. H.

1961 *The Plainsmen Of The Yellowstone: a History of the Yellowstone Basin*. University of Nebraska Press, Lincoln.

Brust, James

1995 Lt. Oscar Long's Early Map Details Terrain, Battle Positions. *Greasy Grass* 11:5-13.

Bryson, R. A., D. A. Barerreis and W M. Wendland

1970 The Character of Late-Glacial and Post-Glacial Climatic Changes. In *Pleistocene and Recent Environments of the Central Plains*, edited by W. Dort and J. K. Jones, pp. 53-74. Kansas University Press, Lawrence, KS.

Carrington, Henry

1973 *The Indian Question*. Sol Lewis, New York.

Carroll, John M. (ed.)

1987 *Custer's Chief of Scouts*. Bison Books, Lincoln, NE.

1993 *They Rode with Custer: A Biographical Directory of the Men that Rode with General George A. Custer*. Carroll and Company, Mattituck, N.Y.

Carstensen, Vernon

1968 *The Public Lands: Studies in the History of the Public Domain*. University of Wisconsin, Madison.

Cecil, Jerry

1995 Researching the Tale of Lt. Crittenden's Pocket Watch. *Greasy Grass* 11:34, 37-38.

Chittenden, Hiram Martin

1900 *The Yellowstone National Park*. Third edition. Robert Clark Company, Cincinnati, OH.

Chorne, Laudie

1997 *Following the Custer Trail of 1876*. Printing Plus, Bismarck, ND.

Connor, Melissa

1986 Exhumation of Grave 402, Block B, Custer Battlefield National Cemetery. Rocky Mountain Region Archeological Project Report, dated April 8, 1986. On file, National Park Service, Midwest Archeological Center, Lincoln, NE.

1994 Exhumation of Human Remains on the Pitsch Property Near Little Bighorn Battlefield National Monument. MS on file, Midwest Archeological Center, National Park Service, Lincoln, NE.

Connor, Melissa and Douglas D. Scott

1998 Metal Detector Use in Archaeology: An Introduction. *Historical Archaeology* 32(4):73-82.

Cross, Walt

2006 *Custer's Lost Officer: The Search for Lieutenant Henry Moore Harrington, 7th US Cavalry*. Cross Publications, Stillwater, OK.

Davis, C. M.

1976 A Preliminary Archaeological Reconnaissance Survey, Bureau of Land Management Lands, Southeastern Montana. University of Montana for Bureau of Land Management, Miles City, MT.

Davis, L. B., S. A. Aaberg and J. W. Fisher, Jr.

1980 Cultural Resources in the Limestone Hills Montana Army National Guard Training Site, Broadwater County, Montana. Montana State University for Bureau of Land Management, Montana State Office, Billings.

Deaver, Kenneth and Steven Aaberg

1977 Archaeological Survey of the Kansas-Nebraska Pipeline Project Area: Phillips County, Montana. Professional Analysts for the Bureau of Land Management, Lewistown District, MT.

Deaver, Kenneth and Sherry Deaver

1988 Prehistoric Cultural Resource Over-view of Southeast Montana. Ethnoscience for Bureau of Land Management, Miles City, MT

De Vore, Steven L.

2002 Search for the Horse Burial Pit: Conductivity and Magnetic Gradient Investigations at Last Stand Hill, Little Bighorn Battlefield National Monument, Montana. Appendix B in *Archeological Investigations of the "Horse Cemetery" Site, Little Bighorn Battlefield National Monument*, by Douglas D. Scott. Midwest Archeological Center, National Park Service, Lincoln, NE.

2005 Geophysical Investigations of the Reno-Benteen Defensive Site, Little Bighorn Battlefield National Monument, Bighorn County, Montana. Report on file, Midwest Archeological Center, National Park Service, Lincoln, NE.

LITTLE BIGHORN

Doerner, John A.

2002 The Enduring Monument – The Enigma of Custer Hill. Paper delivered February 23 at the 6th Annual Denver Custer/Indian Wars Symposium, Denver, CO.

Donahue, Michael

2008 Drawing Battle Lines: The Map Testimony of Custer's Last Fight. Upton and Sons, El Segundo, CA.

Doran, R. E.

1987 The Man Who Got to the Rosebud. Papers of the Custer Battlefield Historical and Museum Association Symposium, June 26, pp 19-33, Custer Battlefield Historical and Museum Association, Crow Agency, Montana.

Duke, Phillip G.

1991 Points in Time: Structure and Event in a Late Northern Plains Hunting Society. University Press of Colorado, Boulder.

du Mont, John

1974 Custer Battle Guns. Old Army Press, Fort Collins, CO.

Dustin, Fred

1953 Some Aftermath of the Little Bighorn Fight in 1876: The Burial of the Dead. In W.A. Graham, The Custer Myth, pp. 362-72. Bonanza Books, NY

Ewers, John C.

1958 The Blackfeet: Raiders on the North-western Plains. University of Oklahoma Press, Norman.

1980 The Horse in Blackfoot Indian Culture. Reprinted Smithsonian Institution, Washington, DC. Originally published 1955, Bulletin 159, Bureau of American Ethnology, Smithsonian Institution.

Forbis, Richard G.

1962 The Old Women's Buffalo Jump, Alberta. Contributions to Anthropology, 1960, Part 1:55-123. National Museums of Canada, Bulletin 180. Ottawa, Ontario, Canada.

Fox, Richard A., Jr.

1983 1983 Archeological Investigations at Custer Battlefield National Monument. Ms. on file, Midwest Archeological Center, Lincoln, NE.

1984 Suggestions for Archaeological Investigations at Custer Battlefield National Monument. Ms on file, Little Bighorn Battlefield National Monument, Crow Agency, MT.

REFERENCES CITED

- 1988 Discerning History Through Archaeology: The Custer Battle. Ph.D. Dissertation, Department of Archaeology, University of Calgary, Calgary, Alberta, Canada.
- 1993 Archaeology, History, and Custer's Last Battle. University of Oklahoma Press, Norman.
- 1996 Significance of the Investigations, Archaeological Investigations at the Renon-Benteen Defense Site, Little Bighorn Battlefield, Montana. *Missouri Archaeologist* 57:87-88.
- Fox, Richard A., Jr. and Douglas D. Scott
1991 The Post-Civil War Battlefield Pattern. *Historical Archaeology* 25(2):92-103.
- Frison, George
1991 Prehistoric Hunters of the High Plains. 2nd ed., rev. Academic Press, New York.
- Frison, G. C., D. Schwab, L. A. Hannus, P. Winham, D. Walter and R. C. Mainfort
1996 Archaeology of the Northwestern Plains. In *Archaeological and Bioarchaeological Resources of the Northern Plains*, edited by G. C. Frison and C. Mainfort. Tri-Service Cultural Research Center, USACERL Special Report 97/2.
- Gatliff, Betty Pat
1984 Facial Sculpture on the Skull for Identification. *American Journal of Forensic Medicine and Pathology* 5(4):327-332.
- Gibbon, John
1877 Last Summer's Expedition Against the Sioux. *American Catholic Quarterly Review* 2(1):271-304.
- Glenner, Richard A., P. Willey, and Douglas D. Scott
1994 Back to the Little Bighorn: Remains of a 7th Cavalry Trooper, Recovered at the Little Bighorn battlefield in 1903, Provide A Glimpse of Nineteenth Century Dental Practices. *Journal of the American Dentistry Association*, 125:835-843.
- Graham, W. H.
1953 *The Custer Myth: A Source Book*. Bonanza Books, New York.
- Gray, John
1963 Last Rites for Lonesome Charley Reynolds. *Montana, the Magazine of Western History* 13(4):40-51.
- 1975 Nightmares into Day Dreams. *By Valor and Arms* 1(4):30-9.
- 1976 *Centennial Campaign: The Sioux War of 1876*. Old Army Press, Fort Collins, CO.

LITTLE BIGHORN

1991 Custer's Last Campaign: Mitch Boyer and the Little Bighorn Reconstructed. University of Nebraska Press, Lincoln.

Greene, Jerome A.

1986 Evidence and the Custer Enigma: A Reconstruction of Indian-Military History. Outbooks, Reno, NV (reprint of 1976 edition).

2008 Stricken Field, Little Bighorn: The Little Bighorn Since 1876. University of Oklahoma Press, Norman.

Gregg, Michael L.

1985 An Overview of the Prehistory of Western and Central North Dakota. Cultural Resources Series, No. 1. Bureau of Land Management, Montana State Office, Billings, MT.

Hammer, Kenneth

1976 Custer in '76 Walter Camp's Notes on the Custer Fight. Brigham Young University Press, Provo.

1995 Men With Custer: Biographies of the 7th Cavalry. Custer Battlefield Historical and Museum Association, Hardin, MT.

Hardorff, R. Dutch

1984 Burials, Exhumations and Reinterments: A View from Custer Hill. In Custer and His Times, Book 2. Little Bighorn Associates, NY.

1985 Markers, Artifacts, and Indian Testimony: Preliminary Findings on the Custer Battle. W. D. Horn, Short Hills, NJ.

Hardorff, Richard G.

1989 The Custer Battle Casualties. Upton and Sons, El Segundo, CA.

1997 Camp, Custer, and the Little Bighorn. Upton and Sons, El Segundo, California.

Harris, C. E.

1980 Sherlock Holmes Would Be Impressed. American Rifleman 128(5):36-39,82.

Hatcher, Julian, Frank J. Jury, and Jac Weller

1977 Firearms Investigation, Identification and Evidence. Stackpole Books, Harrisburg, PA.

Haynes, C. Vance Jr.

1989 Archaeological Geology of Deep Ravine, Custer Battlefield National Monument. In Archeological Perspectives on the Battle of the Little Big Horn. by Douglas D. Scott, Richard A. Fox Jr, Melissa A. Connor, and Dick Harmon, pp. 224-242, University of Oklahoma Press, Norman.

REFERENCES CITED

- Hedren, Paul L.
1973 Carbine Extraction Failure at the Little Big Horn: A New Examination. *Military Collector and Historian* 25(2):66-68.
- Hommon, H. B.
1940 Report of Inspections At Custer's Battlefield National Monument, Montana. File 660-033, Sanitation, RG 79, Box 167, Records of National Park Service Region II Central Classified Files 1936-1952, National Archives and Records Administration, Federal Records Center, Kansas City, MO.
- Horsted, Paul, Ernest Grafe, and Jon Nelson
2009 *Crossing the Plains with Custer*. Golden Valley Press, Custer, SD.
- Hutchins, James
1976 *Boots and Saddles at the Little Bighorn*. Old Army Press, Fort Collins, CO.
- Husted, Wilfred M.
1969 *Bighorn Canyon Archaeology*. River Basin Surveys, Publications in Salvage Archaeology, No. 12. Smithsonian Institution. Washington, DC.
- Hyson, John M., and Joseph W.A. Whitehorne
1993 Dental Forensics: The Fate of Lieutenant Harrington at the Little Big Horn (sic.). *Bulletin of the History of Dentistry* 41(3):103-107.
- Josten, N. E. and G. S. Carpenter
1995 Results from Rapid Geophysical Surveyor Investigation of Archaeological Sites at the Little Bighorn Battlefield National Monument. Idaho National Engineering Laboratory, Idaho Falls.
- Kehoe, Alice B.
1973 *The Gull Lake Site: A Prehistoric Bison Drive Site in Southwestern Saskatchewan*. Milwaukee Public Museum, Publications in Anthropology and History 1, Milwaukee, WI.
- King, W. Kent
1981 *Tombstones for Bluecoats: New Insights into the Custer Mythology*. Published by the author, Marion Station, California.
- Kuhlman, Charles
1951 *Legend into History*. Stackpole Books, Harrisburg, PA.
- Lahren, Lawrence A.
1976 *The Myers-Hindman Site: An Exploratory Study of Human Occupation Patterns in the Upper Yellowstone Valley from 7000 B.C. to A.D. 1200*. Livingston, Montana: Anthropologos Researches International Incorporated.

LITTLE BIGHORN

Lawrence, Elizabeth Atwood

1989 *His Very Silence Speaks: Comanche-The Horse Who Survived Custer's Last Stand*. Wayne State University Press, Detroit, MI.

Lee, Ronald F.

1970 *The Antiquities Act of 1906*. Department of the Interior, Washington, DC.

Lewis, Berkeley R.

1972 *Small Arms Ammunition at the International Exposition Philadelphia, 1876*. *Smithsonian Studies In History and Technology* 11. Smithsonian Institution, Washington, DC.

Libby, O. G. (editor)

1920 *The Arikara Narrative of the Campaign Against the Hostile Dakotas*, June, 1876. *North Dakota Historical Society Collections* 6.

Liddic, Bruce R. and Paul Harbaugh

1995 *Camp on Custer: Transcribing the Custer Myth*. Arthur H. Clark Company, Spokane.

Loendorf, Lawrence L.

1969 *The Results of the Archaeological Survey in the Pryor Mountain - Bighorn Canyon Recreation Area - 1968 Field Season*. Report for the United States Department of Interior (BLM), National Park Service and the University of Montana, Missoula.

1973 *Prehistoric Settlement Patterns in the Pryor Mountains, Montana*. PhD dissertation. University of Missouri. UMI Dissertation Services, Ann Arbor, MI.

Luce, Edward S.

1939 *Keogh, Comanche, and Custer*. John S. Swift, St. Louis.

1941a Memorandum to Superintendent, Yellowstone National Park dated April 9, 1941. Accession 381, Administrative correspondence, on file in the archives of Little Bighorn Battlefield National Monument, Crow Agency, MT.

1941b Discovery of human bones on Custer Battlefield Area. Memorandum to Quartermaster General dated April 18, 1941. Accession 381, Administrative correspondence on file in the archives of Little Bighorn Battlefield National Monument, Crow Agency, MT.

1941c Memorandum to Superintendent Yellowstone National Park dated May 6, 1941. Accession 381, Administrative correspondence on file in the archives of Little Bighorn Battlefield National Monument, Crow Agency, MT.

REFERENCES CITED

- 1941d Letter to Colonel Elwood Nye dated May 27, 1941. Elwood Nye scrapbook, 1941-1961, Accession 253 on file in the archives of Little Bighorn Battlefield National Monument, Crow Agency, MT.
- MacNeish, Richard S.
1958 An Introduction to The Archaeology Of Southeastern Manitoba. National Museums of Canada, Bulletin 157. Ottawa, Canada.
- Magnussen, Daniel O.
1974 Peter Thompson's Narrative of the Little Bighorn Campaign 1876. Arthur Clark Co., Glendale, CA.
- Mahan, D. H.
1861 An Elementary Treatise on Advance Guard, Outpost, and Detachment of Service of Troops. John Willey, New York.
- Malone, M. P., R. B. Roeder and W. L. Lang
1991 Montana A History of Two Centuries. University of Washington Press, Seattle, WA.
- Mangum, Neil C.
1987a Battle of the Rosebud: Prelude to the Little Bighorn. Upton and Sons, El Segundo, CA.

1987b Popular Reaction to Custer: The Public's Perception. 1st Annual Symposium Custer Battlefield Historical and Museum Association, pp54-61. Custer Battlefield Historical and Museum Association, Hardin, MT.
- Marquis, Thomas B.
1931 Wooden Leg; A Warrior Who Fought Custer. University of Nebraska Press, Lincoln.

1976 Keep the Last Bullet for Yourself. Reference Publications, Algonac, MI
- McChristian, Douglas
1993 Historian's Corner. The Battlefield Dispatch 12(1):10.

1995 The U.S. Army in the West, 1870-1880. University of Oklahoma Press, Norman.

1996 Burying the Hatchet: The Semi-Centennial of the Battle of the Little Bighorn. Montana, The Magazine of Western History. 46(2):50-65.

2009 Fort Laramie: Bastion of the Plains. University of Oklahoma Press, Norman.
- McDermott, John D.
2003 Circle of Fire: The Indian War of 1865. Stackpole Books, Mechanicsburg, PA.

LITTLE BIGHORN

Michno, Gregory

1993 Crazy Horse, Custer, and the Sweep to the North. *Montana: The Magazine of Western History* 43(3):42-53.

1994 *The Mystery of E Troop*. Mountain Press, Missoula, MT.

Moore, Michael and Michael Donahue

1991 Gibbon's Route to Custer Hill. *Greasy Grass* 7:22-31.

National Park Service

1997 National Park Service, Cultural Resource Management Guideline, Release No. 5. National Park Service, Washington, DC.

Nickel, Robert K.

2002 A Ground-Penetrating Radar Search for a Horse Burial Pit Associated with the 1876 Battle of the Little Bighorn, Appendix A in *Archeological Investigations of the "Horse Cemetery" Site, Little Bighorn Battlefield National Monument*, by Douglas D. Scott. Midwest Archeological Center, National Park Service, Lincoln, NE.

Nichols, Ronald H. (ed.)

1992 *Reno Court of Inquiry*. Custer Battlefield Museum and Historical Association, Hardin, MT.

Norris, Frank

1981 Report Concerning the Restaking of the 1958 Archaeological Survey Point Finds. Ms on file, A-86, Little Bighorn Battlefield National Monument, Crow Agency, MT.

Norris, Philetus W.

1884 *The Calumet of the Coteau, and Other Poetical Legends of the Border*. J.B. Lippincott & Co., Philadelphia.

Nye, Elwood

1946 Letter to Superintendent Edward Luce dated 1946. Accession 381, Administrative correspondence on file in the archives of Little Bighorn Battlefield National Monument, Crow Agency, MT.

Orser, Charles E., Jr.

2004 *Historical Archaeology*. Pearson Prentice Hall, Upper Saddle River, NJ.

Owsley, Douglas W.

1994 A Report on Bone Specimens 94MAR5(3M) and 94MAR5(4M6). Manuscript on file Little Bighorn Battlefield National Monument, Crow Agency, Montana.

Palmer, Robert G.

1975 White Handled Revolvers. *By Valor at Arms* 2(1):28-33.

REFERENCES CITED

- Payne, G. F.
1973 Vegetative Rangeland Types in Montana. Montana Agricultural Experiment Station Bulletin 671, Bozeman, MT.
- Pieters, Nancy and Sandy Barnard
1986 Reburial Service at Custer Battlefield. Courier, NPS Newsletter 31(10):21-22.
- Polka, George E.
1994 Fort Custer: 1877-1898 Then and Now. George E Polka, Billings, MT.
- Powell, Peter J.
1969 Sweet Medicine. University of Oklahoma Press, Norman.
- Reedstrom, Ernest L.
1977 Bugles, Banners, and War Bonnets. Bonanza Books, New York.
- Reeves, Brian O. K.
1990 Communal Bison Hunters of the Northern Plains. In Hunters of the Recent Past. edited by L. B. Davis and B. O. K. Reeves. Unwin Hyman, London, England
- Rickey, Don, Jr.
1956 Research Project to Locate Positions Held by Hostile Indians, June 25-26, 1876, around the Reno-Benteen Defense Perimeter. Manuscript on file, Harpers Ferry Center Archives, National Park, Harpers Ferry, WV.
- 1967 History of the Custer Battlefield. Custer Battlefield Historical and Museum Association. Billings, MT.
- 1996 Preface to Archaeological Investigations at the Renon-Benteen Defense Site, Little Bighorn Battlefield, Montana. Missouri Archaeologist 57:58-59.
- Rickey, Don, Jr. and J. W. Vaughn
Nd Metal Detection Survey at Reno-Benteen Battlefield, June 26-July 3, 1956 with handwritten addendum dated 1958. Ms on file White Swan Library, Little Bighorn Battlefield National Monument, Crow Agency, MT.
- Roll, Tom and Kenneth Deaver
1980 The Bootlegger Trail Site: A Late Prehistoric Spring Bison Kill. Report for Interagency Archaeological Services, Denver, CO.
- Ruebelmann, G. N.
1983 An Overview of the Archaeology and Prehistory of the Lewistown Bureau of Land Management District, Montana. Archaeology in Montana 24:3-165.
- Schoenberger, Dale T.
1990 A Trooper with Custer: Augustus DeVoto's Account of the Little Big Horn. Montana, The Magazine of Western History 40(1):68-71.

LITTLE BIGHORN

Scott, Douglas D.

- 1984a Archeological Research Design and Work Plan for Custer Battlefield National Monument, dated April 12, 1984. On file, National Park Service, Midwest Archeological Center, Lincoln, NE.
- 1984b Review of Custer Battlefield archeological project. Memorandum to Regional Archeologist Anderson, dated July 2, 1984. On file, National Park Service, Midwest Archeological Center, Lincoln, NE.
- 1987a Prehistoric Resources of Custer Battlefield. Rocky Mountain Region Archeological Project Report, dated April 1, 1987. On file, National Park Service, Midwest Archeological Center, Lincoln, NE.
- 1987b Surviving the Second Battle of the Little Bighorn: Effective Means of Dealing with a Media Blitz. In Captivating the Public through the Media While Digging the Past. Technical Series No. 1, Baltimore Center for Urban Archaeology. (edited by Kristen Peters, Elizabeth A. Comer, and Roger E. Kelly).
- 1989a Testing and Evaluation of Two Prehistoric Sites at Custer Battlefield National Monument. Rocky Mountain Region Archeological Project Report, dated September 1989. On file, National Park Service, Midwest Archeological Center, Lincoln, NE.
- 1989b Firearms Identification for the Archeologist. In From Chaco to Chaco, Archeological Society of New Mexico No. 15 publication in honor of Robert H. and Florence C. Lister edited by Meliha S. Duran and David T. Kirkpatrick, pp 141-151.
- 1991 Archeological Investigations at the Reno-Benteen Equipment Disposal Site. In Papers on Little Bighorn Battlefield Archeology: The Equipment Dump, Marker 7, and the Reno Crossing, edited by Douglas D. Scott, pps 1-184. Reprints in Anthropology Volume 42, J and L Reprint Co., Lincoln, NE.
- 1992 Exhumation of Little Bighorn Battle-related Human Remains from the Custer Battlefield National Cemetery. Rocky Mountain Region Archeological Project Report, dated May 20, 1992. On file, National Park Service, Midwest Archeological Center, Lincoln, NE.
- 1993a Archeological Mapping of the Pitsch Property: The Valley Fight Segment of the Battle of the Little Bighorn, Montana. Rocky Mountain Region Archeological Project Report, dated August 31, 1993. On file, National Park Service, Midwest Archeological Center, Lincoln, NE.
- 1993b Exhumations in Custer National Cemetery, Little Bighorn Battlefield National Monument, Montana. Ms on file Midwest Archeological Center, Lincoln.

REFERENCES CITED

- 1996 A Look at Cedar Coulee and Sharpshooter Ridge: Archeological Inventory of the Faron Iron Property Near Little Bighorn Battlefield National Monument. Ms on file, Midwest Archeological Center, National Park Service, Lincoln, NE.
- 1998a Archeological Inventory of the Indian Memorial Site, Little Bighorn Battlefield National Monument. Ms on file, Midwest Archeological Center, Lincoln, NE.
- 1998b Archeological Inventory of the Western Portion of the Irons Property and the Stops Property, Bighorn County, Montana. Ms on file, Midwest Archeological Center, Lincoln, NE.
- 2000 Outside the Boundaries: The 1999 Archeological Inventory of Properties Near the Little Bighorn Battlefield National Monument, 24BH2175. Midwest Archeological Center, Lincoln, NE.
- 2002 Archeological Investigations of the "Horse Cemetery" Site, Little Bighorn Battlefield National Monument. Midwest Archeological Center, National Park Service, Lincoln, NE.
- 2004 Men with Custer, The Dead Tell Their Tale. In G. A. Custer: His Life and Times, by Glenwood J. Swanson, pp 266-287. Swanson Productions, Agua Dulce, CA.
- 2006 Archeological Mitigation of the Federal Lands Highway Program Plan to Rehabilitate Tour Road, Route 10, Little Bighorn Battlefield National Monument, Montana. Midwest Archeological Center Technical Report 94, National Park Service, Lincoln, NE.
- Scott, Douglas and Melissa Connor
1986 Post-Mortem at the Little Bighorn. *Natural History* 95(6):46-55.
- Scott, Douglas and Richard Fox, Jr.
1987 Archeological Insights into the Custer Battle: A Preliminary Assessment. University of Oklahoma Press, Norman.
- Scott, Douglas, Melissa Connor, and Clyde Snow
1988 Nameless Faces of the Little Bighorn. *Greasy Grass* 4:2-5.
- Scott, Douglas and Dick Harmon
1988a A Sharps Rifle from the Battle of the Little Bighorn. *Man at Arms* 10(1):12-15.
- 1988b A Sharps Rifle from the Battle of the Little Bighorn, pp 12-15. In *Guns at the Little Bighorn*. Andrew Mowbray, Lincoln, RI.
- 2004 Firearms and Fields of Fire. In G. A. Custer: His Life and Times, by Glenwood J. Swanson, pp 288-324. Swanson Productions, Agua Dulce, CA.

LITTLE BIGHORN

- Scott, Douglas D., Richard A. Fox, Jr., Melissa A. Connor, and Dick Harmon
1989 Archaeological Perspectives on the Battle of the Little Bighorn. University of Oklahoma Press, Norman.
- Scott, Douglas and Douglas Owsley
1991 Oh, what tales bones could tell - and often do! Greasy Grass volume 7: 33-39.
- Scott, Douglas D. and Clyde Collins Snow
1991 Archeology and Forensic Anthropology of the Human Remains from the Reno Retreat Crossing, in Papers on Little Bighorn Battlefield Archeology: The Equipment Dump, Marker 7, and the Reno Crossing, edited by Douglas Scott. Reprints in Anthropology Volume 42, pp 207-236. J and L Reprint Co., Lincoln, NE.
- Scott, Douglas and P. Willey
1996 Custer's Men Took Names to Their Graves. Greasy Grass 12:20-28.
- Scott, Douglas D. and Peter Bleed
1997 A Good Walk Around the Boundary: Archeological Inventory of the Dyck and other Properties Adjacent to Little Bighorn Battlefield National Monument. Special Publication of the Nebraska Association of Professional Archeologists and the Nebraska State Historical Society, Lincoln, NE.
- Scott, Douglas D., Peter Bleed, Andrew E. Masich, and Jason Pitsch
1997 An Inscribed Native American Battle Image from the Little Bighorn Battlefield. Plains Anthropologist 42(161):287-302.
- Scott, Douglas D., P. Willey, and Melissa Connor
1998 They Died With Custer: The Soldiers' Skeletons From The Battle of the Little Bighorn. University of Oklahoma Press, Norman.
- Scott, Douglas D., Thomas D. Thiessen, Jeffrey J. Richner, and Scott Stadler
2006 An Archeological Inventory and Overview of Pipestone National Monument, Minnesota. Midwest Archeological Center Occasional Studies in Anthropology, No. 34. Midwest Archeological Center, National Park Service, Lincoln, NE.
- Scott, Douglas and Lucien Haag
2009 "Listen to the Minié Balls": Identifying Firearms in Battlefield Archaeology. In Fields of Conflict: Battlefield Archaeology from Imperial Rome to Korea, edited by Douglas Scott, Lawrence Babits, and Charles Haecker, pp 102-120. Potomac Books, Washington, DC
- Scott, Hugh Lenox
1928 Some Memories of a Soldier. The Century Co., New York.

- Scott, Linda C.
1987 Pollen Analysis of Stratigraphic De-posits at the Mill Iron Site, Southeastern Montana. Report by Palynological Associates for Bureau of Land Management, Montana State Office, Miles City.
- Shaffer, Brian
2008 Finger Bones Cut from the Men at Little Bighorn. Paper presented at the 73rd Annual Meeting of the Society for American Archaeology, Vancouver, BC.
- Shufeldt, R. W.
1910 Personal Adventures of a Human Skull Collector. *The Medical Council* 15(4):123-127.
- Shumate, M.
1965 Ancient Surface Finds from the Missouri Valley near Cascade, Montana. *Archaeology in Montana* 6(2): 17-19.
- Sills, Joe, Jr.
1994 Weir Point Perspective. 7th Annual Symposium Custer Battlefield Historical and Museum Association, Inc. pp 45-51, privately published, Hardin, MT.
- Sledzik, Paul S. and Lars G. Sandberg
2002 The Effects of Nineteenth-Century Military Service on Health. In *The Backbone of History: Health and Nutrition in the Western Hemisphere*, edited by Richard H. Steckel and Jerome C. Rose, pp 185-207. Cambridge University Press, Cambridge.
- Snow, Clyde Collins and John Fitzpatrick
1989 Human Osteological Remains from the Battle of the Little Bighorn. In *Archaeological Perspectives On the Battle of the Little Bighorn*, by Douglas D. Scott, Richard A. Fox, Jr., Melissa A. Connor, and Dick Harmon, University of Oklahoma Press, Norman.
- Stewart, Edgar I.
1955 *Custer's Luck*. University of Oklahoma Press, Norman.
- Tabrum, Alan R.
1978 Report on the Plesiosaur Collected at Custer Battlefield National Monument. Department of Geology, University of Montana, Missoula.
- Taunton, Francis B.
1986 Custer's field "A Scene of Sickening Horror." Johnson-Taunton Military Press, London.

1987 *The Enigma of Weir Point. No Pride in the Little Big Horn*, Special Publication No. 7. The English Westerners' Society, London:17-41.

LITTLE BIGHORN

Utley, Robert

1972 *The Reno Court of Inquiry: the Chicago Times Account*. Old Army Press, Fort Collins, CO.

1986 *On Digging Up Custer Battlefield*. *Montana: The Magazine of Western History* 36(1):80-82.

1988 *Cavalier in Buckskin: George Armstrong Custer and the Western Military Frontier*. University of Oklahoma Press, Norman.

2004 *Custer and Me: A Historian Memoir*. University of Oklahoma Press, Norman.

Vaughn, J. W.

1956 *With Crook on the Rosebud*. Stackpole, Harrisburg, PA.

1966 *Indian Fights: New Facts on Seven Encounters*. University of Oklahoma Press, Norman.

Vihlne, Shannon M.

2008 *Custer's Last Drag: An Examination of Tobacco Use Among the Seventh Cavalry During the Nineteenth Century*. MA thesis, Department of Anthropology, University of Montana, Missoula.

Waldbauer, Richard and Sherry Hutt

2006 *The Antiquities Act and its Centennial*. *CRM: The Journal of Heritage Stewardship* 3(1):36-48.

Walker-Kuntz, Patrick J. and Sunday Walker-Kuntz

1999 *Battlefield - East Highway 212 Cultural Resource Inventory in Big Horn County, Montana*. Ethnoscience Inc., Billings, MT.

War Department

1879 *Ordnance Notes*, no. 115. Washington, D.C.

Weibert, Don

1989 *Cartridges, Cases, and Custer*. Privately published by the author, Billings, MT.

Weibert, Henry and Don Weibert

1985 *Sixty-six Years in Custer's Shadow*. Falcon Press, Billings, MT.

Wells, Wayne

1989 *The Fight on Calhoun Hill*. 2nd Annual Symposium Custer Battlefield Historical and Museum Association, Inc. pp 22-34, privately published, Hardin, MT.

Wheeler, H. W.

1923 *Buffalo Days*. Bobbs-Merrill, Indianapolis.

REFERENCES CITED

- Willey, P.
1993 Osteological Analysis of Human Remains from the Custer Battlefield National Cemetery. California State University, Chico, CA.
- 1994 Human Osteology of the Pitsch Burials. Midwest Archeological Center, Lincoln, Nebraska.
- 1995 Osteological Analysis of Scattered Human Bones from the Little Bighorn Battlefield National Monument. MS on file, Little Bighorn Battlefield National Monument, Crow Agency, Montana.
- 1997 Osteological Analysis of Human Skeletons Excavated from the Custer National Cemetery. Technical Report No. 50, Midwest Archeological Center, National Park Service, Lincoln, NE.
- Willey, P. and Douglas D. Scott
1996 'The Bullets Buzzed Like Bees': Gunshot Wounds in Skeletons from the Battle of the Little Bighorn. *International Journal of Osteoarchaeology* 6(1):15-27.
- Willey, P. and Douglas D. Scott
1999 Clinkers on the Little Bighorn Battlefield: In Situ Investigations of Scattered Recent Cremains. In *Forensic Osteological Analysis: A Book of Case Studies* edited by Scott I. Fairgrieve, pages 129-140, Charles C. Thomas, Springfield, IL.
- Willey, P., Amanda Blanchard, Thomas D. Holland, and Douglas D. Scott
2004 A Case of Mistaken Identity. *Greasy Grass* 20:16-21.

LITTLE BIGHORN

APPENDIX

BIBLIOGRAPHY OF ARCHEOLOGICAL REPORTS AND RELATED PUBLICATIONS RELATING TO LITTLE BIGHORN BATTLEFIELD NATIONAL MONUMENT

Applied Ground Imaging

1996 Little Bighorn Battlefield, Montana, Non-Intrusive Characterization Survey Field Project, Ground Penetrating Radar Survey. Manuscript report on file Midwest Archeological Center, Lincoln, NE.

Barnard, Warren E. "Sandy"

1985 Volunteers Crucial in Custer Battle Dig. *CRM Bulletin* 8(5):2-3).

1995 Edward Botzer: Was He Custer's 'Last Trooper?'. *Greasy Grass* 11:2-4

1998 *Digging Into Custer's Last Stand*. AST Press, Terra Haute, IN.

Bennett, Connie

1977 Preconstruction archeological investigations at Custer Battlefield National Monument. Memo report on file, National Park Service, Midwest Archeological Center, Lincoln, NE.

Benson, Christopher

2000 A GIS for the Little Bighorn Battlefield National Monument. Paper presented at the 2000 ESRI GIS Conference, posted on the ESRI website as of June 6, 2005, <http://gis.esri.com/library/userconf/proc00/professional/papers/PAP338/p338.htm>.

Bozell, John R.

1985 Non-Human Vertebrate Faunal Remains Recovered During 1984 Surface Collections at the Custer Battlefield National Monument, Montana. Ms. on file Midwest Archeological Center, Lincoln, NE.

1989 Non-Human Vertebrate Faunal Remains from Custer Battlefield National Monument. In *Archaeological Perspectives On the Battle of the Little Bighorn*, by Douglas D. Scott, Richard A. Fox, Jr., Melissa A. Connor, and Dick Harmon, pps 283-298. University of Oklahoma Press, Norman.

Bray, Robert

1958 A report of archeological investigations at the Reno-Benteen site Custer Battlefield National Monument June 2 - July 1, 1958. Ms on file Midwest Archeological Center, Lincoln, NE.

1996 Archaeological Investigations at the Renon-Benteen Defense Site, Little Bighorn Battlefield, Montana. *Missouri Archaeologist* 57:58-95.

LITTLE BIGHORN

Broome, Jeff

2000 On Locating the Kidder Massacre Site of 1867. *The Denver Westerners Roundup*, 56(4):3-18.

2002 Custer, Kidder and Tragedy at Beaver Creek. *Wild West*, 15(1):38-48.

2003 Indian Massacres in Elbert County, Colorado: New Information on the 1864 Hungate and 1868 Dietemann Murders. *The Denver Westerners Roundup* 60(1):3-30.

2006 Custer's Summer Indian Campaign of 1867: New Information on the U.S. Seventh Cavalry Desertions at Riverside Station. *Little Big Horn Associates Research Review* 20(2):17-30.

2007a Custer's First Fight with Plains Indians. *Wild West* 20(1):28-35.

2007b Custer's Summer Indian Campaign of 1867. *The Denver Westerners Roundup* 65(4):3-33.

2009 *Custer into the West with the Journal and Maps of Lieutenant Henry Jackson*. Upton and Sons, El Segundo, CA.

Coleman Research

1996 Little Bighorn Measurements II, Processing Results, Final Report. Coleman Research Corp. MS on file, Midwest Archeological Center, National Park Service, Lincoln, NE.

Connor, Melissa

1986 Exhumation of Grave 402, Block B, Custer Battlefield National Cemetery. Rocky Mountain Region Archeological Project Report, dated April 8, 1986. On file, National Park Service, Midwest Archeological Center, Lincoln, NE.

1991 The Application of Comparative Bone Histology to Fragmented Archeological Bone from the Reno-Benteen Dump, Custer Battlefield National Monument. Appendix B of Archeological Investigations at the Reno-Benteen Equipment Disposal Site, in *Papers on Little Bighorn Battlefield Archeology: The Equipment Dump, Marker 7, and the Reno Crossing*, edited by Douglas D. Scott, pps 148-166. *Reprints in Anthropology Volume 42*, J and L Reprint Co., Lincoln, NE.

1994 Exhumation of Human Remains on the Pitsch Property Near Little Bighorn Battlefield National Monument. MS on file, Midwest Archeological Center, National Park Service, Lincoln, NE.

Connor, Melissa and Douglas D. Scott

1998 Metal Detector Use in Archaeology: An Introduction. *Historical Archaeology* 32(4):73-82.

De Vore, Steven L.

2002a Search for the Horse Burial Pit: Conductivity and Magnetic Gradient Investigations at Last Stand Hill, Little Bighorn Battlefield National Monument, Montana. Midwest Archeological Center, National Park Service, Lincoln, NE.

2002b Search for the Horse Burial Pit: Conductivity and Magnetic Gradient Investigations at Last Stand Hill, Little Bighorn Battlefield National Monument, Montana. Appendix B in Archeological Investigations of the "Horse Cemetery" Site, Little Bighorn Battlefield National Monument, by Douglas D. Scott. Midwest Archeological Center, National Park Service, Lincoln, NE.

2002c Trip Report – Inadvertent Discovery of Remains Related to Fort Phil Kearney reinterments. Memorandum on file, Midwest Archeological Center, National Park Service, Lincoln, NE.

2005 Geophysical Investigations of the Reno-Benteen Defensive Site, Little Bighorn Battlefield National Monument, Bighorn County, Montana. Report on file, Midwest Archeological Center, National Park Service, Lincoln, NE.

Fox, Richard A., Jr.

1983 1983 Archeological Investigations at Custer Battlefield National Monument. MS on file at Custer Battlefield National Monument, Crow Agency, MT.

1984 Suggestions for Archaeological Investigations at Custer Battlefield National Monument. Ms on file, Little Bighorn Battlefield National Monument, Crow Agency, MT.

1988 Discerning History Through Archaeology: The Custer Battle. Ph.D. Dissertation, Department of Archaeology, University of Calgary, Calgary, Alberta, Canada.

1993 *Archaeology, History, and Custer's Last Battle*. University of Oklahoma Press, Norman.

1996a West River History: The Indian Village on Little Bighorn River, June 25-26, 1876. In *Legacy, New Perspectives on the Battle of the Little Bighorn*, edited by Charles E. Rankin, pp 139-166, Montana Historical Society Press, Helena.

1996b The Value of Oral History: White Eagles Account. 9th Annual Symposium Custer Battlefield Historical and Museum Association, Hardin, Montana, no publisher noted, pps 1-28.

2005 Native and "Newcomer": Battle of the Little Bighorn. In *Unlocking the Past: Celebrating Historical Archaeology in North America*, edited by Lu Ann De Cunzo and John H. Jameson, Jr., pp 166-173. The Society for Historical Archaeology and University Press of Florida, Gainesville.

LITTLE BIGHORN

Fox, Richard A., Jr. and Douglas D. Scott

1991 The Post-Civil War Battlefield Pattern. *Historical Archaeology* 25(2):92-103.

Glenner, Richard A., P. Willey, and Douglas D. Scott

1994 Back to the Little Bighorn: Remains of a 7th Cavalry Trooper, Recovered at the Little Bighorn battlefield in 1903, Provide A Glimpse of Nineteenth Century Dental Practices. *Journal of the American Dentistry Association*, 125:835-843.

Greene, Jerome A.

1979 *Evidence and the Custer Enigma: A Reconstruction of Indian-Military History*. Outbooks, Reno, NV.

Haynes, C. Vance Jr.

1989 Archaeological Geology of Deep Ravine, Custer Battlefield National Monument. In *Archeological Perspectives on the Battle of the Little Big Horn*. by Douglas D. Scott, Richard A. Fox Jr, Melissa A. Connor, and Dick Harmon, pp. 224-242, University of Oklahoma Press, Norman.

1990 Geoarchaeological Investigations at Custer Battlefield National Monument, 1989. Ms on file Midwest Archeological Center, Lincoln.

1991 Geoarcheological Investigations at Custer Battlefield National Monument. Appendix C. of Archeological Investigations at the Reno-Benteen Equipment Disposal Site, in Papers on Little Bighorn Battlefield Archeology: The Equipment Dump, Marker 7, and the Reno Crossing, edited by Douglas D. Scott, pps 167-184. *Reprints in Anthropology Volume 42*, J and L Reprint Co., Lincoln.

Hedren, Paul L.

1973 Carbine Extraction Failure at the Little Big Horn: A New Examination. *Military Collector and Historian* 25(2):66 68.

Heinz, Ralph

1989 Tack rivets. pp. 205-206. In *Archaeological Perspectives on the Battle of the Little Bighorn*. University of Oklahoma Press, Norman by Douglas D. Scott, Richard A. Fox Jr., Melissa Connor, and Dick Harmon, University of Oklahoma Press, Norman.

1990 Cavalry Equipment From Reno/Benteen Dump Site (1989). Ms on file Midwest Archeological Center, Lincoln, NE.

Heski, Thomas M.

1997 "Digging" and "Picking" to the Powder: The Yellowstone Expedition's Route from O'Fallon Creek to Powder River, June 7, 1876. *Research Review: The Journal of the Little Big Horn Associates* 11(1):11-17, 31.

2001 Camp Powell: The Powder River Supply Depot. *Research Review: The Journal of the Little Big Horn Associates* 17(1):13-24.

- Horsted, Paul, Ernest Grafe, and Jon Nelson
2009 *Crossing the Plains with Custer*. Golden Valley Press, Custer, SD.
- Johnson, Randy and Nancy Allan
1999 *A Dispatch to Custer: The Tragedy of Lieutenant Kidder*. Mountain Press Publishing, Missoula, MT.
- Jones, Bruce A.
2002 *Historical Archeology at the Village on Pawnee Fork, Ness County, Kansas*. Technical Report No. 86, Midwest Archeological Center, National Park Service, Lincoln, NE.
- Josten, N. E. and G. S. Carpenter
1995 *Results from Rapid Geophysical Surveyor Investigation of Archaeological Sites at the Little Bighorn Battlefield National Monument*. Idaho National Engineering Laboratory, Idaho Falls.
- Lees, William B., Douglas D. Scott, and C. Vance Haynes
2001 *History Underfoot: The Search for Physical Evidence of the 1868 Attack on Black Kettle's Village*. *Chronicles of Oklahoma* 79(2):158-181.
- Nickel, Robert K.
2002a *A Ground-Penetrating Radar Search for a Horse Burial Pit Associated with the 1876 Battle of the Little Bighorn*. Midwest Archeological Center, National Park Service, Lincoln, NE.

2002b *A Ground-Penetrating Radar Search for a Horse Burial Pit Associated with the 1876 Battle of the Little Bighorn, Appendix A in Archeological Investigations of the "Horse Cemetery" Site, Little Bighorn Battlefield National Monument*, by Douglas D. Scott. Midwest Archeological Center, National Park Service, Lincoln, NE.
- Owsley, Douglas W.
1994 *A Report on Bone Specimens 94MAR5(3M) and 94MAR5(4M6)*. Manuscript on file Little Bighorn Battlefield National Monument, Crow Agency, MT.
- Phillips, Patrick
1981 *Tin Cans*. In *Archaeological Perspectives on the Battle of the Little Bighorn* by Douglas D. Scott, Richard A. Fox Jr., Melissa Connor, and Dick Harmon, pp. 215-221. University of Oklahoma Press, Norman.

1987 *Cannibalism, Combat and Post Battle Mutilation: Observed Similarities Between Cannibalism Criteria and Human Remains From Custer Battlefield*. Master of Arts Thesis, Department of Anthropology, University of Nebraska, Lincoln.

LITTLE BIGHORN

Pieters, Nancy and Sandy Barnard

1986 Reburial Service at Custer Battlefield. *Courier, NPS Newsletter* 31(10):21-22.

Pitsch, Jason with Keith Werts

2009 The Burial Site of Limber Bones. *Greasy Grass*, volume 25:40-42.

Rea, Bob

1998 The Washita Trail: The Seventh U.S. Cavalry's Route of March to and from the Battle of the Washita. *Chronicles of Oklahoma* 76(3):244-261.

Rickey, Don, Jr.

1956 Research Project to Locate Positions Held by Hostile Indians, June 25-26, 1876, around the Reno-Benteen Defense Perimeter. Manuscript on file, Harpers Ferry Center Archives, National Park, Harpers Ferry, WV.

1967 *History of the Custer Battlefield*. Custer Battlefield Historical and Museum Association. Billings, MT.

1996 Preface to Archaeological Investigations at the Renon-Benteen Defense Site, Little Bighorn Battlefield, Montana. *Missouri Archaeologist* 57:58-59.

Rickey, Don, Jr. and J. W. Vaughn

Nd Metal Detection Survey at Reno-Benteen Battlefield, June 26-July 3, 1956 with handwritten addendum dated 1958. Ms on file White Swan Library, Little Bighorn Battlefield National Monument, Crow Agency, MT.

Scott, Douglas D.

1984a Archeological Research Design and Work Plan for Custer Battlefield National Monument, dated April 12, 1984. On file, National Park Service, Midwest Archeological Center, Lincoln, NE.

1984b Review of Custer Battlefield archeological project. Memorandum to Regional Archeologist Anderson, dated July 2, 1984. On file, National Park Service, Midwest Archeological Center, Lincoln, NE.

1987a The Recovery and Replacement of a Cremated Burial at Custer Battlefield National Monument. Rocky Mountain Region Archeological Project Report, dated February 27, 1987. On file, National Park Service, Midwest Archeological Center, Lincoln, NE.

1987b Prehistoric Resources of Custer Battlefield. Rocky Mountain Region Archeological Project Report, dated April 1, 1987. On file, National Park Service, Midwest Archeological Center, Lincoln, NE.

- 1987c Surviving the Second Battle of the Little Bighorn: Effective Means of Dealing with a Media Blitz. In *Captivating the Public through the Media While Digging the Past*. Technical Series No. 1, Baltimore Center for Urban Archaeology. (edited by Kristen Peters, Elizabeth A. Comer, and Roger E. Kelly).
- 1987d Identification of additional markers with human bone association. Memorandum to Superintendent, Custer Battlefield National Monument, dated December 21, 1987. On file, National Park Service, Midwest Archeological Center, Lincoln, NE.
- 1989 Testing and Evaluation of Two Prehistoric Sites at Custer Battlefield National Monument. Rocky Mountain Region Archeological Project Report, dated September 1989. Manuscript on file, Midwest Archeological Center, National Park Service, Lincoln, NE.
- 1990 Interpreting Archaeology at Custer's Last Stand. In *What's Past is Prologue Our Legacy Our Future*, edited by David L. Kulhavy and Michael H. Legg, pp 159-163. National Interpreters Workshop, Center for Applied Studies, School of Forestry Stephen F. Austin State University, Nacogdoches, LA.
- 1991a Papers on Little Bighorn Battlefield Archeology: The Equipment Dump, Marker 7, and the Reno Crossing. *Reprints in Anthropology Volume 42*, J and L Reprint Co., Lincoln, NE.
- 1991b Archeological Investigations at the Reno-Benteen Equipment Disposal Site. In Papers on Little Bighorn Battlefield Archeology: The Equipment Dump, Marker 7, and the Reno Crossing, edited by Douglas D. Scott, pps 1-184. *Reprints in Anthropology Volume 42*, J and L Reprint Co., Lincoln, NE.
- 1991c Trip report on reburial of soldier remains at Custer Battlefield National Monument. Memorandum to Chief, Midwest Archeological Center, dated June 22, 1991. On file, National Park Service, Midwest Archeological Center, Lincoln, NE.
- 1992a So as to Render Unserviceable to the Enemy: Archaeology at the Reno-Benteen Equipment Disposal Site. *5th Annual Symposium*, pp 84-96. Custer Battlefield Historical and Museum Association, Hardin, MT.
- 1992b Exhumation of Little Bighorn Battle-related Human Remains from the Custer Battlefield National Cemetery. Rocky Mountain Region Archeological Project Report, dated May 20, 1992. On file, National Park Service, Midwest Archeological Center, Lincoln, NE.
- 1992c Deep Ravine Overlook Site Little Bighorn National Battlefield, Montana. Rocky Mountain Region Archeological Project Report, dated July 14, 1992. On file, National Park Service, Midwest Archeological Center, Lincoln, NE.

LITTLE BIGHORN

- 1992d Trip Report to Little Bighorn Battlefield National Monument (LIBI). Memorandum to Chief, Midwest Archeological Center, dated June 30, 1992. On file, National Park Service, Midwest Archeological Center, Lincoln, NE.
- 1992e Trip report for National Archives research. Memorandum to Chief, Midwest Archeological Center, dated September 10, 1992. On file, National Park Service, Midwest Archeological Center, Lincoln, NE.
- 1993a Archeological Mapping of the Pitsch Property: The Valley Fight Segment of the Battle of the Little Bighorn, Montana. Rocky Mountain Region Archeological Project Report, dated August 31, 1993. On file, National Park Service, Midwest Archeological Center, Lincoln, NE.
- 1993b Trip report on the Reno-Benteen Walkway fill project, Little Bighorn National Battlefield. Memorandum to Chief, Midwest Archeological Center, dated September 20, 1993. On file, National Park Service, Midwest Archeological Center, Lincoln, NE.
- 1994 Assessment of Little Bighorn Grassfire on Cultural Resources. Memorandum to Assistant Regional Director, Anthropology/Archeology dated August 10, 1994. Copy on file Midwest Archeological Center, National Park Service, Lincoln, NE.
- 1995 Little Bighorn Battlefield National Monument Remote Sensing Exercise and Percolation Test Sites Inventory. Memorandum to Acting Assistant Regional Director, Anthropology/Archeology dated March 24, 1995. Copy on file Midwest Archeological Center, National Park Service, Lincoln, NE.
- 1996a Archaeological Perspectives on the Battle of the Little Bighorn: A Retrospective. In *Legacy, New Perspectives on the Battle of the Little Bighorn*, edited by Charles E. Rankin, pp 167-188, Montana Historical Society Press, Helena.
- 1996b A Look at Cedar Coulee and Sharpshooter Ridges: Archeological Inventory of the Faron Iron Property Near Little Bighorn Battlefield National Monument. Midwest Archeological Center, National Park Service, Lincoln, NE.
- 1996c Trip Report on Riflepit Restoration at Reno-Benteen Defense Site, Little Bighorn Battlefield National Monument. Midwest Archeological Center, National Park Service, Lincoln, NE.
- 1998a Archeological Inventory of the Indian Memorial Site, Little Bighorn Battlefield National Monument. Ms on file, Midwest Archeological Center, Lincoln, NE.
- 1998b Archeological Inventory of the Western Portion of the Irons Property and the Stops Property, Bighorn County, Montana. Ms on file, Midwest Archeological Center, Lincoln, NE.

- 1999a Archaeologists: Battlefield Detectives. In *Little Bighorn Remembered: The Untold Story of Custer's Last Stand* edited by Herman J. Viola, pp 165-177, Times Books, New York.
- 1999b Archeological Inventory of the Site of a Water Gauging Station on the Little Bighorn River, Montana. Ms on file, Midwest Archeological Center, Lincoln, NE.
- 2000a Outside the Boundaries: The 1999 Archeological Inventory of Properties Near the Little Bighorn Battlefield National Monument, 24BH2175. Ms on file, Midwest Archeological Center, Lincoln, NE.
- 2000b Archeological Investigations of Custer's June 23, 1876 Campsite, Rosebud County, Montana. Ms on file, Midwest Archeological Center, Lincoln, NE.
- 2001 Washita Present Comments. In *Washita Symposium: Past, Present, and Future*, pp 59-63. Washita Battlefield, Cheyenne, OK.
- 2002a Cartridges, Bones, and Bullets: A Look Back at Archaeology of the Little Bighorn. *Greasy Grass* 18:24-30.
- 2002b Cartridges, Bullets, and Bones: The Value of Archaeology of the Little Bighorn Battle. *Battlefields Review* Issue 19:26-31.
- 2002c Archeological Investigations of the "Horse Cemetery" Site, Little Bighorn Battlefield National Monument. Midwest Archeological Center, National Park Service, Lincoln, NE.
- 2004a The Little Bighorn Battlefield. In *Encyclopedia of the Great Plains* edited by David J. Wishart, pp 830-831. University of Nebraska Press, Lincoln.
- 2004b Men with Custer, The Dead Tell Their Tale. In *G. A. Custer: His Life and Times*, by Glenwood J. Swanson, pp 266-287. Swanson Productions, Agua Dulce, CA.
- 2005a Archeological Inventory of the Little Bighorn Battlefield National Monument Visitors Center. Ms on file, Midwest Archeological Center, Lincoln, NE.
- 2005b Preliminary Artefact Finds. *Battlefields Annual Review*, edited by Jon Cooksey, pg 12. Pen and Sword Military Books, Barnesly, South Yorkshire, UK.
- 2005c Interpreting Archeology at the Little Bighorn Battlefield National Monument. In *Preserving Western History*, edited by Andrew Gulliford, pp 20-31. University of New Mexico Press, Albuquerque.

LITTLE BIGHORN

2006 Archeological Mitigation of the Federal Lands Highway Program Plan to Rehabilitate Tour Road, Route 10, Little Bighorn Battlefield National Monument, Montana. Midwest Archeological Center Technical Report 94, National Park Service, Lincoln, NE.

2009 Battlefield Archaeology: Some New Insights into Custer's Last Stand. In *Schlachtfeldarchäologie*, edited by Harald Meller, pp 253-257. Tagungen des Landesmuseums für Vorgeschichte, Halle.

Scott, Douglas and Richard Fox, Jr.

1987 *Archaeological Insights into the Custer Battle: A Preliminary Assessment*. University of Oklahoma Press, Norman.

Scott, Douglas, and Melissa Connor

1986 Post-Mortem at the Little Bighorn. *Natural History* 95(6):46-55.

1988 Reburial at the Little Bighorn. *CRM Bulletin* 11(5-6):6-8. National Park Service.

Scott, Douglas, Melissa Connor, and Clyde Snow

1988 Nameless Faces of the Little Bighorn. *Greasy Grass* 4:2-5

Scott, Douglas and Dick Harmon

1988a A Sharps Rifle from the Battle of the Little Bighorn. *Man at Arms* 10(1):12-15.

1988b A Sharps Rifle from the Battle of the Little Bighorn, pp 12-15. In *Guns at the Little Bighorn*. Andrew Mowbray, Lincoln, RI.

2004 Firearms and Fields of Fire. In G. A. *Custer: His Life and Times*, by Glenwood J. Swanson, pp 288-324. Swanson Productions, Agua Dulce, CA.

Scott, Douglas D., Richard A. Fox, Jr., Melissa A. Connor, and Dick Harmon

1989 *Archaeological Perspectives On the Battle of the Little Bighorn*. University of Oklahoma Press, Norman.

Scott, Douglas D. and Clyde Collins Snow

1991a Mitigative Excavations at Marker 7, in *Papers on Little Bighorn Battlefield Archeology: The Equipment Dump, Marker 7, and the Reno Crossing*, edited by Douglas Scott. *Reprints in Anthropology* Volume 42, pp 185-206. J and L Reprint Co., Lincoln, NE.

1991b Archeology and Forensic Anthropology of the Human Remains from the Reno Retreat Crossing, in *Papers on Little Bighorn Battlefield Archeology: The Equipment Dump, Marker 7, and the Reno Crossing*, edited by Douglas Scott. *Reprints in Anthropology* Volume 42, pp 207-236. J and L Reprint Co., Lincoln, NE.

- Scott, Douglas and Douglas Owsley
1991 Oh, what tales bones could tell - and often do! *Greasy Grass* volume 7: 33-39.
- Scott, Douglas and P. Willey
1995 The Custer Battlefield National Cemetery Human Remains Identification Project. *8th Annual Symposium, Custer Battlefield Historical and Museum Association, Inc.*, pp 12-29, no publisher or location noted.

1996 Custer's Men Took Names to Their Graves. *Greasy Grass* 12:20-28.
- Scott, Douglas and P. Willey
1997 Little Bighorn: Human Remains from the Custer National Cemetery. In *In Remembrance: Archaeology and Death* edited by David A. Poirier and Nicholas F. Bellantoni, pp 155-171. Bergin and Garvey, Westport, CT.
- Scott, Douglas D., P. Willey, and Melissa A. Connor
1998 *They Died with Custer: Soldier's Bones from the Battle of the Little Bighorn*. University of Oklahoma Press, Norman.
- Scott, Douglas D. and Peter Bleed
1997a *A Good Walk Around the Boundary: Archeological Inventory of the Dyck and other Properties Adjacent to Little Bighorn Battlefield National Monument*. Special Publication of the Nebraska Association of Professional Archeologists and the Nebraska State Historical Society, Lincoln, NE.
- Scott, Douglas D., Peter Bleed, Andrew E. Masich, and Jason Pitsch
1997b An Inscribed Native American Battle Image from the Little Bighorn Battlefield. *Plains Anthropologist* 42(161):287-302.
- Snow, Clyde Collins and John Fitzpatrick
1989 Human Osteological Remains from the Battle of the Little Bighorn. In *Archaeological Perspectives On the Battle of the Little Bighorn*, by Douglas D. Scott, Richard A. Fox, Jr., Melissa A. Connor, and Dick Harmon, University of Oklahoma Press, Norman.
- Vaughn, J. W.
1966 *Indian Fights: New Facts on Seven Encounters*. University of Oklahoma Press, Norman.
- Vihlene, Shannon M.
2008 Custer's Last Drag: An Examination of Tobacco Use Among the Seventh Cavalry During the Nineteenth Century. MA thesis, Department of Anthropology, University of Montana, Missoula.
- Walker-Kuntz, Patrick J. and Sunday Walker-Kuntz
1999 Battlefield - East Highway 212 Cultural Resource Inventory in Big Horn County, Montana. Ethnoscience Inc., Billings, MT.

LITTLE BIGHORN

Willey, P.

1989 Unpublished notes on Reno Crossing skeletal remains. On file at the National Park Service, Midwest Archeological Center, Lincoln, NE.

1994 Human Osteology of the Pitsch Burials. Midwest Archeological Center, Lincoln, NE.

1995 Osteological Analysis of Scattered Human Bones from the Little Bighorn Battlefield National Monument. MS on file, Little Bighorn Battlefield National Monument, Crow Agency, MT.

1996 Osteological Analysis of Human Skeletons Excavated from the Custer Battlefield National Cemetery. National Park Service, Midwest Archeological Center, Lincoln, NE.

1996 Human Skull and Mandible (LIBI 1996 HR-1 and HR-2) Attributed to and Non-Human Bones (LIBI HR-3 through HR-6) Found on the Little Bighorn Battlefield, Montana. Department of Anthropology, Chico State University, Chico, CA.

1997 Osteological Analysis of Human Skeletons Excavated from the Custer National Cemetery. Technical Report No. 50, Midwest Archeological Center, National Park Service, Lincoln, NE.

Willey, P. and Douglas D. Scott

1996 'The Bullets Buzzed Like Bees': Gunshot Wounds in Skeletons from the Battle of the Little Bighorn. *International Journal of Osteoarchaeology* 6(1):15-27.

1997 Abstract: Who's Buried in Custer's Grave? *Proceedings of the American Academy of Forensic Sciences* 3.

Willey, P. and Douglas D. Scott

1999 Clinkers on the Little Bighorn Battlefield: In Situ Investigations of Scattered Recent Cremains. In *Forensic Osteological Analysis: A Book of Case Studies* edited by Scott I. Fairgrieve, pages 129-140, Charles C. Thomas, Springfield, IL.

Willey, P. and Douglas D. Scott

1999 Who's Buried in Custer's Grave? *Journal of Forensic Sciences* 44(3):656-665.

Willey, P., Richard A. Glenner, and Douglas D. Scott

1996 Oral Health of Seventh Cavalry troopers: Dentitions from the Custer National Cemetery. *Journal of the History of Dentistry* 44(1):3-14.

Willey, P., Amanda Blanchard, Thomas D. Holland, and Douglas D. Scott

2004 A Case of Mistaken Identity. *Greasy Grass* 20:16-21.