AN ARCHEOLOGICAL INVENTORY AND OVERVIEW OF PIPESTONE NATIONAL MONUMENT, MINNESOTA

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ABSTRACT

This volume provides an overview of the history of archeological investigations conducted at the famous catlinite quarries that constitute one of the primary resources of Pipestone National Monument, Pipestone County, Minnesota. It also provides an inventory of the 43 identified archeological localities or, in Archeological Sites Management Information System (ASMIS) terms, subsites that comprise the monument, the entirety of which is officially recorded as archeological site 21PP2. Euroamerican knowledge of the catlinite quarries since the seventeenth century is summarized and nineteenth-century antiquarian interest in them is reviewed. Professional archeological investigations of the quarries, which began in 1882 and have continued to the present day, are summarized and archeological inventory investigations conducted in 1993, 1994, and 1997-1998 are described. The latter investigations were conducted under the aegis of the National Park Service's Systemwide Archeological Inventory Program (SAIP), and were synchronized with prescribed fire burns to reduce vegetative fuel load and encourage the growth of native prairie vegetation. The SAIP inventory was facilitated by the development of a photogrametrically-produced, geo-referenced base map with 50-centimeter contour intervals. Test excavations were conducted at the Richner site, an extensive prehistoric artifact scatter, and at a stone circle site discovered in 1994.

Catlinite as a geological substance is also summarized in the report and past chemical and mineralogical studies designed to characterize catlinite and other pipestones, as well as to correlate archeological artifacts of catlinite with geological material sources, are reviewed.

The 43 archeological localities, or ASMIS subsites, are comprised of stone quarries, petroglyphs, mounds, stone circles, artifact scatters representing temporary habitation and catlinite workshop sites, a group of presumed tool sharpening grooves, and historic graffiti. Historic and archeological clues to the existence of a small cemetery for students of the Pipestone Indian School, used around the turn of the twentieth century, exist but this feature is not considered an archeological resource and its existence remains to be confirmed through non-invasive geophysical methods such as ground-penetrating radar. The monument's Native American rock art, found both in situ and on slabs of quartzite removed from their original location near the Three Maidens boulders during the late nineteenth century, was also documented as part of the 1990s inventory efforts. Test excavations and observations of the extent of ground surface disturbance due to the actions of burrowing rodents suggest that the monument's soil mantle is experiencing on-going bioturbation which leads to repeated cycles of burial, exposure, reburial, and reexposure of archeological artifacts and features. It is recommended that archeological inventory investigations and total station transit mapping continue to be synchronized with future prescribed burns to increase knowledge of the monument's archeological resource base as this burial/exposure cycle takes place.

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Pipestone National Monument in its entirety is a property listed on the National Register of Historic Places. In addition, the rock art sites of the monument, both those that occur in situ and that represented on the displaced slabs, are contributing elements of a multiple property National Register of Historic Places district based on the theme of American Indian rock art in the state of Minnesota.

This study is respectfully dedicated to the memory of
Paul L. Beaubien and John S. ("Steve") Sigstad,
whose pioneering studies of the archeology of Pipestone
National Monument opened the doors for our research.

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Many people contributed in numerous ways to the research reported in this volume. Foremost among them is Alan R. Woolworth of the Minnesota Historical Society, who repeatedly shared his extensive files and knowledge and offered wise counsel on many occasions. Dr. Don Stevens of the National Park Service's Midwest Regional Office generously shared information gathered during his on-going historical research relating to Pipestone National Monument. Dr. Jean Prior of the University of Iowa advised us of the Samuel Calvin photos, and Julie Golden provided prints of them. Steven R. Schulze, Court Administrator of Pipestone County, furnished a copy of Charles Bennett's will. Dr. David Breternitz, formerly of the University of Colorado, shared his personal file on John S. Sigstad's 1965 research. Paula Flemming of the National Anthropological Archives and anthropology collections manager Deborah Hull-Walski of the National Museum of Natural History, Smithsonian Institution, assisted our search for archival and artifact holdings relating to early research at the Pipestone quarries. Marni Schlesinger-Harris of the Library of Michigan, Barbara Louie of the Detroit Public Library, Russell Martin of the American Antiquarian Society, and Miriam Touba of the New-York Historical Society helped locate issues of the Norris Suburban newspaper containing information about the catlinite quarries; in addition, Ms. Touba transcribed part of one of Philetus W. Norris' The Great West columns in that newspaper. Roberta W. Williamson, Director, Moody County Historical Society, Flandreau, helped search for information about former Flandreau resident, George A. Perley. David Rambow and Chris Roelfsema-Hummel, past directors of the Pipestone County Historical Society made the resources of the Society available to us. Rambow generously shared many of his personal research files, which contained much information new to us. Rambow, Robert Kolbe of Sioux Falls, South Dakota, and Donald Schwarck of South Lyon, Michigan, kindly shared copies of Illingworth stereographs from their personal photograph collections. Mr. Rambow also shared with us information concerning the identity of the individual who made the "TOOPSATA" inscription on a petrogylph slab from the Three Maidens area of the monument; shared a previously unknown (to us) published account of the quarries by Rudolf Cronau; and offered invaluable comments on an earlier version of this report. Physicists Dr. Michael Glascock of the University of Missouri and Dr. John Weymouth of the University of Nebraska critiqued John S. Sigstad's pioneering study of the mineralogical characteristics of catlinite and other pipestones. Dr. Dale R. Henning, Dr. Scott Anfinson, and Craig M. Johnson all applied their expert knowledge to a re-evaluation of the prehistoric pottery from Pipestone National Monument. Dr. Scott Anfinson, formerly of the Minnesota State Historic Preservation Office and now the present State Archaeologist, and Mark Dudzik, former State Archeologist, facilitated access to the site records maintained by their respective offices. Dr. Fred Finney made us aware of certain literature concerning non-cultural "mounds" created through bioturbation.

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INTRODUCTION

A Brief Historical Perspective

The famed pipestone quarries of southwestern Minnesota (Figures 1 and 2) that constitute the core of Pipestone National Monument have fascinated scholars and the public ever since the first eyewitness description of them was published over 160 years ago. Likewise, the quarry vicinity has been the subject of sporadic archeological investigations for over 120 years. Although many early visitors to the catlinite quarries commented on the quarries themselves and nearby archeological features, primarily the petroglyphs or rock art found there, the first detailed documentation of these features did not appear in print until 1884. Newton H. Winchell, the Minnesota state geologist from 1872 until 1900 (Nute and Ackerman 1935:81; Merrill 1964:469), may have visited the quarries as early as 1877 or 1878. A short description of the geology and topography of the quarries appeared in the annual report of the Geological and Natural History Survey of Minnesota the latter year (Winchell 1878). In 1884 Winchell published four plates depicting 40 of the "most conspicuous and important" of the petroglyphs around the Three Maidens boulders (Winchell and Upham 1884:555-561; reprinted in Woolworth 1983:15-18).

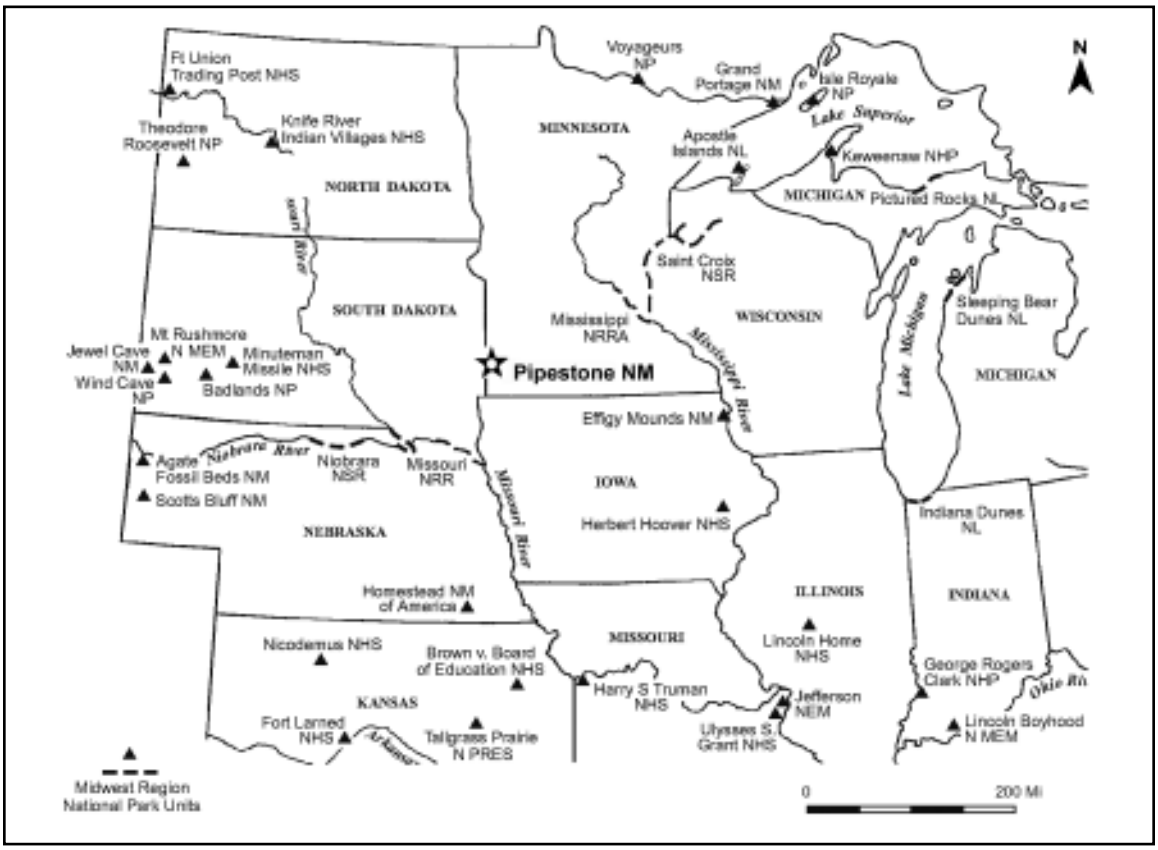

Figure 1. The location of Pipestone National Monument, Pipestone County, Minnesota.

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The next researcher to document the archeology at the quarries was Philetus W. Norris, a colorful individual who had traveled widely through the American West and had served as the second superintendent of Yellowstone National Park from 1877 to 1882 (Chittenden 1900:303-305; Binkowski 1995). Norris claimed to have visited the quarries four times: in 1842 or 1843 (Appendix A; Thomas 1894:44); 1857 (Appendix A; Thomas 1894:42); 1877 (Appendix A; Norris 1877; Thomas 1894:42); and 1882 (Appendix A; Thomas 1894:42-43; Mallery 1893:87). On the last occasion, he was employed by the Smithsonian Institution's Division of Mound Exploration as an archeologist (Brown 1981; Smith 1981, 1985; Perttula and Price 1984). During the summer of 1882, Norris excavated in seven mounds near the falls and the quarries, as well as in three mounds associated with an irregularly circular earthwork located about two miles northeast of the quarries.

Sometime in the early 1880s, the quarries were visited by a German traveler in the United States, Rudolf Cronau. He published the nineteenth-century equivalent of a "coffee table book" based on his travels (Cronau 1886), with one page of text about the quarries and a single, full-page drawing of the falls. He published a more detailed narrative, entitled Im Wilden Westen, in 1890. In the latter (Cronau 1890:85) he illustrated 15 of the Three Maidens petroglyphs and remarked that he had recorded only "40 to 50" of the thousands of petroglyphs that Catlin is said to have observed. Cronau's illustration of the petroglyphs was reproduced by Mallery (1893:88, Figure 50).

During the summer of 1889, another Smithsonian researcher, Walter James Hoffman, visited Pipestone "to copy the petroglyphs upon the cliffs of that historic quarry." Unfortunately, no information about Hoffman's visit is available other than brief mention of it in the annual report of the Bureau of Ethnology for the 1888-1889 fiscal year (Powell 1893:xiii).

A second archeologist also visited Pipestone in 1889. Theodore Hayes Lewis was employed by Alfred J. Hill of St. Paul, Minnesota, to conduct archeological surveys within several north-central states, including Minnesota, between 1880 and 1895, the year of Hill's death. They called this undertaking the Northwestern Archaeological Survey (Lewis 1898; Keyes 1928; Dobbs 1991). On August 14, 1889, Lewis made tracings of 79 petroglyphs on 35 Sioux Quartzite slabs which had been removed from the Three Maidens vicinity at the behest of a local Pipestone resident, Charles H. Bennett (Appendix C; Winchell 1911:Plate VIII).

In 1892, yet another Smithsonian researcher visited the quarries for the purpose of investigating the archeology there. William Henry Holmes, also of the Bureau of Ethnology, spent ten days at Pipestone in June of that year, drawing and mapping the historic quarries and other nearby archeological features (Powell 1896:xxviii). The results of his visit were first described in print in an abstract published in the proceedings of the forty-first meeting of the American Association for the Advancement of Science, a scientific conference held at Rochester, New York, the following August (Holmes 1892a). He presented more information about the quarries in

his description of catlinite which was published in 1907 in the first volume of Frederick Webb Hodges' monumental Handbook of American Indians North of Mexico (Holmes 1907). His most complete description of the quarries, however, was not published until 1919. In a chapter in Part 1 of the Handbook of Aboriginal American Antiquities, entitled "The Red Pipestone Quarry," Holmes (1919) summarized what was then known about catlinite, its geological occurrence at Pipestone, and the quarries. Homes is reported to have made a plane table map while at Pipestone (John Wesley Powell to the Commissioner of Indian Affairs, April 12, 1898, in Gurley n.d.:16-19), and a detailed map of the quarries and Winnewissa Falls area appears in his 1919 article (Holmes 1919:Figure 123). An interesting feature of Holmes' published map of the quarries is the location of eight mounds and more than 300 small unlabeled circles, the latter presumably circular alignments of stones often called "tipi rings." Several sketch maps in his unpublished notebook depict circles that are labeled as "lodges."

On April 24-25, 1905, the quarries were visited by a Minnesota Historical Society archeologist, Jacob Vradenburg Brower. He drew general maps of the quarry area on four pages of his field notebook, depicting such features as the Three Maidens, various roads, the falls, some of the quarries, the Nicollet inscription rock, Pipestone Creek, and a feature labeled "Jumper's Mound," possibly a reference to the newly-made mound observed by Catlin and which Norris believed he had dug into in 1882.

More than 40 years lapsed before the quarries again received archeological attention. In 1949, Paul L. Beaubien, Regional Archeologist of the National Park Service's Region Two office in Omaha, spent five days (June 14-18) visiting the quarries, by then a national monument, and assessing the archeology of the area. His report of that visit (Beaubien 1949, 1955, 1957, 1983) reviewed the history of the quarries as recorded by various Euroamericans, described the archeological surface features of the monument, and offered recommendations for further work. In general, he noted that much of the archeological evidence earlier observed by archeologists had "melted away, or... been removed or destroyed." In particular, he noted that no mounds were to be seen, the surviving petroglyphs (only 14 of Bennett's slabs were known to Beaubien) had only recently been returned to the monument, and only four stone circles or tipi rings, whose condition he described as "broken," could be found. In walking cultivated fields, he reported finding scattered rocks that once could have been part of circular stone alignments, a portion of a grooved maul, an ovate scraper of quartzite, and numerous pieces of worked catlinite. He offered two recommendations: 1) "archeological exploration" (i.e., excavation) of the quarries at several locations along the quarry line to obtain samples of catlinite from different portions of the quarries and artifacts that might help to understand the use of the area in prehistoric times; and 2) the development of an archeological base map in conjunction with civil engineering surveys of the monument land. Beaubien also offered a more implicit recommendation that the monument bound-

ary be expanded to protect adjoining lands which contained archeological evidence pertaining to the quarries.

Despite the long-term interest in Pipestone's archeology only one attempt to inventory the entire monument occurred. In 1965 and 1966 John S. "Steve" Sigstad conducted a visual inventory of the monument and undertook a limited site testing program (Sigstad 1970a). He was hampered by thick vegetation that obscured the ground surface, yet he managed to identify and record 22 sites in the monument. Sigstad's work ultimately led to a pioneering study of the age and distribution of catlinite (Sigstad 1973).

The research conducted by these various individuals is reviewed in more detail in Chapter 7.

The Current Study

Like all Federal bureaus, the National Park Service (NPS) is obligated by the National Historic Preservation Act (particularly through section 110[a][2]), Executive Order 11593, and section 14 of the Archeological Resources Protection Act to identify, evaluate, preserve, and protect historic properties, of which one type is archeological sites. However, a 1991 Management Control Review of the Service's archeological program identified a critical high risk material weakness in the basic inventory information about archeological resources on National Park System lands. In short, the review indicated that the NPS simply does not know what its archeological resources consist of - their numbers, their locations, their significance, their condition - and consequently NPS officials cannot make informed judgments about their proper management.

Sigstad's 1965 inventory exceeded professional standards of the day, yet the monument could not be considered fully inventoried because survey and recordation standards had changed by the 1990s. Under a national archeological survey initiative, an NPS task force created the Systemwide Archeological Inventory Program, or SAIP (Aubry et al. 1992), a long-term strategy to inventory archeological resources on NPS lands. The program is intended to provide a framework for systematic, scientific research that locates, evaluates, and documents archeological resources. The importance of SAIP is that it emphasizes research within a cultural resources management framework. The purpose, structure, and requirements of the SAIP have been published and each NPS Region is required to develop a general plan to implement this program.

The Midwest Region developed a SAIP plan that identified the need to conduct a full inventory of Pipestone National Monument. It had been nearly four decades since the last in-depth evaluation of the monument's archeological resources. Obviously the regional knowledge of prehistory has advanced in the interim, and it was appropriate to revisit the Pipestone resources and re-evaluate them within these new archeological paradigms and increased understanding of the regional culture history and overall human use of the landscape. Another factor that helped stimulate the Pipestone inventory project was that it was complemented by a study of the monument's rock art started in 1994 (Thiessen and Bailey 2000) and by a review of the archeology and ethnohistory of the nearby Blood Run site initiated in 1996 (Thiessen 1998).

The information resulting from these efforts provided a valuable perspective for assessing the archeological resources of Pipestone National Monument.

It was obvious from a perusal of the current archeological literature that many additional archeological resources have been identified in Pipestone County and in the region in general since Sigstad's survey. Several syntheses for nearby regions had recently become available and helped place the monument's resources in a broader perspective (Anfinson 1997; Alex 2000).

Another issue confronting the need was that while Sigstad had recorded his sites on site forms and given them sequential trinomial archeological site numbers, he had never formally submitted the forms to the state archeologist for official registration. Thus, his site numbers were not recognized by the state and there arose confusion over the use of official and unofficial site numbers in the professional literature and databases. A goal of the re-inventory project was to clarify and rectify these numbering problems.

SAIP funds were made available in fiscal years 1997 and 1998 to conduct the project. The overall objective of the two-year study was to complete a pedestrian examination of the monument, synchronized with the monument's prescribed grass burn program. By scheduling the inventory efforts to follow the prescribed burns, greater ground visibility would be achieved, thus allowing greater archeological resource visibility as well. Once sites, locales, and findspots were identified they could be recorded, assessed, and evaluated in the context of the monument's National Register of Historic Places status as contributing or non-contributing resources. In addition, all of the monument's land could be examined within a two-year program of prescribed burns, and the two-year study cycle allowed evaluation of selected sites/locales by means of test excavations. The methods and results of the 1998-1999 inventory efforts are detailed in Chapter 8.

The project research design also called for a review and evaluation of prior archeological studies of the monument. Combining the new inventory effort, site testing, and the review of previous research allowed for a total reassessment of the significance of the park's archeological resources.

An area of particular concern was the need to re-evaluate Sigstad's catlinite age and distribution study, which he undertook following his survey of the monument. Since he completed his dissertation on the subject, much research with similar goals but different methods (x-ray powder diffraction and x-ray florescence, as well as neutron activation analysis) had been performed on catlinite artifacts as well as artifacts made of other pipestones. The services of two physicists, Dr. John Weymouth of the University of Nebraska and Dr. Michael Glascock of the University of Missouri, were obtained to critique and evaluate Sigstad's research in light of current knowledge of the methodology and instrumentation he employed. This is summarized in a later chapter.

Another component of the Pipestone study was the reorganization of the monument's archeologi-

cal collections housed at the Midwest Archeological Center. Over the years the Beaubien and Sigstad collections had become intermixed. The original records and photographs also needed reorganization and a finding aid developed so that their potential for research could be realized. The expert opinions of three regional specialists were solicited with regard to the typing, age, and taxonomic affiliation of the prehistoric pottery recovered at Pipestone by Beaubien and Sigstad and the few sherds found during the course of the current inventory effort. Dr. Scott Anfinson of the Minnesota Historical Society, Dr. Dale R. Henning of the Illinois State Museum, and Mr. Craig M. Johnson independently studied the prehistoric pottery from Pipestone and provided separate reports of their research during the course of the project. These re-evaluation studies are also summarized in a later chapter.

Complementing this collections reorganization effort was the accessioning and cataloging of an extensive group of Sigstad's photographs which were donated to Pipestone National Monument in July of 1996 by William and Marcia Tate of Aurora, Colorado. A finding aid for this image collection was developed (Dale 1997).

The final field study was an add-on to the project. Peter Topping, an archeologist with English Heritage (the former Royal Monuments Commission of the United Kingdom), was a guest at the Midwest Archeological Center in 1998. Center Manager Mark Lynott, William Hunt, Bruce Jones, and Scott and Thiessen visited Pipestone on May 5-8, 1998, to allow Topping to train the team in a small-scale mapping technique employed by English Heritage archeologists. Portions of the South Quarry pits were mapped during this training exercise. The resulting map, finished by Topping after his return to England, appears on the cover of this report.

The research undertaken as part of the 1997-1998 SAIP inventory effort has been supplemented by observations during subsequent brief visits to the monument made by Midwest Archeological Center personnel for various purposes, such as those made in 2001 by Thiessen (Thiessen 2001) and in 2005 by Scott and Ann Bauermeister (Scott 2005). Later, post-inventory research has also augmented the body of knowledge about the monument's archeological and ethnographic resources, and the use made of them by native peoples (Toupal 2004; Zedeño and Basaldú 2004; Scott and Thiessen 2005).

This Report

This report accomplishes several purposes. In addition to reviewing the history and environmental setting of the monument and the culture history of the surrounding region (Chapters 2, 3, and 4, respectively), it summarizes catlinite as a geological substance and reviews past and on-going studies of the chemical and mineralogical characteristics of catlinite to distinguish it from other pipestones and to attempt to determine its use by native peoples through time and space (Chapter 5). Particular attention is paid to the pioneering "age and distribution" study of catlinite that was conducted by John S. Sigstad. The report reviews the state of knowledge about the quarries during

Figure 2. Aerial photograph of Pipestone National Monument with selected labeled features (adapted from monument-wide photogrammetric map, 1997).

the early nineteenth century and earlier (Chapter 6), as well as the history of archeological investigations conducted at the quarries since the latter part of the nineteenth century (Chapter 7). It describes the methods and results of the 1993, 1994, and 1997-1998 archeological field inventory efforts at Pipestone National Monument (Chapter 8), and presents an inventory of the archeological localities that comprise site 21PP2 at the monument. It revisits the archeological artifact collections of the monument and assesses the temporal and cultural implications for occupation or use of the immediate vicinity of the quarries, particularly as inferred from prehistoric chipped stone projectile points and ceramics (Chapter 10). It also summarizes available information about prehistoric Native American rock art that occurs within the monument (Chapter 11), a complementary study that was initiated in 1994. And finally the report offers recommendations for both informed management of the monument's archeological resources and future research studies of them (Chapter 12).

HISTORY AND BACKGROUND OF THE MONUMENT

History of the Pipestone Indian Reservation

The area that today surrounds the red pipestone quarries of southwest Minnesota has been known to humans for at least 5000 years. Native Americans certainly used the area for hunting and foraging as early as the Late Archaic era (Alex 2000:73-84; aka the Middle Prehistoric Period in the nearby Prairie Lake Region to the north and west [Anfinson 1997:42-88]) which began around 3000 BC. By at least the Middle Woodland period (circa 200 BC to AD 400 [Alex 2000:115]; aka Fox Lake Phase of the Middle Prehistoric Period in the Prairie Lake Region, 200 BC - AD 700 [Anfinson 1997:47-75]) the native inhabitants of the region were digging, using, and trading the red argillite that became known as pipestone or catlinite. The quarries were alluded to in the writings of seventeenth and eighteenth century Europeans, but it was not until George Catlin visited the quarries in 1836 that they became more generally known. The earlier history of the quarries is discussed in a subsequent chapter. Presented here is a brief history of the quarries and the surrounding land from the mid-nineteenth century until the locale became a national monument in 1937. Much of the information presented here is drawn, largely verbatim, from histories written by Murray (1965) and Rothman and Holder (1992). Other general sources of information about the history of the quarries and Pipestone National Monument include Davis (1934), Murray (1961), Corbett (1980), and Kelley (1997). Information about the founding and development of the city of Pipestone can be found in Rose (1911), Pipestone County Centennial Committee (1958), Pipestone County Historical Society (1984), and Amato (2002a-b).

In the treaty signed at Traverse des Sioux, Minnesota Territory in 1851, the Sisseton and Wahpeton bands of Sioux ceded to the U.S. government their lands in southwestern Minnesota (Kappler 1972:588-590). The Yankton Sioux also claimed much of this land but were not signatories to the treaty (Davis 1934:47; Murray 1965:19; Corbett 1976:20).

Because of the dissatisfaction of the Yanktons with this land cession, a separate treaty with them was signed on April 19, 1858, and ratified by the Senate on February 16, 1859. Article 8 of the treaty reserved land around the quarries and addressed the Yanktons' rights to them (Kappler 1972:779):

> *The said Yankton Indians shall be secured in the free and unrestricted use of the Red Pipestone Quarry, or so much thereof as they have been accustomed to frequent and use for the purpose of procuring stone for pipes; and the United States hereby stipulate and agree to cause to be surveyed and marked so much thereof as shall be necessary and proper for that purpose, and retain the same and keep it open and free to the Indians to visit and procure stone for pipes so long as they shall desire.*

To comply with the treaty, the General Land Office was ordered to conduct a survey of the land to be reserved by this clause. The reservation

was to be one mile square, centered on the rock bearing the inscription of the Nicollet-Fremont party (Corbett 1978:101-102). The reservation was also to be closed to public land surveys at this boundary. C.H. Snow and Henry Sutton completed the survey in August 1859. The 1859 survey established the boundaries of the reservation, portions of which coincide with some of today's monument boundary (Murray 1965:9-11). Two slightly different versions of the 1859 survey map exist. One is at the National Archives and Records Administration (NARA) in Washington, D.C. (Record Group 75, Central Map File, No. 53, Pipestone Quarry Reserve, Hutton and Snow, Surveyors, 1859; and also Record Group 49, Map Enclosures Removed from Volumes: Case F-Field Notes, Entry 128[22]) and the other is in the Alfred J. Hill Papers, Box 5, at the Minnesota Historical Society. The narrative report filed by Snow and Hutton is at NARA (Record Group 49, Map Enclosures Removed from Volumes: Case F-Field Notes, Entry 128[23]), and the Society also has a copy.

During 1870, public land surveys in the Pipestone area were completed, but the General Land Office instructions were ignored and the surveys extended into the Pipestone reservation tract. This led to the filing of questionable homestead claims for land within the reservation (Murray 1965:23).

By July 1872 the General Land Office ordered a resurvey of the reservation and its boundaries to be marked on public land plats. The resurvey was completed in late July. It was found that the reservation occupied part of sections 1 and 2, Township 106, Range 46 West, and a small strip of sections 35 and 36, Township 107, Range 46 West. It was also found that the reservation boundaries were not aligned parallel to public land survey directions, resulting in small portions of sections 1 and 2, Township 106, being outside the southern boundary of the reservation (Murray 1965:23). The report of the 1872 resurvey is on file at NARA (Record Group 49, Map Enclosures Removed from Volumes: Case F-Field Notes, Entry 128[24]).

By late 1875, all of the filings on the reservation had been canceled except that of August Clausen. A questionable patent was issued to Clausen for the southwest quarter of section 1, Township 106. By late 1877, this tract was in the possession of Herbert M. Carpenter of Minneapolis, and by 1880, quartzite for building stone was being quarried from this land (Murray 1965:24-25).

More settlers arrived in the area after "Pipestone City" was platted in 1876. By 1878 the village was a small but growing trading center. With the increased population in the area, other encroachments on the reservation land sprang up. A two-story house was built on reservation land in 1883, and other structures soon followed (Murray 1965:25-26).

In a July 20, 1882, letter to one of the town's founders, the Yankton chief Strike-the-Ree complained about Carpenter's asserting a right to reservation land and stated that the Yanktons understood that a township of land was to be reserved for them, not merely a section (*Pipestone County Star*, August 3, 1882). As a result of complaints from Yanktons and some of the local Pipestone citizens, the Commissioner of

Indian Affairs sent an agent to Pipestone to investigate. The agent reported back that the intruders lacked legal title to the land they occupied and offered: "I will take pleasure in removing them and in tearing down their buildings if you so direct" (Murray 1965:25-26).

The matter was referred to the Secretary of the Interior, but no action was taken during the Arthur administration. The 1884 election of Grover Cleveland to the Presidency brought into the government officials who were more sympathetic to native concerns. In the meantime, more people illegally settled on the reservation lands. The Yanktons became increasingly angry about this situation, and petitioned the Commissioner in November 1886 to take action.

The Commissioner of Indian Affairs and the Secretary of the Interior favored removal of the settlers, forced if necessary. The squatters ignored written notices to voluntarily remove themselves from the land, so assistance was sought from the U.S. Army at Fort Randall, South Dakota (Murray 1965:25-40).

A detail of 10 soldiers commanded by Captain J.W. Bean arrived in Pipestone in October of 1887. The presence of the Army persuaded the squatters to move by the following Monday, October 17, and to remove their buildings by March 1, 1888. In the meantime Lieutenant W.N. Blow surveyed and re-marked the reservation boundaries, the third survey on reservation land (Murray 1965:27).

A considerable body of highly pleased Yanktons witnessed the removal (Murray 1965:27-28). A local agricultural association negotiated an agreement with the Yanktons present which allowed the association to rent the fenced portions of the land for use as a fair grounds, which represented the first use of any of the reservation land for anything like the purpose of a park (Murray 1965:27).

A railway track had been laid across the reservation in 1884 by the Burlington, Cedar Rapids, and North Railway in violation of the treaty rights. To deal, in part, with this intrusion, Congress passed a law entitled "An Act for the Disposition of the Agricultural Lands Embraced Within the Limits of the Pipestone Indian Reservation" (25 Stat. 1012). It provided 1) that a board of appraisers should evaluate all lands on the reservation, including the right-of-way claimed by the railway; 2) that the former settlers might have priority to purchase lands from which they had been removed, if agreeable to the Indians; and 3) that the consent of a majority of the adult men of the tribe must be obtained and that the Indians might give their consent to the entire proposal or to either part individually (Murray 1965:28).

The lands were appraised in May 1889 in accordance with the provisions of the Act. The board of appraisers produced an itemized appraisal of individual parcels of the reservation land, and set a value, including damages for the railway land (Murray 1965:28).

A commission was appointed to negotiate with the Yanktons as a tribe, and discussions ensued between August 3 and August 21. The Indians agreed to accept payment for the railway right-of-way, which was received from the railway company by 1890. However, they refused to sell the other

lands. Traces of the railway roadbed and the site of a railroad water tank can still be seen east of the quartzite ledge.

In 1891, Congress passed legislation that authorized the building of an Indian boarding school on the reservation land at Pipestone. The school opened in 1893, despite protests from the Yanktons (Murray 1965:33). In 1897 the Yankton tribe asked for compensation for the land used for the school, and lengthy litigation followed to determine if the Yanktons indeed "owned" the reservation land and if they were entitled to compensation for it. A Supreme Court decision on November 22, 1926, ruled that the United States had taken 648 acres of land from the Yanktons, who were therefore entitled to compensation. The Court of Claims set a value on the land and the tribe received $328,558.90 in 1929 (Murray 1965:33-39).

About 1910, an important land alteration occurred on the reservation. To alleviate periodic backing up of water and flooding of the Pipestone Indian School's agricultural land, Congress appropriated $4,000 in 1909 for certain "improvements." Some of the land was to improve the condition of the road leading south toward the city of Pipestone, but the majority of it (estimated at $3,200) was to be used to straighten the channel of Pipestone Creek between the railroad bridge and Winnewissa Falls. The channel would also be lowered by nine feet. A contract in the amount of $2,900 for the channelization work and $600 for the road work was awarded on March 14, 1910, to a firm named Gross Brothers, and presumably this work was accomplished soon thereafter (U.S. Senate Committee on Indian Affairs to the Acting Commissioner of Indian Affairs, June 7, 1909; R.M. Pringle, Supervisor of Engineering, Pipestone Indian Training School, to the Commissioner of Indian Affairs, November 11, 1909; Abstract of Proposals Received at Washington, D.C., February 25, 1910, for Removal of obstructions, etc.; and Superintendent, Pipestone Indian Training School, to the Commissioner of Indian Affairs; all in the National Archives and Records Administration, Record Group 75, Bureau of Indian Affairs, Central Classified Files 1907-1939, Box 26, File Pipestone 54743-1909-39; see also the "Days Gone By" column in the *Pipestone County Star*, May 2, 1984; Murray 1965:44).

Lands that currently comprise Pipestone National Monument are within Sections 1 and 2 of Township 46 West, Range 106 North.

Creating the National Monument

The idea of the Pipestone quarries as something of national significance is not new to the twentieth century. The writings of Catlin, Schoolcraft, and Longfellow were nationally renowned. During the late nineteenth century many early settlers and visitors wrote about the quarries. All of these works served to publicize the quarries and the community of Pipestone, drawing widespread attention to the area.

Interest in setting aside the quarries as a national park existed as early as 1886 (Corbett 1976:41). Before 1890, local advocates drew up four petitions calling for establishment of the Indian school. These also contained language asking that a "National Indian Pipestone Park" be created. A

bill introduced in the Congress contained such a provision. However, an entirely different bill was passed in its stead, which did not authorize a park to be established (Murray 1965:42).

In November of 1895, another bill was introduced in the House of Representatives (Murray 1965:42-43), which contained the following language:

> *That the Pipestone Indian Reservation, in Pipestone County, Minnesota as heretofore bounded by treaty and legislation, be, and the same is hereby, set apart and designated "The Indian Pipestone National Park," and is placed as such under the supervision of the Secretary of the Interior.*

The bill died in committee (Murray 1965:42-43; Corbett 1976:41).

In 1916, a plan was written by Ralph J. Boomer (1916) for development of a recreational park on the reservation. Boomer's plan, which was written as a Bachelor of Science thesis in engineering at the Iowa State College of Agriculture and Mechanic Arts (now Iowa State University), prescribed a "highly improved, developed" park containing concentrated recreational facilities. Though this plan itself was never implemented, it influenced local thinking through the 1920s, according to Murray (1965:44).

Beginning in 1919, steps were taken by local interests to develop a small part of the reservation land into a city park. A bathhouse and graveled beach were proposed. The bathhouse was built near one of the natural lakes along Pipestone Creek, but cloudy land title problems precluded acquisition of the land (Murray 1965:46).

In 1923, the Minnesota Commissioner of Highways directed the Highway Commission to create a plan for a small State park on the reservation (Commissioner of Highways 1924). While this was underway, the local post of the American Legion organized a volunteer force which cut weeds around the falls and improved the first small lake below it. Despite the passage of legislation for this purpose in the Minnesota legislature in 1925, the problem of cloudy land title again precluded acquisition of the land (Murray 1965:44-46).

In 1925 the Catlinite Chapter of the Daughters of the American Revolution (DAR) installed a bronze plaque on the stone bearing the Nicollet inscriptions. Encroachment of the quartzite stone quarry south of the reservation threatened destruction of the Three Maidens, so in 1926 the DAR also sought to protect the Three Maidens boulders by erecting a fence between them and the quarry (*Pipestone County Star*, September 3, 1926). In 1928, the DAR purchased a purported title to this tract from the Staso Milling Company of Chicago and subsequently transferred the land to the city of Pipestone in 1928 (Murray 1965:44-46; *Pipestone County Star*, May 18, 1928).

After the question of Native American ownership of the reservation land was settled by payment to the Yanktons, local individuals and groups renewed their interest in establishing a park. In November 1929, the DAR passed a resolution favoring the establishment of a national park or monument (Murray 1965:47; *Pipestone County Star*, December

3, 1929). A meeting at the Calumet Hotel in Pipestone in January, 1932, was attended by representatives of 53 governmental and local organizations, who endorsed the idea of promoting the creation of a national park (Murray 1965:47; *Pipestone County Star*, January 19, 1932). This ultimately resulted in the formation of the Pipestone Indian Shrine Association (Murray 1965:48).

The result of this meeting was the drafting of a bill to establish a park of 81.75 acres. The bill would also grant quarrying rights to Indians of all tribes, since the quarrying rights granted by treaty were extinguished when the Government acquired land title from the Yanktons (Murray 1965:47).

Pipestone Indian School Superintendent James W. Balmer sought the opinion of the Bureau of Indian Affairs on the proposal during his next visit to Washington (Murray 1965:47). Despite the fact that bureau officials objected to the park concept, to promote further interest in the proposal the Pipestone Indian Shrine Association that same year produced and distributed a booklet entitled The Pipestone Indian Shrine (Murray 1965:48). The efforts produced results, as the Bureau of Indian Affairs sent a representative to a late April meeting of the Association to discuss the proposals. The result was a report, endorsed by the Bureau's representative, that recommended the establishment of a park (Charles H. Berry, Field Representative, Office of Indian Affairs, and J.W. Balmer, Superintendent, Pipestone Indian School, to the Commissioner of Indian Affairs, May 14, 1932, in the National Archives and Records Administration, Record Group 75, Bureau of Indian Affairs, Central Classified Files 1907-1939, Box 18, File Pipestone 11113-1932-307.2 lot 2; Murray 1965:48).

In July 1932, the National Park Service reviewed the issue and an administrative assistant to the Secretary of the Interior visited Pipestone to personally investigate the proposal (Murray 1965:48).

In October 1933, Winifred Bartlett, president of the Association, lobbied the Director of the National Park Service and the Commissioner of Indian Affairs regarding the park proposal (Murray 1965:48).

About this time, local improvements began to be made under the aegis of New Deal work relief programs. Late in 1933 and early in 1934, the Civil Works Administration began development of the roads bordering the reservation, including a road from the junction of Hiawatha and Reservation Avenues west to the Three Maidens area. The Indian Emergency Conservation Work (IECW) program began improvements on the reservation in January 1934, using Indian labor (Mitchell 1934; Murray 1965:49). Road construction, fencing, tree and shrub planting, and construction of a dam along the creek outside the proposed park was accomplished. A stone obelisk monument was also constructed to mark the purported location of a small cemetery where several students from the Indian School were buried (see Appendix D). The monument bore the inscription "PEACE FOR EVER," which years later led to some confusion in the monument's interpretive program over whether the concept of "rest in peace" for the deceased was

intended or the idea of peace among all native peoples who visited the quarries.

Beginning in 1934, several legislative efforts were made to create a national park on reservation land. One such bill was introduced in the Senate in May 1934,, but no action was taken on it (Murray 1965:49). On January 22 of the following year, another bill, S. 1339, was introduced in the Senate. The Senate passed the bill, but the House did not act upon it (Murray 1965:49-50).

A third bill was introduced in the Senate in January 1937. S. 1075 passed the Senate on August 6, the House on August 21, and on August 25, 1937, it was signed into law by the President. The bill authorized Pipestone National Monument, prescribed its boundary to encompass approximately 116 acres, and reserved quarrying of catlinite to Indians of all tribes (Murray 1965:46-51).

Boundary Changes

The first caretaker or custodian of the monument was the Pipestone Indian School Superintendent, J.W. Balmer. He volunteered his time to watch over the unmanned monument and insured that only Native Americans quarried the pipestone (Rothman and Holder 1992:77-80).

In 1940 Albert Drysdale was appointed the first seasonal superintendent (then called "custodian") and a plan was developed by the Park Service's regional office to build a museum, residence, utility building, roads, trails, and other infrastructure to accommodate the growing visitation (Rothman and Holder 1992:80-82). However, World War II intervened and all plans were set aside until the national emergency was over.

During the war years Pipestone suffered from neglect. It was not until 1946 that plans were made to upgrade the management and infrastructure at the monument. The first full-time superintendent, Lyle Linch, reported for duty in 1948. It was Linch who reinvigorated the monument and was directly responsible for having Regional Archeologist Paul Beaubien begin a new round of archeological studies after a hiatus of more than forty years (Rothman and Holder 1992:88-90; Beaubien 1949, 1955, 1957, 1983).

During the early years of the monument's existence, the Service recognized that the Three Maidens site should be a part of the monument. After years of wrangling and prolonged negotiations with the City of Pipestone, the Three Maidens Tract was added to the monument in 1951 (Rothman and Holder 1992:92-95, 100).

When the eventual closing of the Pipestone Indian School began to be anticipated in the late 1940s, transfer of the school's land to the monument began to be considered by National Park Service and Bureau of Indian Affairs officials (Murray 1965:55-56; Rothman and Holder 1992:97-98; see also "Recommendations for Boundary Adjustments at Pipestone National Monument," by Weldon W. Gratton, Park Landscape Architect, February 14, 1951, in the National Archives and Records Administration, Central Plains Region, Kansas City, Missouri, Record Group 79, Records of the National Park Service, Region II (Midwest), Pipestone National Monument, Decimal Codes 501-03 through 630, Box 194, File 602, Boundaries-General). Paul Beaubien's

archeological investigations of Pipestone National Monument help to justify plans for eventual expansion of the monument (Murray 1965:55; Rothman and Holder 1992:99). In 1949, he inspected Indian School land outside the monument and determined that not all of the historic quarries and archeological features were within the monument's boundary. He concluded that additional land, much of which was controlled by the Pipestone Indian School, should be added to the monument (Beaubien 1949). After closure of the Indian School in 1954, 164 acres were added to the monument in 1957 (Murray 1965:56; Rothman and Holder 1992:100). Much of the remainder of the school land was transferred to the State of Minnesota as a wildlife refuge and for educational purposes (Rothman and Holder 1992:96-100). Today the monument lands total 281.78 acres owned in fee.

Figure 3. Late nineteenth or early twentieth century view of an active quarry at Pipestone National Monument. Photograph by Samuel Calvin (negative 258, Calvin Photographic Collection, Department of Geoscience, University of Iowa)

Figure 4. Long disused quarry pits along the quarry line at Pipestone National Monument (view to the north from the South Quarry).

Figure 5. Native American tipi camp at the catlinite quarries, 1892 (W.H. Holmes papers, National Anthropological Archives, Smithsonian Institution, photograph 72-3245).

Figure 2-4. White craftsman fashioning objects from catlinite, 1892 (W.H. Holmes papers, National Anthropological Archives, Smithsonian Institution, photograph 72-3247).

ENVIRONMENTAL SETTING

Introduction

Pipestone National Monument lies in the Northeastern Plains subarea at the northeastern edge of the tallgrass prairie in the region known as the Coteau des Prairies (Gregg et al. 1996:77-78; Anonymous 1988). The Coteau is situated on the western slope of the landform that divides the Mississippi River drainage from that of its main tributary, the Missouri River. Pipestone Creek, which runs through the monument, flows into Split Rock Creek, then into the Big Sioux River and thence into the Missouri River. The water of the creek cascades over the Sioux quartzite ledge at Winnewissa Falls, a landscape feature that has often been photographed for its scenic beauty. The channel of Pipestone Creek above Winnewissa Falls was straightened in 1910, resulting in relocation of the falls to the southward and the creation of a straight upstream channel extending approximately 250 feet between a former railroad bridge and the new location of the falls (R.M. Pringle, Supervisor of Engineering, Pipestone Indian School, to the Commissioner of Indian Affairs, November 11, 1909, in National Archives and Records Administration, Record Group 75, Bureau of Indian Affairs, Central Classified Files 1907-1939, Box 26, File Pipestone 54743-1909-39; and Abstract of Proposals Received at Washington, D.C., February 25th, 1910, for Removal of obstructions, etc. in same file).

The land is usually characterized as gently rolling with numerous outcrops of Sioux quartzite bedrock. This simple description belies the relatively complex geology that gave rise to the Coteau and exposed the interbedded catlinite layers which, in turn, led to the catlinite exploitation and created the archeological record of the monument. Because the bedrock Sioux quartzite outcrops so extensively in the monument and the overlying mantle of soil is generally thin (three meters or less) in most of the monument, much of the land has never been cultivated. The exception to this is the rising land west of the quarry line, sometimes referred to as the "West Ridge" area, which was cultivated well into the first half of the twentieth century.

Geology

Catlinite or pipestone, for which the park is known, is an argillite. Argillites are a relatively soft compacted rock derived of shale or mudstone. Essentially they are a transitional rock, in terms of hardness and permeability, between slate and shale. Argillites used by Native Americans for the fashioning of pipes and other artifacts are found in many different areas of the United States. Pipestone National Monument's variety is known as catlinite, named in honor of the nineteenth century artist, George Catlin. The monument's catlinite is found interbedded between layers of Sioux quartzite. It is generally characterized by its red color which is the result of the presence of hematite. However, the color of catlinite varies from red to maroon, brown, orange, yellowish orange, green-gray, blue-gray, cream, and white.

The layers of catlinite were formed from a red clay that was compressed by stream deposited sands as

they were formed by various geologic processes into Sioux quartzite. Sioux quartzite is regarded as Pre-Cambrian or early Ordovician in age (Baldwin 1949:10). A generalized and simple explanation of the process is that the red clay substratum was covered by stream deposited sands. These sands became sandstone and compressed the clay into a mudstone. Glaciation played a role in the formation of catlinite by removing some sediment and sandstone, with the weight of the ice layer further compressing and raising the temperature of the remaining sandstone and mudstone to a point that they eventually formed the very hard and dense Sioux quartzite and the much softer catlinite layers.

Various geologic processes also caused the catlinite and quartzite to dip to the east. This left discontinuous Sioux quartzite outcrops at ground surface throughout the Coteau area. In some places the catlinite seams were also exposed at or near the surface, which allowed them to be discovered and exploited by prehistoric Native Americans. Catlinite occurs in layers or seams up to about 35 to 45 centimeters thick. Most catlinite suitable for carving comes from a 5 centimeter-thick layer within a thicker layer, the remainder being too friable for use. Through time the surface catlinite exposures have been quarried away. Today, it is not uncommon to remove several feet of Sioux quartzite to reach the catlinite layer. Eighty-three quarry pits or quarrying spaces are currently designated within Pipestone National Monument, numbered, from south to north, 1 through 83. Quarries 1, 2, and 3 are located on the south side of the entrance road and have not been worked in years. These were designated by archeologist Paul Beaubien as the "South Quarry," though park staff do not presently refer to them by that name. Quarries 4 (north of the entrance road) through 35 (near the visitor center) are presently called the South Quarry Line by the park staff. The North Quarry Line begins with Quarry 36 and extends northward through Quarry 46. Quarry spaces 47 through 68 are not active quarries and are reserved for future use, as needed. The Sun Dance Quarry Line, formerly referred to by Beaubien as the "North Quarry," consists of Quarries 69 through 83. Of these, Quarries 69 and 70 are not active quarries, and Quarry 83 is reserved for use by Sun Dance participants (Jim LaRock, Superintendent of Pipestone National Monument, email communications to Thiessen, June 9, 2003, and January 27, 2005). Forty-seven pits were allotted to individual quarriers by permit as of July, 2002 (Jim LaRock, Superintendent of Pipestone National Monument, email communication to Thiessen, July 10, 2002).

Catlinite was named and chemically characterized by Charles T. Jackson in 1839. His initial study of the stone (Silliman 1839) identified it as a sericite or muscovite. Berg (1938) was the first to examine catlinite microscopically and by means of x-ray and chemical analyses to determine its constituent components. Berg's analysis characterized catlinite as being composed of sericite, hematite, diaspore, pyrophyllite, pyrite, and possibly rutile. He also suspected it contained quartz, but this has not been borne out by subsequent research. Jackson's and Berg's work, conducted nearly one hundred years apart, characterized catlinite for archeological purposes for many years. However, their

research on the mineralogical characteristics of catlinite has been superceded by Gundersen's (1991, 2002) later work using x-ray powder diffraction analysis.

It was often assumed by many researchers that all pipestone could be attributed to a source within or somewhere near what became Pipestone National Monument. The first to recognize and publish on the fact that all pipestone is not catlinite was the legendary Minnesota geologist Newton Winchell (1884). Subsequent work by Howell (1940) and Sigstad (1973) determined there were numerous pipestone sources around the country. Beginning in the early 1980s, Gunderson (1991, 2002, and others) continued research on the sources of pipestones and has identified nearly thirty different quarries or pipestone sources. While all pipestones are similar in chemical makeup, they are individually minerologically distinct, which can be determined by x-ray powder diffraction, x-ray florescence, or neutron activation analysis. Catlinite is pipestone, but not all pipestones are catlinite, is perhaps the simplest way to define the uniqueness of the soft red argillite found at Pipestone National Monument.

In the monument overlying the catlinite layers and the Sioux quartzite is a thin unsorted and unstratified layer of gravel and sands laid down by the Kansan glacial advance of about 100,000 years ago. There is also some additional glacial till present that is ascribed to the Wisconsin glacial age of about 20,000 years age (Baldwin 1949:14).

Today's soil that overlies the bedrock and glacial till is composed of one to two centimeters of humus at the surface below which there is a layer of gray silty loam about three centimeters thick, then one or two centimeters to two meters of yellow wind-blown loess. The soils within the monument are generally characterized as the Brookings-Hildewood association in the valley, the Kransburg-Vienna association on the west side of the park, and the Ihlen-Rock association on the east ridge (Hokanson et al. 1976). Direct observation of excavation units and soil exposures in Pipestone National Monument confirm this soil deposition sequence. The soils within the monument's boundary are extensively and heavily bioturbated by very active and widespread rodent burrowing. No clear soil stratification appears to remain in the areas observed or tested within the monument. Elevation within the monument varies from about 1650 feet along the lower reaches of Pipestone Creek to 1720 feet on the eastern side of the park, a total elevation change of only 70 feet (21.3 meters).

Climate

The glacial episodes that created the gently rolling landforms of the Coteau des Prairie established the base on which the tallgrass prairie took root. Today the weather is characterized by marked seasonal variation. Winters are generally cold with mean lows around 10 degrees and highs around 20 degrees (Fahrenheit) in January, although temperatures can reach extreme lows around 50 degrees below zero. Snow generally begins to fall in November and extends through early April. The first frost-free days are normally seen in late April or early to mid-May. Summers are warm with July highs reaching the 100-degree mark. The annual precipitation is

around 19 inches, with over three-quarters of it occurring between April and September (Strub 1960; Kuehnast 1974).

The paleoecology of the Pipestone area is not well understood. The shallow bioturbated soils are poor candidates for yielding reliable information on the paleoclimatic sequence of the Coteau region. Anfinson (1997:16-17) provides a general model of the prehistoric climatic sequence that likely fits the Coteau region. At the end of the last glaciation, about 13,500 years ago, the area experienced a warming trend that allowed the development of an open deciduous forest with numerous and large prairie openings. This regime lasted until about 7,000 years ago and was followed by a continued warmer and dryer climate until about 5,500 years ago. The forested areas retreated during this period, establishing the Prairie Lake and Coteau des Prairie regions much as they are seen today. With minor fluctuations in the climate, a warm dry trend between AD 1200-1400 and a cool period beginning around AD 1550, the area remained relatively stable until the advent of intensive farming and land use in the historic period.

Flora

Historically, virtually all visitors to the Pipestone area during the nineteenth and early twentieth centuries comment on the absence of trees, suggesting that the flora and appearance of the landscape changed greatly during the twentieth century. Although the historical landscape of the quarries has not been formally studied, how much change has occurred can be roughly measured by examination of botanical notes made by the botanist of the Nicollet expedition, Carl Andreas Geyer, and drawings and photographs of the area made during the nineteenth century.

Geyer (1838) recorded the vegetation at the catlinite quarries as a participant in the Joseph Nicollett expedition. Geyer's journal (1838) lists the grasses, flowers, and other common native prairie plants that dominated the vegetation of the area in the late 1830s. His notes, almost exclusively, describe the plants in terms of the Latin nomenclature of the day. Most of the names are recognizable today, and it is abundantly clear that Geyer rarely noted the presence of shrubs or trees at Pipestone. Four pencil sketches of the Sioux quartzite ledge, produced by members of the expedition, generally corroborate the impression gained from Geyer's notes and show only a few small shrubs and low trees at the base of the ledge (see discussion below).

Dr. J. Fraser Boughter, the post surgeon at Fort Dakota in 1869, also provides a list of flora present in the region in his description of Fort Dakota and vicinity (Rambow 2003:31-40).

The catlinite quarries and nearby landscape features have often been depicted in drawings, paintings, and photographs, especially after the turn of the twentieth century when local interests increasingly promoted them as a tourist attraction. Several of the earliest depictions, made during the nineteenth century, have not been published or are scarce today in published form. These early illustrations generally do not depict quarries and other features of archeological interest, but primarily serve to pictorially document the

environment, particularly the general lack of trees and other woody vegetation at the quarries in the years after they were first visited by white men.

The earliest depiction was made by George Catlin in 1836, who sketched and painted the general landscape in the vicinity of the quarries. Although distorted in perspective, Catlin's artwork and romantic description of the quarries have greatly contributed to the lore and fame of the place. Catlin's *Pipe Stone Quarry* was first published in 1841 (Ewers 1956:490) and has been republished many times since (e.g., Holmes 1919:255; Heilbron 1958:18-19; McCracken 1959:177; Catlin 1973, 2:facing page 165; Rambow 1989:8; Dippie 1990:41; Troccoli 1993:157; and others). Usually reproduced as a painting, sketch versions of it have been published (Holmes 1919:255; Dippie 1990:41). Catlin copied and recopied many of his works, so original paintings of his quarry scene exist in more than one repository. These include the U.S. National Museum, where it is cataloged as Catlin painting number 337 and U.S. National Museum number 386334 (Ewers 1956:510, Plate 19.2; Halpin 1965:26), and the Gilcrease Institute in Tulsa, Oklahoma (Troccoli 1993:157). Catlin's picture is most notable for the comprehensive range of features that it depicts. Although the perspective has been foreshortened, Catlin's depiction shows the approximate relationships between Pipestone Creek, Winnewissa Falls, the quarries, the Sioux quartzite ledge, the Three Maidens, the Leaping Rock, and the burial mound of a young Sioux man said to have died while attempting to jump to or from the Leaping Rock. Catlin's view of the quarries, and cross-sectional and plan view sketches of two mounds made by P.W. Norris in 1882 (see Appendix B), are the only pictorial representations of aboriginal mounds that once existed near the quarries (see Winchell 1911:109). Catlin's illustration may also have served as the inspiration and basis for a similar but much romanticized and highly inaccurate view of the quarries and the quartzite ledge that appears as the frontispiece in Norris' 1884 book, *The Calumet of the Coteau.*

After Catlin, the next nineteenth-century pictorial renderings of the vicinity of the quarries were four sketches produced during the 1838 visit by the exploration party headed by Joseph N. Nicollet. One of these drawings, credited to either the Viscount de Montmort, a French embassy official from Washington, or to Nicollet himself, has been published (Bray and Bray 1976:80). It shows a portion of the Sioux quartzite ledge, including the Leaping Rock surmounted by the U.S. flag which John C. Fremont erected there on July 4, 1838. Three other sketches, in the same hand, exist among the Nicollet Papers at the Library of Congress. These show additional segments of the ledge and are probably of most interest because they show little vegetation near the ledge other than some small brushy plants growing in rock crevices. The Montmort/Nicollet drawings do not depict features of archeological interest.

The next artistic renderings of the quarries and nearby features are three sketches made in 1859 by a man named W.O. Williams. Alan R. Woolworth, who called our attention to these drawings and provided copies of them, has suggested (letter to Thomas D. Thiessen, March 9, 1998) that Williams may have

been a member of the General Land Office survey party that worked in the vicinity of the quarries that year. Williams drew separate views of a quarry pit with the Sioux quartzite ledge in the background (Figure 7; MHS SD4P/r41, negative 79767) and of Winnewissa Falls with the adjacent Leaping Rock (Figure 8; MHS SD4P/r4, negative 79765). The latter sketch was redrawn by Chester Kozlak and was published by Nydahl (1950:204). Williams' depictions of the ledge show no woody vegetation present. He also drew an interesting view of a Native American contemplating petroglyphs on Sioux quartzite bedrock about the base of the Three Maidens, which is discussed in Chapter 11 (see Figure 21). The Minnesota Historical Society possesses albumen prints of these three drawings. The reverse of each contains a notation that they were presented to Alfred J. Hill by W.O. Williams in September of 1859, and were given by Hill to the Society in August of 1862.

The earliest known photographs of the vicinity of the quarries are several stereograph views taken in May or June of 1870 by the noted Minnesota photographer, William Henry Illingworth (Murray 1961:15 and note 37; 1965:21). Illingworth began his photographic career in St. Paul in 1863 (Wilson 1990:54) and continued to practice photography until the later 1880s, dying by his own hand in 1893 (Grosscup 1975; Wilson 1990). He is best known for the images he created during the Fisk expedition to the gold fields in 1866 and the Custer expedition to the Black Hills in 1874, both of which parties he accompanied (Grosscup 1975; Darrah 1964:83-85; Waldsmith 1991:35, 41, 98-99). Although he operated from Red Wing, Minnesota, for a brief time (Wilson 1990:54; Schwarck 2002:272), Illingworth's studio was located in St. Paul between 1867 and 1874 (Grosscup 1975:44; Schwarck 2002:272), the time during which he visited the quarries.

Illingworth's 1870 visit to the quarries is documented in articles in the *Sioux City Journal* newspaper for June 11 and June 12 of that year.[1] At the time, Illingworth operated with a partner in Sioux City, Iowa, under the name of Gurnsey and Illingworth. Apparently traveling alone, he departed Sioux City on May 28, 1870, and returned on June 8, having photographed the falls on the Big Sioux River and the catlinite quarries. The *Sioux City Journal* article of June 12 mentions the four photographs that he made of the quarries and nearby landscape features, as described below. The weather during Illingworth's trip was characterized as having been extremely rainy, with the result that "he was drenched through and through by the heavy drenching showers that were then prevalent, and had no opportunity of drying his clothing." He was said to be so disheveled on his return to Sioux City that his partner preserved the sight by taking his photograph.[2]

The Illingworth photographs of the vicinity of the quarries have a complex publication history, due largely to the sale and swapping of negatives and publication rights among photographers, resulting in their multiple publication, a

[1]The authors are indebted to David Rambow for providing transcriptions of the text of these articles.

[2]*Sioux City Journal*, June 12, 1870.

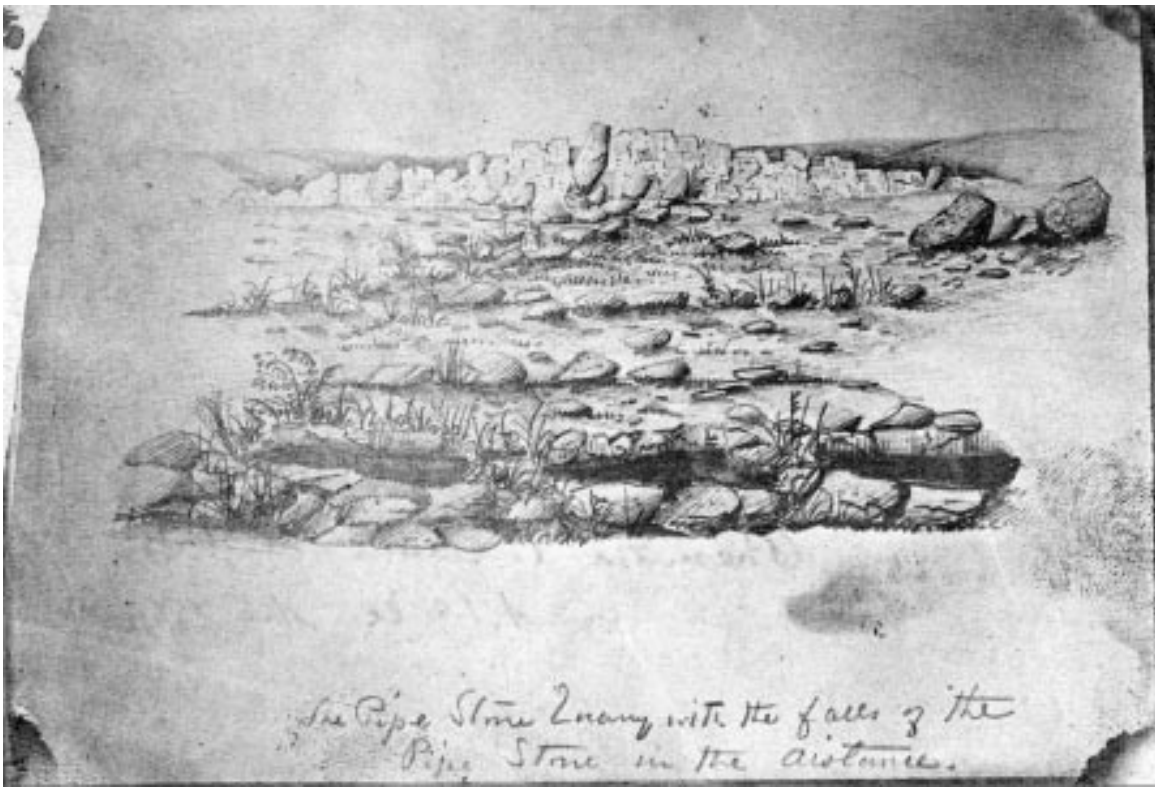

Figure 7. A catlinite quarry pit drawn by W.O. Williams, 1859 (courtesy of Alan R. Woolworth and the Minnesota Historical Society, locator SD4P/r41, negative 79767).

Figure 8. Winnewissa Falls drawn by W.O. Williams, 1859 (courtesy of Alan R. Woolworth and the Minnesota Historical Society, locator SD4P/r4, negative 79765).

common practice of the day.[3] It also appears that Illingworth, while based in St. Paul, at times entered into partnerships with other photographers to publish his images (Schwarck 2002:275). One photograph is a view of Winnewissa Falls, taken from slightly below the top of the falls and from the south (left) bank of Pipestone Creek (Murray 1965:22; Corbett 1980:87). It exists as a stereocard bearing the label, "Photographed and Published by Gurnsey & Illingworth, Sioux City, Iowa."[4] The obverse of the card bears the notation, "Ent'd according to Act of Congress in the year 1870, by Gurnsey & Illingworth, in the Clerk's Office of the U.S. Dist. Court, 1st Jud. Dist., Terr of Dak." The same view also was published in stereocard form by E.H. Burritt, of 148 Third Street, St. Paul, with printed acknowledgement of Illingworth as the photographer.[5] A second view is of the Leaping Rock and a portion of the quartzite ledge. It exists as a stereocard published by Illingworth alone from his St. Paul[6] studio and also by Gurnsey and Illingworth at Sioux City.[7] The same image was also published under the label of Hamilton and Hoyt, Sioux City, Iowa.[8] The third view was taken from atop the falls, looking westward along Pipestone Creek as it descends from the falls (Figure 9). The pond is visible in the distance. It was also published by the firm of Hamilton and Hoyt of Sioux City, Iowa, with no acknowledgment of Illingworth as the photographer.[9] The same image, in the collection of the Minnesota Historical Society (FS6.1/p1, negative 7580-A), is attributed to Illingworth but has been misidentified as a view of the falls on the Big Sioux River in 1870.[10] The Minnesota Historical Society example appears to have been produced from an original Illingworth negative purchased by the Society from Edward A. Bromley in 1927 (Wilson 1990:56). Another Illingworth stereograph at the Minnesota Historical Society (SD4P/r26, no negative number) shows a segment of the quartzite ledge (Figure 10). It was published by Illingworth. Finally, a fifth Illingworth photograph may be another view of Winnewissa Falls, but the image is identified as a view of the Big Sioux falls (Minnesota Historical Society, FS6.1/p3, negative 7575-A). It too is from an Illingworth/Bromley negative. The four and possibly five Illingworth views show little of archeological interest, but appear to con-

[3]We are indebted to David Rambow, formerly of the Pipestone County Historical Museum and the Siouxland Heritage Museums in Sioux Falls, South Dakota, for bringing the Illingworth photographs to our attention, and for providing a copy of a stereocard in his possession. We are also grateful to Robert Kolbe of Sioux Falls and Donald Schwarck of South Lyon, Michigan, for sharing copies of Illingworth images in their collections. Steve Nielsen of the Minnesota Historical Society facilitated our examination of photographs in the Society's collection.

[4]Rambow and Kolbe collections. An example is also in the photographic collections of the Minnesota Historical Society (SD4P/r, negative 5878).

[5]Schwarck collection.

[6]Schwarck collection.

[7]Kolbe collection.

[8]Minnesota Historical Society photographic collection, SD4P/r28, negative 4582. Darrah (1964:198, 208, 229) lists J.H. Hamilton as a Sioux City photographer during the "Decline" period of American stereography (1878-1898).

[9]Kolbe collection.

[10]We are indebted to David Rambow for pointing out this misidentification.

Figure 9. W.H. Illingworth photograph of the catlinite quarries, 1870. View is to the west from Winnewissa Falls. Quartzite spoil piles can be seen along the quarry line in the distance (courtesy of the Minnesota Historical Society, locator FS6.1/p1, negative 7580-A).

Figure 10. W.H. Illingworth photograph of a portion of the Sioux quartzite ledge at the catlinite quarries, 1870. View is to the east (courtesy of the Minnesota Historical Society, locator SD4P/r26, negative 96796).

firm the virtual absence of woody vegetation in the vicinity as early as 1870.

The Minnesota Historical Society also possesses three early stereographs taken in the vicinities of the catlinite quarries by F.O. Pease, a Pipestone, Minnesota, photographer. Though the stereographs themselves are undated, the Society's records attribute the date of 1885 to all three. One (SD4P/r32, negative 15843) is a view of Winnewissa Falls taken from below the falls and on the north (right) bank of Pipestone Creek. Another is a view of the quartzite ledge (SD4P/r25, negative 3285). The third (SD4P/r23, negative 4511) is a view of the Three Maidens; it may be the earliest photographic view of the glacial boulders.

Several other late nineteenth-century drawings or photographs of features in the vicinity of the quarries exist. An undated, unattributed drawing of Winnewissa Falls appears as Figure 38 in Winchell's (1884:534) early description of the geology of Pipestone and Rock counties. Two published drawings of the quartzite ledge made by a German magazine correspondent, Rudolf Cronau, probably during the early 1880s, also show no trees and very little brushy vegetation (Cronau 1886:illustration 13; 1890:illustration between pages 84 and 85). Early photographs of the Three Maidens also portray a landscape devoid of trees and bushes (Holmes 1919:265; Beckering 1989:24; Pipestone County Historical Society 1989:28; Pipestone Indian Shrine Association n.d.:32), as does a view of the quarries published by Holmes (1919:256). Photographs taken or obtained by Holmes during his 1892 visit to the quarries also show a general lack of woody vegetation (National Anthropological Archives, W.H. Holmes collection, negatives 72-3232, 72-3236, 72-3239, 72-3242, 72-3245). The photographs dramatically illustrate the near absence of trees on the prairies surrounding the quarries (see following section on pictorial representations). However, the age and authorship of these photographs has not been established with certainty.

Early twentieth century depictions also show a virtually treeless landscape. Three undated photographic views of the vicinity of the quarries exist in the archives of the Department of Geoscience at the University of Iowa in Iowa City. Taken by Samuel Calvin, the Iowa State Geologist from 1892 to 1904 and 1906 to 1911 (Jean Prior, personal communication to Thiessen, February 7, 2001), one (no. 257) depicts the "Building Stone Quarry" near the Three Maidens. The other two (lantern slides 2565 and 2566; also numbered 259 and 258, respectively) show a quarry in the process of being worked by Indians and the same quarry without the Indians but with the tools left in place.[11] A drawing of the Leaping Rock published by Winchell (1911:112) likewise shows no woody vegetation at the base of the quartzite ledge. The sketch is attributed to Herman Haupt, Jr., the son of Brigadier General Herman Haupt, who served as chief of the U.S. Military Railroads during 1862 and 1863 (Alan R. Woolworth, personal communication, April 5, 2000; Warner 1964:217-218). The

[11]We are indebted to Dr. Jean Prior of the University of Iowa for bringing the Calvin photographs to our attention. Image no. 258 has been published by Alex(2000:36).

label on Haupt's sketch indicates that the Leaping Rock is 18 feet 10 inches high.[12]

No doubt other informative historic images of the vicinity of the quarries exist (e.g., see the circa-1890 photograph that appears on the cover of South Dakota History 8[2]). All of these early images of various geographic features near the catlinite quarries reveal virtually no trees and little shrubby or woody vegetation in the vicinity. It was not until the region became settled in the late nineteenth century and later that trees and larger shrubs began to have a significant foothold in the monument. An article published in the *Pipestone County Star* on June 24, 1880, noted the beginning of tree growth along Pipestone Creek and the Sioux quartzite ledge (Murray 1961:74; 1965:42). Tree growth on the Pipestone Indian School land was even encouraged by local residents. In 1934 the City of Pipestone furnished elm trees, which were planted by the Indian Emergency Conservation Work project that year (Mitchell 1934:27; Murray 1961:85-86; 1965:49). From at least 5,500 years ago the area was tallgrass prairie.

The dominant native vegetation is the Bluestem Prairie type (*Andropogon-Panicum-Sorghastrum*). However, cultivation, and until 1974, a lack of periodic fire has allowed a variety of invader species and successional plants to become established to the point where the monument superintendent proposed in 1950 a plan to clear a portion of the quartzite ledge to restore its historic appearance (Memorandum from the Superintendent, Pipestone National Monument, to the Regional Director, Region Two, March 21, 1950, Subject: Historic Landmark, with cover sheet titled "Research (Vista Clearing)," copy on file at Pipestone National Monument; see also Becker et al. 1986:23-25).

Smooth bromegrass (*Bromus inermis*) and Kentucky bluegrass (*Poa prantensis*) predominate the western portion of the park which was under cultivation until it was acquired by the Service in the 1950s. Other invader species are present in the park and include yellow sweetclover (*Melilotus officinalis*), white sweetclover (*Melilotis alba*), quackgrass (*Agropyron repens*), Canada thistle (*Circium arvense*), and red clover (*Trifolium pratense*). A variety of woody vegetation is present along the Sioux quartzite ledge and in the riparian habitat created by Pipestone Creek. The woody vegetation includes snowberry (*Symphoicarpos occidentalis*), European buckthorn (*Phamnus cathartica*), smooth sumac (*Rhus glabra*), wild black currant (*Ribes americanum*), chokecherry (*Prunus virginiana*), American plum (*Prunus americana*), sand cherry (*Prunus besseyi*), hackberry (*Celtis occidentalis*), green ash (*Fraxinus pennsylvanica*), bur oak (*Quercus macrocarpa*), American elm (*Ulmus americana*), and, rarely, grey dogwood (*Cornus racemosa*)[13] (Stubbendieck and Willson 1986; Gia Wagner, email communication, January 27, 2005).

[12]Haupt's sketch is to be found in a manuscript by him entitled "North American Indians. Ethnology of the Dakota,-Sioux,-and Ojibway,-Chippeway-Indians." The original is in the Ayer Collection at the Newberry Library, Chicago, Illinois. We are grateful to Alan R. Woolworth for bringing this to our attention and providing a copy of the manuscript.

[13]Occurs only as a rare species within the monument (Gia Wagner, email communication, January 27, 2005).

Becker et al. (1986) provide a detailed list of 319 taxa from 76 vascular plant families they identified and collected in the park. Sixty-five species and varieties of lichens have been found within the monument (Vinyard 1984; Willson and Vinyard 1986). Ninety species of plants within the Monument that have significance for Native Americans have been inventoried (Toupal et al. 2004).

Fauna

Anfinson (1997:20-21) identifies about 50 animal species that were native to the Prairie Lake Region and adjacent Coteau around the time of contact.[14] He identifies the majority as small burrowing prairie mammals. At the time the prairie became dominant, around 9,000 years ago, the majority of fauna later identified by historic travelers were present in the region. The largest mammal of the area prior to white settlement was the bison. Bison disappeared from the region in the mid- to late nineteenth century (Becker et al. 1986). The last sighting of a bison in southwestern Minnesota occurred in 1879 (Amato et al. 2001). Elk (*Cervus canadensis*) were the second largest mammal found in the Prairie Lake Region in precontact and early contact times and have since disappeared from the region. Two species of deer were present in the Prairie Lake Region: mule deer (*Odocoileus hemionus*) in the west and white-tailed deer (*Odocoileus virginiana*) in the east. Large numbers of deer were not common in the south and west. Other mammals present were the white-tailed jackrabbit (*Lepus townsendii*), cottontail rabbit (*Sylvilagus floridanus*), woodchuck (*Marmota monax*), raccoon (*Procyon rotor*), and possibly the grizzly bear (*Ursus arctos*). Amphibian and reptile species were not numerous in the Prairie Lake Region or the Coteau. Turtles, including the painted turtle (*Chrysemys picta bell*) and the snapping turtle (*Chrysemys serpentina*), and possibly others as well, were present. Frogs and other amphibians inhabited the available wetlands near creeks and rivers. Mussels and crayfish were locally available in the lakes and sloughs, with mussels being especially abundant in the Minnesota River, some 60 miles to the north. Today the animal species that predominate in Pipestone are the small mammals and over 100 species of birds (Becker et al. 1986). The only larger mammal is the white-tailed deer. Reptiles recently observed include snapping and painted turtles, garter snakes, frogs, and lizards. Some fish inhabit the creek and nearby lake and include northern pike, white sucker, sunfish, bullhead, and bass, along with minnows and shiners. Over 100 species of birds have been observed at the monument (Snyder 1985).

[14]Dr. J. Fraser Boughter, the post surgeon at Fort Dakota in 1869, provides an extensive list of fauna present in the region in his description of Fort Dakota and the vicinity (Rambow 2003:40-58).

REGIONAL CULTURE HISTORY

Prairie Lake Region

Physiographically, Pipestone National Monument is located on a landform called the Coteau des Prairies, a prominent elevated plateau that extends from northeastern South Dakota into southwestern Minnesota (Wright 1972b:573-574, 576-577; Ojakangas and Matsch 1982:223; Winham 1990:14-15). The monument is also located a few miles from the southern and western fringe of the Prairie Lake Region, an area archeologically defined as the eastern margin of the Great Plains, and the northern fringe of the Prairie Peninsula (Anfinson 1982, 1987, 1990:146-147, 1997; Winham 1990:14-15; Wedel 1961:22-24; Wood 1998:9-13). The Prairie Peninsula largely coincides with today's "cornbelt" region of the Midwest stretching from the eastern boundary of the Plains eastward into Indiana (Henning 1970:3-4). Pipestone National Monument is within the Southwest Riverine archeologial region, the smallest of the nine Minnesota archeological regions posited by Anfinson (1990:145-146). Although Winham (1990) does not characterize archeological complexes in Minnesota, the Southwest Riverine region of Minnesota would be within an extension of Winham's (1990:14-15) Upper Big Soux archeological region, which he defined within South Dakota.

Although little has been written of the prehistory of the region immediately surrounding the catlinite quarries, three excellent syntheses of the archeology of nearby areas will be used to frame the regional archeological context of the monument. One interprets the archeology of the Prairie Lake Region (Anfinson 1997), which lies a few miles to the north, west, and east of Pipestone, Minnesota. A brief publication by the same author (Anfinson 1999), based on Anfinson's synthesis of the Prairie Lake Region, summarizes the archeology of southwestern Minnesota for lay readers. Another synthesis summarizes the archeology of the state of Iowa (Alex 2000), including the northwestern corner of the state, which lies about 35 miles to the south of Pipestone National Monument. The third (Winham 1990) describes the range of types of archeological sites found in the Big Sioux River drainage in eastern South Dakota, and their location on the landscape. Johnson (1988) provides a broad outline of the prehistoric culture history of the entire state of Minnesota, though very generalized and written for a lay readership. These and other sources are the basis for three subsequent sections of this chapter.

The nomenclature and dating used by the authors of these syntheses differ somewhat from one another and from culture historical terminology utilized in other regions where catlinite artifacts have been found. In particular, the culture history terminology used by Anfinson (1987, 1997) is markedly different from the more "standard" culture history sequences discussed by other authors. The culture history terminology and date ranges used by Anfinson (1997) and Alex (2000) are compared in Table 1, along with the nomenclature and ages used by Johnson (1988).

The quarries were used for catlinite extraction by native peoples

beginning as early as the Early and Middle Woodland periods and continuing to the present day (Emerson et al. 2002; Boszhardt and Gundersen 1996, 2003). Occupation or other use of the Pipestone area for other purposes (e.g., hunting or camping) by archeologically defined cultures may have begun as early as the Prairie Archaic (Anfinson 1997:35-39) or Middle Archaic (Alex 2000:67-68) period of 5,500 years ago and continued on a sporadic basis until the present. There appear to be no long-term habitation sites or villages at or near Pipestone. Rather the area seems to have been used, possibly in a number of different ways, for temporary camps for hunting and other resource extraction activities, like the famed catlinite quarrying so well documented in the historic and modern eras. The cultural sequence and site types recorded in the archeological record are typical of the area and in general for western Minnesota, eastern South Dakota, and northwestern Iowa (Anfinson 1997; Winham 1990; Aufderheide et al. 1994; Benn 1990a, b; Alex 2000). The following section provides a brief summary of the culture history of southwestern Minnesota and its surrounding areas.

Anfinson (1982, 1987, 1997:121-126) defines the Prairie Lake Region as a Plains region, both environmentally and culturally. He describes the peoples who resided there through time as partially dependent on bison hunting for at least 9,000 years, with two periods particularly focused on bison hunting, one prior to about 5000 BC and the other in the Late Prehistoric Period (AD 900-1650). During the Late Prehistoric, Anfinson concludes the region contained semi-sedentary settlements of Plains Village cultures closely related to the Middle Missouri Tradition of the Northern Plains. None of the village sites of these peoples exists close to Pipestone National Monument, however. By the time of contact with Euroamerican peoples, the Prairie Lake Region was occupied by nomadic Sioux peoples including the Dakota or Santee, Yankton, and Yanktonai.

Anfinson posits that the Prairie Lake Region and by extension, the Coteau des Prairies, did not witness the rise in sedentism that characterized the Middle Archaic lifestyle of the Mississippi valley. He holds that the upland resources of the Prairie Lake and Coteau regions became most important during the Archaic. Big game hunting remained the basic way of life throughout most of the Archaic, as bison populations expanded eastward with the post-glacial warming trend. Changes in subsistence and presumably settlement patterns from the Paleoindian to the Archaic were probably not as pronounced as in other Midwestern areas. A similar contrast between Archaic-period hunting-related sites in western Iowa vs. evidence for more intensively utilized base camps and more varied resource exploitation in eastern Iowa has been noted by Alex (2000:54-84).

In both the Coteau and Prairie Lake Region, there is very little evidence for Paleoindian occupation (ca. 10,000-6,000 BC according to Anfinson 1997, ca. 11,000-8,500 BC according to Alex 2000). Evidence of Paleoindian presence in an area often occurs in the form of a number of distinctive projectile point forms, usually found as isolated artifacts. Within Pipestone

Table 1. Culture history nomenclature and dating used by selected authors with respect to archeological complexes in southwestern Minnesota, northwestern Iowa, and eastern South Dakota.

Anfinson 1997	Alex 2000	Johnson 1988
Early Prehistoric Period 10,000-3,000 BC	Paleoindian 11,000-8500 BC	Paleoindian Tradition 10,000 BC?-6000 BC
Paleoindian Tradition 10,000-6000 BC	Late Pleistocene Hunters 11,000-10,500 BC	
	Early Holocene Hunters and Foragers 10,500-8500 BC	
	Archaic 8500-800 BC	Eastern Archaic Tradition 6000-800 BC
	Early Archaic 8500-5500 BC	
Prairie Archaic Tradition 5500-3000 BC	Middle Archaic 5500-3000 BC	
Middle Prehistoric Period 3000-AD 900	Late Archaic 3000-800 BC	
	Woodland 800 BC-AD 1200	Woodland Tradition 800 BC-AD 1700
	Early Woodland 800-200 BC	
	Middle Woodland 200 BC-AD 400	
	Late Woodland AD 400-1200	
Late Prehistoric Period AD 900-1650	Late Prehistoric AD 950-post 1650	
Great Oasis Phase AD 900-1200	Great Oasis AD 95-1100	
Cambria Phase AD 1000-1200	Mill Creek AD 1100-1250	
Big Stone Phase AD 1100-1300		
Blue Earth Phase AD 1000-1650	Oneota Late AD 1200s-post 1650	

County only one Paleoindian projectile point is reported, and its origin to the area is in some doubt (Higginbottom and Shane 1996). Paleoindian projectile points exist in a private collection from the Pedersen Site at Lake Benton, about 20 miles north of Pipestone National Monument, and other projectiles are reported from Rock and Nobles counties to the south and southeast of Pipestone County (Anfinson 1997:29, 33; Skaar et al. 1994:52-54). In general, however, there is a true scarcity of archaeological remains in the Coteau and Prairie Lake Region related to the Paleoindian use of the area. Paleoindian remains are scarce also in Iowa. An example of a fluted form of projectile point known as Clovis was recently found in Woodbury County, Iowa, about 100 miles south of Pipestone National Monument (Molyneaux 1998a, 1998b, 2000).

The Archaic period began in southern Minnesota by around 9,000 years ago. This cultural adaptation appears to be in response to a stabilized environment and the emergence of a mixed grass prairie vegetation that indicated a warmer dryer climate than that of today. Anfinson (1997:122) suggests the subsistence resources of the Prairie Lake Region became more stable and more abundant with bison and other animals being hunted. Archeological sites appear to be located near the available water sources during this period. Water would have been present at these locations just below the surface or in small waterholes. Anfinson believes that the warm-season sites may have been located on the bottoms of largely dry lake basins or on the lowest terraces in the major river valleys. He (Anfinson 1997:122) suggests most of these sites are now covered with water or deeply buried in lacustrine or alluvial sediments.

By 5,000 years ago southern Minnesota saw the environment become somewhat cooler and wetter. The true tallgrass prairie of the Coteau developed at this time and, with minor fluctations, continues today. This fostered the development of a stable cultural tradition that was to exist in the region for more than the next four millenia, or until about 200 BC (Anfinson 1997:42, 122). With the lakes full of water most of the time, the wetlands of the Prairie Lake region, coupled with the tallgrass uplands of the Coteau, offered a rich and diverse resource base that allowed a more sedentary lifestyle to develop.

In the Prairie Lake Region there arose an archeological manifestation known as the Mountain Lake Phase (ca. 3,000-200 BC; Anfinson 1997:42-47). The phase was characterized by habitation sites on islands and peninsulas in lakes; more diverse subsistence based on upland and lowland species; heavy use of local lithic resources; and what Anfinson (1997:122) describes as "resistance to outside influences involving changes in the basic way of life, social interaction, and ideological expressions." In sum, according to Anfinson (1997:122), "Middle Prehistoric changes largely are confined to technological improvements or stylistic forms. These markers differentiate phases but do not constitute significant cultural change with regard to ways of life."

In Iowa, the last several centuries of the time spanned by the Mountain Lake Phase, i.e., ca. 800-200 BC, constitute the Early Woodland period (Alex

2000:87-98). During this period, the first pottery, technologically unsophisticated, appeared and is a hallmark of the advent of the Woodland tradition in Iowa. In western Iowa, the pottery is termed Crawford ware (Alex 2000:96-97). In both the Prairie Lake Region and western Iowa, cultural complexes lacked the technological sophistication, mortuary ritual elaboration, and presumed social complexity that arose in archeological cultures along the Mississippi valley and eastward.

The Midwestern Woodland Tradition appears in the region with the addition of pottery to the material culture assemblage of the Fox Lake Phase (ca. 200 BC-AD 700; Anfinson 1997:47-75), which succeeded the Mountain Lake Phase. In southwestern Minnesota, the earliest ceramics comprise the Fox Lake type series (Anfinson 1997:55). Anfinson (1997:122) sees few other Woodland trappings being added to the lifestyle of those inhabiting southwestern Minnesota in this era. He suggests that the use of burial mounds appeared late in the Fox Lake Phase, but not the elaboration of mortuary ritual that characterized cultural complexes to the east (Anfinson 1997:71; Alex 2000:111).

In Iowa, the earlier part of the Fox Lake Phase timespan, ca. 200 BC-AD 400, comprises the Middle Woodland period (Alex 2000:97-115). Mound building on a monumental scale plus elaboration of ceramic technology and certain other classes of material culture characterize complexes along the Mississippi and Illinois river valleys and through much of Ohio and Indiana. However, this degree of cultural sophistication did not arise in western Iowa or southwestern Minnesota. Alex (2000:111-112) characterized this as a time of cultural conservatism in the Prairie Lake Region.

The Lake Benton Phase (ca. AD 700-1200; Anfinson 1997:75), which succeeded the Fox Lake Phase in the Prairie Lake Region, apparently had some cultural contacts to the northeast, as indicated by ceramic stylistic similarities to St. Croix-Onamia types and the introduction of crushed granite temper. Burial mound use became more widespread and the bow and arrow saw its introduction in this phase, although there is no evidence for a change in subsistence-settlement patterns. The Lake Benton Phase closed the Woodland tradition and marked the transition to Late Prehistoric cultures in the Prairie Lake Region. The Lake Benton Phase timespan coincided with much of the Late Woodland period in Iowa (ca. AD 400-1200; Alex 2000:115-137), as well as the rise and fall of the Middle Mississippian stage centered on Cahokia near present-day St. Louis (ca. AD 1050-1350; Alex 2000:137).

Within the Prairie Lake Region, the transition from the Middle Prehistoric (ca. 3,000 BC-AD 900) to the Late Prehistoric (ca. AD 900-1650) is characterized by the appearance of horticultural villages. This cultural transition is evidenced by semi- or fully sedentary villages based on the raising of garden crops, new cultural contacts, and increased populations. Anfinson (1997:123) notes that the first horticultural village cultures appear to represent migrations into the region since the indigenous terminal Woodland culture differs substantially in important subsistence and artifactual characteristics, especially ceramics.

Interestingly, village sites of this period are not known in the Pipestone area.

The migration of horticultural villagers into the Prairie Lake Region had an effect on the indigenous population, but its extent is not well understood. This period is characterized by the Great Oasis and Big Stone phases in the region. They appear to have the closest relationship with the terminal Woodland peoples, but definitive Great Oasis and Big Stone associated sites are very limited and poorly understood in the region. It appears the area was shared (or disputed) by Woodland, Plains Village, and Oneota peoples for several centuries. At the time of the disappearance of Great Oasis and Cambria about AD 1200, evidence for terminal Woodland peoples is scarce. Anfinson (1997:124) suggests that at least some of the Lake Benton peoples became part of the Big Stone Phase, a terminal Late Prehistoric Plains Village complex present in the northwestern Prairie Lake Region, primarily in the Minnesota River valley. He also suggests that the Prairie Lake Region may have been partitioned by the horticultural villagers with the eastern region dominated by Oneota, the Minnesota River valley by Cambria, the southwest by Great Oasis, and the northwest eventually by Big Stone.

An intriguing assertion by Anfinson (1997:124) is that eastern groups may have traveled, on an intermittent basis, into the region's western areas to hunt. He suggests this is evidenced by small campsites in southwestern Minnesota where mixed upper horizons contain terminal Woodland, Plains Village, and Oneota components.

Environmental change in the form of a severe drought is postulated to have caused the demise of the Mill Creek Culture in the AD 1000 to 1300 time period. Anfinson (1997:123-25) strongly disagrees with this tenet. He instead argues that the environmental changes were not so devastating as to be debilitating to the Mill Creek peoples; rather, the drier period may have increased the bison range, which allowed for a change in animal procurement practices. Emphasis was on hunting bison instead of deer. He also asserts maize-based horticulture was not abandoned in the northeastern Plains at this time. He notes that by AD 1300, Blue Earth Oneota flourished in south-central Minnesota, concentrated only one hundred miles northeast of the Mill Creek settlements. But, forty miles north of the Blue Earth concentration, Cambria peoples abandoned their major villages in the Minnesota River valley by AD 1300. Cambria subsistence patterns are very similar to Blue Earth with limited use of bison indicated in the major villages. He suggests the regional environmental setting in southern Minnesota, with its deep and broad river valleys, would not likely have been wholly depleted of soil and wood resources even in a time of drought. He notes that in the northern section of the northeastern Plains, horticulture apparently continued to flourish in the Late Prehistoric, and horticulture also flourished along the Missouri River valley in the Dakotas at this time as well. Anfinson (1997:124-125) attributes the demise of the Plains Village cultures of southwestern Minnesota to a deteriorating climate that may have contributed to other stresses on these cultures. He argues that as Oneota influences increased in the eastern Plains

around AD 1200, Mill Creek and other eastern Plains Village groups began to add fortifications to their main villages and abandon outlying settlements, suggesting that intergroup conflict may have been intense and widespread. Southwestern Minnesota appears to have been partitioned with Great Oasis in the west; Cambria in the north; and Blue Earth Oneota in the east.

Anfinson's (1997:124) "best fit" explanation for cultural change that occurred in the western Midwest at about AD 1200 is that Oneota expansion caused a great deal of resource competition and armed conflict in the area. He sees the Plains Village Tradition withdrawing to the Middle Missouri subarea of the Northern Plains (i.e., the Missouri River valley in the Dakotas) and abandoning the southern part of the northeastern Plains when the Oneota was experiencing its greatest expansion in the northeastern Plains and western Midwest. Anfinson (1997:125) sees this expansion and its concomitant conflict as the most plausible explanation for the abandonment of the southern northeastern Plains by Plains Villagers.

It is difficult to improve upon Anfinson's conclusion regarding the final phase of Native American use of the Prairie Lake Region and, by association, the Coteau. In his typically clear style, Anfinson (1997:124-125) summarizes his view of post AD 1200 use of the area:

> *Hickerson's (1970) study of the historic Ojibwa Dakota conflict suggests that northern west-central Minnesota was virtually unoccupied in the last years of the Late Prehistoric because of intertribal resource competition. This may be a useful model to help explain the cultural situation in the Prairie Lake Region in Late Prehistoric and early contact times. With the increasing interest in bison hunting and maize cultivation, perhaps brought on by widespread population pressure, improved varieties of maize, and/or increased availability of bison in the eastern Plains, numerous groups expanded into the Prairie Lake Region. There, bison herds roamed and ideal maize growing areas existed. Initially, this expansion was relatively peaceful, but as resource competition and population pressure increased, so did hostility. Finally, around AD 1200, conflict was so intense that much of the Prairie Lake Region was abandoned for year-around settlement.*

Northwestern Iowa

Northwestern Iowa comprises the final area with archeological sites that share similar environmental and cultural sequences for comparison to southwestern Minnesota. Northwestern Iowa is considered to be at the eastern edge of the Central Plains subarea as defined by Wedel (1961). It is also at the boundary of an area defined as the Western Prairie Peninsula subarea of Iowa and Missouri, and it is within the Big Sioux region as defined by Anfinson (1987:351-354).

Benn's (1990a) discussion of the northwestern Iowa Rainbow Site's cultural components provides a convenient summary of the area's cultural sequence. Alex (2000) has recently reevaluated and summarized the archeology of Iowa. Both these works were used to summarize the Northwest

Iowa cultural sequence that may reflect those prehistoric peoples who used the Pipestone area. They identify the Archaic period in terms similar to those used by Anfinson (1997). The Archaic peoples were mobile foragers relying on hunting and wild plant collecting for subsistence. Benn (1990a) sees no major cultural shifts in the Early Woodland period in this area, again agreeing with other assessments of the nature of cultural adaptation to the Big Sioux and Prairie Lake regions (Anfinson 1997:122; Alex 2000:54-84). The Middle Woodland period is seen as a growth in the regional populations dependent on locally available resources; in essence, Middle Woodland represents a continuation of the foraging strategy, but with the introduction of pottery and a few other new artifact styles, and probably a growth or intensification of contact, and possibly trade, with other groups. Benn (1990a:223-224) and Alex (2000:54-84) also see elaboration of certain rituals and associated artifacts, especially concerning burial of the dead.

By the beginning of the Late Woodland period the prairie peoples were apparently staying in one place longer, developing a thinner-walled pottery, employing storage pits as a means to offset the meager results of hunting and gathering during the winter season, and perhaps developing or intensifying horticultural activities like planting or encouraging plants with starch-rich and oily seeds (Alex 2000:115-130). They also diversified their hunting and gathering strategies to include a wider range of animals, plants, and aquatic resources in the diet. By the Late Woodland, the major change was the introduction of maize horticulture and the continued elaboration of ritual and ceremonalism. Base camps were occupied for longer periods, possibly in response to the need to tend crops. Seasonal mobility is still very much evident in the archeological record, but it does not manifest itself as intensely as in the earlier periods.

In the final prehistoric period the northwest Iowa peoples grew from the trappings of the Late Woodland into the Plains Villagers (Alex 2000:138-210). Sites were more intensely occupied and there seems to be the appearance of a strong leadership at the family, band, and other group levels. Agricultural intensification, principally based on maize horticulture, is argued to be a large factor in the formation of the archeological record. Residences are nearly permanent and there is significant development in storage pit technology. There is strong evidence for the intensification of trade and, possibly, intergroup conflict. Interestingly, at least some of the Oneota people in the northwestern Iowa area, possibly the ancestors of the historic Omaha, Ioway, and Oto tribes, may have shared a special relationship with the catlinite quarries. They may have quarried the stone, widely traded the stone, and controlled access to the quarries after AD 1200 or 1300 until the advent of the historic period ca. AD 1700 (see Chapter 10).

The Big Sioux Drainage

The Big Sioux River drainage in South Dakota is differentiated from the Rock River and Split Rock Creek drainages and the Prairie Lake Region of Minnesota for convienence of discussion. The Big Sioux River, which Pipestone Creek ultimately flows into

via Split Rock Creek, exhibits a similar geological and geomorphological history to the Pipestone area. Winham (1990) has developed a comprehensive review of the culture history, site types, and site locations for the Big Sioux drainage. The area of eastern South Dakota is not extensively inventoried, but it apparently exhibits about the same inventory coverage as southwestern Minnesota, although no extensive sampling or probability inventories have been done in the area. Winham (1990) notes that most of the site identification work in the drainage has been the result of one of two processes: random site discovery, often by amateurs; and cultural resource management-driven work, often focused on linear transects following pipeline, transmission, or highway corridors.

Winham (1990:58-108) reviews and identifies sites present in the drainage area dating to the Archaic period, Besant, Woodland (including numerous sites with mounds), Late Prehistoric, Great Oasis, Plains Village, Oneota, Historic Native American, and Historic Euroamerican eras. He suggests (Winham 1990:161-163) that the average site density of the drainage is about 8.9 sites per square mile, although the lower reaches of the drainage may not have a density that high. Lithic scatters, mound sites, and a few village sites are found throughout the drainage, but stone circle sites and rock cairns are found only in the upper portion of the drainage. The lower Big Sioux River drainage has a higher density of village sites and sites dating to the Great Oasis Phase and sites affiliated with the Oneota tradition.

The availability of large numbers of bison in the eastern periphery of the Plains is seen as an an important reason for Oneota people to have spread westward, with the consequences of resource competition and armed conflict with indigenous local villagers (Henning 1998b:239-240; Fishel 1999:117-118; Ritterbush 2002). The presence of the nearby catlinite quarries has also been suggested as a reason for the establishment of an Oneota occupation at the mouth of Blood Run Creek (Benn 1986, 3:32; 1990b:82), an extensive Oneota occupation and burial site that straddles the Big Sioux River southeast of Sioux Falls, South Dakota, approximately 40 miles southwest of Pipestone National Monument (Henning 1998a:383; 2001:233; Henning and Thiessen, eds., 2004). Oneota peoples are believed to have spread into the western periphery of the Prairie Peninsula during the Developmental Horizon of the Oneota Tradition (AD 1000-1350; Henning 1998a:353) and established permanent villages in western Iowa around AD 1250 (Henning 1998b:240). Most Oneota researchers have suggested that the Oneota peoples engaged in a widespread trading network in which catlinite was one of the important commodities of exchange, particularly during the Classic Horizon (Harvey 1979:209; Tiffany and Anderson 1993:303; Gibbon 1995:190; Henning 1998a:356-360; 1998b:242; 2003:213-214). The putative dates of AD 1500 to 1700 for Blood Run span portions of the late Classic (AD 1350-1650) and Historic (AD 1650-1775) horizons of the tradition (Henning 1998a:353, 383). Gibbon (1995:190) has suggested that catlinite pipes played an important role in prehistoric antecedents of the calumet ceremony after about AD 1200, which may be one of the reasons for widespread trade in

the material. It has even been suggested that the Oneota controlled access to the quarries and that Blood Run was an important trade center from which catlinite, among other commodities, was disseminated (Henning 1998a:385; 1998b:241-242; 2003:213; Fishel 1999:127; Alex 2000:204; Bray 2003; Henning and Thiessen 2004:597-598). Benchley et al. (1997:23) have observed that catlinite use becomes widespread after about AD 1200, which would generally correlate with the spread of Oneota peoples into the western prairies of northwestern Iowa. Henning (2003:213) believes that Oneota exploitation of the catlinite quarries began about AD 1450. Catlinite artifacts are said to be common at Blood Run (Harvey 1979:151, 188; Henning 1998a:385, 2003:213-214; Henning and Thiessen 2004:598), and two pieces of red pipestone from there have been confirmed as catlinite through x-ray diffraction analysis (Table 5-2). Interestingly, while catlinite is abundant at the Blood Run Site, it appears to be rare in Blue Earth Phase components of the Oneota Tradition, which are found in the Prairie Lake Region as well as along the Little Sioux River (Henning 1998a:379; Anfinson 1997:112-119). The occupants of the Blood Run Site, at least on the eve of documented contact with Euroamericans at around AD 1700, are believed to have been the Dhegiha-speaking Omahas/Poncas (combined) and the Chiwere-speaking Ioways and Otos (Thiessen 1998a, 2004; Henning 2003:213; Henning and Thiessen, eds., 2004). Historical and traditional sources of information also suggest that the Omahas lived elsewhere in the Big Sioux River drainage by the advent of the historic period, ca. AD 1700 (Thiessen 1998a, 2004).

Site location in the lower Big Sioux area tends to concentrate on floodplain terraces, valley bluffs, hills, and ridges (Winham 1990:162). In the upper Big Sioux drainage sites tend to be located on lake edges, lake bluffs, and on hilltops and ridge slopes of the prairie/plains area. The site locations appear similar to those observed by Anfinson (1987, 1997) and Gibbon and Hruby (1983) for southwestern Minnesota.

Site Location Patterns in the Study Area

The Minnesota Statewide Archaeological Survey ([Lofstrom et al.] 1981) conducted a sample survey of portions of Minnesota between 1977 and 1980. Sample units were drawn from a universe defined during the development of the survey model. The southwestern Minnesota counties of Rock, Pipestone, and Nobles were among the areas sampled. The sampling in these three counties was conducted during the spring of 1979 and was centered on the Rock River drainage and its tributaries. The inventory work did not include the monument or the Pipestone Creek drainage. However, inventory took place within five miles to the east of the monument. Sample units consisted of quarter quarter sections (40 acres each).

The sampling design for the Rock River survey identified four strata as the sampling universe. The first stratum was the Rock River and its valley; the second was defined as lands lying in the drainage of the Rock's main permanent tributaries; stratum 3 included all sample units crossed by intermittent streams in the Rock River drainage; and stratum 4 comprised the remainder of

the drainage's landforms. The survey design identified 1,964 40-acre sample units in the drainage. Field investigators were able to inventory 207 of the sample units or about a 10 percent sample.

The Rock River drainage inventory determined that prehistoric archeological sites occur in the highest numbers and greatest density in the permanent river and creek valleys and on their adjacent blufftops. They found much lower site density in the uplands and along the intermittent streams.

Gibbon and Hruby (1983) conducted cluster and discriminate function analyses of the Rock River drainage sample data to generate a statistically based association between stone tool assemblages and spatial and functional patterns. The sites they used in the analyses were typical lithic scatters that more often than not contained few if any diagnostic artifacts. Their statistical analyses suggested that there were time and space patterns in the archeological record.

They concluded that Archaic-period foragers used a variety of topographical settings for resource procurement, and Archaic peoples used a narrower range of lithic raw materials than did subsequent peoples such as the Woodland and Mississippian. The study determined that Woodland and Mississippian peoples used more Sioux quartzite than earlier peoples, a greater variety of lithic raw materials, and these later peoples tended to focus their food procurement activities in the Rock River valley (Gibbon and Hruby 1983:148). Finally they concluded that special activity sites from all periods are located in a variety of topographic settings within the Rock River drainage.

Recorded Archeological Sites in Pipestone County

The Minnesota Historical Society and the Office of the State Archeologist's archeological site records were consulted during the project to determine the number and type of archeological sites recorded in Pipestone County. There are 31 archeological sites recorded in the county, with the majority located in the Rock River drainage (Gibbon 1980a; 1980b; Lothson and Clouse 1985; Pederen 1989; Pedersen and Hudak 1981; Dudzik and Nunnally 1995; Peterson 1994; Radford and George 1993).

Minnesota uses the Smithsonian trinomial system to designate sites. Minnesota is designated 21 in the system and Pipestone County is designated as PP. Site 21PP2 is the entire monument, as it is considered to be a single archeological site with multiple localities or, in Archeological Sites Management Information System (ASMIS) terms, subsites.

The remaining 29 sites in the county are identified in Table 2. As can be seen in the table 23 sites are identified as lithic scatters, one is an isolated find of a core, two are isolated finds of flaking debris and bone, one is a mound site, and one site consists of a series of stone circles, and one is identified as a habitation site.

No information on cultural affiliation or age is available for the majority of the recorded sites. They are simply the ubiquitous surface lithic scatters that indicate some past use of the area by some prehistoric inhabitants or visitors. The few datable sites are assigned a preliminary cultural/temporal as-

Table 2. Pipestone County archeological sites.

Site Number	Type	Date	Affiliation	Comment
21PP1	Earthwork and mound	Unknown	Unknown	Historically reported but not located
21PP2	Quarry	2500 BP to present	Woodland to Modern	Pipestone National Monument
21PP3	Lithic Scatter	Unknown	Unknown	Flakes
21PP4	Lithic Scatter	5,500 BP to 600 BP	Archaic-Mississippian habitation	Miss. projectile point, scraper, bifaces, core, shell fragment, flakes
21PP5	Lithic Scatter	Unknown	Unknown	Flakes, possible house depressions
21PP6	Lithic Scatter	Unknown	Unknown	Flakes
21PP7	Lithic Scatter	Unknown	Unknown	Flakes
21PP8	Lithic Scatter	Unknown	Unknown	Flakes
21PP9	Lithic Scatter	Unknown	Unknown	Flakes
21PP10	Lithic Scatter	Unknown	Unknown	Flakes
21PP11	Lithic Scatter	Unknown	Unknown	Flake tool, flakes
21PP12	Lithic Scatter	Unknown	Unknown	Spokeshaves, flakes
21PP13	Mound Group	5,500 BP to 150 BP	Archaic - Historic	Ground stone, projectile point, flakes
21PP14	Lithic Scatter	Unknown	Unknown	Shell fragment, flakes
21PP15	Lithic Scatter	Unknown	Unknown	Adze, core, flakes
21PP16	Lithic Scatter	Unknown	Unknown	Flakes
21PP17	Lithic Scatter	Unknown	Unknown	Pipestone fragment, end scraper, flakes
21PP18	Lithic Scatter	Unknown	Unknown	Scraper, projectile point, bison skull, flakes
21PP19	Lithic Scatter	Unknown	Unknown	Burins, flakes
21PP20	Lithic Scatter	Unknown	Unknown	Pipestone fragment, flakes
21PP21	Lithic Scatter	Unknown	Unknown	Core, biface, flakes
21PP22	Lithic Scatter	2,500 BP to 1,000 BP	Woodland	Pottery, projectile point, flakes
21PP23	Lithic Scatter	Unknown	Unknown	Flakes

Table 2. Cconcluded

Site Number	Type	Date	Affiliation	Comment
21PP24	Lithic Scatter	Unknown	Unknown	Core, flakes
21PP25	Lithic Scatter	Unknown	Unknown	Scrapers, flakes
21PP26	Lithic Scatter	Unknown	Unknown	Flakes
21PP27	Lithic Scatter	Unknown	Unknown	Flakes
21PP28	Isolated Find	Unknown	Unknown	Chert core
21PP29	Stone Circle	5,500 BP to 2,500 BP	Archaic	4 stone circles, chopper, grooved mauls, stemmed point
21PP30	Lithic Scatter	2,000 BP to 1,000 BP	Middle Woodland	Prairie Corner Notched point, flakes
21PP31	Isolated Find	Unknown	Unknown	2 flakes

sociation by the presence of diagnostic artifact types that have been dated elsewhere in other contexts. Site 21PP4 is identified as a habitation site dating to the Archaic and Mississippian periods of occupation based on the presence of tools, some shell fragments, and a projectile point. An undated prehistoric site (21PP5) is believed to have several house depressions of undetermined age.

The Signal Hill Mound Group (21PP13) has a date range from Archaic to historic for the use of the site. Three mounds with associated projectile points, lithic debris and ground stone comprise the site assemblage. Site 21PP22 is dated to the Woodland period based on the presence of projectile points and pottery sherds, and 21PP30 is dated to the Middle Woodland period based on the presence of a single diagnostic projectile point.

One site, 21PP29, the Boulder Tipi Ring Site, has four stone circles that are associated with a stemmed projectile point, a chopper, and several grooved mauls that are thought to date to the Archaic period of occupation. Only one site, 21PP22, has yielded pottery outside Pipestone National Monument, two sites have contained shell fragments, 21PP4 and 21PP14, and other than the monument only two other sites have yielded pipestone fragments, 21PP17 and 21PP20.

Archeological inventory investigations conducted by the Minnesota Historical Society in 1994 in advance of reconstruction of 17.87 miles of Highway 23 from I-90 northward to the town of Jasper resulted in the identification of 12 prehistoric archeological sites (Skaar et al. 1994). These sites, all of which occur in Rock County, were identified on the basis of lithic artifacts numbering from one (seven sites) or two (four sites) flakes or patterned tools to as many as 71 flakes and tools (one site). A possible fragmentary Paleoindian or Archaic biface was recovered from the Gulseth Site, which yielded 71 artifacts to the surveyors (Skaar 1994:52-54). The investigators noted the presence of a wide variety of lithic raw material types at these and 17 other prehistoric sites in Rock, Nobles, and Murray counties, some of them from distant source locations (Skaar 1994:79-85). To account for this variability, they offered alternative hypothetical explanations that the exotic stone was 1) carried into the region by Native Americans who visited the catlinite quarries from afar or 2) was received from distant groups by local Native Americans in exchange for catlinite (Skaar 1994:84). The 12 sites were considered potentially eligible for the National Register of Historic Places and were recommended for further evaluation (Skaar 1994:iii).

It is interesting to note that if Winham's (1990) site density projection of 8.9 sites per square mile throughout the South Dakota portion of the Big Sioux River drainage holds true for the Minnesota portion of the drainage also (and presuming that all of Pipestone County is within the Big Sioux drainage, both of which presumptions are questionable), the 464-square-mile Pipestone County could be expected to contain over 4,000 recorded archeological sites, in contrast to the 31 sites that have actually been recorded. It is evident that many more archeological resources exist in Pipestone County than have been found to date.

CATLINITE AND OTHER PIPESTONES

Pipestone National Monument lies over a vast geological stone formation known as Sioux Quartzite. Sioux Quartzite is a hard, cross-bedded orthoquartzite from Early Proterozoic times, dating back as much as 1.5 to 1.75 billion years ago, formed as a result of fluvial processes associated with a braided-stream river system (Baldwin 1949; Austin 1972; Bretz 1981:131-134; Morey 1983:5, 12, 18; 1984:69). Underlying much of southwestern Minnesota, southeastern South Dakota, and northwestern Iowa, Sioux Quartzite outcrops at relatively few places within this large region. One of the places where it does outcrop prominently, however, is Pipestone National Monument, where it forms a west-facing escarpment that extends north-south through the monument (Morey and Setterholm 1987). It is believed to extend from 1,000 to 3,000 meters (3,300 to 9,800 feet) in thickness, although the accuracy of this estimate has been questioned (Austin 1972:450; Bretz 1981:131-133; Morey 1984:72). Within the monument, the quartzite is overlain by a thin mantle of pre-Wisconsin glacial till (> ca. 35,000 years old) that is generally three meters or less in thickness (Delin 1980:10; Morey 1983:5; Wright 1972a:518). Sioux Quartzite is composed of more than 90 percent medium-to-fine quartz sand grains encoated with hematite which gives the stone a reddish to gray appearance (Delin 1980:10; Morey 1984:61-62; Morey and Setterholm 1987:75). Within the monument, beds of Sioux Quartzite dip to the east at an angle of 5 to 10 degrees (Morey 1983:5; 1984:60).

Encompassed within the Sioux Quartzite are discontinuous thin beds of finer-grained materials variously characterized as siltstone, mudstone, silty mudstone, clayey mudstone, and claystone (Austin 1972:452; Delin 1980:12; Morey 1983:16). At Pipestone National Monument, a claystone named catlinite occurs in discontinuous beds ranging from about an inch to 2 feet in thickness (Delin 1980:7; Morey 1983:1, 10; 1984:62-63). Catlinite is named after the artist

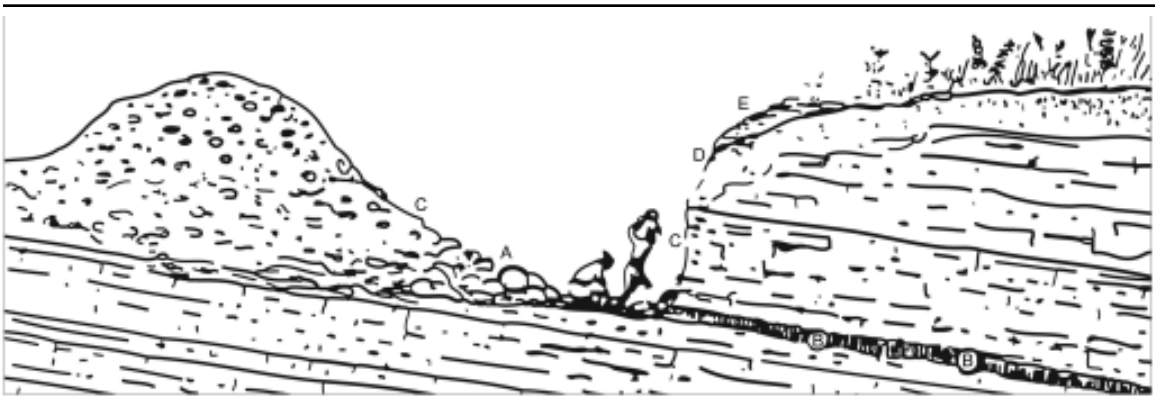

Figure 11. Schematic cross-section of a catlinite quarry pit, showing relationship of the catlinite and Sioux quartzite deposits and the dip of the catlinite beds. A, quartzite rubble; B, the catlinite layer; C, Sioux quartzite above the catlinite and as a spoil pile; D, earth overburden; and E, rubble pile of earth and rock.

George Catlin, who was the first to document the quarries in art and published narrative based on personal observation, and to bring samples of the material with him when he returned east (Silliman 1839). Mineralogically, catlinite is composed principally of pyrophyllite and muscovite, with lesser amounts of diaspore and kaolinite (Gundersen 1991, 2002; Emerson et al. 2005:198). Unlike quartzite, mudstone, and silty mudstone, catlinite lacks quartz in its mineral composition, which gives it a relatively soft and carvable quality (Morey 1983:11, 30; Morey and Setterholm 1987:75; Emerson et al. 2005:198). Like the quartzite in which it is embedded, it generally appears reddish in color due to hematite, but its color may vary from dark maroon to near white (Gundersen 1991:18-19; 2002:45). The paler colors of catlinite, often occurring as spots such as characterize much of the catlinite taken from the Spotted Quarry, are due to partial leaching of the hematite, not to replacement of hematite by pyrophyllite as is sometimes stated (Gundersen 1991:18, 19; 2002:45). Catlinite is often said to be softer and more easily carved immediately following its exposure to the air (Brackenridge in Williams 1992:196; Gardner-Sharp 1885:169; U.S. Court of Claims 1927:161, 189), but this is not true (McGuire 1899:572; Berg 1938:262-263; Gundersen 1991:5; 2002:37).

Catlinite originated as mud deposited on riverine floodplains during major flooding episodes. It represents vertical accretion deposits that survived river channel meandering and interbraiding (Morey 1983:18; 1984:71). As such vertical accretion deposits in braided stream systems seldom survive, catlinite and other pipestones of similar composition are scarce and occur as patchy and discontinuous beds (Morey 1983:1, 18; 1984:71; Morey and Setterholm 1987:76).

At one time catlinite outcropped in the Sioux Quartzite along a line that extended approximately north-south through the center of the monument, approximating the present-day quarry line. From this point, it dips eastward at angles of 5 to 10 degrees from horizontal (Delin 1980:9; Morey 1983:5). Through an exploratory drilling program undertaken by the U.S. Geological Survey and the Minnesota Geological Survey in 1979 and 1980, it has been determined that six separate catlinite beds were exposed in the quarry faces at that time, three each along the north and south quarry lines (Delin 1980; Morey 1983; Gundersen 1991, 2002). The beds exposed in the north quarry line do not correlate with those in the south line (Gundersen 1991:22; 2002:46). Additional beds were also found to be present in the Sioux Quartzite but were not represented by surface or quarry outcrops. The outcropped beds extend to the east as much as 300 to 400 feet, but are increasingly deeper below the ground surface in that direction due to the dip of the formation (Morey 1983:1, 20).

Petrologically, catlinite and other similar claystones are classified as argillites (Gundersen 1988a, 1991:4, 2002:35; Gundersen et al. 2002:106-107). Although generally similar in nature, argillites from different provenances (i.e., source locations) can generally be distinguished from one another on the basis of mineralogical composition (Gundersen 1984, 1991, 2002; Gundersen et al. 2002). The argillites found at Pipestone National Monument, although varying slightly

from bed to bed, share sufficiently distinctive mineralogical attributes to warrant collectively referring to them as catlinite or in the plural form, catlinites (Gundersen 1991, 2002; Gundersen et al. 2002). Howell (1940:57) and Gundersen (1991:4; 1993; 2002:35; see also Gundersen et al. 2002:107) have urged that the name "catlinite" be reserved exclusively for argillite from the quarries at Pipestone National Monument, which is the type locality for catlinite as originally chemically analyzed by Jackson (Silliman 1839). Gundersen suggests that argillites from other localities be referred to by the more generic term "pipestone." Hence, in his research, he refers to these other materials as "Kansas pipestone" (Gundersen 1981; 1982a, b; 1989; 1991; 2002; Gundersen et al. 2002:109-110; Gundersen and Blakeslee 2002; Penman and Gundersen 1999), "South Dakota pipestone" (Gundersen 1985, 1988b), "Wisconsin pipestone" (Gundersen 1983, 1987), and so on. "Flint clay" is another term, although perhaps inappropriate (James N. Gundersen, personal communication to Thiessen, 2002), that has been applied to pipestones from various sources in Missouri, Illinois, Ohio, and Kentucky (Farnsworth 1996; Berres 1996; Emerson and Hughes 1996, 2000, 2001; Hughes et al. 1996, 1998; Moore and Hughes 2000).

Claystones that exhibit color and characteristics generally similar to catlinite are known to occur at a number of widespread locations in the United States. Although not all such locations have been verified through systematic geological study, these locations reportedly include places in Arizona, Arkansas, Illinois, Iowa, Kansas, Minnesota, Missouri, Montana, Ohio, South Dakota, and Wisconsin (see Table 11). These sources include claystones that are in situ within geological bedrock formations as well as claystone fragments transported from their original locations by glaciers and deposited in glacial till. Stone materials from many of these locations have been used for aboriginal artifacts in prehistoric and historic times. Pipestones from Wisconsin and Illinois appear to have been used for making artifacts as early as 5,000 years ago (Broihahn 1996; Hughes et al. 1998:711), some 3,000 years before the earliest evidence of catlinite artifacts (Boszhardt and Gundersen 1996).

The fact that catlinite and red pipestones from different locations, though of generally similar appearance, can be distinguished on the basis of their mineral composition has important implications for our understanding of prehistoric and historic trading connections and other cultural interactions, as well as for determining the earliest use of true catlinite. Argillites that have been carved into pipes and other artifacts are often termed catlinite in the archeological literature, but without supporting compositional analyses it should not be presumed that they are from the Minnesota quarries and not from some other location (Gundersen 1993; Gundersen et al. 2002:107). A number of researchers have attempted to distinguish catlinite from argillites of similar color and appearance; to identify source formations and deposits for other pipestones; and to relate archeological artifacts of catlinite or other pipestone material to their original geological sources. Several methods have been used experimentally to distinguish the chemical and mineralogi-

Table 3. Reported sources of soft red pipestones other than the catlinite quarries.

Source	Reference
ARIZONA	
Del Rio argillite, upper Verde valley near Prescott, Yavapai County	Bartlett 1939 Howell 1940 Sigstad 1973:14-15 Spendlove 1986 Gundersen & Elson 1991 Elson & Gundersen 1992
Deer Creek argillite, southern side of Deer Creek in the Upper Tonto Basin	Gundersen & Elson 1991 Elson & Gundersen 1992
Pine Creek-Oak Spring argillite, along Pine and Oak Spring creeks north of Payson	Gundersen & Elson 1991 Elson & Gunderson 1992
Tuscon Mountain Redbed argillite, within Saguaro National Monument, west of Tucson	Gundersen & Elson 1991 Elson & Gunderson 1992
Near Silver Bell, Pima County	DiPeso 1956:xxiii, 84-85 Sigstad 1973:15
ARKANSAS	
South bank of Arkansas River in Little Rock	Sigstad 1973:15
Bauxite in south-central Arkansas	Emerson and Hughes 2000
ILLINOIS	
Neda Formation in northwestern Illinois (“Sterling pipestone”)	Farnsworth 1996 Hughes et al. 1996, 1998 Berres 1996 Wisseman et al. n.d.:5-6
IOWA	
Glacial drift in O’Brien County	Gundersen & Tiffany 1986
KANSAS	
Kansan-age glacial drift near Manhattan, Kansas	Gundersen & O’Shea 1981 Gundersen 1981 Gundersen 1982 Gundersen 1984? Sigstad 1973:15-16

Table 3. Continued

Source	Reference
Medial and upper Kansan-age glacial drift in northern Kansas through east-central Nebraska	Gundersen & O'Shea 1981 Gundersen 1984? Gundersen 1988b Gundersen 1989 Gundersen & Ludwickson 1982 Penman & Gundersen 1999 Boszhardt & Gundersen 1996
Ninnescah shale, south-central Kansas	Sigstad 1973:15
MINNESOTA	
Near Jasper, Pipestone/Rock counties	Sigstad 1973:12
Section 20, Rose Dell township, Rock County	Winchell 1884:543
Near Luverne, Rock County	Winchell 1884:543
Several locations in Cottonwood County	Sigstad 1973:12 Gundersen & Tiffany 1986:47, 55-57
"on St. Peter's [Minnesota] River"	Maximilian in Thwaites 1966:321
MISSOURI	
Southeastern Missouri flint clays	Hughes et al. 1996 Emerson & Hughes 1996, 2000, 2001 Wisseman et al. n.d.:6-9
MONTANA	
Powder River	Bradley 1917
OHIO	
Scioto County	Mills 1916:107, 132-133 Shetrone 1930:178 Sigstad 1973:14 Holzapfel 1995 Britt 1995 Murphy 1996 Hughes et al. 1996 Hughes et al. 1998:715-717
Perry County	Sigstad 1973:14
Location not specified	West 1934, Part 1:331

Table 3. Continued

Source	Reference
ONTARIO	
Along the north shore of Rainy Lake	Lamb 1970:105
SOUTH DAKOTA	
Palisade State Park	Winchell 1884:542 Gundersen & O'Shea 1981
Near Sioux Falls	White 1869 Howell 1940? Gundersen 1984? Gundersen 1988b
Along Split Rock Creek, Minnehaha County	Sigstad 1973:12-13
WISCONSIN	
On the banks of Ottaway (Pipestone or Lac Courte Oreilles) Lake at the source of the LaMauvaise River [Sawyer County]	Schoolcraft 1821:192 Brown 1906:293 Schoolcraft in Williams 1992:133
Various places in Barron County, Wisconsin [Barron Formation]	Schoolcraft 1851:383 Strong et al. 1882 West 1910 West 1911:63 Brown 1906:194; 1914 Hotchkiss et al. 1915:37-38 Barrett 1926 West 1934, Part 1:330-331 Howell 1940 Sigstad 1973:13-14 Sinclair 1981 Gundersen 1983 Gundersen 1987 Broihahn 1996 Hill n.d.
Near Devil's Lake, Sauk County, Wisconsin [Baraboo Formation]	Woodman 1882 Winchell 1884:542 Gundersen 1987 Boszhardt 1997
Headwaters of the Cedar River, a tributary of the Chippewa River, in Sec. 27, T. 35 N., R. 10 W. [Red Cedar River in Dunn County?]	Woodman 1882

Table 3. Concluded

Source	Reference
Near the Calumet or Painted Rock, about 20 miles above the mouth of the Black River [Buffalo County]	De la Ronde 1876:7, 348-349 Brown 1906:297
Marathon County	Gundersen 1987
Pipestone Creek quarry in Sawyer County	Gundersen 1987 Penman & Gundersen 1999 West 1911:62-63 Brown 1912:182
Chippewa River 8 km above Eau Clair [in Chippewa County?]	Brunson 1975, 2:169-170 Penman & Gundersen 1999

cal characteristics of catlinite, including color streak comparison, neutron activation analysis, x-ray powder diffraction analysis, and x-ray fluorescence. Among those efforts, briefly reviewed below, the work of two men stands out-John S. Sigstad and James N. Gundersen.

Efforts to distinguish the chemical elements that comprise catlinite began with the stone samples that George Catlin brought back from the quarries in 1836. Catlin furnished those samples to Charles T. Jackson, a noted geologist of his time (Merrill 1964:120-121), who identified the basic chemical constituents of catlinite (Silliman 1839). Minnesota State Geologist Newton H. Winchell (1884:542) also subjected catlinite samples to chemical analysis. Samples were again taken from the quarries in 1937 or 1938, and were microscopically and chemically examined and also x-rayed at the University of Minnesota. Berg (1938) published a detailed mineralogical description of catlinite based on this work (see also a letter from H. Holmes Ellis, The Lithic Laboratory for the Eastern United States, to Edward A. Hummel, Acting Regional Historian, National Park Service, Omaha, Nebraska, November 15, 1938, copy on file, Pipestone National Monument).

The earliest attempt to correlate archeological artifacts with the catlinite quarries and other pipestone sources occurred in the late 1930s when David H. Howell (1940), of Claremont Colleges, Claremont, California, obtained specimens of catlinite from Minnesota and other pipestones from South Dakota, Barron County, Wisconsin, and Del Rio, Arizona. He subjected them to spectrographic and petrographic analyses to establish the relative amounts of certain chemical elements present, which he used to establish a baseline for comparison with archeological artifacts made from catlinite and other pipestones (Howell 1940:49-50). He was able to make a gross distinction between the Arizona pipestone and the lumped samples from the northern states, among which the South Dakota samples were distinguished by minute traces of silver. His research was successful on a gross scale in distinguishing between the stone from the Southwest and the upper Midwest, but was not useful for correlating individual artifacts with specific geological sources of stone.[1] He recommended continuation of these analyses with additional samples, and he also called for more precise nomenclature of catlinite and other pipestones, a recommendation echoed years later by James N. Gundersen.

National Park Service officials early encouraged compositional studies of catlinite to establish a compositional "standard" or signature by which it could be distinguished from pipestones from other sources, and thus open the door to studies of the age and geographic/cultural range of catlinite use. During the summer of 1949,

[1]Catlinite samples collected at the monument in 1962 were also examined by petrographic microscopy and x-ray spectrometer by Professor Aaron C. Waters of John Hopkins University. Although his results were communicated to the monument superintendent, the only documentation of his work that we have been able to locate is an April 30, 1963 memorandum from superintendent Carl R. Stoddard to the Regional Director, informing the latter of the general results of Waters' examination.

Superintendent Lyle Linch corresponded with P.W. Bridgman of Harvard University to arrange for chemical analyses by the Mineralogy Department (see letters from Linch to Bridgman dated July 17 and August 13, 1949, copies on file, Pipestone National Monument; letters from Bridgman to Linch dated June 17 and August 4, 1949, copies on file, Pipestone National Monument; and a letter from L.H. Abbot to Linch, August 3, 1949, copy on file, Pipestone National Monument). Samples of catlinite and Wisconsin pipestone were submitted in 1960 to G.F. Hanson, the State Geologist of the Wisconsin Geological Survey, to determine their mineralogical composition through x-ray powder diffraction analysis (see letter from Hanson to R.J. McMullen, Acting Superintendent, Pipestone National Monument, with results of the analyses attached, October 27, 1960, copy on file, Pipestone National Monument; letter from Robert A. Murray, Park Historian, Pipestone National Monument, to Hanson, April 27, 1961, copy on file, Pipestone National Monument; and a letter from Hanson to Murray, May 1, 1961, copy on file, Pipestone National Monument).

A few years after Hanson's initial experiment, a doctoral graduate student at the University of Missouri, John S. Sigstad, proposed an alternative methodology to accomplish the goals of correlating catlinite and pipestone artifacts with geological sources (Sigstad 1973:6). A major objective of Sigstad's dissertation research, conducted in the late 1960s and early 1970s, was to establish the temporal and geographic parameters of catlinite usage among native North American peoples (Sigstad 1968b, 1973). As early as 1966, Harry A. Tourtelot of the U.S. Geological Survey offered to conduct a mineralogical study of catlinite samples for Sigstad, but the results of his work, if it was conducted, are not documented in the archives of Pipestone National Monument (letter from Tourtelot to Sigstad, July 18, 1966, copy on file, Pipestone National Monument; see also letters from Margaret Killgore, U.S. Geological Survey, to Robert H. Rose, National Park Service, Washington, D.C., dated April 28, 1966, and from Rose to Tourtelot, dated August 9, 1966, copies on file, Pipestone National Monument).

Sigstad (1973:20) initially experimented with microchemical means of determining the mineralogical constituents of catlinite and pipestone samples, but abandoned this approach because it required relatively large samples of stone, which was not feasible for sampling artifacts of relatively small size. He also attempted to distinguish different pipestones by the color of the residue that was left after a sample was rubbed across a streak plate (Sigstad 1970b), but he later rejected this method as producing variable and unreliable results (Sigstad 1973:34-35). The method by which Sigstad ultimately chose to address these questions was neutron activation analysis, commonly referred to as NAA. With this method, powdered samples of stone were subjected to neutron bombardment to create artificial radioactive isotopes. The rate of radioactive decay of these isotopes was then measured by a detector over a period of time. This allowed the calculation of the half-lives of the radioisotopes present, and the subsequent identification of the original elements from which the isotopes were created (Sigstad 1968b:6; 1973:21). The nuclear reactor at

the University of Missouri-Columbia was employed for Sigstad's research.

During 1966 and 1967, Sigstad (1973:11-16) visited the catlinite quarries and as many other known or suspected sources of other pipestones as was practical in order to obtain samples of stone for NAA analysis. In addition to several of the quarries at Pipestone National Monument, he obtained pipestone samples from near the town of Jasper in Pipestone County, Minnesota; several locations in Cottonwood County, Minnesota; Minnehaha County, South Dakota; Barron County, Wisconsin; Scioto County, Ohio; Yavapai County, Arizona; Pima County, Arizona; near Little Rock, Arkansas; in south-central Kansas (Ninnescah shale); and near Manhattan, Kansas (Sigstad 1973:11-16). He also located hundreds of archeological artifacts in museum collections that were suspected to be made from catlinite or other pipestone material, and obtained powder samples from them. He sought to obtain samples that reflected a wide range of cultural and chronological contexts.

Sigstad presented his analyses and conclusions in a doctoral dissertation completed at the University of Missouri in 1973, which also was submitted to the National Park Service in that year in fulfillment of a contract which supported Sigstad's research. Unfortunately, his conclusions about the mineralogical "signatures" of catlinite and other pipestones, and their use by Native Americans through time and space, have not borne up. As early as 1986, Gundersen and Tiffany (1986:48) concluded that none of the methods tried by Sigstad "produced reliable results." Two physicists recently independently re-assessed Sigstad's dissertation research and, on different grounds, also judged the results of his research not to be reliable. Michael D. Glascock, who works in the same reactor facility which Sigstad utilized at the University of Missouri, has found several problems with the methods used by Sigstad, which invalidate the conclusions that Sigstad offered regarding the provenance of his irradiated samples:

> *Unfortunately, the NAA work reported by Sigstad (1973) is seriously flawed and his data should not be used in any way to interpret or attribute provenance to the samples of pipestone or catlinite he analyzed. The fact that Sigstad's experiments were actually conducted with a NaI [sodium iodide] detector instead of a GeLi [lithium-drifted germanium] detector indicates that he was lacking in a technical understanding of nuclear radiation and nuclear radiation detection. The inconclusive results from Sigstad's long irradiation experiment was based on a poor decision and his lack of time to properly reconsider other alternative irradiation measurement parameters. Finally, Sigstad's misidentification of the gamma rays in his sample spectra led to calculations of several meaningless ratios which he unfortunately used to make provenance assignments for his artifacts. (Glascock 1997:8)*

Glascock (1997:1) concluded that "Sigstad's work was of limited value because the methods he used did not produce reliable results." Glascock (1997:1, 8) also concluded that, while Sigstad's failed research discouraged research-

ers from further NAA studies of catlinite, NAA, properly utilized, remains a valuable tool for identifying the chemical constituents of a wide variety of archeological materials, including catlinite and other pipestones. Glascock and his colleague, A. Holly Mead of the University of Idaho, have undertaken limited NAA study of catlinite and pipestone samples and artifacts (Mead and Glascock 1998, Mead 1999).

Another physicist, John W. Weymouth of the University of Nebraska, evaluated Sigstad's research and concluded, largely on statistical grounds, that "most all of the assignments of artifacts to source groups are unjustified" (Weymouth 1997:4). He also expressed concern that Sigstad's analyses did not identify a large enough pool of chemical elements, and that the analyses failed to demonstrate the range of chemical variation present at different locations within the quarries at Pipestone National Monument (Weymouth 1997:4). Weymouth was unaware of the information available to Glascock at the reactor where Sigstad performed his work, and could not have arrived at the same conclusions regarding methodological shortcomings. While Sigstad's research on the chemical composition of catlinite was methodologically flawed, the concept of his research has been described as "provocative" (Gundersen and Tiffany 1986) and has stimulated subsequent fruitful research by Gundersen and others.[2] Sigstad, an anthropology graduate student, simply was not well served by his physicist advisors.

Weymouth (1981) earlier conducted an experimental x-ray fluorescence study of catlinite samples taken from bore holes within the monument. X-ray fluorescence identifies the chemical composition of samples subjected to irradiation by x-rays to excite "characteristic fluorescent X-Rays in the sample" (Weymouth 1981:2). The intensity or "count rate" of the resulting fluorescent x-rays is then compared to the intensities produced by a "standard of known composition" (Weymouth 1981:2). Weymouth (1981:6) "encountered a wide variation in elemental concentrations among different samples" from five bore holes at the monument. Weymouth (1981:5) noted that his x-ray florescence study examined different elements than those studied by Sigstad with NAA.

James N. Gundersen, a geologist recently retired from Wichita State University, has successfully employed x-ray powder diffractometry over the past two decades to identify hundreds of artifacts made of catlinite and other pipestones, often in collaboration with archeologists (Boszhardt and Gundersen 1996; Elson and Gundersen 1992; Gundersen 1981, 1982a-b, 1983, 1984, 1985, 1987, 1988a-b, 1989, 1991, 1993, 1996, 1999, 2002; Gundersen and Elson 1991; Gundersen and Ludwickson 1982; Gundersen and O'Shea 1981; Gundersen and Tiffany 1986; Gundersen et al. 2002; Ludwickson et al. 1993; Penman and Gundersen 1999; and Siemens and Gundersen 1982). X-ray powder diffractometry is one of a number of techniques of x-ray diffraction analysis (Gundersen

[2]Sigstad's ideas about the age and distribution of catlinite are also discussed in Sigstad 1965a and 1968b, and in Anonymous 1970. He died in 1989 (Krause 1990).

1988b:86; see also Tite 1972:285-287):

> *All x-ray diffraction analyses are concerned with measuring the internal structures of crystals. The structures are most easily visualized as orderly arrangements of regularly spaced planes of "atoms" that make up the crystal. Because minerals are crystals, they are also composed of these many, but unique, sets of parallel internal atomic planes. X-ray diffraction methods measure the distances separating these sets of planes (i.e. the so-called "d-spacings") in an unknown specimen, which are then compared with those of known standard materials for the identification of the unknown.*

Gundersen (1991:10-11; 2002:40) explains the objectives of x-ray powder diffraction analysis:

> *Essentially any mineral is composed of orderly arrangements of ions (or groups thereof) that are located at regularly repeated, fixed distances from one another in three-dimensional space such as to constitute their own specific internal crystalline structure. Each such internal crystalline structure is essentially unique to a given mineral species. This three-dimensional periodic distribution of ions, in a given mineral, also defines a number of differently oriented, internal sets of regularly-spaced, parallel planes of these ions for that particular mineral. The regular distance of separation of these parallel planes is the "d-spacing" for that particular set of planes within said mineral. Depending on its internal complexity, a given mineral can have a dozen or two sets of specific "d-spacing" planes of ions... Because x-ray photons interact with the electrons of the ions of these internal parallel planes in a very specific manner, x-ray diffraction analysis of minerals is the standard method used to detect the presence of such internal ionic planes in a mineral (i.e. crystalline) sample...In order to detect the presence of as many as possible of the reflections from all of the many sets of internal d-spacing planes present in a given mineral or assemblage of minerals, a completely random oriented powder sample is placed in the incident x-ray beam...*

Elson and Gundersen (1992:429) offer a "nontechnical" explanation of how the analysis is performed:

> *...X-ray diffractometry is a process by which a flat- surfaced, powdered sample is rotated about a predetermined axis through a fixed narrow X-ray beam. An X-ray detecting system is used to measure the angle of the scatter of the X-rays deflected from the sample. The resulting pattern of scattered X-rays is unique for each constituent mineral within a sample and therefore a unique mineralogical "fingerprint" can be determined. These data were then plotted using correspondence analysis, a multivariate data reduction technique...which displays the data matrix as points in low dimension geometrical space. This allowed for the linkage between an argillite*

artifact from a given provenience with its raw material source area.

Gundersen and Tiffany (1986:51) conclude that:

> *...After an XRD [x-ray diffraction] diffractometer analysis, the measured d-spacings of an unknown artifact material are then compared with the known d-spacings of known mineral standards...then, by structural analogy, the mineralogical constituents of the unknown pipestone [or catlinite] sample are thus determined and/or verified.*

The method requires that a sample of each artifact to be analyzed first be transformed to powder, which requires a small sample of stone from to be removed from each artifact (Gundersen and Tiffany 1986:50; Gundersen 1991:12-13, 2002:41-42; Wisseman et al. 2002:696).

Gundersen has extensively and successfully employed x-ray powder diffraction analysis to correlate archeological artifacts of catlinite and other pipestones with geological sources. His research has resulted in the identification of over 360 catlinite artifacts from more than 44 archeological sites in nine states and one Canadian province (Table 4). In addition, portable infrared mineral analyzer spectroscopy has confirmed catlinite artifacts from a tenth state, Ohio (Emerson et al. 2005). The sites from which catlinite artifacts have been identified range in age from prehistoric Early/Middle Woodland times well into historic time (Table 4). Certain catlinite artifacts from Iowa, Wisconsin, and Ohio sites may date to Early and Middle Woodland times (ca. 500 BC to AD 500), suggesting that usage of the material may have begun perhaps as much as 2,500 years ago (see site 13FT2 and Wisconsin listings on Table 4; Boszhardt and Gundersen 1996, n.d.; Stevenson et al. 1997:158; Emerson and Hughes 2001:152, Emerson et al. 2005; Theler and Boszhardt 2003:121). The vast majority of confirmed catlinite artifacts, however, date within the past 900 years (AD 1100 and later), attesting to intensive and possibly increasing catlinite quarrying during much of the past millennium. Clearly, catlinite was extracted from the Pipestone National Monument quarries for a very long time and was widely traded through much of the North American continent, some artifacts ending up as far away from the quarries as Alabama, Oklahoma, and northern Manitoba.

In recent years, a group of Illinois archeologists and geologists have collaborated to investigate the geological sources of material used to make stylistically distinctive Middle Woodland pipes and Middle Mississippian figurines. The results of these studies have pointed to relatively local sources of pipestones, called flint clays by these researchers (Hughes et al. 1996; Moore and Hughes 2000), contrary to earlier interpretations that these items originated from distant sources and were traded into western Illinois (Hughes et al. 1998; Emerson and Hughes 2000; Emerson and Hughes 2001). In the latter stages of this innovative research, a non-destructive and low-cost means of identifying the mineral constituents of pipestones has been employed, the Portable Infrared Mineral Analyzer

Table 4. Catlinite artifacts confirmed by x-ray powder diffraction and portable infrared mineral analyzer spectrsoscopy analyses. Compiled from data furnished to the Midwest Archeological Center by James N. Gundersen of Wichita State University, April, 1998, and selected written sources.

State/province/ site no./name	# of confirmed catlinite objects	Archeological taxon/ cultural affiliation	Date	Reference
ALABAMA				
1MB94 Old Mobile	34	French colonial town	AD 1702-1711	Gundersen et al. 2002
1MB147	1	Native American house	AD 1702-1711	Gundersen et al. 2002
ILLINOIS				
Cahokia area	5	*	*	Emerson & Hughes 2001:154-155 Booth & Koldehoff 1999 Emerson et al. 1983 Walthall & Benchley 1987
* In a paper completed and published after April 1998, Emerson and Hughes (2001:154-155) indicate that seven catlinite artifacts from Cahokia area sites date from the 14th century or later. Four are from “Oneota/Historic” contexts and three are from the early 18th century River L’Abbe Mission.				
IOWA				
Cl-71	1	Unknown	Unknown	Pipe bowl found in Clayton County, 6 miles southeast of Elgin; Keyes Collection.
13FT2 Clermont or Krueger-Thompson Mound Group	1	Middle Woodland		Keyes Collection; Sellars 1992

Table 4. Continued

State/province/ site no./name	# of confirmed catlinite objects	Archeological taxon/ cultural affiliation	Date	Reference
13LA1 McKinney	1	Oneota	ca. AD 1500s-early 1600s	Iowa Archeologivcal Society Newsletter 90:1 (1978); Tiffany 1988
13LO2 Blood Run site	2	Oneota	AD 1500-1700	Keyes Collection; Harvey 1979
Ly-55	6	Unknown	Unknown	Keyes collection from Lyon County
Ly-65	3	Unknown	Unknown	Keyes collection from Lyon County
Ly-145	Data Lost	Unknown	Unknown	Keyes collection from Lyon County
13PM1 Broken Kettle	1	Mill Creek	AD 1100-1200	Keyes Collection; Orr 1939 (in microcard)
Worth County (Wh-289 and Wh-290?)	2	Unknown	Unknown	Keyes Collection; 2 pipes
Unknown (“E.O.”)	2	Unknown	Unknown	Ellison Orr portion of the Keyes Collection
Contextual information provided by William Green, Iowa State Archaeologist, letter to Thomas D. Thiessen, August 3, 1999. The Charles R. Keyes Collection belongs to the State Historical Society of Iowa and is jointly curated with the Office of the State Archaeologist of the University of Iowa.				
KANSAS				
14CO23	1			Invalid number; possibly 14CO3?
14CY5	2	White Rock Aspect	Late Ceramic	O’Brien 1976; Ritterbush and Logan 1991
14DP2	2	Nebraska Phase & Kansa	Late Ceramic	Wedel 1959; Witty 1964; Slattery

Table 4. Continued

State/province/ site no./name	# of confirmed catlinite objects	Archeological taxon/ cultural affiliation	Date	Reference
14JW2	2	Great Bend Aspect	Middle Ceramic	Fenenga 1951; Neuman 1963; Bradley 1984; Gunnerson 1987; Logan and Hedden 1991; Ritterbush 1999
14KP8	1			Invalid number
14MN328 Marion	1	Great Bend Aspect	Late Ceramic	Reynolds 1982; Rohn and Emerson 1984; Lees et al. 1987, 1988, 1989
14RC8	1	Great Bend Aspect	Late Ceramic	Wedel 1956, 1959; Thode 1961; Witty 1977; Lees 1985; Manz et al. 1990; Loosle 1991; Wulfkuhle and Witty 1992; Slattery 1995; Zehnder 1998
14RC9/14RC302	1	Great Bend Aspect	Late Ceramic	Wedel 1956, 1959; Manz et al. 1990; Loosle 1991; Slattery 1995
14SH302	1	Grasshopper Falls Phase & Kansa	Early Ceramic & Historic (1820-1865)	
? Brown County (?)	1			
? Lyon County, Hyde collection	1			
? Rice County surface finds	10			
? Rice or Marion County surface	1			

Table 4. Continued

State/province/ site no./name	# of confirmed catlinite objects	Archeological taxon/ cultural affiliation	Date	Reference
? Cowley County surface finds	1			
Contextual information provided by Anita Frank, Kansas State Historical Society, letter to Thomas D. Thiessen, August 10, 1999.				
MANITOBA				
HgLt-1 Nagami Bay	4	Cree	ca A.D. 1665	Brownlee and Syms 1999
NEBRASKA				
25BU1 Linwood	17	Pawnee	ca. AD 1750-1853	Gundersen and Ludwickson 1982; Wedel 1936; Grange 1968; O'Shea 1989
25BU4 Barcal	10	Lower Loup Phase/ Protohistoric Pawnee	ca. AD 1750-1770s	Gundersen and O'Shea 1981; Gundersen and Ludwickson 1982; Wedel 1936; Grange 1968; O'Shea 1989
25CX1 Gray	2	Lower Loop Phase/ Protohistoric Pawnee	ca. AD 1600-1750	Wedel 1936; Grange 1968; O'Shea 1989
25GA1 Blue Springs	2	Pawnee	AD 1809-1825	Wedel 1936; Grange 1968; 'Shea 1989
25HW1 Palmer	9	Pawnee	ca. AD 1770s-1844	Wedel 1936; Grange 1968; O'Shea 1989
25HW16 Stabaco	2	Pawnee	AD 1720-1760	Holen and Peterson 1995
25NC1 Burkett	3	Lower Loup Phase/ Protohistoric Pawnee	ca. AD 1600-1750	Wedel 1936; Grange 1968; O'Shea 1989
A.T. Hill Collection specimens				
ES34	3			
ES36	1			
ES36	1			

Table 4. Continued

State/province/ site no./name	# of confirmed catlinite objects	Archeological taxon/ cultural affiliation	Date	Reference
25NC20 Genoa	3	Pawnee	AD 1859-1876	Wedel 1936; Grange 1968; O'Shea 1989
25PK1 Clarks	7	Pawnee	AD 1823-1849	Wedel 1936; Grange 1968; O'Shea 1989
25SD1 Yutan	107	Oto	ca. AD 1775-1837	Ludwickson 1994:137-138
25SD31 Woodcliff	1	Possibly Oto	ca. AD 1700-1750	
25SY116 Eagle Ridge	44	Oto?	ca. 1730-1750?	Gundersen 2001
25WT1 Hill	2	Pawnee	ca. AD 1775-1809	Wedel 1936, 1986; Grange 1968; O'Shea 1989
Contextual information provided by John R. Bozell, Nebraska State Historical Society, personal communication to Thomas D. Thiessen, August 1999.				
NORTH DAKOTA				
32CS101 Shea site	1	Northeastern Plains Village Complex	ca. AD 1450	Michlovic and Schneider 1993
32WI117 Fort Union Trading Post	25	Historic	AD 1828-1867	J. Gundersen to W. Hunt, personal communication, July 2002; Barbour 2001
OHIO				
Tremper Mound, Scioto County	9	Middle Woodland (Hopewell)	500 BC-AD 500	Emerson et al. 2002, 2005
OKLAHOMA				
34GD16 Seltzer site, surface	1	Washita River Phase	AD 1250-1450	Brooks 1989; Drass 1997
34KA3 Deer Creek	1	Protohistoric/ Historic Wichita	AD 1680-1750	Wedel 1981; Bell 1984; Vehik 1992
34WA2 Duncan	?	Wheeler Phase	ca. AD 1450-1650	Drass and Baugh 1997
Contextual information provided by Robert L. Brooks, Oklahoma State Archaeologist, letter to Thomas D. Thiessen, August 4, 1999.				

Table 4. Continued

State/province/ site no./name	# of confirmed catlinite objects	Archeological taxon/ cultural affiliation	Date	Reference
SOUTH DAKOTA				
39BF3 Talking Crow	34	Campbell Creek Phase, Initial Coalescent	ca. AD 1425-1500	Smith 1977
		Talking Crow Phase, Post-Contact Coalescent	AD 1725-1750	
		Historic Dakota	ca. AD 1865-1950	
39HE202 Cadotte	1	Felicia Phase, Post-Contact Coalescent	ca. AD 1700	Smith and Johnson 1968:37-41
39LM47 Clarkstown	18	Extended Coalescent or Historic Dakota?	AD 1550-1675 or late 19th cent.	Lehmer 1971; Smith and Grange 1958:125-126
39ST224 Cattle Oiler	3	Extended Middle Missouri	ca. AD 1200-1350?	Ludwickson et al. 1993
Surface in Butte County	1	Late Prehistoric/Historic	Unknown	Gundersen et al. 2000
WISCONSIN				
47BF115 Maxi	3	Historic Native American	Early 19th cent	Gundersen 1989; Penman and Gundersen 1999
47LC19 Midway	1	Oneota	ca. AD 1330-1635	Gundersen 1989 Penman and Gundersen 1999
47LC76 Olson	1	Oneota	ca. AD 1321-1369 or AD 1387-1434	Gundersen 1989 Penman and Gundersen 1999
47LC95 Tremaine	8	Oneota	ca. AD 1283-1445	Gundersen 1989 Penman and Gundersen 1999
47LC149 Filler	5	Oneota	ca. AD 1640-1650	Penman and Gundersen 1999
47LC262 Ot	5	Oneota	Two components between the range ca. AD 1450-1667	Gundersen 1989 Penman and Gundersen 1999

Table 4. Concluded

State/province/ site no./name	# of confirmed catlinite objects	Archeological taxon/ cultural affiliation	Date	Reference
47AS24 Marina/LMA 7306?	2	Historic Native American, probably Chippewa	ca. 18th-19th cent	Birmingham and Salzer 1984
Unknown site, Sheboygan County	1	Early Woodland	ca. 500 BC-AD 100	Boszhardt and Gundersen 1996, n.d. Emerson and Hughes 2001:152
Unknown site, Manitowoc County	1	Early Woodland	ca. 500 BC-AD 100	Boszhardt and Gundersen 1996, n.d. Emerson and Hughes 2001:152
47Tr-30 Nicholls Mound	1	Middle Woodland	ca. AD 100-500	Boszhardt 1998 Boszhardt and Gundersen 1996, n.d Emerson and Hughes 2001:152
Unknown site, Marquette County	1	Middle Woodland	ca. AD 100-500	Boszhardt 1998 Boszhardt and Gundersen 1996, n.d. Emerson and Hughes 2001:152
Unknown site, Outagamie County	1	Middle Woodland	ca. AD 100-500	Boszhardt 1998 Boszhardt and Gundersen 1996, n.d. Emeson and Hughes 2001:152

(PIMA) spectrometer (Hynes et al. 2001; Wisseman et al. 2002; Emerson et al. 2005). As Emerson et al. (2005:194) state:

> *The Portable Infrared Mineral Analyzer (PIMA) uses the shortwave infrared (SWIR) portion (1300-2500 nm) of the electromagnetic spectrum to measure reflected radiation from a sample surface. The signature of the radiation absorbed by the specimen reveals the inter-atomic bond energies that characterize specific minerals and displays them as PIMA spectra. What makes PIMA ideal for pipestone sourcing is that the instrument is especially sensitive to minerals that have hydroxol, water, carbonate, or phosphate bonds--such minerals dominate the pipestone groups. Additionally, we have demonstrated that the major pipestone groups, i.e., Missouri flint clay, catlinite, and Fuert Hill, Sterling, and Wisconsin pipestones, have distinctive mineralogical compositions and produce recognizably different PIMA spectra.*

Hynes et al. (2001) summarize the practical aspects of using the PIMA spectrometer:

> *The internally calibrated, shoe-box size PIMA is a near-infrared reflectance spectrometer using radiation from 1300 to 2500 nanometers. The 30 to 60 second exposure for each sample provides a safe, nondestructive method of analysis for use on valuable museum artifacts without concerns of residual radiation. PIMA can be connected directly to a laptop or desktop computer for laboratory use. Portability of the PIMA, with its attached palmtop computer, allows analysis of artifacts in the field or museum setting. Little to no sample preparation is required. Hand samples offer the best spectra, but powders, smears or sedimented slides, and thin sections can also be used. Surface roundness and curvature of the specimen exhibit only minimal problems in the resulting spectrum.*

Experimentation of PIMA spectroscopy with catlinite samples is in its infancy (Emerson et al. 2002, 2005), but holds promise to be an efficient and economic means of sourcing presumed catlinite artifacts not previously available to Gundersen or Glascock and his associates because of concerns about partial destruction of artifacts for x-ray diffraction and NAA analyses. Thomas E. Emerson and his colleagues visited the Midwest Archeological Center on August 16 and 17, 2004, and analyzed many of Sigstad's and Gundersen's catlinite and pipestone samples with two PIMA instruments; the preliminary results of this experimental research have been useful in confirming two varieties of catlinite from the Pipestone National Monument quarries, designated catlinite A and catlinite B (Emerson et al. 2005:201-202).

To date, the most successful and widely applied method of sourcing catlinite artifacts has been Gundersen's x-ray powder diffraction analysis. Unfortunately, samples submitted to Gundersen for x-ray powder diffraction analysis have not been systematically selected to answer broad questions about the distribution of catlinite in time and space throughout North America, which was one

of the objectives of Sigstad's research. Individual researchers have submitted samples to answer research questions of a local or regional nature, but not as part of an integrated, multi-institutional, collaborative effort to determine the age and geographic/cultural parameters of catlinite utilization in prehistoric times. It is hoped that a comprehensive sourcing and dating effort of this nature can be undertaken in the future.

EARLY KNOWLEDGE OF THE QUARRIES, 17TH CENTURY – 1880'S

A brief review is here presented of early reports of the quarries and recorded visits to them by Native Americans and Euroamericans from the seventeenth century into the 1880s, when the first systematic archeological research began in the vicinity of the quarries. Early perceptions of the quarries and the stone that could be found in them kindled interest in the quarries and their antiquity, and ultimately led to visits by a succession of archeologists and avocational antiquarians during the closing two decades of the nineteenth century and later. This early history of the quarries and nearby landscape and archeological features stimulated the first scholarly research interest in the archeological resources in the vicinity of the quarries. Archeological research that began during the 1880s and continued intermittently for over a century is summarized in the next chapter.

French Reports, 17th and 18th Centuries

The earliest Euroamericans to penetrate to the interior of the North American continent, Frenchmen and French-Canadians from New France, observed stone pipe bowls in use by virtually all of the native peoples they encountered. These bowls were often described as being made of a red stone. Although there is no way to establish if these were made of true Minnesota catlinite or pipestone from some other location, widespread archeological evidence from many locations distant from Pipestone National Monument confirms that catlinite was being extracted from the Minnesota quarries and widely diffused among North American native peoples long before the advent of the French. The French took particular note of these pipes because they were an integral part of a widespread ritual known as the calumet ceremony, by which fictive kin relationships were established between individuals in different cultural groups, who were often otherwise hostile to one another. By this means, intergroup trade took place under a temporary arrangement of peace. French accounts are replete with descriptions of the calumet ceremony performed by Native Americans, and bear witness to French use of calumet pipes to engender peaceful relationships with the peoples with whom they came into contact, thereby furthering their own commercial trading interests.[1]

A comprehensive survey of the calumet ceremony and its historic practice among North American Indians is beyond the scope of this study, and is not here attempted. However, brief review of selected French reports will establish the historical context for the use of red stone pipes long before the first recorded Euroamerican visit to the catlinite quarries. Paul Beaubien presented many of these references in the manuscript version of his report

[1]The term "calumet" is often reserved for the long, decorated wooden stems to which the bowls were attached. In some accounts these stems were regarded as ritually more important than the pipe bowl to which they were connected. Nevertheless, the entire ritual has come to be commonly called the calumet ceremony or, in contemporary terms, "dancing" or "singing" the calumet. Pipes used in the ceremony are sometimes called "peace pipes" or "pipes of peace."

on archeological research at Pipestone National Monument (Beaubien 1955). This information did not appear in the published version of his report (Beaubien 1957), but was included by Alan Woolworth in a later republication of Beaubien's report (Woolworth 1983).

References to "red" stone pipes occurred as early as 1637, when a Jesuit priest, Father Paul le Jeune, recorded that a Huron "medicine-man" or "Sorcerer" had demanded to be given "a pipe of red stone" and tobacco (Thwaites 1898:33).

In writing of his many adventures in the 1650s and 1660s, Pierre Esprit Radisson twice mentioned red stone pipes. While a prisoner of the Mohawk Iroquois in 1652-1653, Radisson observed that his Mohawk adoptive "father" possessed a "calumet of red stoane [sic]" (Scull 1943:57; Adams 1961:23). On a later 1659-1660 "voyage" into Lake Superior with his brother-in-law, Médard Chouart, Sieur des Groseilliers, Radisson participated in a calumet ceremony among the Sioux (the "Nation of the Beefe"). He described the calumet as "a pipe...of a red stone, as bigge [sic] as a fist and as long as a hand" (Scull 1943:208; Adams 1961:134).[2]

Father Jacques Marquette, who traveled in the Upper Mississippi country in 1673, described a "Calumet" he received from the Illinois Indians as being "fashioned from a red stone, polished like marble" (Thwaites 1900a:131; Kellogg 1967:245).

Father Louis André observed "Red Calumets" among a group of Ioways who visited a Winnebago village near Green Bay, Wisconsin, in 1676 (Thwaites 1900b:203).

Father Louis Hennepin, who travelled with La Salle in 1678-1679 and was held captive by the Sioux for a time in 1680, described an Illinois calumet as "made of a Red Stone like our Marble" (Thwaites 1903, 2:654). He also described a calumet given to La Salle by the Pottawatomi as "a large pipe; its bowl is of highly polished red stone" (Cross 1938:43). In his description of the calumet and its importance to Native Americans, Hennepin states that "it is nothing else but a large Tobacco-Pipe made of Red, Black, or White Marble" (Thwaites 1903, 1:125). Hennepin's writings are somewhat controversial and he has been accused of plagiarism by some modern scholars (Rioux 1969:281), so it is difficult to know if he borrowed the language of his calumet descriptions from other sources.

Nicolas Perrot, who spent much time among the native peoples of the Upper Mississippi country between 1665 and 1699, is said to have observed calumets of red stone on more than one occasion (La Potherie in Blair 1996, 1:325 and 2:96; Kellogg 1967:84).

The first French visitor to the Upper Mississippi region who left unequivocal information about the catlinite quarries was Pierre-Charles Le

[2]Though the scholarship of Grace Lee Nute (1978) and Arthur T. Adams (1961) often disagrees on the chronology of Radisson's travels as interpreted from his memoir written during the winter of 1668-1669, they agree on the dates of the two "voyages" during which Radisson noted red stone pipes among native peoples.

Sueur. Le Sueur, a Frenchman who traded for furs in the upper Mississippi River region at various times between the mid-1680s and 1701, spent seven years among the Sioux. During his last visit, in 1700-1701, he built a fort in the Sioux country, not far from the confluence of the Blue Earth and Minnesota rivers. He furnished much valuable information to French map-makers of the period, which has been extensively analyzed and interpreted by the late Mildred Mott Wedel (1974).

Much information from Le Sueur is believed to be reflected on a 1697 map drawn by Jean-Baptiste Louis Franquelin, the Royal Hydrographer and Geographer of the King of France (Wedel 1974). One of the locations shown for a group of the "Sioux of the West" (one of two gross divisions of the Sioux recognized by Le Sueur) is labeled "Hinhancton" or "Hehaneton," "Nation de la Pierre," and is so named "because of an outcrop of red stones which is near their home in the middle of a prairie" (Wedel 1974:166). This is the earliest probable reference to the source of the red stone so widely used for making pipes. Wedel points out that if this refers to the historic catlinite quarries, "the location is wrong," as the "Hinhanctons" (Yanktons?) are depicted on or near the Minnesota River. The same village name also appears in the Delisle notes based on Le Sueur's now-lost journal (Wedel 1974:166).

Another map that may reflect information ultimately from Le Sueur is Guillaume Delisle's 1702 "Carte de la Riviere de Mississipi [sic] Sur le memoires de Mr le Sueur" (Wedel 1981:6; see also Wood and Birk in Wood 2001: Plate 4 and pages 2-4; and Wood and Birk 2001), which carries the phrase "Carriere de pierre rouge" (quarry of the red stone) situated between the Minnesota (R. St. Pierre) and Des Moines (R. des Moingona) rivers. Shea (1861:111), in his translation of Le Sueur's list of villages of the "Sioux of the West," gives this name as "The Hinhanetons, (Ihanktonwan) village of the red stone quarry." Thwaites (1902:14) translates this very nearly the same: "The Hinhanetons-`Village of the red-stone quarry.' He identifies the "Hinhanetons" as the Yankton Sioux.

Antoine Denis Raudot, an Intendant (the third highest-ranking official of New France, below only the governor and bishop [Vachon 1969:xxi]), mentioned the catlinite quarries in a 1710 letter describing the Sioux Indians: "It is from their country that the red stone is obtained for the calumets" (Kinietz 1965:378). Raudot, however, took his information from other sources, generally from the writings of Louis de la Porte de Louvigny (Kinietz 1965:335).

The Jesuit priest Pierre-François-Xavier de Charlevoix, who sojourned in New France in 1705-1708/9 and 1720-1722, and who descended the Mississippi River during the latter period, wrote that the calumet "is commonly made of a sort of reddish marble, very easy to work, and found in the country of the Aiouez, beyond the Mississippi" (Kellogg 1923, 1:304). At the beginning of the eighteenth century, the Ioway Indians are believed to have been living in the region of northwestern Iowa and southern Minnesota (Wedel 1981; 1986:48; Norall 1988:108-109; Thiessen 1998a, 2004).

PIPESTONE

Throughout the life of New France, French officials and others wrote about "red stone" being used for Native American pipes. For example, in a December 12, 1758 listing of native peoples in French Louisiana and Illinois, Governor Kerlérec offered the following observation about the Kansa Indians: "It is on their lands that there are found quarries of red stone from which are made the calumets for all the nations" (Nasatir 1990, 1:52). If this is a reference to the catlinite quarries, Kerlérec is mistaken, as the Kansas did not at any time occupy the region of southwestern Minnesota. Ludwickson et al. (1993:161) have offered the plausible suggestion that this may be a reference to so-called "Kansas pipestone" from local glacial till sources.

The above quoted sources are not exhaustive on the subject of red stone pipes and catlinite as known to the French. Certainly many more mentions can be found in the seventeenth and eighteenth-century writings of Frenchmen and French-Canadians. However, this brief survey serves to illustrate the widespread occurrence of red stone, possibly catlinite, pipes among native peoples known to the men of New France. They also suggest that shortly before the beginning of the eighteenth century, and certainly during that century, Frenchmen possessed some idea of the general location of the catlinite quarries, although none is known to have personally visited them.

Jonathan Carver, 1766-1767

Jonathan Carver, a Massachusetts native who fought as a colonial militia officer in the French and Indian War (Parker 1976), is not known to have personally visited the catlinite quarries but briefly mentioned them in a popular travel book first published in London in 1778 (Carver 1974). The book was based in part on his 1766-1767 travels in the Upper Mississippi Region under the auspices of Robert Rogers, then commandant at Fort Michlimackinac at the Straits of Mackinac on eastern Lake Superior, and in part on the published writings of other travelers in the New World. Carver's book has been much criticized for plagiarism, but recent research based on his original manuscript journals has suggested that his writings have more veracity than once believed (Parker 1976).

In his *Travels Through the Interior Parts of North America, in the Years 1766, 1767, and 1768*, Carver provides what is probably heresay information about the quarries. In his discussion of the "River St. Pierre," or Minnesota River, on the lower reaches of which he is believed to have spent the winter of 1766-1767 (Parker 1976:16-17), Carver (1974:101) stated briefly that

> *Near that branch which is termed the Marble River, is a mountain, from whence the Indians get a sort of red stone, out of which they hew the bowls of their pipes.*

If Carver's mention of the "Marble River" is a reference to Pipestone Creek, his geography is confused, as the latter stream is a tributary of Split Rock Creek and the Big Sioux River in the Missouri River drainage, not the Minnesota River in the Mississippi drainage. A

map included in his volume (Carver 1974; also reproduced in Temple 1975: Plate LXXIII), entitled "A Plan of Captain Carver's Travels in the interior [sic] Parts of North America in 1766 and 1767, shows the "Red Marble R." as a tributary of the "River St. Pierre."

In his journals, which were unpublished until 1976, Carver also recorded the concept of the quarries as a peaceful meeting place for all tribes (Parker 1976:138-139):

> *On the plains between the river St. Piere [sic; Minnesota River] and Missouri is a large mountain of red marble where all the neighbouring nations resort for stone to make pipes of. Even those who hold perpetual wars in all other parts meet here in peace.*

This same theme is also reflected on the above-mentioned map, which depicts a group of hill or mountain symbols south and east of the "Red Marble" river. These symbols are labeled "Country of Peace," and the further explanation is offered that "In these Mountains are large Quarries of Red Marble where the Neighboring Nations resort to get their Calumets of Peace." Carver's notes are possibly the earliest recorded mention of the catlinite quarries as a place of peace among all who visit them.

Elsewhere in his book, Carver (1974:268-269, 359-362) discusses the use of pipes in the calumet, or peacemaking, ceremony. At one point in these discussions, he states that "the bowl of it [i.e., the calumet pipe] is made of red marble" (Carver 1974:359).

Spanish Reports, Late 18th - Early 19th Centuries

France ceded Louisiana to Spain in 1762, although most of the inhabitants continued to be of French extraction and it was several years before Spain established effective administrative control of Spanish Louisiana (Nasatir 1976:6 et seq.; 1990, 1:58 et seq.). Spanish accounts of the Upper Missouri, especially from the 1790s to the purchase of Louisiana by the United States, contain occasional references to red stone pipes and the source of the stone.

Although no Spaniard is known to have visited the quarries, Spanish authorities possessed some fairly accurate information about their location. In a draft December 12, 1785 letter addressed to the comandante of the Provincias Internas in New Orleans, Spanish Governor-General of Louisiana Esteban Rodriguez Miró reported that

> *Thirty leagues above the Chato River [Platte River] on the left bank of the Missouri is the River of the Sius [Big Sioux River]. They claim that twenty leagues up this river is the quarry for the red stone of which the Indians make their pipes for their calumets. (Nasatir 1990, 1:123)*

Writing in his "Description of the Upper Missouri," ca. 1796, the trader Jean Baptiste Trudeau mistakenly referred to the red pipestone quarries as being on a tributary of the James River:

> *Forty-five leagues from there on the same side, goes out the river St.*

> *James, a beautiful river, very abundant in beaver and other wild animals. It has, according to the report of the savages, a course of more than a hundred leagues and comes also from the north. It disembogues [sic] into several other little rivers, one of which is named the river of the red stone. It takes its name from a quarry of this stone that is found upon its banks. (Nasatir 1990, 2:378; see also Abel 1921:161-162)*

In writing of the period 1803-1804, another trader, Pierre-Antoine Tabeau wrote regarding the annual Sioux interband gatherings known as "trade fairs:"

> *Much trading is done there. Each man brings different articles, according to the places over which he has wandered. Those who have frequented the St. Peter's River [Minnesota River] and that of the Mohens furnish guns, kettles, red pipes, and bows of walnut. (Abel 1939:122-123)*

Meriwether Lewis and William Clark, 1804

Meriwether Lewis and William Clark, leaders of the famed exploration expedition that ascended the Missouri River in 1804 and returned to St. Louis in 1806, did not personally visit the catlinite quarries. However, they did record information about them in their journal and in some notes compiled during the winter of 1804-1805 at Fort Mandan and sent back east the following spring. In the former, William Clark recorded in his journal entry for August 21, 1804 (Moulton 1986:498) that the expedition

> *...passed the Soues River S.S. this River is about the Size of Grand river and as Mr. Durrien our Soues intptr. says "navagable to the falls 70 or 80 Leagues and above these falls Still further, those falls are 200 feet or there abouts & has two princapal pitches, and heads with the St. peters passing the head of the Demoien, on the right below the falls a Creek Coms in which passes thro Clifts of red rock which the Indians make pipes of, and when the different nations Meet at [X: a Sort of asylum for all nations, no fighting there] those queries all is piece...*

The "Mr. Durrien" here mentioned as the source of this information is the Canadian-born fur trader Pierre Dorion, Sr., whom Lewis and Clark encountered traveling down the Missouri River with a party of Sioux on June 12, 1804. The officers hired Dorion to accompany them upriver as an interpreter, and he obviously shared geographical information with them (Moulton 1986:294 and 195, footnote 3; see also Thwaites 1904, 1:46-47, 115 and Munnick 1971:107).

In the notes compiled by the two officers at Fort Mandan during the winter of 1804-1805, Lewis reiterated some of this information (Moulton 1987:355-356):

> *...the 2nd The River of the Rock, passes the head of the River Demoin, and takes it's rise in small lakes. the third is called red pipe Stone river, which heads with the waters of the River St. Peters. the country watered by this last river is remarkable for furnishing a red stone, of which the savages make their most esteemed pipes. the Indians of many nations travel vast*

distances to obtain this stone, and it is ascerted, tho' with what justice I will not pretend to determine, that all nations are at peace with each other while in this district of country, or on the waters of this river.-

The theme of the quarries as a place where peace prevailed between Indian nations also appears on a map related to the expedition (Thwaites 1905:Map 3; also described in Wheat 1958:39, 204, as "Map 267"), which bears the following notation near the depiction of Pipestone Creek: "here the different Tribes meet in friendship to get stone for pipes". The map was originally said to be a copy of a contemporary French or Spanish manuscript, but was not more specifically identified by Thwaites (1905:v). More recent analysis of the map has led to the conclusion that it postdates the Lewis and Clark expedition and was probably created in the ca. 1807-1810 period (Chomko 1984-1985; Chomko's description of Plate 14 in Wood 1983). Similar notations appear on other post-expeditionary maps (Coues n.d., 2:endpiece; Moulton 1983:Maps 125 and 126).

Antoine Soulard, 1805

In a letter written in March 1805, the cartographer Antoine Soulard (Mitchill 1806) briefly describes the catlinite quarries, probably on the basis of hearsay information. In speaking of geological features along the Missouri River, he states:

The rocks are generally calcareous; though there is one which is peculiar to this river. It is of a blood-red colour, compact, yielding to a tool, hardening in the air, and receiving the neatest polish. The natives make their pipes of it. The strata are so extensive that there is any quantity that may be wanted for other purposes.

In this letter, Soulard claims to have personally ascended the Missouri River "about 600 leagues" (Mitchill 1806:309), but no other evidence is known to corroborate this statement (Wood 1996:187-188; also W. Raymond Wood, email communication to Thiessen, May 4, 2004). Consequently, the historical basis for Soulard's description of catlinite and the quarries is not known.

Henry Marie Brackenridge, 1814

Although he did not personally visit the quarries, the naturalist Henry Marie Brackenridge wrote of them, presumably based on information he read or heard from other sources (Brackenridge 1814:68-69):

...A beautiful serpentine of a red color, is found about three hundred miles west of the Mississippi, near the heads of la riviere des Moines and the St. Peters, and of which the Indians make their pipes. It is soft and easily cut, into any shape in the first instance, but soon assumes the hardness of stone. A curious circumstance is connected with this and noticed by several writers. The Indians of different tribes, no matter how inveterate or fierce their animosities, meet here, always in peace. In this sacred spot of general rendezvous, that most ungovernable of savage propensities, revenge, is completely subdued.

PIPESTONE

Henry Rowe Schoolcraft, 1820

Henry Rowe Schoolcraft did not personally visit the historic catlinite quarries, but knew of them from other sources. In the capacity of geologist, he accompanied Lewis Cass' expedition to Lake Superior in 1820 (Williams 1992:ix-x). In his journal entry for July 31, 1820, Schoolcraft (1821:299; Williams 1992:196-197) wrote a remarkably accurate description of the quarries:

> *This river [i.e., the St. Peters or Minnesota River] has long been noted as the locality of that beautiful red stone of which the Indians manufacture the bowls of their pipes, but after all that has been said on the subject, by Carver, Breckenridge [sic], and others, it does not appear that it is found upon the immediate banks of this stream. The quarry is situated in the prairie country intermediate between the St. Peter's and the Sioux River of the Missouri. It is said that the stratum does not exceed a foot in thickness, and that it is found two or three feet below the soil. The Indians go once a year to procure their supplies, and as it has been resorted to for a very long period, the excavations are said to be extensive, and if the accounts are to be relied on, cover an area of fifty acres. This stone is a red steatite, intermediate in its qualities, between the common soap-stone and serpentine. It yields very readily to the knife when first taken from the quarry, and as it has no grit, may be sawed without injury to a common hand saw, but it acquires a degree of hardness by long exposure to the air. It will not take a polish by the processes pursued in our marble-yards, as I have ascertained by submiting a piece of the stone to the experiment, but the Indian pipes assume a glossy appearance after long use...*

Philander Prescott, 1832 and 1833

The question of who was the first non-Native American to visit the famous catlinite quarries has been debated since the 1844 publication of Catlin's *Letters and Notes on the Manners, Customs, and Conditions of North American Indians*. George Catlin claimed that he and a travelling companion, Englishman Robert S. Wood, had been told by the Sioux that they were the first Euroamerican visitors to the quarries, in 1836 (Catlin 1973, 2:172), a claim that was hotly questioned by his contemporaries (Dippie 1990:188-191). The historian Theodore L. Nydahl (1950:197, footnote 8) asserted that a white man named "Ratter" and six other men from Fort Snelling set out to visit the quarries in 1831 and William Warren claimed that non-Indians had visited the quarries for over a century before Catlin (Warren 1957:114). Warren cites no evidence for his assertion, and Nydahl offers support for his conclusion in the unpublished papers of Lawrence Taliaferro, Indian Agent at Fort Snelling in 1831. The Taliaferro journal entry in question, that for August 15, 1831, actually states: "The Ratler and Six men start for the Pipe Stone quarry & are to bring me specimens of the Stone for Several Cabinets of Curiosities" (Lawrence Taliaferro Papers, 1812-1868, Minnesota Historical Society microfilm publication, roll 3, volume 11, journal, part one, June-September 1831, entry for Monday, August 15, 1831). This is not a reference to a white man, but to a Mdewakanton Dakota man named

Rattler, or Kahdaya ("He Who Causes a Rattling"), a member of the Kaposia band living near the Fort Snelling-Mendota area in the 1830s and 1840s and who died in 1851 (Williams 1876:123-124, 257; Diedrich 1995:33, 37, 39-40, 48).

The first white man definitely known to have visited the catlinite quarries and to have left a written record of his presence was Philander Prescott, who visited the quarries twice before Catlin. Prescott worked as a fur trader and in other employment at various places in the Minnesota River valley from 1820 through his untimely death in 1862. He stopped briefly at the quarries in 1832 en route to the Big Sioux River and again in 1833 upon his return to Mendota near present-day Minneapolis, Minnesota.

Prescott and a mixed-blood fellow trader, Joseph Laframboise (or La Framboise), had been assigned to establish American Fur Company wintering posts on the Big Sioux River in the fall of 1832. En route to their assignments in the company of a party of Sioux Indians, Prescott, Laframboise, and the Indians stopped at the quarries for one day (probably in September) to obtain stone for making pipes. This event is mentioned in two separate accounts by Prescott, which both give an incorrect date for the visit. The first account, written in response to an 1847 Indian Bureau inquiry about the customs of the Sioux Indians, was published in the 1852 volume of Henry R. Schoolcraft's monumental six-volume work, *Information Respecting the History, Condition and Prospects of the Indian Tribes of the United States* (Prescott 1852). One of the questions in the Indian Bureau inquiry related to aboriginal pipes, to which Prescott replied with a brief, one-paragraph description of catlinite and the quarries (Prescott 1852:176). He concluded the paragraph with the statement that "In 1830 I found a 6 lb. cannon-ball here" (i.e., at the quarries). Later scholarship shows this date to be incorrect.

The same visit is described at more length in a memoir that Prescott wrote circa 1860 at the urging of the Governor of Minnesota, two years before his violent death at the outbreak of the Sioux uprising of 1862. The entire manuscript was edited by Donald Dean Parker and published for the first time in 1966 (Parker 1966). Prescott described the quarries as being 100 yards long, two feet deep at the north end, and ten feet deep at the south end. He and Laframboise tried unsuccessfully to assist the Indians of their party by blasting the overlying quartzite with gunpowder. The Sioux extracted catlinite by dropping heavy boulders on the quartzite, and then prying out pieces of catlinite with hoes and axes. Prescott again mentioned the cannonball (Parker 1966:139), which the Indians told him had been fired at the Arikaras on the Missouri River, probably an allusion to the shelling of the Arikara village near the mouth of the Grand River in 1823 by troops from Fort Atkinson in present-day Nebraska (Robinson 1902). He related the first recorded native lore of the quarries, a story about the famous Leaping Rock (Parker 1966:137-139), told to him by the Indians. After a stay of a day or less, Prescott, Laframboise, and the Indians continued their journey to the Big Sioux because the Indians were fearful that enemies were in the area (Parker 1966:139).

After an unsuccessful trading season at a wintering post on the Big Sioux above the falls of that river, Prescott returned to Mendota, the American Fur Company's headquarters for the Minnesota River valley trade. During his return trip in the spring of 1833, he again stopped at the catlinite quarries for a day in order to dig for catlinite. However, little catlinite was obtained because Prescott's party did not have proper tools for the work (Parker 1966:144).

Prescott's first account (Prescott 1852) incorrectly attributes his first visit to the year 1830, and the manuscript version of his second account wrongly states it as 1831. Using internal evidence from the latter account, Parker has convincingly corrected the date of the first and second visits to 1832 and 1833, respectively (Parker 1966:134, footnote 11, and 142, footnote 21).

George Catlin, 1836

The fame of the catlinite quarries is largely due to the romanticized description of them, and of their lore, publicized by the writings and paintings of George Catlin, a lawyer-turned-artist who visited the quarries in 1836 out of a sense of curiosity and adventure (Catlin 1973). Although Catlin was not the first white visitor to the quarries (see above), he was, however, the first to publish an eyewitness account of the place. He also submitted samples of the stone from there for scientific analysis, for which he became the namesake of catlinite (Jackson 1839). He visited the quarries in late August and early September of 1836 in the company of an Englishman, Robert Serril Wood, and the American Fur Company trader, Joseph Laframboise, who had accompanied Philander Prescott to the quarries four years earlier (Minnesota Historical Society 1965:Lawrence Taliaferro Papers, 1813-1868, Roll 3, Volume 14 (Journal, January-December 1836), Document 372, Frames 86 and 90; also manuscript pages 155 and 163; entries for Sunday, August 21, and Monday, September 5, 1836; Catlin 1973, 2:162, 177).

Catlin first described the quarries in an 1839 letter to a chemist, Dr. Charles T. Jackson, which was read before the Boston Society of Natural History on September 4, 1839 and subsequently published in *The American Journal of Science and Arts* (Catlin 1839; Ewers 1979:69-77). However, his most detailed, and also most romanticized, description of the quarries was contained in volume two of his monumental work, *Letters and Notes on the Manners, Customs, and Condition of the North American Indians*, first published in American and British editions in 1841. This work saw many subsequent editions (see a partial publication history in McCracken 1959:212-214), and is still in print today; the version relied on for this study is the 1973 reprint by Dover Publications (Catlin 1973), which is based on an 1844 London edition. Catlin's *Letters and Notes* is a compilation of letters supposedly written during his wide-ranging western travels in the 1830s. Letter No. 54 describes his visit to the quarries, but may not have been entirely written during his stay there, as it contains much of the language from the 1839 letter to Professor Jackson.

Although Catlin was motivated by a combination of curiosity and a sense of mission to record Native American culture prior to its disappear-

ance before the advance of the American frontier, his writings lack factual detail and are highly colored by a romantic and rambling style that has often been criticized. Many contemporaries challenged the accuracy of his claims (Dippie 1990), and even one-time supporters later criticized him severely, as for example in this portion of an 1856 speech delivered before the Minnesota Historical Society by H.H. Sibley (1872:392-393), who as a fur trader had facilitated Catlin's visit to the quarries:

> *...Of all those who have visited the wilds of the Northwest, no one was received with greater attention than George Catlin, by resident white men, and no one deserved it so little as he did...His object in coming here was to visit the Pipe Stone quarry, and I furnished horses, without charge, for himself and his companion, Mr. Wood, an English gentleman of intelligence, provided them with a trusty Indian guide, and gave them also letters to the gentlemen at the head of my trading posts on the route, which rendered it quite certain that they would meet with no impediment from the Indians...His letters abounded with mis-statements, and the voluminous work subsequently produced by him was equal to them in that respect. The people in this quarter were absolutely astounded at his misrepresentations of men and things. There is but one redeeming feature in his book, and that is, his sketches of Indian faces and scenes, which are sufficiently faithful, as he was skillful in that line, and his pencil could not, therefore, like his pen, vary much from the truth.*

Sibley's harsh words must be viewed in the light of his charge that Catlin's writings "contained severe reflections upon the military and upon traders alike" (Sibley 1872:393), so perhaps the former fur trader and future army officer and governor of Minnesota overreacted to what he perceived as Catlin's stinging criticism of his professional interests. Even Native Americans were skeptical when told of stories about the quarries that were published in the American press, according to Joseph Nicollet, who visited the quarries in 1838 (Bray and Bray 1976:75-76):

> *...the Indians have no other superstitions about the red rock that do not also pertain to other circumstances of their lives when they look for a plant, an animal, or an enemy.* ***There have been stories written recently on this subject that, when we tell them, greatly amuse the Indians and those who have lived a long time among them****. This is so even among the Sioux, who are of all the nations the most apt to take superstitions seriously and who profess a fanatical regard for tradition. (emphasis added)*

Edmund and Martha Bray (1976:76, footnote 62), the editors of Nicollet's journals, suggest that Nicollet's remarks must have been in reference to Catlin's series of letters, first published in the New York *Daily Globe and Commercial Advertiser* between 1832 and 1837. Nonetheless, regardless of the unscholarly and unfocused qualities of his writings, George Catlin must be regarded as the source of much of the lore that has grown up around the quarries and other features in their immediate vicinity.

PIPESTONE

What did Catlin observe in the vicinity of the quarries that has relevance to the archeology of Pipestone National Monument? He clearly was impressed with the Three Maidens boulders and mentioned the high regard in which they were held by Native Americans:

> *At the base of the wall and within a few rods of it, and on the very ground where the Indians dig for the red stone, rests a group of five stupendous bowlders of gneiss leaning against each other...That these five immense blocks...should have been hurled some hundreds of miles from their native bed and lodged in so singular a group on this elevated ridge, is truly a matter of surprise for the scientific world, as well as for the poor Indian, whose superstitious veneration of them is such that not a spear of grass is broken or bent by his feet, within three or four rods of the group; where he stops and in humble supplication, by throwing plugs of tobacco to them, solicits their permission (as the guardian spirit of the place) to dig and carry away the red stone for his pipes. The surface of these bowlders I found in every part entire and unscratched by any thing...(Catlin 1839:142; see also Catlin 1973, 2:202-203)*

He did not mention rock art in his 1839 letter, but did allude to the petroglyphs of the monument in *Letters and Notes* (Catlin 1973, 2:167-168); unfortunately he did not describe them in any detail:

> *...here are to be seen (and will continue to be seen for ages to come), the totems and arms of the different tribes, who have visited this place for ages past, deeply engraved on the quartz rocks, where they are to be recognized in a moment (and not to be denied) by the passing traveller, who has been among these tribes, and acquired even but a partial knowledge of them and their respective modes...The thousands of inscriptions and paintings on the rocks at this place, as well as the ancient diggings for the pipe-stone, will afford amusement for the world who will visit it, without furnishing the least data, I should think, of the time at which these excavations commenced, or of the period at which the Sioux assumed the exclusive right to it.*

He also commented on bird track glyphs in the context of a Sioux tradition (Catlin 1973, 2:168):

> *Tradition of the Sioux.--"Before the creation of man, the Great Spirit (whose tracks are yet to be seen on the stones, at the Red Pipe, in the form of the tracks of a large bird) used to slay the buffaloes and eat them on the ledge of the Red Rocks, on the top of the Coteau des Prairies, and their blood running on to the rocks, turned them red..."*

It is not known if this is an allusion to the bird track petroglyphs among the Three Maidens group, on the Derby panel, the Noble petroglyph, or other glyphs elsewhere in the monument that are presently unrecorded.

In a footnote on page 170 of volume two of *Letters and Notes* (Catlin 1973, 2:170), Catlin recorded further lore about the Leaping Rock, which has archeological implications:

The medicine (or leaping) rock is a part of the precipice which has become severed from the main part, standing about seven or eight feet from the wall, just equal in height, and about seven feet in diameter.

It stands like an immense column of thirty-five feet high, and highly polished on its top and sides. It requires a daring effort to leap on to its top from the main wall, and back again, and many a heart has sighed for the honour of the feat without daring to make the attempt. Some few have tried it with success, and left their arrows standing in its crevice, several of which are seen there at this time; others have leapt the chasm and fallen from the slippery surface on which they could not hold, and suffered instant death upon the craggy rocks below. Every young man in the nation is ambitious to perform this feat; and those who have successfully done it are allowed to boast of it all their lives. In the sketch already exhibited, there will be seen, a view of the "leaping rock;" and in the middle of the picture, a mound, of a conical form, of ten feet height, which was erected over the body of a distinguished young man who was killed by making this daring effort, about two years before I was there, and whose sad fate was related to me by a Sioux chief, who was father of the young man, and was visiting the Red Pipe Stone Quarry, with thirty others of his tribe, when we were there, and cried over the grave, as he related the story to Mr. Wood and myself, of his son's death.

This mound feature has been commented on and/or recorded by later visitors to the quarries, including Norris, Bennett (according to Storrs), and Brower. Interestingly, but perhaps not related to the death of the young man described by Catlin, a Yankton woman said to be more than 81 years old, testified in 1927 that her brother was buried at the catlinite quarries (U.S. Court of Claims 1927:163). She stated that her brother died at the quarries before she was born; her birth was estimated to have been ca. 1846.

Joseph Nicollet, 1838

Less than two years after Catlin, an official government exploration party reached the quarries led by a French astronomer and cartographer, Joseph Nicolas Nicollet. Nicollet was a French scientist who came to the United States in 1832 with the goal of advancing geographical knowledge of the frontier; he conducted two expeditions in the region between the Mississippi and Missouri rivers in 1838 and 1839 under the sponsorship of the War Department (Bray and Bray 1976; Bray 1969, 1994; Smith 1977). The major products of his exploration were the first detailed maps of the Upper Mississippi basin (Bray 1994; Wood 1993).

Among Nicollet's 17-man party at various times in 1838 were a young army officer, John C. Fremont; a German botanist, Charles A. Geyer; J. Eugene Flandin, the 17-year-old son of a prominent New York family; the Viscount de Montmort, an official of the French legation in Washington; another Frenchman, Captain Gaspard de Belligny; Joseph Laframboise, the American Fur Company trader who

had guided Catlin and his companion to the quarries two years earlier; Joseph Renville, Jr., who served as a guide for Nicollet's party; the son of Sleepy Eyes, a chief of the Sisseton Sioux; and eight voyageurs. Nicollet and his men reached the quarries in the early afternoon of June 29, 1838, and departed to continue their explorations on July 6, 1838, after spending more than six days in camp at the quarries. The visit is detailed in Nicollet's daily journal (Bray and Bray 1976:72-84) and his official report of the expedition (Nicollet 1843:14-17). Fremont also briefly described the visit in his memoirs (Fremont 1888:35-36; Jackson and Spence, 1:15-16).

Nicollet was joined at the quarries by three families of Wahpeton Sioux Indians, whom his men assisted in taking catlinite by using gunpowder to blast the overlying mantle of Sioux quartzite. Nicollet described the manner in which the Wahpetons mined the catlinite. He noted that the women of the party camped at some distance from the men while at the quarries and were prohibited from visiting the quarries while the Native American men were working there (Bray and Bray 1976:75-76; see also Nicollet 1843:15). He recorded that

> *The discovery of the red earth is due to the passage of animals which hollowed out a deep pathway...The pathway revealed the surface of the red rock...The pathway made formerly by the passage of the animals is still clearly visible for nearly a mile... [Bray and Bray 1976:76; see also Nicollet 1843:16]*

Nicollet (Bray and Bray 1976:84) also made slight reference to the Three Maidens petroglyphs in his description of the group of glacial erratics:

> *But the most extraordinary thing here is that the prairie of this valley contains a group of granite blocks toward the southern end which are larger than any I have so far seen. Two or three of them are 60 feet in circumference and 10 to 12 feet high. They lie right on the red crust which covers the red pipestone. These rocks, which appear to be rolled, in an isolated place where their strange characteristics contrast with everything around them, and the few small rolled stones of the same kind that appear in the valley are a very astonishing sight. One must ask where they came from. The situation is a mystery.* ***It is on the red fragments which serve as paving stones for these rocks that the Sioux come to write their names as is their custom. They say, moreover, that three female spirits live in this mysterious place and that it is they who have engraved all of the characters that one sees on the red pavement and that one can hear them at work at night****. Etc., Etc., Etc. (At another time rewrite these notes made at a gallop.) [Emphasis added.]*

This description of the Three Maidens does not appear in his official report.

Nicollet also noted in his journal (Bray and Bray 1976:84) that "The tombs which cover the valley or are scattered about the open prairie by wolves. Bones of bison.", but did not elaborate about these "tombs" despite

his note to himself to rewrite this hurried portion of his journal at a later date.

Interestingly, Nicollet provided details about two earthen enclosures that he encountered during his approach to the quarries from the east. Located outside of the present monument boundary, these features are discussed in Appendix E.

More than merely observing the archeological features in the vicinity of the quarries, Nicollet's party actually added to their number. The prominent members of the party (Nicollet, Fremont, Geyer, Laframboise, Flandin, and Renville) carved their initials into a flat quartzite surface atop the ledge, not far from the Leaping Rock, where they remain today. This is described in Nicollet's journal entry for June 30, 1838 (Bray and Bray 1976:73) and in an 1885 letter to Charles Bennett, an early resident of Pipestone (Rose 1911:255-256, footnote 7). In a 1900 interview with South Dakota historian Doane Robinson, Renville's widow is said to have exclaimed "Joe, my Joe" when shown a copy of the inscribed initials (Robinson 1928:517-518).

A party of Dakota Indians, 1842

In a series of articles in the *Minnesota Free Press* and *St. Peter Free Press* newspapers in 1858 and 1859, the missionary Stephen R, Riggs published a series of biographical sketches of Dakota Sioux Indians with whom he was acquainted from his missionary endeavors at various places along the Minnesota River (Riggs 1918). One of these sketches was about a man named Toonkanwechashta, translated as "Stone Man" by Riggs (1918:527-531), who was killed by lightning during a journey to the catlinite quarries in the late summer of 1842. Riggs (1918:531) related the journey of this unfortunate party as follows:

> *The summer of 1842 was passing. The autumn was coming on. The corn which they had planted and hoed was now yielding them food. An expedition to the Red Pipestone Quarry was got up. It consisted of quite a party, some fifteen or twenty of the principal men of the villages at Lac qui Parle, among whom was Big Walker, the present chief of one of the clans in the vicinity of the Yellow Medicine. They had made a day's journey of thirty or thirty-five miles and encamped on the border of the Coteau des Prairies. Some, it appears, were sleeping under carts which had iron bound wheels, and others lay near by. A storm came up. But there was more thunder and lightning than rain. They lay there unconscious of danger, when suddenly the electric fluid smote them, stunning, scorching, burning, and killing. At first they thought it was the charge of an enemy. Those who were only stunned gradually recovered to a state of consciousness. Eagle Help and several others were a long time in coming to life and were found to be badly burned. Three men in all the meridian life, Toonkanwechashta, Wakenehdooza, and Tashoonka, and two horses were dead. In their language, the wakinyan, the thunder, had done it. We say it is the lightning that burns and splits the gnarled oak, that tears up the earth in its passage to and from it; but the Dakotas ascribe all these things to the thunder-bird. The very*

name wakinyan signifies a winged animal. Sometimes they see this veritable creature. And if they have not seen it for themselves, they have heard a hundred stories about it, and have learned to make its image with a piece of coal or carve it with a knife. And surely a bird so wonderful as this must be wakan. Near the head of the Coteau des Prairies there are rocks in which are seen the tracks of this great bird, and the locality has obtained the name of Thunder Tracks. This sad event frustrated the expedition to the Red Pipestone. They buried the dead and returned home bringing the scathed and injured ones.

Visitors in the 1840s and 1850s

Although details are scant, it is certain that other whites visited the quarries in the years that followed Nicollet's presence there. Unfortunately, the details of these visits are typically sparse in the historic record.

Philetus W. Norris and several Ojibwa companions were driven away from the quarries by Sioux in 1842 or 1843 (see later discussion and Appendix B).

In a column titled "Local Mentions," the *Rock County Herald*, December 7, 1877, page 8, makes brief mention of an 1845 visit to the quarries by a missionary:

Father Ravoux, a venerable old gentleman, is a native of France, and was one of the first Minnesota pioneers. He came to the United States as a missionary among the Indians in the year 1838, and proceeded to the missionary station of Dubuque, and after a brief visit went to his charge at Mendota, an Indian village about six miles from the present site of the city of St. Paul. In the year 1845, Father Ravoux, attended by a single white man, accompanied a party of Sioux Indians on an extended journey through the Western wilderness, visiting Redwood, the Pipestone Quarry, the Falls of the Big Sioux River, Vermillion, and Ft. Pierre, returning via Des Moines to Dubuque...

Upham and Dunlap (1912:628) identify this man as Augustin Ravoux, a Roman Catholic priest born in France in 1815. They confirm that he came to the United States in 1838 and was ordained in 1840. They provide little detail about his life other than simply observing that he "Visited the Sioux in 1841-42 at Traverse des Sioux and Lac qui Parle." Father Ravoux died at St. Paul in 1906.

A "Judge Swan," a resident of Sioux City, Iowa, in 1894 apparently visited the quarries about 1853 and again in 1862, according to a brief article in the *Pipestone County Star*, January 19, 1894:

Among the most prominent guests in the city today was Judge Swan, of Sioux City, Iowa. The Judge was up on important business, but still he found time to tell of his former visits to Pipestone. Forty-one years ago [1853?] the Judge camped on the very spot where the Government school now stands. He was out on a hunting expedition with a party of Indians who passed through this section en route from Lake Shetek to Dakota. Again in 1862, Mr. Swan camped here, but this time he was with a party of 200 whites who were after a

band of red men who were on the war path. He has also been here once or twice since that time and he is always pleased to note the rapid forward strides being made by our little city.

This man was probably Joseph H. Swan, as discussed later in this chapter in conjunction with visits by U.S. Army soldiers during the Civil War. Joseph H. Swan served as a first lieutenant and, later, captain in Company I of the Third Minnesota Volunteer Infantry in 1862 (State of Minnesota 1890:193).

Abbie Gardner-Sharp, 1857-1858

Shortly after the Spirit Lake Massacre in the spring of 1857, a party of Santee Sioux camped at the catlinite quarries with several white captives, one of whom was a woman named Abbie Gardner. While camped there for one day, the Native Americans quarried catlinite, then resumed their westward journey toward the Big Sioux River. Gardner later wrote of her experiences in a memoir and commented on her forced visit to the quarries, including some remarks about the petroglyphs there, which she may have personally viewed (Gardner-Sharp 1885:168-172):

Our journey led through the famous pipestone quarry, in Pipestone county, Minnesota. It is situated on a small tributary of the Big Sioux, called Pipestone Creek. The surface of the country is broken and picturesque abounding in bluffs and cliffs. But its principal attraction, of course, is a layer of peculiar and beautiful rock, highly prized by the Indians and no doubt valuable to the whites. The cliffs here are similar to those at Luverne, but smaller. Beneath these, on a level tract of land, is found the precious pipestone. The stratum is about fourteen inches thick, and is overlaid by four feet of other rock, and about two feet of earth, which must be removed before the coveted rock is reached. It is softer than slate, entirely free from grit, and not liable to fracture. When first taken out, it is soft, and easily cut with ordinary tools, hardly dulling them more than wood does. On exposure to the air, it becomes hard, and is capable of receiving a high polish. It has already been used for mantels, table-tops, and the like, as well as for ornaments, and is doubtless destined to more extensive use. In color it varies from light pink to deep, dark red; while some of it is mottled with all these shades, giving great variety.

"The great Red Pipestone Quarry," whence the North American Indians have, from time immemorial, obtained the material for their pipes, has become almost as famous among the white race, being celebrated in song and story, as among the Indians themselves...

Our captors rested themselves here for about one day, in which time they were engaged in the delightful task of gathering the pipestone and shaping it into pipes, which were formed in the manner foretold ages ago.

The smooth surface of the "Medicine Rocks," are covered with Indian hieroglyphics, of various grotesque forms, representing persons, animals, and turtles, and very many in the form of the tracks of a large bird...

After six weeks of incessant marching over the trackless prairie, and through the deep snow, we reached the Big Sioux...

W.O. Williams, 1859

Alan R. Woolworth, emeritus research fellow of the Minnesota Historical Society, has called our attention to three sketches of features in the vicinity of the catlinite quarries drawn by W.O. Williams, probably in 1859. The original sketches are not known to exist, but albumen photographic prints of them apparently were given by Williams to Alfred J. Hill in September, 1859. According to a handwritten notation on the reverse of the prints, Hill later donated them to the Minnesota Historical Society in August, 1862. The prints remain in the Society's collections under catalog number SD4P/r41.

Three different subjects are depicted on the prints. One is labelled "The Pipe Stone Quarry with the falls of the Pipe Stone in the distance," and shows a view of a quarry pit in the foreground with the quartzite ledge in the background (Figure 7). Another depicts Winnewissa Falls, the pool of water at its base, and adjacent rock formations, including the Leaping Rock (Figure 8). It is labeled "The Falls of the Pipe Stone with the `Leaping Rock' in front." This sketch was redrawn by Chester Kozlak and published in Theodore Nydahl's (1950:204) article, "The Pipestone Quarry and the Indians." The third, and most interesting, sketch (Figure 21) shows a Native American seated by the Three Maidens, contemplating petroglyphs which are quite visible on the quartzite bedrock. It is labeled "The granite Boulders at the Pipe Stone Quarry." The scene is a remarkable and scarce view of the in situ petroglyphs, although individual motifs are not fully discernible. The name "W.O. Williams" and the year "1859" appear as graffiti on one of the larger boulders of the Three Maidens group, a clever way for the artist to put his name and date on his production.

Unfortunately, the identity of W.O. Williams is not known. Alan R. Woolworth (letter to Thiessen, March 9, 1998) has suggested that he may have been a member of the Henry Hutton and C.H. Snow party that surveyed and mapped the Pipestone Reservation in 1859, but this remains to be confirmed.

Emmanuel Domenech, pre-1860

In a two-volume work published in English in 1860, entitled *Seven Years' Residence in the Great Deserts of North America*, the French Abbè Emmanuel Domenech wrote of the geography of North America. In volume two (Domenech 1860), he described the Coteau des Prairie, including the catlinite quarries, although it is doubtful from his text if he personally visited there. For example, he (Domenech 1860:344) describes the quartzite ledge as being on the west side of the quarries rather than as being situated to the east of them. He also (Domenech 1860:347) describes "the assemblage of several enormous cylindrical blocks"-a probable reference to the Three Maidens boulders-as being composed of "gneiss, felspar, mica, granite, and of blue, red, white, and black slate." Consequently, his sparse remarks on the rock art and archeology of the area are of little value (Domenech 1860:344-345):

...The rocks are of a bright red, polished and shining. Some of them bear traces of ancient and modern hieroglyphics, which are cut or painted on the rock. They are mementoes left by the Red Skins, each time they went on a pilgimage [sic] to seek the materials with which they make their pipes, earrings, and other ornaments of this kind. Several tombs are also to be seen there, as also the ruins of monuments, which either served as fortifications or as sepulchres for illustrious warriors.

James W. Lynd, 1862

It is ironic that some of the earliest knowledge of the catlinite quarries, a place of such special meaning to Native Americans, comes to us from two white men who met untimely and violent deaths at Native American hands during the Dakota uprising of 1862 in Minnesota. Such was the fate of Philander Prescott, the first white man known to have visited the quarries, and of James W. Lynd, who had prepared a manuscript study of the Sioux Indians at the time of his death. In their collection of Minnesota biographies, Upham and Dunlap (1912:457) state that Lynd was born in Baltimore in 1830 and died at the Lower Sioux Agency on August 18, 1862. He came to Minnesota about 1853 to live among the Sioux and write a book about them, and also served in the state legislature in 1861 (Upham and Dunlap 1912:457).

Lynd may have had his study with him at the time of his death, as six bundles of the manuscript, entitled "History of the Dakotas and other North American Indians," are reported to have been found by a U.S. Army soldier at the Lower Sioux Agency sawmill or near Little Crow's nearby village in the spring of 1863 following the uprising (Riggs 1864:143). The soldier gave them to his commanding officer, Captain L.W. Shepherd, who in turn gave them to the well-known missionary, Stephen R. Riggs.

The manuscript as received by Riggs was incomplete. Its value was initially unrecognized by the soldiers at Fort Ridgely, some of whom used pages for cleaning their weapons (Riggs 1864:143). Six chapters of Lynd's work survived in whole or in part. Riggs published one chapter in its entirety, entitled "The Religion of the Dakotas," which makes no mention of catlinite or the quarries. Both, however, are described in an excerpt from the second chapter, "The Sioux and their Country," which Riggs (1864:145) published in his introductory remarks about the Lynd manuscript:

The Pipe Stone Quarry is a place of great importance to the Sioux. From it they obtain the red stone clay--Catlinite--of which their pipes and images are formed; and a peculiar sacredness is, in their minds, attached to the place. Numerous high bluffs and cliffs surround it; and the alluvial flat below these, in which the quarry is situated, contains a huge boulder that rests upon a flat rock of glistening, smooth appearance, the level of which is but a few inches above the surface of the ground. Upon the portions of this rock not covered by the boulder above and upon the boulder itself are carved sundry wonderful figures--lizzards [sic], snakes, otters, Indian gods, rabbits with cloven

feet, muskrats with human feet, and other strange and incomprehensible things--all cut into the solid granite, and not without a great deal of time and labor expended in the performance. The commoner Indians, even to this day, are accustomed to look upon these with feelings of mysterious awe, as they call to mind the legend connected therewith.

A large party of Ehanktonwanna and Teetonwan Dakotas, says the legend, had gathered together at the quarry to dig the stone. Upon a sultry evening, just before sunrise, the heavens suddenly became overclouded, accompanied by heavy rumbling thunder, and every sign of an approaching storm, such as frequently arises on the prairie without much warning. Each one hurried to his lodge expecting a storm, when a vivid flash of lightning, followed immediately by a crashing peal of thunder, broke over them, and, looking towards the huge boulder beyond their camp, they saw a pillar or column of smoke standing upon it, which moved to and fro, and gradually settled down into the outline of a huge giant, seated upon the boulder, with one long arm extended to heaven and the other pointing down to his feet. Peal after peal of thunder, and flashes of lightning in quick succession followed, and this figure then suddenly disappeared. The next morning the Sioux went to this boulder, and found these figures and images upon it, where before there had been nothing; and ever since that the place has been regarded as wakan or sacred.

Before Lynd's demise, George Catlin had published his now-famous account of the lore of the quarries, so that information would have been available to Lynd. However, the "legend" related by Lynd above does not closely parallel any of the several stories about the origin or discovery of catlinite presented by Catlin, and so probably derives from another source, possibly the Dakotas whom Lynd personally knew. The exaggerated and inaccurate description of the setting of the quarries, however, suggests that Lynd never visited that place in person but must have related secondhand information.

Lynd's description of the quarries and the legend about them were published verbatim by W.P. Clark in his 1885 book, *The Indian Sign Language* (Clark 1982), and portions of it appear in an unpublished tradition attributed in 1934 by James H. Cook to unnamed Sioux and Cheyenne Indians. The Cook story, which is contained in the Cook Family Papers, Archive & Manuscript Collection, Manuscripts, Box 91 (on file at Agate Fossil Beds National Monument, Harrison, Nebraska), was written by Cook and is dated April 12, 1934 at Scottsbluff, Nebraska:

Sioux and Cheyenne Indian Legend of the Pipe Stone Quarry in Minnesota

The quarry was discovered hundreds of years ago by some Cheyenne Indians who were told by an old beaver whose life had been spared by them, and who turned his form into that of a man while telling where the mystery stone could be found, with which they could make pipes

in which to create the smoke that would carry a prayer to the "Great Mystery," father of all life, and of the world. The "Wakan Tanka."

Arriving at the place they were told to go, the Indians set up their hide lodges, they there held a council and prayed for further guidance. While so engaged a thunder storm came on. Bolts of lightning struck all about their camp and peals of thunder rent the air, crash after crash.

One bolt of lightning struck a huge boulder which lay just in front of their camp. Looking out of their lodges, the Indians saw a great column of smoke in the form of a man standing on that boulder. One of his hands was extended towards the sky, the other was pointing toward the rock at his feet. That column of smoke soon cleared away, and the storm passed on.

Going out to look at the boulder upon which the smoke figure stood, they saw that a big flat rock upon which the boulder rested had all sorts of figures carved upon it, some of which represented snakes, lizards, and others. Others represented rabbits with cloven feet and muskrats, or beavers, with human feet. Looking about them they soon found the red rock from which they could make the pipes which have since been used by many Indian tribes when making peace treaties with each other, or the peace commissioners who have represented the U.S. Government, when treaties have been made with hostile Indians who opposed the oncoming of the white Mila Haskan (Long Knives) people into their hunting grounds.

U.S. Army soldiers, 1862-1864

Part of the lore concerning the catlinite quarries is a story of U.S. Army soldiers having camped there during the Civil War. The soldiers are said to have dug up mounds in the vicinity of the quarries to purposely desecrate the graves of Native Americans in retaliation for Indian depredations during the Sioux uprising of 1862. During his 1882 visit to the quarries, Philetus W. Norris apparently heard tales of this from local residents. He judged the soldiers' activities at the quarries to have been the reason that so few human bones and artifacts were found in the mounds that he excavated. As explained in his preliminary report (see Appendix B):

> *...these mounds are the work of man, but I frankly admit are far short of my anticipations in Skeletons tools weapons and ornaments actually found in them. And here I venture a fact and a suggestion. I am informed by high authority that at different periods of the Sioux war in Minnesota during the Rebellion, detachments of troops (who had facilities for obtaining fuel) encamped for successive days or weeks at this Indian reservation. These were mainly residents of those regions, incensed alike at the guilty and the innocent, the living and the dead, if the detested race some of whom had perpetrated demonic atrocities upon their friends, and with such feelings, abundant time and tools, wreaking vengeance upon the race by upsetting their graves and burial mounds and securing relics was alike a pastime and a boast. From the fact of their being upon the reservation of a band ever mainly*

friendly, and semicivilized, these excavations were mainly refilled, and hence their external appearance, and the commingled situation of the material of the mounds and the want of relics found in them, which theory although not wholly satisfactory to myself is all I can offer until further researches sustain or disprove it.

Although Norris cited no supporting information, corroboration of the visits by soldiers is to be found in a reminiscent article by one of the participants in at least three such camping episodes, James Boyd Hubbell. In late 1863, Hubbell had a government contract to deliver cattle and supplies to the Winnebago Indians who had recently been sent to what is today the Crow Creek Reservation on the Missouri River in South Dakota. Hubbell's party, which set out overland from Lake Crystal, Minnesota, in early November, 1863, consisted of more than 150 wagons and was accompanied by an escort of companies D, E, and H of the Sixth Minnesota Volunteer Infantry, totaling approximately 175 soldiers (Hill 1899; Lass 1965). The expedition, which was informally referred to as the "Moscow Expedition" because it was made in the dead of winter, passed near the catlinite quarries sometime between November 19 and 23, 1863 (Hill 1899:23; Lass 1965:237).

Hubbell, who was with the "Moscow expedition," recalled that he had camped near the quarries on three occasions (Hubbell 1902:14):

The Minneapolis Times *of Sunday has an article written by Bertha Lincoln, giving many interesting facts and legends relative to the red Pipestone quarry, new to me, although I had visited there several times years ago, having camped near there in December, 1863, with what the newspapers of that time called the Moscow expedition. I had taken a contract to deliver beef cattle and supplies for the Indians at Fort Thompson, on the Missouri river, and it was so late in the season, it was regarded as a rather hazardous undertaking, saying nothing of the supposed danger from hostile Indians. I had 153 wagons loaded with supplies, and over 800 head of cattle, and had a military escort of four companies of infantry, under command of Capt. Whitney, who, I believe, is now a resident of Minneapolis. The train was over a mile in length. The celebrated Anson Northrup was wagonmaster, a man of great courage, strength, energy, and endurance.*

I camped at the Pipestone quarry with another expedition, July 4, 1864, and again with a third expedition the same year in the fall. While camped at the quarry in July, there was a terrific thunderstorm, and it seemed as if the lightning struck the rocks all about our camp. Some of the men reported seeing Indian paintings on the three large boulders and rocks near the quarry, to which the article in the Times refers, but I did not see them.

Although Hubbell is incorrect about some details, such as the month of December and the number of accompanying infantry companies, his description of lightning striking "the rocks all about our camp" suggests that the camp was very close to the quartzite ledge. The allusion to "Indian paintings" on

the Three Maidens boulders and other rocks may refer to pictographs which have since disappeared, or it may allude to petroglyphs, although none such are known to have been made directly on the Three Maidens boulders.

In a letter to the commanding officer of the Sixth Minnesota Volunteers, one of the officers who accompanied the 1863 party, Lieutenant S.H. King, reported his arrival at the catlinite quarries and the crossing of Pipestone Creek, but, unfortunately, furnished no details (King 1865).

The quarries may have been visited a year earlier, in the late fall of 1862, when a detachment of about 150 soldiers of the Third Minnesota Volunteer Infantry, under the command of Lieutenant Joseph H. Swan, camped about a mile east of the quarries (Murray 1961:13; Swan 1899:282c). It is possible that this same party of soldiers was mentioned in a January 19, 1894 article in the *Pipestone County Star*, in a story attributed to one "Judge Swan," who was probably the officer whose report is cited above: "Again in 1862, Mr. Swan camped here, but this time he was with a party of 200 whites who were after a band of red men who were on the war path." Perhaps Lieutenant Swan and some of his men may have visited the nearby quarries out of curiosity.

Ferdinand V. Hayden, 1865

Ferdinand V. Hayden was an energetic geologist who accompanied U.S. Army exploration and mapping expeditions that traveled widely through the Missouri River basin before the Civil War, including those led by Lt. G.K. Warren in 1855-1857 and Capt. W.F. Raynolds in 1859-1860 (Goetzmann 1979). He later led geological exploring parties through much of the West in the 1860s and 1870s and is recognized as one of the major contributors to geological and paleontological knowledge of the West (Goetzmann 1979:422-426).

During one of these explorations in the eastern part of Dakota territory, Hayden made a sidetrip from Fort Dakota on the Big Sioux River to visit the renowned catlinite quarries in October of 1865. Shortly thereafter, he presented summary descriptions of this visit before meetings of the Academy of Natural Sciences of Philadelphia and the American Philosophical Society. Each of these organizations published an abstract of his remarks in their proceedings (Academy of Natural Sciences of Philadelphia 1866:291-292; American Philosophical Society 1866:274-275). A more complete report of his visit was published in an 1867 issue of *The American Journal of Science* (Hayden 1867), and it was republished, with only minor punctuation changes, two years later (Hayden 1869).

In his fuller account, Hayden (1867:20) described the immediate environs of the quarries, including the quartzite "escarpment" and the falls:

> *On reaching the source of the Pipestone creek, in the valley of which the Pipestone bed is located, I was surprised to see how inconspicuous a place it is. Indeed, had I not known of the existence of a rock in this locality so celebrated in this region, I should have passed it by almost unnoticed. A single glance at*

the red quartzites here, assured me that these rocks were of the same age with those before mentioned at James and Vermillion rivers, and at Sioux Falls. The layer of Pipestone is about the lowest rock that can be seen. It rests upon a gray quartzite, and there are about five feet of the same gray quartzite above it, which have to be removed with great labor before the Pipestone can be secured. About 300 yards from the Pipestone exposure is an escarpment, or nearly vertical wall of variegated quartzite, extending directly across the valley. Each end of the wall passes from view beneath the superficial covering of the prairie. It is about half a mile in length. About a quarter of a mile further up the valley there is another small escarpment, so that the entire thickness of the rock exposed at this point is about 50 feet. Not a tree can be seen; only a few small bushes growing among the rocks. There is a little stream of clear, pure water flowing from the rocks, with a perpendicular fall of about 30 feet, forming a beautiful cascade. The evidences of erosion were very marked, and the question arose--how could all the materials which must once have existed here joined on to these walls, have been removed, except by a stream much larger and more powerful in its erosive action than the one at present flowing here? There is a slight inclination of the beds from 1° to 3°, about 15° S. of E.

While he mentioned the Three Maidens boulders, he did not write about the associated petroglyphs (Hayden 1867:20):

About 200 yards southeast of the quarry are five massive boulders, composed of a very coarse flesh-colored feldspathic granite, very much like that which forms the nucleus of the Black Hills.

As a geologist, Hayden was primarily interested in the catlinite layers and the quartzite which overlay them. He did, however, describe the quarries themselves and offer speculation about their relative age (Hayden 1867:20-21):

...A ditch from four to six feet wide and about 500 yards in length, extending partly across the valley of Pipestone creek, reveals what has thus far been done in excavating the rock. There are indications of an unusual amount of labor on the part of the Indians in former years to secure the precious material.

This rock has been used for many years past by the Indians of the Northwest for the manufacture of pipes, and it was formerly the custom of some of the tribes to make the locality an annual visit to secure a portion of the precious material. They placed a higher value on the rock, because they could make far more beautiful and showy pipes than from any other material known to them. Besides, this was and is now, the only locality from whence the true pipestone can be obtained, and the labor is so great in throwing off the five feet of solid quartzite that rests upon it, that the rock has always been rare. For a mile or two before reaching the quarry the prairie is strewed with fragments that have been cast away by pilgrims.

Nearly all of our writers on Indian history have invested this place with a number of legends or myths. They have represented the locality as having been known to the Indians from remote antiquity. All these notions, I am convinced, will disappear before the light of a careful investigation of the facts. It is quite probable that the rock has not been known to the Indians more than eighty or one hundred years, and perhaps not even as long a period. I could not find a trace of a stone implement in the vicinity, nor could I hear that any had ever been found; and indeed nothing could be seen that would lead one to suppose that the place had been visited for a longer period than fifty years. All the excavations could have been made within that time. There are many rude iron tools scattered about, and some of them were taken out of the ditch last summer in a complete state of oxydation [sic].

Again, it does not appear that in the mounds which have been opened in the Mississippi valley so extensively, any trace of this rock has ever been found. It is well known that the pipe is the most important of the dead man's possessions and is almost invariably buried with the body, and if a knowledge of this rock had extended back into the stone age, it is almost certain that some indications of it would have been brought to light in the vast number of mounds that have been opened in the valley of the Mississippi. Pipes and other ornaments, made from steatite, have been in use among Indians from the earliest indications of their history, and they are still manufactured from this material on the Pacific coast.

Interestingly, Hayden's addresses to the two learned societies included some remarks about the recent manufacture of pipes and other objects of catlinite by whites:

> *Dr. H. exhibited a number of ornaments manufactured from the Pipestone by the North-west Fur Company. They consist of pipes of various patterns and sizes, cups, candlesticks, etc. They are turned in a lathe. Within a year or two this company have made nearly two thousand pipes, which they send up to the Upper Missouri Indians, near the foot of the Rocky Mountains, and trade them for a robe a-piece. Hereafter some doubt will be thrown upon the genuineness of these Indian pipes. (Academy of Natural Sciences of Philadelphia 1866:292)*

> *Dr. Hayden made some remarks on a short visit to the celebrated Pipestone Quarry, and exhibited some specimens of the rock, as well as some pipes and other ornaments that had been made from the rock with a turning lathe. The Northwest Fur Company have manufactured nearly two thousand pipes within the past two years, and traded them to the Indians on the Upper Missouri. This fact will throw a suspicion on the genuineness of Indian pipes in the future. (American Philosophical Society 1866:274)*

Hayden's report of pipes being made for the Northwest Fur Company finds remarkable corroboration in a later statement by one of the concern's principals, James Boyd Hubbell (1902:15-16):

> *Referring again to the red pipestone, I venture to say the residents of Pipestone city and that beautiful section are not aware of the fact that a large quantity of the pipestone was hauled to Lake Sheteck and manufactured into Indian pipes and other things by machinery. It was not considered safe for the men to work at the quarry, hence the vacant houses at Lake Sheteck, which were deserted by the settlers during the outbreak, were utilized. The owners that had escaped had not at that time ventured to return. Gen. Sully had expected to be ordered to make a treaty with the Sioux, and, as the red stone pipes were prized highly by them, he engaged with me for 5,000 pipes at $5 apiece. I employed men to make them under the supervision of A.B. Smith, one of the earliest settlers of Dakota.*
>
> *Gen. Sully did not make the treaty as expected, but the pipes were no loss, as we traded them to good advantage with the Indians all along the Missouri, receiving a well dressed buffalo robe or its equivalent in other skins for a pipe. Robes at that time were worth over $10 on an average.*

Interestingly, this manufacture of pipes by whites may have a longer and more complex history than Hayden and Hubbell intimate. Dr. J. Frazer Boughter was the post surgeon at Fort Dakota, on the site of present-day Sioux Falls, in the late 1860s. As the post's medical officer, Boughter was also responsible for recording observations on weather, geology, fauna and flora, and other aspects of local natural history. He compiled a descriptive commentary that dealt with various natural history subjects, which has been transcribed by David Rambow (2003).[3] After remarking on a local source of pipestone close to Fort Dakota, Boughter comments on it and its use for pipe-making:

> *This pipestone is not of such a uniform redness as that found at the [catlinite] Quarry, it is much lighter in color, very frequently mottled and contains a much less quantity of per-oxide of iron; although equally as good and as easily wrought, it is not prized so highly by the Indians for the manufacture of pipes. Considerable quantity has been dug from this spot by a company organized in connection with the Northwest Fur Company, who had located at Sioux Falls City previous to its destruction by the Indians a factory for the manufacture of pipes and various articles used in trade with the Indians for furs. (Rambow 2003:25)*

The destruction of Sioux Falls mentioned by Boughter refers to the town's being burned by Indians following its abandonment in about September 1862 (Rambow 2003:2).

Charles A. White, 1868

Dr. Charles A. White, the Iowa State Geologist from 1866 to 1873 (Merrill 1964:435), traveled up the Big Sioux River from Sioux City, Iowa to Fort Dakota at the falls of the Big Sioux (present-day Sioux Falls) in July, 1868. From there, he

[3]The authors are indebted to David Rambow for graciously making available his transcription of Boughter's commentary.

and four companions, accompanied by a Sioux Indian guide, traveled overland to visit the catlinite quarries. His account of the trip, published in an 1869 issue of *American Naturalist* (White 1869) and subsequently reprinted (White 1983, 1989), relates that between the Big Sioux River and the quarries, no trees were observed "save a single elm by the side of a small creek" (White 1983:13; 1989:21).

At the quarries White was somewhat disappointed to find that the quartzite outcrop was not as imposing as he had expected (White 1983:13; 1989:21). After being shown the quarries by the guide, White and his companions inspected the quarries, the quartzite ledge, and the vicinity of the Three Maidens. He described the Three Maidens and the nearby petroglyphs (White 1983:14; 1989:22):

> *...The "Medicine Rocks," (C) [this symbol appears on an accompanying sketch map made by White] towards the southern end of the plain, rest directly upon the glacier-smoothed surface of the quartzite. We see the distinct striae beneath and around them, and feel almost as if we had caught them in the very act of making their tracks, for they are granite strangers from the northward, and we have visited the place where they were born, and know them and their generation. The two largest of these boulders are some twelve to fifteen feet in diameter, and are the ones believed by the Indians to cover the two squaws mentioned in the legend...*
>
> *Many square yards of the glacier-smoothed surface at the Medicine Rocks are covered thickly with Indian hieroglyphics, made by pecking the hard surface with sharp-pointed stone. These are of various grotesque forms, intended to represent persons, animals of the region, turtles, and very many also* ***in the form of the tracks of a large bird****... [emphasis in original]*

The following morning the party collected specimens of catlinite "from the rejected pieces strewn upon the ground," and resumed their return journey to Fort Dakota. At their departure, the guide made a brief visit to the Three Maidens:

> *...Mazachistina mounts at the same time, but starts off towards the Medicine Rocks, around which he makes a rapid turn and overtakes us upon the road. He is utterly silent when we ask him why he went there, but we should doubtless be thankful that we got away with our Pipestone in safety from the wrath of the guardian spirits of the Medicine rocks.*

One of White's companions was Dr. J. Frazer Boughter, the post surgeon at Fort Dakota mentioned above. In his description of Fort Dakota and its environs, Boughter also commented on the catlinite quarries. Soon after his return to Fort Dakota from the visit to the quarries, Boughter recorded on August 31, 1868 (Rambow 2003:59):

> *...The Great Red Pipestone Quarry thirty-five (35) miles north-east of this Post, is a point of annual pilgrimage of many hundreds of the Sioux. At this time no other tribes or band visit this vicinity.*

PIPESTONE

Writing again on March 5, 1869, he commented at greater length (Rambow 2003:24-27):

> *Another locality in this vicinity, interesting both from a geological and legendary point of view, and of which not a great deal is generally know[n] is the celebrated "Great Red Pipestone Quarry" immortalized by Longfellow in his "Song of Hiawatha," the spot where "Gitche Manito" smoked his peace pipe.*
>
> *Being fortunate enough to visit this locality with a geological party in the month of July 1868, from personal observation the spot can be described...[he goes on to comment on a source of pipestone local to Fort Dakota]*
>
> *The Great Red Pipestone Quarry is within the State of Minnesota about thirty (30) miles in a direct line from its south-western corner, and three (3) or four (4) miles from its western boundary, its direction from this Post is about north, north-east, a road or tepe [sic] trail, not very distinctly marked is found leading to it and is the road generally used by the bands of Indians from the Missouri River who visit it.*
>
> *The large exposure of Quartzite extending north and south is visible for a considerable distance as you approach, for the general prairie surface rises continuously until you reach a distance of three (3) miles, when it slopes gently to the rocks. The annexed diagram drawn by Dr. White, gives the relative position of the principal points of the locality.*[4] *D.E. Principal Exposure of rocks, extending a mile in length from north to south.*
>
> *A. Greatest perpedicular height, abouth [sic] seventy (70) feet, over which the brook flows.*
>
> *B. A shallow ditch, a quarter of a mile long in which the pipestone is found.*
>
> *C. Granite boulders, known as the "Medicine Rocks*
>
> *The only rock found here is the red quartzite and the granite boulders drifted from their home in the Minnesota River Valley as above mentioned.*
>
> *The pipestone is found exposed in a ditch, a quarter of a mile long, west of and lying parallel to the principal exposure of red quartzite forming the ledge.*
>
> *The pipestone is in thin and shaly layers, in aggregate thickness, and has been removed at very great labor by the Indians, who use but the rudest implements, to obtain the coveted treasure.*
>
> *The surface of the ground rises here very greatly to the westward "To the land of the Setting Sun," and also to the eastward, here interrupted by the ledge of quartzite already mentioned.*

[4]This diagram is published in White (1869:650; 1983:13; and 1989:__).

The dip of the quartzite is very considerable, the total thickness of the strata is about one hundred and fifty (150) feet, the surface ledges disappearing very rapidly to the eastward.

The granite boulders mentioned and known by the Indians as the "Medicine Rocks" rest directly upon the surface of the quartzite, smoothed and polished by the action of the glaciers and whirling sand.

The largest boulders are twelve (12) or fifteen (15) feet in diameter, and are supposed by the Indians to cover the remains of two squaws, who must be propitiated whenever they would take any pipestone away. The smooth surface of the quartzite upon which rest the "medicine rocks," is covered with rude and fantastic Indian hieroglyphics, pecked upon the hard surface with some sharp pointed instrument or stone. Pipestone is chemically a clay (silicate of alumina) colored brick-red with the per-oxide of iron; geologically it is metamorphic clay, as the quartzite is metamorphic sandstone. once a layer of clay intercalated between layers of sandstone, the same metamorphic action that changed the latter to a quartzite, also converted the clay into a pipestone.

A small stream coming from the eastward and flowing through the marsh to the east of the quartzite ledge falls over it at the centre and at its highest point a distance of twenty (20) feet, it then flows to the westward and finally empties into the Big Sioux River.

*Along this stream were found a few stunted Common Willow (**Salix longifolia**), and the Reed grass (**Phragmilies communis**) a few botanical specimens were also collected. (Rambow 2003:24-27)*

Ernest V. Sutton, 1873

Ernest V. Sutton, an early resident of southwestern Minnesota, late in life wrote about a visit to the catlinite quarries when he was a boy in 1873 (Sutton n.d.:35-36). He made particular mention of the Three Maidens:

In the summer of 1873 father took me on a visit to this quarry. The surrounding country, as well as the quarry itself, then looked far different from what it does today. There were no houses, highways, railroad tracks or piles of rubbish and tin cans; the prairie was just as God made it...

*At the old quarry (a number of new ones have since been opened) a few Indians were slowly and patiently prying out the stone with wooden wedges the same as their fathers had done for centuries. We watched them as they laboriously worked to pry the stone loose. After carefully inspecting the specimen it was dipped in water to see if any white spots showed up. When this did happen the stone was thrown away and a new piece dug out...**

Out on the prairie, not far away, lay three enormous boulders, looking exactly as if they had fallen from the sky.

I was climbing up onto one of these rocks when the Indians saw me and stopped their work. Presently they came toward where I was and began

pointing and jabbering away, which I couldn't understand. Finally one old man pointed to the rock and shook his head, as much as to say, "you must not go up there." Father told me to come down, then shook his head to the Indians, thus assuring them he would see that I didn't try it again. The Indians now returned to their work.

The referenced footnote concerned uses for discarded catlinite:

**This pile of rejected stone, the accumulation of many years, was later worked over by white men and made into napkin rings and other novelties to be sold as souvenirs. Pieces too small to be used were dumped in the street to serve as a pavement.*

Interestingly, Sutton made no mention of the Three Maidens petroglyphs, which he may have personally observed in situ. However, he did comment on the rock art at the quarries (Sutton n.d.:34-35):

...Besides these early explorers others have left printed records in which all agree this place has always been a sacred spot to the Indians...

Among the ancient pictographs was one representing the tracks of the "Thunder Bird," a mythical bird supposed to govern the weather. This and many other of these early etchings have been destroyed or carried away by vandals.

This last statement is probably a reference to the removal of the Three Maidens petroglyphs in 1888 or 1889, as well as defacement of the Native American motifs by the carving of settlers' names over them.

Charles H. Bennett, 1874-1900s

Charles H. Bennett was one of the founding fathers and leading citizens of the community of Pipestone. He had a deep interest in antiquarian matters and is perhaps best known as the man who "collected" the Three Maidens petroglyphs. Several brief biographies of Bennett have been published (Anonymous 1889:651-654; Rose 1911:659-661; Pipestone County Historical Society 1984:159-160; Beckering 1989; Pipestone County Genealogical Society 1991:13; Pipestone County Genealogical Society and Pipestone County Historical Society 2000:19-20), and an obituary article appeared on the front page of the *Pipestone County Star* on August 24, 1926. His role in the founding and development of the city of Pipestone is detailed in a comprehensive county history (Rose 1911), to which he personally contributed much information. The brief biographical summary that follows has been gleaned from these sources.

Born in Michigan in 1846, Bennett served in the Civil War, then worked as a druggist in Sioux City, Iowa from 1866 to 1869. In the latter year he established his own drugstore in Le Mars, Iowa. Drawn to the area by tales of the catlinite quarries, Bennett and several companions visited the quarries in 1873 and decided to found a community at the location of present-day Pipestone. He returned in 1874 and built a shanty to firm up his land claim. He returned in 1876 to take up permanent residence in the fledgling community. Transferring

his drugstore business to Pipestone, he became a leading member and promoter of the community until his death on August 23, 1926. In addition to apothecary supplies, Bennett also sold both raw catlinite and finished catlinite pipes and other objects at his store (Beckering 1989; Storrs 1916; Beal 1991:5). He was said to have at one time been "the owner of the largest stock of raw and manufactured Indian pipestone in the world" (Bennett obituary, *Pipestone County Star*, August 24, 1926, page 1).

Bennett's attention was early drawn not only to the quarries themselves, but to the nearby archeological features as well. He was one of the first to comment on the many stone circles or "tipi rings" visible on the prairie near the quarries:

> *Among other things which attracted my attention were hundreds upon hundreds of places within a mile of here of circular form, surrounded by stones of from six inches to two feet in diameter, some of which were sunken in the ground so as to be scarcely visible, all indicating unmistakably that some time in the years or centuries gone by, they were the habitations of Indians, and that they constituted villages of considerable size.*

This statement was made in 1878, probably as part of a public address made by him on July 4th of that year (Rose 1911:245, 262). Although few such archeological features have survived more than a century of cultivation, bioturbation, sedimentation, and other disruptions, Bennett's observation finds corroboration in the map of the quarries that was published by Holmes in 1919 (Holmes 1919:254), on which are shown more than 300 small "camp sites and lodge rings" in the immediate vicinity of the quarries.

As a Pipestone resident who was knowledgeable about the quarries and nearby archeological features, Bennett was consulted by many of the archeologists who possessed an interest in the quarries. Norris, for example, mentioned in the preliminary report of his investigation, that Bennett assisted him in his research (Appendix B). Lewis, Holmes, Winchell, Alfred J. Hill, Lewis' collaborator and sponsor (Winchell 1911:114), and Edwin A. Barber (1883), who published a pioneering essay on the nature of catlinite and the distribution of pipes made from it and other pipestones, all personally met or corresponded with Bennett.

Norris's notes indicate that Bennett and other persons had previously dug into many of the mounds in the vicinity of the quarries (Appendix B), which finds some corroboration in a later statement attributed to Bennett by Caryl B. Storrs, a Twin Cities newspaperman who received a guided tour of the quarries and nearby archeological features from Bennett in 1916. With respect to Norris' mound no. 2, which Catlin identified as the grave of a young Native American who died at the Leaping Rock, Storrs (1916) quotes Bennett as saying:

> *"Do you see this little depression? That was the grave of an Indian boy who tried to jump from the cliff over to the top of the Great Spirit shaft. He was killed 80 years ago, and I dug some of his bones up 40 years ago."*

Bennett actively solicited information from persons knowledgeable about the archeology and history of the region. For example, he wrote to retired general John C. Fremont, who had been a member of Nicollet's 1838 exploration party (Storrs 1916). Fremont's September 3, 1885, reply is quoted at length by Rose (1911:255-256, footnote 7). When a party of Yanktons visited the quarries in 1879, Bennett sought out two of the chiefs, Strikes-the-Ree and Fat Mandan, and interviewed them for information about the quarries and the nearby earthwork (Rose 1911:246, footnote 2; 248-249, footnote 4; Thiessen 1998a:47-49).

Bennett is best known, however, for having removed and publicized many of the petroglyphs that surrounded the Three Maidens boulders. The petroglyphs originally existed on the surface of the Sioux quartzite bedrock that underlay the six Three Maidens boulders. They were observed and commented on by many early visitors to the quarries, beginning with George Catlin and Joseph Nicollet in the 1830s. As in situ petroglyphs, they were traced or drawn by several visitors in the 1870s and 1880s (Perley's "chart;" Winchell 1884; Cronau 1890; and Norris, in Appendix B, this volume). The images on the quartzite slabs, after removal from their original location, were traced, drawn, and/or described by Lewis in 1889 (Winchell 1911:564, Plate VIII; see also Appendix C) and Holmes in 1892 (Holmes 1892e).

Sometime in 1888 or 1889-the exact date is not known-many of the petroglyphs were removed on 36 slabs of quartzite taken from their original locations about the Three Maidens by a local stone sculptor, Leon H. Moore, possibly at the instigation of Bennett (Pipestone County Genealogical Society 1991:25; Beal 1991:7-8). On August 25, 1902, Moore gave a signed receipt to Bennett for $20.00 for the slabs, on which he noted "removal being made by me from land owned by me-on years 1888 or 1889-said stones taken from locality about one half mile south from Great Red Pipestone Quarry" (copy on file, Pipestone County Historical Society). Clearly, the slabs were in Bennett's possession by August 1889, when Theodore H. Lewis recorded the motives on 35 slabs "owned by C.H. Bennett" (Appendix C). Why Moore provided Bennett with a receipt some 13 or 14 years after removing them is not clear. Possibly, Bennett had plans to display them in formal exhibitions and wanted no doubt as to their ownership at the time. Bennett's original motivation for having the stones removed was to preserve them from being defaced by inscriptions being chiseled into the quartzite by recent visitors to the quarries (Bartlett n.d.:5; Gurley n.d.:13; Mitchell 1934:26; Beal 1991:42; Dudzik 1995:102, 103). For an example of such defacement, see the "BUCK SKIN JIM" inscription evident in Figure 36.

Bennett appears to have exhibited, or to have assisted with the display of, catlinite-related materials in at least two world's fairs around the turn of the century. He is listed as having received an award for his display of "pipestone" at the Columbian Exposition that was held at Chicago, Illinois in 1893 (Anonymous n.d.:68). Other examples of catlinite were also displayed at that exposition. A Mr. L.O. Pease of Pipestone received an award for his "miniature stationary engine made of pipestone," and the Pipestone County

World's Fair Club (in which Bennett is likely to have participated) was rewarded for displaying a "mantel and hearth of pipestone and jasper" (Anonymous n.d.:56-57). The mantel may be preserved in the historic Pipestone County courthouse today (Alan R. Woolworth, letter to Thiessen, October 21, 1997).

Bennett displayed his rock art-bearing quartzite slabs at the Louisiana Purchase Exposition at St. Louis in 1904, where he "was awarded a silver medal by the superior jury for this exhibit" (Rose 1911:244, footnote 1; Winchell 1911:112). In fact, Bennett entered two displays in the Louisiana Purchase Exposition, and assisted the Pipestone County Women's World's Fair Auxiliary with the display of the same catlinite mantel that had been featured at the Columbian Exposition (*Pipestone County Star*, April 1, 1904). All three displays won awards. Bennett's display of the Three Maidens rock art, termed "hieroglyphic stones" in the press of the day, earned a silver medal, while his catlinite display and the catlinite mantel both earned bronze medals (*Pipestone County Star*, September 4, 1905 and February 3, 1906; Committee on Press and Publicity 1904:48; Anonymous 1905:30, 32, 34, 58-59). Bennett had 17 photographs taken of the quartzite slabs, in which at least 31 slabs were depicted (Figures 35-41). Bennett provided the Minnesota Historical Society with prints made from the original glass negatives, which today are in the collections of the Pipestone County Historical Society (Winchell 1911:112, 563, 564; Dudzik 1995:102). An additional photograph shows Bennett posing outdoors with the slabs arranged along a fenceline (Figure 52; Dudzik 1995:103); at least 33 slabs are visible in the photograph.

Caryl B. Storrs, who personally met Bennett in 1916, remarked that

> *...In his [i.e., Bennett's] side yard is a magnificent collection of stone slabs graven with crude images of turtles, octopi, buffalo, elk, men, women and other objects by the mysterious race which antedated the Indians and which, according to his thoughtful speculation, throws great light upon their origin. But that is another story.*

Unfortunately, Storrs wrote no more about Bennett's collection of petroglyphs, although he did quote Bennett as saying, "Most of my mysterious carved stones came from the foot of the maidens" (Storrs 1916).

Bennett's rock art collection was bequeathed to the Pipestone County Old Settlers Historical Society after his death in 1926. What happened to it subsequently is explained in the chapter on rock art.

Bennett was deeply involved in gathering and sharing information about the history and prehistory of the region in which he lived. Many of the archeologists and other early visitors to the catlinite quarries benefitted from information given out by him. Through his inquiring mind and propensity to immerse himself in local lore, much of the legacy of the catlinite quarries and the Pipestone community has been preserved.

George Amasa Perley, 1876

One of the earliest attempts to record the Three Maidens petroglyphs is also the most enigmatic. A crude dia-

gram called "Perley's chart" appears to depict at least some of the Three Maidens petroglyphs in a circular arrangement, probably around the massive glacial boulders (Figure 22). The original drawing is not known to exist, but two copies have survived. One of the two copies is among the Pipestone National Monument records at the Kansas City branch of the National Archives and Records Administration (Record Group 79, Records of the National Park Service, Region II (Midwest Region), Omaha, Nebraska, National Parks and Monuments Central Classified Files [1936-52], Pipestone National Monument, Decimal Code 503, Box 194). It bears two handwritten notations: "As the rocks were arranged in 1876 Perley's chart" and "Pipestone-pictographs/Copied for HW Baker by Miss Winifred Bartlett-8/15/46." Bartlett was a Pipestone citizen and local historian, and Howard W. Baker at the time was Associate Regional Director of Region II of the National Park Service in Omaha. Baker had visited the monument on August 14 and 15 of that year. His memorandum report stated that "While visiting with Miss Bartlett, we learned that she had a sketch map showing the location of these rocks before they were removed from the Three Maiden area. She made a tracing of this map which I have turned over to Mr. Hagen" (ibid., Decimal Code 200). Olaf T. Hagen was Regional Historian at the time.

A photocopy of "Perley's chart" also exists in the archives of Pipestone National Monument. On the sheet on which the diagram appears is typed "Pipestone National Monument Petroglyphs at Three Maidens Site as arranged in 1876. Perley's Chart." The typed initials (LKL) of Lyle K. Linch, former superintendent of Pipestone National Monument from 1948 to 1954 (Rothman and Holder 1992:242), and the date "1/13/49" appear in the lower right corner, suggesting that Linch was responsible for creating the copy.

The author of the original "Perley's chart" is not known with certainty, although strong clues to the diagram's probable authorship exist. A man named George A. Perley was deposed on September 30, 1927 in connection with litigation over the Yankton tribal claim to the quarries (U.S. Court of Claims 1927:216-221). Perley described himself as a retired farmer living in Flandreau, South Dakota, which is a approximately 27 miles west of Pipestone. When asked if he was familiar with "the history of the Pipestone Reservation," Perley replied "Quite good." Judging from his testimony, he seems to have had an interest in historical matters.

Additional information about this man exists in a published history of the Perley family (Perley 1906:598-601) and in his obituary published on September 27, 1933 in the *Flandreau Herald*. George Amasa Perley was born in Wisconsin in 1849. After nearly completing seminary studies at Wasioja, Minnesota, he homesteaded near Flandreau, South Dakota in May of 1876. He was a Moody County delegate to the constitutional convention of 1882 and served in the South Dakota Senate in 1911-1912 (Perley 1906:599; *Biographical Directory of the South Dakota Legislature 1889-1989, vol. 2*, p. 874). He possessed an interest in music and wrote several songs, a collection of which was published in a booklet titled *Tune Touched*

Measured Musings (Perley 1906:598-599; letter from Roberta W. Williamson, Director, Moody County Historical Society, to Thiessen, October 22, 1998).

As yet, no documentation has been found to establish a definite connection between George A. Perley and "Perley's chart," but circumstantial evidence supporting his authorship of the diagram is strong. He was an educated, creative man with an interest in historical subjects. He took up residence in a community near the quarries in 1876, the year that "Perley's chart" appears to have been created.

Though "Perley's chart" (Figure 22) appears crude in execution and conventionalized in its representation of petroglyphs in a uniform circle, it may represent a plan view of the in situ petroglyphs around the Three Maidens boulders. Together with Winchell's petroglyph drawings that were published in 1884, "Perley's chart" and Winchell's drawings represent two of the earliest attempts to record individual motives in the Three Maidens petroglyph group. Moreover, "Perley's chart" is the only known diagram that may show approximate relationships between individual glyphs before they were removed on quartzite slabs in 1888 or 1889 (see the previous discussion of Charles H. Bennett, as well as Chapter 11). Several of the individual motives shown on "Perley's chart" clearly are the same images documented in more detailed fashion by later recorders, including Winchell (1884), Lewis (in Winchell 1911), Holmes (1892e), and possibly Cronau (1890) (see Table 19). Although its depictions are by no means precise renderings, "Perley's chart" may ultimately satisfy some of the concerns expressed by W.H. Holmes and Garrick Mallery over what they viewed as Newton H. Winchell's failure to record the full context and association of individual motives (Mallery 1893:88-89; Winchell 1911:563-564). "Perley's chart" is of considerable potential importance to more fully understanding the Three Maidens petroglyphs.

Rudolf Cronau, early 1880s

Rudolf Cronau (1855-1939) was a special correspondent for the German newspaper, *Die Gartenlaube*. His employer sent him to the United States in 1881 to send back articles on life and landscapes in America, which he heavily illustrated with his own artwork.[5] In 1881 and 1882 he traveled widely through many parts of the United States, including a visit to the catlinite quarries that probably took place in the summer or fall of 1881 (Trenton and Hassrick 1983:258). He produced two books about his travels in America (Cronau 1886, 1890). One of the books, entitled *Von Wunderland zu Wunderland* (Cronau 1886), is the equivalent of a modern-day coffee table travel book, offering one page of text and one full-page illustration for many of the places visited by Cronau. The Pipestone illustration that it contains shows a

[5]Biographical information about Cronau is drawn from two internet websites: that for the Balch Institute for Ethnic Studies of the Historical Society of Pennsylvania <http:balchinstitute.org/manuscript_guide/html/cronau.html>, which houses some of Cronau's papers; and that for the Philadelphia Print Shop, Ltd <http://www.philaprintshop.com/cronau.html>. Trenton and Hassrick's (1983) book was especially useful in determining when he probably visited the quarries.

group of mounted Indians approaching Winnewissa Falls; neither the quarries nor the Three Maidens are visible, and the accompanying text is highly romanticized, with lengthy quotations from Longfellow's "Song of Hiawatha."

The later book (Cronau 1890), entitled *In Wilden Westen*, is more informative. It, too, is a romanticized account and repeats much information from Catlin and earlier authors.[6] However, it occasionally offers details gleaned from Cronau's personal observations at the quarries. For example, after relating Catlin's tale of the Leaping Rock, and the young Indian who died attempting to jump to the rock and who was buried nearby, Cronau (1890:83) adds that he took one of the dead man's molar teeth with him as a souvenir, "To be reminded of the person's tragic death." Cronau states that the tooth had "been found by a wolf." Whether the tooth that he "souvenired" was actually a human tooth or was from some other mammal, is unclear from his account.

Cronau several times refers to information furnished to him by Padani-apapi, whom he describes as a 90-year-old chief of the Yanktons (which he calls Yanktonais). Padani-apapi told Cronau (1890:83) that "his people had repeatedly found the bones of warriors from other tribes at the foot of the medicine rock" (i.e., the Leaping Rock). Cronau (18990:82) quotes Padani-apapi at length regarding how catlinite was quarried during the chief's youth:

> *We visited the pipestone quarry annually in the months of July and August, when my fathers were still alive and I was a small boy. Working the mines was possible only during this time since its water had dried out. Before we approached the sacred ground, all of us followed a three day long purification of fasting, prayers, sacrifices, imploring the Great Spirit to expose the holy minerals, buried beneath the rocks. On the fourth day, we painted ourselves and began working. Each warrior picked up a block of stone and smashed it against the rocks until they crumbled. Hard and thick layers of rock sometimes made this work last days or weeks; rocks were often colored red by the blood of our hands and feet.*

Cronau (1890:87) states that Padani-apapi led the Yankton treaty delegation that visited Washington, D.C. Consequently, Padani-apapi is none other than the famous Yankton chief, Strikes-the-Ree, who is known to have visited the quarries as late as 1879. "Pal-la-ne-a-pa-pe," or "the man that was struck by the Ree," was one of the signatories to the Yankton treaty of 1858 (Kappler 1972:776-781).

Cronau (1890:87) also comments on the earthen enclosure a short distance northeast of the quarries, which he states was "over 2,000 feet in diameter" and was still visible at the time of his visit. However, most of his discussion of this feature appears to be taken from Nicollet.

Of more interest are Cronau's (1890:83-85) remarks about the

[6]We are indebted to Dirk Loëbenbrück for an English translation of Cronau's text, and to Dr. David T. Hughes for providing the translation for our use. Both are of Wichita State University.

Three Maidens and the nearby petroglyphs, which probably were in situ at the time of his visit:

> *Of further interest are several blocks of stone which weigh thousands of tons. One of those measure approximately 60 feet in diameter and 10 to 15 feet in width. Several totems and symbols, representing the Indian visitors, are hewn into the red rocks. Catlin assured that the number of such representations ranged into the thousands, yet I only recorded about 40 to 50 of these.*

Cronau's (1890) drawings of 14 of the petroglyphs, labeled "Indian Totems," appear on page 85 of his book and herein are reproduced as Figure 25. Although many of them appear fanciful and he may have embellished the diagrams of what he believed to be depicted on the quartzite, at least four or five of his glyphs appear to match glyphs recorded by later investigators, which lends a degree of credibility to Cronau's renditions in general. Intriguingly, an earlier account of his visit to the quarries was published in *Die Gartenlaube* circa 1882-1883 as one installment of the column "Um die Erde" ("Around the Earth"; Hogarth 1986:45; Cronau n.d.).[7] A larger group of glyphs, drawn by Cronau, appears in the article (on page 86 of the magazine) and is comprised of 22 single glyphs or groups of possibly associated motifs (Figure 11-7). Some of these glyphs appear to correlate with specific motifs depicted in the 1890 book, and some do not. Detailed comparison of the two groups of renderings should be undertaken, and such comparison should be expanded to petroglyph motifs recorded earlier and later than Cronau's visit.

Richard Franklin Pettigrew and Frederick W. Pettigrew, 1880s

Two brothers, Richard F. and Frederick W. Pettigrew, who were prominent citizens of Sioux Falls, South Dakota, in the late nineteenth century, also possessed an interest in antiquarian matters (Hoskins and Rambow 1987). Richard F. Pettigrew was a U.S. Senator and businessman in Sioux Falls (Olson 1982). His brother, Frederick W. Pettigrew, actively investigated and wrote about local archeological sites, particularly the ancient village and mounds at the mouth of Blood Run Creek on the Big Sioux River several miles southeast of Sioux Falls. However, he also visited the catlinite quarries at an unspecified date, probably in the 1880s.

In an 1891 newspaper article which focused largely on the Blood Run Site, he pondered some of the archeological remains he saw at the quarries, particularly relating to the age of the petroglyphs there, which he probably observed in situ (Pettigrew 1891:14):

[7]David Rambow, personal communication to Thiessen, 2005. A photocopy of the article was graciously provided to the authors by Mr. Rambow, who purchased the newspaper excerpt in a Bavarian bookshop. Unfortunately, the date of publication and volume, issue, and exact page numbers are not known. Comparison of the yet-to-be-translated text of the magazine article with that in the In Wilden Westen book revealed an overall similarity between the two accounts, but some obvious differences in language as well.

> *...Several years ago I examined the ancient diggings at the great red pipestone quarry[,] have noticed also on later visits that the accumulation of vegetable mould in the pits as well as on the rubbish heaps denote great age, and both sod and vegetable mould are of the same thickness as that which covers the mounds in the village [a reference to the Blood Run site]. The picture writing cut into the smooth, weather-worn surface of overlying quartzite at the great red pipestone quarry exhibited many curious and grotesque forms, among which can be traced the turtle, fox, skunk and bear. Tradition gives us no explanation of this, neither can any of the present race of Indians enlighten us upon that subject. The peculiar dry moss that grows so slowly upon smooth rock surfaces has spread itself persistently over these picture writings, requiring undoubtedly the same lapse of time as the formation of the vegetable mould upon the mounds, in the pits and on the rubbish heaps. Whoever the people were that quarried the pipestone, made the pictures, built the mounds and the fort, I am unable to say; but I do believe it was all done by one and the same people at about the same time, and that they were the mound builders from the Ohio, or their kindred tribes...*

The same article, virtually verbatim, was published ten years later in the *Bulletin of the Minnesota Academy of Science* (Pettigrew 1901).

Both men left extensive collections of personal and professional papers, which today are housed in the Siouxland Heritage Museums in Sioux Falls (Olson 1982). A search of these materials may reveal further information about F.W. Pettigrew's visit to the catlinite quarries, and perhaps also correspondence with George Perley and Charles Bennett, educated contemporaries who shared an interest in antiquarian matters (Alan R. Woolworth, personal communication to Thiessen).

PREVIOUS ARCHEOLOGICAL INVESTIGATIONS, 1870'S –1980'S

This chapter reviews the research conducted by professional investigators who visited the archeological resources in the vicinity of the catlinite quarries beginning in the 1870s. Their researches at the quarries are distinguished from the activities of men with avocational interest in the quarries, such as Perley and Bennett, by their legacy of systematically recorded information. American archeology was in its infancy during the latter part of the nineteenth century, but the fame of the catlinite quarries early attracted the attention of men who sought to investigate and record the quarries and the diverse archeological resources found near them. Early interest in the archeological resources at the quarries was intense, as evidenced by the visits of six investigators within the space of 30 years (between 1877/78 and 1905), three of them from the Smithsonian Institution within the space of 11 years. After 1905, the quarries and nearby features received little attention from archeologists for the next 44 years. In 1949, 12 years after the establishment of Pipestone National Monument, the first National Park Service archeologist visited the quarries. Since then other archeologists have intermittently visited the quarries for various purposes up to the present time.

Newton H. Winchell, ca. 1877-1878

The earliest of these men, and the first to publish depictions of the rock art at the Three Maidens, was a professional geologist. Newton H. Winchell served as the Minnesota State Geologist from 1872 to 1900 (Nute and Ackerman 1935:81). Winchell probably visited Pipestone County and the quarries sometime in 1877 during his official geological researches in the state (Winchell 1884:542). In the annual report of the Geological and Natural History Survey of Minnesota for that year ([Winchell] 1878), he published a description of the geology of Pipestone County and neighboring Rock County. In addition to describing the quarries in some detail, as well as the chemical composition of catlinite, Winchell ([Winchell] 1878:108-109) also commented on the Three Maidens petroglyphs, which he observed in situ:

> *On the surface of the glaciated quartzyte about these boulders [i.e., the Three Maidens], which is kept clean by the rebound of the winds, are a great many hieroglyphic inscriptions, which were made by pecking out the rock with some sharp-pointed instrument. They are of different sizes and dates, the latter being evinced by their manner of crossing and interfering, also by a difference in the weight of the instrument used. They generally represent some animal, such as the turtle, wolf, bear, badger, buffalo, elk, and the human form. The "crane's-foot is the most common...The Indians regard the "Three Maidens," represented by the three larger boulders, as the maids from whom the tribes sprung after the destructive anger of the Manitou had slain the people. It would seem as if any warrior or hunter who had been fortunate in the chase and happened to pass here, left his tribute of thanks to the Great Spirit in a rude representation of his game, and perhaps a figure of himself,*

on the rocks about these boulders. In some cases there is a connection of several figures by a continuous line, chipped in the surface of the rock in the same manner, as if some legend or adventure were narrated, but for the most part the figures are isolated. This is the "sacred ground" of the locality. There are hieroglyphics at no other place around here, though there is abundance of bare rock.

In a later geological report on Pipestone County, Winchell, assisted by Warren Upham (Winchell and Upham 1884:555-560), repeated much of this information virtually verbatim, and added:

> ...The excavation of the surface of the rock is very slight, generally not exceeding a sixteenth of an inch, and sometimes only enough to leave a tracing of the designed form. The hardness of the rock was a barrier to deep sculpturing with the imperfect instruments of the aborigines; but it has effectually preserved the rude forms that were made. The fine glacial scratches that are abundantly scattered over this quartzyte, indicate the tenacity with which it retains all such impressions, and will warrant the assignment of any date to these inscriptions that may be called for within the human period. Yet it is probable that they date back to no very great antiquity. They pertain at least to the dynasty of the present Indian tribes. The totems of the turtle and the bear, which are known to have been powerful among the clans of the native races in America at the time of the earliest European knowledge of them, and which exist to this day, are the most frequent objects represented. The "crane's foot," or "turkey-foot," or "bird-track," terms which refer to the same totem-sign, the snipe, is not only common on these rocks but is seen among the rock inscriptions of Ohio, and was one of the totems of the Iroquois of New York.

Winchell and Upham's report contains the first published depictions of actual glyphs, probably recorded during Winchell's 1877 visit to the quarries. Forty glyphs are shown at one-quarter size in four plates in his report (Winchell and Upham 1884:Plates I, J, K, L), and are reproduced herein as Figure 24. These plates were reprinted in a collection of catlinite quarry-related articles edited by Alan R. Woolworth (1983:15-18). Concerning these depictions, Winchell and Upham (1884:560) state:

> *The illustrations seen on plates I, J, K, L, are approximately one fourth the size of the inscriptions. There are others that are very indistinct, and some that are unintelligible from imperfect or designless cutting. Figure 17 is deeply cut, and was partly hid by overgrowing turf. Figure 24, having its diametral lines agreeing with the cardinal points of the compass, may be intended to express the line of the horizon, and the points north, south, east and west; and it may be so recent as to have been suggested by the modern compass. Figure 31 was interpreted, according to Mr. Sweet, by a Sioux Indian from Flandreau, with these words, "Indian kill elk, three miles," pointing toward the south.*

Figure 33, which interferes with figure 37, is the earlier of the two, as indicated by the difference in cutting.

The "Mr. Sweet" mentioned here, is Daniel Sweet, who homesteaded in Pipestone County in 1874 and was one of the first white settlers in the region. He and Charles H. Bennett platted the Pipestone town site in 1876 (Rose 1911:320; Pipestone County Genealogical Society 1991:31; Pipestone County Genealogical Society and Pipestone County Historical Society 2000:51-52).

Though Winchell's illustrations of the Three Maidens petroglyphs appear somewhat fanciful and several cannot be matched with later, more accurate drawings of individual glyphs, several of them (Winchell's figures 3-4, 7-8, 12-13, 16, 18, 20, 23, 26-27, 30, 33, 35-39, and possibly 5, 9, 11, 19, 22, 25, 34, and 40; see Table 19) do resemble later renditions, lending substantial credibility to Winchell's early drawings.

Winchell later (1911) published a major compilation of information about Minnesota's archeology entitled *The Aborigines of Minnesota*, based largely on the surveys conducted by Theodore Hayes Lewis and Alfred J. Hill between 1880 and 1895. Included in that work are detailed drawings of 79 individual glyphs recorded by Lewis in 1889 after the petroglyphs were removed from their original location near the Three Maidens (Winchell 1911:Plate VIII). Winchell (1911:565), who had personally observed the petroglyphs in situ before their removal, remarked that they occur "on the quartzite only, at and around the base of the six boulders, mostly on the south side, but there are a few on the north side and on the quartzite between the boulders."

In this later work, Winchell also defended himself from criticism earlier received from W.H. Holmes of the Smithsonian Institution, to the effect that though he had published individual glyph depictions in his 1884 article, he had failed to record the spatial relationships between the in situ glyphs. Since the petroglyphs had since been removed from their original locations without careful recordation, Holmes maintained (Mallery 1893:88-89), this potentially important relational information was lost forever:

> *The trouble with the figures copied and published by Prof. Winchell is that they are not arranged in the original order. It will now be impossible to correct this entirely, as most of the stones have been taken up and removed...The Winchell drawings were evidently drawn by eye and have a very large personal equation; besides, they are mixed up while appearing to be in some order. The few groups that I was able to get [during an 1892 visit to Pipestone] are, it seems to me, of more interest than all the single figures you could put in a book. There can be little doubt that in the main this great group of pictures was arranged in definite order, agreeing with the arrangements of mythical personages and positions usual in the aboriginal ceremonials of the region. It is a great pity that this original order has been destroyed, but the inroads of relic hunters and inscription cranks made it necessary to take up the stones. One large stone was taken to Minneapolis*

> *by Prof. Winchell. There area few pieces still in place. All were near the base of one of the great granite boulders, and it is said here that formerly, within the memory of the living, the place was visited by Indians who wished to consult the gods.*

In defense, Winchell (1911:563-564) pointed to his statement in the 1884 article that "for the most part the figures are isolated," asserting that this "relieves the onus of the complaint by Dr. W.H. Holmes." Holmes visited Pipestone in 1892 and inspected the petroglyph slabs in Bennett's possession. He wrote letters to Mallery from there, and Mallery's quotation of Holmes is composed from the language of two such letters dated May 25 and June 2, 1892 (Holmes 1892c, 1892d).

Though the tone of the argument between these two men appears to have been sharp, it is possible that each was unfair to the other. Holmes, perhaps, had excessive expectations about the information that could be gleaned from the spatial interrelationships of in situ petroglyphs, and Winchell, possibly, did not appreciate the potential value of recording the in situ petroglyphs in spatial relationship to one another when he had the opportunity.

Philetus W. Norris, 1882

One of the most colorful figures to investigate the quarries and the antiquities associated with them was Philetus W. Norris. Norris' checkered career included experience as a businessman, soldier, legislator, writer, poet, explorer, park superintendent, traveler, and archeologist (Chittenden 1900:303-305; Haines 1977, 1:103 et seq.; Binkowski 1995), 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 controversial 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).

At various times, Norris traveled widely through the West (Binkowski 1995). 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 (Haines 1977, 1:259). 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). Issues survive in at least three repositories (see Appendix A). 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. He arranged and annotated the clippings, evidently in anticipation of publication in book form, but died in 1885 before this could be accomplished. Appendix A reproduces excerpts from two 1877 letters from this collection that concern the catlinite quarries.

Norris visited the catlinite quarries at least four times, the last time as a practicing archeologist employed by the Smithsonian Institution. Little is known of his first two visits, other than brief mention of them in his writings. The first occurred in 1842 or 1843 when Norris, in the company of a party of Chippewas, visited the quarries to obtain catlinite. It is first mentioned in a published letter that Norris wrote while at the quarries in 1877 (see Appendix A):

> *Niccolet [sic] backed by the Government visited it [i.e., the quarries] in 1838 or '39; and in 1843 myself a Frenchman and five Chippewa braves reached it from the St. Peter's river [i.e., the Minnesota River], but were surrounded upon the quarry by such numbers of Sioux warriors that we gladly escaped with our hair but no pipestone...*

Norris again mentioned this visit in the report detailing his 1882 archeological researches at the quarries (see Appendix B), although he stated the date as 1842: "My first visit to this Quarry was for pipestone with a small party of Chippewa Indians in 1842..." In the same report (Appendix B) he elaborated about this visit slightly in his discussion of the earthwork northeast of the quarries, which he noted as a possible defensive position during his flight from the Sioux:

> *In 1842 then in ignorance of his visit [i.e., the visit of the Nicollet party] I was led by a Chippewa Indian comrade to the crescent shaped works and then to the large circular one with the view of judging their fitness for defense if necessary from the Sioux and noted them particularly, and not deeming them defensible with our small party, we did not in our subsequent retreat attempt to reach them or to make a stand in a similar circular work a mile or two Northerly of it, which I have not since seen, but learn that such a work in that direction is now under cultivation.*

Norris commented on the difference in the height of the earthwork when seen in 1842-43 and again in 1882:

> *My observation was so careful, and recollection remains so clear that although I took no notes at the time of my first visit, I have no hesitancy in vouching that these embankments are now so much lower than they were at the time as to indicate they are modern work, but certainly older than claimed by an aged Yankton Sioux...*

This is a reference to information provided in 1879 by the famous Yankton chief, Strikes-the-Ree, to Pipestone resident Charles H. Bennett, who had an interest in antiquarian matters (see Appendix E). Strikes-the-Ree believed the earthwork had been constructed some 90 or 100 years previous, during a war between the Omahas and the Sissetons for possession of the quarries (Rose 1911:246, footnote 2; Thiessen

1998:47). Dubious that the earthwork was that recent in age, Norris added:

> *Some of the Chippeways of our party claimed to have been there during that war, and certainly well knew their location and character, and planned in reference to them in case of an emergency before leaving Mankato, but did not claim to know when or by whom they were built.*

Thomas (1894:44), who later published much of the information in Norris's 1882 report, briefly referred to Norris' 1842 observation of one of the two enclosures earlier noted by Nicollet, but did not reiterate any of the meager details from Norris' report.

Norris' second visit to the quarries occurred in 1857, but little is known of it. He observed that the mound previously commented on by Catlin "but little exceeded 6 feet in height" at that time (Appendix B; see also Thomas 1894:42).

Norris again visited the quarries in 1877, en route to assume his post as superintendent of the newly-established Yellowstone National Park. The quarries were mentioned in two letters published in his "The Great West" column, herein partially reproduced in Appendix A. His visit is described in a letter written at the quarries on June 4, 1877. Another letter, undated but numbered 52, provides Norris' colorful version of the romantic lore about the quarries being the peaceable resort of all tribes of American Indians until the Sioux took control of them and prevented other tribes from visiting there.

The June 4 letter is the more informative of the two. It mentions his 1842-43 visit, describes the geology of the immediate quarry area, tells the story of the quarries as the source of material for peace pipes, the "birth place" of the American Indians, and a place of peace among tribes. Most of this lore, of course, was available to Norris in the earlier writings of Catlin and Nicollet. The letter also provides some comments about Catlin's earlier observations about the Three Maidens boulders and about a burial mound near the Leaping Rock. Norris reiterated the story that the tramping of buffalo over time revealed the catlinite deposit to American Indians. As to his own activities while at the quarries in 1877, Norris relates that he "and two assistants" secured 150 pounds of catlinite, and he personally jumped onto the famous Leaping Rock, finding that it required "no special effort or danger in the feat," despite his age of 56 years at the time.

Norris also mentions observing the inscription made by members of the Nicollet party, as well as petroglyphs and, possibly, pictographs:

> *Near it [i.e., the Leaping Rock] is Niccollet's [sic] record of his visit which nearly the only legible one, as the Indian certainly never possessed tools capable of carving the glazed surface upon which our steel tools received more impression than they made; still there are some faint etchings and paintings of former councils, and stalwart warriors of fable and fame-also imprints upon the rocks that the credulous superstition of the red men have ever viewed as the footprints of the Buffalo eating war Eagle Manitau [sic] of the Legend days agone.*

Following his termination as superintendent of Yellowstone National Park, Norris was employed by the Smithsonian Institution as one of three permanent field workers in the Division of Mound Exploration, directed by Cyrus Thomas (Smith 1981, 1985; Brown 1981; Gibbon 1998a). It was the job of these field workers to visit various regions of the country, recording and often digging into aboriginal mounds at Thomas' instructions. Despite his relatively advanced age (over 60 years), Norris pursued this work energetically until shortly before his death from malaria early in 1885 (Perttula and Price 1984:11). One of his first field destinations was the catlinite quarries, with which he was familiar from his three prior visits.

Norris visited the quarries in August of 1882, and "opened" ten mounds in their vicinity on August 29 and 30. On February 10, 1883, Norris sent his "preliminary" report of this and other work to W.H. Holmes, who was then associated with the Bureau of Ethnology in an honorary manner (Meltzer and Dunnell 1992:xiv). This report survives, in part, in the National Anthropological Archives at the Smithsonian Institution, and is reproduced herein as Appendix B. Unfortunately, pages 10 and 11 of the report are missing and none of the listed enclosures have been located. Nevertheless, the report provides more detail about Norris' mound excavations at the quarries than Cyrus Thomas, the director of the Division of Mound Exploration, included in his comprehensive report on the activities of the Division (Thomas 1894). In the published report, Thomas synopsized Norris' description of the mounds he investigated near the quarries, but ignored Norris' largely speculative and fanciful conclusions and interpretations of their origin.

Norris conducted the first systematic archeological research at what was later designated the Pipestone National Monument. He partially excavated ten mounds or mound-like features in the vicinity of the quarries, seven of which today would lie on monument land. The other three (which he numbered mounds 8, 9, and 10) were associated with the earthwork feature that once existed approximately two miles northeast of the quarries (see Appendix B). His preliminary report (Appendix B) provides detailed notes on his excavations and the contents of the mounds, and this information was synopsized in Cyrus Thomas' published report on the activities of the Division of Mound Exploration (Thomas 1894:42-44). Norris' manuscript preliminary report also contains plan and profile sketches of mounds 1 and 3, which are reproduced in Appendix B. The information resulting from Norris' mound explorations within the present-day monument boundaries is summarized in Table 5. Unfortunately, the specific locations of these mounds are not known today, despite the fact that a map of "the Calumet Cliffs & Quarry" accompanied his report but has not been located. Perhaps the best clue to the location of these mounds lies on the detailed map published in 1919 by W.H. Holmes (1919:254), who visited the quarries in 1892, ten years after Norris' visit, and who was the immediate recipient of Norris' preliminary report. Holmes' map shows the location of eight features labeled "mounds," nearly the same number of mounds reported by Norris close to the quarries. Holmes certainly knew the

Table 5. Mounds investigated at the catlinite quarries by P.W. Norris in 1882. Information taken from his preliminary report submitted to W.H. Holmes on February 10, 1883.

Mound no.	Location	Diameter	Height	Contents	Comments
1	Not specified	28 ft	3 ft	Dark colored soil mixed with quartzite fragments; several pieces of catlinite including one worked	No bones were found; mound was trenched (3 ft wide) from the south to the center, where the excavation was enlarged, then a narrower trench was contined to the northeast periphery (see sketch in Appendix B)
2	North of Pipestone Creek, according to Catlin painting	Not specified	10 ft (Catlin in 1836) 6 ft in 1857	Dark colored soil; wood fragments, including a whip handle; rock fragments piled into a cairn; a perforated bear claw and glass beads were taken by Norris	Catlin stated that it was built ca. 1834 and contained the body of an Indian killed by a fall from the Leaping Rock; trenched from the south to and beyond the center; opened and looted prior to 1877
3	"amidst the large angular blocks of rock from the Cliff, and upon a slope towards the stream below the falls"	25 ft	3 ft	dark soil; rock fragments; several catlinite fragments	A 4-ft trench was dug from the south "nearly across it" (see sketch in Appendix B)
4	"beside an ancient trail near its rocky ford of the creek"	58 ft long NE-SW; 34 ft wide	4 ft	dark soil; rock fragments; mixed human and animal bones; catlinite fragments (one numbered 45 in Norris' collection	A 4-ft trench was dug "Southerly across the middle of the mound and Shafts sunk in several other portions of it;" Norris concluded the mound had been "thoroughly upturned and replaced at some recent period"
5	"near the South fork of the creek;" below the falls	25 ft	2.5 ft	dark soil	A 4-ft excavation was dug in the center to bedrock

Table 5. Concluded

Mound no.	Location	Diameter	Height	Contents	Comments
6	"upon the rock but turf covered margin of the Sloughy channel of the creek about 100 yards above the falls where the slight Easterly dip of the... bed rock allows a deep alluvial deposit nearly to the brink of the falls"	35 ft	6 ft	dark soil; large rocks piled above charcoal or ashes; human and coyote catlinite fragments; stone perforator marked 94 in Norris' collection	Trenched to the center, "and another crossing it in the center"
7	"across the sloughy stream and somewhat nearer the Cliff than No. 6"	30 ft	4 ft	dark soil; rock fragments; catlinite fragments; traces of decayed bones	A 3-ft wide trench was dug from the south side to the center

details of Norris' research at the quarries, and it is reasonable to surmise that he looked for the same mounds investigated by Norris, which may have shown evidence of Norris' earlier digging. However, it is apparent from Norris' report (Appendix B) that more mounds existed in the vicinity of the quarries than he dug into, and some of them had been previously looted by local people:

> *Neither the developments made or the time that I could properly spare justified opening the few remaining mounds below the falls and hence I ascended above them, and some mounds recently opened by Messers Bennett and George &c*

Norris evidently tired of digging into what he concluded were previously disturbed mounds, so he went farther from the quarries to seek intact mounds (Appendix B):

> *As this [referring to mound 7] was also the result of the recent researches of Messers Bennett & George in adjacent mounds I went 2 miles North Easterly...*

Norris collected several artifacts during his research at the quarries, which he sent back to the Smithsonian Institution. In November, 1997, Douglas Scott visited the Smithsonian's Museum Support Center in Suitland, Maryland, where he located four catalog lots of artifacts collected by P.W. Norris during his 1882 excavations at Pipestone (Table 6).

Although Norris' activities at the quarries focused largely on mound features, the petroglyphs did not escape his attention. The letter he sent to W.H. Holmes in 1883 mentions that he "traced many of the totem etchings found upon the rocks," and his preliminary report itself makes brief mention of this work (Appendix B):

> *The roll of full sized copies of etchings are from a few of the countless numbers found upon the vitreous flesh colored rocks around the huge granite boulders between which tradition and history alike the Indians believed was the residence of the two Genii guardians of the Sacred Quarry and to whom propitiatory offerings were always made before attempting to secure a fragment of this rock and hence the etchings, are doubtless the totem marks of the respective natives or clans, and are accurate as they [were] carefully copied by a far better artist than myself from the impressions upon thick soft paper well pressed upon them.*

From this it is apparent that someone other than Norris, perhaps someone from the local Pipestone community, made a series of full-size tracings or rubbings of the Three Maidens petroglyphs, which would have been in situ at that time. Early in his report, Norris acknowledges the assistance "of Mr. H.C. [sic] Bennett of Pipestone [i.e., Charles H. Bennett], Miss Nellie F. and Mr. G.C. George," one or more of whom may have created the tracings.[1] The re-

[1]We are indebted to David Rambow for pointing out that Gilman C. George was the father of Charles Bennett's wife, Adelaide B. George, and that Nellie F. George was Adelaide's sister. See also footnote 1 in Appendix B.

Table 6. Artifacts from Pipestone in the collections of the U.S. National Museum of Natural History, Smithsonian Institution, July 8, 1998.

Catalog No.	Identification	Find location	Collector	Comments
A071531	5 pieces of catlinite	Pipestone	P. W. Norris 1883	1 frag. was cut by a stone tool
A071611	Large chert biface	Pipestone City mound	P. W. Norris 1883	Catalog records indicate collected projectile point and flakes are missing
A071612	Chert drill fragment	Pipestone City mound	P. W. Norris 1883	
A071613	Large side-notched chert biface/projectile point	Pipestone	C. T. Thomas from P. W. Norris 1883	
A170303	Iron axe head and large chunk of Sioux quartzite	Pipestone	W. H. Holmes	Old BAE cat. no. 852; quartzite has possible edge battering
A170303	3 Sioux quartzite hammerstones, and 2 pieces Sioux quartzite	Pipestone	W. H. Holmes	Old BAE cat. no. 852
A170303	6 large quartzite hammerstones	Pipestone	W. H. Holmes 1892	Old BAE cat. no. 852
A170303	8 large quartzite hammerstones	Pipestone	W. H. Holmes 1892	Old BAE cat. no. 852
A170304	7 pieces of catlinite, 1 piece of Sioux quartzite	Pipestone	W. H. Holmes	Old BAE cat. no. 853; 1 catlinite frag. is scored
A170304	11 pieces catlinite, 5 pieces Sioux quartzite, 5 pottery sherds	Pipestone	W. H. Holmes	Old BAE cat. no. 853; sherds are not provenienced and may not be from the area.
A170304	19 large pieces of catlinite	Pipestone	W. H. Holmes 1892	Old BAE cat. no. 853
A170317	Large piece catlinite	Pipestone	W. H. Holmes	Old BAE cat. no. 859
A170317	7 pieces catlinite, 1 catlinite pipe blank	Pipestone	W. H. Holmes	Old BAE cat. no. 869; pipe blank Holmes 1919:261, Fig. 132a; catlinite pieces are worked

Table 6. Concluded

Catalog No.	Identification	Find location	Collector	Comments
A170317	22 large pieces catlinite, 1 piece Sioux quartzite	Pipestone	W. H. Holmes 1892	Old BAE cat. no. 869; 2 catlinite frags worked with metal tools, 1 is depicted in Holmes 1919:261, Fig 132c
A170318	1 piece Sioux quartzite	Pipestone	W. H. Holmes	Old BAE cat. no. 870; quartzite is scribed by metal tools, probably a compass
A170318	9 catlinite discs	Pipestone	W. H. Holmes 1892	Old BAE cat. No. 870; hand inked with numbers. #5 is in Holmes 1919:261, Fig. 132e; #46 is in Holmes 1919:261, Fig 132b
A170319	4 large and 1 small Sioux quartzite hammerstones	Pipestone	W. H. Holmes 1892	Old BAE cat. no. 871
A170319	8 large Sioux quartzite hammerstones, 2 large grooved mauls	Pipestone	W. H. Holmes 1892	Old BAE cat. no. 871
A417984	9 samples of pipestone	Pipestone National Monument	Richard Slatter 11/08/1957	All pieces show evidence of working with metal tools

port also indicates that "1 Long roll of totem tracings" was enclosed, along with "11 Sketches of painted totems;" however, these enclosures have not been located. The reference to "painted totems" suggests that Norris may also have observed pictographs at the quarries, which is also suggested by the reference to "paintings" in his 1877 letter.

The earliest published mention of Norris' recordation of the rock art at the catlinite quarries was made by Garrick Mallery (1886:23) in his study, "Pictographs of the North American Indians. A Preliminary Paper:"

> *Mr. P.W. Norris has discovered large numbers of pecked totemic characters on the horizontal face of the ledges of rock at Pipe Stone Quarry, Minnesota, of which he has presented copies. The custom prevailed, it is stated, for each Indian who gathered stone (Catlinite) for pipes to inscribe his totem upon the rock before venturing to quarry upon this ground. Some of the cliffs in the immediate vicinity were of too hard a nature to admit of pecking or scratching, and upon these the characters were placed in colors.*

Mallery (1893:87) repeated this information almost verbatim in his later work, "Picture-writing of the American Indians," and added that "Mr. Norris distinguished bird tracks, the outline of a bird resembling a pelican, deer, turtle, a circle with an interior cross, and a human figure." Unfortunately, Mallery did not publish the tracings or rubbings supplied by Norris, nor is their present whereabouts known. The intriguing reference to colored characters, or pictographs, presumably is based on now-lost information provided to Mallery by Norris.

Norris (1884:176) himself published another reference to possible pictographs at the quarries, in connection with a florid and romanticized discussion of the burial of Indian dead in the earth or in cairns in the vicinity of the quarries:

> *The countless numbers of these cairns in the valley, upon the cliff, and for miles upon the surrounding coteau, literally form a sacred cemetery in a land of savages; and as these purple- or flesh-colored rocks are seemingly glazed too hard for carving with any tool known to these people, many of them and portions of the cliff are nearly covered with the fading painted totems of the pilgrims who have mouldered to dust beneath them.*

If Norris or any of the other nineteenth century visitors to the quarries actually observed painted images, or pictographs there, they uniformly failed to record them or the records of them have been lost.

Norris's preliminary report of his researches at the quarries may have stimulated interest in the famous pipestone quarries among his colleagues at the Smithsonian Institution. Within the decade that followed, two more Smithsonian researchers visited the historic quarries to investigate and record archeological features there.

Walter James Hoffman, 1888

Walter James Hoffman was one of the archeological and ethnograph-

ic field workers of the Smithsonian Institution's Bureau of Ethnology (later the Bureau of American Ethnology) in the late nineteenth century. He made a visit to Pipestone for the purpose of documenting the petroglyphs there, but little is known of his visit, which probably occurred in July or August 1888. In his annual report of the activities of the Bureau of Ethnology for the fiscal year that ended June 30, 1889, J.W. Powell (1893:xiii) simply observed that "On leaving the above reservations [i.e., Red Lake and White Earth Indian Reservations in Minnesota, which he visited in July], Mr. Hoffman proceeded to Pipestone, Minnesota, to copy the petroglyphs upon the cliffs of that historic quarry." Efforts to locate Hoffman's notes, drawings, or other documentation of this visit, have not been successful.

Theodore Hayes Lewis, 1889

Theodore Hayes Lewis is responsible for creating the most extensive and most detailed documentation of the Pipestone petroglyphs that exists. In partnership with Alfred J. Hill, a St. Paul, Minnesota, civil engineer who financed his work, Lewis conducted the Northwestern Archaeological Survey between 1880 and 1895, the year of Hill's death. During this time, Lewis visited and mapped hundreds of prehistoric mound groups and other archeological sites in much of the north-central United States (Lewis 1898; Keyes 1928; Finney 2001). The extensive maps and notes that he made are today housed at the Minnesota Historical Society (Northwestern Archaeological Survey 1991; Dobbs 1991). The Society also possesses 16 sheets of Lewis' original drawings, depicting a total of 80 motifs (Alan R. Woolworth, letter to Thiessen, November 10, 1998). Each sheet measures 20 by 30 inches (ibid.). In correspondence with a publisher, Lewis described the method by which he recorded images. This information has been published (current as of August 3, 1998) on the internet at (http://www.geocities.com/Athens/Oracle/2596/lewisrubbings.html). He first pencilled an outline of the motif directly on the stone, then made a rubbing of the outlined image by laying greased tissue paper over it, and then re-outlined the rubbing for later reduction and publication.

Among the places Lewis visited was Pipestone, Minnesota, where he traced and described the petroglyphs that had recently been removed from the bedrock underlying the Three Maidens. The notes he made during his visit, which occurred between August 9 and 14, 1889, are contained in two field notebooks. His notes on the Three Maidens petroglyphs, plus some miscellaneous observations about petroglyphs and the manner in which he recorded them, are contained in a notebook entitled "Record of Pictographs" (Northwestern Archaeological Survey 1991:Reel 7, frames 705-707, 727-731). A transcription of them appears in Appendix C.

At the time that Lewis visited Pipestone, the petroglyphs had already been removed from their original location near the Three Maidens and the resulting slabs of quartzite were in the possession of Charles H. Bennett,

a prominent early citizen of Pipestone (Winchell 1911:564-565).[2] Lewis carefully made notes and tracings of the individual glyphs on 35 of Bennett's slabs (see Appendix C), which were later published by Newton H. Winchell (1911:Plate VIII). These drawings constitute the most detailed and accurate depictions of the Three Maidens petroglyphs published to date. In an August 11 letter to Hill from Pipestone Lewis (1889a) wrote:

> *During the last four days I have been copying pictographs. Also made a copy of the Nicollet inscription.*
>
> *There are no pictures on the 3 maids nor at the old pipestone quarries. They only existed on the rocks around the 3 maids. I have 3 hammers and 2 flat rocks with pictures on them and may get a large piece tommorow [sic] which I found yesterday, all of which I will ship in a few days. When I send the tracings, look them over, but please fold them back the same as when received.*

From this letter, it appears that Lewis planned to ship possibly three petroglyph slabs to St. Paul. A letter dated the following day, August 12 (Lewis 1889b), may also allude to one of these slabs:

> *If I get the new stone it will weigh 75 or 100 lbs so I will ship it by freight via Manitoba Road, in your name. better have Dolan call at [the] manitoba [sic] depot saturday and take them direct to the house.*

In his notes, Lewis divided the Three Maidens petroglyphs into three classes presumed to have been created in different ways (see Appendix C). Although these conclusions were later accepted and published by Winchell (1911:564), their validity has not been demonstrated and they must be regarded as speculation. Lewis also stated (Appendix C; see also Winchell 1911:565) that the petroglyphs were originally found in the Sioux quartzite "at and around the base of the 6 boulders [i.e., the Three Maidens] mostly on the south side, but there were a few a the North side and on the quartz between the boulders." Since Lewis is not known to have personally observed in situ petroglyphs at the Three Maidens, this information may have been provided to him by Bennett or other local persons. Lewis' chief contribution to knowledge of the Three Maidens petroglyphs lies in his detailed drawings of many of them.

William Henry Holmes, 1892

Four years after Hoffman's departure, the quarries were again visited by a Smithsonian Institution researcher, William Henry Holmes. Holmes

[2]Interestingly, a brief note in the *Pipestone County Star* newspaper for August 16, 1889, mentions Lewis' visit:

> *Prof. T.H. Lewis...has been in the city the past week taking notes. He visited the sacred pipestone quarries and spent a day or two in taking copies of the hieroglyphics on the rocks near the three maidens and falls. He also dug into the Indian graves near the quarries and spent several days in the vicinity of the old forts east of this city.*

While this note seems to suggest that petroglyphs were still in situ at the Three Maidens at the time of Lewis' visit, his description of them on individual slabs in Bennett's possession (see Appendix C) testifies to their removal prior to his visit. The authors are indebted to David Rambow for pointing out this intriguing note.

worked during the 1870s as a scientific illustrator and geologist on the United States Geological Survey of the Territories and as an employee of the U.S. Geological Survey after its formation in 1879 (Meltzer and Dunnell 1992; Gibbon 1998b; Fernlund 2000). Although not salaried by the Smithsonian, Holmes conducted numerous archeological researches for the Bureau of Ethnology in the 1880s. In 1889 he was hired to supervise the Bureau's "archeologic fieldwork" (Meltzer and Dunnell 1992:xiv-xv; Gibbon 1998b). It was in this capacity that he visited Pipestone, Minnesota, and the nearby quarries in 1892. His visit to Pipestone presented an opportunity to blend his professional interests in geology, Native American mining of stone, and anthropology (Fernlund 2000:130-132).

Unlike previous Smithsonian researchers who visited the quarries, Norris and Hoffman, Holmes observed a wider range of archeological features near the quarries and later summarized them in print. The map that he published served as the most detailed archeological base map of the quarries for nearly 80 years (Holmes 1919:254), and it continues today to provide the only known documentation for more than 300 features-mounds and circular stone alignments-that have largely vanished from the historical landscape of the quarries. He deserves recognition as one of the most important scientific chroniclers of the quarries.[3]

Holmes spent ten days visiting the quarries in May and June, 1892 (Powell 1896:xxviii; Holmes 1892c, 1892d). His visit was briefly reported in the *Pipestone County Star* newspaper for June 3, 1892:

> *Prof. W.H. Holmes, of the bureau of Ethnology of the Smithsonian Institute [sic], at Washington, D.C., who has been here the past few days collecting data in regard to our historic quarries, has nearly completed his labors. Mr. Holmes is at present engaged in studying up the Pre-Columbian quarrying industries of the United States for the Smithsonian Institute. While here he has taken photographs of the quarries, the ledge, three maidens, falls, etc., and also etchings of the Indian hieroglyphics on the rocks on the reservation. Mr. Holmes also takes exact measurements of the elevations around the quarries and when he reaches Washington will make a bas-relief map of the reservation on a scale of 100 feet to the inch. This map will be made in putty after which it will be cast in plaster and then painted in natural colors and when finished will be a perfect miniature of the quarries. This map will be on exhibition at the World's Fair in Chicago next year, after which it will be kept at the Institute. Cuts of the quarries and falls will be made and published in a volume devoted to this subject to be issued by the government in a short time. Mr. Holmes has been aided greatly in his work here by C.H. Bennett, L.H. Moore and others.*[4]

[3]Despite this, his other notable scientific achievements often overshadow his catlinite quarries study. His visit to Pipestone, for example, is not even mentioned in a recent book-length biography (Fernlund 2000).

[4]The authors are indebted to David Rambow for pointing out this newspaper article.

It is not known whether the bas-relief map mentioned in this article was ever made.

After his visit to Pipestone, Holmes presented a paper, in which he discussed the quarries, before the annual meeting of the American Association for the Advancement of Science the following August (Holmes 1892a). He also published expanded versions of that paper in later years (Holmes 1907, 1919). His most complete description of the quarries and associated features is presented in the 1919 article, which also contains his detailed map of the immediate vicinity of the quarries (Figure 12). In addition to the quarries (which he labeled as "ancient" and "recent"), the Nicollet inscription, the falls, and the Three Maidens with associated petroglyphs, the map depicts the locations of eight mounds and more than 300 small circular symbols that probably represent the "camp sites and lodge rings" mentioned in his text (Holmes 1919:254, 255). The last is probably a reference to circular stone alignments or "tipi rings" believed to have weighed down the edges of hide or canvas tipi coverings. Unfortunately, the accuracy and precision with which archeological features were plotted on the map are not known; no explanation of how the map was constructed exists and no manuscript version of it has been located. However, it is likely that Holmes took considerable care to make an exact map, which may be the basis for the published version. In an April 12, 1898 letter to the Commissioner of Indian Affairs (quoted at length in Gurley n.d.:16-19), J.W. Powell, director of the Bureau of Ethnology, stated:

> *The locality was visited in 1892 by a collaborator of the Bureau, and extensive examinations and planetable surveys were made. The examinations and surveys were designed as the basis for a special report, the preparation of which has thus far been prevented by circumstances, including and [sic] unforeseen change in personnel. As shown by the plan-table [sic] sheets and accompanying photographs, the glen of Pipestone Creek is a most picturesque spot in a region of monotonous character, while it abounds in the most extensive aboriginal quarries in the country, which furnish a highly significant record of aboriginal industry and philosophy...*

It appears that not only did Holmes produce a plane table map of the vicinity of the quarries, but it, or a copy of it, was provided to the Commissioner of Indian Affairs. An approximately 96 cm by 66 cm vellum, finished map exists in the National Anthropological Archives (Holmes n.d.) and may be the map furnished to the Commissioner. It differs slightly from the version published in 1919. The published map shows a larger number of small circles or "lodge" rings, particularly a group of 17 near Winnewissa Falls, which do not appear on the larger map. Also, the published map bears notations of "ancient" and "recent" quarry pits, which likewise do not appear on the larger, unpublished map, and the northernmost mound shown on the published map is not so labeled on the unpublished version. The feature labeled as a quarry near the falls on the published map is not so labeled on the unpublished map, where it is depicted as a body of water.

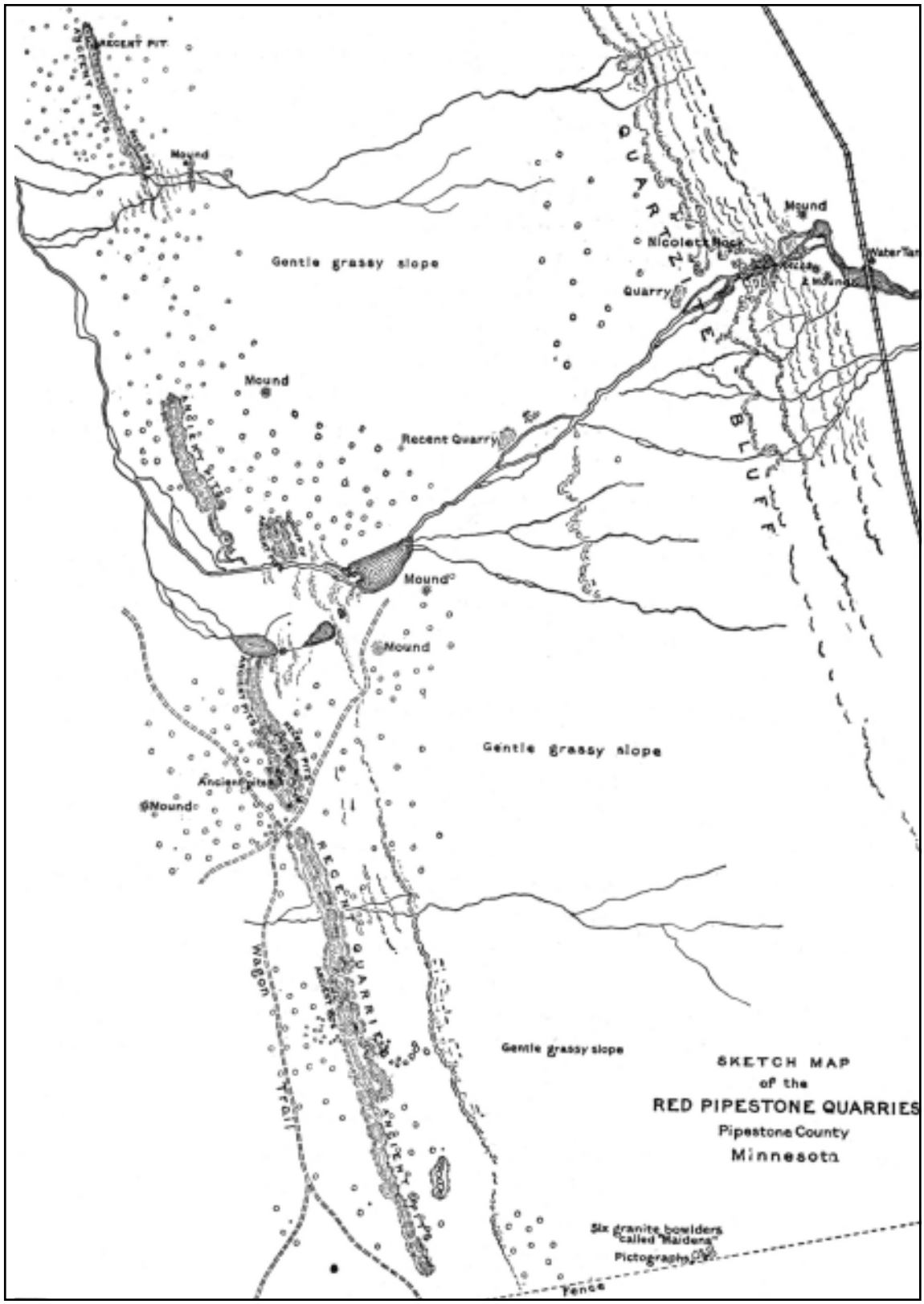

Figure 12. W.H. Holmes' 1892 map of the catlinite quarries and nearby archeological features (from Holmes 1919:Figure 123).

Probably the most interesting product of his visit is the notebook in which he made sketches and notes concerning the quarries and nearby features (Holmes 1892b). Preserved in the National Anthropological Archives, it consists of diagrams and notations made on 57 non-consecutively numbered pages, plus three sides of two unpaginated sheets. For the most part, the sketches are not detailed, but are made in the rapid sketching manner often employed during the nineteenth century for hurried, on-the-spot documentation (e.g., see Verner 1889 for explanation of similar expedient techniques employed for military map-making purposes). Several of the sketches are rough maps of areas near the quarries, showing the locations of "lodge sites" and other features. Other sketches show the Three Maidens and may provide valuable clues to the locations of petroglyphs on the Sioux quartzite bedrock which underlies the boulder (see Figure 54 for an example). Two sketches are general views of the vicinity, one of which appears to show one or two of the "lodge sites" that appear in large numbers on his 1919 map. At least one sketch depicts petroglyphs that may have been in situ around the Three Maidens at the time of Holmes' visit, and several are of the quartzite slabs that were in Charles H. Bennett's possession by that time. Other pages are filled with narrative notes, including a list of 12 photographs that may have been taken by Bennett.

On three pages of the notebook, Holmes (1892b:51, 53, 55) reflected on the purpose of his visit and observed that visitors who earlier wrote about the quarries

> *gave but a hasty glance at the main features of the interesting phenomena of the arts & of the quarry. I now propose to review each and every important feature and in detail that a record of what is visible & known today will be available to future generations to whom the pipestone quarry and the whole Coteau des prairie will exist only in history. To map it and record it and picture it & to collect its antique relics. This work is not attempted any too soon, already the hand of the vandal has fallen heavily upon the treasures of the sacred valley. The ancient pits and trenches are being absorbed by the new, and the pictographic records, the rosters of the Dakota, pecked in the surface of the glacier scarred quartzite, are fast giving place to the elaborately cut names of thousands of thoughtless visitors...traces of the sacred calumet quarries will disappear forever.*

Holmes collected a number of stone tools from the quarries and the nearby "lodge-shop sites," which he speculates were probably used to extract the catlinite from the quarry pits, to work the removed catlinite, and to drive stakes into the ground (Holmes 1892a:278; 1907:218; 1919:255). Five examples were illustrated in his 1919 article, along with five catlinite artifacts (Holmes 1919:261-261). Douglas Scott relocated some of these artifacts at the U.S. National Museum of Natural History in 1997 (see Table 6).

Holmes seems to have paid considerable attention to the petroglyphs in the area, although they received relatively little attention in his published writings (Holmes 1919:264):

An important feature of the quarry site is a group of large granite bowlders called the maidens, brought from the far north by glacial ice, about the base of which, engraved on the glaciated floor of reddish quartzite, were formerly a number of petroglyphs, representing no doubt mythological beings associated with the locality.

A nearly identical description exists in Holmes' 1907 article, which has the additional statement that "These have been taken up and are now in possession of Mr. Bennett" (1907:219). The petroglyphs are not mentioned in his 1892 publication.

Holmes must certainly have observed at least some of the rock art-bearing quartzite slabs that had been removed from their original location three or four years before his visit, as well as petroglyphs that were still in place around the Three Maidens. In his June 2, 1892 letter to Garrick Mallery, concerning the Three Maidens petroglyphs, Holmes (1892d; see below) stated that "There are a few pieces still in place." The Three Maidens appear in 13 sketches in his notebook, and individual petroglyphs or groups of petroglyphs appear in 5 sketches. Four of the latter appear to portray slabs on which several of the motifs can be correlated with the earlier Lewis drawings, and one sketch appears to represent an in situ petroglyph. One of the petroglyph sketches (on pages 8-9) bears the notation, "This group is on the south side near the S.E. bowlder." The notebook also contains further clues to the existence of in situ petroglyphs about the base of the Three Maidens. Two of the Three Maidens views (on pages 17 and 22; see Figure 54) depict human figures pointing to or looking at the ground or bedrock beneath the huge boulders. Both of these sketches, plus two other views of the Three Maidens (on pages 7 and 16), contain small "x" marks about the base of the boulders, which may represent Holmes' attempt to depict the locations of in situ rock art. If the perspective on the Three Maidens can be re-established today, it may be possible to conduct limited excavation in the thin mantle of introduced soil that surrounds the boulders and confirm the presence of petroglyphs in these locations. By the same means, it may also be possible to match the existing rock art slabs in the Pipestone National Monument museum collection to their original positions about the Three Maidens (Alan R. Woolworth, letter to Thiessen, November 10, 1998).

At the quarry, Holmes made rubbings or tracings of individual petroglyphs, which he provided to Garrick Mallery at the Smithsonian Institution. From Pipestone, he sent two letters to Mallery in which he discussed the petroglyphs:

May 25, 1892

My Dear Col. Mallery

I reached this place at noon today and have already seen all, or nearly all, of the Winchell pictographs and may be able to add to the list.

The trouble with the published figures is that they are not arranged in the original order. It will now be impossible to correct this entirely as most of the stones have been taken up and removed. I will do what I can and send you the result in a few days.

I have already collected a pile of stone hammers & rejects from the old shops & quarries. I start in on my map today. It is cold & windy here.

Please say to Major Powell that I am getting on famously.

Yours truly, W.H. Holmes [1892c]

June 2nd 1892

My Dear Colonel Mallery

I send you under another cover all the tracings of petroglyphs I had time to make. It is a tedious work and difficult on account of the terrible cold winds that blow here constantly. These are enough for comparison with what is published. The Winchell drawings were evidently drawn by eye and have a very large personal equation-besides they are mixed up while appearing to be in some order. The few groups that I was able to get are-it seems to me-of more interest than all the simple figures you could put in a book. There can be little doubt that in the main this great group of pictures was arranged in definite order agreeing with arrangements of mythical personages and positions usual in the aboriginal ceremonials of the region. It is a great pity that the original order has been destroyed but the inroads of relic hunters & inscription cranks made it necessary to take up the stones. One large stone was taken to Minneapolis by Prof. Winchell. I will trace it tomorrow. There are a few pieces still in place. All were near the base of one of the great granite bowlders and it is said here that formerly-within the memory of the living-the place was visited by Indians who wished to consult the gods.

Please excuse this scribbling.

Yours truly, W.H. Holmes [1892d]

The tracings which Holmes made of more than 30 individual Three Maidens petroglyphs are preserved at the National Anthropological Archives (Holmes 1892e), and a set of drawings of the same motifs, probably made from the tracings, also exists at the National Anthropological Archives (Alan R. Woolworth, personal communication to Thiessen). These tracings closely resemble the tracings and drawings made three years earlier by T.H. Lewis. About two dozen of Holmes' tracings can be viewed on the internet (as of January 28, 2005) at <http://www.tcinternet.net/users/cbailey/holmes.html>.

Although Holmes' petroglyph tracings were never published, Mallery combined most of the text of the two above letters by Holmes, and published it as a Holmes' quotation in his "Picture-writing of the American Indians" (Mallery 1893:88-89) as a criticism of Winchell's earlier renditions of the Three Maidens petroglyphs. In reply to this criticism, Winchell published Lewis' drawings of the Three Maidens petroglyphs and defended himself in his monumental work, *The Aborigines of Minnesota* (Winchell 1911:563-564 and Plate VIII):

Plate VIII shows drawings made by Mr. Lewis. They are in the main isolated and disconnected figures, though with some overlapping. This

fact is apparent not only from the illustrations of R. Cronau, the figures published by the writer in 1884, the figures drawn by T.H. Lewis and reproduced on Plate VIII, but also by a set of seventeen photographs presented to the Minnesota Historical Society by Mr. C.H. Bennett, of Pipestone city, made from nature. This relieves the onus of the complaint by Dr. W.H. Holmes that by the writer, in 1884, the original order was destroyed, and that some presumed "arrangement of mythical personages and positions usual in the aboriginal ceremonials of the region" had thus been lost to archeology. The writer remarked in 1884: "In some cases there is a connection of several figures by a continuous line, chipped in the surface of the rock in such a manner as if some legend were narrated, but for the most part the figures are isolated." This remark is all the evidence there ever was that would warrant the hypothesis of Dr. Holmes, and, in the light of everything that has transpired since, it is plain that that evidence is very slight.

The argument between the two men did not continue in print. Despite the numerous published and unpublished recordings of the Three Maidens petroglyphs, their precise spatial relationships to one another, including any "connections" between individual motives, remain undocumented other than in the enigmatic "Perley's Chart.". The original glass negatives of the 17 photographs mentioned by Winchell are preserved at the Pipestone County Historical Society (see further discussion under Charles H. Bennett).

Interestingly, page 57 of Holmes' notebook (1892b) contains a brief notation that "There were many pictographs on the flat rocks above the falls but they have all been removed or destroyed." This is a further suggestion that rock art may once have existed at other locations near the quarries, although taken at face value, this statement means that Holmes could not have personally seen such glyphs and must have obtained the information from a local informant such as Bennett.

Jacob Vradenburgh Brower, 1905

More than 12 years passed before another archeologist visited the quarries. On April 24-25, 1905, the quarries were visited by a Minnesota Historical Society archeologist, Jacob Vradenburgh Brower.[5] He drew general maps of the quarry area on four pages of his field notebook, depicting such features as the Three Maidens, various roads, the falls, some of the quarries, the Nicollet inscription rock, Pipestone Creek, and a feature labeled "`Jumper's' Mound," probably a reference to the burial mound observed by Catlin and which Norris believed he had dug into in 1882.[6] The Minnesota Historical Society has published a microfilm edi-

[5]A brief biography of Brower was written by his friend, Josiah B. Cheney (1906), and was published shortly after Brower's death in 1905. He died within a month and a half of visiting the quarries.

[6]Brower was assisted in this work by H.J. Bernier, a "practical surveyor," also from St. Paul (Pipestone County Star, April 28, 1905). The authors are indebted to David Rambow for pointing out this information.

tion of his field notebook (Brower 1976). The Pipestone entries are on pages 28-31 in field notebook 25, volume 83, reel 3.

Gordon C. Baldwin and Paul L. Beaubien, 1948-1949

More than forty years lapsed before the quarries again received archeological attention, during which time they were designated a national monument and came under the administration of the National Park Service. Soon after Pipestone National Monument was authorized by legislation, planning for development and management of the new park was begun. Apparently late in 1940, Edward A. Hummel, Regional Supervisor of Historic Sites for Region II of the National Park Service, compiled a "Preliminary Historical Development Report for Pipestone National Monument" (in the National Archives and Records Administration, Central Plains Region, Kansas City, Missouri, Record Group 79, Records of the National Park Service, Region II [Midwest], Omaha, Nebraska, Pipestone National Monument, Decimal Code 501-03 through 603, Box 194, File 621, Construction Projects). This document outlined physical development as well as research needs of the new park. Among the research needs, reports on the following topics were identified:

1. Significance of pipe-smoking to the American Indian.

2. Materials used in the manufacture of aboriginal pipes and the importance of catlinite to the Indians...

3. An analysis of red pipestone pipes in the various museums to determine, if possible, which came from the Pipestone National Monument quarries and the preparation of a chart showing the diffusion of Minnesota catlinite throughout the American continent.

4. A compilation of all legends and traditions associated with the Pipestone National Monument area.

5. The manufacture of catlinite articles by the American Indian with a discussion and description of tools used, methods, etc.

6. The history of the Minnesota catlinite quarries...

7. The contribution of the American Indian to the world-wide custom of smoking."

The report stated that these studies should be conducted "by someone who is trained in archaeology and who has studied the ethnology of the American Indian." These research goals and development plans were offered as long-term prospects, as the report noted that "development of the area may not be initiated in the near future."

More specific research plans coincided with the arrival of the monument's first full-time manager, Lyle K. Linch, on March 1, 1948. "Custodian" Linch met with the Regional Director and other Regional Office staff on March 1 and 2 of that year to review the full range of matters relevant to operation of the monument-planning, operations, interpretation, and facilities (agenda titled "Subjects for Discussion with Custodian Linch Pipestone National Monument March 1-2," in Archeology

Outside MRB, Minnesota file at the Midwest Archeological Center). Included in the discussions was the topic of "Interpretation and Research," as well as the development of an archeological and historical base map for the monument. Regional Archeologist Jesse D. Jennings participated in part of these discussions. Jennings later resigned from the National Park Service on September 1, 1948, and it was left to his colleague Gordon C. Baldwin, an archeologist who also worked in the Regional Office but primarily in the administration of the Interagency Archeological Salvage Program, to follow up with arrangements regarding the initiation of an archeological research program for the monument (Jennings 1994:140-141, 159; Thiessen 1992:7, 16).

Baldwin made plans to visit the monument as well as the Minnesota Historical Society and the University of Minnesota in early December of 1948, but the trip was delayed on account of weather conditions, car trouble, and illness (memoranda from Howard W. Baker, Associate Regional Director, to Superintendent Lyle K. Linch, November 12, 1948; and from Lawrence C. Merriam, Regional Director to Linch, December 6, 1948; both in Archeology Outside MRB, Minnesota file at the Midwest Archeological Center).

In the meantime, appropriate research goals and objectives were considered by Linch, Baldwin, and his supervisor, Regional Historian Olaf T. Hagen. After a visit by Linch to the Omaha office on November 29-30, Hagen documented the discussions between Linch, Baldwin, and himself, and outlined an ambitious research program in a memorandum to the files (December 9, 1948, in Archeology Outside MRB, Minnesota file at the Midwest Archeological Center):

> *...General discussions...suggest several topics should be thoroughly understood before much time is given to the pipe smoking subject which will be interpreted in the museum. To be sure of our facts concerning the chief assets of the area we will need a study bringing together the basic data about the geology of Pipestone, and the distribution of this material, and the use of other quarries (Ohio and Wisconsin, for example) by the Indians. Secondly, to know the truth about the importance of these quarries we should review the literature about and collections of objects, reportedly of catlinite, found in different parts of the country.*
>
> *Other features of the area including Leaping Rock, Winnewissa Falls, Indian burials, and the Three Maidens should be the subject of research and possibly monographs. Some attention should also be given to the petroglyphs and pictographs, formerly near the Three Maidens, and apparently found in other places, in order that any interpretation of them reflect scientific knowledge available about these hieroglyphics which can be made the basis for mystifying but fruitless speculation...*
>
> *To me it now seems that the subjects on which information is needed and to which research should give priority are: (1) geology of catlinite and the distribution of pipestone quarries and the extent of their use by the Indians (2) the distribution of arti-*

facts made from material asserted to be of catlinite from the Minnesota quarries and the identification of those still found in collections to establish the extent of prehistoric and early historic trade in this pipestone (3) compilation of archeological, ethnological, and historical evidence concerning (a) the quarries and their location (b) the Three Maidens (c) the pictographs and petroglyphs of the area (d) fortifications in the general vicinity of the quarries possibly outside the monument (e) Leaping Rock (f) the burials in the area.

In a memorandum to Hagen dated December 14, 1948 (in Archeology Outside MRB, Minnesota file at the Midwest Archeological Center), Baldwin endorsed Hagen's outline and additionally proposed a program of archeological field work on monument land:

...However, in addition I believe a thorough surface survey of the area should be made by an archeologist so that we would have an accurate inventory of all the archeological camp sites, burials, etc. on the monument. So far as I know this has never been done for Pipestone. Further upon laboratory study of whatever material is recovered and from the surface indications showing at the sites themselves, it is possible that at some future time a limited amount of testing or excavation would result in giving us a better understanding of the prehistoric occupation and use of that area.

Baldwin went on to suggest that Linch, who he described as "a trained geologist" (Rothman and Holder [1992:89, 177] state that Linch possessed a degree in biology), could proceed with the top research priority, a study of "the geology of catlinite including also a study of the differences if any between Minnesota catlinite and that from Ohio, Wisconsin, or other quarries."

In a memorandum dated the following day (Howard W. Baker to Lyle K. Linch, December 15, 1948, in Archeology Outside MRB, Minnesota file at the Midwest Archeological Center), Associate Regional Director Baker transmitted Baldwin's memorandum to Linch and encouraged him to begin the recommended geological study. He also added:

You will also note that it is suggested that a thorough surface survey of the monument is desirable, and we hope that you will be able to accomplish it in a manner which will enable us to prepare for the master plan a reliable archeological base map.

What Baldwin thought about management's assigning the archeological aspect of the research program to the park superintendent is not recorded, but it surely was not in agreement with his recommendation that the survey be conducted "by an archeologist."

Baldwin's visit to the monument was rescheduled for January 16-21, 1949, and was preceded by a flurry of correspondence regarding the travel schedule and arrangements (memorandum from Howard W. Baker, Acting Regional Director, to Linch, January 6, 1949; memorandum from Linch to the Regional Director, January 11, 1949; memorandum from Howard W. Baker, Associate Regional Director, to Linch,

January 13, 1949; letter from Gordon C. Baldwin to Dr. Lloyd Wilford, University of Minnesota, January 14, 1949; all in Archeology Outside MRB, Minnesota file at the Midwest Archeological Center). The visit itself was described in a memorandum that Baldwin submitted to Hagen (memorandum from Gordon C. Baldwin to the Regional Historian, January 25, 1949, in Archeology Outside MRB, Minnesota file at the Midwest Archeological Center). January 17th was devoted to an inspection of "the various features of the monument" by Baldwin and Linch, as well as a visit beyond the monument's boundary to see a particular type of archeological feature:

> *...Upon information secured by Superintendent Linch from a local resident, search was made for evidences of Indian occupation just to the northeast of the monument and an excellent series of eight to ten historic and prehistoric tipi rings was located...*

Unfortunately, no details of the "tipi rings" were recorded in Baldwin's trip report. The day concluded with Baldwin giving a talk to the local Exchange Club about "the anthropological program of the National Park Service with particular emphasis on the Missouri River Basin Archeological Survey and Salvage Program." January 18 and 19 were spent in Minneapolis and St. Paul, where Baldwin and Linch conferred with Drs. George W. Schwartz and Lloyd Wilford, a geologist and archeologist, respectively, with the University of Minnesota and G. Hubert Smith of the Minnesota Historical Society. They also visited the Science Museum in St. Paul, which Baldwin described as "one of the best small museums I have seen." After returning to Pipestone, Baldwin and Linch found a telegram and an airmail letter from the Regional Office awaiting them, with instructions to "make a study of possible boundary adjustments" at the monument, which they did on the morning of January 21. This boundary "study" was conducted in anticipation of the eventual closing of the Pipestone Indian School and transfer of its land to the monument and the state of Minnesota ("Recommendations for Boundary Adjustments at Pipestone National Monument," report by Weldon W. Gratton, February 14, 1951, in the National Archives and Records Administration, Great Plains Region, Record Group 79, Records of the National Park Service, Region II [Midwest Region], Pipestone National Monument, Decimal Codes 501-0345-630, Box 194, File 602, Boundaries-General).

Baldwin transmitted further thoughts about Pipestone National Monument archeology to Hagen in a March 25, 1949 memorandum (in Archeology Outside MRB, Minnesota file at the Midwest Archeological Center):

> *Due to the relatively heavy snow cover on the monument area, I was not able to secure too good an idea of the resources and possibilities of the archeological features of the monument. However, I do feel that archeological sites exist in and adjacent to the area, and that Superintendent Linch could begin a surface survey for such features, and prepare an archeological base map of the area. This should include all aboriginal quarry sites, tipi rings, camp sites, petroglyph areas, mounds, or any other prehistoric or historic Indian feature.*

He complimented Linch on the geological report he had written, and recommended that Linch obtain specimens of pipestones from known quarries in other states for eventual analysis to distinguish different sources from one another:

> *Superintendent Linch can also continue securing specimens of pipestone from other quarries in other states and can endeavor to contact some university, possibly the University of Iowa, as he has indicated to me, in assisting in the analysis of the various types of Pipestone and the eventual identification of prehistoric and historic objects manufactured from this stone.*

Baldwin also recommended an excavation program "in connection with the refuse matter from several of the aboriginal quarry pits" in order to obtain "information on the early use of the area by the Indians and furnish a number of specimens for future exhibit purposes." He suggested that a sum of "$5,000 or so" would be adequate for this purpose.

He closed the memorandum with the suggestion that he again visit the monument during the coming summer to better understand the archeological features there and plan future research with the superintendent.

Viewed collectively, these several plans and memoranda dating from the period 1940-1949 proposed a far-sighted series of archeological investigations to benefit Pipestone National Monument. Although not presented in a detailed manner, recommended investigations included an inventory of the surficial archeological features of the monument; an excavation program focused on the quarry pits; development of an archeological base map of monument land; documentation of rock art within the monument; distributional studies of catlinite artifacts; and compositional studies of catlinite and other pipestones to correlate artifacts with material source quarries. Such a comprehensive research program posed an ambitious undertaking, and efforts to implement most aspects of the proposed research have been initiated at different times over the years. Over 50 years later, in 2002, some of the recommended studies have been completed while others are underway or have yet to be initiated. With varying degrees of success, progress has been made toward the realization of many of the research goals considered by Hummel, Baldwin, Hagen, and Linch. One notable exception is the recommended investigation of the "fortifications in the general vicinity of the quarries," which lay outside the monument boundary, as proposed by Hagen in his December 9, 1948 memorandum. This fortification, observed at various times during the nineteenth century, is no longer visible and has not been located during twentieth-century visits by archeologists (see Appendix E).

Lyle Linch again visited the Region Two office in Omaha, on April 1, 1949, and further discussions occurred about the comprehensive research program for Pipestone National Monument. By this time, another archeologist, Paul L. Beaubien, had entered the picture. Beaubien, a veteran National Park Service employee and former "Custodian" of two national monuments in the Southwest, was appointed Regional Archeologist in 1949

(Steen 1964:486). In a memorandum for the files prepared by Olaf Hagen on April 4, 1949 (in Archeology Outside MRB, Minnesota file at the Midwest Archeological Center), Hagen remarked that Linch's geological study "has been reviewed favorably by Archeologists Beaubien and Baldwin." This appears to represent Baldwin's last formal involvement with the archeology of Pipestone National Monument. Paul Beaubien, evidently newly arrived on the scene, was the first National Park Service archeologist to undertake field work at Pipestone National Monument, in the summer of 1949. For some reason which has escaped documentation, Linch was not charged with the responsibility to conduct archeological research at the monument, as had been earlier recommended. Aside from the fact that he was not a trained archeologist, this may have been because Linch, though enthusiastic about his supervision of the monument, sometimes had to be restrained from the overly-energetic discharge of his duties (Rothman and Holder 1992:90-91, 177). He also was prone to romantic and inaccurate interpretation of the resources under his charge, as, for example, his claim of discovering an ancient Egyptian "ankh" symbol at the monument (Rothman and Holder 1992:91).

In his April 4 memorandum, Hagen again summarized the research that should be accomplished for the monument. Top priority should be given to completing the geological study undertaken by Linch. The next priority was archeology:

> *...A second topic should deal with archeology and provide for reconnaissance and excavation necessary to complete the base map for the area. Such study would include an examination of the literature on the burials and fortifications outside the monument, and also a study of artifacts in different museum collections labeled as Minnesota pipestone objects, and aim at dating so far as possible the earliest human use of the quarries.*

Hagen went on to endorse Baldwin's earlier estimate of $5,000 for the archeological research and requested that this amount be made available in the future. He also recommended investigations focused on historical research, the "legend and lore" of the quarries, and development of a museum prospectus.

Paul Beaubien spent five days (June 14-18, 1949) visiting the quarries and assessing the archeology of the monument and immediately adjacent land. His report of that visit (Beaubien 1949), completed on September 20, 1949, reviewed the history and lore of the quarries as recorded by various Euroamericans, described the archeological surface features of the monument, and offered recommendations for further investigation. In general, he noted that much of the archeological evidence earlier observed by archeologists had "melted away, or...been removed or destroyed." In particular, he noted that only traces of the mounds could be found with the aid of maps, the surviving petroglyphs (only 14 of Bennett's slabs) reposed in the basement of the Pipestone Public Library, and only four tipi rings, whose condition he described as "broken," could be found, and they lay outside the present monument boundary. In walking cultivated fields adjacent to the monument,

he reported finding scattered rocks that once could have been part of circular stone alignments, a portion of a grooved maul, an ovate scraper of quartzite, and numerous pieces of worked catlinite. He concluded that "The bulk of the [archeological] evidence, therefore, still to be had from surface reconnaissance is limited chiefly to work-shop refuse, the age of which is uncertain."

He offered two recommendations for further archeological work: **1)** "archeological exploration" (i.e., excavation) of the quarries at different places along the quarry line to obtain samples of catlinite from different portions of the quarries and artifacts that might help understand the use of the area in prehistoric times; and **2)** the development of an archeological base map in conjunction with the performance of civil engineering surveys of the monument land. Beaubien also recommended that the park boundary be expanded on the north and west to protect adjoining lands which contained archeological evidence of the exploitation of the quarries. This recommendation was probably an extension of the boundary "study" carried out by Baldwin and Linch the previous January.

Beaubien returned to Pipestone National Monument between October 4 and 27, 1949 to conduct excavations at several locations within the monument (Beaubien 1955, 1957, 1983). The purpose of his work was "to recover data and materials for use in the National Park Service interpretive program and to supplement and verify the work of previous investigators" (Beaubien 1955:1). This investigation was not formally reported until a manuscript was produced in 1955 to provide information needed for eventual interpretive purposes (Beaubien 1955:3):

> *During the winter of 1954-1955, the National Park Service made plans to enlarge the present visitor contact station to provide additional space for office facilities and for the installation of temporary museum exhibits. Before attempting to complete plans for the exhibits, and as an aid to the area's interpretive program, it was thought that an account of the 1949 archeological investigations should be available...*

The 1955 report was published two years later (Beaubien 1957), but with only two of the 34 photographs that appeared in the manuscript version. It was also republished in 1983, with all photographs included (Beaubien 1983), except for one, for which a line drawing was substituted. The 1955, 1957, and 1983 versions contained much of the text of the 1949 report, as well as much additional information.

Beaubien excavated at three locations at or near the quarry pits, and at four other locations within the monument. He excavated an east-west, five-foot-wide trench across the quarry line near its southern extent, "a few feet north of the south boundary fence" and recorded the profile of the north wall of the trench (Beaubien 1955:12-13, Figure 1). From this excavation he recovered 12 granite cobbles or small boulders, which he termed "hammer stones," worked pieces of catlinite, and fragments of two large animal rib bones. Cut marks resembling saw marks appeared on some of the worked catlinite pieces, suggesting that the trench was worked in

historic times, though no metal tools were recovered (Beaubien 1955:13).

Beaubien also excavated on the right bank of Pipestone Creek "immediately west" of the Spotted Pipestone Quarry (Beaubien 1955:17). This was in an area where catlinite strata occurred close to the ground surface, suggesting that it may have been near the place where catlinite was first discovered and quarried by Native Americans. He reported finding only catlinite of poor quality, "containing considerable sand."

Beaubien's third quarry excavation occurred at one of the pits in the north quarry line (Beaubien 1955:18). The rock strata evident here were measured and recorded (Beaubien 1955:Figure 2). The pipestone here was likewise reported to be of poor quality. The only artifact reported by Beaubien was a "modern steel hatchet," indicating a relatively recent date for the quarrying that occurred here (Beaubien 1955:18). Beaubien's 1949 excavation was re-excavated by John S. Sigstad on August 1, 1966, who collected additional samples of catlinite (Sigstad 1966:102-105; 1970a:13). Sigstad reported finding the inscribed names of P. Beaubine [sic], L.K. Linch, and G. Bryan and the date "Oct. 1949" on the face of the catlinite bed (ibid.; George Bryan was a renowned pipe-maker and monument employee). Sigstad added his name and that of Bill Bryan, his assistant and a son of George, to the inscription, along with the date "Aug. 1966."

Beaubien also excavated a mound located "about midway between the Spotted Pipestone Quarry and the quartzite outcropping," north of Pipestone Creek (Beaubien 1955:21-22). Beaubien believed that the mound had been previously excavated, and he hoped to find archeological remains that had been overlooked. He was not explicit about who the earlier investigators were, but he believed the mound to be near the location of the one that appears in Catlin's painting of the quarries. Consequently, it may be that Beaubien thought he was re-excavating mound "No. 2" trenched in 1882 by Philetus W. Norris (see Appendix B). Beaubien found only rock slabs in the mound, which he attributed to the Oneota Orr focus.

Beaubien dug test excavations in the monument's picnic area, which at that time was located west of the quartzite ledge at an approximate location where today the southern portion of the Circle Trail exits the timbered area into the grassland nearly directly east of the visitor center. He reported the recovery of approximately 30 pottery sherds from that location (Beaubien 1955:23).

Because several pottery sherds had been found during construction of a trail near the base of the Leaping Rock, Beaubien excavated at locations immediately east of the Leaping Rock and also "a few yards" west of the rock column, which he designated as Leaping Rock Site No. 1 and Leaping Rock Site No. 2, respectively (Beaubien 1955:24-27). He also collected approximately 40 potsherds from soil that had been removed from the Leaping Rock Site No. 1 area by the trail construction crew. As "all evidence of stratigraphy" had been destroyed at Leaping Rock Site No. 1 by the trail crew, Beaubien sought an undisturbed nearby location where deposits were intact. This he found at Leaping Rock Site No. 2, where he exca-

vated two feet of soil in arbitrary levels. This excavation resulted in the recovery of approximately 350 pottery sherds. Because fragments of the same pottery vessel were found in both the upper and lower levels of this excavation, and because the deposit contained fragments of historic phonograph records throughout, Beaubien concluded that "no importance could be attached to the depths at which the objects were found or to the association of catlinite artifacts with early ceramic types" (Beaubien 1955:27). He also observed what he interpreted as a "water-worn appearance" to the sherds, and suggested that they may have been redeposited from a location above the quartzite ledge (Beaubien 1955:27). His 1955 manuscript version concludes that this is an unlikely possibility because of "the limited area above the site" (Beaubien 1955:27; 1983:49), but this statement does not appear in the 1957 published version (Beaubien 1957).

Beaubien's investigations at Pipestone National Monument resulted in the recovery of a sizeable pottery collection. It is the first report of the occurrence of pottery at or in the vicinity of the monument, and Beaubien's pottery collection is much larger than any ceramic assemblage recovered by later investigators. Because the varying attributes of pottery form, decoration, and temper often are culturally diagnostic, pottery can potentially reveal information about the age and cultural identity of prehistoric groups who occupied or visited the locality of the quarries. Beaubien and, later, Sigstad (1970a) attempted to identify ceramic types represented in the monument collection, but the most recent and up-to-date interpretation has been offered by three prehistorians who have the benefit of much more information than was available at the time of Beaubien's and Sigstad's work (Anfinson 1998; Henning 1998; Johnson 1998).

Beaubien's report concludes with only a few recommendations for further research (Beaubien 1955:43-44). He recommended continuing examination of archeological reports to help establish the age and distribution of catlinite artifacts, and he suggested that further research in historical sources may shed light on the quarries as the "focal point" of the "Peace pipe" concept. He recommended "Spectrographic examinations" of catlinite artifacts to help establish the distribution of catlinite in time and space outside the monument. He also recommended continuing efforts to locate within the monument sites with undisturbed stratigraphy. A statement about the importance of establishing "the direct connection of worked catlinite with the older Woodland pottery types" appears in the 1955 and 1983 versions, but not in the 1957 publication (Beaubien 1955:43-44; 1983:57). Finally, he recommended documentation and mapping of a layer of catlinite discovered during waterline trenching "about midway between the Superintendent's residence and the known quarry."

Except for some of the pottery, the artifacts and catlinite samples taken from all three excavations were stored at the Regional Office in Omaha until April, 1954, when Beaubien transported them back to the monument (memorandum from Beaubien to the Regional Historian, April 27, 1954, copy on file at Pipestone National Monument). In 1981, much of the Beaubien collection, along with other archeological collections at

Pipestone National Monument, was transferred to the Midwest Archeological Center, except for artifacts on display and other selected artifacts (accession records, Midwest Archeological Center).

At the time of Beaubien's 1954 visit to the park (April 19-24), Lyle Linch told him of the discovery of "a few artifacts four feet below the present surface while digging a deep post hole" above the quartzite ledge and south of Pipestone Creek, between Hiawatha Avenue and the former railroad roadbed (memorandum from Beaubien to the Regional Historian, April 27, 1954, copy on file at Pipestone National Monument). Beaubien recommended investigation of this possible site "sometime when funds and time permit" (ibid.; Beaubien 1955:44; 1983:57). In 1965, John S. Sigstad searched for this site but found no evidence of it (Sigstad 1970a:8).

John S. Sigstad, 1965-1966

After Beaubien's 1949 investigation, no archeological field work was conducted at Pipestone National Monument for 16 years. In 1965, the National Park Service contracted with the University of Colorado for a park wide archeological survey of the monument land, test excavations at selected sites, and production of an archeological base map. The investigation was conducted by John S. ("Steve") Sigstad, a recently-graduated masters student in anthropology at the University of Colorado (Krause 1990). Sigstad was assisted by his wife, Elizabeth, monument Historian Tom Roll, and occasionally by laborers hired from the local community (Sigstad 1970a:2). Dr. David A. Breternitz of the Department of Anthropology served as principal investigator for the research. Sigstad returned to the monument in 1966 to excavate for catlinite samples from several of the quarry pits, but this was a separately contracted project with the University of Missouri, where Sigstad had by then entered the doctoral program in anthropology. Dr. Dale R. Henning served as principal investigator for this later phase of research. The 1965 and 1966 fieldwork was reported by Sigstad (n.d. and 1970a). That research and some of his subsequent searches for pipestone samples and artifacts are detailed in a series of field notebooks kept by Sigstad, now housed at the Midwest Archeological Center (Sigstad 1965b, 1966, 1966-1967, and 1967-1968).

Under the direction of Richard A. Krause after Henning's departure from the University of Missouri, Sigstad continued research related to the monument through the completion of his doctoral dissertation in 1973 (Sigstad 1973). The goal of this research was to determine the age and geographical extent of catlinite and other pipestone use throughout North America. This research, called the "age and distribution of catlinite" project, was contractually supported by the National Park Service, and the resulting dissertation served to fulfill the contract (Sigstad 1973). Sigstad's age and distribution of catlinite study is discussed in Chapter 5 of this report

Sigstad's interest in the temporal and cultural/geographical distribution of catlinite artifacts may have pre-dated his 1965 fieldwork at the monument. In a paper completed during the Spring 1965 semester at the University of Colorado for a course entitled "Culture Historical Reconstruction" (Sigstad 1965a), he at-

Table 7. Isolated archeological artifacts recorded by John S. Sigstad at Pipestone National Monument, 1965.

Number	Description	Location
pp0a	Catlinite fragmnent worked with metal tool	30' S of visitor center road & 60' W of former railroad
pp0b	Two catlinite fragments worked with metal tools	935' N of visitor center road & 50' E of former railroad
pp0c	Worked catlinite fragment	905' N of visitor center road & 50' E of former railroad
pp0d	Worked catlinite fragment	750' N of visitor center road & 25' W of former railroad
pp0e	Worked catlinite fragment	450' N of visitor center road & 1800' W of E Monument boundary
pp0f	Worked catlinite fragment Bird bone fragments (recent) Ceramic sherds?	600' S of Pipestone Creek & 25' W of former railroad
pp0g	Worked catlinite fragment	50' N of pp4
pp0h	Two worked catlinite fragments	20' S of visitor center road & 750' W of Three Maidens
pp0i	Worked catlinite fragment	1161' N of S Monument boundary & 500' E of visitor center road
pp0j	Worked catlinite fragment	30' due E of pp0i
pp0k	Catlinite fragment worked with metal tool	1405' N of S Monument boundary & 530' E of visitor center road
pp0l	Worked catlinite fragment	15' N of pp0k
pp0m	Large worked catlinite fragment	1690' N of S Monument boundary & 200' E of visitor center
pp0n	Two catlinite fragments worked with metal tools	1705' N of S Monument boundary & 400' E of visitor center
pp0o	Two worked catlinite fragments	600' N of S Monument boundary & 450' E of W Monument boundary
pp0p	Worked catlinite fragment	610' N of S Monument boundary & 80' E E of W Monument boundary
pp0q	Small gray quartzite "blade"	370' N of S Monument boundary & 225' E of W Monument boundary
pp0r	Catlinite fragment worked with metal tool	1580' N of S Monument boundary & 405(?)' E of W Monument boundary
pp0s	Two worked catlinite fragments (one worked with metal tool)	750' E of W Monument boundary & 1675' N of S Monument boundary

Table 7. Concluded

Number	Description	Location
pp0t	Projectile point tip	1450' S of N Monument boundary & 500' E of W Monument boundary
pp0u	Two worked catlinite fragments Two bone fragments Nodules of yellow ochre	600' E of SE corner of visitor center & 450' S of center of Lake Hiawatha
pp0v	Worked catlinite fragment	60' W of Lake Hiawatha on the N bank of Pipestone Creek
pp0w	Worked catlinite fragment	100' W of N end of visitor center

Figure 13. Excavation units at Locality 16c, Sigstad's "sweat lodge" site. Note the concentration of fire-cracked rock, presumably the result of heating rocks for sweat lodge ceremonies. (MWAC 642/PIPE 180, 14-01:19)

tempted to survey the temporal and cultural range of archeological artifacts made of catlinite. Although he examined and summarized a great deal of relevant literature, he recognized the fact that most artifacts labeled by various investigators as being of catlinite had not been subjected to systematic compositional analysis to confirm those identifications, thus precluding any definitive conclusions about the use of catlinite in North America through space and time. This study may have stimulated his later doctoral researches toward this goal. Consequently, he probably possessed considerable interest in the quarries before being chosen to archeologically inventory them in 1965. See below for a discussion of confusion arising from Sigstad's assignment of site numbers.

During his 1965 research at Pipestone National Monument, Sigstad recorded a total of 22 sites. These included four mounds; seven quarries, including the one stabilized for exhibit purposes; one workshop site; four workshop and/or occupation sites, including one that he believed contained evidence of a sweat lodge; three occupation sites; and two groups of pits that he concluded were not quarries (Sigstad 1970; see Table 9-1.) He also recorded the Three Maidens boulders and associated petroglyph slabs as a single site. Twenty-three isolated single artifacts were also recorded (Sigstad 1970: Table 4; see Table 7, this volume). No site number was assigned to the carved initials of the Nicollet party atop the ledge or to the other historic names and dates pecked into the nearby quartzite.

On the evening of June 13, 1965, shortly after arriving at the monument, Sigstad conferred with Dr. Wilfred D. Logan of the Midwest Regional Office and monument Historian Tom Roll about the research strategy for the project. He recorded the following notes about that meeting in his daily log (Sigstad 1965b:3-4):

> *Wil thinks that there is a campsite somewhere between the houses [sic] of the Monument administrator and the railroad track. He also suggested that level areas immediately west of the quartzite ledge might be a good bet for testing for campsites.*
>
> *Logan and I decided that I should test mounds for which there is no evidence of previous excavation or vandalism, and that unless tipi rings which I might encounter had some special feature, that there was no reason for testing these.*
>
> *Logan also suggested that Tom Roll and I bring our pottery to Omaha to be identified which we will try to do.*

Assisted by his wife, Sigstad systematically examined all monument land during nine workdays between June 14 and June 24, 1965 (Sigstad 1965b:4-29; 1970a). To organize and facilitate the survey, the monument was divided into quarters and these were subdivided into 64 "roughly square" sections, each measuring approximately 1,000 feet on a side. Each section was walked in 10 to 15-foot transects, during which as much ground as possible was visually examined, often on hands and knees (Sigstad 1970a:8). The monument's thick grass cover forced particular reliance on examination of rodent backdirt piles for evidence of

Native American use or occupation:

> *...The vegetation is still so lush as to greatly inhibit surveying operations, and I sincerely hope that the gopher population has been more active in the northern portion of the Monument than it has been in the southern portion. (Letter from Sigstad to Wilfred D. Logan, National Park Service, Midwest Region, Omaha, Nebraska, June 18, 1969; copy in possession of David A. Breternitz, Dove Creek, Colorado; see also Sigstad 1970a:8)*

Sigstad's field notebooks do not explain the methods by which sites and isolated artifacts were plotted on the base map of the monument. However, site locations are described in terms of east-west and north-south distances, usually rounded to the nearest 5 or 10 feet, from the monument boundaries or other landmarks. In the absence of notes about the use of surveying instruments or other precise, on-the-ground measuring devices, the resulting locations must be regarded as approximations only. An additional uncertainty, unknown to Sigstad at the time, is introduced by the fact that the base map provided by the National Park Service for his use, is not accurately drawn and has a north-south distortion on the order of ten percent and an east-west distortion of about three percent (Douglas Scott, personal communication). Consequently, Sigstad's archeological base map of the monument cannot be registered, or matched, with the base map that was photogrammetrically produced for the 1997-1998 inventory project.

Sigstad assigned numbers to 22 archeological sites within the monument boundary. These numbers were of the trinomial form widely used by the Smithsonian Institution and other archeological researchers (Sigstad 1970a:8). For example, the site number 21PP1 is composed of three elements: "21" designates the state of Minnesota; "PP" designates Pipestone County; and "1" designates the first site recorded within the county. Site information was recorded on standard University of Colorado Museum Archeological Survey forms. Additional Archaeological Survey of Missouri Survey Sheet forms and notes were completed for nine sites that Sigstad revisited in 1966, mostly quarries (sites 21PP3, 21PP5, 21PP7-12, and 21PP18).

There are problems associated with use of Sigstad's site numbers. None of the numbers were ever officially registered with the Minnesota State Archeologist or the State Historic Preservation Office. The result is that 22 unofficial site numbers exist for archeological resources within the Pipestone National Monument. These duplicate numbers officially assigned to archeological resources elsewhere in Pipestone County outside the monument, including the number 21PP2 which is the state's official site number for all archeological resources encompassed within the monument boundary. To reduce confusion from this multiplicity of official and unofficial numbers, we have chosen to arbitrarily refer to Sigstad's unofficial site numbers in binomial form with lower case letters. For example, Sigstad's site 21PP13 will be referred to as pp13 in this report to distinguish it from officially-assigned state site numbers. Previously reported sites were not assigned numbers by Sigstad if they could not be relocated (Sigstad 1970a:8).

Isolated artifacts were each designated "21PP0" followed by a lower case letter, "a" through "w" (Sigstad 1970a:8). The present authors have chosen to regard Pipestone National Monument as one formally recorded archeological site that contains 43 defined archeological loci or subsites (see Chapter 9 and Table 12).

After completing his systematic examination of the monument land, defining site areas, and recording discoveries of isolated artifacts (principally worked fragments of catlinite), Sigstad turned his attention to selecting sites for test excavation. Between June 28 and August 7, 1965, he conducted test excavations at a variety of sites, including a mound, four occupation or workshop sites, eight quarries or suspected quarries, and also in a non-site area. His excavation methods were more rigorous than those employed by previous investigators (Sigstad 1970a:15). Excavation units consisted of five-foot squares placed on a grid system established from a separate datum point for each site. Excavation proceeded by six-inch levels measured from the northwest corner of each unit. At least one excavation pit at each site was dug until bedrock was encountered. Soil from cultural deposits was screened. Observations were recorded in his daily log, profiles were recorded, and completed excavations were photographed.

Four of the sites recorded by Sigstad were described as mounds. None of them appeared to correlate with any of the eight mounds mapped by Holmes in 1892 (Sigstad 1970a:10). In accordance with his earlier discussion with Logan and Roll, when he was advised to dig test excavations only in mounds that appeared undisturbed, Sigstad selected one of the four mounds that he recorded in the monument. From his test excavation in mound pp2, located south of one of the two park staff residences, he concluded that it was a refuse pile of quartzite fragments, probably of relatively recent origin (Sigstad 1970a:9). Mound pp14 had been previously excavated and was not further investigated by Sigstad, and mound pp17 was considered to be a twentieth-century grave associated with the Pipestone Indian School and likewise was not disturbed (Sigstad 1970a:10). The fourth mound he recorded (pp6) also was not excavated, and was judged likely to be a pile of debris from the nearby Union Quarry pit (Sigstad 1970a:10).

Sigstad also dug test excavations in three sites that he characterized as occupation sites and/or workshop areas associated with the extraction and processing of catlinite. The sites were selected principally because they yielded a few small potsherds on the surface, promising the possible discovery of additional, potentially diagnostic pottery through excavation.

Two five-by-five-foot excavation units were placed approximately 100 feet apart at site pp13 (Sigstad 1970a:14-16). They revealed sterile yellow clay at 18 inches and Sioux quartzite bedrock at 42 inches below the surface (Sigstad 1970a:15). Cultural materials recovered consisted mostly of a mixture of historic debris (particularly in the uppermost six inches), catlinite fragments (four of which exhibited evidence of being worked), 15 small bone fragments, two chipped stone tools, and 25 flakes resulting from the manufacture of chipped

stone tools. None of these artifacts was diagnostic as to age or cultural affiliation.

At site pp16, Sigstad (1970a:16-23) placed test excavations in three separate areas, which he described separately as pp16 North, pp16 South, and the "Sweat Lodge" area. Three five-foot-square excavation units were dug in pp16 North. Sterile yellow clay was encountered at 24 inches below the surface, and bedrock at 66 inches (Sigstad 1970a:17). Within the top two feet of soil were recovered 157 catlinite fragments; 26 of them were worked, including a disk, a pipe blank, and possibly two pieces of incised tablets. Other prehistoric artifacts recovered included two chipped stone projectile points, lithic flaking debris, two possible "rubbing" stones, and possibly several dozen small bone fragments, some of which had been burned. The relatively few historic-age artifacts were limited to the uppermost six inches of deposit. On the basis of the catlinite disk, pipe blank, two possible tablet fragments, and possibly one of the projectile points, Sigstad (1970a:18) tentatively posited an Oneota cultural affiliation for this northern portion of pp16.

At pp16 South, two adjacent test excavations partially overlapped a small surface depression that may have indicated a house structure (Sigstad 1965b:38; 1970a:19-20). Bedrock was encountered in one of these units at depths ranging from about 47 to 82 inches below surface. In one of these units, a concrete slab was encountered between six and 18 inches below the surface; this slab, which was laid on sand, was believed to have been the base of an earlier monument erected to mark the location of a small cemetery for deceased students from the nearby Pipestone Indian School (Sigstad 1965b:38-40; Mitchell 1934). Material recovered from the disturbed soil above the concrete slab included historic objects such as pieces of wire, barbed wire, nails, wire staples, tinfoil, bottle glass, firearm cartridge cases, and a bullet, as well as a chipped stone projectile point tip, lithic flaking debris, animal bone and tooth fragments, catlinite fragments, and two small shell-tempered prehistoric potsherds (Sigstad 1970a:19). No historic artifacts were found below the concrete slab, though additional prehistoric objects were found there, including the base of a concave-base, side-notched chipped stone projectile point, more lithic flaking debris, two unworked catlinite fragments, and one small bone fragment (Sigstad 1970a:19-20). The adjacent excavation unit, which did not contain evidence of prior disturbance due to the construction of the monument, yielded two chipped stone projectile point tips, a convex-base unnotched projectile point, an end scraper, lithic flaking debris, worked and unworked catlinite fragments, bone fragments, and several historic artifacts (the last occurred only in the uppermost six inches). Sigstad (1970a:20) concluded that this area, like pp16 North, had been a workshop and/or temporary campsite. He tentatively suggested that the projectile points were similar to Oneota examples and to what would today be considered Late Archaic complexes, but cautioned against placing too much reliance on this interpretation. The location of the monument which formerly stood in this location was still visible in 1998 as a shallow depression, and has been marked by monument staff with an orange-painted iron pipe.

Five test units at the "Sweat Lodge" area of site pp16 were placed

over a group of three small depressions that were discovered when the grass cover was removed (Sigstad 1970a:20-23). Two of the depressions were found to be shallow basins that contained clay fill mixed with unidentified organic matter. The third depression contained a pile of cracked and apparently burned quartzite fragments. The top 18 inches of the soil in these test units yielded worked and unworked pieces of catlinite (including three fragments of catlinite disks), chipped stone tools (including seven projectile points), lithic flaking debris, two possible "rubbing" stones, and bone fragments, one of which was identified as being from bison. On the basis of the pits, the apparently cracked and burned rock, the organic material, and the distance at which these features were located from the quarries themselves, Sigstad offered the tentative interpretation that these represented activities associated with a sweat lodge. Sigstad's excavations at this "Sweat Lodge" site were still visible in 1998, some 33 years after he dug them.

The third site excavated by Sigstad, pp21, was an area located about 225 feet north of Beaubien's "Picnic Area" site, which Sigstad designated as pp22. Among the meager artifacts collected from the surface in this location was a grit-tempered potsherd (Sigstad 1970a:24). Sigstad (1970a:24-25) placed two test units in this area. Two historic artifacts were found in the uppermost six inches, while the 24 inches of cultural deposits yielded the usual mixture of worked and unworked catlinite, chipped stone tools and flakes (including two end scrapers and a projectile point mid-section), and bone fragments. Sigstad (1970a:25) concluded that the site represented a workshop area and/or a briefly occupied campsite.

Sigstad also excavated two five-by-five-foot test units in the western portion of the park informally called the West Ridge area. Although no sites had been formally defined in this area, he excavated there because numerous artifacts had been found there in the past, according to local people, and Paul Beaubien was believed to have intended to dig test excavations in the West Ridge area but did not do so (Sigstad 1970a:25-26). Sigstad located his test units where isolated artifacts had been found. As generally elsewhere in the monument, culturally sterile yellow clay was encountered at about 18 inches below the surface. Excavation was continued beyond that depth in an effort to reach bedrock; however, the water table was encountered at 138 inches below the surface, which precluded further digging. The tests yielded very little in the way of artifacts, and Sigstad (1970a:26) declined to define the tested areas as an archeological site.

In 1966, Sigstad excavated in several of the quarry pits in order to obtain samples of catlinite for his subsequent age and distribution study. This work is described in his daily field log and summarized in his formal report (Sigstad 1966, 1970a). Because the catlinite samples obtained in 1949 by Beaubien could not be located, Sigstad re-excavated in the pits that Beaubien had designated the South Quarry (pp3), the Spotted Quarry (pp12), and the North Quarry (pp11). In the North Quarry, Sigstad found the names of Beaubien, Lyle Linch, and George Bryan inscribed into the catlinite face that was exposed upon re-exca-

vation (Sigstad 1970:13; Sigstad 1966:102-105). Sigstad collected catlinite samples from pp5, pp8, and pp10. He also dug test excavations into pits designated as sites pp9 and pp18, but found no catlinite in them and concluded that they had not been dug for the purpose of extracting that kind of stone (Sigstad 1970a:12, 14).

It is interesting to note that in all of his test excavations, Sigstad found no evidence of stratified cultural deposits other than the tendency for artifacts of historical age to occur in the uppermost several inches of each test unit. This agrees with observations made during the 1997 test excavations at the large workshop/occupation site north of Pipestone Creek and above the quartzite ledge (see later discussion).

Although Sigstad tried to systematically inventory the range of archeological resources at Pipestone National Monument, he gave little attention to the monument's rock art. He briefly mentioned the Three Maidens petroglyph slabs in both his daily log and his formal report (Sigstad 1965b:6; 1970a:8-9), but did not document them individually. Interestingly, Sigstad was told of in situ petroglyphs still in the bedrock under the Three Maidens and for a time planned to excavate in search of them near the end of the 1965 project, but ultimately did not carry out this work (Sigstad 1965b:67-68):

> *We had tentatively planned to so some investigating in the vicinity of the three maidens. Former P.N.M. Historian Abelson advised that there were still petroglyphs in situ on the Sioux quartzite where it outcrops at the base of the glacial erratics. There are about 5 places where this situation occurs. Stratigraphic excavation here would be pointless, however, since the Hiawatha Pageant Club has done much earth moving here in order to construct the stage for their little production. We abandoned plans to work here, however, mainly because there are Hiawatha Pageant tipis and other distractions which would greatly hinder any sort of horizontal control. Sometime when the Pageant is not on, on the other hand, it might be worthwhile to probe for the pictographs. This probably would not entail a great deal of excavation.*

A significant part of Sigstad's research was his re-examination of the prehistoric pottery recovered from within the monument, mostly during Beaubien's work at the Leaping Rock sites No. 1 and 2 (pp19 and pp20, respectively). Sigstad's (1970a:27-29) interpretation of the potsherd assemblage was facilitated by type identifications suggested by Dale R. Henning, his mentor at the University of Missouri during analysis of his inventory data. Although Beaubien's (1957:14-15) earlier analysis of the pottery suggested an approximate 400-year prehistoric timespan for Native American presence at the quarries (ca. fifteenth into the eighteenth centuries A.D.), Sigstad (1970a:27-28, Tables 7a and 7b) concluded that types from Middle Missouri, Mill Creek, Cambria, Great Oasis, and Oneota complexes were represented, along with generalized late Woodland pottery. Geographically, these kinds of pottery were found from central South Dakota into southern Minnesota and northwestern Iowa. Temporally, they potentially span the eighth to the eighteenth centuries A.D.

Sigstad's interpretation of the Pipestone pottery remained the basis for interpreting much of the culture history of the monument until the pottery was re-assessed in 1998 (Anfinson 1998; Henning 1998; Johnson 1998; see Chapter 10).

In the history of archeological investigation of the catlinite quarries and nearby archeological features, John S. Sigstad's research efforts deserve special acknowledgement and appreciation. He was the first to take a comprehensive, fine-grained look at the range of in situ archeological resources within the monument. He examined the monument's land in a more systematic and thorough manner than any of his predecessors, documented the monument's resources in a more systematic fashion than earlier investigators, and he excavated a greater variety of the monument's archeological resources than did any of them. He was the first to attempt to establish the age and cultural affiliation of the monument's archeological resources on the basis of carefully collected archeological data rather than relying on questionably-recorded and poorly-interpreted traditions and historical information. His pioneering fieldwork in the monument in 1965 and 1966 laid the foundation for his subsequent study of the age and distribution of catlinite and other pipestones. Although the age and distribution study was not without substantial problems that limit it's ultimate usefulness (see Chapter 5), it served to stimulate later studies by others sharing his goals but employing other methods of physical examination (see later discussion).

Post-Sigstad Investigations, 1971-1998

During the years following Sigstad's 1965-1966 field work, a variety of archeological investigations and activities took place at Pipestone National Monument. These are summarized in Table 8. Most of these investigations were small-scale, usually conducted in response to planned construction or development actions, or in response to the reported discovery of artifacts or faunal remains on monument land. Because of the small scale and brevity of most of these investigations, they are typically summarized in trip report memoranda, short informal reports, and other less formal means.

By the early 1970s, an archeologist, Roy W. Reaves III, was added to the monument staff. Between October 19 and 28, 1971, Reaves ([1973]) conducted survey, monitoring, and excavation activities in connection with construction of two structures within the monument, an addition to the visitor center called the Upper Midwest Cultural Center and a six-unit apartment complex and parking lot near the eastern monument boundary, north of Pipestone Creek. His pre-construction survey and monitoring of construction work at the apartment complex revealed no cultural materials, although he did observe fragments of Sioux quartzite and catlinite which he concluded were deposited by water or glacial movement (Reaves [1973:2-3]). Most of the area planned for the Cultural Center had been previously disturbed by road construction and landscaping around the existing visitor center. However, the southeast corner of the structure would impact an historic quarry pit. Local quarriers

Table 8. Miscellaneous archeological activities at Pipestone National Monument, 1970s-1990s.

Date	Archeologist(s)	Activity	Reference
1971	Roy W. Reaves, III	Excavations at the location of the Upper Midwest Cultural Center and Six-Unit Apartment Complex	Reaves 1971
1973	John E. Ehrenhard Thomas D. Thiessen Wilfred M. Husted	Monitoring of the installation of two sewer lines to connect the park to the Pipestone city sewage system	Ehrenhard 1973 Ryan 1973 Husted 1973
1974	Roy W. Reaves, III	Visit to Pipestone NM and recommendations for mitigating the impact of quarrying activities to the Monument's archeological resources through an archeological research program	Reaves 1974
1980	Robert K. Nickel Thomas D. Thiessen	Examination of the north quarry line	Nickel and Thiessen 1980
1980	Robert K. Nickel	Mapping of the north quarry line	
1981	Robert K. Nickel	Monitoring of the installation of underground powerlines	
1981	Thomas D. Thiessen W.E. Sudderth	Investigation of the discovery of horse bones along the Circle Trail	Thiessen 1981a
1981	Mark J. Lynott	Visit and inspection of the north quarry line	Lynott 1981
1987	Susan M. Monk	Shovel testing of areas affected by installation of a comfort station	Monk 1987
1993	Caven P. Clark	Inventory in connection with a prescribed grass burn	Clark 1996
1994	Jeffrey J. Richner Vergil E. Noble	Inventory in connection with a prescribed grass burn	Richner 1994
1994	Timothy V. Gillen	Investigation of the discovery of animal bones in the Spotted Quarry	Hannus 1994
1997	Douglas D. Scott Thomas D. Thiessen	Inventory in connection with a prescribed grass burn	This volume

Table 8. Concluded

Date	Archeologist(s)	Activity	Reference
1997	Kevin S. Stadler	Test excavations at a stone circle site and an extensive camp/workshop site	This volume
1998	Douglas D. Scott Thomas D. Thiessen	Inventroy in connection with a prescribed grass burn	This volume
1998	Robert K. Nickel Forest Frost	Geophysical surveys at the suspected location of the Indian School cemetery	This volume

were questioned about the pit, but none recalled ever seeing it actively worked (Reaves [1973:3]). Reaves supervised the excavation of a north-south and an east-west trench through the pit and its adjacent spoil berm. Cultural materials recovered from the pit included tin cans, broken bottles, buckets and other metal containers, an iron axehead, quartzite fragments, hammerstones, and a fragmentary chipped stone tool (Reaves [1973:4]). These materials were not fully analyzed, but Reaves concluded that the historic artifacts dated in age from the late nineteenth century into the 1930s and he regarded only the chipped stone tool fragment as prehistoric (Reaves [1973:5]). Because of fiscal limitations, the excavations were halted before excavation of the pit was completed, although Reaves ([1973:5]) noted that part of the pit was outside the limits of construction disturbance and was filled in as part of the landscaping surrounding the building.

The next archeological work at the monument was necessitated by the installation of two sewer lines to connect the monument with the city's sewage system in the fall of 1973. Trenches were excavated to the visitor center from 8th Avenue and to the apartment units from Hiawatha Avenue (Palmer 1973). The Northeast Region of the National Park Service requested archeological assistance from the Midwest Region (Brooks 1973). In response, Midwest Archeological Center Archeologists John E. Ehrenhard and Thomas D. Thiessen, in company with Park Technician Ray Mundell and Scientific Illustrator Jerry Livingston, all of whom happened to be traveling through Minnesota at the time, stopped at the monument on October 19, 1973. Ehrenhard and Thiessen examined the alignment of the sewer line that originated at 8th Avenue and extended through monument land, crossed the entrance road, and ended at the visitor center (Ehrenhard 1973; Ryan 1973). The portion west of the entrance road had been excavated and filled in before their arrival, and trenching east of the road had not yet started. A depression and a quarry pit existed near the alignment and were pointed out to the park staff, with the recommendations that care be taken to avoid them and that park staff closely monitor the rest of the construction work. After the Advisory Council on Historic Preservation later questioned why the trenching was not being monitored by an archeologist, the Northeast Region sent Archeologist Wilfred M. Husted to Pipestone National Monument to observe the remainder of the work, with the Midwest Archeological Center standing by to send additional archeological help if needed. Husted remained on-site for approximately one month (personal communication to Thiessen, June 27, 1997). On November 14, 1973, he formally recommended that, because of the unexpectedly slow progress of the construction work, test excavations be conducted along the remaining portion of the alignment (Husted 1973). It appears that no such excavations were ever conducted and that monitoring was the only archeological work performed, with negative results.

Roy Reaves, who had left the monument staff sometime after his 1971 work to accept a position as one of three Executive Order 11593 consultants in the National Park Service, returned briefly in 1974 as part of his responsibility to advise Federal land managers about

compliance with Executive Order 11593, which directed Federal agencies to inventory significant historic properties and nominate qualifying properties to the National Register of Historic Places. Following his visit, Reaves (1974) voiced concern that the legislatively-mandated quarrying activities were gradually destroying the primary archeological resources of the monument-the historic quarries. To mitigate this impact, he recommended consultation under Section 106 of the National Historic Preservation Act, implementation of an extensive program of test excavations focused on the historic quarries, and development of a resource management plan based on the results of the archeological research (Reaves 1974:2). He also suggested several research questions to be addressed through the testing program. The archeological research he recommended appears not to have been carried out. His concern about the impact of quarrying on the monument's archeological resources, however, after protracted discussion, eventually led to agreement between the National Park Service, the State Historic Preservation Officer, and the Advisory Council on Historic Preservation. It was agreed that quarrying was the primary purpose for which the monument was created and would take precedence over quarry preservation in Section 106 compliance matters (Rothman and Holder 1992:189-194).

At the request of the monument superintendent, Archeologists Robert K. Nickel and Thomas D. Thiessen visited Pipestone National Monument on July 2-3, 1980 to examine the north quarry line. The superintendent anticipated the need to open new quarries along the north quarry line in the future to accommodate growing Native American interest in obtaining catlinite, and he expressed concern about the resulting impact to historic quarries identified by Sigstad. Nickel and Thiessen examined the quarry line from the Spotted Quarry northward, and concluded that Sigstad's designation of site 21PP11 was in error (Nickel and Thiessen 1980:1). There were no visible quarries between the Spotted Quarry and adjacent inactive quarries-collectively designated as 21PP10 by Sigstad-and the northern group of quarries north of an intermittent watershed that drained higher land to the east. This latter group had been designated by Sigstad as 21PP12. They experimented with several proton magnetometer transects across older, inactive quarry pits and noticed that magnetic values were consistently higher outside the pits than inside them (Nickel and Thiessen 1980:1-2). Two magnetometer traverses across the suspected location of 21PP11 revealed no comparable pattern of values. They recommended preparation of a transit map of the entire group of quarries that constitute the north quarry line, and a close-interval shovel testing program in the suspected location of 21PP11. If these measures failed to confirm the presence of quarry pits in the area that Sigstad designated as 21PP11, they recommended that new quarries be opened there and elsewhere along the north quarry line. Although they noted that no previous excavations in quarry pits at the monument had revealed any "clear-cut evidence of any significant antiquity," they recommended that some of the older, inactive pits be preserved for future archeological investigation (Nickel and Thiessen 1980:2). They also recommended implementation of a multi-year program of "diverse

investigations," synchronized with the park's prescribed grass burn program; that quarry permit holders be required to surrender any archeological artifacts they encounter during their quarrying activities; and that catlinite samples be periodically collected and documented from each active quarry to build up a collection of reference samples that could be used in the future to define the mineralogical diversity of the catlinite beds (Nickel and Thiessen 1980:3).

Two of these recommendations were ultimately acted upon. Nickel, assisted by Randy Bellomo and Janis (Emery) Dial-Jones, returned to Pipestone before the end of Fiscal Year 1980 to map the quarries along the north quarry line (Midwest Archeological Center n.d.a:45; see also Nickel 1980), but the resulting map has not been located at the Midwest Archeological Center. In 1982, Nickel and Thiessen conducted the recommended shovel-testing investigation of the area designated as 21PP11, and they also recorded one newly discovered site on monument land (Midwest Archeological Center n.d.c:14). This investigation has not been fully reported.

On June 19-20, 1981, Archeologists Thomas D. Thiessen and W.E. Sudderth investigated the reported discovery of articulated bones during trail work at Pipestone National Monument (Thiessen 1981a). Bones had been found in situ along the southern portion of the Circle Trail at the point where the trail emerges from the timber along the west face of the Sioux quartzite ledge. Thiessen and Sudderth began excavation of the bones which had been exposed by the trail workers. Some of the bones found by the maintenance workers had previously been sent to the Midwest Archeological Center for identification. While they were in the park, word arrived by telephone from the Center that the bones were those of a horse. Because there was no evidence of fire, deliberate burial, or any other cultural associations, it was concluded that the animal died a natural death (Thiessen 1981a; Midwest Archeological Center n.d.b:28). The remaining bones were left in place, and Thiessen and Sudderth returned to Lincoln with a number of boxes containing artifacts and catlinite from Beaubien's 1949 work.

A few days after their visit, Midwest Archeological Center Archeologist Mark J. Lynott visited the monument on June 27, 1981 (Lynott 1981). He examined the area designated by Sigstad as 21PP11 and also concluded that Sigstad's base map is in error. He examined a possible mound-like feature that may have been mapped by Holmes and recorded by Sigstad as 21PP14. He collected three pieces of stone chipping debris and a glass bead from the surface of the mound, which he described as being 7-8m by 4-5m and 0.75-1.0m high.

During Fiscal Year 1981, Nickel also monitored the installation of underground powerlines at Pipestone National Monument (Midwest Archeological Center n.d.b:28), with negative results.

In addition to the discovery of the horse remains underlying the Circle Trail, additional bones and other artifacts have been reported by park staff from time to time. In 1965 Park Historian Tom E. Roll (1965a, 1965b) reported to both Wilfred D. Logan of the Midwest Regional Office and to John

S. Sigstad the discovery of a number of horse bones during the digging of a new quarry along the south quarry line and south of the Union Quarry. Roll suggested that possibly two individuals were represented, but did not report the presence of any cultural materials in association. In 1981 monument Maintenance Foreman Chuck Derby reported to the Midwest Archeological Center the discovery of an inscribed rock in backdirt from a underground powerline project north of the visitor center (Thiessen 1981b). The rock was described as being about 1.5 feet square and eight inches thick; it bore the name "ANDREW WILSON," the date "1885," a word that appeared to be "ONIO," and the depictions of a tipi and a hatchet.[7] Derby was advised to accession it into the monument's museum collection and make a measured sketch map of the location of its discovery. In 1984, park staff found a bone, a rock, and a broken bottle fragment on the ground surface while clearing brush near the visitor center, and sent them to the Midwest Archeological Center for identification (McSwain 1984). The Center Chief identified the bone as a probable cow mandible; the stone as natural and not culturally modified; and the bottle fragment as dating to the early 20th century (Calabrese 1984). On October 28, 1994, two quarriers who were re-opening an inactive pit north of the Spotted Quarry found a number of bones, which they reported to park staff. The park staff, in turn, reported the discovery to the Midwest Archeological Center, and on the same day Timothy V. Gillen from the Archeology Laboratory at Augustana College visited the monument to investigate the find. Gillen concluded that the remains were those of a horse that pre-dated 1957, when the monument acquired the land where the bones were found (Hannus 1994). On May 11, 1995, a partial mandible was found during quarrying in the north end of pit no. 21 in the south quarry line. The mandible was sent to the Midwest Archeological Center with a note regarding its discovery (McSwain 1995). It was judged to be probable bison by John R. Bozell and Amy Koch of the Nebraska State Historical Society (Bozell n.d.). At some date in the early 1980s, a suspected human skull was observed near the shore of the dammed lake within the monument. Midwest Archeological Center archeologists Robert K. Nickel and Thomas D. Thiessen were sent to examine the discovery, which turned out to be merely a bleached and disarticulated turtle carapace. Because no archeological resources were involved, no trip report was prepared to document the find.

In 1987, Pipestone National Monument was visited by archeologist Susan M. Monk of Mankato, Minnesota. Monk had been contracted by the Midwest Archeological Center to conduct a shovel test inventory of areas to be affected by construction of a new comfort station west of the Three Maidens, which she accomplished on September 15. She visually examined and shovel tested an extensive area around the

[7]Though there is no way to demonstrate any connection with this stone, a man named Andrew William Wilson (born at Crystal Lake, Iowa, on March 1, 1871) moved with his family to Pipestone in 1883 at the age of 12. He was a merchant at Pipestone until 1917, when he moved to Los Angeles, California, where he died on July 4, 1928. See *The Pipestone Leader*, July 12, 1928, page 1, column 6, and the *Pipestone County Star*, July 6, 1928, page 1, column 6.

comfort station location, but did not find any cultural materials (Monk 1987).

As recommended in 1980, efforts began in the 1990s to coordinate archeological inventories with prescribed grass burns conducted periodically within the monument for vegetation management purposes. The objectives, methods, and results of the 1990s inventory investigations are described in the chapter that follows.

Introduction

Pipestone National Monument is attempting to restore the native tallgrass prairie to a semblance of its historic appearance though the use of prescribed fire. The monument is surrounded by modern agricultural fields, an in-use cemetery, and residential areas. Modern agricultural practices and residential plantings of non-native plant species have caused the monument's vegetation to become dominated by brome grasses, other non-native species, and a series of successional plants that have become established in previously disturbed areas. The monument uses some mechanical means to cut back unwanted plants like sumac. Other species, particularly the grasses and some weeds, require control by fire to allow the native tallgrass prairie species to re-establish (Kjellsen and Higgins 1990). Since 1973 the monument has conducted a cyclical prescribed burning program to encourage the establishment and growth of the native tallgrass species (Stubbendieck and Willson 1986:88; Rothman and Holder 1992:187) (Figure 14).

Prescribed fire programs, such as that currently implemented on a cyclical basis at Pipestone National Monument, can serve as tools for the management of archeological resources in two ways. First, combustion of the grass and leaf duff cover may expose artifacts and archeological features that otherwise would be obscured. This presents the opportunity to systemati-

Figure 14. Prescribed burn in progress at Pipestone National Monument, October 1997. (MWAC 729/PIPE 182, 3477)

cally record these discoveries and augment the state of baseline knowledge about a park's archeological resources. In this sense, post-burn archeological inventories can facilitate discovery and recordation of archeological resources.

Second, post-burn inventories can serve as a means to assess the effects of fire to archeological artifacts that lie on or near the surface of the ground. An experimental study of the effects of prescribed fire on a variety of artifacts in a grassland setting was conducted by researchers from the University of North Dakota before the 1990s inventory efforts at Pipestone National Monument (Sayler et al. 1989; Picha et al. 1991). The study concluded that most classes of artifacts (stone, bone, glass, lead, etc.) experience relatively little alteration from the effects of grassland fires in subsurface contexts that are even a centimeter or less below the surface, while artifacts exposed at the surface can experience substantial alteration, depending on the type of material composing them (i.e., lithic cobbles, chipped stone tools and debris, glass, and lead artifacts will experience less alteration than artifacts of wood, bone, and shell). A more recent study of the effects on wildland and prescribed fire on archeological resources (Buenger 2003, n.d.a, and n.d.b) resulted in a similar conclusion, i.e., fire did not significantly affect most classes of surface and near-surface artifacts in grassland settings. Interestingly, 244 artifacts collected after the 1993 prescribed burn at Pipestone National Monument (see below) were examined during the study, which concluded that "the impact of the 1993 prescribed burn at Pipestone National Monument did not significantly affect surface collections from sites within the burn area" (Buenger n.d.b:2).

Due to the lush ground cover in the monument it has not been possible to conduct detailed archeological examination of the ground surface without the benefit of prescribed burns. With the implementation of the prescribed burn program the ground surface became available for inspection and three episodes of archeological investigation were undertaken in concert with the prescribed burn program for the first purpose mentioned above, i.e., the identification and documentation of archeological artifacts and features. In each case the procedure was to conduct visual inventories of the ground surface as soon after burn episodes as possible, usually within a week to 10 days. Ground visibility following individual burns varies depending on the completeness of combustion, but in general burns eliminate much of the vegetative mass and considerably enhance ground visibility.

A variety of archeological inventory investigations were conducted within the monument intermittently during the 1990s (Table 9). Caven P. Clark of MWAC conducted the first archeological burn inventory in 1993. Jeffrey J. Richner and Vergil E. Noble, also of MWAC, conducted the second inventory in 1994. In September 1994 Thomas Thiessen and Alan Smith visited the monument to document the petroglyphs there, particularly those from the Three Maidens area. When Systemwide Archeological Inventory Program funds became available in 1997, Pipestone National Monument was targeted partially in response to the fact that the monument's prescribed burn plan called for nearly the entire monument to be burned over the course of a two-year period to manipulate and eliminate undesirable spe-

Table 9. Archeological inventory investigations at Pipestone National Monument, 1993-2001

Date	Participants	Activities Conducted	Reference	Accession
May 24-?, 1993	Caven P. Clark ?	Controlled burn tract inventory Rock art recordation	Trip report? Clark 1996	PIPE 176/MWAC 507
May 23-27, 1994	Jeffrey J. Richner Vergil E. Noble	Controlled burn tract inventory Rock art recordation	Richner 1994	PIPE 177/MWAC 557
Sep 12-15, 1994	Thomas D. Thiessen Alan Smith	Rock art recordation	Thiessen 1994	PIPE 179/MWAC 588
May 10, 1997	Aerial Services, Inc Cedar Rapids, Iowa	Aerial overflight photography	Lynott 1997	?
June 9-13, 1997	Douglas D. Scott Thomas D. Thiessen	Controlled burn tract inventory	Notes on file, MWAC	PIPE 181/MWAC 704a
July 24-26, 1997	Thomas D. Thiessen	Monitoring of bridge replacement	Thiessen 1997	?
October 6-17, 1997	Scott Stadler Harold Roeker Bill Volf Lisa Stanley Ronald Marvin Glen Livermont* Bruce Bessken*	Test excavations at the Richner and Stone Circle sites	Stadler 1997	PIPE 182/MWAC 729
October 28-30, 1997	Douglas D. Scott Alan Smith	Controlled burn tract inventory	Scott 1997	PIPE 181/MWAC 704b
May 5-7, 1998	Mark J. Lynott Douglas D. Scott Thomas D. Thiessen William J. Hunt, Jr. Bruce A. Jones Peter Topping**	Mapping of the South Quarry	Thiessen 1998b	?

Table 9. Concluded

Date	Participants	Activities Conducted	Reference	Accession
June 1-4, 1998	Douglas D. Scott Thomas D. Thiessen Robert K. Nickel Forest Frost	Controlled burn tract inventory	Thiessen 1998c Appendix D, this volume	PIPE 181/MWAC 704c
May 22-23, 2001	Thomas D. Thiessen	Rock art recordation Inspection of Locality 17	Thiessen 2001	PIPE 188/MWAC 946

* Detailed from Badlands National Park.

** Of the Royal Commission on Historical Monuments of England.

cies and encourage the growth of native species. Inventory investigations were conducted at various times during 1997 and 1998. Presently, the monument's prescribed burn cycle is three years, with one of the three burn areas within the monument being burned each year (Kristin Legg, email communication to Thiessen, August 9, 2002).

The 1993 Prescribed Burn Inventory

Synchronizing archeological investigations with the monument's prescribed burn program was recommended in 1980 (Nickel and Thiessen 1980), but not undertaken until 1993. Clark (1996) was the first archeologist to survey a prescribed burn area for the monument. The burn, which was conducted in May 1993, was located in the northwestern corner of the monument and covered about 30 acres, bounded on the west by a monument boundary fence and road, on the north by a boundary fence, on the south by a mowed strip, and on the east by an irregular line conforming to the wet lowlands. The entire burn area was walked in linear transects oriented north-south about 20 m (65.6 ft) apart.

Artifacts located on the surface of the site were marked with pin flags and later mapped with a theodolite. Artifacts were collected with reference to single site areas but not in any smaller provenience unit than that. Field numbers used to identify archeological sites include the monument acronym (PIPE) followed by the year of investigation and the temporary, sequentially-assigned site number (e.g., PIPE93-1). A similar numbering convention was followed by Richner and Noble during the 1994 investigation. After plotting artifact distribution on an archeological base map, some field numbers were combined into larger site designations.

Five site-like areas were defined by Clark (1996) on the basis of surface finds in the burn unit. At the time of survey, the distribution of artifacts suggested that the five distinct areas were marked by concentrations of chipped stone and worked catlinite and were separated from one another by areas generally lacking artifacts. He characterized these as occupation or workshop locations. Spot finds were also recorded in the burn area not associated with any of the five larger sites. These include a single piece of worked catlinite and a chipped stone projectile point found in the lower-lying ground on the east edge of the burn area.

Clark (1996:9-10, Figure 7) also recorded a group of petroglyphs on a single quartzite outcrop located near the quartzite ledge north of Winnewissa Falls. These were not assigned a temporary site number, but were named the Derby Petroglyph Site.

The 1994 Prescribed Burn Archeological Inventory

The 1994 inventory was conducted by MWAC archeologists Jeffrey Richner and Vergil Noble from May 23 to 27 (Richner 1994). They accomplished the inventory by walking the survey zones in linear (north-to-south) transects. Typically, spacing between transects was maintained at about 5 m (16.5 ft). All artifacts and features observed on the ground surface of a particular survey tract were marked with pin flags. After survey of the tract was

completed, notes were made regarding each flagged item or feature, and plan views and site maps were drawn. Diagnostic or exotic materials were collected selectively, but most of the items noted were left in place. Each find spot or site was mapped relative to fixed points, such as property monuments or other relatively permanent landscape features. The identified archeological resources were plotted on an archeological base map used by Clark during his 1993 survey of other prescribed burn units. Each survey tract and archeological resource also was documented with black-and-white and color photography.

The southwest corner of the monument, west of the entrance road and south of the area surveyed by Clark in 1993, was the first tract examined. It is a former agricultural field lying upon a gently sloping hill that crests near the west boundary fence; the high ground trends from NNW to SSE. Unfortunately, the burn was incomplete in this area, leaving a rather heavy, residual ground cover over most of the survey tract. Lush, green grass still covered much of the southern edge of the tract. Ground visibility was less than 20 percent for most of the area, though better visibility was afforded on the east and north edges of the tract where the burn was more efficient.

Two isolated artifacts of worked catlinite were found in this survey zone, both recorded near the crest of the slope on the side of the hill facing east. The objects were collected since the monument planned to harrow the area to prepare a seed bed. One of the catlinite objects is a flat, circular disc modified through cuts and striations on all surfaces. Richner (1994) believed it likely that additional archeological resources occur in the area where the isolated finds were made, but were obscured by ground cover.

The second survey zone was a burn area north and east from the monument housing units. This survey zone is bordered on the west by the old road that formerly led north past the houses, on the north by the Circle Trail (below the quartzite ledge) and Pipestone Creek (above the ledge), on the south by the entrance road, and on the east by the abandoned railroad bed. Although the tract east of the former railroad grade was burned, time limits did not permit its survey. Most of this survey zone consists of a gently sloping upland where quartzite outcrops dominate the landscape. A small, flat area at the base of the quartzite bluff was also included in this burn. No cultural resources were recorded despite good surface visibility in the upland, quartzite-dominated portion of this tract. One site, 21PP2, Locality 21, the Beaubien Picnic Site, was relocated and reinventoried. The site was found to be larger and more linear than reported by Beaubien.

The final area surveyed in 1994 was the upland zone north of Pipestone Creek and east of the quartzite ledge line. This area consists of a flat soil bench that gives way on the west to a sloping bedrock dominated area adjacent to the steep rock bluff edge. The tract is bordered on the north and east by a fence marking the NPS boundary line. An intermittent drainage cuts across this tract, effectively separating it into north and south segments. Two sites, a single petroglyph (21PP2, Locality 30, 1994-2, the Noble Petroglyph) and a

lithic scatter (21PP2, Locality 31, 1994-3, the Richner Site), were recorded south of the drainage, and one stone circle site (21PP2, Locality 32, 1994-4) was recorded north of the intermittent drainage. Here Richner and Noble recorded two circular stone alignment features similar to "tipi rings" of the northern and northwestern Plains (Kehoe 1958, 1960; Davis 1983), and a third circular stone pattern a short distance away which Richner (1994:4-5) suggests might represent a sweat lodge (Figure 15). These stone alignment features are potentially highly significant because they are among the few such features that have survived of the many recorded in the immediate vicinity of the quarries during the late nineteenth century. William Henry Holmes' (1919:254) 1892 map, for example, depicts over 300 similar features. No such features were known to exist until the 1994 discovery of the features at 1994-4. Richner concluded the report of his visit with recommendations that the program of prescribed grass burn inventories be continued.

The 1994 Rock Art Documentation Project

Thomas Thiessen and Alan Smith visited Pipestone National Monument on September 12-15, 1994, to document petroglyphs on 17 quartzite slabs originally from the vicinity of the Three Maidens and on two other slabs from an unknown location. All of the slabs are in the monument's museum collection. They were photographed under a variety of conditions (wet, dry, in natural and artificial light) and notes

Figure 15. Jeffrey Richner, Chuck Derby, and Betty McSwain examining the Stone Circle Site, 1994. (MWAC 557/PIPE 177, 3601)

were made about them (Thiessen 1994). The photographs are archived at the Midwest Archeological Center, and the petroglyphs and their history are reviewed in this volume (see Chapter 11).

The 1997-1998 Monument-wide Archeological Inventory Following the Prescribed Burns

During Fiscal Years 1997 and 1998, virtually all of the monument land was burned at different times, except for the grounds immediately surrounding the visitor center and other structures. Through funding from the National Park Service's Systemwide Archeological Inventory Program (SAIP), pedestrian visual inventory, test excavations at selected sites, and a review and assessment of the monument's archeological resources were undertaken.

The SAIP inventory fieldwork occurred in 1997 and 1998 following three episodes of controlled burning. The first burn occurred in late May 1997 and consisted of about 90 acres on the eastern side of the monument. The second inventory followed a late September burn, also of about 90 acres on the western side of the monument. The final burn occurred in late May 1998 and the subsequent inventory covered the area from Pipestone Creek north of the visitor center to the west edge of the Sioux Quartzite ledge and north to the north boundary fence. With the exception of the area immediately adjacent to the visitor center, the parking lots, roads, and the Three Maidens area, the entire monument was inventoried.

Each burn segment or tract was walked in parallel transects with spacing between individuals maintained at approximately 10 meters. Transects were walked north and south or east to west depending on the judgement of the investigators. Isolated artifacts were found throughout the monument. These ranged from isolated projectile points, other lithic tools and debitage, to worked and unworked catlinite pieces. The density of worked and unworked catlinite increased near the quarry line, which was not unexpected. The quarry line and the discontinuous but extensive artifact scatter associated with the extraction and manipulation of catlinite was considered a single locality and resource.

The SAIP inventory effort succeeded in relocating and mapping the Picnic Site (Locality 22), the Richner Site (Locality 31), Sigstad's PP17 mound and the Indian School cemetery monument base site (Localities 17 and 42), Sigstad's pp16 sweat lodge excavation site (Locality 16c), the Derby Petroglyph Panel (Locality 28), and the Noble Petroglyph (Locality 30). In addition a lithic scatter (Locality 34) was discovered in the vicinity of Sigstad's pp9 Quarry, two possible stone circles (Localities 16d and 40) were located near the Indian School cemetery monument base and nearby mound (Locality 17), and six mound-like features (Localities 33, 35, 36, 37, 38, and 39) were also recorded. Between October 6 and 17, 1997, a field crew under the direction of Archeologist Scott Stadler dug test excavations at the Richner Site (Locality 31) and the stone circle site recorded in 1994 (Locality 32) (Stadler 1997).

Base Maps and Field Mapping Techniques

The first task undertaken in the project was to develop a new and accurate monument archeological base map. This was accomplished by contracting for low-altitude aerial photography that resulted in a photogrammetically-produced base map of the entire monument. Under contract to the Midwest Archeological Center, Aerial Services of Cedar Rapids, Iowa, produced aerial photographs and a monument-wide base map for the SAIP inventory. The baseline mapping data were used for archeological mapping and creation of an archeological resource base map. The data were also provided to the monument for use in creation of a geographic information system (GIS)-based electronic monument resources base map.

On May 10, 1997, Aerial Services overflew the monument taking aerial photographs at altitudes of 3,400 and 6,600 feet. Stereoscopic photo pairs of the monument lands were produced at each altitude. They then produced and ground-truthed a contour map of the monument. The map depicted the location of all roads, trails, structures, and features visible from the photography, with contour intervals of 50 centimeters. The map was produced on mylar and electronically on CD-ROM in an ArcInfo-compatible format. Copies of the map, CD-ROM, aerial photographic prints, and original aerial photographic negatives were filed with the Technical Information Center of the NPS Denver Service Center (Lynott 1997).

Aerial Services georeferenced their ground control points with the metric state plane coordinate system based on the WG87 coordinates. They also established a series of georeferenced datums in the monument. Each datum was marked with a MAGNAIL and permanently set. Datum 1 is located at the edge of a sidewalk in the visitor center parking lot. Datum 7 is set at the northwest corner of the monument boundary fence and Datum 8 is set at the southwest monument boundary corner. Datum 9 was set along the monument entrance road near the Three Maidens area restroom. Other datums were set outside the monument boundary for georeferencing purposes.

All surface artifacts, site boundaries, features, excavation boundaries, and remote sensing grid boundaries were mapped during the 1997-1998 SAIP inventory using a total station transit. The instrument used was a Lietz SET4B total station transit with a SDR33 data recorder. Each transit shot was recorded on the data recorder and given a previously established identification code. The specific artifact number was provided by the SDR33 used in auto-generate point mode. The general procedure for field mapping was as follows: the instrument was set up at an established datum point, and distance, azimuth, and xyz coordinate point readings for each artifact location or shot were recorded electronically to the nearest millimeter.

At the completion of a given day's work the recorded data were downloaded onto a laptop computer containing the SOKKIA software program MAP. The raw file was processed by the computer and a map of that day's finds was then displayed. The MAP files were then transferred to AutoCad,

a software package used to refine and complete the basic illustrations created with MAP. The completed series of maps provides a clear picture of the nature of artifact distributions and associations. The individual AutoCad files from the field work were converted to block drawings and transferred into the Pipestone electronic base map.

In order to facilitate the field mapping several temporary datums were established and shot in from one of the permanent datums set by Aerial Services. All temporary datums were set with wooden stakes. Temporary datums 31 and 32 are located south of the Richner Site. Temporary datum 40 is 10 meters north of Datum 1, and temporary datums 45, 46, and 47 are located near the Indian School cemetery monument base site (Locality 42). Temporary datum 45 is an orange-painted iron pipe that denotes the former location of the memorial base. Datum 1 has the state plane metric coordinates of N215169.969/ E613494.9001 and an elevation of 505.5537 meters. All temporary datums are registered to these coordinates.

Sigstad Base Map Rectification

John S. Sigstad placed his site locations from the 1965 monument inventory on a base map provided by the NPS. The base map is dated 1941 and was created by the Minnesota Highway Department. An effort was made to digitize Sigstad's site locations and the base map boundary into ArcInfo for inclusion as a layer on the new electronic base map, and for correlation with the 1997-1998 SAIP inventory data. It was impossible to register the old map with the 1997 map. It became apparent that the 1941 base map was improperly scaled and has an uncorrectable error. The map scale is in error by three percent east to west and ten percent north to south.

In an attempt to locate Sigstad's sites on the new base map his field notes and records were consulted to determine how he plotted his sites. Sigstad apparently eyeballed the site locations as he discovered them and located them on his copy of the monument base map by observation. He later computed distances recorded in his site records and report by measuring from the plotted map location to some nearby feature such as a monument boundary fence, building, or other feature.

Using Sigstad's notes, records, and plotted site locations, but ignoring his distance measurements, the site location data were transferred to the electronic base map. All Sigstad site locations must be considered approximations. However, the 1997-1998 SAIP inventory effort re-recorded Sigstad's sites or features as they were encountered. The old locations plotted from Sigstad's map showed moderate to good correlation with total station-mapped locations.

Fieldwork Schedules

The 1997 and 1998 monument-wide inventory field investigations followed the monument's burn cycle (Table 9). Douglas Scott and Thomas Thiessen conducted the inventory of essentially the eastern third of the monument between June 9 and June 12, 1997. Scott and Alan Smith conducted the inventory of the monument's western and southern third between October 28 and October 30, 1997. A Midwest Archeological

Center crew under the direction of Scott Stadler conducted test excavations at two sites between October 6 and October 17, 1997. Scott and Thiessen returned to Pipestone on June 1, 1998, and completed the northern third after the grass burn in that area. They were accompanied by Robert Nickel and Forest Frost, who conducted magnetic and electrical resistivity surveys of the site of the former Indian "Peace Memorial" marker and the presumed site of an Indian School cemetery used in the 1890s and early 1900s (Locality 42), as well as a magnetic survey at the Stone Circle Site (Locality 32). That geophysical work is summarized in a separate report (Nickel and Frost 2000).

During July 1997 Thomas Thiessen also monitored the replacement of two bridge spans over Pipestone Creek for the monument. No cultural resources were observed (Thiessen 1997).

Tested Sites

21PP2, LOCALITY 31, 1994-3, THE RICHNER SITE

The site is a dense scatter of worked catlinite, chipped stone debris and tools, and faunal remains first recorded by Richner and Noble in 1994 (Richner 1994). The scatter covers most of the flat soil bench flanking the east property line and is about 120 m x 60 m (400 ft x 200 ft) in extent. It probably extends east outside the monument boundary, but no attempt was made to confirm that speculation. The western edge is contiguous with the highest elevation of the field; artifacts do not occur in appreciable numbers downslope from the flat bench. Richner and Noble observed more than 30 artifacts on the ground surface on this site, including a variety of shaped and modified pieces of catlinite, two end scrapers, a biface, and various pieces of chipped stone debitage. Numerous fragmentary faunal elements that appear to be quite old were also observed. All of the bone fragments were too small and weathered to permit identification by element or species, and so were not further analyzed beyond noting their presence in test unit descriptions and Tables 10 and 11. The bone fragments are not necessarily archeological in origin, however, and may represent animals who died natural deaths, whose remains were weathered and eventually mixed into the soil through bioturbation and other pedoturbation processes. A small collection consisting of three formal tools and six pieces of debitage representing different material types were collected for comparative purposes during the 1994 inventory. This site is situated immediately north of a mound recorded on the Holmes (1919:254) map made in 1892. There is no indication of a mound in the area today. Pipestone Creek is located south of the site, and the creek has been extensively channelized in this area. The creek bank and surrounding land have been significantly altered in the area immediately south of the site, perhaps truncating its southern margin and destroying the mound, if Holmes' location was correct.

The site was redocumented in June 1997 (field notes on file, accession PIPE 181/MWAC 704a). The area was walked in two wide transects and all visible surface artifacts were flagged and mapped with a total station. Over 90 artifacts including lithic debitage,

Table 10. Artifacts from Test Units 1-6 at the Richner Site (21PP2, Locality 31, 1994-3).

Test Unit No./Level	Chipped Stone Tools	Chipped Stone Debitage	Worked Catlinite	Unworked Catlinite	Bone Fragments	Other
TU 1/0-10 cm	1 (biface)	15	0	2	2	
TU 1/10-20 cm	1 (biface)	26	0	3	0	
TU 1/20-30 cm	1 (biface)	27	1	4	4	1 (glass sherd)
TU 1/30-40 cm	1 (retouched flake)	40	0	2	1	
TU 1/40-50 cm	0	5	0	0	0	
TU1/total	4	113	1	11	7	1
TU 2/0-10 cm	2 (scraper + utilized flake)	14	1	3	0	
TU 2/10-20 cm	1 (projectile point)	32	3	1	2	
TU 2/20-30 cm	0	53	3	0	0	
TU 2/30-40 cm	1 (biface)	53	0	0	1	
TU 2/40-50 cm	1 (scraper)	37	0	0	12	
TU 2/50-60 cm	0	4	0	0	2	
TU 2/total	5	179	6	4	17	
TU 3/0-10 cm	0	3	2	0	0	
TU 3/10-20 cm	0	7	0	2	1	
TU 3/20-30 cm	0	7	1	0	0	
TU 3/30-40 cm	1 (projectile point)	1	0	0	0	
TU 3/40-50 cm	0	5	0	0	0	
TU 3/total	1	23	3	2	1	
TU 4/0-10 cm	0	2	0	2	1	
TU 4/10-20 cm	0	5	0	2	4	
TU 4/20-30 cm	0	6	0	3	0	
TU 4/30-40 cm	0	11	0	0	0	
TU 4/50-50 cm	0	11	1	0	1	
TU 4/total	0	35	1	7	6	

Table 10. Concluded

Test Unit No./Level	Chipped Stone Tools	Chipped Stone Debitage	Worked Catlinite	Unworked Catlinite	Bone Fragments	Other
TU 5/0-10 cm	0	10	20	13	0	
TU 5/10-20 cm	1 (projectile point)	15	6	4	0	1 (pottery sherd?)
TU 5/20-30 cm	0	12	1	0	1	
TU 5/30-40 xm	0	1	0	0	0	
TU 5/total	1	38	27	17	1	
TU 6/0-10 cm	0	0	0	0	0	
TU 6/10-20 cm	0	0	0	0	0	
TU 6/20-30 cm	0	0	0	0	0	
TU 6/30-40 cm	0	2	0	0	0	
TU 6/40-50 cm	0	1	0	0	0	
TU 6/total	0	3	0	0	0	
Total of all TUs	11	391	38	41	32	2

Table 11. Artifacts from Test Units in Features 1-3 at the Stone Circle Site (21PP2, Locality 32, 1994-4).

Test Unit No./Level	Chipped Stone Tools	Chipped Stone Debitage	Worked Catlinite	Unworked Catlinite	Bone Fragments	Other
Feature 1, Northernmost Stone Circle						
Unit 96N/105W						
0-10 cm	0	2	1	0	0	0
10-20 cm	0	4	0	0	0	1 (fire cracked rock)
20-30 cm	0	6	0	0	0	0
Unit 97N/105W						
0-10 cm	0	1	1	0	0	0
10-20 cm	0	12	0	0	0	2 (fire cracked rocks)
20-30 cm	0	0	0	0	0	0
30-40 cm	0	0	0	0	0	0
Unit 98N/105W						
0-10 cm	0	0	1	0	0	0
10-20 cm	0	12	0	0	0	0
20-30 cm	0	10	0	0	0	0
30-40 cm	0	1	0	0	0	0
40-50 cm	0	1	0	0	0	0
Unit 99N/105W						
0-10 cm	0	0	2	0	0	0
10-20 cm	0	1	0	0	0	0
20-30 cm	0	10	0	0	0	0
30-40 cm	0	1	1	0	0	0
Unit 100N/105W						
0-10 cm	0	0	0	0	0	0
10-20 cm	0	2	0	0	0	0
20-30 cm	0	3	0	0	0	0
30-40 cm	0	0	0	0	0	0

Table 11. Continued

Test Unit No./Level	Chipped Stone Tools	Chipped Stone Debitage	Worked Catlinite	Unworked Catlinite	Bone Fragments	Other
Unit 101N/105W						
0-10 cm	0	0	0	6	0	0
10-20 cm	0	3	0	2	0	0
20-30 cm	0	0	0	0	0	0
30-40 cm	0	0	0	0	0	0
Unit 102N/105W						
0-10 cm	0	0	0	7	1	4 (fire cracked rocks)
10-20 cm	0	1	0	7	0	0
20-30 cm	0	0	0	0	0	0
30-40 cm	0	1	0	1	0	0
Feature 3, Southernmost Stone Circle						
Unit 77N/110W						
0-10 cm	0	13	1	3	0	0
Unit 78N/110W						
0-10 cm	0	16	0	2	0	0
Unit 79N/110W						
0-10 cm	0	14	2	3	0	0
10-20 cm	0	16	0	0	1	0
20-30 cm	0	14	0	0	1	0
Unit 80N/110W						
0-10 cm	0	12	2	2	0	1 (curved glass sherd)

Table 11. Concluded

Test Unit No./Level	Chipped Stone Tools	Chipped Stone Debitage	Worked Catlinite	Unworked Catlinite	Bone Fragments	Other
Natural Rock Cluster						
Unit 70N/118W						
0-10 cm	0	6	0	5	3	0
10-20 cm	0	2	1	0	4	0
20-30 cm	0	0	0	0	0	0

worked and unworked catlinite, a few fragments of bone, and two pottery sherds were recorded. Several pieces of worked stone, the sherds, and a single piece of worked catlinite were collected.

Immediately prior to conducting the test excavations in October 1997, a pedestrian survey of the site area was again undertaken (Stadler 1997). The area was rewalked at roughly 5-meter intervals. All artifacts were flagged and then two test units (numbered 1 and 2) were established in the densest concentration. The surface collection which was plotted by Stadler using a total station yielded two projectile points, 30 worked catlinite fragments, four unworked catlinite fragments, and 22 pieces of lithic debitage.

TU 1 was about 20 meters WNW of datum 32 (established during the 1997 burn inventory). TU 2 was about 34 meters NW of the same datum. The other four test units were judgementally placed in an effort to determine the extent of the site. TU 3 was set up about 5 meters west of the east boundary fence. TU 4 was placed about 30 meters north of TU 3 and 30-35 meters west of the boundary fence. TU 5 was about 20 meters NW of TU 2. The last test unit (TU 6) was placed across the drainage to the north but still between Locality 34 and the Richner Site. The unit was placed to test the hypothesis that the uplands was essentially a large lithic scatter with several areas of dense artifact concentration, and it was dug as a control unit.

The test units were excavated in 10 cm levels and screened with 1/4-inch mesh. All artifacts were collected. Upon completion of excavations, all units were profiled and photographed before being backfilled. Abundant rodent disturbance was noted throughout the area. One very energetic rodent did his/her best to fill in one test unit whenever the excavators broke for lunch or at the end of the day.

Soils at the Richner Site were very dark brown (black) from the surface to about 30 cm. From 30 cm to 45 cm they changed to dark brown and were more compacted, dry, and blocky. The underlying layer began at about 40 cm where it turned yellowish brown, which was the sterile layer. Bedrock was deeper at this site than at Locality 32 (the Stone Circle Site). Several units were probed after completion of the excavation to try and find bedrock but were unsuccessful. Artifacts recovered from each test unit are listed in Table 10.

Test Unit 1

This unit was excavated to 50 cmbs. The 0-10 cm level yielded one biface, 15 pieces of debitage, two unworked catlinite fragments, and two bone fragments. The 10-20 cm level yielded one biface (a possible projectile point fragment), 26 pieces of debitage, and three unworked catlinite fragments. The 20-30 cm level yielded one pipe bowl fragment (catlinite), one biface, 27 pieces of debitage, four unworked catlinite fragments, four bone fragments, and one piece of flat glass, which is probably intrusive. The 30-40 cm yielded one retouched flake, one bone fragment, two unworked catlinite fragments, and 40 pieces of debitage. The 40-50 cm level yielded five pieces of debitage.

Test Unit 2

This unit was excavated to 60 cm and then probed to bedrock. There was one piece of debitage on the surface. The 0-10 cm level yielded one scraper, one utilized flake, one worked catlinite fragment, three unworked catlinite fragments, and 14 pieces of debitage. The 10-20 cm level yielded one projectile point, three worked catlinite fragments, one unworked catlinite fragment, 32 pieces of debitage, and two bone fragments. The 20-30 cm level yielded three worked catlinite fragments, and 53 pieces of debitage. The 30-40 cm level yielded one biface, 53 pieces of debitage, and one bone fragment. The 40-50 cm level yielded one scraper, 37 pieces of debitage, and 12 bone fragments. The 50-60 cm level yielded four pieces of debitage, and two bone fragments. The soil probing below this level revealed that at 75 cmbs the soil becomes a pure fine tan sand. This sand layer continues to bedrock which is at 150 cmbs.

Test Unit 3

This unit was excavated to 50 cmbs. The 0-10 cm level yielded two worked catlinite fragments, and three pieces of debitage. The 10-20 cm level yielded seven pieces of debitage, two unworked catlinite fragments, and one bone fragment. The 20-30 cm level yielded only one worked catlinite fragment and seven pieces of debitage. The 30-40 cm yielded one projectile point and one piece of debitage. The 40-50 cm level yielded five pieces of debitage.

Test Unit 4

Test Unit 4 was excavated to 50 cmbs and probed to 100 cmbs. The 0-10 cm level yielded two pieces of debitage, two unworked catlinite fragments, and one bone fragment. The 10-20 cm level yielded five pieces of debitage, two unworked catlinite fragments, and four bone fragments. The 20-30 cm yielded six pieces of debitage and three pieces of unworked catlinite. The 30-40 cm level yielded 11 pieces of debitage, and the 40-50 cm level yielded 11 pieces of debitage, one piece of worked catlinite, and one bone fragment. The soil probe revealed that at 66 cm the soil turns to a solid yellowish brown clay. At 81 cmbs calcium carbonate/caliche starts to appear in the clay and continues to 100 cm, the bottom of the probing effort.

Test Unit 5

Test Unit 5 was excavated to bedrock which was encountered at 40 cmbs. One piece of worked catlinite was found on the surface. The 0-10 cm level yielded 19 pieces of worked catlinite, 13 unworked catlinite pieces, and 10 pieces of debitage. The 10-20 cm level yielded one projectile point, one possible pottery (burned clay?) sherd, six pieces of worked catlinite, four pieces of unworked catlinite, and 15 pieces of debitage. The 20-30 cm level yielded one piece of worked catlinite, 12 pieces of debitage, and one bone fragment, and the 30-40 cm level yielded only one piece of debitage.

Test Unit 6

Test Unit 6 was excavated to 50 cmbs and probed to 62 cmbs. The 0-10 cm level yielded no artifacts as did the 10-20 cm and 20-30 cm levels. The 30-40 cm level yielded two pieces of debitage, and the 40-50 cm level only one piece of debitage. Only the south half of the 40-50 cm level was excavated due to time

constraints. The soil probe revealed that the yellow brown clay with caliche continued to 62 cmbs. The clay was very indurated and difficult to probe.

Interpretations

Due to the extensive rodent disturbance throughout the site area it is unlikely that the vertical proveniences provide any valid stratigraphic data. The horizontal distribution is undoubtedly compromised by rodent activity to some degree, but may at least provide an adulterated glimpse at the site's artifact patterning. With the exception of the single piece of probable intrusive glass the artifacts recovered from the site are all prehistoric in origin, or at least bear no evidence of being worked with metal tools. The surface mapping of the artifact distribution and the excavation data suggest that worked and unworked catlinite concentrate in specific areas of the site. Some of the lithic debitage is associated with the catlinite concentrations and may reflect tool maintenance activities related to catinite processing. The single pipe blank may suggest that catlinite preforms were roughed out on-site for transport to other localities for finishing.

The absence of evidence for occupational features such as hearths, storage pits, and posts as well as the remaining lithic debitage and the paucity of tools and pottery sherds suggest the site was also a short-term campsite. The primary purpose may have been associated with the extraction and processing of catlinite, but the site was also used as a camp to support those activities.

The ceramics found on the site during the June 1997 burn inventory and the six projectile points found during the October 1997 excavations provide the only datable artifact types (see Chapter 10). They suggest the site was occupied in the Late Woodland to Late Prehistoric time frame, i.e., sometime within the AD 400 to 1650 time span.

21PP2, LOCALITY 32, 1994-4, STONE CIRCLE SITE

The area north of the intermittent drainage was surveyed using the same methods previously described. A sparse scatter of chipped stone items was noted in this area, but no artifact concentrations were apparent. A single scraper was collected from the surface of this site during the 1994 inventory by Richner and Noble. However, toward the northwest portion of the flat soil bench, a short distance east from the rock outcrop zone, three cultural features were observed, mapped, and photographed by Richner and Noble. These features and their associated artifact scatters comprise Locality 32 (1994-4) (see Figure 16).

Features 1 and 2 are adjacent, roughly circular arrangements of quartzite rocks. The rocks, which are exposed only partly above the prairie earth, appear purposefully arranged to form circular alignments a single rock in width. Feature 1, the northernmost of the circular alignments, is about 5 m (16.5 ft) in diameter with a 2.5 m-wide (8 ft-wide) gap in the rock circle, facing due east. Richner and Noble mapped 19 rocks in this circular alignment.

Figure 16. Test Unit 97N 105W showing the edge of Feature 1 at the Stone Circle Site, October 1997. The stone concentration at the far end of the unit marks the circular stone alignment. (MWAC 729/PIPE 182, 3477)

Feature 2, a second circular alignment located about 2 m south and slightly west of Feature 1, is somewhat smaller, but has the same configuration as Feature 1, including the break in the otherwise continuous pattern of rocks. Richner and Noble mapped eight rocks in this alignment. A single piece of chipped stone debitage was observed just inside the opening of Feature 1. At the opening of Feature 2, a piece of debitage and a fragmentary chipped stone bifacial tool were found. These three artifacts were collected.

A third rock cluster, Feature 3, is about 10 m (33 ft) south of Feature 2 and forms a smaller, roughly circular pattern 3.75 m (12.3 ft) in diameter. Numerous rocks are present (28 were mapped), and they occur in a more complex grouping than in either of the single-rock circles. Further, the interior of the feature is disturbed by a large soil mound created by burrowing mammals. A small scatter of chipped stone debitage (all of the same raw material) was observed and collected on the surface near a possible opening or break in the feature, which faces SSE.

Features 1 and 2 appear to be rock arrangements commonly referred to as "tipi rings" in the literature (Kehoe 1958, 1960; Davis 1983). Such features may have had multiple functions, but are commonly thought to represent a pattern of stones used to support poles and/or hold down hide coverings in the construction of a tipi. The facts that tipis historically were often

oriented to face generally east (Kehoe 1960:444; 1983:336;Quigg and Brumley 1984:12), and, when discernible, the gaps in these rock circles also face east, lends some additional support to interpretation of the features as tipi rings. The function of the third feature is less clear, though its position at a moderate distance from the presumed living quarters suggests the possibility that this rock cluster could represent a traditional sweat lodge. No evidence of fire hearths or other features was found during the test excavations at this site.

As noted above, the rocks forming all three features at Locality 32 (1994-4) are partly buried in the undisturbed prairie soil. In placing pin flags around the perimeter of the features to assist photography it was noted that most of the rocks have perhaps 75 percent or more of their mass under ground, with only small areas exposed on the surface. This fact, in combination with an apparent absence of historic items and apparent association of lithic materials with each feature, strongly indicates that the features and the site have considerable antiquity. Based upon surface indications, this would appear to be a significant site, especially rare in the eastern United States where such features have not usually survived modern agricultural activities.

Test excavations were dug at the site in October 1997 by a crew under the direction of MWAC archeologist Scott Stadler in order to determine the site's function and age. As one of only three recorded stone circle sites, and the best preserved example, in the monument it was deemed worthy of testing. A site datum was established using a chaining pin that was left in 1994 by Richner and Noble, which is located east of the northernmost stone circle (Feature 1). An excavation grid was established with a Brunton, and the datum was designated as coordinate 100N/100W. The excavation units were also mapped using a total station. Features 1 and 3 were selected for investigation by digging a test trench through each. Feature 2 was not selected for test excavation because only three of the eight rocks noted by Richner and Noble were visible at the time of a revisit by Douglas Scott and Thomas Thiessen on June 11, 1997 (field notes on file, Midwest Archeological Center).

Two trenches and a single 1x1 test unit were excavated. One trench extended through the approximate center of Feature 1, the northernmost tipi ring. It consisted of seven consecutive 1x1m units, one of which was excavated to bedrock. Soils are generally as follows: 0-30 cm is black silty loam which is followed by a much more compacted, dry, blocky lighter colored silty loam that appears to be sterile except for the occasional artifact in a rodent run. As a result, most of the units were excavated to a depth of 40 cmbs. Most artifacts were recovered in the upper black layer of soil above 30 cm.

The other trench was dug in Feature 3, the southernmost circle of the three suspected tipi rings. It consisted of four consecutive 1x1m units that began with 77N/110W and ended with 80N/110W. The trench extended through the approximate center of the circle.

Each 1x1m unit is described below. All were excavated using 10 cm levels and all material was screened

through 1/4 inch mesh. Evidence of rodent burrowing was present in almost every unit. The artifacts found in the excavations are listed in Table 8-3.

Feature 1, the Northernmost Stone Circle

96N/105W

This unit was excavated to 50 cmbs and was believed to be outside the main rock alignment. A cluster of cobbles was located at the north end of this unit extending into the next unit at a depth of about 20 cmbs. These may be part of the circle itself. At 0-10 cmbs two pieces of debitage and one piece of worked catlinite were recovered. The level from 10-20 cmbs yielded four pieces of debitage and one fire cracked rock, and the 20-30 cmbs level yielded six pieces of debitage. No artifacts were found below 30 cmbs.

97N/105W

This unit was excavated to 40 cmbs. The alignment cobbles are in the south wall of this unit and extend into the unit to the south. One piece of debitage and one worked catlinite fragment were found at 0-10 cm. The 10-20 cm level revealed 12 pieces of debitage, and two fire cracked rocks. No artifacts were recovered below 20 cm.

98N/105W

This unit was excavated to bedrock as a control unit. Bedrock was located at 65 cm. The 0-10 cm level contained one worked catlinite fragment; the 10-20 cm level had 12 pieces of debitage; the 20-30 cm level had 10 pieces of debitage; the 30-40 cm level yielded one piece of debitage; and the 40-50 cm level yielded one piece of debitage. No artifacts were recovered below 50 cm.

99N/105W

This unit was excavated to 40 cm. The 0-10 cm level yielded two fragments of worked catlinite; the 10-20 cm level had 1 piece of debitage; the 20-30 cm level yielded 10 bone fragments; and the 30-40 cm level yielded one piece of debitage and one worked catlinite fragment.

100N/105W

This unit was excavated to 40 cm. The 0-10 cm and 30-40 cm levels contained no artifacts, although the 10-20 cm level yielded two pieces of debitage and the 20-30 cm level yielded three pieces of debitage.

101N/105W

This unit was excavated to 40 cm. The 0-10 cm level yielded six unworked catlinite fragments, and the 10-20 cm level yielded three pieces of debitage and two unworked catlinite fragments. There were no artifacts recovered below 20 cm.

102N/105W

This unit was excavated to 40 cmbs. This unit is suspected to be outside (north) of the rock alignment. The 0-10 cm level yielded seven unworked catlinite fragments, four fire cracked rocks, and one bone fragment. The 10-20 cm level had one piece of debitage and seven unworked catlinite fragments. The 20-30 cm level yielded no artifacts, but the 30-40 cm level yielded one piece of debitage and one unworked catlinite fragment.

Feature 3, the Southernmost Stone Circle

77N\110W

This unit was only excavated to 10 cmbs because of the large number of quartzite cobbles present. The

soil was a dark silty loam with a large number of plant roots and inclusions of smaller stones. There were 13 pieces of debitage and four pieces of catlinite (one worked and three unworked) recovered from this unit.

78N/110W

This unit also was only excavated to 10 cmbs due to even more quartzite cobbles than the previous unit. Sixteen debitage and two unworked catlinite fragments were found. The soil is the same as described for the previous unit.

79N/110W

This unit was excavated to 30 cm since there were far fewer quartzite cobbles here. This may be either the center of the rock feature or it was possibly excavated previously since the rocks appear to be piled on either side of this unit. The 0-10 cm level yielded 14 pieces of debitage, two worked catlinite and three unworked catlinite fragments. The 10-20 cmbs level yielded 16 pieces of debitage and 1 bone fragment. The 20-30 cmbs level yielded 14 pieces of debitage and one bone fragment. The unit was stopped once very large naturally occurring cobbles were found in the soil matrix.

80N/110W

This unit was only excavated to 10 cmbs due, once again, to a heavy concentration of naturally occurring quartzite cobbles. Artifacts recovered include 12 pieces of debitage, two worked catlinite fragments, two unworked catlinite pieces, and one piece of curved glass. The glass appears intrusive and probably originated in a rodent burrow, although the stratigraphy is unclear.

The Third Test Excavation

70N/118W

An apparent cluster of rocks was observed by Scott Stadler approximately five meters west of Feature 3, and was selected for test excavation. This 1x1 m unit was excavated to 40 cmbs. The 0-10 cm level yielded five unworked catlinite fragments, six pieces of debitage, and three bone fragments. The 10-20 cm level yielded two pieces of debitage, one worked catlinite fragment, and four bone fragments. The 20-30 cm level yielded three pieces of debitage. There were no artifacts below 30 cm. Excavation was stopped at 40 cm due to encountering large naturally occurring quartzite boulders as well as the realization that this was not a cultural feature as first suspected.

Interpretation

Test excavations confirmed the likely cultural nature of two of the three stone features recorded in 1994 by Richner and Noble. The presence of lithic debris in the features, as well as around the site in general, suggests the area was used as a short-term habitation and special use site. Feature 1, the northernmost stone alignment, appears to be a true cultural feature. It most strongly resembles a tipi ring. The presence of lithic debitage and catlinite in and near the stone alignment, as well as the presence of fire altered rock suggest the site was used as a temporary habitation and for the processing of raw catlinite. The lithic debris appears to be consistent with tool maintenance activities, and the catlinite fragments appear to be discards from the initial reduction and processing of raw mate-

rial. With the exception of one piece of intrusive modern glass probably introduced by rodent burrowing activity, the artifact assemblage is consistent with a prehistoric date. The absence of diagnostic tools or datable charcoal prevents an absolute date of use from being stated; however, the lithic reduction debris sequence represented is consistent with a late prehistoric occupation date.

Feature 3, the southernmost stone circle, is more enigmatic. The center of unit 79N/110W suggests this area was previously disturbed. It was initially suggested that this area may have been a sweat lodge, but the absence of fire altered rock, the absence of charcoal, and the lack of a discernible pattern to the excavated rock argue against this point. It seems more likely that this area of the site represents a previously excavated rock mound. This may be a remnant of one of the mounds excavated in 1882 by Norris or perhaps by Charles Bennett and his friends before the turn of the century. The lithic debris present in the "mound" fill may be fortuitous in the sense that it was deposited as backfill from the early excavations or it may be contemporary with the construction of the feature, if it is indeed a constructed mound. If the lithic material is contemporary with the feature construction then it seems likely it is associated with the stone circle alignment and the general lithic scatter noted in the area.

The third area investigated, with a 1x1 m est unit, was not judged to contain any cultural features other than a few artifacts inadvertently mixed into the soil, probably the result of bioturbation.

INVENTORY OF ARCHEOLOGICAL RESOURCES

Introduction

In this chapter a complete listing of the recorded archeological resources at Pipestone National Monument is presented and summarized. As mentioned earlier, the entire monument has been assigned one official site number (21PP2) by the State Archaeologist. During his 1965 monument-wide survey, Sigstad (1970a) assigned trinomial numbers to 22 sites that he recorded within the monument boundary. He also completed University of Colorado (where he had graduated the semester previous to his work at Pipestone) Museum archeological site forms for each of these sites. Following his 1965 Pipestone research, Sigstad began graduate studies at the University of Missouri. During his test excavations at quarry pits in the monument in 1966, he also completed Archaeological Survey of Missouri site forms for six quarries or groups of quarries (21PP3, 5, 7-10) and completed "freehand" site forms for three more quarries (21PP11-12, 18). Sigstad's forms were never submitted to the State Archaeologist and so were not formally entered in the Minnesota site files. Consequently, while they appear similar to officially recorded trinomial numbers for Pipestone County archeological sites, his numbers duplicate official state numbers assigned to Pipestone County sites outside the monument.

The view of the site definition situation at Pipestone National Monument that is held by the authors is that the entire monument is a single archeological site, or rather complex, that is presently composed of 43 localities or "subsites" (Table 12). The Archeological Sites Management Information System (ASMIS), which is the National Park Service's official database for archeological sites throughout the National Park System, defines a "subsite" as "a discrete, separately managed feature, unit or area within an ASMIS archeological site. Subsites have location and can be spatially differentiated from other subsites within a specific archeological site" (National Park Service 2001:8).

For the sake of simplification, and to reduce the potential for confusion arising from the unofficial numbers used by Sigstad, we recommend that for present and future reference purposes, the state designator ("21") be omitted from Sigstad's numbers and that the county designator be presented as lower case letters, i.e., "pp" rather than "PP." Thus, for example, the 18th site recorded by Sigstad would be referred to as locality/subsite 18 or "pp18." To preserve the utility and order of Sigstad's numbers, the 22 sites he recorded should continue to constitute the first 22 localities or subsites recorded within the monument. Sites recorded after Sigstad's work are herein assigned locality or subsite numbers that continue the number series initiated by Sigstad. Site number "21PP2" should be used only with reference to the entire monument as a single archeological property.

The following are brief synopses of information about each archeological locality or subsite that has been recorded at Pipestone National Monument. All site designations that have been used in the past, including the Sigstad number

(as applicable), temporary field number, and locality or subsite number assigned herein are identified, along with names given to subsites, where available.

Site/Subsite Descriptions

21PP2, LOCALITY 1, SIGSTAD SITE PP1, THREE MAIDENS

The Three Maidens is a well-known feature within Pipestone National Monument. It consists of six large glacial erratic boulders situated along the monument's south boundary. The boulders are so named because Native American tradition holds that they are the abode of three (sometimes said to be two) female spirits who guard the quarries and must be propitiated before catlinite is taken from the pits. Today the boulders rest on a well-manicured grassy area, but during the nineteenth century there was apparently little soil development around them and the boulders rested on exposed Sioux quartzite bedrock. Petroglyphs were visible around the base of the boulders, many of which were removed in order to save them from destruction by vandals (see Chapter 11 for more history of the petroglyphs). The Three Maidens are an important part of Pipestone National Monument today, and have a transcendental significance to the quarriers and Native American visitors to the monument (Hughes and Stewart 1997:22-26). Offerings of food and tobacco are often left at the Three Maidens by modern quarriers (Hughes and Stewart 1997:25-26). The Three Maidens were assigned site number 21PP1 by Sigstad, but that number is officially recorded for the earthwork that once existed northeast of the quarries (see Appendix E and Table 2).

21PP2, LOCALITY 2, SIGSTAD SITE PP2

Locality 2 is a low circular mound located at the south side of the park housing complex. Sigstad (1970a:9) described the feature as roughly circular and about 1 meter high. Sigstad (1970a:9) dug a 5x5 foot test pit in the center of the apparent mound and concluded it was a man-made feature, but unlikely to be prehistoric in origin. He believed the feature is probably a refuse pile consisting of soil and Sioux quartzite with lithic debris inadvertently intermixed in the fill. The mound appears substantially the same today as described by Sigstad.

21PP2, LOCALITY 3, SIGSTAD SITE PP3, SOUTH QUARRY PITS

Locality 3 is the South Quarry pits. In 1949, Beaubien (1957:7-9, Figure 1; 1983:40-41, 43-45) dug a five-foot-wide trench across one of the pits, from which he recovered 12 ungrooved hammerstones, two possible bison rib fragments, and about 150 pieces of catlinite. Beaubien (1957, 1983) believed the hammerstones and ribs to be quarrying tools, although the catlinite he found in his excavations exhibited evidence of sawing with metal tools. Sigstad (1970a:10-11) also dug a test excavation in the southeast quarter of these pits, which he apparently regarded as one quarry. He found one hammerstone, a "few" pieces of catlinite, and a "china plate fragment." The South Quarry pits are not used today and are overgrown with brush. Other than the vegetation they appear to be substantially the same as described by Beaubien and Sigstad. As a demonstration of mapping techniques used by the Royal Commission on Historical Monuments of England,

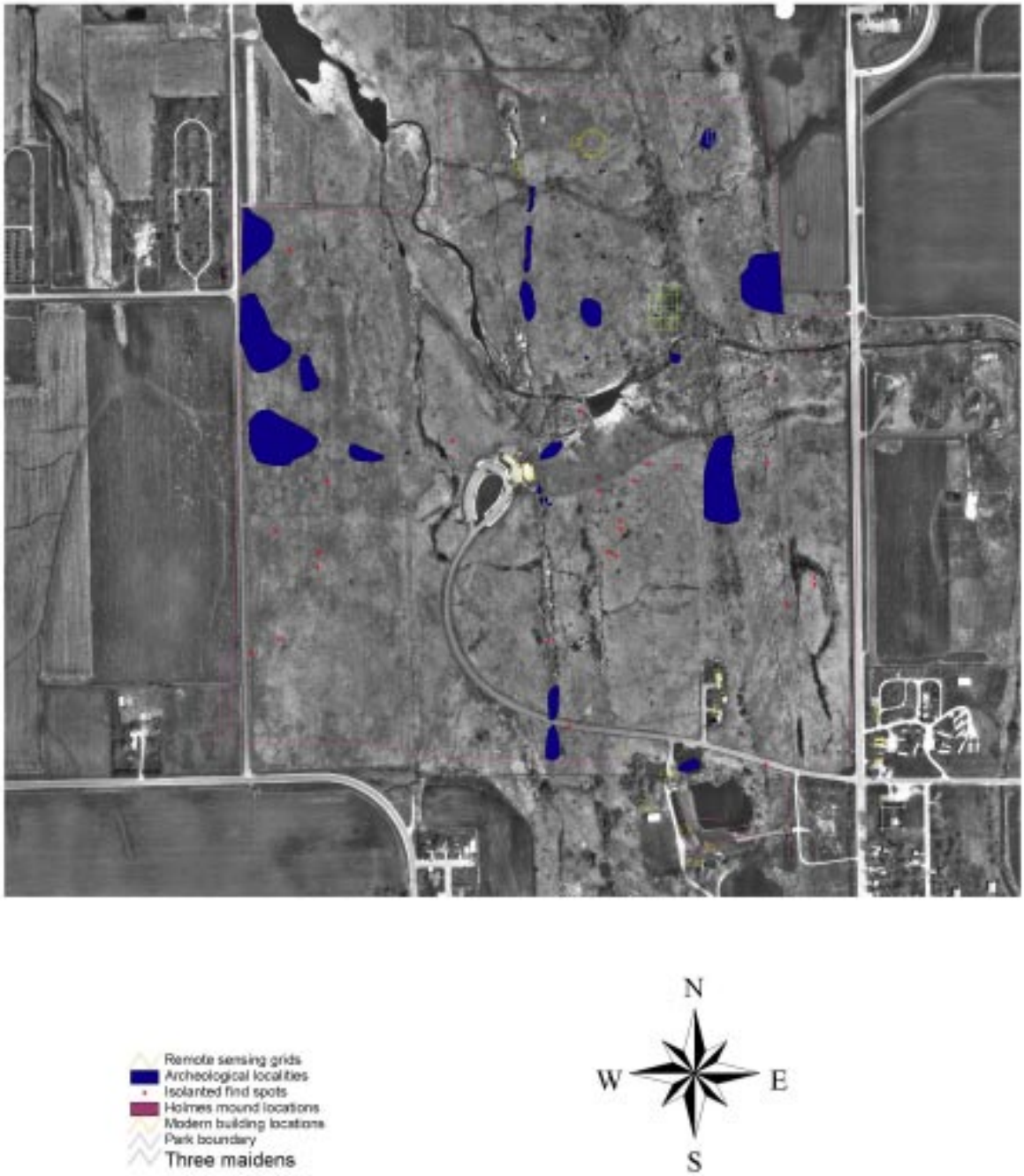

Figure 17. Archeological base map developed for the 1997-1998 inventories.

Table 12. Recorded archeological features, Pipestone National Monument.

Minn. St. Site No.	NPS Locality No.	Sigstad or NPS field number/name	Nature of site	References	Comments
21PP2	Loc. 1	1/Three Maidens	Glacial boulders and petroglyphs	Sigstad 1970:8-9	Petrogylphs removed from site in 1888 or 1889
21PP2	Loc. 2	2	Mound	Sigstad 1970:9	Not recorded by WHH; excavated by JSS; refuse pile
21PP2	Loc. 3	3/South Quarry	Quarry	Beaubien 1955:12-16 1957:7-8 Sigstad 1970:5, 10-11	Excavated by PLB; re- excavated by JSS
21PP2	Loc. 4	4	Workshop	Sigstad 1970:14	Should be considered part of 21,22 & 29
21PP2	Loc. 5	5	Quarry	Sigstad 1970:11	
21PP2	Loc. 6	6	Mound	Sigstad 1970:10	Not excavated. Not currently visible
21PP2	Loc. 7	7/Exhibt Quarry	Stabilized quarry	Sigstad 1970:11	
21PP2	Loc. 8	8/Outlaw Quarry	Quarry	Sigstad 1970:11	Not currently visible
21PP2	Loc. 9	9	6 shallow pits and 3-4 petroglyphs	Sigstad 1970:12 Scott 2005	JSS concludes these are not quarries
21PP2	Loc. 10	10	Quarry	Sigstad 1970:12-13	JSS may have tested
21PP2	Loc. 11	11/North Quarry	Quarry	Beaubien 1955:18 1957:9-10 Sigstad 1970:5, 13	Excavated by PLB; re- excavated by JSS
21PP2	Loc. 12	12/Spotted Quarry	Quarry	Beaubien 1955:17 1957:8-9 Sigstad 1970:5, 13-14	PLB tested near this quarry; excavated by JSS
21PP2	Loc. 13	13	Workshop or occupation site	Sigstad 1970:14-16	JSS tested; concluded this is a workshop or briefly occupied habitation site; ceramics

Table 12. Continued

Minn. St. Site No.	NPS Locality No.	Sigstad or NPS field number/name	Nature of site	References	Comments
21PP2	Loc. 14	14	Mound	Beaubien 1955:21-22 1957:10 Sigstad 1970:10	Possibly observed by GC; possibly excavated by PWN; appears on WHH map; excavated by PLB; Not currently visible
21PP2	Loc. 15	15	Occupation site	Sigstad 1970:16	
	Loc.16a	16/north portion	Workshop or occupation site	Sigstad 1970:16-18	JSS excavated; concluded this is a workshop or temporary campsite; ceramics
21PP2	Loc. 16b	16/south portion	Workshop or occupation site	Sigstad 1970:19-20	JSS excavated; concluded this is a workshop or brief occupation site; ceramics
	Loc. 16c	16/Sweat Lodge	3 depressions	Sigstad 1970:20-23	JSS excavated; concluded this is remains of a sweat lodge
21PP2	Loc. 16d	98-1	Stone circle	SAIP Inventory	
21PP2	Loc. 17	17/Indian Burial Marker	Mound	Sigstad 1970: Map 1	JSS does not discuss in text; site form indicates local informant identified this as the grave of an Indian School female student who died in 1910
21PP2	Loc. 18	18	Pits & heaps of broken quartzite	Sigstad 1970:14	JSS excavated & concluded that this is not a quarry, that quartzite may have been brought here
21PP2	Loc. 19	19/Leaping Rock No. 1	Occupation site	Beaubien 1955:24-43 1957:11-15 Sigstad 1970:5, 23-24	Excavated by PLB; ceramics

Table 12. Continued

Minn. St. Site No.	NPS Locality No.	Sigstad or NPS field number/name	Nature of site	References	Comments
21PP2	Loc. 20	20/Leaping Rock No. 2	Occupation site	Beaubien 1955:24-43 1957:11-15 Sigstad 1970:5-6, 23-24	Excavated by PLB; ceramics
21PP2	Loc. 21	21/N of Picnic Area	Workshop/ occupation site	Sigstad 1970:5, 24-25	225' N of picnic area tested by PLB; excavated by JSS
21PP2	Loc. 22	22/Beaubien's Picnic	Ceramic site	Beaubien 1955:23 1957:11 Sigstad 1970:5, 25	Tested by PLB; JSS (1970:5) erroneously refers to this as 21PP21; ceramics
21PP2	Loc. 23	PIPE93-1	Surface scatter	Clark 1996:5	CPC interprets as a workshop/ occupation site
21PP2	Loc. 24	PIPE93-2	Surface scatter	Clark 1996:6	CPC interprets as a workshop/ occupation site
21PP2	Loc. 25	PIPE93-3	Surface scatter	Clark 1996:7	CPC interprets as a workshop
21PP2	Loc. 26	PIPE93-4	Surface scatter	Clark 1996:7-8	
21PP2	Loc. 27	PIPE93-5	Surface scatter	Clark 1996:8	
21PP2	Loc. 28	Derby Petrogylph Site	Petroglyph panel	Clark 1996:9-10	
21PP2	Loc. 29	1994-1	Surface scatter	Richner 1994:2-3	May be 21PP4
21PP2	Loc. 30	1994-2, Noble Petroglyph	Petroglyph	Richner 1994:3	
21PP2	Loc. 31	1994-3	Surface scatter	Richner 1994:3-4	
21PP2	Loc. 32	1994-4	Stone alignments	Richner 1994:4-5	
21PP2	Loc. 33	1997-1	Mound	SAIP Inventory	Possible Holmes Mound
21PP2	Loc. 34	1997-2	Lithic scatter	SAIP Inventory	
21PP2	Loc. 35	1998-2 (Mound B and C)	Mound	SAIP Inventory	Possible Holmes Mound
21PP2	Loc. 36	1998-3 (Mound D)	Possible Mound	SAIP Inventory	

Table 12. Concluded

Minn. St. Site No.	NPS Locality No.	Sigstad or NPS field number/name	Nature of site	References	Comments
21PP2	Loc. 37	1998-4 (Mound E)	Possible Mound	SAIP Inventory	
21PP2	Loc. 38	1998-5 (Mound F)	Possible Mound	SAIP Inventory	
21PP2	Loc. 39	1998-6 (Mound A)	Possible Mound	SAIP Inventory	
21PP2	Loc. 40	1998-7	Stone circle	SAIP Inventory	Possibly depicted by PLB and JSS on maps
21PP2	Loc. 41	Nicolette Inscription	Petroglyph	SAIP Inventory	Bray and Bray 1976:73
21PP2	Loc. 43		Possible tool sharpening grooves	Scott 2005	

Key to initials: PLB = Paul L. Beaubien; GC = George Catlin; CPC = Caven P. Clark; WHH = William Henry Holmes; PWN = Philetus W. Norris; JSS = John S. Sigstad

the South Quarry was mapped on May 6-7, 1998, under the direction of Commission archeologist Peter Topping (Thiessen 1998b). The finished map appears on the cover of this volume.

21PP2, LOCALITY 4, SIGSTAD SITE PP4, BEAUBIEN'S PICNIC SITE

See Localites 21, 22, and 29 for a discussion of this workshop area.

21PP2, LOCALITY 5, SIGSTAD SITE PP5

Locality 5 is the Union Quarry pit. The original site form completed by Sigstad in 1965 describes the feature as an excavation about 10 feet deep, 60 feet long and 20 feet wide. Sigstad (1970a:11) refers to the locale as an area of several quarry pits including the Lone Tree pit, Indian Joe pit, as well as the Union pit. These pits were not entered during the current inventory effort as there is active quarry working on-going in this locale. They are now larger due to continued quarrying activities.

21PP2, LOCALITY 6, SIGSTAD SITE PP6

Locality 6 is a mound located about 10 feet northeast of the Union Quarry pit (Locality 5) by Sigstad (1970a:10). He recorded the mound as being 40 feet long northeast to southwest, 20 feet wide northwest to southeast, and four feet tall. Sigstad (1970s:10) recorded no artifacts near the mound, and suggested it may be merely a humus-covered spoil pile of quarry debris. The mound is not observable today as it is under recent quarry spoil.

21PP2, LOCALITY 7, SIGSTAD SITE PP7

Sigstad (1970) recorded the stabilized interpretive quarry pit near the monument visitor center as a site, now Locality 7. The feature has laid Sioux quartzite stairs leading into the pit. The walls are stabilized with Sioux quartzite as is the floor of the pit. In situ Sioux quartzite and catlinite deposits are visible in the east face of the pit.

21PP2, LOCALITY 8, SIGSTAD SITE PP8

Locality 8, also identified as the Outlaw Quarry pit by Sigstad (1970a:11), is a quarry pit located about 8 feet (2.5 meters) south of Locality 7. Sigstad did not give the dimensions of the pit on his 1965 site form, but did describe it in his report (Sigstad 1970a:11) as 10 feet long, slightly less wide with a depth of 15 feet, and with a northeast to southwest linear orientation. The pit is not visible today.

21PP2, LOCALITY 9, SIGSTAD SITE PP9

A series of six shallow pits located west of Pipestone Creek and near the monument's north boundary is designated Locality 9. Sigstad (1970a:12) tested the depressions and found no catlinite strata nor any artifacts. He concluded the features were not quarries and suggested that possibly they were dug by persons hoping to find a new catlinite source but failed to do so. Today the features are visible and essentially remain as described by Sigstad. During a 2005 visit to assess archeological site conditions throughout the monument, archeologists Ann Bauermeister and Douglas Scott noted three or four petroglyphs

on a Sioux quartzite outcrop about seven meters south of the main Locality 9 quarry. They consider this rock art, called the Bauermeister Petroglyphs, to be within Locality 9 (Scott 2005).

21PP2, LOCALITY 10, SIGSTAD SITE PP10

Locality 10 was the northernmost quarry when it was recorded in 1965. Others have since been opened to the north of this locality. When Sigstad (1970a:12-13) recorded and test excavated the feature he noted it was about seven feet by 10 feet oriented north and south. When observed in 1965 the quarry was abandoned and filled with modern trash including broken concrete. Sigstad's test excavation (1970a:12-13) yielded 33 worked catlinite fragments, a worked antler fragment, two cow or bison tibiae proximal ends, a fragment of glass, a tin can, and a steel file. The quarry pit has been subsequently reopened and is actively quarried today.

21PP2, LOCALITY 11, SIGSTAD SITE PP11, NORTH QUARRY PITS

The North Quarry pits were designated Locality 11. They were investigated by Paul Beaubien (1957:9-10, Figure 2; 1983:40, 45), who cleared the pit of debris and found poor-quality in situ catlinite and a modern steel hatchet. The quarry is believed to have been in operation since the early 1900s. Sigstad (1970a:13) also tested the feature with a 5x5 foot excavation and recovered metal tool-modified catlinite fragments. Sigstad also exposed an inscription on the wall of the pit that contained the names of Paul Beaubien, Lyle Lynch, and George Bryan, dated 1949. Sigstad added his name to the list and took samples of catlinite. The quarry pits are actively quarried today. A discrepancy between the location of pp11 as shown on Sigstad's (1970a:38) base map and the ground surface has been noted (Nickel and Thiessen 1980; Lynott 1981); no quarry pits are visible on the ground where pp11 is depicted on Sigstad's map.

21PP2, LOCALITY 12, SIGSTAD SITE PP12, SPOTTED QUARRY

Locality 12 is the famed Spotted Quarry, known for catlinite that exhibits light-colored spots where hematite has partially leached from the stone (Gundersen 1991:19-20; 2002:45). Sigstad (1970a:13) considered the Spotted Quarry to be a candidate for one of the earliest quarries in the monument because of it's proximity to Pipestone Creek and the presumption that stream erosion may have exposed the catlinite deposit. However, Beaubien's (1957:7-9; 1983:45) investigations recovered only metal tools and metal-cut pieces of catlinite. Sigstad also took samples of catlinite from this quarry.

21PP2, LOCALITY 13, SIGSTAD SITE PP13

A large, circa 1000 square foot area lithic site, located near the northwest curve of the interpretive trail loop is designated Locality 13. Sigstad (1970a:14-15) stated he found two fragments of shell-tempered pottery on the surface of this site as well as four fragments of catlinite and various other lithic debris. He tested the site with two 5x5 foot square test units placed 100 feet apart. He did not recover any diagnostic artifacts during his excavations. He did find that the upper 18 inches of soil matrix contained mixed historic and

prehistoric materials, which is typical of the monument's bioturbated soil deposition. The excavations yielded no additional pottery, although more lithic debris, catlinite, and an end scraper were recovered. No features were noted during Sigstad's testing work. This locality was re-examined during the current inventory effort, but no artifacts were visible on the ground surface at that time.

21PP2, LOCALITY 14, SIGSTAD SITE PP14

Beaubien (1955:21-22; 1983:45-49) excavated a mound located "about midway between the Spotted Pipestone Quarry and the quartzite outcropping," north of Pipestone Creek, now designated as Locality 14. Beaubien believed that the mound had been previously excavated, and he hoped to find archeological remains that had been overlooked. He failed to find any artifactual material, but noted the presence of rock slabs which he suggested might denote an Oneota Orr focus affiliation. Despite the absence of human bone, Beaubien (1955:caption of Photo No. 7; 1983:caption of Figure 9) assumed the feature was a burial mound, an assumption not supported by any evidence. A photograph of the excavated feature appears in the 1955 draft report and the image appears as a drawing in the 1983 republication of Beaubien's report, but neither illustration was included in the 1957 publication. Beaubien was not explicit about who the earlier investigators may have been, but he believed the mound to be near the location of the one that appears in Catlin's painting of the quarries. Consequently, it may be that Beaubien thought he was re-excavating mound "No. 2" trenched in 1882 by Philetus W. Norris (see Appendix B). The mound is not visible today.

21PP2, LOCALITY 15, SIGSTAD SITE PP15

Sigstad (1970a:16) considered the possibility that the lithic scatter designated as Locality 15 was nothing more than an extension of Locality 13. Sigstad observed a few fragments of catlinite, fourteen pieces of lithic debris, three small fragments of bone, and fourteen nodules of yellow ochre on the site's surface. He recorded the artifact area as about 750 feet square. The current inventory effort noted a sparse scatter of lithic debris in this area. No diagnostic artifacts were found. The disturbed nature of the soils makes any clear definition of a site or locality boundary difficult, but the general belief is that Localities 13, 15, and 16 constitute a single large locality, probably used from time to time over many years. These are probably not discrete subsites or localities, rather artifact clusters of a larger subsite that manifests itself from time to time (due to bioturbation) as sparse scatters of lithic debitage.

21PP2, LOCALITY 16, SIGSTAD SITE PP16

At Locality 16, Sigstad (1970a:16-23) placed test excavations in three separate areas, which he described separately as pp16 North, pp16 South, and the "Sweat Lodge" area, now designated as Locality 16a, 16b, and 16c respectively. Three five-foot-square excavation units were dug in pp16 North. Within the top two feet he recovered 157 catlinite fragments; 26 of them were worked, including a disk, a pipe blank, and possibly two pieces of incised tablets. Other prehistoric artifacts recovered included two

chipped stone projectile points, lithic flaking debris, two possible "rubbing" stones, and possibly several dozen small bone fragments, some of which had been burned. The relatively few historic-age artifacts were limited to the uppermost six inches of the deposit. On the basis of the catlinite disk, pipe blank, two possible tablet fragments, and possibly one of the projectile points, Sigstad (1970a:18) tentatively posited an Oneota cultural affiliation for this portion of Locality 16.

Two adjacent 5x5 foot test excavations partially overlapped a small surface depression that may have indicated a house structure (Sigstad 1965b:38; 1970a:19-20) that defined pp16 South. Bedrock was encountered in one of these units at depths ranging from about 47 to 82 inches below surface. In one of these units, a concrete slab was encountered between six and 18 inches below the surface; this slab, which was laid on sand, was believed to have been the base of an earlier monument alleged to mark the location of a small cemetery for deceased students from the nearby Pipestone Indian School (Sigstad 1965b:38-40; see also Mitchell 1934). Material recovered from the disturbed soil above the concrete slab included historic objects such as pieces of wire, barbed wire, nails, wire staples, tinfoil, bottle glass, firearm cartridge cases, and a bullet, as well as catlinite, a chipped stone projectile point tip, lithic flaking debris, animal bone and tooth fragments, catlinite fragments, and two small shell-tempered prehistoric potsherds (Sigstad 1970a:19). No historic artifacts were found below the concrete slab, though additional prehistoric objects were found there, including the base of a concave-base, side-notched chipped stone projectile point, more lithic flaking debris, two unworked catlinite fragments, and one small bone fragment (Sigstad 1970a:19-20). The adjacent excavation unit, which did not contain evidence of prior disturbance due to the construction of the monument, yielded two chipped stone projectile point tips, a convex-base unnotched projectile point, an end scraper, lithic flaking debris, worked and unworked catlinite fragments, bone fragments, and several historic artifacts (the last occurred only in the uppermost six inches). Sigstad (1970a:20) concluded that this area, like pp16 North, had been a workshop and/or temporary campsite. He tentatively suggested that the projectile points were similar to Oneota examples and to what would today be considered Late Archaic complexes, but cautioned against placing too much reliance on this interpretation. The location of the monument which formerly stood in this location was still visible as a shallow depression in 1998, and had been marked by monument staff with an orange-painted iron pipe.

Five 5x5 foot test units at the "Sweat Lodge" area of site pp16 were placed over a group of three small depressions that were discovered when the grass cover was removed (Sigstad 1970a:20-23). Two of the depressions were found to be shallow basins that contained clay fill mixed with unidentified organic matter. The third depression contained a pile of cracked and apparently burned quartzite fragments. The top 18 inches of the soil in these test units yielded worked and unworked pieces of catlinite (including three fragments of catlinite disks), chipped stone tools (including seven projectile points), lithic flaking debris, two possible "rub-

bing" stones, and bone fragments, one of which was identified as being from bison. On the basis of the pits, the apparently cracked and burned rock, the organic material, and the distance at which these features were located from the quarries themselves, Sigstad offered the tentative interpretation that these represented activities associated with a sweat lodge. Sigstad's excavations at this "Sweat Lodge" site were still visible in 1998, some 33 years after he dug them.

During the 1998 investigations an area of lithic debris was identified and mapped. Associated with the lithic debitage is a series of quartzite stones that appear to form a partial circular alignment. This may be another tipi circle or ring, and it may be part of a cluster of four such features recorded on Sigstad's archeological base map on the basis of observations made by Beaubien in 1949 (1949:11; 1955:12; 1957:7; 1983:43). Sigstad (1970a:8) did not give the area a site number because he could not relocate the circles mentioned by Beaubien. Although the 1998 locale, designated 16d, is not plotted in the exact place that Sigstad plots his 1965 stone rings, given the known base map errors inherent in the Sigstad archeological base map, it appears likely the two locales are one and the same. Most of the individual rocks were buried in the soil and were located through probing with pinflag wires.

The amount of rock material in this area is substantial as it is near the quarry line. Thus this may be a spurious site rather than a stone circle feature. It should be tested sometime in the future to determine if it is a true rock alignment. If so, it may be an indication that many more circular alignments or tipi rings remain buried within the monument.

21PP2, LOCALITY 17, SIGSTAD SITE PP17

Locality 17 is an oblong to rectangular earth mound that was recorded by Sigstad (1965 site form, on file, Midwest Archeological Center) as being approximately 10 feet north-south by five feet east-west and about four feet in height, and also as being "roughly circular" and "approximately 15 feet in diameter" (Sigstad 1970a:10). Sigstad (1970a:10) described the mound as being "covered with rock slabs," but it did not appear so when revisited in 1997-1998 and 2001. It is located 20 meters north of the iron pipe marking the location of the base of the former "Peace" monument (see Locality 42). It is heavily vegetated and is the second largest mound-like feature encountered during the inventory work. On the basis of oral history, it is said to contain a grave associated with the former Pipestone Indian School:

> According to local informants, it marks the grave of a former student of the nearby Indian school. (Sigstad 1970a:10)

> Local Indian source says mound contains 1910 Burial of Indian school girl. (1965 site form filled out by E.P. Sigstad, on file, Midwest Archeological Center)

The mound was revisited in 2001 (Thiessen 2001) after another burn in the area. At that time the mound was clear of much of the vegetation that had partially obscured the feature during the 1998 field work. An alignment of Sioux quartzite rocks was noted at the southeast corner of the mound's base. The east-west segment was visible for 70 cm

and the north-south segment for about 1.4 meters. Some concrete was noted on a stone near the western extremity of the east-west alignment. This suggests the feature is historic in age and may be the only tangible evidence of the Indian cemetery site (see Appendix D). The mound has not been disturbed by excavation. The feature was referred to as Mound A during the SAIP inventory project.

21PP2, LOCALITY 18, SIGSTAD SITE PP18

Locality 18 consists of two quarry pits located north of Pipestone Creek alongside the interpretive trail. Sigstad (1970a:14) only casually mentioned the pits and associated spoil heaps. His site form gives little additional information other than dimensions. He described the southern pit as 20 feet long east to west, 15 feet north to south, and 8 feet deep. The northern pit had the same depth, but was 16 feet long east to west and 10 feet wide north to south. The pits are essentially in the same condition today.

21PP2, LOCALITY 19, SIGSTAD SITE PP19, BEAUBIEN'S LEAPING ROCK SITE NO. 1

At the base of Leaping Rock is Locality 19, designated by Beaubien (1957:12; 1983:49-57) as Leaping Rock Site No. 1. Beaubien excavated in this area, already disturbed by monument trail development, and recovered some lithic materials as well as 40 pieces of prehistoric pottery (see Chapter 10).

21PP2, LOCALITY 20, SIGSTAD SITE PP20, BEAUBIEN'S LEAPING ROCK SITE NO. 2

Beaubien's (1957:12; 1983:49-57) Leaping Rock Site No. 2 is Locality 20, located only a few feet from Leaping Rock Site No. 1. Beaubien's work here, in what he believed was an undisturbed area, yielded lithic debris and over 350 prehistoric ceramic sherds. He also found fragments of modern phonographic records intermixed in the soil matrix. In his summary of the pottery, Beaubien concluded that the rounded nature of the sherds' edges indicated they had been water abraded and had been water transported from above the ledge and redeposited during flooding episodes. Reanalysis of Beaubien's pottery finds (see Chapter 10) indicates that the sherds are not waterworn. It is likely that bioturbation, so common throughout the monument, was the cause of the intermixing of prehistoric and modern artifacts.

21PP2, LOCALITIES 21 AND 22, SIGSTAD SITES PP21 AND PP22, BEAUBIEN'S PICNIC SITE
(see also Localities 4 and 29)

A relatively dense surface scatter of chipped lithic material was recorded on the lower, flat bench southeast of the visitor center. The lithic debris was originally identified as the Picnic Site by Beaubien (1957:11; 1983:49) and later as two distinct lithic scatters by Sigstad (1970a:14, 25), sites pp4 and pp22. Richner (1994) re-evaluated the Picnic Site and expanded its boundary significantly. The parkwide inventory effort again redefined the site boundary to be inclusive of localities 4, 21, 22, and 29. This large lithic scatter extends south from north of the paved trail along the face of the rock bluff to well south of the trail. Artifacts consist of chipped stone debitage and numerous modified pieces of catlinite. The catlin-

ite consists almost entirely of the "spotted" variety, all of which appears to have been worked with stone tools. A single prehistoric ceramic sherd typical of the Late Woodland period (ca. AD 700-1650) was collected from this artifact scatter.

21PP2, LOCALITY 23, PIPE93-1

This surface scatter was defined in the northwestern corner of the monument by Clark (1996). The area measures 140 m north-south and 65 m east-west. These are only partial dimensions, since the inventory stopped at the monument's western boundary, and the artifact scatter continued at least up to the boundary fence line. No inventory was conducted outside of the monument boundaries. The site is situated on the level to gently sloping edge of an east-facing hill. Specific artifact locations were fairly diffuse across the site. The kinds of artifacts found at this site include only two pieces of worked catlinite, in contrast to a proportionately large number of chipped stone artifacts. This suggests that, in spite of proximity to the quarries, the main activities here were similar to those found on most occupation sites in the region and less focused on catlinite working.

21PP2, LOCALITY 24, PIPE93-2

The second large area from which artifacts were recovered in 1993 (Clark 1996) measures 160 m northwest by southeast and 70 m northeast by southwest and is truncated by the western monument boundary fence and road. The setting is analogous to that of Locality 23, from which it is divided by a small erosional feature. This site is almost exclusively prehistoric in terms of artifact content. There are a large number of chipped stone artifacts, with more worked catlinite than was found at Locality 23 (PIPE93-1). Again, the artifacts suggest a primarily domestic function of the site, with some processing of catlinite taking place.

21PP2, LOCALITY 25, PIPE93-3

This site consists of surface finds in an area 100 m square located near the western border of the monument nearly opposite the visitor center (Clark 1996). The ground is nearly level, sloping gradually to the east. There is very little to suggest a campsite. Rather, the predominance of worked catlinite indicates that the location served as a workshop, probably ancillary to occupation sites nearby. The proportion of stone-cut to saw-cut catlinite is roughly equal, which could be construed to mean that the location was used for similar activities over a long period of time, and that several reduction techniques were in use simultaneously in the historic period. Spotted catlinite is more abundant here; it also occurs at Locality 21/22, 23 (where one piece was recovered), 29, and, of course, 12 (the Spotted Quarry).

21PP2, LOCALITY 26, PIPE93-4

This site is located downslope and between Locality 24 (PIPE93-2) to the northwest and Locality 25 (PIPE93-3) to the southwest (Clark 1996). From this area, Sigstad (1970a) recovered a single projectile point, which he designated 21PP0-t. The locality measures 110 m north-south by 40 m east-west. Artifacts include several chipped stone items, including two large Sioux quartzite bifaces that likely served as digging and/or quarrying tools. No historic artifacts were recovered here.

21PP2, LOCALITY 27, PIPE93-5

Where the ground slopes down to the east from the western boundary fence of the monument, Clark (1996) defined another surface scatter site, located 75 m east of Locality 25 (PIPE93-3). Sigstad (1970a) reported finding a single piece of worked catlinite from this area in 1965. Artifacts located in 1993 include a few chert and quartzite waste flakes, one projectile point, and three pieces of worked catlinite. An historic object, an earthenware cylinder with an open central core that has the number 2 stamped on the bottom (?) is of unknown origin or function.

21PP2, LOCALITY 28, DERBY PETROGLYPH PANEL AND THE LEGG PETROGLYPH

A group of petroglyphs on a quartzite outcrop was found by Maintenance Foreman Chuck Derby in 1992, who brought it to the attention of the MWAC crew in 1993 (Clark 1996). Subsequently the site was expanded to include an additional bird track petroglyph discovered in 2001 by Kristin Legg, the monument's Resource Specialist (Thiessen 2001). The locality is located approximately 360 m north of Winnewissa Falls on the west side of the Sioux quartzite ridge. The rock art panel is not on the main bedrock part of the ridge but is on horizontal exposures of red quartzite near the base of the ridge. Owing to the surrounding sod and grass cover, it was not possible to determine if the rock was detached or part of a bedrock feature.

The petroglyphs were photographed under both wet and dry conditions, and a scale drawing was made. The locality consists of one large panel of Sioux quartzite with a number of distinct elements including a bird motif, a turtle, two human foot motifs, three "turkey" tracks, and six zones of amorphous pecking. The Legg Petroglyph is a bird track motif located on a nearby outcrop about one meter south of the Derby panel.

21PP2, LOCALITY 29, 1994-1, BEAUBIEN'S PICNIC SITE (SEE ALSO LOCALITIES 4, 21, AND 22)

Richner and Noble (Richner 1994) noted an extensive scatter of chipped stone debitage and worked catlinite fragments over an area measuring approximately 85 m by 20 m, situated west of the quartzite ledge near or coincident with Beaubien's Picnic Site (see also Localities 4, 21, and 22). Most of the catlinite was observed to be of the "spotted" variety and appeared to have been worked with stone tools. They collected one prehistoric pottery sherd judged to be Late Woodland in age (AD 700-1650).

21PP2, LOCALITY 30, 1994-2, NOBLE PETROGLYPH

Locality 30 (1994-2), consists of a single petroglyph on a roughly horizontal quartzite rock outcrop at the north edge of the intermittent drainage and east of the quartzite ledge (Richner 1994). Approximately 6 to 8 meters north of the single bird track petroglyph are two more possible petroglyphs. Both are circular and were identified by Glen Livermont (Thiessen 2001). Positive identification of the two circular glyphs as definite petroglyphs has not been confirmed. The upper surface of the rock containing the bird track is polished smooth, possibly through a combination of glacial and more recent stream

actions. The single figure on this rock is a pecked form that appears to represent the track of a bird, possibly a wild turkey. The feature is subtle, and is pecked lightly into the very hard rock surface. The petroglyph appears to have considerable antiquity. The track is depicted about 10 cm x 10 cm (4 in x 4 in) in size. Formal documentation included a measured, freehand drawing (actual size) in pencil, as well as photography under various light conditions. No direct tracings, rubbings, or other treatment of the feature was undertaken. It was noted, with considerable interest, that an offering tied in a piece of cloth had been left near this site sometime prior to the prescribed burn, possibly indicating that the rock art has spiritual significance to contemporary Native Americans. On the other hand, the placement of the offering near the glyph may have been purely coincidental, perhaps in connection with vision quest activities. Continued maintenance of the site's integrity should be carefully considered relative to any future activities that might be proposed in this immediate area.

21PP2, LOCALITY 31, 1994-3, RICHNER SITE

The site is a dense scatter of worked catlinite, chipped stone debris and tools, and faunal remains recorded in 1994 (Richner 1994). The scatter covers most of the flat soil bench flanking the monument's east property line and is about 120 m x 60 m (400 ft x 200 ft) in extent. It probably extends east outside the monument boundary, but no attempt was made to confirm that speculation. The western edge is contiguous with the highest elevation of the field; artifacts do not occur in appreciable numbers down slope from the flat bench. This site is situated immediately north of a mound recorded on the Holmes (1919:254) map made in 1892. There is no indication of a mound in the area today. Pipestone Creek is located south of the site, and the creek has been extensively channelized in this area. The creek bank and other surrounding land has been significantly altered in the area immediately south of the site, perhaps truncating its southern margin and destroying the mound, if Holmes' location was correct.

The site was redocumented in May 1997. The area was walked in two wide transects and all visible surface artifacts were flagged and mapped with a total station. Over 90 artifacts were recorded, including lithic debitage, worked and unworked catlinite, a few fragments of bone, and two pottery sherds. Several pieces of worked stone, the sherds, and a single piece of worked catlinite were collected.

Six test excavations were dug at the site in October 1997 and are described in Chapter 8 of this volume. The site is judged to have been extensively affected by long-term bioturbation, resulting in mixing of subsurface soil deposits. The site has been characterized as a short-term and/or repeated-use campsite that supported the quarrying and initial shaping of catlinite (see Chapter 8) in late prehistoric times. The ceramics found on the site during the 1997 burn inventory and the projectile points found during the excavations provide the only datable artifact types. They suggest the site was occupied in the Late Woodland through Late Prehistoric time frame (circa AD 400-1650). Because none of the catlinite workshop debris observed

at the site appears to exhibit modification by metal tools, the Richner Site may hold important clues to prehistoric catlinite artifact manufacturing processes.

21PP2, LOCALITY 32, 1994-4, STONE CIRCLE SITE

A sparse scatter of chipped stone items was found in the area north of an intermittent drainage in the northeast corner of the monument in 1994 (Richner 1994). Three potentially cultural features-two apparent circular stone alignments and a stone cluster-were observed, mapped, and photographed. Test excavations were dug through two of these features in October 1997; the results of this work are reported in Chapter 8 of this volume.

Feature 1, the northernmost of the three features, appears to be a type of rock arrangement commonly referred to as "tipi rings" in the literature. Such features are commonly thought to represent stones that supported poles and/or held down hide coverings used in the construction of conical tents called tipis.

Feature 2 was not test excavated. A test trench through Feature 3, the southernmost feature, yielded inconclusive results, though the possibility was offered that the cluster of rocks may be the remnant of one of the mounds excavated in 1883 by Norris or perhaps by Charles Bennett and his friends before the turn of the century.

The presence of lithic debris in the features as well as around the site, suggests the area was used as a short-term habitation and special use site in late prehistoric times.

Despite the absence of evidence for hearths or other subsurface features, the Stone Circle Site is highly important as one of the last vestiges of the once most numerous type of archeological features at the quarries-circular rock alignments. Holmes' (1919:254) 1892 map of a portion of the present Pipestone National Monument land shows over 300 rock circles in the vicinity of the quarries. Except for the Stone Circle Site (Locality 32) and two other recently identified possible (but unconfirmed) circular rock alignments (Localities 16d and 40), evidence of such features has vanished from the archeological landscape of Pipestone National Monument. Tipi rings are a rare feature in the upper Midwest because most of them have been destroyed by modern agricultural practices. At Pipestone National Monument, where most of the monument lands have never been subjected to cultivation, the rocks comprising such rings could have been removed for use in quarrying catlinite and constructing buildings in the local community, or they could have been largely buried through the effects of bioturbation since Native Americans stopped camping at the quarries a century or more ago.

21PP2, LOCALITY 33, 1997-1

A low, irregularly shaped earth and rock mound 6.8 meters long and 3.5 meters wide was found west of the visitor center and designated 1997-1. The mound is about .5 meters high and appears composed of large to moderate sized Sioux quartize boulders. The visible boulders exhibit significant weathering. This mound is about 70 meters northwest of a mound depicted on the Sigstad (1970a:Map 1) base map as the site of a

probable mound plotted by Holmes in 1892. In all likelihood this is the Holmes mound and Sigstad's plot is in error due to the scaling errors present in the base map he used for plotting site locations.

21PP2, LOCALITY 34, 1997-2

A small lithic scatter was located between 40 and 60 meters north northwest of Locality 9 which Sigstad (1970a) recorded as six shallow pits. The lithic scatter was composed of three flakes and one triangular projectile point fragment that is described below as a Late Prehistoric point. The few bits of lithic debris were scattered over a roughly 20-30 meter wide area.

21PP2, LOCALITIES 35, 36, 37, 38, 1998-2, -3, -4, -5, AND -6; MOUNDS B, C, D, E, AND F

The 1998 inventory focused on the burn area north of the visitor center and west of the Sioux quartzite ledge to Pipestone Creek and north to the monument boundary. Within this area scattered and isolated lithic debitage was noted and mapped as were six possible earth mounds. The possible mounds were designated A through F (mound A is discussed under Locality 17). Mounds B and C (Locality 35) are approximately 2.5 meters in diameter and located 50 meters south of the Sun Dance circle. The mounds are circular and about 3 meters apart. They appear composed entirely of earth and are about 1 meter high. It is possible their origin is natural, but without testing it is impossible to be sure.

Mounds D, E, and F (Localities 36, 37, 38) are located about 150 meters northwest of the iron pipe that marks the location of the Indian cemetery "Peace" monument base location. They are also earth mounds about 2.5 to 3 meters in diameter and about 1 to 1.5 meters high. These may also be natural in origin, the result of bioturbation; however, they are located in a zone were twenty-four pieces of debitage were found on the surface. Until testing can confirm or refute their origin it should be assumed they are of human origin.

21PP2, LOCALITY 39

Locality 39 is a catlinite quarry pit that partially underlies the southeast corner of the cultural center addition to the monument's visitor center. The pit lies to the north of the Exhibit Quarry and was described as being two to four feet deep and surrounded by a low berm of quarry spoil rocks (Reaves [1973:3]). Because of construction of the cultural center, the quarry is probably partially or wholly destroyed, though it is possible that some intact portion of it lies buried beneath fill placed around the building. Quarriers questioned in 1971 did not remember the quarry ever being actively worked (Reaves [1973:3]).

Monument Archeologist Roy W. Reaves III [1973] monitored the construction of the cultural center and partially excavated the quarry pit in 1971 to salvage artifacts and data while other parts of the cultural center were under construction. Assisted by four excavators, Reaves dug two trenches of unrecorded width; both originated near the center of the quarry pit (Reaves 1973:Map 2]). Trench 1 extended approximately west from the origin point and was 27 feet long (Reaves [1973:4]). Trench 2 extended approximately north from the same origin point as Trench 1, and was

32 feet long (Reaves [1973:4]). When the trenches were completed, the east face of Trench 2 was excavated in an eastward direction until available funds and time ran out (Reaves [1973:4-5]). Other than one chipped stone tool fragment and several hammerstones, the artifacts recovered were all of modern origin. Reaves ([1973:5]) judged the artifactual assemblage to date between the late nineteenth century and the 1930s.

21PP2, LOCALITY 40, 1998-7

Locality 40 is a partial stone circle. The stone alignment was noted during the remote sensing work at the Indian cemetery site in 1998. The largest diameter between the visible stones is six meters. It is located about 20 meters south of the iron pipe denoting the former location of the "Peace" monument. The rocks in the alignment appear to be Sioux quartzite. They are nearly buried in the soil, with only tips protruding. A steel rod probe was used to locate several other stones that may close the alignment, but only those with some surface indication were mapped. Fifteen pieces of lithic debitage were found within 25 meters of the alignment. None were diagnostic.

21PP2, LOCALITY 41, NICOLLET INSCRIPTION

In 1838 an official government exploration party reached the quarries led by a French astronomer and cartographer, Joseph Nicolas Nicollet (Bray and Bray 1976; Bray 1969, 1994; Smith 1977). The major product of his exploration was the first detailed map of the Upper Mississippi basin. Nicollet made many observations during his sojourn in the Pipestone area, among them notations he made about several archeological sites. More than merely observing the archeological features in the vicinity of the quarries, Nicollet's party actually added to their number. The prominent members of the party (Nicollet, Fremont, Geyer, La Framboise, Flandin, and Renville) carved their initials into a flat quartzite surface atop the ledge, not far from the Leaping Rock, where they remain today. This is described in Nicollet's journal entry for June 30, 1838 (Bray and Bray 1976:73). The inscription was recorded by Theodore Lewis in 1889 (Winchell 1911:565).

21PP2, LOCALITY 42, "PEACE" MONUMENT BASE

A shallow depression of about one meter diameter lies in the prairie below the quartzite ledge north of Pipestone Creek, about 20 meters south of Locality 17. The depression marks the former location of a stone and concrete obelisk monument erected in 1934 to commemorate the nearby graves of deceased students from the Pipestone Indian School (Mitchell 1934:28-29). While digging one of two test excavations at site pp16 South in 1965, Sigtad (1970a:19) encountered a concrete slab that comprised part of the base of the "Peace" monument. Monument staff have marked its location with an orange-painted iron pipe. Although the location of this feature coincides with that of Locality 16b, it is given separate locality status because, along with Locality 17, it is one of two possible tangible clues to the location of the Pipestone Indian School cemetery, which has not been definitely located (see Appendix D). The obelisk was removed sometime between 1950 and 1963 when its base was demolished

(Betty McSwain, personal communication to Thiessen, October 31, 1994).

In 1998, magnetic and electrical resistivity surveys were conducted over and near the monument base location in an unsuccessful effort to detect the presence of grave shafts through these non-invasive methods (Nickel and Frost 2000).

21PP2, LOCALITY 43, TOOL SHARPENING GROOVES

During a visit in August 2005 for the purpose of assessing the condition of the monument's archeological subsites, archeologists Ann Bauermeister and Douglas Scott were shown an archeological feature by David Rambow of the monument's staff. It consisted of several worn grooves in the Sioux quartzite ledge immediately north of the Picnic site, Locality 22. These grooves, which are of unknown age, "appear to be consistent with sharpening grooves for modification of ground stone tools" (Scott 2005). Scott concluded that they may be associated with prehistoric use of Locality 22. In the memorandum in which this feature is reported, Scott erred in recording the grooves as Locality 42; they are actually at Locality 43.

Locality Observations and Summary

Pipestone National Monument is a complex archeological manifestation. It is appropriate to consider the monument as one large archeological site composed of a variety of subsites or localities for administrative purposes. The monument can be divided for administrative purposes into six subsites types: quarries, rock art, mounds, stone circles, lithic scatters, possible tool sharpening grooves, and historic features.

The catlinite quarries can be defined as a single subsite type made up of many individual locales. The quarry pits are actively used and are a resource that is and will continue to be consumed by use as provided for in the monument's legislative authorization. Spaces allotted to quarriers by official permits are numbered 1 through 83 along the quarry line, from south to north (Jim LaRock, email communications to Thiessen, June 9, 2003, and January 27, 2005). Spaces 1 through 46 and 69 through 83 are in existing quarry pits (though not all are active pits at the present time), with spaces 47 through 68 reserved for the opening of new pits as needed in the future. As subsites or locales, the quarries are not static features, but ones that will change through time in configuration and depth, as quarrying activities proceed. Three episodes of archeological excavation of selected quarry pits by Beaubien (1949, 1955, 1957, 1983), Sigstad (1970a), and Reaves ([1973]) have yielded very little information about the time depth of quarrying activities or the manner of quarrying catlinite that cannot be obtained from other data sources. It is recommended, based on our present knowledge and the sacred reverence in which the quarries are held by Native Americans, that no additional archeological excavations be conducted within the quarry pits themselves.

A second subsite type is the rock art localities. To date, there are two in situ Native American rock art subsites in the monument, the Derby/Legg

and Noble petroglyphs.[1] All the in situ petroglyphs are difficult to see, except under optimum light conditions. Given that, it is entirely possible that other undiscovered petroglyphs are present in the monument, most likely located near the Sioux quartzite ledge and perhaps obscured by lichen growth, simply awaiting chance discovery. Another (and the largest) petroglyph group is no longer in place, but the remains of much of it are housed in the monument's museum collection. These are the Bennett petroglyphs that were removed from around the Three Maidens in 1888 or 1889. Seventeen of the 35 or 36 petroglyph-bearing quartzite slabs recorded by Theodore H. Lewis survive (see Appendix C and Chapter 11), but the present whereabouts of the remaining 18 slabs is unknown. There is a possibility that some petroglyphs remain in situ near the Three Maidens boulders and it is recommended the area be managed to minimize any subsurface disturbance. In addition, the monument's museum collection also holds two quartzite slabs that do not match Lewis' descriptions; these are not confirmed as part of the original Three Maidens grouping.

Other rock art is reported to have existed or is known to be present in the monument, notably pictographs (painted images), for which very little documentation exists (see Chapter 11). P.W. Norris (1884) reported seeing painted designs on rocks at Pipestone. Although not the first person to comment on possible painted designs or pictographs in the area, Norris was the last to make that observation. It is entirely possible that pictographs existed in the monument, but they may have been destroyed by exposure to the climate over time or obscured by algae growth on the Sioux quartzite outcrops and/or on the Three Maidens boulders.

Mounds constitute the third sub-site type (Table 13). Despite the fact that they number in the thousands in the state of Minnesota (Arzigian and Stevenson 2003), mounds are so poorly known at Pipestone National Monument as to be regarded as unconfirmed and dubious archeological features. They were noted by several nineteenth-century visitors to the quarries. The most famous mound was the so-called "Jumper's Mound," presumed to be the burial place of a young Sioux man. In 1836, Catlin (1973, 2:170) noted the presence of a 10 foot tall mound, which a Sioux chief told him contained the remains of his son, who had fallen to his death from the Leaping Rock two years previous. It is prominently depicted in his well-known painting of the quarries as being situated along the north (i.e., right) bank of Pipestone Creek approximately midway between the quarries and the quartzite ledge (Catlin 1973, 2:Plate 270; McCracken 1959:177; Dippie 1990:41; Troccoli 1993:157). The mound is reported by Storrs (1916; see also Chapter 6, this volume) to have been dug into by local Pipestone resident Charles H. Bennett, possibly around 1876. Rudolf Cronau, a German visitor to the quarries in the early 1880s, was aware of the Leaping Rock legend and Catlin's depiction of the mound in his painting of the quarries. Although he does not mention

[1]In addition, one other sub-site (Locality 9) contains three or four recently-observed in situ petroglyphs which have yet to be formally recorded (Scott 2005).

Table 13. Mounds reported at Pipestone National Monument.

Locality	Investigator	Size (ft)	Height (ft)	Partially Excavated (Yes/No)	Contents	Conclusion
Norris No. 1	Norris, 1882	28 diam.	3	Yes	Rock fragments	Refuse heap?
Norris No. 2 (Loc. 14)	Norris, 1882 Brower, 1905 Beaubien, 1949	35 diam.	4	Yes	Rock fragments Decaying wood	Burial mound observed by Catlin and dug up by Bennett
Norris No. 3	Norris, 1882	25 diam.	3	Yes	Rock fragments Few catlinite fragments	Refuse heap?
Norris No. 4	Norris, 1882	58 x 34	4	Yes	Rock fragments Human and animal bones (coyote mandible, deer cranium fragment) Catlinite fragments	Refuse heap?
Norris No. 5	Norris, 1882	25 x ? oval	2.5	Yes	“Ethnologically nothing of value”	Refuse heap?
Norris No. 6	Norris, 1882	35 diam.	6	Yes	Rock fragments Decayed human and coyote bones Stone drill Catlinite fragments	No conclusion
Norris No. 7	Norris, 1882	30 diam.	4	Yes	Rock fragments Catlinite fragments	“a pile of angular stones”

Table 13. Concluded

Locality	Investigator	Size (ft)	Height (ft)	Partially Excavated (Yes/No)	Contents	Conclusion
Loc. 2	Sigstad, 1965	30 diam.	3	Yes	Rock fragments Catlinite fragments Utilized jasper flake River cobbles Modern trash	Refuse pile
Loc. 6	Sigstad, 1965	20 x ? oval	4	No	Not tested	Pile of quarry debris
Loc. 17	Sigstad, 1965	10 x 5 oval	4	No	Not tested	Grave of Indian School student

observing the mound or any remnant of it, he claimed to have found one of the dead man's molar teeth, which had "been found by a wolf" (Cronau 1890:83). Philetus W. Norris (Thomas 1894:42-43; Appendix B, this volume) reported the mound as about six feet high in 1857. When he again observed it in 1877 (ibid.) it had been partially excavated; he was told, perhaps by Bennett himself, that a human cranium and some "weapons and trinkets" had been removed from the mound. Norris retrieved a perforated bear claw and some glass beads from angular rock fragments in the excavated area, which was south of the center of the mound. When he again returned in 1882, Norris recorded that the mound had been further dug into and was then four feet tall and 35 feet in diameter (Appendix B). Norris excavated a trench from the south edge of the mound to a point beyond its center (Appendix B). He found "some mostly decayed fragments of wood," one of which he interpreted as the remains of a Native American quirt (Appendix B). He also found a relatively large quantity of rock fragments, which he speculated had been a "cairn" raised over the corpse. Minnesota Historical Society archeologist Jacob V. Brower (1976:Volume 83, Field Notebook 25) visited the quarries on April 24-25, 1905, and drew measured maps of some of the features there, including the "Location]. of `Jumper's' Mound." It is not certain, however, whether any remnant of the mound was visible at the time, or whether Brower was informed of the location by a local resident, perhaps Charles H. Bennett. In 1916, Bennett pointed out the mound's location, described as a "depression," to visiting newspaperman Caryl B. Storrs (1916). Perhaps the last recorded observation of this mound was made by Paul Beaubien in 1949. Beaubien (1955:21-22, Map 1, Photo No. 7; 1957:10, Map 1; 1983:45-49, Map 1, Figure 8) excavated a mound that had previously been dug into at an unknown date and by parties unknown. He found only a veneer of rocks over the mound and attributed an Oneota Orr Focus association to the feature. Unfortunately, he did not describe the appearance of the mound prior to his excavation of it, nor did he present much detail about his work there. Apparently from its location north of Pipestone Creek and approximately midway between the quarry line and the quartzite ledge, he suggested that it may have been the burial mound observed by Catlin. Sigstad (1970a:5) assigned site number pp14 to this feature; the number is incorrectly stated as pp4 on page 5 of Sigstad's report, but is correctly numbered on his published base map.

The other mounds reported as once existing at the quarries are enigmatic. In 1882 Norris (Thomas 1894:42-43; Appendix B) partially excavated seven mounds that likely existed on land within the present-day monument boundary. One of these (his No. 2) he believed to be the burial mound noted by Catlin, as discussed above. Of the other six, Thomas (1894:42-43) concluded that four were probably refuse heaps (nos. 1, 3-5), one was "little else than a pile of angular stones" (no. 7), and one was undetermined (no. 6). Two mounds (nos. 4 and 6) were reported to have contained human and animal bone fragments (Appendix B), but no diagnostic elements of human bones were identified by Norris, whose training and experience in human osteology are unknown. Fragments of catlinite are reported as

having been found in mounds excavated by Norris, as is one stone drill tool. However, worked and unworked catlinite fragments and chipped stone tools are widely distributed throughout the monument, and their deposition in the mounds or refuse piles could have been the result of bioturbation or other form of pedoturbation. In fact, Norris himself came close to this conclusion in his notes regarding Mound no. 4 (Appendix B):

> *This irregular intermixture of the contents of the mound, circular and ridge like elevations in various parts of it justify the inference that it has been pretty thoroughly upturned and replaced at some recent period.*

During that same visit, Norris also excavated at three mounds or earthen features located a couple of miles east of the quarries. That work is described in Appendix E.

Holmes mapped archeological features near the quarries in 1892. His map (Holmes 1919:254) depicts seven mounds: one each on either side of Pipestone Creek above the quartzite ledge; four east of the quarry line and one to the west of it. He did not excavate any of the mounds or even mention them in his notes or the text of his most comprehensive publication about Pipestone (Holmes 1919). Only the "Jumper's" mound is shown on Brower's 1905 map. When NPS archeologist Paul Beaubien (1949:10; 1955:10-12; 1957:7; 1983:3) visited Pipestone National Monument in 1949, he recorded that "There are no mounds worthy of the name; with the help of maps, however, traces of the former existence of some can be found." As mentioned above, he excavated a mound that may have been the one observed by Catlin, but found that it contained only rocks. Sigstad (1970a:9) excavated a 5x5 foot test excavation in the center of site pp2, a mound close to the monument's staff housing area. He dug until bedrock was encountered at 50 to 55 inches below the ground surface, but found only slabs of quartzite and sandstone, three fragments of worked catlinite, a utilized jasper flake, two river cobbles, and modern trash. He concluded that the mound was a refuse pile. He also assigned site numbers pp6 to an apparent mound east of the Union Quarry pit and pp17 to a mound near the former "Peace" monument location. He did not excavate in either feature, but concluded that pp6 was probably a pile of quarry debris and suggested, on the basis of oral history, that pp17 was the grave of a deceased former student of the Pipestone Indian School.

Of the seven possible mounds documented during the 1997-1998 inventory effort (Localities 17, 33, 35-38) the authors are comfortable with identifying only two (Localities 17 and 33) as probable mounds. Locality 17 is certainly a cultural feature, although it appears to be of late nineteenth or early twentieth century construction. Only one mound (Locality 33) currently exists that may be one identified by Holmes (1919). Locality 14, the mound observed by Catlin in 1836 and called the "Jumper's" mound by Brower, appears to have been a true burial mound, judging from statements about its contents by Charles H. Bennett, who excavated and effectively destroyed the feature. This mound is no longer visible and its precise location is unknown.

The other mounds should be categorized as mound candidates. They are heaps of earth, but their origin is open to question. Only excavation will answer the question as to whether they are human and prehistoric in origin or if they are the product of natural processes of bioturbation.[2] Norris (Thomas 1894; Appendix B) faced essentially the same questions when he dug into several of the mounds that once dotted the area, as did Charles Bennett in the late nineteenth and early twentieth centuries. With one or two exceptions the early excavations failed to determine the mounds' origins with any degree of finality. Yet the mounds are mentioned as a cultural component of the Pipestone quarries beginning with some of the earliest visitors. They remain as enigmatic today as they were to those early travelers and explorers of southwest Minnesota.

The fourth subsite type is represented by the stone circle locales. Stone circles or "tipi rings" remain another of the monument's archeological enigmas. Circular alignments of stones are a common archeological feature of the Northern Plains and are believed to have functioned as weights to hold hide and cloth tipi coverings in place (Finnigan 1982; Brasser 1982; Davis 1983; Quigg and Brumley 1984; Banks and Snortland 1995). Stone circles and other stone alignments, though not numerous, have long been noted in western Minnesota, eastern South Dakota, and northwestern Iowa (Lewis 1889c, 1890, 1891; Hudak 1972). Today they are a rare type of archeological feature in the upper Midwest, possibly because, in part, of the long-term destructive effects of agriculture.

Stone circles are reported to have once been extremely abundant near the quarries. Early Pipestone resident Charles H. Bennett, in an address on July 4, 1878, stated that "hundreds upon hundreds" of stone circles once existed in the vicinity (Rose 1911:245, 262; see also Chapter 6, this volume). In 1892 Holmes (1919:254) mapped over 300 stone circles near the quarry pits. Yet only three possible stone circles (Localities 16d, 32, and 40) were identified during the archeological inventory investigations of the 1990s. Bioturbation may have destroyed or buried many of the circles over the last 100 or so years, and, of course, many of the individual stones may have been carried off for other purposes such as quarrying and building construction. When the monument was visited by archeologist Gordon Baldwin in 1949, 58 years after Holmes' visit, he reported observing "an excellent series" of eight to 10 stone circles northeast of what was then the monument boundary (Memorandum to the Regional Historian, January 25, 1949, in "Archeology outside MRB Minnesota file at the Midwest Archeological Center). His successor, Paul Beaubien, eventually reported these as only four "broken" circles (Beaubien 1949:11; 1955:12; 1957:7; 1983:43), which Sigstad (1970a:8) was unable to relocate during his 1965 survey.

[9]There is a growing literature on mound-like landscape features that are the result of natural processes (cf. Scheffer 1947; Quinn 1961; Ross et al. 1968; Aten and Bolich 1981; Davis 1982; Cox 1984; O'Brien et al. 1989; Johnson et al. 1999; and others). They are often called Mima, prairie, or pimple mounds.

The archeological stone circles recorded to date, suggest that the circular rock alignments themselves are a very subtle form of cultural feature. Many are likely buried in the sod and soil that has built up in the years since Holmes mapped them with his plane table and alidade to essentially obscure these subtle features. If this supposition is correct then many more stone circle features lie buried just beneath the sod of Pipestone National Monument and care should be taken to ensure that any surface disturbing activities do not inadvertently impact a buried stone circle or any associated artifacts.

The monument might easily be described as a very large dispersed lithic scatter. This fifth subsite type is the most common type of archeological manifestation to be presently found in the monument. In the course of the various inventory efforts within the Monument sixteen subsites or localities were identified as discrete lithic scatters. The parkwide inventory effort has suggested that Localities 4, 21, 22, and 29 be considered a single large lithic scatter/workshop/campsite located at the base of the Sioux quartzite ledge east of the visitor center. Localities 13, 15, 16, and 18 likewise should be considered as a large occupation area located on the north side of the interpretive loop trail and north of Pipestone Creek. It may also be advisable to consider the bench or terrace on the west side of the monument as one large prehistoric occupation area. There are six identified localities on the terrace and numerous isolated artifact finds. Both the localities and the isolated finds include lithic debris from tool maintenance as well as processed catlinite. Given the extent of bioturbation observed in the monument it may well be that any given surface manifestation of lithic debris or catlinite pieces, especially on the western terrace, is simply what is visible at any given moment and does not reflect the true extent or complexity of artifact distribution throughout the monument. For management purposes it is appropriate to continue to identify and plot isolated artifact finds as they appear. Over time the distribution of find plots may provide more insight into the true nature and extent of the prehistoric occupation of the monument and allow for discrete sites to be defined in terms of area, age, and function to a greater degree than can be accomplished with the information collected to date.

Another subsite type is represented by the possible tool sharpening grooves observed at Locality 43. Grooves like these, presumed to be the result of ground stone tool modification activities, are not common in the upper Midwest.

The final subsite type are features that are historic in age. This subsite type includes the Nicollet inscription and other historic and modern graffiti as discussed below. Other historic localities that may be included in this category, but were not a part of the park-wide inventory effort, include the historic railroad grade, the site of the railroad water tank (no evidence of it was seen during the current inventory work), abandoned roads and trails, and other more recent features relating to the use of the quarries and development of the monument's infrastructure. Since several of these features were not over 50 years old at the time of the field work they were not included. However, as they reach that

magical age and become "historic" in nature, documentation of their extent and condition would be appropriate. It may not be necessary to preserve the features in toto, but recordation will be a means to document their role in the history of Pipestone National Monument.

Historic and more recent graffiti are to be found at various places within the monument. The Nicollet inscription and other late 19th century and 20th century graffiti represent a tangible reminder of the long history of visitation to the quarries. Only the Nicollet inscription was recorded during this inventory effort as a subsite or locality. The later visitor graffiti may not warrant detailed recording as archeological subsites, but photographs or sketches of the inscriptions as well as a GPS coordinate location for each should be recorded in order to preserve the information as part of the monument's visitation history.

ANALYSIS OF SELECTED ARTIFACT CATEGORIES

Introduction

The Midwest Archeological Center houses and curates all or portions of 31 archeological and archeologically-related collections (e.g., stone samples) from Pipestone National Monument. The accession numbers, year in which the collections were made, and investigator responsible for making them are identified in Table 14. Small portions of several of these collections, principally those artifacts with value for exhibits or other public interpretation purposes, have been retained at the monument. Collections made before the establishment of the Midwest Archeological Center in 1969 were stored at the monument until their transfer to the Center sometime after that year. As part of the SAIP inventory program, the collections were reviewed and evaluated. Since several of them had become mixed over the years-particularly those made by Beaubien and Sigstad-the collections were re-sorted and cataloged in 1997 and 1998, and some of the collections were subdivided to better maintain their physical cohesion and integrity. Currently (2004), 31 collections and subdivisions of collections are curated at the Midwest Archeological Center (Table 14). Although not fully cataloged at present (e.g., the very large Gundersen stone sample collection, received in 2002, has not yet been reorganized and cataloged), the monument collections at the Midwest Archeological Center comprise well over 11,000 individual artifacts, specimens, and associated archival records.

Certain of the collections-notably those made by Paul Beaubien in 1949 and by John Sigstad in 1965 and 1966-retain exceptional research value. For example, Beaubien's 1949 collection (MWAC-53a/PIPE-171) contains more than 90 percent of all of the prehistoric pottery found at the monument to date. It also represents the most thoroughly documented of the three episodes of quarry pit excavation that have occurred in the past, although admittedly little was found in the way of artifacts. Sigstad's 1965 and 1966 collections (MWAC-54a/PIPE-172 and MWAC-54b/PIPE-172) represent the first monument-wide, systematic archeological inventory effort, and the second episode of quarry pit excavations. Moreover, another Sigstad collection (MWAC-120/PIPE-172) contains powdered catlinite residues that Sigstad used for many of his neutron activation analysis assays, and thus represents the potential for similar compositional studies in the future with neutron activation analysis or other methods performed on the same samples. Gundersen's catlinite and pipestone specimen collection (MWAC-1000/PIPE-191) is an outstanding resource for future compositional studies, including, in particular, studies designed to explore the mineralogical variability within the several catlinite beds at the monument. It includes catlinite samples from most of the numbered quarry pits in the monument, plus chips from the 1979 and 1980 drilling projects conducted by the U.S. Geological Survey and the Minnesota Geological Survey. Apart from serving the needs of carefully formulated future compositional studies, the Gundersen catlinite samples from the monument should be maintained as a relatively comprehensive index collection of catlinite samples from many documented locations.

Table 14. Pipestone National Monument archeological collections at the Midwest Archeological Center.

MWAC	PIPE	Year Made	Investigator
53a	171	1949	Paul L. Beaubien
53b	171	Unknown	Unknown
53c	171	1949	PIPE superintendent
54a	172	1965	John S. Sigstad
54b	172	1965	John S. Sigstad? (Possibly collected by Superintendent Lynch, photographed by Beaubien, restudied by Sigstad,and intermixed with Sigstad's collection.)
55	173	1973	Wilfred M. Husted
56	173	1970	Unknown
57	173	1971	Roy W. Reaves, III
58	173	1974	Unknown
59	173	1981	Mark J. Lynott
60	173	1981	Thomas D. Thiessen
120	172	1967	John S. Sigstad
200	174	1982	Robert K. Nickel
268	183	Unknown	Unknown
507	176	1993	Caven P. Clark
557	177	1994	Jeffrey J. Richer
562	--	1994?	Temporary accession returned to PIPE
583	178	1994	Timothy Gillen
588	179	1994	Thomas D. Thiessen
639	184	1966	John S. Sigstad
640	185	1987	Susan Monk
641	--	Unknown	Number no longer in use

Table14. Concluded

MWAC	PIPE	Year Made	Investigator
642	180	1960	John S. Sigstad
704a	181	1997	Douglas D. Scott and Thomas D. Thiessen
704b	181	1997	Douglas D. Scott
704c	181	1998	Douglas D. Scott and Thomas D. Thiessen
729	182	1997	Scott Stadler
781	186	1995	PIPE staff
783	187	1993	PIPE staff
946	188	2001	Thomas D. Thiessen
1000	191	Unknown	James N. Gundersen

Last updated: August 19, 2003, by Karin M. Roberts

Many of the collections consist of one or a very few artifacts collected at various times (e.g., MWAC-55/PIPE-173), and some consist only of notes and/or photographs made by monument staff or visiting archeologists (MWAC-946/PIPE-188 is an example). Some collections are problematic and their significance cannot be explained at present, as in the example of MWAC-268/PIPE-183 which presumably relates to a site assigned a field number of 21PP23. The number presumably would indicate that the site represents an extension of the field number series assigned by Sigstad, but the investigator is unknown and no completed site form (official or unofficial) for site 21PP23 in the monument is known to exist.

Chipped Stone Artifacts

The stone tool collection can be divided into two gross categories of chipped-stone tools and waste debitage, and worked catlinite. The bulk of the chipped stone includes a large variety of cherts, chalcedony, and quartzite, including the locally available Sioux quartzite. Lithic raw material types and sources have been reviewed for Minnesota by Bakken (1999) and for Iowa by Morrow (1994). Tools range from projectile points and scrapers to utilized flakes. Waste flakes or debitage, which are the by-products of the manufacture or resharpening of stone tools, are the most numerous form of chipped stone.

Formal chipped stone tools include projectile points, bifaces and biface fragments, and unifacial scraping tools. Sioux quartzite is ubiquitous since its source is immediately present at and near the catlinite quarries. Bakken (1999:63) has noted that Sioux quartzite exhibits poor flake morphology in artifact form. Consequently, it probably was not often used for activities other than for expedient pounding and bashing, which do not require much alteration of raw material into patterned tools. Much of the chipped stone was obtained from secondary sources, probably originating in stream beds or glacial features where the individual pieces were subject to natural weathering processes. The only identified non-local raw materials include plate chalcedony from western South Dakota, where it occurs over a wide area including the Badlands and Black Hills, and Knife River flint (KRF) from North Dakota (Ahler 1977). A brown translucent chert frequently misidentified as KRF is believed to originate in northern Ontario, north of Lake Superior (Griffin and Quimby 1961:98). Steinbring (1974:68-70), in his discussion of Pickerel Lake site artifacts from Quetico Provincial Park, suggests that the "pre-Cambrian algal domes in the vicinity of Schreiber, Ontario, northeast of Thunder Bay, might well yield comparable variations." Indeed, chemical characterization of some of the KRF mimics by Julig et al. (1989) indicates that much of what has been identified as KRF clusters more closely with the Hudson Bay Lowland Chert samples than with KRF.

The discussion that follows focuses on two kinds of prehistoric artifact classes from which chronological implications may be derived, projectile points and pottery.

Projectile Point Typology

The 1997 and 1998 field investigations of Pipestone recovered 12 projectile

points or point fragments. These projectile points are described and typed according to the regional typology. All fit within known regional types and show no significant variation from those types. Since the projectile point finds were either surface finds or found in test excavations with no evident stratigraphic association, dating relies entirely on dates determined from other archeological contexts in the region. At best this associative dating technique can only provide a probable range of dates of use for these projectile points and thus for their presence at Pipestone. Useful summaries of projectile point typology are provided by Morrow (1984), Higginbottom (1996), and Boszhardt (2003). Seventeen projectile points, representing various episodes of archeological investigation, are illustrated in Figure 18.

There is one stemmed projectile point and a possible base fragment in the collection. The complete point is catalog number 3240 (surface find; Figure 18). It is a medium-sized point (42mm long and 22mm wide) with moderate shoulder development and a tapering but slightly rounded stem made of a yellowish chert. The blade is overall triangular in shape with slightly sloping shoulders. It is most similar in style to a Waubesa point or a large Lost Island type point (Morrow 1984:53-54; Higginbottom 1996; Boszhardt 2003:62-63). These are common Early and Middle Woodland era types and are commonly found in Iowa and Minnesota. They date from approximately 500 B.C. to 500 A.D. The possible base fragment (catalog number 3326) is a biface made of gray chert from the Richner Site (Test Unit 1/0-10 cm), that may represent another stemmed projectile point. However, not enough remains to be confident of its attribution.

The majority of the projectile point collection, seven specimens, are of the side-notched variety. Four, catalog numbers 3223 (surface find), 3350 (Richner Site Test Unit 2/10-20cm), 3260 (surface find), and 3396 (Richner Site Test Unit 5/10-20cm), have shallow but wide side-notches with slightly rounded basal ears and are made of mottled gray chert, red quartzite, gray chert, and gray quartzite (Sioux) respectively. Specimens 3223 and 3260 have long blade lengths compared to widths. Both blades tend to parallel sides, but 3223 is somewhat more rounded than the remaining segment of 3260. The complete specimen, 3223, is 38mm long and 18mm wide. The incomplete specimen is 19mm wide but broken at the mid-section. Specimen 3350 is the base, notches, and ears only. This point type is consistent with the Matanzas point that dates to the Late Archaic period, approximately 3000 to 1000 B.C. (Morrow 1984:65; Boszhardt 2003:49-50).

The other three side-notched points (specimens 3221 [surface], 3217 [surface], and 3292 [from the surface of the Richner Site]) are made of gray chert, black chert, and gray quartzite (Sioux) respectively. Specimens 3221 and 3217 are complete while 3292 is broken at the mid-section. They were all surface finds. These points are of medium size (ranging from 42mm long to 28mm long and are 26mm [2] and 17mm wide). They are broad blades with convex sides. The shoulders are weak with shallow side notches and small, slightly rounded ears. These points appear to be consistent with the Besant type that date from Late Archaic to Middle Woodland time periods (Morrow 1984:66; Higginbottom 1996). The Besant complex is considered to be a Late Archaic to Middle Woodland

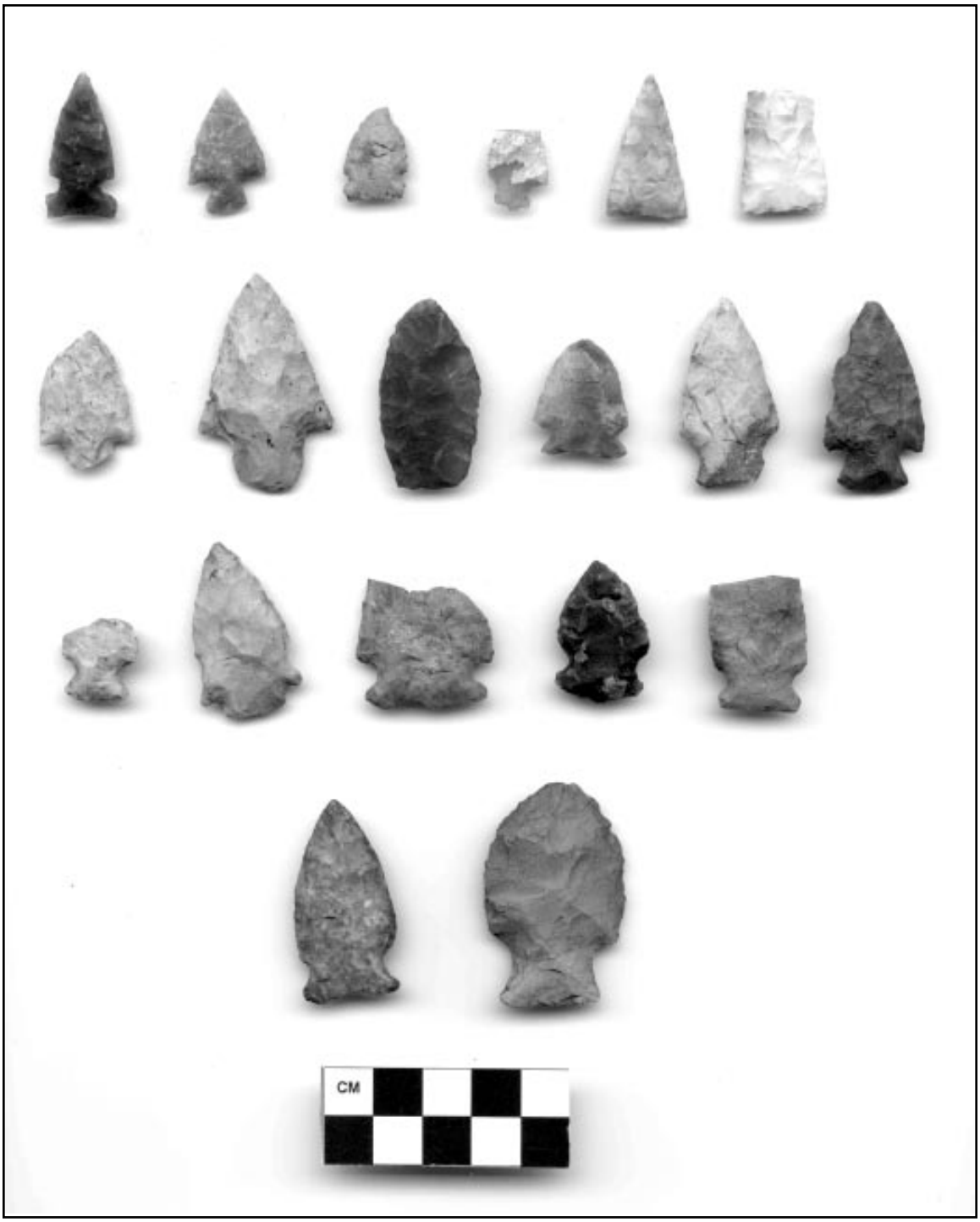

Figure 18. Projectile points from various episodes of archeological investigations at Pipestone National Monument. Top row, left to right: Nos. 2444 (Sigstad site pp16); 3265 (Richner Site, locality 31); 3376 (Richner Site, locality 31); 2359 (Sigstad site pp16); 3114 (isolated find, West Ridge area); and 3216 (Richner Site, locality 31). Second row, left to right: Nos. 3103 (locality 24); 3240 (Richner Site, locality 31); 3211 (Richner Site, locality 31); 3111 (isolated find, West Ridge area); 2424 (Sigstad site pp16); and 3095 (locality 23). Third row, left to right: 3102 (locality 24); 2070 (location unknown, collected by Beaubien); 3292 (Richner Site, locality 31); 3217 (locality 16); and 3260 (locality 32). Fourth row, left to right: Nos. 3223 (locality 16) and 3221 (locality 16).

Plains adaptation. It essentially represents groups of people following a nomadic Archaic lifeway, but with cultural elements of Woodland peoples, such as pottery and mound burials, being added through time. Besant peoples ranged over a wide area of the northern Great Plains in both time and space (Frison 1998:146-148; Johnson and Johnson 1998:218-225; Frison et al. 1996:24-26).

The last three points are all small arrow-type projectile points. Specimen 3216 (a surface find) is the base and mid-section of a triangular point, a surface find, made of white chert. The point base is 16mm wide and is nearly straight. Since the point is incomplete it is difficult to type, but it is probably post-Woodland and likely Late Prehistoric in age, about A.D. 800-1700 (Morrow 1984:80-82). Specimen 3376 is a small triangular side-notched point of yellow quartzite which was found in Test Unit 3 (30-40cm) at the Richner Site. It is 13mm long and 10mm wide and has small notches worked into the sides. The base is straight and the sides are very slightly convex. It is consistent with a Des Moines style point that dates to the Late Woodland and Late Prehistoric periods or about A.D. 500-1500 (Morrow 1984:83). Specimen 3265 is a corner-notched point made of gray quartzite and was found on the surface of the Richner Site. It is 24mm long and 13mm wide with the blade tending to convex sides and is triangular in outline. The shoulders are slightly barbed and the base is slightly convex. This type is consistent with the Koster Point (Morrow 1984:78; Higginbottom 1996; Boszhardt 2003:73-74) that dates to the Late Woodland period from about A.D. 600 to 900.

The 12 projectile points recovered during the 1997 and 1998 investigations date from the Late Archaic period to the Late Prehistoric periods of occupation of the region. They are consistent in style with other points found in the region and there appear to be no previously unknown exotic manufacturing materials present. Most of the stone used to make the projectile points are locally available types.

A comparison of the recent inventory projectile point finds with those recovered by Beaubien (1957) and Sigstad (1970a) was made to ascertain if there were other types present that are not represented in the latest collection. Sigstad (1970a) did not type nor illustrate the projectile points he found. He does provide a descriptive table (Sigstad 1970a:Table 5, 47) of his finds. MWAC houses most of Sigstad's collection for PIPE. The collection records were reviewed and the projectile points and projectile point fragments were reanalyzed. Sigstad (1970a:47) lists 15 projectile points in Table 5. Only four of the pieces in the collection at MWAC could be definitively correlated with Sigstad's Table 5 list among the 10 found in the collection. The four were all recovered during Sigstad's work at Locality 16. Sigstad (1970a) concluded the site was a workshop or a temporary camp. The site also included an area Sigstad interpreted to be the remains of a sweat lodge.

Reanalysis of the available points and point fragments was undertaken as Sigstad had not typed the material he found, and there have been a number of refinements in the dating of projectile point types in the last thirty odd years. Catalog numbers 2376, 2400, and 2484

are point fragments made of gray chert, gray quartzite, and tan chert respectively. The first two are point tip fragments and the third is a midsection. Specimens 2314 and 2349 are listed in Sigstad's Table 5 (1970a:47). Specimen 2314 is a Knife River Flint biface with convex sides that is incomplete. It appears to be the tip of a projectile point. Specimen 2349 is a leaf-shaped biface of brown chert. It is 28mm long and 16mm wide. Sigstad (1970a:47) considered this a leaf-shaped projectile point, although its characterization as a biface is more accurate.

The other two projectile points present in the MWAC-held PIPE collection that correlate to Sigstad's Table 5 list (1970a:47) are specimens 2424 and 2444. Specimen 2424 is a medium-sized tan chert projectile point with convex sides, shoulder side notches and a convex base. It is 39mm long and 22mm wide. The point is Turin-like (Morrow 1984:52) in appearance and probably dates to the Late Archaic period (ca 3500 to 2000 B.C.). The other point is 2444 which is a brown jasper or possibly Knife River Flint triangular-shaped point with well-developed side notches and concave base. It is 30mm long and 13mm wide. It appears to be a Reed or Haskell point that dates to the Late Prehistoric period (Morrow 1984:82, 84; Boszhardt 2003:73-74).

Three incomplete specimens (2359, 2388, and 2410) were also recovered by Sigstad at Locality 16. Specimen 2359 is a small corner-notched and midsection of a point made of tan chert. The notching is deep on one side and shallow on the other with a convex base. The sides appear straight. The point is incomplete enough to defy typing, but it appears to be Late Woodland to Late Prehistoric in age. Specimen 2388 is the base of a mottled pink and white chert side-notched point. It appears similar to the Des Moines Point style (Morrow 1984:83), which is Late Prehistoric in age dating A.D. 500 to 1500. Specimen 2410 is a convex base of gray chert. It is too incomplete to type.

Beaubien (1955:Photos No. 30, 31; 1983:Figures 32, 33) illustrates 15 projectile points he recovered at the Leaping Rock sites (Localities 19 and 20) and 10 projectile points probably recovered by Superintendent Lyle Linch during trail construction. Only six of those points (three identified from each group) are in the MWAC-held PIPE collection. Those six projectile points were reanalyzed.

Leaping Rock (Localities 19 and 20) specimens 2026 and 2069 are both triangular point bases made of brown jasper or Knife River Flint and a gray mottled chert respectively. Neither can be specifically typed. They probably date to the Mississippian or Late Prehistoric period. The other Localities 19-20 point (catalog number 2070) is a corner-notched point of white chert. It is 36mm long and 21mm wide with shallow notches creating a short straight stem. The shoulders are slightly barbed and the outline is overall triangular. The point is similar in form to many Early to Middle Woodland period projectile points. While it is a bit risky to type projectile points from photographs alone, the other eleven points in Beaubien's Photo No. 30 (1955; 1983:Figure 32) from Localities 19 and 20 appear to be Matanzas or Lost Island, Wabesa, Des Moines, and possibly Klunk types (Morrow 1984; Higginbottom 1996; Boszhardt 2003). These types date from the Late Archaic to Late Prehistoric periods in the area.

The other three projectile points are illustrated in Photo No. 31 (Beaubien 1955; 1983:Figure 33) as part of a group of points found during trail construction. Specimen 2536 is a stemmed point made of a yellow-tan chert and is 88mm long and 34mm wide. This a large point with pronounced and slightly barbed shoulders. The stem is narrow and straight with the blade roughly lanceolate in shape. The point is consistent with the Robbins style of the Early Woodland period, 1000-1 B.C. (Morrow 1984:48; Higginbottom 1996). Specimen 2540 is also a yellow-tan chert stemmed point and is 40mm long and 30mm wide. This is a medium-sized point with broad shoulders and a contracting straight-based stem. The point is triangular in outline and is consistent with the Dickson style point that dates to the Middle Woodland period, 500 B.C. to A.D. 350 (Morrow 1984:51; Higginbottom 1996). The final point, specimen 2551, is a medium-sized, 50mm long, and 33mm wide point. It is a brown to tan chert with serrated edges. It has a broad triangular shape with shallow notching and an expanding stem and a slightly convex base. It is consistent with the Union type point of the Middle Woodland period, A.D. 1-500 (Morrow 1984:41). The other points in Photo No. 31 (Beaubien 1955; 1983:33) appear to be Robbins, Kramer, and possibly Besant types (Morrow 1984; Higginbottom 1996).

Clark (1996) recovered several projectile points and point fragments during his post-burn inventory project. He did not assign site numbers to his finds, considering them instead to be isolated finds located in general localities. Clark's PIPE93-1 locality yielded one complete reddish chert expanding-stem point with a subconvex base and barbed shoulders (Clark 1996:5). Locality PIPE93-2 (Clark 1996:6) yielded a fragment of another expanding-stem projectile point and a second nearly complete point with evidence of barbed shoulders, although the base was broken. PIPE1993-3 (Clark 1996:7) had one well-made point with an expanding stem and bilateral notching, while locality PIPE1993-5 yielded a point midsection, and find spot PIPE1993-10 yielded a triangular arrow point. The projectile point forms are typical of those found in and around Pipestone and southwestern Minnesota. The arrow points fall well within the Late Prehistoric period and the other points could date from the Late Archaic through the Woodland eras of occupation.

The stone raw material types used for the projectile points as well as the lithic debitage noted by Clark (1996:15-20) are typical of those noted in all the other archeological investigations at the monument. Most of the material consists of local varieties of cherts and Sioux quartzite. Non-local materials observed include Knife River Flint, a similar brown translucent chert of similar appearance believed to originate in Canada, and some chalcedony of types commonly found in western North Dakota. In essence, the lithic materials recovered by Clark (1996), and specifically the projectile points, confirm the findings of other researchers, but offer no new dating or feature associations to aid in refining our understanding of the prehistoric human use of the land that is now Pipestone National Monument.

Relative Dating Based on Projectile Points

The absence of absolute dates from archeological contexts in the monument requires that associative dating or relative dating be used. Most of the projectile points recovered in the monument, both on the surface and in excavated contexts can be typed to style and thus have an established datable range of use.

Paul Beaubien's (1955; 1957; 1983) archeological investigations in PIPE yielded a variety of projectile points, the majority found in the Leaping Rock site excavations. The projectile point types represented in Beaubien's report indicate a human use of Pipestone extending from the Late Archaic period to the Late Prehistoric as well as into the contact and modern periods. In real terms the dates of human use represented by the projectile points found by Beaubien are 1000 B.C. to A.D. 1700. By 1700 stone projectile points were replaced by iron arrowheads that were readily available through local trade networks with the Euroamericans.

John Sigstad's (1970a) investigations also yielded a variety of projectile points, primarily from Locality 16. Those points also suggest a human use of Pipestone that ranges from about 1000 B.C. to A. D. 1700.

The recent monument-wide inventory yielded only 12 projectile points and only four of those were from excavated contexts, all from the Richner Site. But once again the date range established by this small series suggests human use of the area from the Late Archaic through the Late Prehistoric periods. Given that the modern archeological investigations of the monument are spread over a fifty year period there is a remarkable consistency in the range of projectile point styles and dates from the twentieth century archeological investigations. Each project has recovered generally similar types of lithic materials suggesting that those making and depositing the tools used local sources and raw materials found in the glacial drift deposits as their stone of choice. The only consistently reoccurring non-local material is identified as Knife River Flint, although a similar Ontario type cannot be ruled out.

In looking beyond the boundaries of Pipestone there is nothing remarkable in the archeological lithic record of the monument to differentiate it from that of the surrounding region. The prehistoric humans who used Pipestone may have begun to do so as early as the Late Archaic period of 3,000 years ago and continued on a sporadic basis until the present. There appear to be no long term habitation sites or villages at or near Pipestone. The area seems to have been used for temporary camps for hunting and other resource extraction activities, like that of catlinite quarrying. The cultural sequence and site types recorded in the archeological record are typical of the area in general for western Minnesota, eastern South Dakota, and northwestern Iowa (Anfinson 1997; Winham 1990; Aufderheide et al. 1994; Benn 1990a; Alex 2000). The projectile point styles do not reflect any evidence of non-local groups regularly using the area; rather they suggest that regionally-based people used the Pipestone locale repeatedly over a long period of time, at least 3,000 years, albeit on a temporary basis.

Prehistoric Pottery

Pottery is an extremely plastic medium for artists and craftsmen in all cultures that make and utilize ceramic vessels. It can be formed into many different shapes and decorated in a myriad of ways to achieve highly individualistic-or highly uniform-products. In nonliterate societies, pottery-making practices are handed down from generation to generation and are transmitted orally and by demonstration from skilled practitioners to novices. In this way, traditions of pottery making-i.e., accepted ways of making and decorating ceramic vessels-are maintained through time within individual cultures. Innovation and change within such pottery-making traditions occur, of course, but on the whole the knowledge of crafting pottery in certain ways persists. It is this continuity of knowledge and practice that provides archeologists with a valuable tool to distinguish one prehistoric culture from another largely on the basis of the pottery remnants that survive, usually in the form of pieces of broken vessels. By examining the range of variation exhibited in the manner of construction, temper, shape, size, and decorative styles within assemblages of potsherds, archeologists have developed elaborate classifications that allow comparisons between such assemblages.

Prehistoric pottery has been found in 10 locations within Pipestone National Monument (Table 15). Although the reports of these finds indicate that the recovered sherds total approximately 435, nearly 700 sherds today exist in the Pipestone collections that are housed at the monument and the Midwest Archeological Center. Several reasons probably account for this discrepancy, including breakage during handling and storage, differences in how sherds have been counted by various researchers, and inclusion of sherds not from Pipestone (Anfinson 1998:4). Ten sherds are on permanent display in the monument's visitor center. Five sherds bearing decoration suggestive of Middle Woodland times are illustrated in Figure 19.

Paul L. Beaubien and John S. Sigstad, who recovered most of this pottery, discussed the pottery types represented in this assemblage, but did not attempt to describe the sherds individually or analyze them in detail. Their reports were published more than 45 and 30 years ago, respectively. Consequently, the conclusions they based on the collective Pipestone pottery assemblage are out of date in terms of later archeological research conducted in regions surrounding the monument. To gain a more up-to-date perspective on the Pipestone pottery assemblage and what it can tell us about who lived at or visited the quarries in the past, and when this happened, arrangements were made for three researchers to independently assess the assemblage. Each researcher was chosen because of his expertise in the archeology of a particular nearby region. Dale R. Henning is a researcher of long standing on Oneota complexes in Iowa, as well as other late prehistoric complexes in the western Prairie Peninsula region. In his dissertation research, Scott Anfinson (1987; 1997) revised the culture-historical taxonomy for a region that he terms the Prairie Lake Region, comprised of most of southwestern Minnesota and adjacent portions of Iowa and South Dakota.

Figure 19. Late Middle Woodland pottery from Pipestone National Monument. Top row, left to right: Nos. 3201 (Picnic Site, localities 4/21/28/29) and 3205 (Picnic Site, localities 4/21/28/29). Bottom row, left to right: Nos. 2126, 2133, and 2135, probably all from Beaubien's Leaping Rock sites (localities 19 and 20).

Table 15. Locations at Pipestone National Monument where prehistoric ceramics have been found.

Site	No. of sherds	Context	Reference
PP13	2	Surface of gopher backsoil	Sigstad 1970:15
Near PP13 and PP15	1	Surface	Husted 1973
PP16	7	Surface of gopher backsoil	Sigstad 1870:16
PP16 South	2	Excavated from secondary fill over concrete slab	Sigstad 1970:19
PP19 Leaping Rock #1	“more than 40”	Screened from fill removed for trail construction	Beaubien 1955:24; 1957:11-12
PP20 Leaping Rock #2	“approximately 350”	Excavated from presumed disturbed context	Beaubien 1955:27; 1957:12
PP21 Picnic Area North	1	Surface of gopher backsoil	Sigstad 1970:24
PP22 Beaubien’s Picnic Area	“some 30”	Excavated	Beaubien 1955:23; 1957:11
1994-3 Richner site	2	Surface	This volume
Isolated find	1	Ca. 10 inches below surface in east wall of quarry space 80	This volume

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The Prairie Lake Region extends to within 20 miles to the north of the catlinite quarries. Craig M. Johnson (1996) has completed a comprehensive review of Native American archeological complexes in the Middle Missouri Subarea, a large region straddling most of the Missouri River valley in the Dakotas and extending as far east as northwestern Iowa. Each of these scholars brought his unique regional archeological knowledge and perspective to bear on the interpretation of the pottery from Pipestone National Monument (Henning 1998c; Johnson 1998; Anfinson 1998).

The largest portion of the Pipestone pottery resulted from 1949 excavations by Paul Beaubien in three locations: Leaping Rock Site No. 1 (Locality 19), Leaping Rock Site No. 2 (Locality 20), and the Picnic Area site (Locality 22). Though exact counts are not presented in his report (Beaubien 1955, 1957, 1983), approximately 420 sherds were recovered at these three locations. Investigations by Sigstad and later researchers have added only 15 more sherds to the Pipestone pottery collection.

Unfortunately neither Beaubien's field notes or artifact catalog have been located, so little information exists about the pottery excavated by him other than what appears in his report (Beaubien 1955, 1957, 1983). The potsherds bear individual field catalog numbers, but the catalog is not known to exist; consequently, Beaubien's large pottery assemblage cannot be sorted into lots representing original provenience associations within the monument. This is particularly unfortunate, as Beaubien's assemblage accounts for more than 90 percent of the potsherds that have been found in the monument. Anfinson (1998:5-6) postulated a provenience scheme based on single-digit prefix numbers that appear as part of the numbering system used by Beaubien. However, correlation of Beaubien's catalog numbers with proveniences stated in the captions of artifact photographs that appear in Beaubien's 1955 manuscript report does not support Anfinson's interpretation (notes by Ann C. Bauermeister, on file, Midwest Archeological Center; Johnson 1998:17).

The only pottery from Pipestone National Monument that can be associated with specific locales within the monument with any degree of reliability (see Table 15) are the 12 sherds collected by Sigstad, the single sherd collected by Husted, the two sherds collected from the Richner site, some of the sherds illustrated by Beaubien (1955: Photos No. 13-17; 1983:Figures 15-19; notes by Ann C. Bauermeister, on file, Midwest Archeological Center), and a single rim sherd found by Chief Ranger Glen Livermont found on October 21, 2001, while removing the soil overburden in the east face of quarry space 80 in the northern quarry line (memorandum from Livermont to Thiessen, November 2, 2001).[1] Livermont's discovery (PIPE accession 190) appears to be a Late Prehistoric Initial Middle Missouri sherd and is, as far as we know, the only prehistoric sherd found in close proximity to the actual quar-

[1]Beaubien's pottery photographs do not appear in his published report (Beaubien 1957), but accompany his 1955 draft manuscript and are reproduced in the 1983 republication of his report (Beaubien's Figures 15-19 in Woolworth 1983, pp. 53-54).

ries. The captions of Beaubien's pottery photographs preserve much of what little information has survived about the provenience of those artifacts.

Although the three analysts do not agree in all respects about details of the Pipestone pottery assemblage, such as the nomenclature of pottery types represented, they do agree remarkably closely in many of their conclusions. An approximate concordance of their typological conclusions is presented in Table 16, and Table 17 presents a crude comparison of their dateable pottery lumped into general time periods.

Though their terminology differs somewhat according to their regional taxonomic perspective, all three agree that the earliest pottery yet found within the monument dates to what are generally regarded as Middle Woodland times, a period that lasted from the last few centuries B.C. to possibly as late as AD 500 or 700 (Johnson 1998:5-7, 11, 18; Anfinson 1998:10-11, 12, 15; Henning 1998c:i, 3, 6). Pottery of this age is represented by only a relative handful of sherds, including 12 or 13 body sherds that exhibit a form of decoration or surface finish called rocker-stamping or roulette-stamping (Figure 19). Rocker-stamping is a treatment characteristic that is more common in northeastern Iowa (Logan 1976) but is absent or rare in southwestern Minnesota (Anfinson 1998:15, 17; Johnson 1998:11; Henning 1998c:13). Two rim or near-rim sherds (nos. 1072 and either 5/337 or 5/332) are classified as Fox Lake Horizontal Cordmarked by Anfinson (1998:11), while only one of these sherds is so classified by Johnson (1998:6). Johnson (1998:7, Table A.3), however, assigns the other sherd to the type Arthur Cord Roughened, which he regards as coeval with the later part of the Fox Lake Phase in which Fox Lake ceramics are found, perhaps dating to ca. AD 500 or later. Sherd no. 1072 is regarded by Henning (1998c:3, Table 2) as being of Late Middle Woodland age, though he declines to assign a type name to it. It was collected from the Richner site locality in 1997 and is one of the few clues to the age of that site (see discussion of the Richner site elsewhere in this volume). The other sherd was collected by Beaubien and its provenience within the monument is not known.

Anfinson (1998:18), Johnson (1998:18), and Henning (1998c:15-16) caution that the fact that Middle Woodland pottery has been found within the monument does not necessarily mean that Middle Woodland people visited the locale for the purpose of quarrying catlinite. They may have been present for other purposes, such as hunting or temporary camping in the shelter of the quartzite ledge. Ultimately, the answer to the question of when catlinite extraction began may be answered best with data about confirmed catlinite artifacts from dated cultural contexts outside the monument. It is interesting to note that pipes made of catlinite have recently been confirmed from early and Middle Woodland contexts in Wisconsin (Boszhardt and Gundersen 2003) and a Middle Woodland Hopewell context in Ohio (Emerson et al. 2005), suggesting that if Early and Middle Woodland peoples were not visiting the quarries to obtain catlinite, they were obtaining it through trade connections with other people.

Table 16. Concordance of classifications of prehistoric ceramics from Pipestone National Monument.

Pottery ware/type	Cultural taxon	Date	Beaubien	Sigstad	Anfinson	Henning	Johnson
Woodland (general)	Woodland tradition			x			
Late Middle Woodland (general)	Woodland tradition	200 BC-AD 500				x	
Late Woodland (general)	Woodland tradition	AD 500-800				x	
Randall Incised	“Upper Woodland”		x	x			x
Fox Lake Horizontal Cordmarked	Woodland Fox Lake Phase	200 BC-AD 700			x		x
Lake Benton Cordwrapped Stick Impressed	Woodland Lake Benton Phase	AD 700-1200			x		x
Lake Benton Vertical Cordmarked	Woodland Lake Benton Phase	AD 700-1200			x		x
Arthur Cord Roughened	Woodland	Late Fox Lake Phase					x
Loseke Ware, Missouri Bluffs Cord Impressed	Woodland				x		x
Foreman Plain	Initial Middle Missouri	AD 1000-1250	x		x	x	x
Chamberlain Incised Triangle	Great Oasis/Initial	AD 1000-1250	x				
Chamberlain Incised	Initial Middle Missouri			x	x	x	
Randall Plain	Initial Middle Missouri				x		
Mitchell Broad-trailed	Cambria/Initial Middle Missouri		x	x	x		
Cambria (general)	Cambria/Initial Middle Missouri			x			
Mitchell Modified Lip	Mill Creek/Initial Middle Missouri		x		x	x	x

Table 16. Concluded

Pottery ware/type	Cultural taxon	Date	Beaubien	Sigstad	Anfinson	Henning	Johnson
Great Oasis (general)	Great Oasis/Initial Middle Missouri			x			
Great Oasis High Rim Trailed*	Great Oasis/Initial Middle Missouri				x		
Great Oasis High Rim	Great Oasis/Initial Middle Missouri					x	
Great Oasis Incised	Great Oasis/Initial Middle	AD 1000-1250					x
Mill Creek (general)	Initial Middle Missouri			x			
Anderson Low Rim	Initial Middle Missouri			x		x	
Anderson Everted Rim	Initial Middle Missouri	AD 1000-1250					x
Anderson Tool Impressed	Initial Middle Missouri	AD 1000-1250					x
Anderson Plain	Initial Middle Missouri	AD 1000-1250					
Sanford Ware	Initial Middle Missouri			x			
Plains Village (general)	Plains Village tradition				x		
Oneota (general)	Oneota tradition	AD 1350-historic	x		x		
Allamakee Trailed	Oneota tradition	AD 1350-historic		x			
Correctionville Trailed	Oneota tradition	AD 1350-historic					x
Coalescent tradition	Coalescent tradition					x	
Talking Crow Indented	Post-Contact Coalescent	Historic					x

* Classified by Beaubien as Chamberlain Incised Triangle and by others as Chamberlain Incised.

Table 17. Comparison of Pipestone National Monument pottery attributed to general chronological periods by different analysts.

Time Period	Anfinson		Johnson		Henning	
	n	%	n	%	n	%
Middle (Initial) Woodland 500 BC - AD 500/700	2	1	2	3.8	1	2.2
Late Woodland AD 500/700 - AD 900/1200	29	17	23	43.4	5	10.9
Plains Village AD 900/1000 - AD 1300 or later	82	49	16	30.3	31	67.4
Oneota AD 1300 - AD 1700	56	33	4	7.5	6	13.0
Unclassified rimsherds			8	15.1	3	6.5

Based on data presented in Anfinson 1998; Johnson 1998; and Henning 1998. Anfinson's figures are based on counts of all datable rim and body sherds, while those of Johnson and Henning are based on rimsherds only. Henning's (1998:15) data on body sherds present a trend through time that is similar to his figures above.

From Table 17, one can see that all three analysts are in general agreement as to the relative frequencies of dateable pottery in the Pipestone ceramic assemblage. All three conclude that the earliest pottery is represented by a relatively small number of sherds attributable to the Middle Woodland period, perhaps AD 500/700 or earlier, followed by a notable increase in the number of sherds representing Late Woodland peoples. Two of the three analysts see this as being followed by a substantial increase in pottery of the Plains Woodland tradition; in contrast, Johnson notes a modest decrease in Plains Woodland pottery compared to that of the preceding Late Woodland period. All three agree that the frequency of Oneota pottery is substantially diminished from earlier Plains Village frequencies. These figures attest to the presence of successive prehistoric Native American peoples at the quarries from the Middle Woodland period to possibly as late as the advent of historic time (ca. AD 1700-1750?). This suggests that Native Americans have used the quarry locale, probably for multiple purposes, over much of the past two millennia.

One problem that the three pottery analysts were asked to address is the reputed presence of water-worn sherds in the pottery excavated by Beaubien in 1949 at the Leaping Rock No. 1 and 2 sites. In his report of this work, Beaubien (1955:27; 1957:12; 1983:49) noted that fragments of modern phonograph records were found at all levels of his two-feet-deep excavations and he asserted that many of the potsherds from the Leaping Rock sites were water-worn. He suggested that they had been washed down from their original location atop the ledge and redeposited about the base of the Leaping Rock.[2] Sigstad (1970a:28-29) accepted this conclusion uncritically. After examining all of the Pipestone pottery for evidence of water wear, including the nearly 400 sherds from Beaubien's two Leaping Rock sites (which are only a few yards apart), all three analysts found little evidence of sherds having been abraded by being tumbled in water. Anfinson (1998:15-16) and Johnson (1998:17) suggested that foot traffic and repeated re-use of the locale for various purposes contributed to the worn appearance of some of the sherds. Henning (1998c:2) attributed the slightly worn appearance of some sherds to zealous brushing and cleaning in the laboratory. Anfinson (1998:16) also suggested that some sherds were composed of a softer clay paste and were more susceptible of mechanical abrasion, while bioturbation likely caused the mixture of historic and prehistoric artifacts. It is notable that neither Beaubien, Sigstad, or more recent excavators at Pipestone National Monument have described any subsurface cultural stratigraphy; artifacts are reported as having been found at various depths not correlated with cultural strata. Bioturbation-the churning and mixing of soils through the actions of burrowing fauna-is a process that is recognized to affect the archeological record (Wood and Johnson 1978; Bocek 1992). It may be that decades, if not centuries, of bioturbation of

[2]Beaubien himself seems to have doubted this conclusion, as his unpublished manuscript report concludes with the sentence, "However, the limited area above the site seemed to preclude this latter theory" (of redeposition; Beaubien 1955:27). This statement does not appear in the published version of his report (Beaubien 1957, 1983).

the soil mantle in the monument, which in most places is less than 10 feet deep (3 meters), has eradicated most, if not all, evidence of cultural stratigraphy and has contributed to the worn or tumbled and abraded appearance of the sherds.

ROCK ART

Introduction

Among the diverse archeological resources of Pipestone National Monument are Native American petroglyphs, which are images or designs pecked into Sioux quartzite bedrock. In general, the petroglyphs at Pipestone have received little scientific attention, particularly during the twentieth century. They were recorded several times during the nineteenth century (Table 18) and the most complete record of them was published in 1911 (Winchell 1911:564 and Plate 8). In an early survey of Native American rock art in the United States, Julian H. Steward (1937:415-417) briefly mentioned the Pipestone petroglyphs and reproduced three glyphs selected from previously published drawings.

The petroglyphs at Pipestone are known from approximately 100 glyphs, or individual motifs, from three locales within the monument's boundary.[1] At two of these locales, the Noble and Derby petroglyphs (Localities 30 and 28, respectively), the images are in situ, just as they were created. The petroglyphs from the third locale, around the Three Maidens glacial boulders (Locality 1; see Figure 20), were removed from their original location late in the nineteenth century as a series of 35 or 36 Sioux quartzite slabs, each bearing one or more glyphs. Eighteen of the Three Maidens slabs are preserved at the monument today. As a result of repeated movement of the petroglyph-bearing quartzite slabs among different places in the Pipestone community over the years, some of the petroglyphs were lost. Most of the surviving petroglyphs laid on the grounds of the monument's visitor center for years until they were taken to more secure quarters within the visitor center in 1997. One additional slab is in the monument's museum collection, but it is not definitely known to have originated at the Three Maidens.

In addition to Native American rock art, the monument contains pecked graffiti in the form of the names and initials of early American visitors to the quarries and residents of the Pipestone vicinity. These can be found at several locations on the Sioux quartzite outcrops, mostly atop the ledge near Winnewissa Falls and the Leaping Rock. The most famous and historic of these are the initials of several members of the Nicollet party who spent about a week at the quarries during the summer of 1838. Joseph Nicollet, John Charles Fremont, Charles A. Geyer, Joseph Laframboise, J. Eugene Flandin, and Joseph Renville, Sr. carved their initials and the date of "July 1 38" into the quartzite atop the ledge near the Leaping Rock (Bray and Bray 1976:22, 73; Robinson 1928:517-518; Rose 1911:255-256, footnote 7; Winchell 1911:Plate 9).

The monument's Native American petroglyphs are contributing elements of a multiple property

[1]In late 2005, a group of three or four petroglyphs were observed in a fourth location within the monument (Scott 2005). The motifs appear to be one bird track, one or two anthropomorphs or zoomorphs, and one of indistinguishable form. Called the Bauermeister Petroglyphs, they are considered a component of Locality 9 (pp9). Since they have not yet been formally recorded, they will not be further discussed in this chapter.

National Register of Historic Places district based on the theme of American Indian rock art in the state of Minnesota. The multiple property nomination form for this district was completed on March 18, 1995 by Mark J. Dudzik, and the property was formally listed on the National Register on November 14, 1996. The nomination form subsequently became the basis for an article by Dudzik (1997) that surveys rock art throughout the state of Minnesota.

To place them in a broader regional context, the rock art locales at Pipestone National Monument comprise three of 55 American Indian rock art sites recorded in Minnesota (Dudzik 1997:100). Thirty-two of the 55 sites consist of petroglyphs, i.e., designs created by pecking, abrading, or incising the stone to remove part of the rock surfaces, while 20 contain pictographs, or designs created by applying or painting natural pigments to rock surfaces (Dudzik 1997:100-101). Two of the 55 consist of petroforms, or images created as boulder outlines, and the remaining site contains both petroglyphs and pictographs (Dudzik 1997:101).

The nearest concentration of Native American rock art sites occurs in Cottonwood County, a little over 50 miles to the east. The most notable of these is the Jeffers Petroglyph Site, where an estimated 2,000 to 2,500 glyphs occur on an extensive outcrop of Sioux quartzite (Lothson 1976; Callahan 2001a). Many of the glyphs at Jeffers are different from those known at Pipestone National Monument, being images of artifact types dating from Archaic times.

Figure 20. The Three Maidens glacial erratics, 1892. For scale, note human figure standing on one of the boulders (W.H. Holmes papers, National Anthropological Archives, Smithsonian Institution, photograph 72-3236). View to the north.

Table 18. Pipestone National Monument rock art recording events.

Rock Art Site	Recorder	Date	Reference
Three Maidens Petroglyphs	George A. Perley, Flandreau, South Dakota ("Perley's Chart")	1876	Thiessen and Bailey 2000; this volume
	Newton H. Winchell, Minnesota State Geologist	1878?	Winchell and Upham 1884
	Rudolf Cronau, German traveler	1881	Cronau 1890; n.d.
	Philetus W. Norris, Smithsonian Institution	1882	Norris 1883
	Walter J. Hoffman, Smithsonian Institution	1888	Powell 1893:xiii
	Theodore H. Lewis, Northwestern 1889 Archaeological Survey		Winchell 1911:564 and Plate 8; this volume Appendix C,
	William H. Holmes, Smithsonian Institution	1892	Holmes 1892e
	Thomas D. Thiessen and Alan Smith, Midwest Archeological Center	1994	Thiessen and Bailey 2000; this volume
Derby Petroglyphs	Caven P. Clark, National Park Service, Midwest Archeological Center	1993	Clark 1996
Legg Petroglyph	Thomas D. Thiessen, National Park Service, Midwest Archeological Center	2001	Thiessen 2001
Noble Petroglyphs	Jeffrey J. Richner and Vergil E. Noble, National Park Service, Midwest Archeological Center	1994	Richner 1994
	Thomas D. Thiessen, Midwest Archeological Center	2001	Thiessen 2001
Bauermeister Petroglyphs	Douglas D. Scott	2005	Scott 2005

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Pictographs

Although all of the existing rock art at Pipestone consists of petroglyphs, there are hints in the historical record that pictographs may once have existed there as well. George Catlin (1973, 2:168) observed "thousands of inscriptions and ***paintings***..." (emphasis added) during his 1836 visit to the quarries. The French Abbé Emmanuel Domenech (1860:344-345) later wrote that "...The rocks are of a bright red, polished and shining. Some of them bear traces of ancient and modern hieroglyphics, which are cut or ***painted*** on the rock..." (emphasis added). Since he is not known to have personally visited the quarries, Domenech may simply have repeated Catlin's information. James Boyd Hubbell camped near the quarries with a contingent of soldiers during the Civil War. Years later he recalled that "I camped at the Pipestone quarry with another expedition, July 4, 1864... Some of the men reported seeing Indian ***paintings*** on the three large boulders and rocks near the quarry...but I did not see them" (emphasis added) (Hubbell 1902:14). The reference to painted images on the Three Maidens boulders is interesting in light of the Dakota practice of sometimes painting large venerated boulders (Hovey 1887; Winchell 1911:facing page 508; Steinbring and Buchner 1997; Callahan 2000, 2001b). Ernest V. Sutton (n.d.:35), who visited the quarries as a boy about 1873, recalled that "Among the ancient ***pictographs*** was one representing the tracks of the `Thunder Bird,' a mythical bird supposed to govern the weather. This and many others of these early etchings have been destroyed or carried away by vandals" (emphasis added). The fact that he referred to the rock images as both "pictographs" and "etchings" suggests that he was lax in his use of the term "pictographs," which cannot be taken to mean that he observed paintings on the rocks.

In a deposition recorded in 1927, a Yankton elder named Simon Antelope spoke about visits he made to the quarries between about 1875 and 1887. He mentioned the creation of "paintings" and "declarations" on the rocks (United States Court of Claims 1927:169-170):

> *On one of my visits to the quarry I observed some ceremonies that were put on at the time. The Indians, after digging a hole in the ground and getting down to the rock they were intending to remove, would take some of their paints and do various paintings there and offer up a prayer. They were not praying to the rock itself but to the Great Master, the Great Spirit, God; in other words, that this rock they intended to get out, that it would be made easy to them and they would have no difficulties in getting it. In connection with their trip there they would put other declarations on the rock as an offering to the Great Spirit...*

The most reliable suggestion that pictographs once existed at the quarries comes from Philetus W. Norris, a Smithsonian Institution archeologist who appears to have observed painted images at the quarries during visits in 1877 and 1882. In a published letter dated June 4, 1877 (Appendix A), Norris alluded to "some faint etchings and ***paintings*** of former councils" (emphasis added). The official report of his 1882 visit to the quarries (Appendix B) was accompa-

nied by "11 Sketches of painted totems," but unfortunately those drawings are not known to survive. Presumably based on these now-missing drawings, Garrick Mallery (1886:23) stated that

> *Mr. P.W. Norris has discovered large numbers of pecked totemic characters on the horizontal face of the ledges of rock at Pipe Stone Quarry, Minnesota, of which he has presented copies. The custom prevailed, it is stated, for each Indian who gathered stone (Catlinite) for pipes to inscribe his totem upon the rock before venturing to quarry upon this ground. Some of the cliffs in the immediate vicinity were of too hard a nature to admit of pecking or scratching, and upon these* ***the characters were placed in colors*** *[emphasis added].*

Mallery (1893:87) published a very similar statement a few years later, but unfortunately, he did not publish any of Norris' painted "characters."

Norris himself alluded to the Pipestone "painted totems" only once in print. In describing, very much inaccurately, the region around the quarries as one vast cemetery dotted with "countless" burial cairns, Norris (1884:176) stated that

> *...as these purple- or flesh-colored rocks are seemingly glazed too hard for carving with any tool known to these people, many of them and portions of the cliff are nearly covered with the fading* ***painted totems*** *of the pilgrims who have mouldered to dust beneath them [emphasis added].*

Like Mallery, Norris failed to publish any of these "painted totems." If pictographs did indeed once exist at the quarries, they have disappeared with the passage of time and exposure to the elements.

Petroglyphs

With the exception of three petroglyphs recorded at the Noble and Derby locales in 2001 and the Bauermeister Petroglyphs observed recently (Scott 2005), the rock art of the monument has been briefly reviewed by Thiessen and Bailey (2000; see also Thiessen 1999). Much of the information that follows is repeated and expanded from that source. Information about the petroglyphs in each of the three locales is discussed below.

Three Maidens Petroglyphs (Locality 1)

The first eyewitness description of the Three Maidens boulders was provided by the artist, George Catlin, who visited the quarries in 1836 as part of his self-imposed mission of portraying North American Indian cultures on canvas before those cultures disappeared forever. Although the perspective is distorted, Catlin's famous painting of the quarries shows the Three Maidens boulders off to one side, some distance from the quarries (Catlin 1973, 2:facing p. 165). Catlin observed that the Three Maidens boulders were held in high regard by Native Americans, "whose...veneration of them is such that not a spear of grass is broken or bent...within three or four rods of the group." He also stated that Native Americans regarded the Three Maidens as the guardian spirits of the quarries, and they offered tobacco to them before engaging in quarrying (Catlin 1839:142; see also Catlin 1973, 2:202-203).

PIPESTONE

That the Three Maidens boulders were held in special regard by Native Americans is also attested by at least two other early accounts of visits to the locality. The geologist Charles White was among a party of white visitors to the quarries in 1868 (White 1869; 1983; 1989). When the party prepared to return from the quarries to Fort Dakota on the Big Sioux River, their Sioux guide made a brief visit to the Three Maidens:

> *...Mazachistina mounts at the same time, but starts off towards the Medicine Rocks, around which he makes a rapid turn and overtakes us upon the road. He is utterly silent when we ask him why he went there, but we should doubtless be thankful that we got away with our Pipestone in safety from the wrath of the guardian spirits of the Medicine rocks. (White 1869:653; 1983:14; 1989:22)*

A few years later, in 1873, a party of Native Americans, probably Sioux engaged in quarrying catlinite at the quarries, shooed a young white boy away from the Three Maidens, upon which he had been climbing:

> *I was climbing up onto one of these rocks when the Indians saw me and stopped their work. Presently they came toward where I was and began pointing and jabbering away, which I couldn't understand. Finally one old man pointed to the rock and shook his head, as much as to say, "you must not go up there." Father told me to come down, then shook his head to the Indians, thus assuring them he would see that I didn't try it again. The Indians now returned to their work. (Sutton n.d.:36)*

In addition to veneration of the boulders as the home of guardian spirits, many nearby petroglyphs were observed by early visitors. Catlin made only slight mention of the petroglyphs about the base of the Three Maidens boulders, by observing that "here are to be seen (and will continue to be seen for ages to come), the ***totems*** and ***arms*** of the different tribes, who have visited this place for ages past, deeply engraved on the quartz rocks, where they are to be recognized in a moment...by the passing traveller" (Catlin 1973, 2:167-168; emphasis in original). Catlin alluded to the existence of "thousands of inscriptions and paintings," but this was surely a great exaggeration of their number.

Bird tracks are a common petroglyph motif in the upper Midwest. Examples occur at all the rock art locales at Pipestone National Monument. Interestingly, Catlin (1973, 2:168) commented on bird track glyphs in the context of a Sioux tradition about the quarries:

> *Before the creation of man, the Great Spirit (**whose tracks are yet to be seen on the stones, at the Red Pipe, in the form of the tracks of a large bird**) used to slay the buffaloes and eat them on the ledge of the Red Rocks, on the top of the Coteau des Prairies, and their blood running on to the rocks, turned them red... (emphasis added)*

It is not known if this is an allusion to the bird track petroglyphs among the Three Maidens group, on the Derby panel, the Noble bird track petroglyph, or other glyphs that may exist unrecorded elsewhere in the monument.

In an essay on Wisconsin rock art, Robert J. Salzer (1997:53) has differentiated between bird track-like glyphs that exhibit a claw-like element behind the three forward-extended "claws," and glyphs that lack this presumed anterior extension. The former he labels "tridents" (also sometimes called "turkey track" motifs) and the latter "bisected angles." Both forms occur among the Pipestone National Monument petroglyphs and are here characterized, for the sake of simplicity, as bird track petroglyphs.

Other visitors to the quarries have also commented on bird track glyphs there. During her captivity with the Sioux Indians in 1857, Abbie Gardner spent one day at the quarries with her captors. Writing her memoirs years later, she recalled bird tracks among the rock art motifs at the Tree Maidens, which she called the "Medicine Rocks" (Gardner-Sharp 1885:171):

> *The smooth surface of the "Medicine Rocks," are covered with Indian hieroglyphics, of various grotesque forms, representing persons, animals, and turtles, and very many in the form of the tracks of a large bird...*

The missionary Stephen Riggs, writing in 1858 or 1859, may have meant the quarries when he wrote:

> *...We say it is the lightning that burns and splits the gnarled oak, that tears up the earth in its passage to and from it; but the Dakotas ascribe all these things to the thunderbird...Near the head of the Coteau des Prairies there are rocks in which are seen the tracks of this great bird, and the locality has obtained the name of Thunder Tracks. (Riggs 1918:531)*

Charles A. White, the Iowa State Geologist who visited the quarries in 1868, also wrote of bird track motifs at the "Medicine Rocks" (i.e., the Three Maidens):

> *Many square yards of the glacier-smoothed surface at the Medicine Rocks are covered thickly with Indian hieroglyphics, made by pecking the hard surface with sharp-pointed stone. These are of various grotesque forms, intended to represent persons, animals of the region, turtles, and very many also* ***in the form of the tracks of a large bird****... [emphasis in original] (White 1869:652; 1983:14; 1989:22)*

James Lynd, who spent considerable time living among the Sioux and studying their traditions and customs (Upham and Dunlap 1912:457), wrote about the Three Maidens petroglyphs, though it is not known if he actually visited the quarries:

> *The Pipe Stone Quarry is a place of great importance to the Sioux.... Numerous high bluffs and cliffs surround it; and the alluvial flat below these, in which the quarry is situated, contains a huge boulder that rests upon a flat rock of glistening, smooth appearance, the level of which is but a few inches above the surface of the ground. Upon the portions of this rock not covered by the boulder above and upon the boulder itself are carved sundry wonderful figures-lizzards [sic], snakes, otters, Indian gods, rabbits with cloven feet, muskrats with human feet, and other strange and incomprehensible things-all cut into the solid granite, and not without a*

> *great deal of time and labor expended in the performance. (Riggs 1864:145)*

Lynd's description of the quarries and the legend about them were repeated verbatim by W.P. Clark in his 1885 book, *The Indian Sign Language* (Clark 1982), and portions of it appear in an unpublished tradition attributed in 1934 by James H. Cook to Sioux and Cheyenne Indians. The Cook story, which is contained in the Cook Family Papers, Archive & Manuscript Collection, Manuscripts, Box 91 (on file at Agate Fossil Beds National Monument, Harrison, Nebraska), was written by Cook and is dated April 12, 1934, at Scottsbluff, Nebraska.

Ernest V. Sutton, as a young boy visiting the quarries with his father in 1873, wrote of a single bird track "pictograph," by which he may have meant a petroglyph:

> *Among the ancient pictographs was one representing the tracks of the "Thunder Bird," a mythical bird supposed to govern the weather. (Sutton n.d.:35)*

The first drawing of the Three Maidens petroglyphs was made in 1859 by a man named W.O. Williams (Figure 21). A copy was presented to Alfred Hill by Williams in September of 1859, and was given to the Minnesota Historical Society in August of 1862 (Minnesota Historical Society, notation on reverse of albumen print, SD4P/r42, negative 79766). The drawing depicts a solitary Native American contemplating the boulders and the petroglyphs on the underlying Sioux quartzite bedrock. Williams' identity has not been established, but Alan Woolworth (Woolworth 1999; also letter to Thiessen, March 9, 1998) has speculated that he may have been a member of a party of land surveyors known to have worked in the vicinity of the quarries during that year. The artist's name and the date "1859" cleverly appear as graffiti on one of the boulders. This is the earliest depiction of the Three Maidens petroglyphs in situ, though individual motifs are not recognizable or correlatable with later drawings of them.

It was not until the decade of the 1870s that some of the Three Maidens petroglyphs were first individually recorded; in all, the Three Maidens petroglyphs were historically recorded by various parties a total of at least seven times (Table 18). The Derby and Noble petroglyphs were recorded only since 1993 (Table 18).

The earliest of these recording episodes is also the most enigmatic. A crude diagram called "Perley's chart" appears to depict at least some of the Three Maidens petroglyphs in a circular arrangement, presumably around the massive glacial boulders (Figure 22). The original drawing is not known to exist, but two copies have survived. The earlier of the two copies is among Pipestone National Monument records at the Kansas City branch of the National Archives and Records Administration (Record Group 79, Records of the National Park Service, Region II [Midwest Region], Omaha, Nebraska, National Parks and Monuments Central Classified Files [1936-52], Pipestone National Monument, Decimal Code 503 folder). It bears two handwritten notations: "As the rocks / were ar-

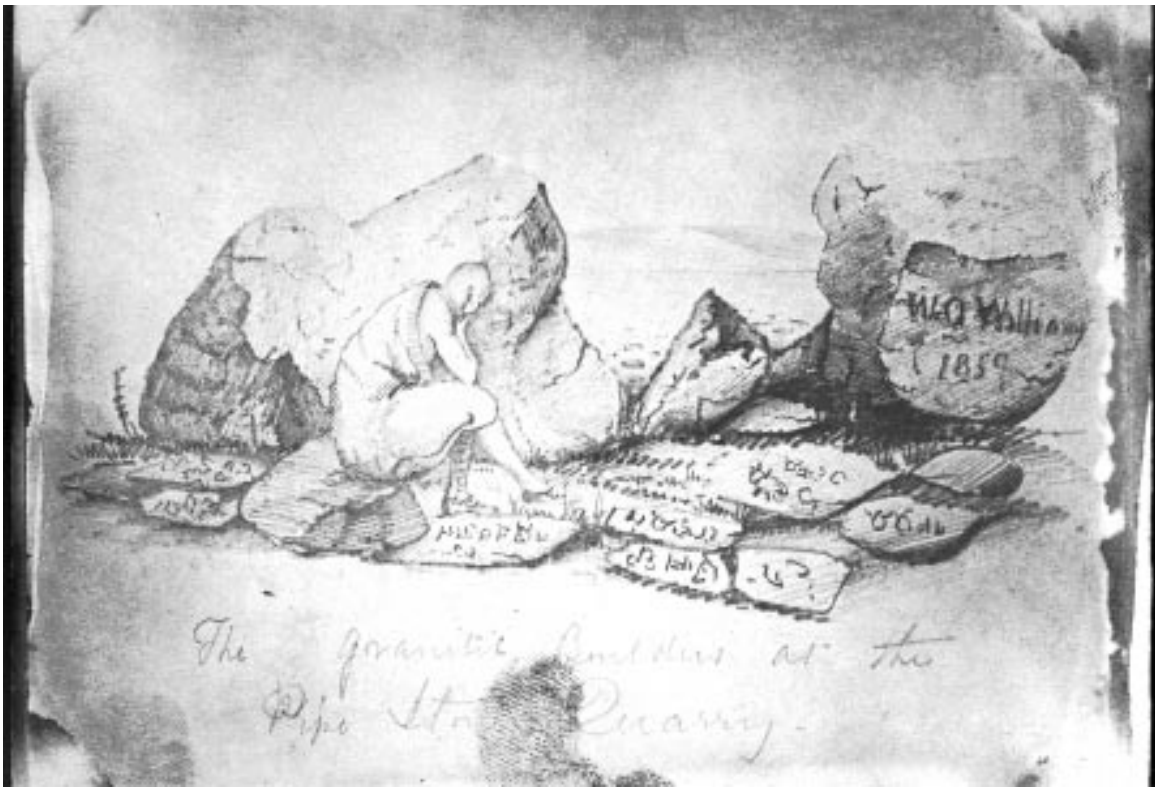

Figure 21. 1859 drawing by W.O. Williams of a Native American contemplating the Three Maidens petroglyphs (courtesy of Alan R. Woolworth and the Minnesota Historical Society, locator SD4P/r42, negative 79766).

Figure 22. "Perley's Chart" of the Three Maidens petroglyphs, 1876. Probably made by George A. Perley of Flandreau, South Dakota. From a copy at Pipestone National Monument (after Thiessen and Bailey 2000:Figure 2).

ranged in / 1876 / Perley's chart" and "Pipestone-pictographs / Copied for HW Baker by / Miss Winifred Bartlett - 8/15/46." Bartlett was a Pipestone citizen and local historian (Beal 1991), and Howard W. Baker at the time was the Associate Regional Director of Region II of the National Park Service in Omaha. Baker visited the monument on August 14 and 15 of that year, and met Bartlett. His August 27 memorandum report to the Regional Director stated that "While visiting with Miss Bartlett, we learned that she had a sketch map showing the location of these rocks before they were removed from the Three Maiden area. She made a tracing of this map which I have turned over to Mr. Hagen" (ibid., Decimal Code 200 folder). Olaf T. Hagen was Regional Historian at the time.

A photocopy of "Perley's chart" also exists in the archives of Pipestone National Monument. On the sheet on which the diagram appears is typed "Pipestone National Monument Petroglyphs at Three Maidens Site as arranged in 1876. *Perley's Chart*." The typed initials (LKL) of Lyle K. Linch, former superintendent of Pipestone National Monument from 1948 to 1954 (Rothman and Holder 1992:242), and the date "1/13/49" appear in the lower right corner, suggesting that Linch was responsible for creating the copy.

The author of the original "Perley's chart" is not known with certainty, although strong clues to the diagram's probable authorship exist. A man named George A. Perley was deposed on September 30, 1927 in connection with litigation over the Yankton tribal claim to the quarries (United States Court of Claims 1927:216-221). Perley described himself as a retired farmer living in Flandreau, South Dakota, which is a few miles west of Pipestone. When asked if he was familiar with "the history of the Pipestone Reservation," Perley replied "Quite good." From his testimony, he seems to have possessed an avid interest in historical matters.

Additional information about this man exists in a published history of the Perley family (Perley 1906:598-601) and in two newspaper articles ("George A. Perley Called by Death at Home Sunday," *Flandreau Herald*, September 27, 1933, p. 1; "Old Pioneer is Called Home," *Moody County Enterprise*, September 27, 1933, p. 1). George Amasa Perley was born in Wisconsin in 1849. After nearly completing seminary studies at Wasioja, Minnesota, he homesteaded near Flandreau, South Dakota, in May of 1876. He was a Moody County delegate to the state constitutional convention of 1882 and served in the South Dakota Senate in 1911-1912 (Perley 1906:599; *Biographical Directory of the South Dakota Legislature 1889-1989*, vol. 2, p. 874). He possessed an interest in music and wrote several songs, a collection of which was published in a booklet titled *Tune Touched Measured Musings* (Perley 1906:598-599; letter from Roberta W. Williamson, Director, Moody County Historical Society, to Thiessen, October 22, 1998).

As yet, no documentation has been found to establish a definite connection between George A. Perley and "Perley's chart," but circumstantial evidence supporting his authorship of the diagram is strong. He was an educated, inquiring man with an interest in historical subjects. He took up residence in a community near

the quarries in 1876, presumably the year that "Perley's chart" was created.

"Perley's chart," though crude in execution and conventionalized in its representation of petroglyphs in a uniform circle, is the only known plan view of the in situ petroglyphs around the Three Maidens boulders before the glyphs were removed on quartzite slabs taken up in 1888 or 1889 (see discussion below). "Perley's chart" represents the earliest known attempt to record individual motifs in the Three Maidens petroglyph group. Several of the individual motifs shown on "Perley's chart" clearly are the same images documented in more detailed fashion by later recorders, including Winchell and Upham (1884), Lewis (in Winchell 1911), Holmes (1892e), and possibly Cronau (1890) (see Table 19 and Figure 23). Although its depictions are by no means precise renderings, "Perley's chart" may ultimately satisfy some of the concerns expressed by W.H. Holmes and Garrick Mallery over what they viewed as Newton H. Winchell's failure to record the full context and spatial interrelationships of individual motifs (Mallery 1893:88-89; Winchell 1911:563-564; see discussion below).

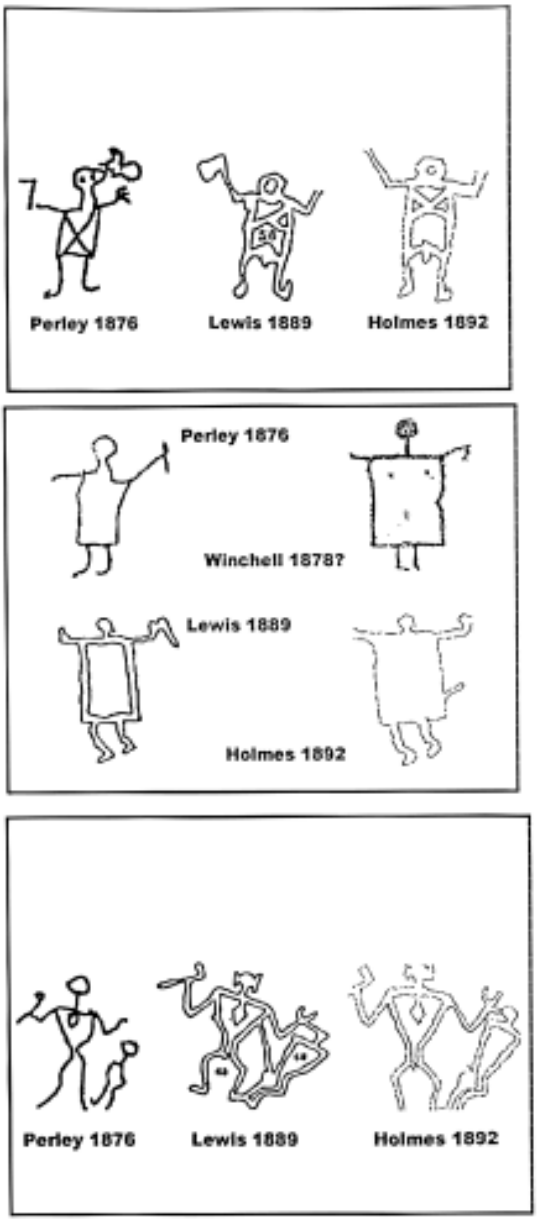

Figure 23. Examples of individual Three Maidens petroglyph motifs drawn at different times by different recorders (after Thiessen and Bailey 2000:Figure 3).

The Three Maidens petroglyphs were next recorded in 1878 or somewhat earlier, when the Minnesota State Geologist, Newton H. Winchell, visited the quarries. Winchell's visit resulted in two publications ([Winchell] 1878; Winchell and Upham 1884) in which the petroglyphs were briefly described. The later of these, the 1884 report by Winchell and his assistant, Warren Upham, contains the first published depictions of individual Three Maidens glyphs. Forty glyphs are shown at one-quarter size in four plates in their report (Winchell and Upham 1884:Plates I, J, K, L; see also Woolworth 1983:15-18) (Figure 24). Though Winchell's illustrations of the Three Maidens petroglyphs appear somewhat fanciful, a number of them can be correlated with more accurately drawn, later renditions, lending

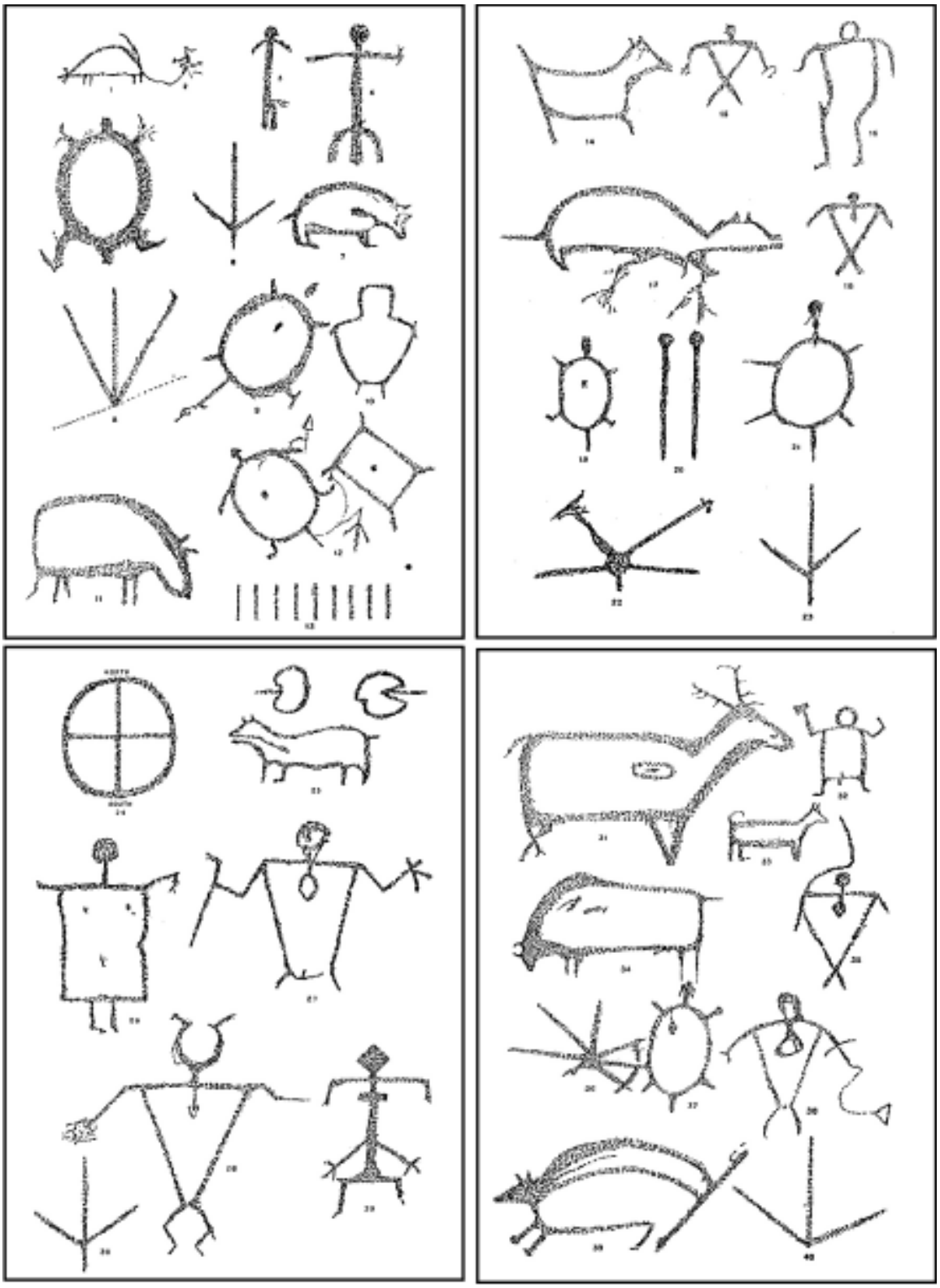

Figure 24. Three Maidens petroglyphs recorded ca. 1878 by Newton H. Winchell (after Thiessen and Bailey 2000:Figure 4).

Table 19. Concordance of published and unpublished petroglyph illustrations, Pipestone National Monument.

Lewis/ Winchell[a]	Holmes[b] Drawings	Holmes[b] Tracings	Winchell[c]	Cronau[d]	Steward[e]	Perley's Chart[f]
1	Yes	No	38	No	No	
2	Yes	No	No	No	No	
3	Yes	No	No	?	No	
4	Yes	No	No	No	No	
6	Yes	No	No	No	No	
8	No	No	33	No	No	
9 & 10	Yes	No	20	Yes	No	
11	Yes	Yes	No	No	No	
12	Yes	Yes	No	No	No	
13	Yes	Yes	No	?	No	
14	Yes	Yes	No	No	No	
15	Yes	Yes	No	No	No	
16	Yes	?	40?	No	No	
17	Yes	Yes	35	No	No	Yes
18	Yes	Yes	7	?	No	

Table 19. Continued

Lewis/ Winchell[a]	Holmes[b] Drawings	Holmes[b] Tracings	Winchell[c]	Cronau[d]	Steward[e]	Perley's Chart[f]
19	Yes	Yes	11?	No	No	
20	Yes	Yes	No	No	No	
21	Yes	Yes	34?	No	No	?
23	Yes (reversed)	Yes	No	No	No	
24	No	No	36	No	No	
25	No	No	37	No	No	
26	No	No	8	No	No	
27	Yes	Yes	No	No	No	
32	Yes	No	25? (partial)	No	No	
40	No	No	9, 12 (partial) or 19	No	No	
41	Yes	Yes	No	Yes	Yes	
42	Yes	Yes	No	No	No	
44	No	No	23	No	No	
45	Yes?	Yes	30	Yes	No	

Table 19. Continued

Lewis/ Winchell[a]	Holmes[b] Drawings	Holmes[b] Tracings	Winchell[c]	Cronau[d]	Steward[e]	Perley's Chart[f]
46	Yes (reversed)	Yes	No	No	No	
47	Yes	Yes	No	No	No	?
48	Yes	Yes	No	No	No	Yes
49	Yes	Yes	27	No	No	Yes
50	Yes	No	26	No	No	Yes
51	No	Yes	18	No	No	
54	No	No	3	No	No	
55	No	No	4	No	No	
57	No	No	39	No	No	
58	Yes	Yes	No	No	No	Yes
59	No	Yes (partial)	22?	No	No	
61	No	Yes (partial)	No	No	No	
67	No	Yes	No	No	No	

Table 19. Concluded

Lewis/ Winchell[a]	Holmes[b] Drawings	Holmes[b] Tracings	Winchell[c]	Cronau[d]	Steward[e]	Perley's Chart[f]
69	No	Yes	No	No	No	
70	No	Yes	No	No	No	
77	No	No	5?	?	?	
			12 (box-like) (partial)	Box-like		
			13 (parallel bars)	Parallel bars		Yes
			16 (human)	?	?	

Lewis/Winchell motifs that do not appear to have been recorded by other investigators include numbers 5, 7, 22, 28-31, 33-39, 43, 52-53, 56, 60, 62-66, 68, 71-76, and 78-79.

a. Winchell 1911:Plate 8. Thirty-three petroglyphs illustrated in Winchell 1911 do not appear to have illustrated counterparts in other references.

b. Holmes (1892e) unpublished drawings and tracings are among his papers at the National Anthropological Archives, Smithsonian Institution, Washington, D.C.

c. Winchell 1884:Plates I, J, K, L; see also Woolworth 1983:15-18. Eighteen petroglyphs illustrated in Winchell 1884 do not appear to have illustrated counterparts in other references.

d. Cronau 1890:85. Seven of the 14 petroglyphs that appear in Cronau 1890 do not appear to have illustrated counterparts in other references.

e. Steward 1937:415-417.

f. This volume.

credibility to Winchell's drawings. One contemporary author, J.E. Todd (1886:3; see also Smith 1906:83), notes that he observed similar figures to those illustrated by Winchell and Upham, "but quite imperfect," along Wolf Creek southwest of Bridgewater, South Dakota.

Years later, after the Three Maidens petroglyphs were removed on slabs of quartzite taken up from their original location, a minor controversy occurred when a Smithsonian Institution researcher, William Henry Holmes, criticized Winchell's failure to record the spatial relationships of the individual glyphs to one another. Because the petroglyphs had since been removed from their original locations without careful recordation, Holmes maintained that potentially important relational information was lost forever:

> *The trouble with the figures copied and published by Prof. Winchell is that they are not arranged in the original order. It will now be impossible to correct this entirely, as most of the stones have been taken up and removed...The Winchell drawings were evidently drawn by eye and have a very large personal equation; besides, they are mixed up while appearing to be in some order...There can be little doubt that in the main this great group of pictures was arranged in definite order, agreeing with the arrangements of mythical personages and positions usual in the aboriginal ceremonials of the region. It is a great pity that this original order has been destroyed... (Mallery 1893:88-89)*

These remarks were originally stated in two letters written by Holmes (1892c, 1892d) to a Smithsonian colleague, Garrick Mallery. Mallery combined portions of the two letters and published them in the guise of a single document in 1893.

In defense, Winchell (1911:563-564) later pointed to a statement in his 1884 article that "for the most part the figures are isolated," believing that this "relieves the onus of the complaint by Dr. W.H. Holmes."

Holmes, possibly, had excessive expectations about the information that could be gleaned from the spatial interrelationships of the in situ petroglyphs, and Winchell, perhaps, did not appreciate the potential value of recording the in situ petroglyphs in relationship to one another when he had the opportunity. "Perley's chart," which does not seem to have been known to either of these men, may someday help to reconstruct the spatial interrelationships between the glyphs, that Holmes considered to be so potentially important.

A German newspaper correspondent in the United States, Rudolph Cronau, visited the catlinite quarries in 1881 and published drawings of 14 glyphs in an 1890 book about his travels (Cronau 1890) (Figure 25) and 22 glyphs in a magazine article that was probably published in 1882 or 1883 (Cronau n.d.:86; see discussion of Cronau in Chapter 6, this volume) (Figure 26). Although Cronau's depictions also appear fanciful and may have been embellished, several of his glyphs appear to match glyphs recorded by later investigators, which lends a degree of credibility to Cronau's

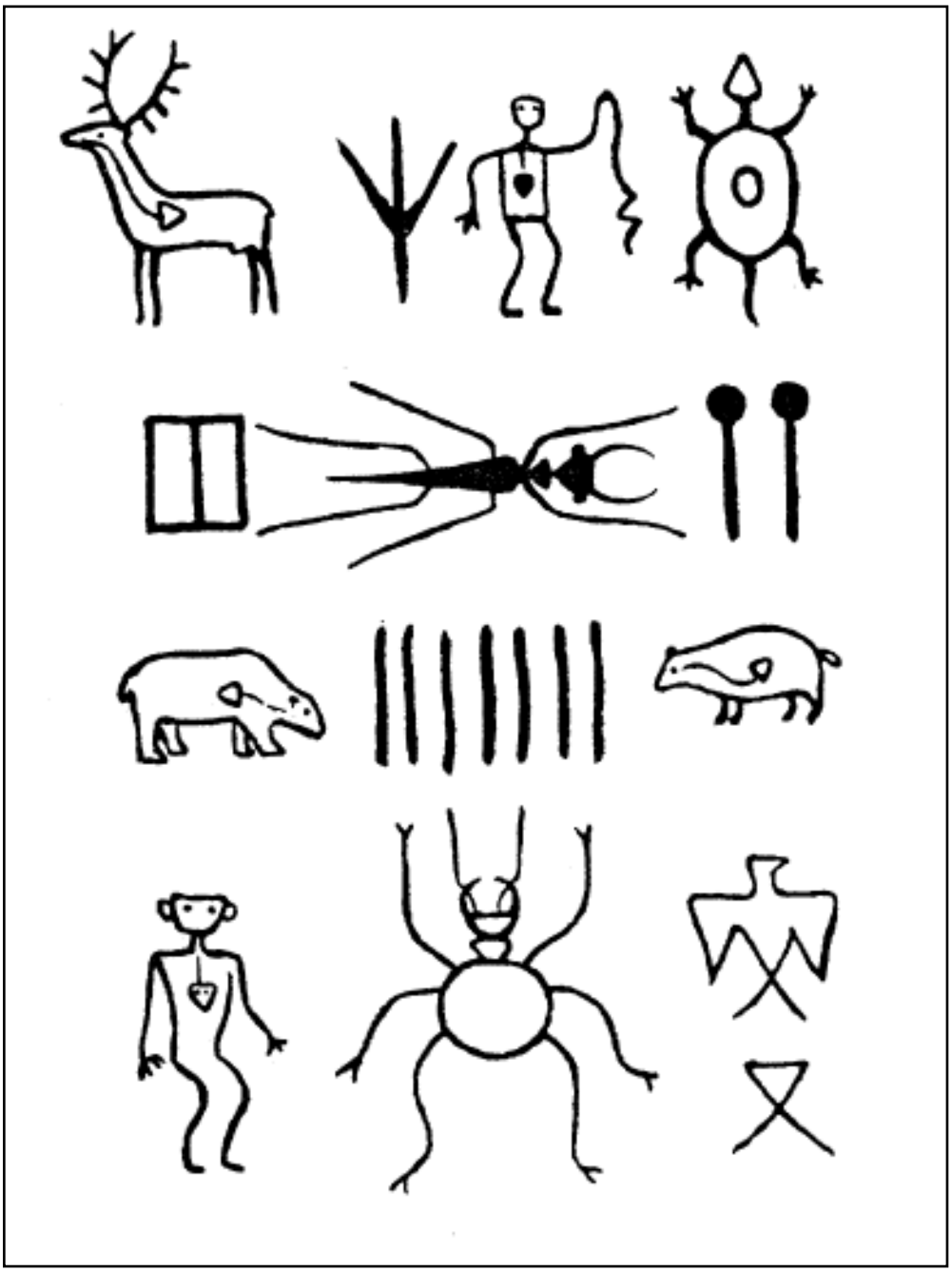

Figure 25. Three Maidens petroglyphs recorded in 1881 by Rudolf Cronau (after Thiessen and Bailey 2000:Figure 5).

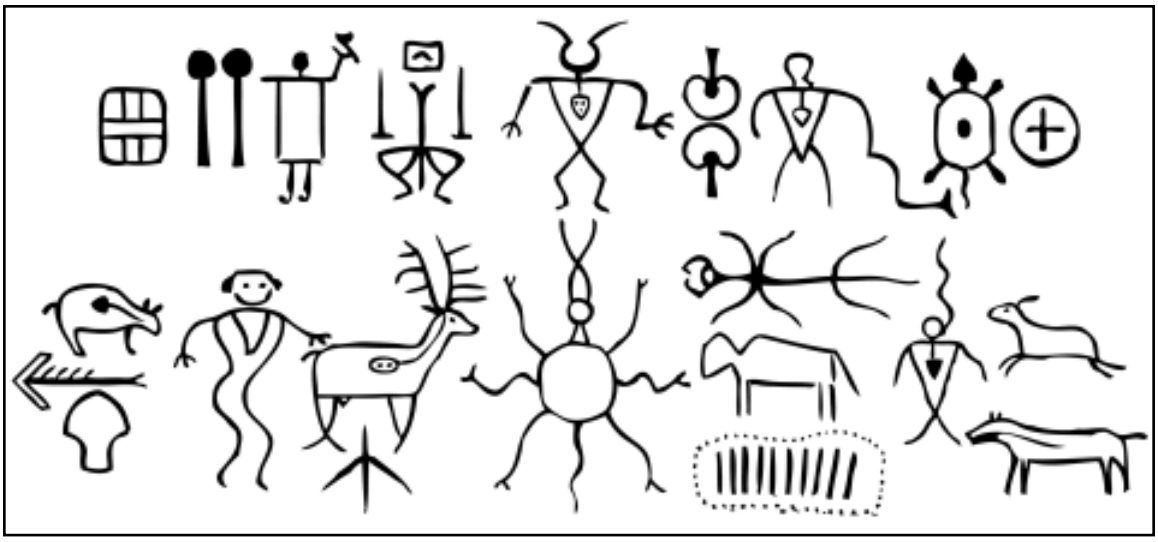

Figure 26. Rudolf Cronau drawing of petroglyphs published in a Die Gartenlaube article of unknown date.

renditions in general (Table 19). Cronau stated that he recorded "40 to 50" of the Three Maidens glyphs, so perhaps additional drawings are preserved in his personal papers, if indeed such exist.

The Three Maidens petroglyphs were also recorded by Philetus W. Norris, Walter James Hoffman, and William Henry Holmes, three Smithsonian Institution researchers who visited the quarries in 1882, 1888, and 1892, respectively (Norris 1883 [see also Appendix B, this volume]; Thomas 1894:42-44; Powell 1893:xiii; Holmes 1892e). Neither Norris' nor Hoffman's tracings or drawings are known to exist.

Holmes, however, made both tracings and rubbings which survive in the National Anthropological Archives at the Smithsonian Institution (1892e). These two sets of documents largely, but not completely, duplicate each other. The sheets are of different sizes. Twenty-one sheets depict rubbings, while 26 sheets consist of tracings of individual motifs. Many are the same motifs earlier recorded by Theodore H. Lewis, but not all of the 79 motifs recorded by Lewis were also recorded by Holmes (see below and Tables 19 and 20). In a letter to Garrick Mallery dated June 2, 1892 (1892d), Holmes referred to reproducing as many of the motifs as he "had time to make," inferring that he did not render all of the motifs presumably made available to him by Charles H. Bennett. Both sets reveal a few other, subtle features not shown in Lewis' drawings, including, in at least three instances, entire motifs apparently not recorded at all by Lewis (see Figures 27-33). For example, the rubbing sheet which depicts a portion of Lewis motif 58 also faintly shows a rectilinear pattern, possibly divided by internal lines into halves or thirds. This motif is apparently so faintly etched into the quartzite that it was not recorded by Lewis. Perhaps this is the rubbing interpreted by Grace Rajnovich (1994:150) as a "shaking tent," a symbol used in the Algonkian Midewiwin rituals (see also Rajnovich 1989). Other glyphs shown on the rubbings and tracings but not recorded by Lewis include a

Table 20. Three Maidens petroglyph motifs recorded in rubbings and tracings made by W.H. Holmes at Pipestone, Minnesota, 1892. Numbers refer to the Lewis motifs as published by N.H. Winchell in 1911.

Rubbings	Tracings
	1
	2
	3
	6
	9 or 10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
23	23
27	27
41	41
42	42
43	43
44	
45	
46	46
47	47
48	48
49	49
50	50
51	
58	58
59	
61	61
67	
69	
70	

From copies made by Ralph Coffman from the original 11 by 17-inch tracings and rubbings in the National Anthropological Archives and provided to Alan R. Woolworth, who shared reduced copies with the authors, July 22, 1998. Other glyphs, not recorded by Lewis, are evident in the depictions (see text).

Three Maidens petroglyph motifs recorded by W.H. Holmes but not by T.H. Lewis (from Holmes rubbings and tracings, National Anthropological Archives, Smithsonian Institution).

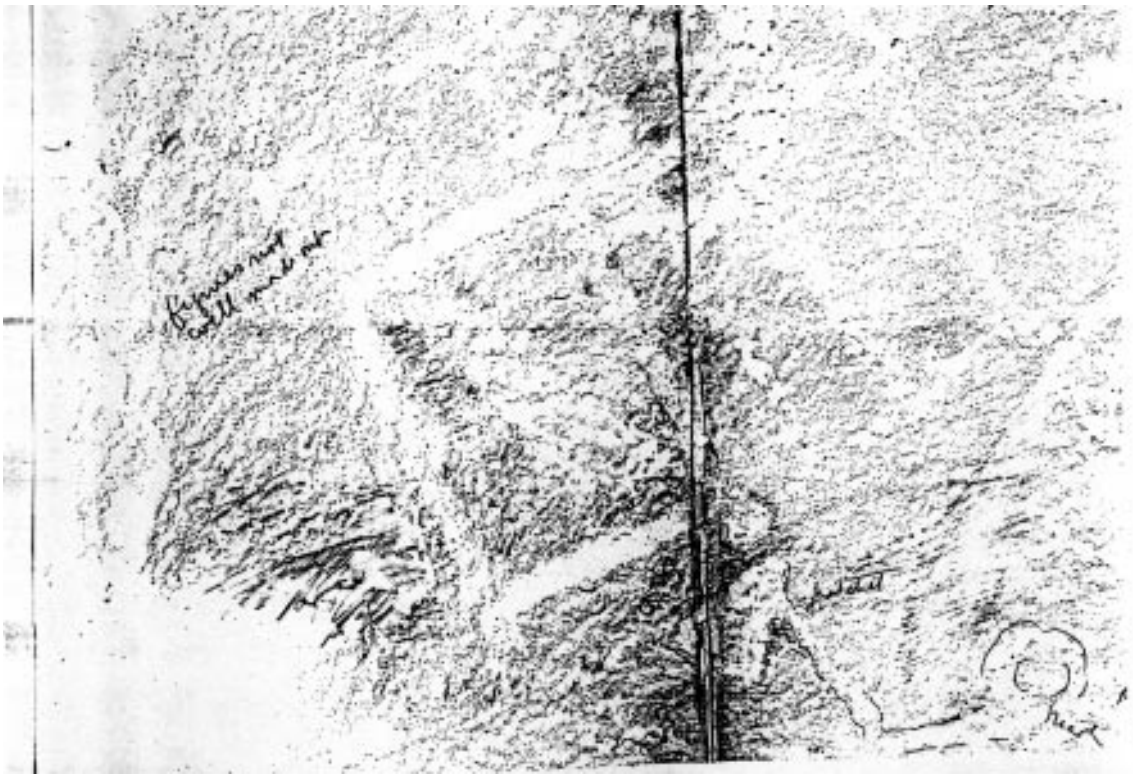

Figure 27. Rectilinear pattern associated with Lewis motif 58.

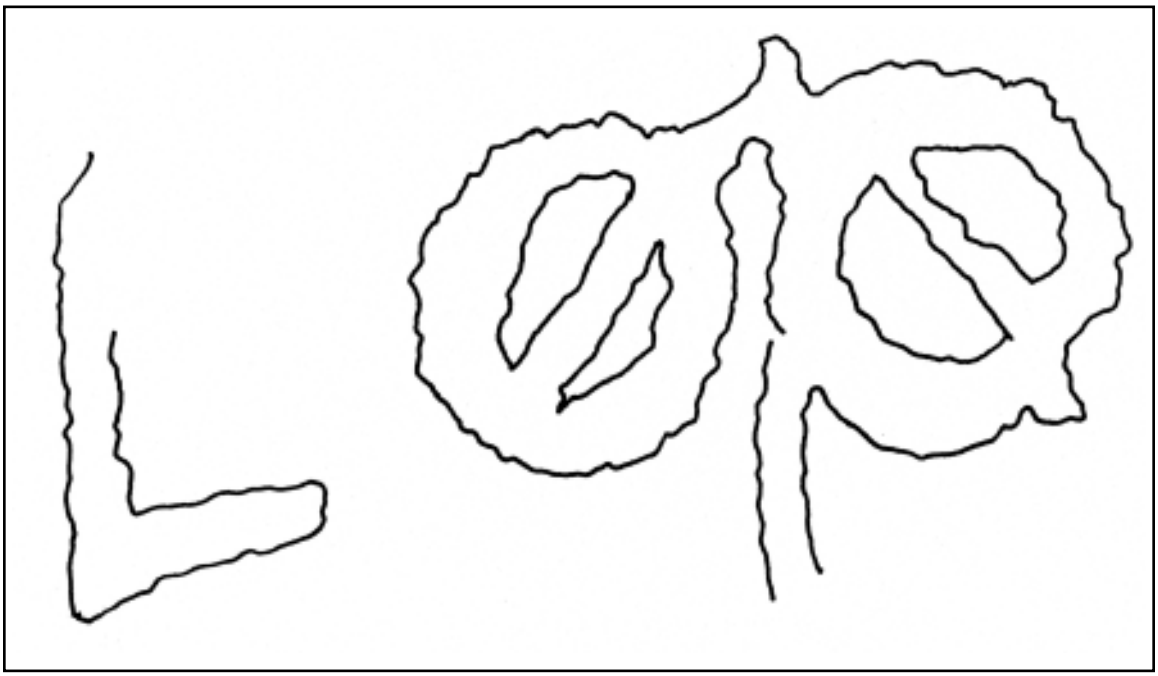

Figure 28. Connected bisected circles.

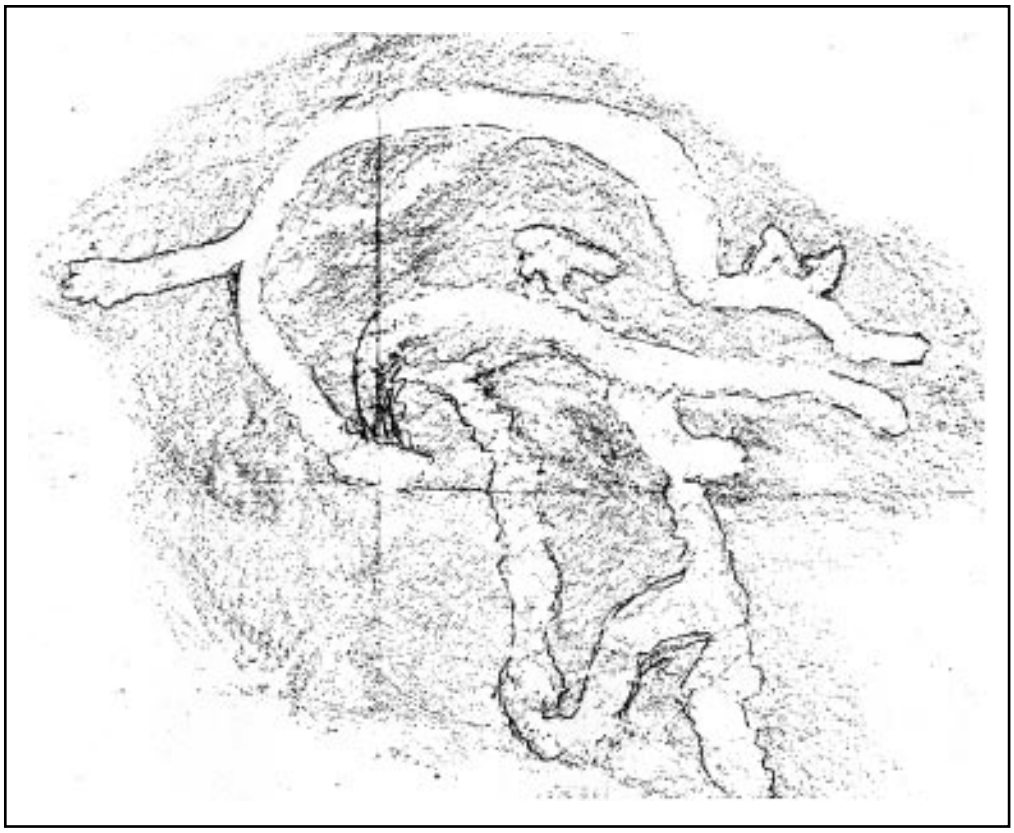

Figure 29. Possible zoomorph associated with Lewis motif.

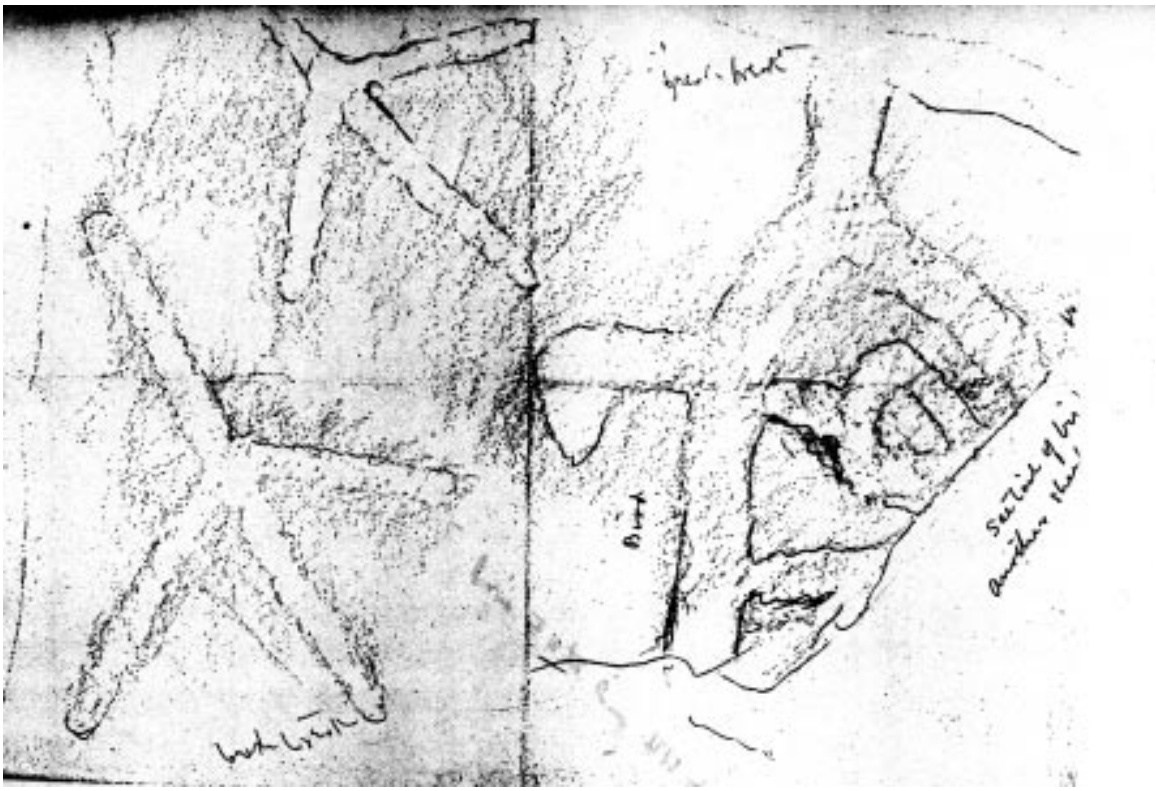

Figure 30. Upper portion of a thunderbird or anthropomorph motif.

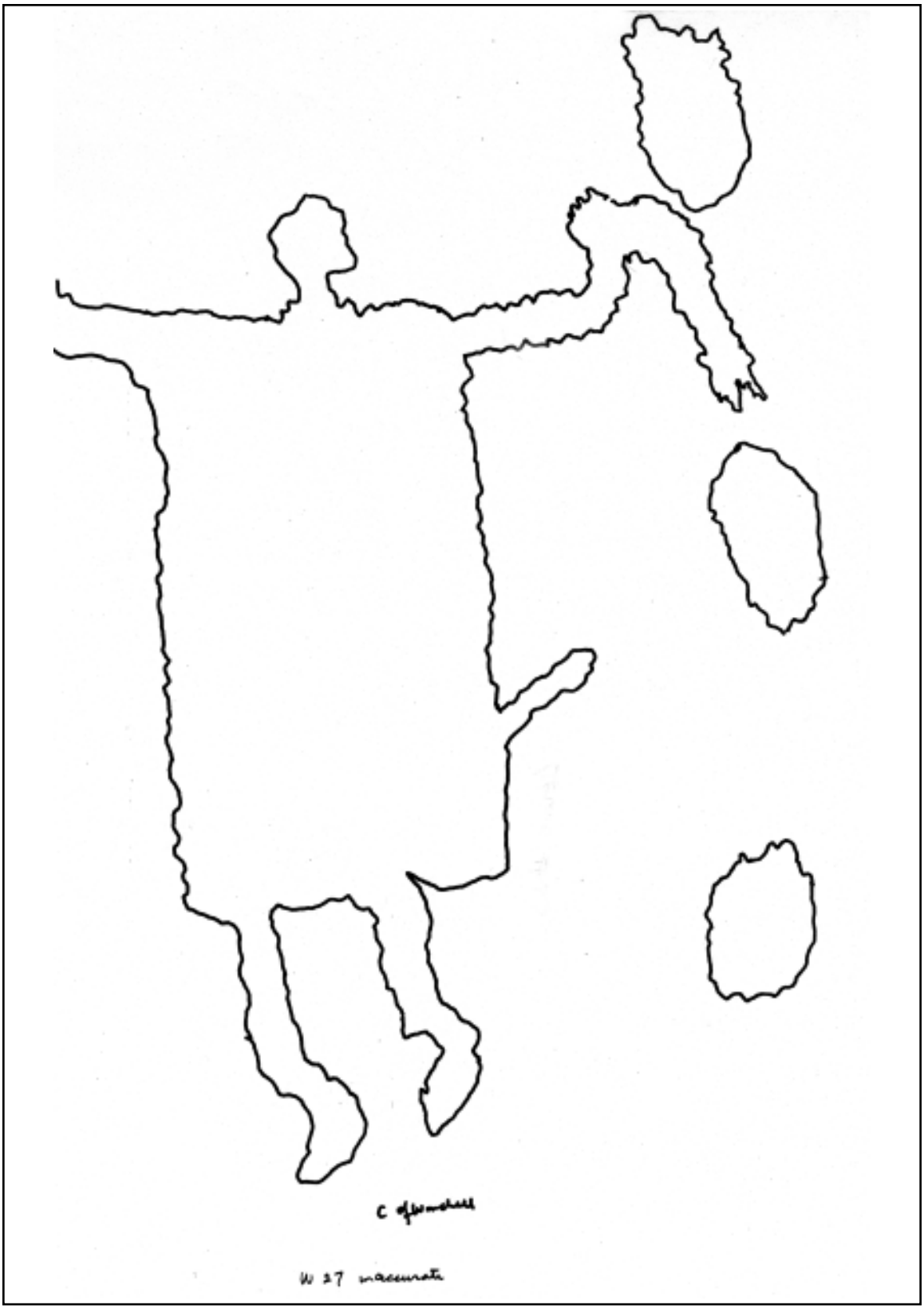

Figure 31. Small pecked circles or "dimples" encircling Lewis motif 50.

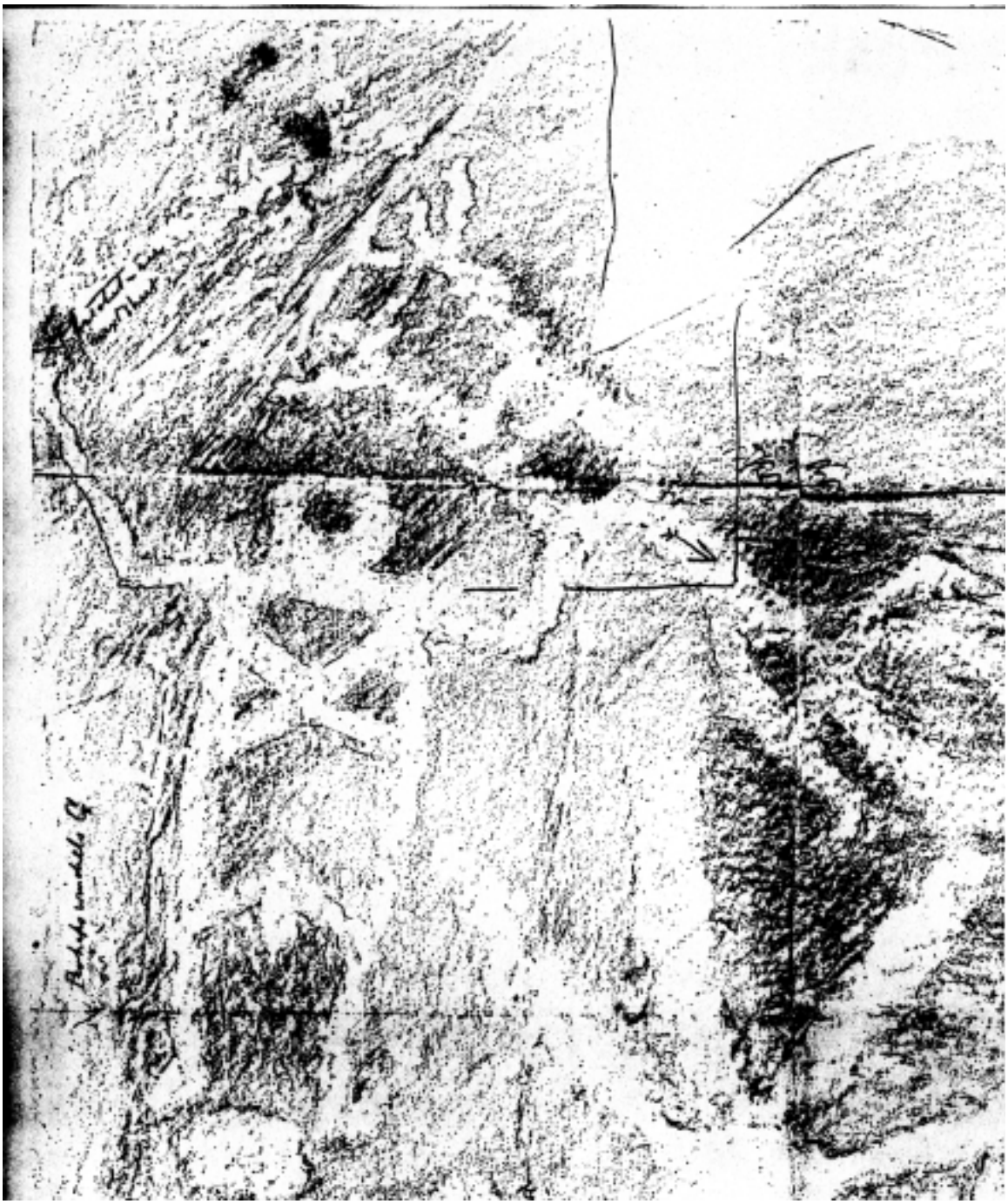

Figure 32. Small pecked circle or oval "dimple" beneath feet of Lewis motif 58.

Figure 33. Small pecked circles or "dimples" in the palms and abdominal region of Lewis motif 14.

pair of connected bisected circles, a possible zoomorphic motif contiguous with Lewis motif 23, and the upper portion of a thunderbird or anthropomorph. Also shown on at least two sheets are curvilinear alignments of small, irregular circles or "dimples" (which Holmes labeled as "tracks" on the sheets) apparently extending around Lewis anthropomorph motif 50 and thunderbird motif 51 (see Figure 46), as well as single "dimple"-like features under Lewis motif 58 and in the palms of the outstretched hands and in the abdominal region of Lewis motif 14. The Holmes tracings and rubbings have not been analyzed or described in published form, but some of them appear on a website created by Charles R. Bailey (http://www.pclink.com/cbailey/holmes.html) and the Holmes rubbing of Lewis motif 48 has been published by Rajnovich (1994:149). Clearly, the Holmes petroglyph depictions deserve further analysis.

The man who most comprehensively recorded the Three Maidens petroglyphs, and whose depictions today constitute the basic "catalogue" of them, was Theodore H. Lewis. Lewis, however, did so in 1889, after the petroglyphs had been removed from their original location. His drawings of 79 individual motifs, on 35 slabs of quartzite, were published in Newton Winchell's monumental 1911 compilation entitled, *The Aborigines of Minnesota* (Figure 34). A transcription of Lewis' notes on the individual quartzite slabs and the motifs that they bear appears as Appendix C. Much of Lewis' information was presented virtually verbatim by Winchell (1911:562-566).

The date that the Three Maidens petroglyphs were removed from their original location is not known with certainty, but their removal occurred in 1888 or 1889, according to a statement by the man who removed them, Leon H. Moore (receipt to Charles H. Bennett, August 25, 1902, copy on file, Pipestone County Historical Society, Pipestone, Minnesota). Moore, a local stonemason, removed the petroglyphs at the behest of Charles H. Bennett, one of the founders and early leading citizens of the town of Pipestone. Ostensibly, they were removed out of concern that they were being defaced by names and other inscriptions being chiseled over the petroglyphs as the Pipestone region became populated, a sort of early misguided attempt at historic preservation (Dudzik 1997:102-103). Indeed, five of the slabs known to have been in Bennett's possession bear English language names or other words pecked over Native American motifs. Lewis Slab 2 bears the nickname "BUCK SKIN JIM" and the name "E. GEORGE," while Slab 24 bears the letters "TOOPSATA" (Table 21; Figures 36 and 46).[2] Slab 22 (Figure 11-10k) appears to bear the crudely pecked initials "HC," a slab for which Lewis' slab number is not known bears names or initials (Figure 49, bottom left), and Slab 21(?) may also bear an historic inscription (Figure 47, left).

[2]Based on information supplied by recent visitor to the monument, David Rambow (email communication to Thiessen, July 16, 2004) has informed us that the "TOOPSATA" inscription was probably made by Tollef O. Opsata, who settled in nearby Rock County in 1870 and visited the quarries in the mid-1870s (Rose 1911:433-434).

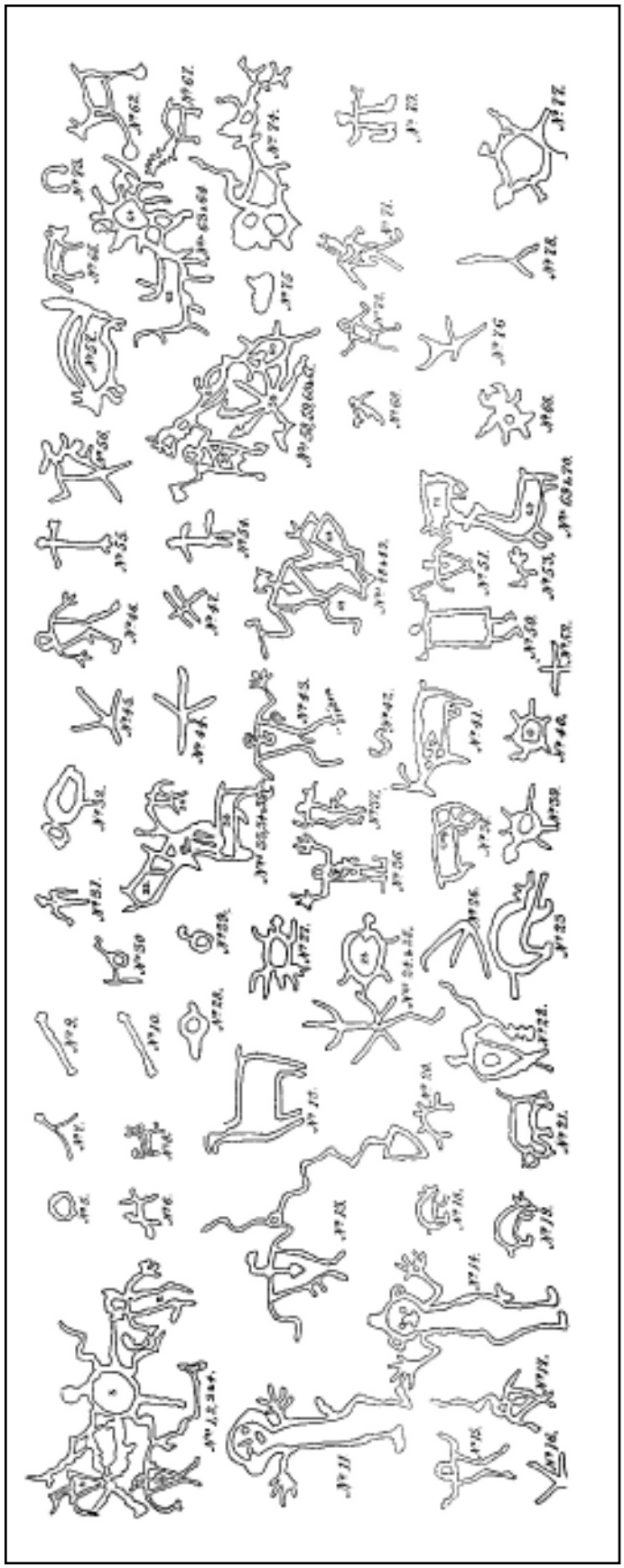

Figure 34. Three Maidens petroglyphs recorded in 1889 by Theodore H. Lewis (after Thiessen and Bailey 2000:Figure 6).

Table 21. Concordance of Bennett petroglyph photographs, Lewis motifs, museum numbers, and figure numbers.

Lewis Slab Number	Lewis Motifs	In Monument Collection? (Y, N/Museum Number)	Figure
1	1-10	Y / #23	11-10a
2	11	Y / #33	11-10b
3	12, 13 (partial), 43	Y* / #21	11-10c (bottom)
4	13 (partial)	Y / #17	11-10d (left)
5	14	Y / #18	11-10d (top)
6	15 + 3 bird tracks	Y / #25	11-10e (right)
7	17-21 + 1 bird track	Y / #19	11-10f (bottom)
8	22	Y / #22	11-10g (right)
11(?)	27	N	11-10h (right)
13	31-32	N	11-10i (bottom)
14	33-35	Y / #32	11-10p
15(?)	36 + anthropomorph(?)	N	11-10g (left)
18	39-40 + linear motif	Y* / none ????	11-10j
19	41-42, 52(?)	Y / #30	11-10h (bottom left)
20	43 + 2 bird tracks, bisected circles	N	11-10c (top)
21(?)	2 bird tracks	N	11-10m (left)
22	46-47	Y* / #34	11-10k (top)
23	48-49	Y / #28	11-10k (bottom)
24	50-52 + “dimples”	Y / #20	11-10l (bottom)
25	54-55	Y / #24	11-10m (right)
26(?)	56 (57 not apparent)	N	11-10h (top left)
29	65-70	Y / #31	11-10n
32	73	N	11-10o (top)

Table 21. Concluded

Lewis Slab Number	Lewis Motifs	In Monument Collection? (Y, N/Museum Number)	Figure
Number unknown	2 bird tracks + dragonfly(?) or 3 bird tracks(?)	Y / #27	11-10e (left)
Number unknown	2(?) bird tracks + unid. motif	N	11-10f (top)
Number unknown	1 bird track	Y / #26 (Slab B)	11-10i (top)
Number unknown	2 bird tracks + zoomorph(?)	N	11-10l (top)
Number unknown	1 bird track + axe/ hatchet(?)	N	11-10o (bottom left)
Number unknown	Bird	N	11-10o (bottom right)
Number unknown	1 bird track	N	11-10q (top)
Number unknown	Turtle(?), bisected circle(?), + 2 or 3 unid. motifs	N	11-10q (bottom)
Slab A	2 hand/feet prints, bird track, cross (not recorded by Lewis or photographed by Bennett)	Y / #29	11-12

* Denotes partial slab; slab has been broken since being recorded by Lewis and part of the original slab is missing.

Bennett kept his Three Maidens rock art "collection" in the side yard of his home for many years, and even exhibited the slabs at the Louisiana Purchase Exposition in St. Louis in 1904, where they earned him a silver medal from the judging panel (Figure 52) (Rose 1911:244; Winchell 1911:112). The proud Mr. Bennett had a series of 17 photographs taken of his prize-winning rock art collection (Table 22; Figures 35 through 51). He provided a set of prints to the Minnesota Historical Society; the original glass negatives are presently housed at the Pipestone County Historical Society. Midwest Archeological Center employee Alan Smith photographed the 18 surviving Three Maidens petroglyph slabs in the monument's museum collection, plus another from an undocumented provenience, in 1994 (Table 22); Smith's color slides and black-and-white photographs are on file at the Center (accession MWAC-588/PIPE-179).

At his death on August 23, 1926, Bennett willed to the Pipestone County Old Settlers Historical Society "...all of the pictograph and hieroglyphic stones now located in my lawn between my store building and my residence, conditioned that said Historic Society will properly care for, house, protect, exhibit and perpetuate the same for public use and benefit..." (Will of Charles H. Bennett, May 19, 1926, on file with the Court Administrator, Pipestone County, Pipestone, Minnesota; see also Bartlett n.d.a:5). By letter dated September 23, 1926, the president and secretary of the Pipestone County Historical Society acknowledged receipt of the slabs, and on December 24, 1928, Bennett's estate provided the Society with Leon Moore's 1902 receipt for purchase of the slabs by Bennett (copies of both documents are on file at the Pipestone County Historical Society).

The Pipestone County Old Settlers Historical Society did not have a building to house the petroglyph slabs. As late as about September 30, 1927, the slabs remained in the yard of Bennett's former home (U.S. Court of Claims 1927:194). The slabs were later moved to new locations from time to time as the matter of a public building to house them and other historical artifacts was considered by the Society. They first appeared to have been housed in the basement of the Pipestone County Courthouse, as stated in a report of two Bureau of Indian Affairs (BIA) officials to the Commissioner of Indian Affairs on May 14, 1932. BIA Field Representative Charles H. Berry visited Pipestone that year to look into the possibility of setting aside a portion of the Pipestone Indian School land as a "National Indian Shrine," under the administration of the BIA. He and J.W. Balmer, the superintendent of the Indian School, met with representatives of over fifty area organizations on the evening of April 27 and reported their findings to the Commissioner of Indian Affairs in a lengthy letter dated May 14 (Rothman and Holder 1992:59-60; National Archives and Records Administration, Record Group 75, Bureau of Indian Affairs, Central Classified Files 1907-1939, Box 18, File Pipestone 1113-1932-307.2, 1 of 2). Berry and Balmer recommended that 81.75 acres be set aside for the shrine, and that the Three Maidens also be included. Their letter contains some interesting remarks concerning the petroglyphs:

Table 22. Native American petroglyphs presently at Pipestone National Monument.

Lewis/Winchell Slab Number[a]/ Other Designation	Winchell Motif(s)[b]	MWAC Photographs[c] (Roll/Exp.)	Bennett Photograph at Minn. Hist. Soc.	Approx. Length/Width of Slab (inches)[d]	Approx. Thickness of Slab (inches)[d]
Slab 1	1-10	R4B/Exp. 13-15 R10B/Exp. 11-15 R2C/Exp. 24-25 R4C/Exp. 13-14	SD4P/p21	35 x 25	5
Slab 2	11 plus "BUCK SKIN JIM" and "E GEORGE"	R6B/Exp. 13-15 R8B/Exp. 11-13 R3C/Exp. 25-26	SD4P/p30	25 x 20.5	7
Slab 3[e]	12-13	R2B/Exp. 12-14 R3B/Exp. 6-8 R1C/Exp. 19-20, 22	SD4P/p19	21 x 13	7
Slab 4	13	R6B/Exp. 7-9 R9B/Exp. 5-7 R2C/Exp. 9-10, 33-34 R3C/Exp. 31-32	SD4P/p24	24 x 20	4.5
Slab 5[e]	14	R1B/Exp. 7-10 R2B/Exp. 5-8 R3B/Exp. 1-2 R1C/Exp. 6, 8	SD4P/p24	45 x 23	7.5
Slab 6	15	R16B/Exp. 1-3 R10B/Exp. 8-10 R2C/Exp. 27-28 R4C/Exp. 10-11	SD4P/p31	30 x 15	6.5

Table 22. Continued

Lewis/Winchell Slab Number[a]/ Other Designation	Winchell Motif(s)[b]	MWAC Photographs[c] (Roll/Exp.)	Bennett Photograph at Minn. Hist. Soc.	Approx. Length/Width of Slab (inches)[d]	Approx. Thickness of Slab (inches)[d]
Slab 7	16-21	R7B/Exp. 11-15 R8B/Exp. 1 R3C/Exp. 13-14	SD4P/p38	40 x 19.5	8.5
Slab 8	22	R9B/Exp. 14-15 R10B/Exp. 1	SD4P/p29	19 x 17	6
Slab 14	33-35	R10B/Exp. 5-7 R4C/Exp. 7-8	SD4P/p22	25.5 x 12	5
Slab 18[e]	39-40	R1B/Exp. 1-6 R2B/Exp. 1-4 R1C/Exp. 1-2	SD4P/p28	17.5 x 15	5.5
Slab 19[e]	41-42	R8B/Exp. 5-7 R3C/Exp. 19-20	SD4/p23	19 x 14	9
Slab 22	46-47	R2B/Exp. 9-11 R3B/Exp. 3-5 R1C/Exp. 12, 15, 16, 18	SD4P/p18	12 x 11	6
Slab 23	48-49	R6B/Exp. 10-12 R9B/Exp. 2-4 R2C/Exp. 3-4, 36-37 R3C/Exp. 16-17	SD4P/p18	23 x 18	5

Table 22. Continued

Lewis/Winchell Slab Number[a]/ Other Designation	Winchell Motif(s)[b]	MWAC Photographs[c] (Roll/Exp.)	Bennett Photograph at Minn. Hist. Soc.	Approx. Length/Width of Slab (inches)[d]	Approx. Thickness of Slab (inches)[d]
Slab 24	50-53 plus "TOOPSATA" plus 4 "dimples"[f]	R6B/Exp. 4-6 R10B/Exp. 2-4 R2C/Exp. 30-31 R4C/Exp. 4-5	SD4P/p26	23.5 x 15.5	4
Slab 25	54-55	R8B/Exp. 8-10 R3C/Exp. 34-35	None	20 x 19	8
Slab 29	65-70	R8B/Exp. 14-15 R9B/Exp. 1 R2C/Exp. 6-7 R3C/Exp. 28-29 R4C/Exp. 1-2	SD4P/p17	44 x 28.5	2.5
Slab number not known	?	R8B/Exp. 2-4 R1C/Exp. 37 R2C/Exp. 1	SD4P/p31	31 x 16	8
Slab number not known[g] (Slab B)	N/A	R9B/Exp. 11-13 R2C/Exp. 15-16 R3C/Exp. 22-23, 37-38	n/A	16 x 16	8.5
Unlisted slab A[g] N/A		R9B/Exp. 8-10 R2C/Exp. 12-13 R3C/Exp. 34-35	N/A	30 x 19	4
Noble petroglyphs[h]	N/A	R3B/Exp. 9-10 R5B/Exp. 1	N/A	In situ in bedrock	

Table 22. Concluded

Lewis/Winchell Slab Number[a]/ Other Designation	Winchell Motif(s)[b]	MWAC Photographs[c] (Roll/Exp.)	Bennett Photograph at Minn. Hist. Soc.	Approx. Length/Width of Slab (inches)[d]	Approx. Thickness of Slab (inches)[d]
Derby petroglyphs[i]	N/A	R2B/Exp. 15 R4B/Exp. 1-2, 4-6 R7B/Exp. 4-10 R1C/Exp. 25-26, 29-32, 34-35 R3C/Exp. 8-10	N/A	In situ in bedrock	
Bauermeister petroglyphs	N/A	Not yet formally recorded	N/A	In situ in bedrock	

a. Lewis in Appendix C, this volume; and Winchell 1911:564.

b. Winchell 1911:Plate 8.

c. 35mm color slides and black-and-white photographs taken on September 13-14, 1994 by Alan Smith, Midwest Archeological Center. Accession MWAC-588/PIPE-179.

d. Measured on September 13-14, 1994.

e. Slabs 3, 5, and 19 have concrete adhering to their edges as a result of having been cemented into a wayside exhibit. Slab 18 is broken into at least five pieces and has an attached typewritten note that reads: "PETROGLYPH REMOVED FROM EXHIBIT AT THREE MAIDENS SUMMER/1991 DAMAGE SUSTAINED IN DEMOLISHING EXHIBIT."

f. Four round pecked areas of approximately one inch diameter partially encircle anthropomorph motif 50. Though not previously recorded on rock art at Pipestone National Monument, Sundstrom (1993:96) has labeled similar motifs "dimples" at rock art sites in eastern South Dakota.

g. Slab A is not listed in the Lewis notes or in Winchell's book. Slab B appears in Fig. 11-10i.

h. Additional photographs, taken in 1994, can be found in accession MWAC-557/PIPE-177.

i. Additional photographs, taken in 1993, can be found in accession MWAC-507/PIPE-176.

Charles H. Bennett's photos of petroglyph slabs with chalked motifs, ca. 1904. See Appendix C and Tables 21 and 22. Courtesy of the Pipestone County Historical Museum.

Figure 35. Lewis Slab 1, bearing motifs 1-10.

Figure 36. Lewis Slab 2, bearing motif 11 plus "BUCK SKIN JIM" and "E GEORGE".

Figure 37. Lewis Slab 3 (lower), bearing motif 12, part of 13, and the feet of anthropomorph motif 43; and Slab 20 (upper), bearing part of motif 43 plus two bird tracks and the pair of bisected circles that were not recorded by Lewis.

Figure 38. Lewis Slab 4 (left), bearing motif 13; and Slab 5 (right), bearing motif 14.

Figure 39. Lewis Slab 6 (right), bearing motif 15 plus three(?) bird tracks; and an unidentified slab bearing three(?) bird tracks.

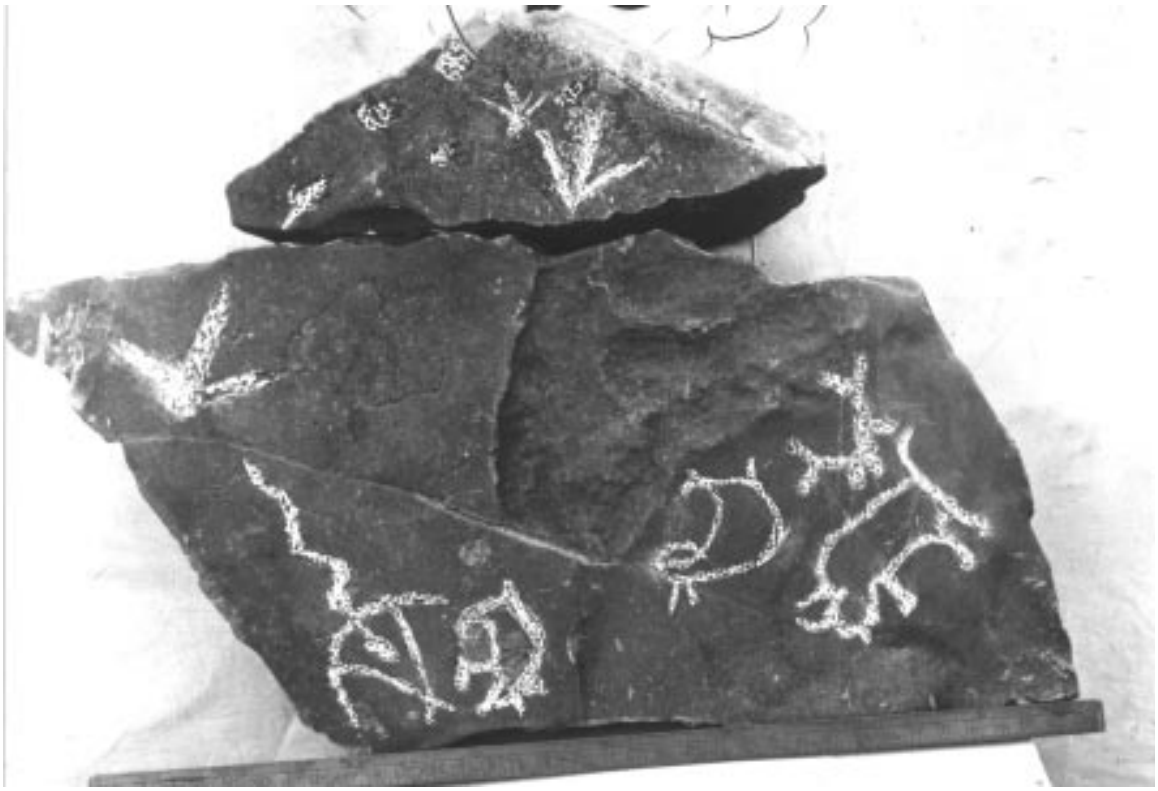

Figure 40. Lewis Slab 7 (lower), bearing motifs 17, 18, 19, 20, 21, and a bird track; and an unidentified slab (upper) with two or more(?) bird tracks.

Figure 41. Lewis Slab 8 (right), bearing motif 22; and Slab 15(?) (left), bearing motif 36 and an unidentified motif.

Figure 42. Lewis Slab 11(?) (right), bearing motif 27; Slab 19 (left lower), bearing motifs 41, 42, 52(?); and Slab 26(?) (left upper), bearing motif 56 (motif 57 is not apparent or may be on an undepicted fragment of this slab).

Figure 43. Lewis Slab 13 (lower), bearing motifs 31 and 32; and an unidentified slab with a bird track, which was formerly designated Slab B.

Figure 44. Lewis Slab 18, bearing motifs 39 and 40, plus an unidentified motif.

Figure 45. Lewis Slab 22 (upper), bearing motifs 46 and 47, plus initials "HC"(?); and Slab 23 (lower), bearing motifs 48 and 49.

Figure 46. Lewis Slab 24 (lower), bearing motifs 50, 51, 52, encircling "dimples," and "TOOPSATA"; and an unidentified slab (upper) bearing two bird tracks and a zoomorph(?) motif.

Figure 47. Lewis Slab 25 (right), bearing motifs 54 and 55; and Slab 21(?) (left), bearing two bird track motifs.

Figure 48. Lewis Slab 29, bearing motifs 65 through 70.

Figure 49. Lewis Slab 32 (upper), bearing motif 73; and two unidentified slabs (lower, left and right), bearing a bird track, an axe(?), and a bird.

Figure 50. Unidentified slab bearing three zoomorph, anthropomorph, and bird track motifs.

Figure 51. Two unidentified slabs, one bearing a single bird track and the other several unidentified motifs.

Figure 52. Charles H. Bennett posing with his "collection" of quartzite slabs bearing petroglyphs from the Three Maidens area, 1906 (courtesy of the Minnesota Historical Society, locator SD4P/p15, negative 37042).

> *To further bring to your attention the sincerity of these local people they collected some years back quite a large number of pictograph stones, some of them with prehistoric markings, while others seem to have been placed there by Indians during religious festivals which formerly were placed in a circle around the "Three Maidens," and if they had been left there they would certainly have either been destroyed or carried away by thoughtless curio seekers.*
>
> *These stones are now stored in the basement of the Pipestone County Court House and are cared for by the Pipestone County historical society.*
>
> *It is planned, should the Indian Shrine be given national significance, to replace these stones in their original positions.* ***A diagram has been kept of the original settings of the stones so they can be replaced in their original positions by following the diagram.*** *(emphasis added)*

The "diagram" here mentioned is not known to exist, unless it is a reference to "Perley's chart," previously discussed.

The county historical society did not seem to have an adequate home for its museum collection in the 1930s. On December 24, 1934, the *Pipestone County Star* reported a meeting of the Pipestone County Old Settlers Historical Society at which the proposition was raised of "erecting a small structure for the purpose [i.e., to house Society property to be removed from a room in the county courthouse], near the Pipestone Indian Shrine park, and incorporate in the walls of such a building the historic hieroglyphic rocks." The Society president appointed a committee to look into the matter. Two months later, on February 26, 1935, the *Star* reported that Society members considered "the idea of securing permission from the county commissioners for the use of the southeast corner of the court house grounds for a small historical building, having the same erected as a relief project." Although the proposal was said to have been met "with great enthusiasm," the building did not materialize, despite the fact that the possibility of seeking Works Progress Administration support was considered over the following five years (*Pipestone County Star*, September 6, 1935 and January 1, 1940).

With the appointment in early January 1940 of a seasonal manager, then titled "Custodian," for the newly authorized Pipestone National Monument, the Society's interest seems to have changed to encouraging the construction of a building at the monument which would house the Society's collection, including the petroglyph slabs. Although the matter was by no means settled, Custodian Albert F. Drysdale reported to the National Park Service Regional Director in Omaha that he had "moved the stones with the hieroglyphic carvings on them to a place of safe keeping" while the Society's officers continued to consider the matter (letter from Drysdale to Regional Director, Omaha, February 2, 1940; copy on file at the Pipestone County Historical Society). Drysdale's letter went on to relate that "there is twenty three (23) of these stones and they run in weight from about one hundred pounds (100 lbs) to about seven hundred pounds (700 lbs.)."

The *Pipestone County Star* reported on March 8, 1940 that

> *with...the probability that there will soon be some move toward the erection of a building at the park, officials of the county society feel that an effort should be made to have space provided for these historical relics in the government building. It is pointed out that some of the relics came from grounds adjoining the park and are closely associated with the history of the quarry region.*

On June 18, 1940, the *Pipestone County Star* again reported that at a meeting of the Pipestone County Old Settlers Historical Society, Drysdale

> *stressed the desirability of a museum in which relics of Pipestone county can be preserved for posterity. Drawings of plans for a proposed museum were introduced. The building would be 40x60 feet with a ground floor and a full basement, at a cost of approximately $23,000. An attempt will be made by the society to secure a federal appropriation for the project.*

World War II delayed any substantive action to develop the new national monument, but near the end of the war and afterward, the National Park Service seems to have taken a more active role in determining the location of the stones. The slabs appear to have been moved, under Service supervision, possibly twice during 1945 and 1946. In a June 4, 1945 memorandum to the Regional Director, Custodian Drysdale submitted a bill for $3.00 to pay the Hess Motor Express company "to move the rock from Mrs. Roe's residence until such time as we can move them to a permanent place" (copy on file, Pipestone National Monument). Drysdale explained that the reason for the move was that "Mrs. Roe sold her home and the new owner requested that these rock[s] with the Hieroglyphics be removed from the yard as soon as possible." Perhaps Mrs. [John S. (Ethelyn)] Roe's home, which was at 911 3rd Avenue SW (Pipestone Telephone Directory, June 1941), was the "place of safe keeping" to which Drysdale had moved the stones in 1940.

No further documentation has been found regarding possible movement of the slabs in 1945. However, the files of the Pipestone National Monument contain an unsigned requisition dated July 15, 1946 to pay the Hess Motor Transfer to move the stones to a new, but unspecified location, at an estimated cost of $10.00. Bureaucracy being what it is, Drysdale may have been told that he had not followed proper procurement procedures in arranging for the movement of the slabs. Four days later, on July 19, Acting Regional Director Howard W. Baker sent Drysdale a memorandum (copy on file, Pipestone County Historical Society) in which he stated:

> *We have your memorandum and requisition of July 15 concerning the moving of certain stone exhibits belonging to the monument. Before approving this requisition, we should like to know if you have explored the possibility of having these stones stored at the Indian School; and if this has not been done, we desire that you do so and submit a new requisition accompanied by a statement showing the place at which these exhibits are to be stored.*

Note that this communication refers to the stones as "belonging to the monument," strongly implying that their ownership had transferred to the National Park Service before July 19, 1946. However, documentation of the actual change in ownership has not been found.

There is no indication of whether or not Drysdale looked into the suggestion of moving the stones to the Pipestone Indian School, but they appear to have been located at the residence of one "Mr. J.E. Peterson" by August of 1946. John E. Peterson was not the party who purchased Mrs. Roe's residence, as his address in the Pipestone Telephone Directory for May 1946 is stated as 913 4th Avenue SW. On August 12, 1946, another requisition (copy on file, Pipestone National Monument) anticipated the transfer of the stones from "there [sic] present location at Mr. J.E. Peterson of 913 4th Ave SW, to the new location of Mr. R.F. Gilmore of 215 2nd Ave SW" at an estimated cost of $10.00. Six days later, the Region Two office issued a purchase order to transfer the stones (copy on file, Pipestone National Monument). However, on the purchase order the destination address of 215 2nd Ave. S.W. has been lined out and the word "Library" has been added by hand. For some reason that is not fully explained in surviving documentation, a decision was made to move the stones to the Pipestone Public Library rather than to the private residence at 215 2nd Ave. S.W. In an August 21, 1946 memorandum to the Regional Director (copy on file, Pipestone County Historical Society), Drysdale explained that

> *We now have permission from the Pipestone Library Board to place the stones, that are now in storage at Peterson's home, in the basement of the library. The purchase order that I have reads that these stones will be moved from the Peterson residence to the Ed Gilmore residence. The distance from either the Gilmore residence or the library is the same. Let me know if I should use this purchase order for moving the stone[s] to the library.*

In a September 12, 1946 memorandum (copy on file, Pipestone County Historical Society), Associate Regional Director Baker noted that the transfer to the library had already been accomplished and he approved the action after the fact.

Lyle K. Linch replaced Drysdale as superintendent of Pipestone National Monument in 1948, and supervised the temporary removal of the petroglyph slabs from the basement of the Pipestone Public Library during remodeling work. In an undated memorandum to the files (but probably dating to October, 1949; copy on file, Pipestone County Historical Society), Linch documented that

> *George Bryan & I hauled all but one of the 22 hieroglyphic stones out to the monument when library was remodeled and placed them about 10′ East of the east ditch of the Monument road just south of the Inkpaduta marker. The one best stone is stored in basement of library.*

He further explained in his Superintendent's Monthly Report dated November 1, 1949 (copy on file, Pipestone National Monument) why the stones had to be moved, and registered a complaint about the lack of storage space or a museum at the monument:

> *Once again this area's pertinent need for a museum was vividly demonstrated when the 22 historic old hieroglyphic stones stored in the city library basement (These huge slabs have been moved many times since they were removed the three maiden site) has to be moved out of the building during its remodeling. (They are comparatively safe in the back yard covered with dirt). They will again be moved back into the basement when the remodeling job is finished. Every such move damages and mars these irreplaceable stones. IT IS A SHAME THIS AREA HAS NO STORAGE SPACE OR MUSEUM!*

How the "back yard" referred to in this report relates to their temporary deposition on monument land described in Lynch's undated memorandum cannot be explained.

In a footnote in his 1950 article, Theodore Nydahl (1950:202, footnote 14) stated that the petroglyphs were then stored in two locations, "at the Pipestone National Monument and in the local library." This footnote was based on a November 11, 1950, letter (copy on file, Pipestone National Monument) from Superintendent Linch which stated that 22 petroglyph slabs had been moved to the monument and one had been left on display in the basement of the Pipestone City library.

It is interesting to note that the total number of petroglyph slabs generally diminished through time. Their number is stated as 36 by Leon Moore, who removed them from their original location in 1888 or 1889 (1902 receipt cited previously); as 35 in Lewis' 1889 notes (Minnesota Historical Society 1991:Reel 7 [also see App. C, this volume]; Winchell 1911:564); as 23 in a 1940 letter to the Regional Director of the National Park Service (letter from Albert F. Drysdale to National Park Service Regional Director, Omaha, Nebraska, February 2, 1940, copy on file at the Pipestone County Historical Society); and as 22 in two 1949 documents (letter to the files at Pipestone National Monument from Lyle K. Linch, [1949], copy on file, Pipestone County Historical Society; and Superintendent's Monthly Report, Pipestone National Monument, November 1, 1949, copy on file, Pipestone National Monument). Twenty three slabs were said to exist in 1950 (letter from Lyle K. Linch to Theodore L. Nydahl, November 11, 1950, copy on file, Pipestone National Monument). Their number was reported as 14 in 1949 (Beaubien 1949:11) and also in 1965 (Sigstad 1970a:8). Nineteen slabs are now in the museum collection of Pipestone National Monument. Clearly, there has been attrition in the survival rate of these stones over time. Eighteen of the slabs described by Lewis or photographed by Bennett, or about half of the number originally removed by Moore, are known to exist, and all are at Pipestone National Monument. None of the missing slabs are known to exist elsewhere, despite the report that Newton H. Winchell took one to Minneapolis prior to 1892 (Holmes 1892d; Mallery 1893:89). There is also an unsubstantiated report that another slab exists in a museum in one of the prairie provinces of Canada (letter from Alan R. Woolworth to Thiessen, March 9, 1998), possibly the Glenbow Museum, which acquired the local Roe collection of Indian artifacts a number of years ago (Chris Roelfsema-

Hummel, personal communication).[3] The 17 missing slabs described by Winchell contained 34 of the 79 motifs recorded by him and published by Winchell (1911:564, Plate 8) (see Table 23).

Much of the development of Pipestone National Monument was linked to MISSION 66, a ten-year program for upgrading facilities in National Park System areas. MISSION 66 was to be completed by 1966, the fiftieth anniversary of the National Park Service. One of the MISSION 66 facilities at Pipestone was a roadside exhibit built in 1959 near the Three Maidens (Murray 1961:108). Several of the petroglyph slabs were incorporated into this exhibit, one of which was inadvertently broken when the exhibit was dismantled years later. Also in 1959, 15 of the slabs were placed alongside one of the paths near the visitor center (*Pipestone County Star*, September 17, 1959, page 1, "Pictographs on Display at Monument").

After the dismantling of the Three Maidens roadside exhibit, the four petroglyph slabs from it were kept in the visitor center, three in the south entry of the building, and the broken one in a Bally box structure within the cultural demonstration center, where the monument's museum collection is stored. The other 15 slabs remained along a pathway on the visitor center grounds near the "exhibit quarry." In 1994, Supervisory Archeologist Jeffrey J. Richner of the Midwest Archeological Center recommended that the slabs along the pathway be "removed and secured" (Richner 1994:5-6). In October, 1997 the 15 slabs that lined the exterior path were brought into the building, where they are presently exhibited on the floor of the cultural demonstration (Palma Wilson, personal communication to Thiessen, January 4, 1999).

Do any in situ petroglyphs still exist in the bedrock that underlies the Three Maidens boulders? William Henry Holmes' correspondence and notes suggest that this is likely, although this has not been confirmed because the area is now covered with a soil mantle that has been introduced to eliminate a water drainage problem and make the area more suitable for park purposes.

Holmes probably observed some petroglyphs that were still in place around the Three Maidens. In a June 2, 1892 letter to Garrick Mallery, concerning the Three Maidens petroglyphs, Holmes (1892d) stated that "There are a few pieces still in place." Holmes kept a field notebook during his 1892 visit (Holmes 1892b), in which he sketched the Three Maidens and other features in the vicinity of the quarries. One sketch appears to represent an in situ petroglyph. One of the petroglyph sketches (on notebook pages 8-9) bears the notation, "This group is on the south side near the S.E. bowlder [sic]." Two of the Three Maidens views (on notebook pages 17 and 22; see Figure 54) depict human figures pointing to or looking at the bedrock beneath the huge boulders. Both of these sketches, plus two other views of the Three Maidens (on notebook pages 7 and 16), contain small "x" marks about the base of the boulders, which may

[3]Mrs. Roe is said to have "felt entitled to 2 stones for having stored them so long." These are said to have been found some years later in the basement of the public library (Bartlett n.d.b).

Table 23. Lost or unidentified Lewis/Winchell petroglyph slabs from the Three Maidens at Pipestone National Monument.

Lewis/Winchell Slab Number [a]	Lewis/Winchell Motif(s) [b]
9	23
10	24-26
11	27
12	28, 29, 30
13	31, 32
15	36
16	37
17	38
20	43
21	44, 45
26	56, 57
27	58, 59, 60, 61
28	62, 63, 64
30	71
31	72
32	73
33	74, 75, 76
34	77
35	78, 79

a. Lewis in Appendix C, this volume; and Winchell 1911:564.

b. Winchell 1911:564 and Plate 8.

represent Holmes' attempt to indicate the locations of in situ rock art. If his perspective on the Three Maidens can be re-established today, it may be possible to conduct limited excavation in the thin mantle of introduced soil that surrounds the boulders and confirm the presence of petroglyphs in these locations. By more extensive excavation, it may also be possible to match the existing rock art slabs in the Pipestone National Monument museum collection to their original positions about the Three Maidens (letter from Alan R. Woolworth to Thiessen, November 10, 1998).

In 1965, archeologist John S. Sigstad contemplated just such an excavation, but that work was not carried out (Sigstad 1965b:67-68):

> *We had tentatively planned to so some investigating in the vicinity of the three maidens. Former P.N.M. Historian Abelson advised that there were still petroglyphs in situ on the Sioux quartzite where it outcrops at the base of the glacial erratics. There are about 5 places where this situation occurs. Stratigraphic excavation here would be pointless, however, since the Hiawatha Pageant Club has done much earth moving here in order to construct the stage for their little production. We abandoned plans to work here, however, mainly because there are Hiawatha Pageant tipis and other distractions which would greatly hinder any sort of horizontal control. Sometime when the Pageant is not on, on the other hand, it might be worthwhile to probe for the pictographs. This probably would not entail a great deal of excavation.*

Interestingly, in a report on the geology of the monument Superintendent Linch (1949:47) suggested that a museum be erected to house the in situ Three Maidens boulders and the petroglyph slabs "restored to their original resting places." No such structure was built.

Derby Petroglyph Panel and the Legg Petroglyph (Locality 28)

In 1992, the monument's longtime chief of maintenance, Chuck Derby, noticed a number of subtle petroglyphs on a Sioux quartzite outcrop below the ledge, in an area he had passed by hundreds of times during his lifetime (*Pipestone County Star*, July 16, 1992). This glyph panel was recorded in 1993 as the Derby petroglyph panel (Clark 1996:9-10, 27). It consists of a bird motif, a turtle, two feet, three bird tracks, and six "amorphous peckings" (Clark 1996:9) (Figure 55). In 2001, an additional single bird track, called the Legg Petroglyph, was observed on a quartzite outcrop approximately a meter south of the outcrop bearing the Derby panel (Thiessen 2001; Figure 56).

Noble Petroglyphs (Locality 30)

During a 1994 archeological examination of a portion of the monument land that was subjected to a prescribed grass burn, a single bird track petroglyph was observed atop the quartzite ledge, the most prominent topographic feature within the monument (Figure 57; Richner 1994:3). The bird track glyph was subsequently called the Noble petroglyph (Dudzik 1997:102). In 2001, monument staff observed two possible petroglyphs in the quartzite outcrop approximately six to eight meters north-northwest of the bird track (Thiessen

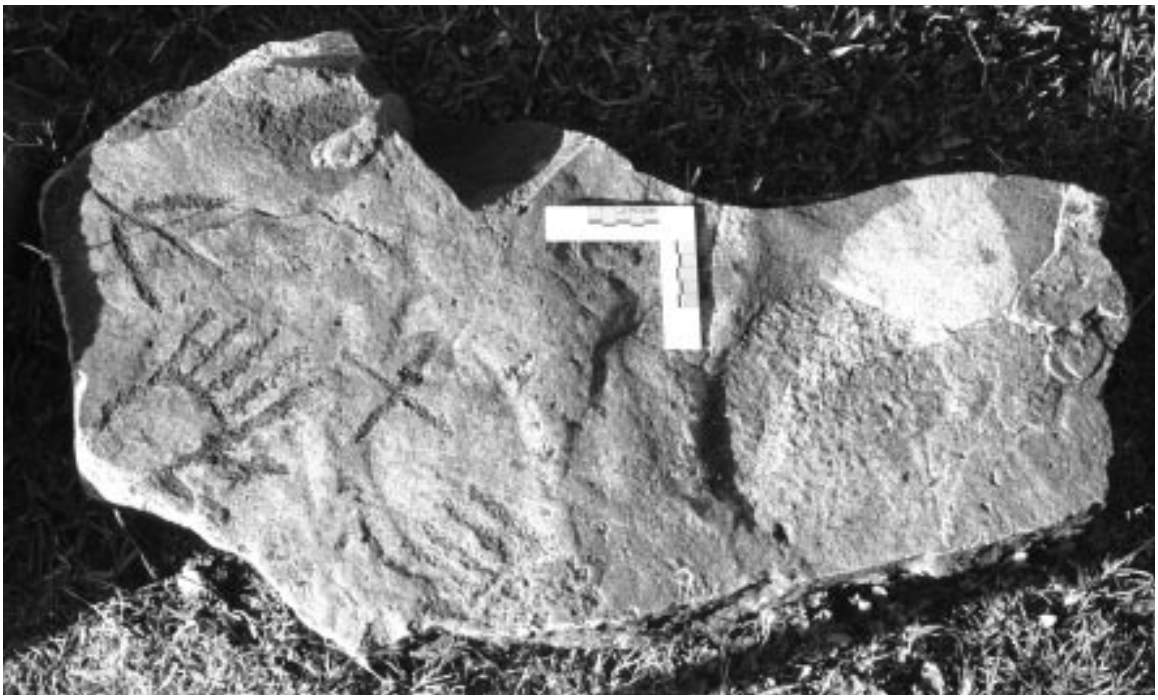

Figure 53. Petroglyph Slab A in the Pipestone National Monument museum collection. Photograph by Alan Smith, 1994 (accession MWAC 588/PIPE 179).

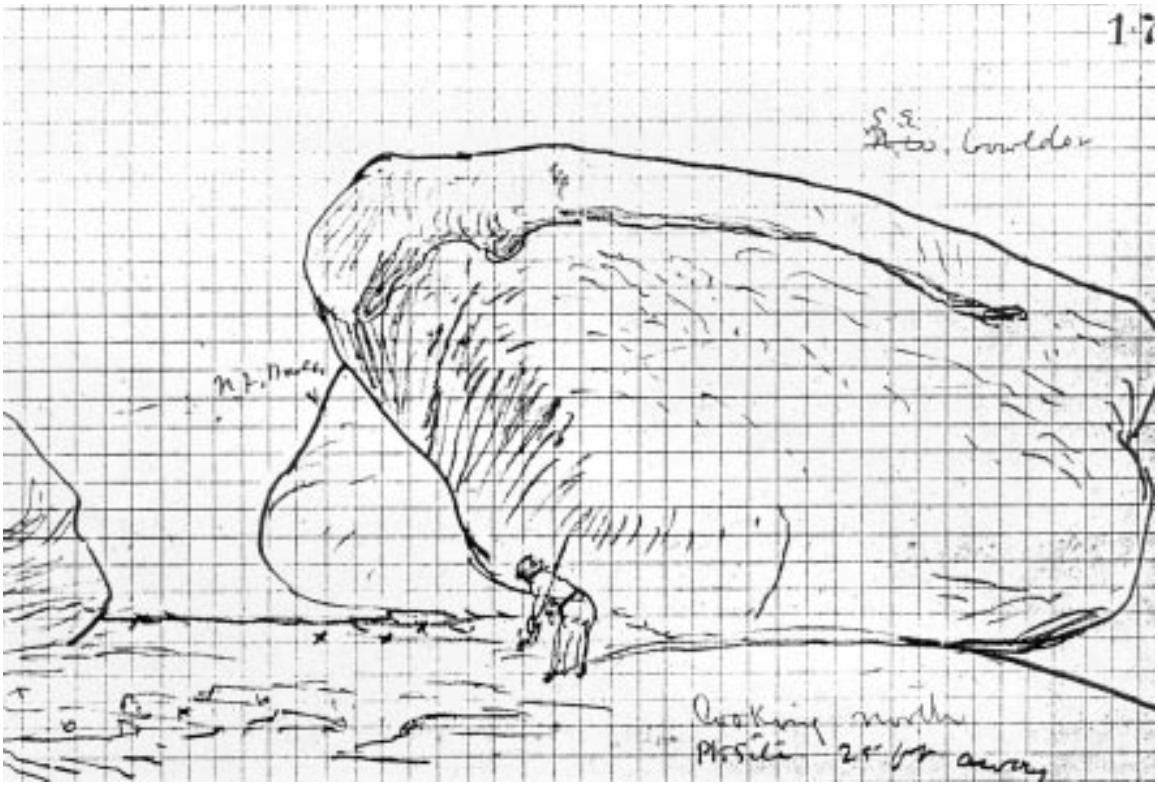

Figure 54. Page 17 from the notebook kept by W.H. Holmes during his 1892 visit to the catlinite quarries. The view is of the Three Maidens and the "x" notations may represent the locations of in situ petroglyphs about the base of the Three Maidens (W.H. Holmes Papers, National Anthropological Archives, Smithsonian Institution).

Figure 55. The Derby petroglyph panel at Pipestone National Monument.

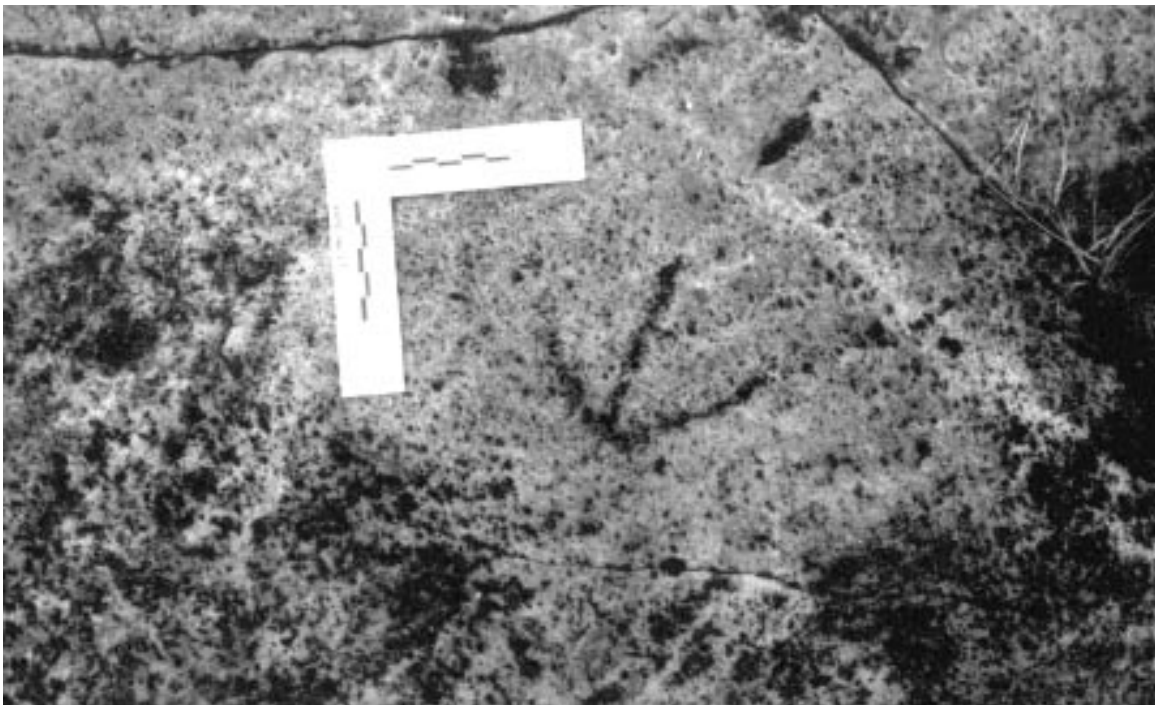

Figure 56. The Noble bird track petroglyph at Pipestone National Monument.

Figure 57. Possible circular petroglyphs recorded in 2001 at Pipestone National Monument. One circle is forward of the tip of the knife blade; the other is in the upper left corner of the photograph.

2001; Figure 11-17). Both are approximately circular, and one bears two short projections on its west side. These three glyphs are the only in situ Native American petroglyphs known to exist on top of the ledge, despite some suggestion in the historical record that other glyphs may once have been observed there.

Description of the Pipestone Petroglyphs

Although often the subject of comment by early visitors to the catlinite quarries, the rock art of Pipestone National Monument has received little attention from professional archeologists and rock art researchers. This is probably due to several factors. Most of the glyphs were removed from the Three Maidens vicinity during the nineteenth century, and many of them were subsequently lost. Prior to 1992, the Three Maidens petroglyphs were the only Native American rock art known to exist in the monument. The attention given to the more than 2,000 glyphs at the nearby Jeffers Petroglyph Site, located about 65 miles to the east-northeast, has overshadowed the smaller and less diverse group of petroglyphs at Pipestone (Lothson 1976; Callahan 2001a).

In his summarization of Minnesota prehistoric rock art, Dudzik (1997:101) classifies individual motifs into three general categories: anthropomorphic, zoomorphic, and geometric/abstract forms. All three categories are represented among the Pipestone petroglyphs (Table 24).

Some of the motifs occur widely at rock art sites through the interior of North America, and have been given names. A prominent example of this at Pipestone is the so-called thunderbird motif, a stylized depiction of a mythological being said to control thunder and lightning (Keyser and Klassen 2001:187, 213-214; Salzer 1997:62). Thunderbird is often depicted as a spread-eagle bird figure with a triangular body, sometimes abbreviated to a curve representing wings attached to a stick-like body. Bird tracks are also often assumed to associate with the Thunderbird being (Keyser and Klassen 2001:180, 188). Although subject to wide interpretation, there may be as many as six full-bodied (nos. 1, 17, 22, 34, 51, and 56) and two stick-bodied (nos. 31 and 68) thunderbird motifs represented among the Three Maidens petroglyphs. The Three Maidens petroglyphs also contain four (and probably more, judging from Charles Bennett's photographs; see Figures 35 through 51) bird track motifs (nos. 16, 26, 44, and 45), two of them clearly of the "trident" variety. Another recurring motif at the Three Maidens is that of the turtle, of which there are at least four examples (nos. 25, 39, 40, and 77). Slab A (Figure 53) bears two handprint or footprint glyphs, and is the only slab that has this type of motif; unfortunately, it is not among the slabs listed and described by Lewis (in Winchell 1911:564), so its association with the Three Maidens petroglyph group is not certain. Slab A also bears a trident bird track and a cross. The Derby petroglyphs contain a turtle, two footprints, four bird tracks, and a possible stick-bodied thunderbird motif (Clark 1996:9, 27), while a single bird track and possibly two circle motifs are known at the Noble Petroglyph Site (Richner 1994).

The thunderbird, bird track, turtle, and hand/footprint are impor-

Table 24. Theodore H. Lewis' categorization of petroglyph motifs at Pipestone National Monument.

Group	Anthropomorphic	Zoomorphic	Geometric/Abstract
Three Maidens[a]			
	2*, "man"	1*, "bird with hart"	5*, "circle"
	11*, "man"	3*, "6 leged beatle"	7*, "nondescript"
	14*, "man with outspread hands"	4*, "part of a bird"	9*, "shaped like pins"
	15*, "man"	8*, "rabbit?"	10*, "shaped like pins"
	36, "man with uplift hands"	12*, "animal"	20*, "nondescript"
	37, "man"	13*, "bird with hart, and also snake attached to wing"	28, "nondescript"
	43, "woman"	16*, "bird track"	29, "nondescript"
	46*, "man"	17*, "bird"	30, "nondescript"
	48*, "man"	18*, "animal"	32, "nondescript"
	49*, "woman defending her virtue"	19*, "animal"	42*, "nondescript"
	50*, "man"	21*, "charging buffalo"	53*, "nondescript"
	54*, "man"	22*, "bird with attachment to wing"	59, "nondescript"
	55*, "man or cross"	23, "animal"	60, "nondescript"
	58, "man"	24*, "perhaps a lizard"	61, "nondescript"
	71, "man with horns"	25*, "turtle"	63, "nondescript"
	72, "woman"	26*, "bird track"	64, "nondescript"
	79, "man"	27, "turtle"	73, "shaped like a horse-shoe"
		31, "bird"	74, "nondescript"
		33*, "animal"	75, "nondescript"
		34*, "bird"	76, "nondescript"
		35*, "animal"	78, "nondescript"
		38, "animal"	
		39*, "turtle"	
		40*, "turtle"	
		41*, "animal"	
		44, "bird track"	
		45, "bird track"	
		47*, "dragon fly"	

Table 24. Concluded

Group	Anthropomorphic	Zoomorphic	Geometric/Abstract
		51*, “bird” 52*, “bird track” 56, “bird” 57, “animal” 62, “animal” 65*, “animal” 66*, “horned turtle” 67*, “moose” 68*, “bird” 69*, “animal” 70*, “animal” 77, “turtle”	
Derby Petroglyphs[b]			
	2 footprints	1 bird 4 bird tracks 1 turtle	6 “amorphous” peckings
Noble Petroglyphs[c]			
		1 bird track	2 circles

a. Motif numbers are from Winchell 1911:564 and the Lewis notes in Appendix C; descriptive names are quoted from Lewis notes; * denotes motifs that survive in the Pipestone National Monument museum collection.

b. Clark 1996:9-10, 27; Thiessen 2001.

c. Richner 1994; Thiessen 2001.

tant recurring motifs in what Keyser and Klassen (2001) have called the Hoofprint Tradition of Plains Indian rock art. Although the focus of their study is on rock art in the Northwestern Plains region, they (Keyser and Klassen 2001:184-185) point out that

> *Northwestern Plains Hoofprint rock art is part of a much broader rock art macrotradition found throughout the eastern and central United States. At sites scattered from the upper Ohio Valley in Pennsylvania and West Virginia, through the central southeast in Kentucky, Tennessee, and Georgia, and into the midwestern states of Missouri, Iowa, Wisconsin, and Minnesota, related rock art motifs include cloven hoofprints, trident bird tracks, and human handprints and footprints. Thunderbirds, occasional vulvaforms, bear tracks, and human faces also occur.*

Pioneering rock art researcher Campbell Grant (1967:137) has stated that "Over the entire Eastern Woodland...the most abundant motifs are the Thunderbird, hands, footprints, animal and turkey tracks."

Although the age of rock art is difficult to establish, a gross estimation may sometimes be made on the basis of the subjects depicted as glyphs, or what is omitted (Keyser 2001:120-123). At Pipestone, for example, no subjects from recent historical time are depicted, such as horses or firearms. This would suggest a prehistoric age for the monument's rock art. Also missing from the Pipestone petroglyphs are motifs that have been interpreted at the nearby Jeffers Petroglyph Site as dating from Archaic times. These glyphs depict spear throwers called atlatls, atlatl weights, tanged copper projectile points, and copper crescents-all artifacts restricted to cultures that existed during the Archaic period, i.e., prior to circa 200 BC (Anfinson 1997:42; see also Lothson 1976:31, Callahan 2001a:37, and Steinbring 1999:7-8). Steinbring (1993:24) believes that the triangular-bodied anthropomorph and thunderbird motifs originated after about AD 1. With these several clues, a guess can be ventured that the Pipestone petroglyphs were likely created between about 200 BC and the advent of historic time in the region, circa AD 1750.

Although the "hallmark" motif of the Hoofprint Tradition, bison hoofprint glyphs, are absent at Pipestone, the presence of other glyphs commonly occurring in Hoofprint Tradition rock art suggests that the creators of the Pipestone petroglyphs shared in the Hoofprint Tradition styles. It may be that bison hoofprint glyphs are more common in the western portion of the Hoofprint Tradition's geographic distribution where bison were presumably most abundant, and other kinds of motifs predominate in the eastern portion of the tradition's distribution. Keyser and Klassen (2001:184; see also Turpin 2001:395) date the Hoofprint Tradition rock art to the Late Prehistoric and Protohistoric periods (circa AD 500-1800). They also suggest that the authors of Hoofprint Tradition rock art were members of the Siouan language family, whose speakers were widely distributed throughout the Plains and Prairie regions of the mid-continent. In historic times, these groups included the Dakota/Nakota/Lakota Sioux, Mandan,

Hidatsa, Crow, Assiniboin, and Ponca, as well as other Chiwere and Degihan speakers such as the Omaha, Ioway, Oto, and Winnebago. Possibly some Algonkian-speaking groups that lived in the Plains, such as the Cheyenne and Plains Cree, also shared in this rock art tradition (Keyser and Klassen 2001:186).

As mentioned before, petroglyph Slab A in the monument's museum collection was not recorded by Lewis and thus its association with the Three Maidens rock art cannot be documented. Slab A bears two handprint or footprint glyphs (Figure 53), a motif unknown among the recorded Three Maidens motifs, although footprint images are reported at the nearby Derby Petroglyph Panel (Clark 1996:9, 27). Slab A also bears a trident bird track glyph and a cross glyph. The coloration of most of the surface of Slab A is unlike most of the documented surviving Three Maidens slabs. Another slab recorded in 1994 by Thiessen as Slab B, and first thought to be part of the Three Maidens rock art, was later seen to be depicted in one of Bennett's photographs (Figure 43, top); thus it likely associates with the Three Maidens group of petroglyphs.

One feature of the Three Maidens rock art not recorded by Lewis (but which appears on Holmes' unpublished rubbings and tracings, and in one of Bennett's photographs) is a curved alignment of circular pecked depressions, a motif called "dimples" by Sundstrom (1993:96), on Slab 24 (Table 21; Figure 46). The depressions are very shallow, which is why they may have escaped the notice of most earlier researchers, and each is approximately one inch in diameter. The six dimples, labeled "tracks" by Holmes, appear to form an arc around Lewis anthropomorph 50 and Lewis thunderbird motif 51 on Slab 24, and may have originally encircled these glyphs before the slab was removed. As mentioned above, a similar single dimple appears below the feet of Lewis anthropomorph 58. Sundstrom (1993:96) states that such dimples are often associated with handprints or footprints, but this does not appear to be the case at Pipestone.

Petroglyphs can be made in a number of ways that include incising, scratching, and abrading in addition to pecking. Because the petroglyphs at Pipestone National Monument are cut into one of the hardest rocks on the North American continent, Sioux quartzite, pecking with another piece of quartzite or other hard stone is the most likely means by which they were made. Because of the hardness of the quartzite, the pecked images are quite shallow and not "deeply engraved" or "deeply cut" as some have asserted (cf. Catlin 1973, 2:168; Grant 1967:133). They are so shallow, in fact, as to be difficult to discern under flat or most ambient lighting conditions, and are best viewed under oblique lighting. In his notes (and repeated virtually verbatim by Winchell [1911:564]), Lewis placed the Three Maidens petroglyphs into three "classes," depending on his assumptions about how they were made, what kind of implement was used to make them, and whether they were polished. He also inferred that one "class," which he believed exhibited polish, was older than the other two classes. He did not, however, relate individual motifs to any of these "classes." In the absence of

any analysis that supports his conclusions, these ideas must be regarded as speculation only and of no substance.

Rock art in general is subject to a wide latitude of interpretation. The best and most fully supported interpretations are usually based on ethnographic analogies, but interpretations are sometimes based on mere speculation which can be unorthodox, if not outright outlandish. Significance and meaning can be assigned at the whim of the researcher, without benefit of any supporting analysis. This has happened with regard to the Three Maidens petroglyphs. In 1950, a local avocational archeologist discovered a feature of the quartzite ledge that he claimed resembled the fabled Egyptian "ankh" motif. At first dubious of any purported connection with Egyptian iconography, superintendent Lyle K. Linch eventually succumbed to the romantic allure of such lore and publicly interpreted this as evidence of some sort of mysterious connection with ancient Egypt (Rothman and Holder 1992:91; see also various newspaper clippings and correspondence in the archives of Pipestone National Monument). The specific location of this rock feature has been lost over the years.

An even wilder interpretation of some of the Three Maidens rock art was offered by James Churchward (1933:242-244) in his book, The Ancient Symbols of Mu. He asserted that several of the petroglyph motifs, particularly Lewis motif 3 (Figure 35) which he interpreted as an octopus, were evidence of ancient connections with the "lost" oceanic continent of Mu, a fictitious land that he literally invented in his writings.

Ethnographic Importance of the Petroglyphs

There is relatively little recorded historic or present-day testimony of Native Americans about the origin and traditional significance of the rock art at Pipestone National Monument. The tradition of the Great Spirit having stood on the quartzite ledge in the form of a large bird has already been mentioned.

Several accounts share a consistent theme of petroglyphs being mysteriously created at night, by spirits unknown or by the female guardian spirits who reside under the Three Maidens boulders. The earliest such tradition was recorded by Nicollet in his journal entry for July 5, 1838 (Bray and Bray 1976:84):

> *But the most extraordinary thing here is that the prairie of this valley contains a group of granite blocks toward the southern end which are larger than any I have so far seen... They lie right on the red crust which covers the red pipestone...**It is on the red fragments which serve as paving stones for these rocks that the Sioux come to write their names as is their custom. They say, moreover, that three female spirits live in this mysterious place and that it is they who have engraved all of the characters that one sees on the red pavement and that one can hear them at work at night...*** *[Emphasis added.]*

This description of the Three Maidens does not appear in Nicollet's official report.

Another such tradition is related by Lynd (Riggs 1864:145):

> *...The commoner Indians, even to this day, are accustomed to look upon these [i.e., the petroglyphs at Pipestone] with feelings of mysterious awe, as they call to mind the legend connected therewith.*
>
> *A large party of Ehanktonwanna and Teetonwan Dakotas, says the legend, had gathered together at the quarry to dig the stone. Upon a sultry evening, just before sunrise, the heavens suddenly became overclouded, accompanied by heavy rumbling thunder, and every sign of an approaching storm, such as frequently arises on the prairie without much warning. Each one hurried to his lodge expecting a storm, when a vivid flash of lightning, followed immediately by a crashing peal of thunder, broke over them, and, looking towards the huge boulder beyond their camp, they saw a pillar or column of smoke standing upon it, which moved to and fro, and gradually settled down into the outline of a huge giant, seated upon the boulder, with one long arm extended to heaven and the other pointing down to his feet. Peal after peal of thunder, and flashes of lightning in quick succession followed, and this figure then suddenly disappeared. The next morning the Sioux went to this boulder, and found these figures and images upon it, where before there had been nothing; and ever since that the place has been regarded as* ***wakan*** *or* ***sacred****. [Emphasis in original.]*

Though not specifically referring to the petroglyphs at Pipestone, in a brief article about petroglyphs on boulders near Brown's Valley, Minnesota, T.H. Lewis (1887:642) related a Dakota tradition about glyphs being created at night by a mysterious "object:"

> *In olden times there used to be an object that merked the boulders at night. It could be seen, but its exact shape was indistinct. It would work, making sounds like hammering, and occasionally emit a light similar to that of a fire-fly. After finishing its work it would give one hearty laugh, like a woman laughing, and then disappear. The next morning the Indians would find another pictured boulder in the vicinity where the object had been seen the night previous.*

Lewis did not attribute this tradition to any specific source, but since he related it in connection with some boulders he observed near the Sisseton-Wahpeton Sioux reservation, perhaps he heard it among those people.

In this context, it is interesting to note that in 1914 anthropologist Wilson D. Wallis recorded stories among some Wahpeton Dakota in Canada about a mythological being named Spider who made noise while working at stones during nighttime (Wallis 1923:39).

The authors are indebted to Linea Sundstrom for pointing out the intriguing connection between the Dakota/Lakota perception of Double Woman and the rock art at Pipestone (personnel communication to Thiessen, February 15, 2001; see also Sundstrom 2000:111-112, 2001, and 2002:105). In 1935 the

anthropologist Ruth Landes (1968:182) recorded among the Prairie Island Mdewakantonwan Dakotas a Pipestone-connected story that involves a mythological being named Double Woman, who is said to have made petroglyphs at night:

> *These mystic women [i.e., Double Woman] were harmless when left alone, but if a hunter became inquisitive or mocking they punished him, causing him to lose his orientation and die in the woods.*
>
> *At Pipestone, Minnesota, in 1935, there was a stone called Standing Rock, which formerly served camping Indians as a windbreak. Here they saw Double-Women oftenest, not in her twin form but by the evidence of sparks flying where the women supposedly hacked pictures out of the rock. Early mornings, insolent little boys used to visit the rock and ridicule the mystic pictures with clumsy scrawls. Once, two "old men" did the same after they found incisions on the rock outlining two running deer pursued by two men with grass tied on their heads. The "old men" realized that these were drawn by Double-Woman, yet they scrawled offensive pictures over the rock.*
>
> *Next day, the two men were hunting. Towards noon they saw two deer lying in the grass beyond the reach of bow and arrow. They ran and ran toward the deer but never reached them; they shot arrows, but the deer only raced north with the arrows. On and on the Indians pursued, growing so warm from exertion that they threw their blankets away and later their leggings until they were completely naked. (The story-teller laughed.) But they aimed steadily at the deer. Day ending, clouds gathering, sleet, rain, and snow falling, the Indians left off to search for the blankets and leggings. They could not remember where they had been. Naked, they hacked the frozen ground with knives and themselves froze to death on the prairie. Next day, people found them. It was Double-Woman who caused them to lose their minds, punishing their mockery.*

A Yankton tradition about the petroglyphs being made by the guardian spirits of the quarries was told by Philip Deloria at Lake Andes, South Dakota, in 1926 (Beckwith 1930:425):

> *In old days an old man came down to earth. He motioned to the medicine-men and chiefs of two rival tribes to come together and he told them how the world was big enough for all and the animals were given them to hunt, not man. But that had not been enough for them, they must kill one another. So they had fought and killed, and the blood that flowed down the river had come together and formed the red pipe-stone. The stone is the blood of Indians. He made the shape of a pipe and sent them down to the reeds for a stem and wove it about with porcupine-quills of mixed colors-in old times a color for each direction. Where the old man stepped was formed a bluff, and there live two fire women who make figures on the bluff.*

The Three Maidens petroglyphs were mentioned by three Yankton elders who gave depositions in 1927 in connec-

tion with the Yankton claim to the quarries which was then under litigation (United States Court of Claims 1927).

Julia Conger, a Yankton tribal member born in 1844, testified (United States Court of Claims 1927:157-158) that she had heard of the Three Maidens rock art from her grandmother:

> *...I have been to Sioux Falls, but never went to Pipestone Quarry. My grandmother told me that in olden times the Indians had that to worship and that they would make sacrifices when they went there. She said, "There is something there that you don't see, something there they pray to and make sacrifices to." I said, "When they go there what do they do there?" She says, "There is something there that they call `Twin Maidens.'" She said, "They make pictures on this rock. Nobody ever saw them with their eyes, but after it was done they could see marks, and they could hear them at night working on this rock, and if anybody went there the next day they could see the pictures on that rock of dogs, ponies, or whatever they had, their pictures would be marked there," and she said, "That is kind of a sacred place." I never went there myself.*

Another deponent, Simon Antelope, a Yankton tribal member who was 79 years of age at the time, spoke of successive visits to the Three Maidens during which he may have witnessed the petroglyphs in situ, their subsequent defacement by vandals, and the aftermath of their removal (United States Court of Claims 1927:169):

> *...I first visited the Pipestone Quarry 52 years ago [i.e., ca. 1875) and the things I saw at that time were somewhere right near where they had the quarry. It is within a quarter of a mile of it. There were several stones that were standing up in the nature of hills. At night I heard noises over there and I could see sparks fly from these stones that I have just described. The following morning I visited these stones and saw what was there, and I found pictures on the stones that were chiseled on, good pictures of buffalo, deer, and other animals, and they were very well done, and there were pictures of Indian men and women, and the pictures were very well done. Upon another visit to the Pipestone Quarry I looked at these stones again, and in addition to the pictures that were on there there were characters made on the stone which appear to be some sort of writing or printing. I couldn't read it, but there was something there that wasn't the pictures or animals. The third visit I made there all these picture writings and things I have just spoken of had departed. Apparently some white people had removed them, taken them away.*

Antelope believed his last visit to the quarries had taken place approximately 40 years previous, or about 1887, which correlates remarkably well with Leon Moore's statement of having removed the petroglyph slabs in 1888 or 1889:

> *I don't remember the exact year, but it was somewhere about 40 years ago [i.e., ca. 1887]. The Yanktons considered these rocks and picture*

writings and all that as being their property. When they were they taken away by somebody we were just robbed of that amount of property. We regarded it equal to the quarry that was there, that it was a part of it.

The final deponent who commented on the rock art was Many Dogs, a Yankton tribal member who was "about 67 years old" at the time (United States Court of Claims 1927:177):

I visited the Pipestone Quarry when I was about 13 years old [i.e., ca. 1873]... I saw large rocks there. There were markings on them, pictures of strange animals, and writings on the rocks.

From these depositions and the tradition recorded by Beckwith, it can be concluded that the Yanktons, who had a close association with the quarries during the nineteenth century, were aware of the petroglyphs but did not know who had made them or for what purpose.

There are suggestions in the historic record that several non-Sioux groups may have made rock art at the quarries. A Mandan man told George Catlin the following in 1832 during Catlin's visit to the upper Missouri River: "We left our ***totems*** or marks on the rocks-we cut them deep in the stones, and they are there now" (Catlin 1973, 2:170; emphasis in original). A Sac chief told Catlin (1973, 2:171): "My mark is on the rocks in many places, but I shall never see them again. They lie where the Great Spirit sees them, for his eye is over that place..." The twentieth-century Ponca tribal historian, Peter Le Claire, wrote of his people that:

They came and lived in Pipestone, Minnesota...When they were in Pipestone they started marking their trail on the big boulders. This was done by the Medicine Men. It was a two-toned picture, part of the picture is already on the wall and it is finished and only a few Poncas an see it, make out what it is. We will come to more of these pictures later. (Howard 1965:17)

During ethnographic research at Pipestone National Monument in 1995 and 1996 (Hughes and Stewart 1997), interviews were conducted with Native Americans who visited the monument for ceremonial purposes or who possessed knowledge of the past use of monument resources by Native Americans. Formal interviews were conducted with eight members of the Yankton Sioux, the Flandreau-Santee Sioux, and the Pipestone Dakota Community (Hughes and Stewart 1997:4-5). The latter group consists of Native Americans who have taken up residence in the Pipestone area for the purpose of quarrying catlinite and making pipes and other objects; its members are primarily from the Sisseton-Wahpeton Sioux, but Chippewa are also represented (Hughes 1995:41-48). Informal interviews were conducted with other Native Americans during the study as well.

During the formal interviews, questions were asked about the origin, purpose, and significance of the Three Maidens petroglyphs as well as the in situ Noble and Derby petroglyphs (Hughes and Stewart 1997:75-76). The results revealed little knowledge about the petroglyphs on the part of present-day Native Americans (Hughes and Stewart 1997:27-28):

The general consensus among informants, both formally interviewed and in casual conversation, is that the meaning of the petroglyphs is forgotten. Five informants who live in the area attempted to make a guess or inject a personal opinion about what the petroglyphs might have meant including winter counts, graffiti, personal markers, spiritual guides, a mark left by one or more spirits, and landmarks or directions on the prairie. Two other informants argued that the original placement or arrangement of the petroglyphs at the Three Maidens might have had meaning, either spiritual or mundane, and that the ceremonies traditionally held at the Three Maidens with the petroglyphs present may have had some special significance in relation to those petroglyphs. Others simply refused to guess whether or not there is or was any spiritual significance or traditional meaning to the petroglyphs.

The researchers went on to explain that the petroglyphs may have taken on new meaning to some of the Native Americans interviewed:

Some people have found significance in certain petroglyphs. Second-hand, or anecdotal information suggests that certain individuals may be able to "hear" the petroglyphs in a spiritual sense. One petroglyph was requested from the Park Service for use in the 1995 Sun Dance at Pipestone. The person requesting the petroglyph said it was "calling" to be there or that the "stones were crying." Another informant overheard a person who said a petroglyph was "speaking."

The glyph mentioned above as being taken to the 1995 American Indian Movement-sponsored Sun Dance ceremonies refers to Lewis motif 12 on Slab 3 (Palma Wilson, email communication to Thiessen, January 23, 1999).

Interestingly, and perhaps coincidentally, a Native American tobacco tie offering was observed suspended from a small bush near the Noble bird track petroglyph when it was recorded in the spring of 1994 (Richner 1994:3; Dudzik 1997:106). This association may simply be coincidental, however, as tobacco ties are a form of offering found often throughout the monument (Hughes and Stewart 1997:42-48).

The Three Maidens petroglyph slabs were also mentioned in a deposition taken on October 12, 1927 from John R. Swanton of the Bureau of American Ethnology (U.S. Court of Claims 1927:186-187), though it is of little value as to the nature of the rock art. He responded only vaguely to questions about the scientific value of the petroglyphs as then perceived:

Redirect question. *There is one thing I want to ask you. The evidence in this case shows that the petroglyphs that used to surround the Three Maidens have been removed from their original site, that they are in the backyard, a private backyard in Blackstone [sic], and were sold by a private individual to the Minnesota Historical Institute. Now, those petroglyphs were essentially of ethnological value, were they not?*

Answer. *Yes.*

Redirect question. *Did the circular fortifications which have been disclosed there not possess a special scientific value?*

Answer. *May I modify my last answer to this extent? I am not familiar with those petroglyphs. I am answering under the assumption that there is no question of their being genuine aboriginal specimens.*

Redirect question. *But they were of special interest, were they not, because of their ethnological value over and above their historic use by the Indians?*

Answer. *Yes.*

Redirect question. *That is what you meant by both an historical and a special interest?*

Answer. *I had reference to things in general, not especially to the petroglyphs. I had reference to everything that is known regarding the significance of the red pipestone in the lives of the Indians and of special geological interest.*

In summary, Native American rock art in the form of petroglyphs has been recorded at three locales within Pipestone National Monument. The most numerous glyphs once were situated in the quartzite bedrock around the group of glacial erratic boulders known as the Three Maidens, which are said to be the home of two or three female guardian spirits of the nearby catlinite quarries. Seventy-nine individual motifs of this petroglyph group were recorded by Theodore Lewis in 1889 (see Appendix C) and were published by Newton Winchell in 1911. Within the last decade, 14 motifs were discovered on rock outcrops below the quartzite ledge (the Derby petroglyphs) and possibly as many as three on top of the ledge (the Noble petroglyphs). Ethnographic and traditional accounts attribute the creation of the Three Maidens petroglyphs to a mythological being or mysterious spirits that work at night. The rock art of Pipestone National Monument is a contributing element to a multiple property district listed on the National Register of Historic Places in 1996.

It is highly likely that additional in situ petroglyphs exist at Pipestone National Monument, possibly obscured beneath the extensive lichens that have developed over much of the exposed rock surface. This possibility is affirmed by the discovery of three or four in situ petroglyphs as recently as 2005 (Scott 2005). Some clues hint at the existence of additional rock art. The label "BIRD TRACKS" appears near a feature called the "Devil's Cave" on a 1950s-era interpretive map, suggesting that presently-unknown bird track glyphs were previously interpreted to visitors. Chuck Derby, former Chief of Maintenance at the monument, once observed a single large bird track glyph atop the quartzite ledge south of the feature called "The Oracle," but was later unable to relocate this petroglyph (personal communication to Thiessen, June 14, 2002).

Most of the prehistoric petroglyphs at Pipestone National Monument have been recorded multiple times and by several different researchers, most

notably Theodore Lewis and William Henry Holmes, among others. The methods used have most often been drawing, tracing, or rubbing. However, these depictions have been based on the limitations of human perception and judgement, and as a result renditions of individual motifs vary considerably. Some motifs were so subtle that they were not recorded, and possibly not even noticed, by those attempting to document the monument's rock art. Emerging technology in the form of laser scanning offers the promise of producing accurate and non-invasive digital records of these petroglyphs in the future. Although applications of this technology to rock art are mostly experimental at present (Bednarik 2001:76; Simpson et al. 2004), it is possible that they can be used in the future to produce accurate documentation of the motifs on the Pipestone petroglyphs that can serve both museum collection documentation, research, and interpretive purposes.

CONCLUSIONS AND RECOMMENDATIONS

In an April 12, 1898, letter advocating the protection of the catlinite quarries, John Wesley Powell, director of the Bureau of American Ethnology at the Smithsonian Institution, wrote to the Commissioner of Indian Affairs:

> *...the ancient Pipestone Quarries are of great and unique interest, first, as embracing a type locality in geology; second, as an aboriginal gathering place in which the industrial and aesthetic characteristics of the Indians were developed and in which the tribesmen learned the lesson of peace; third, as a particularly appropriate and picturesque site for a park; fourth, as a datum point for national literature which is already immortalized in song and story; and, fifth, as a monument of our early history. (Pipestone Indian Shrine Association n.d.:18-19)*

In writing these lines, Powell accurately touched on most of the reasons for which the famous catlinite quarries are renowned and important: their place in geology, ethnology, park landscapes, literature, and history. To this list we would add archeology as one of the essential values of Pipestone National Monument. This value has been realized not only by preservation of the area as a national monument, but also by the recognition given the monument's archeological resources through listing in the National Register of Historic Places on two bases: as a monument-wide archeological complex consisting of multiple localities and as a contributing element to the theme of Native American rock art in the state of Minnesota.

The Progress of Archeological Research at Pipestone National Monument

In the years following the establishment of Pipestone National Monument in 1937, several long-term research goals for the monument were recommended by regional office and monument staff to obtain a variety of historical, ethnological, archeological, and mineralogical information, primarily to incorporate into the monument's developing interpretive program. Formulation of these goals began in 1940 and continued over the following decade (see Edward A. Hummel, "Preliminary Historical Development Report for Pipestone National Monument," in the National Archives and Records Administration, Central Plains Region, Kansas City, Missouri, Record Group 79, Records of the National Park Service, Region II [Midwest], Omaha, Nebraska, Pipestone National Monument, Decimal Code 501-03 through 603, Box 194, File 621, Construction Projects); agenda titled "Subjects for Discussion with Custodian Linch Pipestone National Monument March 1-2 [1948]," in Archeology Outside MRB, Minnesota file at the Midwest Archeological Center; Gordon C. Baldwin, memorandum to the files, December 9, 1948, in Archeology Outside MRB, Minnesota file at the Midwest Archeological Center; Gordon C. Baldwin, memorandum to Olaf T. Hagen, December 14, 1948, in Archeology Outside MRB, Minnesota file at the Midwest Archeological Center; Howard W. Baker, memorandum to Lyle K. Linch, December 15, 1948, in Archeology Outside MRB, Minnesota

file at the Midwest Archeological Center); Gordon C. Baldwin, memorandum to Olaf T. Hagen, March 25, 1949 memorandum, in Archeology Outside MRB, Minnesota file at the Midwest Archeological Center; and Olaf T. Hagen, memorandum to the files, April 4, 1949, in Archeology Outside MRB, Minnesota file at the Midwest Archeological Center; and Beaubien 1949). These research recommendations are summarized at greater length in Chapter 7 of this study.

Viewed collectively, these several plans and memoranda dating from the period 1940-1949 proposed a far-sighted series of archeological investigations to benefit Pipestone National Monument and ultimately the visiting public. Although not presented in a detailed or comprehensive manner, recommended archeological investigations included 1) an inventory of the surficial archeological features of the monument; 2) development of an archeological base map of monument land; 3) an excavation program focused on the quarry pits; 4) documentation of rock art within the monument; 5) distributional studies of catlinite artifacts to identify catlinite objects in widespread cultural and chronological contexts; 6) compositional studies of catlinite and other pipestones to correlate artifacts with material source quarries; and 7) investigation of the "fortification" reported by Nicollet as existing east of the quarries. Even pursued in a piecemeal and uncoordinated manner, such a research program posed an ambitious undertaking, and efforts to implement many aspects of the proposed research were initiated at different times over the years. More than 50 years later, in 2006, some of the recommended studies have been completed while others are underway or have yet to be initiated. With varying degrees of success, progress has been made toward the realization of many of the research goals advocated by Hummel, Baldwin, Hagen, and Linch. One notable exception is the recommended investigation of the "fortifications in the general vicinity of the quarries," which lay outside the monument boundary, as proposed by Hagen in his December 9, 1948 memorandum. This fortification, observed at various times during the nineteenth century, is no longer visible and is not known to have been located during twentieth-century visits by archeologists (see Appendix E).

In general, what can we say about the progress that has been made, or not made, as the case may be, toward meeting these research goals? Considerable progress has been achieved toward meeting objectives 1 and 2, inventorying the archeological features of the monument and developing an archeological base map. The first fieldwork carried out after the research recommendations were made, was Paul Beaubien's five-day reconnaissance of the monument in June, 1949, and his return in October of that year to excavate several of the quarry pits and elsewhere in the monument. Those visits did not result in much progress toward achieving the identified research goals, except for the third one enumerated above, excavation of quarries (see discussion below). Beaubien did, however, reiterate two of the previously recommended research objectives after his June visit-archeological excavation of quarries and creation of a base map. He also recommended that the monument's boundary be expanded to include additional archeological resources.

Sixteen years later, John S. Sigstad systematically surveyed the monument's land and recorded all the archeological resources for which he encountered surface evidence, thus substantially achieving the first and second goals. His investigation, which met the research standards of his time, suffered from limitations beyond his control: 1) the base map provided by the National Park Service for his use contained undetected dimensional errors along two axes, thus limiting the accuracy of the locational information which he plotted on it; 2) the monument had not adopted a prescribed vegetative burn program, which precluded the advantage of seeing large portions of the ground denuded of lush vegetative cover (he was restricted largely to inspecting rodent spoil piles); and 3) today's high-precision surveying equipment, such as total station transits and electronic data recorders, was not available to Sigstad. Nevertheless, Sigstad's survey was comprehensive, useful for many management decisions, and considerably advanced the state of archeological knowledge of the monument.

By the 1990s, a long-term program of archeological resource inventory in coordination with the monument's prescribed burn cycle was recommended. The first such inventory was conducted following a burn in 1993, and successive post-burn inventories were conducted in 1994, 1997, and 1998. As a result of these inventories, it was recognized that many of the monument's archeological resources were repeatedly being greatly affected by processes of bioturbation caused by populations of burrowing rodents. Consequently, these bioturbation processes have created an on-going cycle of artifact burial, exposure, reburial, and re-exposure over time. A one-time inventory investigation, such as that of Sigstad, represents a glimpse of the resources within the inventoried area at that time only and not as they might appear at different times in later years during the on-going process of bioturbation. Consequently, post-burn inventories in the future offer the potential to document additional "glimpses" of the archeological resources at different times and thus contribute to a gradually increasing understanding of the monument's archeological record. This work will be greatly aided by the availability of a photogrammetrically-produced monument-wide base map made in 1997. In addition to being the basis for an archeological resource base map of the monument, this map can serve other resource management and planning purposes as well.

As to the third recommended research goal-quarry excavations-the monument's quarry pits have received three separate episodes of archeological excavation. The first episode consisted of Paul Beaubien's 1949 excavations at three widely-separated locations ranging from the south quarry line to the north quarry line. The second episode of quarry excavations occurred in 1965 and 1966 when John S. Sigstad re-opened Beaubien's former excavations and dug at several other pit locations as well, often to obtain catlinite samples. The third episode happened in 1971 when monument archeologist Roy Reaves excavated trenches through a pit over which the cultural demonstration wing of the visitor center was to be built. Other than recovering a few hammerstones used to break up the overlying Sioux

quartzite and the catlinite beds themselves, some fragmentary bone tools of speculative use, and an occasional metal tool used to work the pits, these excavations have produced only meager results. No insightful evidence of the technology of prehistoric quarrying was obtained from these investigations.

Little progress was made on the fourth recommended research goal, documentation of the monument's rock art, until the 1990s. Prior to 1992, the only rock art known to be from monument land were the petroglyph-bearing Sioux quartzite slabs that Charles Bennett arranged to have removed in 1888 or 1889 from the bedrock underlying the Three Maidens. Said to have numbered 35 or 36 slabs shortly after their removal, Paul Beaubien observed only 14 slabs in 1949. Presently, the monument's museum collection possesses 18 slabs known to have once been part of Bennett's "collection," and one more slab of undocumented provenience. In 1992, an intact panel of 13 glyphs on a bedrock outcrop was reported by Chuck Derby; this panel was documented by Caven Clark in 1993. In 1994, a single bird track motif was recorded elsewhere on the Sioux quartzite bedrock. More recently, one more glyph was noted near the Derby panel, two more possible but unconfirmed motifs were recorded near the Noble bird track motif, a small group of three or four glyphs were observed at Locality 9 in 2005, and, as a result of historical research for the 1997-1998 SAIP inventory project, evidence was found that suggested the possible existence of additional but unrecorded petroglyphs in the bedrock that underlies the Three Maidens. In 1994, the 19 petroglyph slabs in the museum collection were photodocumented. With these documentation efforts, a published article by Thiessen and Bailey (2000), and the completion of the present report (see Chapter 11), this 1949 research objective is substanially completed. Documentation of the Bauermeister Petroglyphs discovered in 2005 remains to be done.

The fifth and sixth recommended research objectives-distributional and compositional studies of catlinite-are linked. Because argillites found in many places across the United States resemble catlinite in color and general appearance, it is necessary to establish the mineralogical character of true catlinite (i.e., from the quarries at the monument) for comparison with the mineralogical characteristics of stone material in artifacts that appear similar to catlinite. Artifacts of true catlinite confirmed in this way can then be studied to establish their cultural and chronological context, and the implications for catlinite extraction and/or trade in prehistoric and early historic times. Constituent analysis of catlinite was first attempted on Catlin's original samples in the 1830s, but it was not until 1940 that compositional analysis was extended to other pipestones besides catlinite. In that year David Howell published the results of his successful comparison of the chemical elements present in catlinite and pipestones from a number of locations. While he was able to distinguish pipestone of Arizona origin from pipestone samples lumped from several sources (including catlinite) in the upper Midwest, his analyses did not distinguish catlinite from all other pipestones of similar appearance.

As a graduate student in the 1960s and 1970s, John S. Sigstad (1968b,

1973) attempted precisely that goal by subjecting stone samples from a large number of locations to neutron activation analysis to establish the presence of certain radioisotopes and identify the chemical elements they derived from. He attempted to use neutron activation analysis (NAA) to identify the chemical constituents (i.e., certain trace elements) present in catlinite and other pipestones from artifacts in museum collections and stone samples taken from source locations (Sigstad 1973). Initially believed to be successful, Sigstad's pioneering analysis was applied to archeological artifacts from many locations and interpretations as to the age and distribution of catlinite usage were offered. Although his methodology was later reviewed and judged to be flawed (Gundersen and Tiffany 1986:48; Glascock 1997; Weymouth 1997), his research stimulated the efforts of later researchers who were more successful in tracing the source locations of various argillites that resemble catlinite. Neutron activation analysis, it should be noted, remains a viable methodology for identifying the source of artifacts made from catlinite and other pipestones, as demonstrated by recent experimental studies of Michael Glascock of the University of Missouri and his associates.

The most notable of these efforts were the x-ray powder diffraction studies of James N. Gundersen, a now-retired geologist from Wichita State University. Over the course of more than two decades, Gundersen's research confirmed more than 360 archeological artifacts as being made from catlinite from the quarries at Pipestone National Monument. These artifacts are from more than 44 archeological sites in nine states (expanded to ten states by studies using portable infrared mineral analysis spectroscopy) and one Canadian province (see Table 5-2). Chronologically the earliest of his confirmed catlinite objects date to the Early and Middle Woodland periods (Boszhardt and Gundersen 2003) and are thus, along with Middle Woodland pipes from the Tremper Mound in Ohio (Emerson et al. 2002, 2005), the earliest evidence of catlinite use by Native Americans, possibly dating as early as 2,500 years ago. The limitations of Gundersen's research derive from the lack of an integrated framework of cultural and chronological criteria for systematic specimen selection before samples are subjected to x-ray powder diffractometry, i.e., he analyzed only samples received from archeologists who happened to know of his research interest and capability, and not from any systematic effort to identify artifacts to be analyzed because of their cultural and chronological significance. An inherent limitation of x-ray powder diffraction methodology is that it requires small amounts of powdered stone taken from artifacts subjected to analysis. This means that some museum artifacts of extraordinary historical or aesthetic value are often not made available for analysis by this method, regardless of whether their provenance is such that x-ray powder diffraction analysis of them would contribute to understanding the broader patterns of catlinite and pipestone use by Native Americans.

New technology in the form of infrared mineral spectroscopy holds great promise for future sourcing studies of catlinite and other pipestones. An instrument called a Portable Infrared Mineral Analyzer (PIMA) has recent-

ly confirmed catlinite from a Middle Woodland temporal context in Ohio (Emerson et al. 2002, 2005) and has added a tenth state to the list of states where catlinite artifacts have been confirmed (see Chapter 5 and Table 5-2). The PIMA instrument offers three major advantages over x-ray powder diffraction and neutron activation analysis: 1) it does not require a powdered sample of the specimen to be analyzed; 2) the operation of the instrument is fast, allowing multiple samples to analyzed in a matter of minutes; and 3) the instrument is easily portable and can be taken to museums and other collections repositories for use.

Thomas Emerson of the University of Illinois and his colleagues are presently experimenting with PIMA analysis of catlinite, a task which is greatly facilitated by James Gundersen's recent donation of his collection of catlinite samples to Pipestone National Monument. Numerous samples in that collection, presently stored at the Midwest Archeological Center, are documented as to the location of the numbered quarry space where Gundersen originally collected them. Emerson and his colleagues visited the Midwest Archeological Center on August 16 and 17, 2004, and used two PIMA instruments to analyze a large number of catlinite and pipestone specimens from the Gundersen collection. Some preliminary results of this experimentation have been used to support PIMA analysis of pipes from the Tremper Mound in Ohio (Emerson et al. 2005).

No progress has been made toward the seventh research goal recommended in 1948, that of investigating the reported "fortification" observed by Nicollet about two miles east of the quarries. Although Philetus Norris dug into this fortification and a possible associated mound feature in 1882, no archeologist since that time is known to have observed this site, despite attempts to locate it. It is possible that the long-term effects of cultivation (and bioturbation?) have eradicated all surface evidence of it that was once visible to the naked eye. Oral tradition shakily links this feature to the catlinite quarries. If it is of interest to National Park Service decision-makers in the future to pursue research focused on the "fortification," aerial photography and geophysical methods may be able to detect its presence, though success with these methods is not a foregone conclusion.

The Archeological Resources of Pipestone National Monument

The entire monument is recorded as one large archeological site or property, comprised at present by 43 subsites (in ASMIS terms) or localities (our term). These subsites are of seven general kinds: 1) quarry pits, where Native Americans extracted catlinite in prehistoric and historic time; 2) petroglyphs pecked into the Sioux quartzite bedrock; 3) mounds, even though none has been confirmed as being of man-made origin through recent (i.e., twentieth century) systematic excavation; 4) circular stone alignments, though very few are suspected to have survived from the hundreds that once dotted the nearby landscape; 5) lithic scatters representing campsites and/or catlinite workshop locations; 6) a set of possible tool sharpening grooves on the Sioux quartzite; and 7) historic features resulting from Euroamerican visits and settlement of the area, most

notably the initials of several members of the Nicollet exploring party of 1838 carved into the top of the Sioux quartzite ledge. Of the last category, only the historic Nicollet party inscription has been documented as an archeological feature.

In addition to these seven kinds of subsites, an eighth type of feature is reported to have existed in two nearby locations outside the monument. The closer example was about two miles east and slightly north of the quarries, and the second was a short distance north of that location. They consist of earthworks, possibly enclosing purported burial mounds. One of these features is described in Appendix E because oral history links it to the quarries. Another type of archeological feature that once may have existed at the monument, but no longer exists today, is pictographs or painted images on the Sioux quartzite or the Three Maidens boulders (see Chapter 11).

A cemetery containing the graves of several students of the former Pipestone Indian School is believed to exist within the monument, not far from Winnewissa Falls. The location of the cemetery has not been confirmed through either documentary or geophysical research (see Appendix D; Nickel and Frost 2000). The best clue to its location is the base of an obelisk monument erected in 1934 to commemorate the memory of the students buried in the cemetery. That location today is represented by a depression in the ground where the monument once stood. It may be possible to locate the cemetery in the future through noninvasive methods, such as magnetic, electrical resistivity/conductivity, and ground-penetrating radar surveys, although initial efforts to locate it through magnetic and resistivity surveys were not successful (Nickel and Frost 2000).

The monument's archeological record has been greatly impacted by the cumulative effects of bioturbation, which is the displacement, churning, and mixing of soil through time by burrowing animals. This is a particularly disruptive process in a place where the soil mantle above bedrock is generally three meters or less, as at Pipestone National Monument. The result is the obscuration of stratigraphy in the buried soil horizons, and the repeated burial and exposure of archeological artifacts and features. Together with removal by human agents, bioturbation may partly account for the virtual disappearance from the landscape of one of the most abundant archeological features observed during the nineteenth century-stone circles representing the position of lodges or tipis occupied by Native American visitors to the quarries. Of the hundreds that once existed near the quarries, only one confirmed and two possible such features were identified during the archeological inventory investigations of the 1990s. Bioturbation may also account for the mound-like features observed by nineteenth-century visitors as well as by the present investigators; these "mounds" may simply be large rodent spoil piles. Despite the fact that no subsurface cultural stratigraphy has been observed in any of the archeological excavations in the monument, nor have any subsurface features such as firehearths, storage pits, or post holes been recorded, the archeological resources of the monument should continue to be inventoried

in conjunction with the monument's prescribed fire management program. Each prescribed burn episode has the potential to reveal artifacts that, when cumulatively mapped over a long period of time, have the potential to reveal more about prehistoric patterns of occupation of the monument and exploitation of catlinite. A growing body of literature about the effects of bioturbation on archeological sites (cf. Hansen and Morris 1968; Wood and Johnson 1978; Erlandson 1984; Bocek 1986, 1992; Erlandson and Rockwell 1987; Johnson 1989) should be reviewed and considered in future planning for the management of burrowing fauna and archeological resources within the monument.

In 1972 or 1973, the monument initiated a two- to three-year cycle of prescribed grass burns to encourage the elimination of exotic vegetation species and their replacement with native species, which has continued to the present day. What effect does this fire management program have on the archeological resources of the monument? Experiments in mixed grass prairie environments in other Plains locales (Sayler et al. 1989; Buenger 2003, n.d.a) have suggested that buried artifacts-even those buried only a centimeter or so below the surface-are virtually unaffected by grass fires. However, experimental studies in mixed grass environments near Grand Forks, North Dakota, and at Badlands National Monument, South Dakota, have resulted in somewhat contradictory conclusions (Sayler et al. 1989; Picha et a;. 1991; Buenger n.d.a). The Grand Forks study (Sayler et al. 1989; Picha et al. 1991) concluded that grass burns, though of relatively low peak temperature and brief burn time, can result in significant thermal alteration of surface artifacts through heat stress-induced fracturing, spalling, melting, charring, and even combustion, particularly for artifact classes such as wood, bone, shell, and lead. The results of later experiments at Badlands National Monument, however, concluded that thermal alteration of surface artifacts is minimal and not significant (Buenger 2003, n.d.a). This conclusion is supported by experimentation (Buenger 2003, n.d.a) as well as by examination of 244 artifacts from Pipestone National Monument and 1,357 artifacts from Homestead National Monument; both are parks in mixed grass prairie settings. In these collections, slightly over two percent and less than eight percent, respectively, of the artifacts were judged to exhibit evidence of thermal alteration, typically blackening with tar but almost no physical alteration (Buenger n.d.b). One difference between the studies, which may explain the higher degree of artifact alteration noted in the Grand Forks experiment, is the larger amount of fuel load in the Grand Forks experimental burn plots (Buenger n.d.a:18). A common but minor effect of fire noted in the Badlands study is the formation of a residual tar deposit on artifacts, which is believed to be removed by weathering over time and therefore is an impermanent change (Buenger n.d.a:18, 135).

While fire (prescribed or natural) would generally have little effect on surface artifacts at Pipestone National Monument (except in those areas of the monument where the fuel load is augmented by woody vegetation), it can facilitate the identification and documentation of archeological resources because it results in the de-

nudation, or partial denudation, of the vegetative ground cover. As explained previously, post-burn archeological inventories present the opportunity to gradually augment knowledge of the monument's archeological record.

The absence of absolute dates from archeological contexts in the park requires that associative dating or relative dating be used. The two types of artifacts available for this purpose are prehistoric pottery and projectile points. The projectile point types represented in collections made by Norris, Beaubien, Sigstad, and the current study indicate that human use of Pipestone extended from the Late Archaic period through the Late Prehistoric to the advent of historic contact with Euroamericans (circa 1000 B.C. to A.D. 1700). Given that the modern archeological investigations of the park span a fifty-year period there is a remarkable consistency in the range of projectile point styles and dates from the archeological investigations conducted in the late twentieth century. Each episode of investigation (Paul Beaubien, John Sigstad, the inventories of the 1990s) has recovered similar types of lithic materials suggesting that those making and depositing the tools used local sources and raw materials found in the glacial drift deposits as their stone of choice. The only consistently recurring non-local material is identified as Knife River Flint, although an Ontario lithic type (Hudson Bay Lowland Chert) of generally similar appearance cannot be ruled out.

The results of a reanalysis of the prehistoric pottery in the park collections indicate that the earliest pottery yet found within the monument dates to what are generally regarded as Middle Woodland times, a period that lasted from the last few centuries B.C. to possibly as late as AD 500 or 700 (Johnson 1998:5-7, 11, 18; Anfinson 1998:10-11, 12, 15; Henning 1998:i, 3, 6).

All three ceramic analysts engaged for this study are in general agreement as to the relative frequencies of dateable pottery in the monument's ceramic assemblage. All three conclude that the earliest pottery is represented by a relatively small number of sherds attributable to the Middle Woodland period, perhaps A.D. 500/700 or earlier, followed by a notable increase in the number of sherds representing Late Woodland peoples. Two of the three analysts see this as being followed by a substantial increase in pottery of the Plains Woodland tradition; in contrast, Johnson notes a modest decrease in Plains Woodland pottery compared to that of the preceding Late Woodland period. All three agree that the frequency of Oneota pottery is substantially diminished from earlier Plains Village frequencies. The ceramic evidence attests to the presence of successive prehistoric Native American peoples at the quarries from the Middle Woodland period to possibly as late as the advent of historic time (ca. AD 1700-1750?). This suggests that Native Americans have used the quarry locale, probably for multiple purposes, over most of the past two millennia.

Sporadic archeological investigations at Pipestone over the last 50 years have consistently recorded the same types of sites and artifact assemblages. Previous investigators, Beaubien and Sigstad, have concluded, and it is clear from the 1997 and 1998 work also, that

there were no extensive aboriginal occupations in the immediate vicinity of the quarries. Although there appear to be no permanent or long-term habitation sites in the monument there is evidence of use of the area for at least 3,000 years. In the modern and recent historic period as well as the Late Prehistoric period, this use was probably focused on the extraction of catlinite. At least one site, the Richner Site, demonstrates that catlinite exploitation took place at least 1,500 years ago. Catlinite artifacts from distant places outside the monument date to the Early and Middle Woodland periods, attesting to catlinite use possibly as early as 2,500 years ago. Catlinite appears to have been most heavily used within the last millennium, spanning the late prehistoric into the historic periods (Table 4).

In looking beyond the boundaries of Pipestone National Monument there is nothing remarkable in the archeological lithic record of the park to differentiate it from that of the surrounding region. The prehistoric humans who visited the Pipestone area, for catlinite extraction or other purposes, may have begun to do so as early as the Late Archaic period of 3,000 years ago and continued on a sporadic basis until the present. There appear to be no long term habitation sites or villages at or near Pipestone. The area seems to have been used for temporary camps for hunting and other resource extraction purposes, like that of catlinite quarrying. The cultural sequence and site types recorded in the archeological record are typical of the area and in general for western Minnesota, eastern South Dakota, and northwestern Iowa (Anfinson 1997; Winham 1990; Aufderheide et al. 1994; Benn 1990; Alex 2000). The projectile point styles do not reflect any evidence of non-local groups regularly using the area; rather they suggest that regionally-based people used the Pipestone locale over a long period of time, at least 3,000 years, albeit on a temporary and repeated basis.

On the basis of this and previous investigations a number of conclusions can be drawn about the archeological resources of Pipestone National Monument. First, extensive occupations of long duration are not in evidence. Second, much working of the quarried catlinite has taken place on the quarry grounds. Third, the nature of catlinite working in the quarry area was the removal of blocks and the rough shaping of items to be manufactured so as to eliminate from transport as much weight as possible. Clearly, the quarries were and continue to be the focus of extractive use. The park lands are littered with the debris of post-extractive processes in the form of catlinite discards and debitage. The general absence of finished catlinite objects on the monument, coupled with the presence of substantial quantities of catlinite detritus, indicates that considerable working of catlinite took place here, with the final finishing of objects apparently taking place elsewhere. Fourth, ritual considerations were probably a part of catlinite quarrying in aboriginal times, including perhaps ritual purification by sweat-bathing (Scott and Thiessen 2001, 2005). And fifth, at least some non-local knappable stone was brought in or traded in from considerable distances as suggested by the presence of artifacts and detritus of Knife River Flint from west-central North Dakota, and of Bijou Hills quartzite from central South Dakota.

As mentioned before, from a cultural resource point of view the monument is recorded as a single archeological site with multiple subsites or localities. As a listed National Register of Historic Places site, Pipestone National Monument has 43 identified archeological localities. These can be considered contributing resources that support National Register of Historic Places status. Of particular importance are the three recently-discovered in situ petroglyph panels. These three rock art locales are the only petroglyphs known to remain in place, although the possibility is strong that additional, yet unrecorded, petroglyphs exist elsewhere in the monument, some of which may be obscured by lichen covering extensive portions of the exposed Sioux quartzite bedrock.

Mounds (or possible mounds) and stone circles indicating former tipi locations once were among the most numerous and visible kinds of archeological resources within the monument. Yet today they have virtually disappeared from the landscape for several reasons, including destruction during earlier archeological excavations, removal for agricultural and construction purposes, and bioturbation. Thus the few localities with these kinds of features (three possible stone circles and two probable mounds) take on added importance just by the fact they have survived the impacts of burrowing animals and earlier consumptive resource investigations.

One of the interesting discoveries made during the current project is the presence of recently deposited broken and incompletely finished catlinite objects (several pipes and a pipe stem). These artifacts were observed in the less frequently used portions of the park, the areas infrequently visited by the public or park staff, and were found not far from the current park boundary fence. These unfinished objects were observed lying in the current grass mat and not embedded in the soil matrix, thus indicating a very recent origin for their deposition. In one instance an object was observed in proximity to an offering wrapped in cloth and tied to the boundary fence wire. We believe these unfinished objects are of very recent origin, were broken or damaged in some manner during the carving process, and symbolically returned by their carvers to the vicinity of the stone's source of origin. Thus, in a sense, the Native American archeological record of Pipestone National Monument is still being formed through the addition of discarded catlinite artifacts.

Recommendations

Several recommendations can be offered for management of the monument's archeological resources and for future studies designed to increase knowledge of the monument's archeological resource base and the use of catlinite.

1. The post-burn inventories and precise mapping of isolated artifacts should be continued. With the process of bioturbation constantly underway in most of the monument, artifacts will be repeatedly buried and exposed, with the result that only a portion of them are visible at any given time following diminishment of grass cover by prescribed fire burns. By continuing to record artifacts as they undergo these cycles of burial and

exposure, a more complete picture can be gradually developed of artifact distribution and different use areas within the monument. Such data should be added to the monument's GIS data layers or themes.

2. Each archeological locality within the monument should be revisited and the condition of each subsite documented on Midwest Archeological Center Site Condition Forms, and ASMIS records should be subsequently updated with this information. This cycle of re-assessment of subsite condition should be conducted at intervals not exceeding five years, and ASMIS records should be updated promptly following each episode of condition reassessment. All of the monument's subsites were visited for this purpose in August 2005, so the next re-assessment episode should be completed by the end of July 2010. Photo documentation of resource condition may be useful in some instances to supplement the data recorded on the form. The initial assessment of site condition should be conducted by a qualified archeologist, but revisits to monitor condition changes can be conducted by non-archeologists possessing the site condition documentation generated from the initial assessment.

3. Mounds are a dubious feature of the monument. Most of those mentioned in the accounts of nineteenth-century visitors are gone, having been eroded or dug into by various parties. Some of those that appear to have survived have been judged to be refuse or rock spoil piles and others may be merely the result of rodent burrowing activities. Only one (Locality 17) appears to be a likely burial mound, probably of relatively recent origin. Park staff should carefully monitor the condition of the tentative mound-like features recorded in Localities 33 and 35 through 38. If they are indeed the result of bioturbation, changes may be noted over the span of a few years. These changes might be increased or decreased height, enlargement of the lateral extent of mounded earth, or diminishment of mound "mass" through the natural processes of erosion and exposure to the weather.

4. Limited test excavations should be conducted to determine the nature of the stone circles suspected to exist in Localities 16d and 40. These two possible circles were detected by probing for shallowly buried rocks with wire or rod probes. If confirmed as deliberately patterned circular stone alignments, they may indicate that similar features, which once numbered in the hundreds near the quarries, may survive elsewhere within the monument in a buried state due to the long-term effects of bioturbation.

5. The natural and cultural features of the Pipestone landscape stimulated early interest and attracted frequent visitors; the graffiti these visitors left behind is a part of the record of historic visitation to the monument. The nineteenth and early twentieth century graffiti

pecked or carved into the Sioux quartzite bedrock in various places before the monument was created in 1937 should be documented. This should include recording their locations with GPS technology and documenting their nature with photographs and transcriptions. It may be possible to identify some of the graffiti creators through names and initials.

6. A study should be conducted of the technology of catlinite working as reflected in catlinite scrap collected from various archeological "workshop" localities in the monument. Based on the nature of marks left on the scrap pieces during the stone reduction or artifact manufacturing processes, it should be possible to distinguish between marks created by metal tools and those made by stone tools, effectively differentiating catlinite assemblages worked prehistorically from those worked during the historic era. To compare and contrast catlinite-working technology of the prehistoric and historic periods, it will be necessary to obtain scraps of worked catlinite from a confirmed prehistoric context. The Richner Site would have an important role in such a study because 1) it is a workshop site that has yielded abundant pieces of worked catlinite; 2) sherds of late Middle Woodland age (ca. AD 500) have been found there; and 3) it lacks evidence of historic occupation.

7. Compositional studies of catlinite artifacts should be continued, as inspired by the research of John S. Sigstad and achieved by James N. Gundersen, particularly if a non-destructive means to do so are found. If the PIMA experimentation underway by Thomas E. Emerson and his associates proves consistently useful in distinguishing catlinite from other pipestones, catlinite in well-provenanced, critically-selected collections should be sought and subjected to PIMA analysis. The effort should be guided by a research design that identifies in detail the chronological, geographic, and cultural objectives and parameters of the research, and criteria for seeking out and selecting artifacts from appropriate chronological and cultural contexts.

8. At his retirement in 2002, James Gundersen donated his personal collection of catlinite and other pipestone samples to the museum collection of Pipestone National Monument. It is presently housed in 28 boxes at the Midwest Archeological Center (accession PIPE 191/ MWAC 1000). At the present writing (January 2006), the collection is being organized and re-packaged for permanent storage. It contains samples (often multiple) from most of the numbered quarry spaces in the monument, and, to our knowledge, is the only nearly comprehensive collection in that regard. The collection also contains catlinite samples from the drilling conducted in 1979 and 1980 to explore the extent of catlinite beds within the monument. The catlinite samples constitute an important reference collection for any study of

the mineralogical variability of the catlinite within the monument, or comparison with pipestones from outside the monument. The collection also has stone samples relating to Gundersen's important research on the so-called "Kansas" pipestone that occurs widely as glacial drift. In addition to solid stone and powder samples, the collection also contains diffractograms, or mineralogical "signature" charts, for many of the samples analyzed by Gundersen. A finding aid should result from the reorganizational effort.

9. The Bauermeister Petroglyphs that were observed at Locality 9 in 2005 (Scott 2005) should be documented by GPS location, photography, and drawings.

10. Rudolf Cronau's (n.d.) article about the catlinite quarries in the Die Gartenlaube newspaper should be translated into English and its content analytically compared with his later published description of them (Cronau 1890).

11. Because it is the only confirmed surficial clue to the location of the Indian School cemetery, the location of the depression that marks the former location of the "Peace" monument should be recorded through Global Positioning System (GPS) technology before it eventually fills in with sediment or the pipe marker is removed.

Archeological evidence stands in mute testimony to the quarrying and use of catlinite by humans for possibly as long as the past two and a half millennia. Artifacts of catlinite from the Minnesota quarries have been documented in dozens of archeological sites in ten states and one Canadian province, and that list will surely grow as pipestone sourcing studies continue. Today, catlinite continues to be quarried and made into pipes and a wide variety of other objects by Native Americans of many tribes. Hughes (1995) and Zeneñp and Basaldú survey a large volume of ethnographic literature that documents catlinite or other pipestone use among fifteen American Indian tribal groups and numerous subdivisions of the Sioux, representing seven linguistic stocks as well as several finer linguistic subclassifications. Hughes (1995:21-23) also summarizes data taken from a review of quarry permits issued between 1973 and 1994. These data show that, in that period of time, 358 individuals from at least 34 tribal groups in both the United States and Canada received permits to quarry catlinite. Clearly, catlinite has special importance to a great many Native Americans of diverse tribal affiliation.

Archeological remains, at Pipestone National Monument and elsewhere, constitute the physical record of this long history of use of and widespread regard for this relatively soft, carvable stone. As the archeological record connected with catlinite continues to grow clearer, whether incrementally as in future prescribed fire episodes at the monument, through the unearthing of catlinite artifacts during future excavation projects, or through material sourcing studies of artifacts from distant places and diverse cultures, the basis for informed management and interpretation of irreplace-

able resources that illuminate that record will increase. It is hoped that the present study contributes to that goal.

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APPENDIX A

SELECTED PORTIONS OF PHILETUS W. NORRIS' LETTERS PUBLISHED IN THE NORRIS SUBURBAN NEWSPAPER

Among the diverse roles performed by Philetus W. Norris during the course of his long and multifaceted career was that of newspaper publisher (Chittenden 1900:303-305; Haines 1977, 1:103 et seq.; Binkowski 1995). Following the conclusion of the Civil War, Norris acquired a large tract of land near Detroit, Michigan. There he established the town of Norris, where he published a newspaper, the *Norris Suburban*, between 1876 and 1878 (Binkowski 1995:9, endnote 8). In a column in that newspaper entitled "The Great West," Norris published a series of letters in which he described his widespread travels through the American West.

Because of his romantic disposition and tortuous writing style, the letters are not as factual as might be desired. Nevertheless, they are a source of information of some interest and rarity because copies of the *Norris Suburban* have survived in relatively few repositories. Issues exist in the holdings of the American Antiquarian Society (the issues of April 21 and August 11, 1876; volume 1, numbers 7 and 23, respectively); the Burton Historical Collection at the Detroit Public Library (December 22, 1876 issue; volume 1, number 42; letter from Barbara Louie, Archivist, Burton Historical Collection, to Thiessen, January 13, 1998); and the New-York Historical Society, which holds many issues (letter from Reference Librarian Mariam Touba, New-York Historical Society, to Thiessen, February 11, 1999). A number of clippings from the "The Great West" column have also been preserved in a notebook or "journal" at the Huntington Library at San Marino, California (HM 506). Norris arranged and edited the clippings, evidently in anticipation of publication in book form, but died in 1885 before this could be accomplished. The notebook is titled "Meanderings of a Mountaineer, or the Journals and Musings (or Jotings) of a Rambler Over Prairie (or Mountain) and Plain."

This appendix reproduces excerpts from two 1877 letters from "The Great West" column that concern the catlinite quarries. Both letters exist in surviving issues of the *Norris Suburban* as well as in the Huntington Library notebook. The transcription presented below was made from a microfilm copy of the Huntington Library notebook clippings. Norris' editorial emendations obscure some of the printed words to the point where they are illegible; these are indicated below by blank lines or are enclosed within brackets with a question mark. Some text that concerns other subjects not relating to the quarries has been omitted.

Letter dated June 4, 1877 (published in issue no. 68, June 22, 1877, page 4; letter from Mariam Touba, Reference Librarian, The New-York Historical Society, New York, New York, to Thiessen, February 11, 1999):

THE GREAT WEST.

Sacred Calumet Quarry
--
The
Pipe of Peace
--
Grasshopper Plague
--
Guardian Spirit
Grottoes

Sacred Calumet, or Pipe Stone Quarry,

June 4th, 1877.

After a brief visit to the ever beautiful heights of Ft. Snelling, the now tunneled, flumed and utilized Falls of St. Anthony, and the ever quiet fairy Minnehaha, I left St. Paul for a trip to the famous Calumet Mountain, or quarry of Indian tradition.

A nearly continuous ride of 178 miles upon the St. Paul & Sioux City Railroad to Worthington, 34 miles to termination of its Western branch and all other railroad connection with the world in this direction, at Luverne, and 30 miles over a new prairie wagon trail, brought me speedily and safely here. Nearly the whole distance is over a fertile, well watered and beautiful undulating prairie, with only two drawbacks: scarcity of timber and surplus of grasshoppers,-both unfortunately, serious ones... Marquette, LeSeur [sic] and other early French missionary explorers ever found a grand pow-wow and smoke all around an indispensable preliminary to any important business. A beautifully ornamented pipe bowl of purple mottled stone, stem of wood and feathers was the traditional calumet of friendship and peace, thus sacredly burying the hatchet and pledging all who in council used it, until openly unearthing the war-pipe with hatchet, blade and stem ornamented with quills of the war eagle which ever indicated defense and war, and such has ever remained and still continues the universal ceremonial custom whatever the form, the material wherever possible to obtain it, has ever been the same, a peculiar redish [sic] purple, mottled, with light redish [sic] spots or specks; soft and easily carved into any desired shape when first dug, and bearing a fine polish gradually hardening and darkening with time and use. Material for all was obtained at one sacred mountain or quarry somewhere upon the famous Cauteau-des-Prairie [sic] of Dakota, (the last of the three syllables, Indian-like receiving the accent) presided over by the Great Manitau [sic] of the red men, where although in _____ conflict elsewhere, they ever smoked, quarried and departed in peace.

But it was sacred to red men alone; for two full centuries no white man was ever allowed to visit it or even learn its location, and to this day no Indian predjudice [sic] or superstition has been more universal, stronger or _____ than hostility to white men ever being allowed to visit the Calumet quarry.

About the year 1836 or '37 the famous Indian painter, Catlin, through great

difficulty, danger and by the aid of a prominent Englishman, visited, _____, and in the main correctly sketched and described it. Niccollet [sic] backed by the Government visited it in 1838 or '39; and in 1843 myself[,] a Frenchman and five Chippewa braves reached it from the St. Peters river, but were surrounded upon the quarry by such numbers of Sioux warriors that we gladly escaped with our hair but no pipestone, to the Pembina half-breeds on the Red River of the North.

Since the Sioux war of 1862, it has been visited and doubtless described, but Catlin's is the only one that I have ever seen. The possession of iron tools, horses and some rude firearms early obtained of the whites around the falls of St. Anthony, for a time strengthened, but forever demoralized the eastern Sioux who then assumed control of the Calumet quarry, keeping rival tribes from there peaceably meeting to organize against the common enemy, and by sale at their own price of fragments, derived in various ways great benefit. Probably few gold or silver mines ever gave the possessors more preponderance over their neighbors than the Pipe quarry did the Sioux, and has been [a source?] of their long continued power not generally well understood. By the last treaty with the Sisson [sic] Sioux they reserve one square mile, embracing the cliffs and quarry, occasionally conveying a supply to their homes a few miles west upon the Sioux river to manufacture and sell, Indian-like, mostly for whiskey.

The sacred quarry though ever said to be in Dakota, is really some 8 or 10 miles east of it in Pipestone county, Minnesota. At some remote period of the past upheaval has lifted nearly horizontally the long elevated vitreous quarry rock basis of the Cateau-des-Prairie [sic] of Dakota and Minnesota, near the head of the Red River of the North. Some all powerful ancient forces eroded a valley about two miles long, north and south, by less than one mile wide from east to west, with a cliff of these vitreous rocks 30 or 40 feet high, for its eastern border, and nearly parallel with, and less than half a mile west of it, another ledge of the same kind of rocks, some 4 or 5 feet high, so stratified and cross fractured as to quarry out in blocks, some 3 or 4 feet long by 2 wide and 1 thick. Beneath the latter, ___ some 4 or 5 feet of drift deposit, or some 8 or 10 feet from the present surface of the valley, is the only known Calumet quarry upon the Continent. It is now in one or two foot of water, though possibly dryer in the fall, nearly horizontal, and in all from 12 to __ inches in thickness. Only the bottom layer of some two or three inches is thick and compact enough for Calumets ___ pipes, most of the upper portions, though soft and beautifully mottled, is still usually too thin and shaly for pipes, but beautiful for many kinds of ornaments.

The once all powerful erosion has formed a chain of small lakes and rock, bordered pools along the creek from the falls over the cliffs, through the valley to the Northwest.

At one of these pools, directly upon the quarry, the tramping of Buffalo at some dimly traditional period of the past, disclosed it to the joyous red men. The immense excavations all in a direct line, nearly due north and south for about one mile, many of them ancient and long

abandoned, evince the patience and toil necessary, with their rude tools and no mechanical appliances, to remove the red rock, and obtain, (often if not always under water) the material for all the conventional pipes of peace and of war, for countless ages not only, for nearly all the Indians of North America (as in all my wanderings over all of the United States and much of British America [no?] other council pipe is used where possible to obtain that) but also all lost, destroyed, and deposited in the cabinets and museums of the civilized world.

With great effort of myself and two assistants I have secured some 150 pounds of the Pipestone, but some of it is from the upper layers; also some small fragments from the red and pink colored cliff wall. Much of the surface of the latter is as smooth as glass and hard as steel, certainly the hardest rock I ever attempted to break, and flakes of it will scratch glass almost like a diamond. Catlin's sketch of the quarry, stream, bluff and number and location of the five huge granite bowlders [sic] (each from ten to thirty feet in diameter) [is?] correct, but not the line facing of the latter. He represents them as in line with the bluffs and with the Guardian Spirits grottoes facing west; they really are near the south end of both bluff and quarry, midway between them lining due east and west [and?] with Guardian grottoes facing north.

His burial cairn of the young Sioux brave who was killed just before his visit by slipping from the Medicine or Leaping rock. That mound (now not over four feet high) and hundreds of others, beside some rude stone and earthwork fortification are in plain view, though mostly above the bluffs. The fall of water is now much greater than he represented it, and during spring floods must be very beautiful.

I think an earnest effort of Catlin or any of his party to have jumped to the Leaping rock would have dispelled much of its legendary terrors, and the prowess of the ambitious braves to there leave their arrow proofs of their agility and daring. Although nearly [56?] years of age I found no special effort or danger in the feat. Practical experience and nerve in cliff climbing and care in not sliding from the glazed rock, 6 or 7 feet in diameter 35 feet high and 6 or 8 feet from the cliff, is all needed for perfect safety in reaching this famous Legend rock.

Near it is Niccollet's [sic] record of his visit which is nearly the only legible one, as the Indian certainly never possessed tools capable of carving the glazed surface upon which our steel tools received more impression than they made[;?] still there are some faint etchings and paintings of former councils, and stalwart warriors of fable and fame-also imprints upon the rocks that the credulous superstition of the red men have ever viewed as the footprints of the Buffalo eating war Eagle Manitau [sic] of the Legend days agone.

A fringe of [desert?] oak, elm, box alder [sic] along the ragged edge of the bluff are all that were within vision for many miles anywhere upon an ocean of green grassy cauteaus [sic] terrace to the summit[,?] blue in the north-eastern horizon.

With all the surrounding evidence, and romantic beauty, it is hard for an old mountaineer to realize that *this* is the fabled birth place of the red Indian race,

the red cliffs, the petrified bodies in mass of antedeluvian [sic] man here drowned in the great deluge, stained with the blood of countless buffalo's [sic], here offered to the great Manitau [sic], and the ridge of rock was moulten [sic] and glazed by their ancient sacrificial fires, or here that Heaven's thunderbolt's [sic] petrified into crimson rocks impious warriors who sacriligiously [sic] sought fragments of the sacred Pipestone before sacrificing to the two female guardian spirits of the boulder grottos, alternately awake and on duty. Hard to feel that (save recently) the painted and plumed stalwart warriors of all the surrounding nations *here* alone laid aside the battle spear and scalping knife, burried [sic] the red hatchet of war, and leisurely met, quarried, smoked and departed in perfect equality and safety, conveying to their lauding friends fragments of the sacred rock for the indispensible [sic] cerimonial [sic] calumet to the remotest tepee or campfire of the red Indian race. Yet such is doubtless traditionally true and [though?] sad not regretful an abler and better race capable of progress and advancement crowd fast upon the dying campfires and fading footprints, and that soon law, human rights and true religion will sweep over this lovely park and permanently surplant the rude virtues and customs and savage oregies [sic] of the doomed Aborigines, and happy homes nestle around the red cliffs and sacred Calumet Quarry of the red mens' fabled birth place, the lovely Cateau [sic] prairie of the distant Dakota Land.

P. W. Norris.

Letter No. 52 (undated; published in issue no. 53, March 9, 1877, page 4; letter from Mariam Touba, Reference Librarian, The New-York Historical Society, New York, New York, to Thiessen, February 11, 1999):

THE GREAT WEST.

The Sioux -- An Interesting Story of the Sioux or Dakotah Savages.
LETTER No. 52.

Our first record of the people by us called Sioux, by themselves Dakotah, is derived from the early French missionaries who visited them around the fairy falls of Minnehaha (or laughing water) and the noted falls of St. Anthony, on the upper Mississippi, about two centuries ago...A race of stalwart, crafty and aggressive warriors, quick to perceive and improve all advantages for slaughter and conquest, they early acquired horses, iron weapons, some firearms, and countless beads and gaudy trinkets, and most profitably monopolized the traffic between the fur-catching Indians and the fur-buying whites, and their greed increasing with their strength, they assumed control of the sacred Calumet, or Pipestone Mountain.

This ledge of peculiar purple rock, 30 or 40 feet high and several miles long, is one of the southern terraces of the elevated table land called "Catea-des-prairies," [sic] near the head of the Red River of the North in Eastern Dakotah, from time immemorial the resort of pilgrims from all the surrounding Indian nations, who, though at war elsewhere, *there*, at the only known quarry of the sacred blood-stone of the great Manitou,

they ever met, smoked and quarried in peace, equality and safety. The location and strength of the Sioux enabled them to sacrilegiously levy tribute upon the pilgrims, or sell at their own price fragments of the sacred stone for the indispensable ceremonial Calumet of peace, and thus enriched and elated, they aspired to [the] conquest of all their neighbors. Only in the Chippeways of the Upper Lakes and the Mississippi did they find a foe nearly their equals in numbers, skill and bravery...

But the Sioux, nearly outlawed from the brotherhood of nations for their sacrilegious [sic] conduct about the sacred Calumet Mountain, having wantonly destroyed their best neighbors, and craftily absorbed the worst, and projected a systematic career of conquest, these Arabs of the new world desired, and as usual with them, captured, absorbed, or Mahommed-like, invented a religion suited to their tastes and purposes.

Virtually closing access to the Peace Mountain to prevent pilgrims from various nations there meeting and planning to unite against them, they embark upon a ruthless crusade of conquest deeming each Sioux a warrior born...

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APPENDIX B

P.W. NORRIS' REPORT ON ARCHEOLOGICAL INVESTIGATIONS AT THE CATLINITE QUARRIES, 1882

The following is a partial transcription of Philetus W. Norris' report on his investigation of several mounds in the vicinity of the catlinite quarries at Pipestone, Minnesota, in August of 1882. It is incomplete because two pages are missing from the original manuscript.

The original and a copy of this report, together with related correspondence and notes, are at the National Anthropological Archives, Smithsonian Institution, Washington, D.C. The original report is in Letters Received 1878-1888, Bureau of American Ethnology, Norris Correspondence file. The letter and a copy of the report are in Manuscript Collection 2400, Box 8, Minnesota Archeology file. A copy of the report is also in Manuscript Collection 2400, Box 3, Minnesota Archeology file. Pages 10 and 11 are missing from both files. The copy was transcribed by Douglas Scott on February 10, 1998. Capitalization and punctuation from the original were retained, only spelling was corrected in some instances.

The following is a partial transcription of Norris' letter to W.H. Holmes, dated February 10, 1883, from Manuscript Collection 2400, Box 8, Minnesota Archeology file.

Sir,

I have the honor to submit a preliminary report of the work entrusted to me in accordance with your letter of August 18, 1882. [Norris states he left Washington and traveled to Detroit then to Madison and finally to Pipestone.] I then proceeded to the Sacred Calumet Quarry (in Pipestone County) Minnesota - near the line of Dakota carefully examined the cliffs, falls ancient and modern quarrys, traced many of the totem etchings found upon the rocks, sketched some ancient earthworks near there, and after securing some of the Calumet rock and also various relics from the 10 Mounds which I opened in that vicinity returned to Prairie Du Chien the last day of August. [The letter continues, dealing with other investigations in other locations.]

Manuscript Collection 2400, Box 3, Minnesota Archeology file contains the following report:

Report of Ethnological Researches, in the Mississippi Valley During 1882 and January 1883,

By,
P. W. Norris,
Ethnological Assistant.
Minnesota.
Pipestone County.

Mounds, or other prehistoric Earthworks are rarely found upon the treeless borders of Minnesota and Dakota, the most important of those of which I have a knowledge being at, or near the Cliff and Quarry of the Sacred Calumet, a fair sketch and description of which and attendant legends may be found page 144 - Vol. 2, and elsewhere, in the English reprint of the famous George Catlin's "North American Indians."

PIPESTONE

This legendary birthplace of the Red Indian Race is embraced in the one mile square Sisseton Indian Reservation which is now adjoined upon the South by the flourishing town of Pipestone.

My first visit to this Quarry was for [end page 1] pipestone with a small party of Chippewa Indians in 1842, my next without them in 1857, again in 1877, and during my last, spent the 29th and 30th days of August 1882 in opening ten mounds, and by the assistance of Mr. H.C. Bennett of Pipestone, Miss Nellie F. and Mr. G. C. George of Warner N H,[1] secured sketches for the accompanying cut of the Cliff Quarry and mounds. The following is from my notes regarding the mounds opened during this last visit.

No. 1 A circular oval topped grassy mound 28 feet in diameter at the base and 3 feet high. I first cut a trench 3 feet wide, to and somewhat below the general surface, from the south side to the center and threw [sic] that for a radius of 3 or 4 feet entirely out. The material found was a dark colored somewhat adhesive alluvial soil unmixed with other soil, charcoal, or ashes, injulosly[?] mingled with fragments of rock. These range in size from 2 or 3 to 12 or 15 inches in length by half as wide, and thinner, evidently not drift material, but angular light colored and very hard jaspery rock similar to that forming the Cliff border, underlying, and thickly strewn over much of the surface of the valley. Continuing the drift Northeasterly to the border of the mound, developed the same dark adhesive earth, and angular rocks, and also several small fragments of the purple [end page 2] yellow mottled Calumet, Catlinite or Pipestone from the Sacred Quarry one of which bore traces of course [i.e., coarse] tool marks, but no human or other bones were found.

No. 2 This is a very interesting mound, from being one of the far Northern ones, having an authentic history, and thus by comparison shed[din]g some light upon those adjacent. It is the mound shown surmounted by a flagstaff and totem, in the sketch by Catlin, and by him stated to have then been made two years, and though no date of his visit is there given; from the fact of its having been after his main operations upon the Missouri and Yellowstone 1832-4 and subsequent campaign to the Comanche country and first visit to Florida and from my personal knowledge of his wanderings I place it in 1836 or 7. Catlin does not give the base of this mound, but places the height at 10 feet which much exceeds my recollection of it from a hasty glance in a horseback retreat from a Superior force of hostile Sioux in 1842. J.N. Nicolette [sic] saw and noted it without giving its size in 1838. I again saw and carefully noted it in 1857, when although apparently undisturbed it but little exceeded 6 feet in height. In 1877 it had certainly been opened [end page 3] and at least the cranium of the skeleton and some of the weapons and trinkets buried with it [are] reported to have been carried off. I did not then disturb it further than to secure a perforated bears claw and some glass beads which were among the fragments of angular rocks in the

[1] The George family of Warner, New Hampshire, were visitors in Pipestone at the time of Norris' presence there. Gilman C. George was C.H. Bennett's father-in-law and Nellie F. George was Mrs. Bennett's younger sister (see the *Pipestone County Star* newspapers of July 20 and 22, 1882). The authors are indebted to David Rambow for pointing out this information.

Figure B1. Profile and plan view of P.W. Norris' Mound 1 at the catlinite quarries, 1882. The plan view shows the trench dug by Norris.

excavation, which was somewhat south of the center of the mound. In 1882 it had evidently been further excavated being only about 4 feet high, but somewhat enlarged at its base which was circular and about 35 feet in diameter.

I then cut a large trench from the South side along the natural surface of the mound to, and beyond the center of the mound. The material was dark adhesive soil similar to that about it, and near the center was some mostly decayed fragments of wood, one of which appeared to have been the short thick perforated stock or handle of an Indian whip; also angular fragments of rock like that surrounding it, aggregating together with that previously thrown out, fully half a cart load. I found no evidence of these rocks ever having been arranged as a stone coffin, but rather as a cairn, over the corpse which from the size and form of the pile was probably, though not positively interred in a sitting posture.

Although the rock and soil material of which this mound is composed are in all respects similar [end page 4] to those about it, I have never at any visit to it during 40 years observed any considerable excavation or other difference in the surface surroundings, although the first casual visit was within 10, and the second, and careful one within 25 years after its construction.

No. 3 The location of this mound amidst the large angular blocks of rock from the Cliff, and upon a slope towards the stream below the falls, renders its form and size somewhat indefinite but it is circular, about 25 feet at base and 3 feet high. A 4 foot trench which I cut from the south side nearly across it demonstrated that the material of which it was composed was a dark alluvium like that around it, without charcoal or ashes, but having a pile of the usual fragments of rock and

Figure B2. Profile and plan view of P.W. Norris' Mound 3 at the catlinite quarries, 1882. The plan view shows the trench dug by Norris.

the base of the center, and with them several small pieces of the pipestone.

No. 4 This mound is beside an ancient trail near its rocky ford of the creek, and is 58 feet in length from North East to South West, 34 feet at its greatest width and much of it about 4 feet high. I found the turf very thick and tough, which [end page 5] cut none the better from finding that, and the dark adhesive soil which composed the main portions of the mound literally filled with angular blocks of vitreous rocks, many of which were a good lift for one man to handle.

Through such material and numerous fragments of decaying human and other bones without any apparent regularity or concentration a four foot trench was opened Southerly across the middle of the mound and Shafts [were] sunk in several other portions of it, to the natural, lighter colored and much harder earth beneath, everywhere finding fragments of both human and animal bones, but no entire skeleton or even skull of either, but the jaw bone of a Coyote, a portion of the skull of a Deer with the Stub of a horn attached, and many fragments of pipestone were removed, one of the latter, having evidence of rude carving is numbered 45 in my collection of 1882.

This irregular intermixture of the contents of the mound, circular and ridge like elevations in various parts of it justify the inference that it has been pretty thoroughly upturned and replaced at some recent period.

No. 5 This mound found near the South fork of the creek is 25 feet at base, 2 ½ feet high at the highest portion of its oval surface, was [end page 6] next opened by a four foot excavation in the center, down through the dark adhesive earth, to the bed rock beneath it.

Ethnologically nothing of value was revealed, but unsought, a Geological fact of much interest. Scraping the smooth surface of the fine grained extremely hard bed rock with the spade disclosed parallel groovings which upon careful cleaning proved most unmistakably to be regular Glacial Striae, remarkably sharply cut and well preserved from abrasion or erosion, from 1 to 2 inches wide, half as deep and trending N.N.E. & S.S.W. or in line with the huge granitic boulders called the Maidens as shown upon the map in the valley. This led to an immediate search for Glacial groovings about the base of these erratic rocks, and upon the Cliff, with the interesting results, to be found noted in their proper order, or connection.

Neither the developments made or the time that I could properly spare justified opening the few remaining mounds below the falls and hence I ascended above them, and some mounds recently opened by Messers Bennett and George &c

No. 6 This is a circular conical mound built upon the rocky but turf covered margin of the Sloughy channel of the creek about 100 yards above the falls where the slight Easterly [end page 7] dip of the horizontally stratified bed rock allows a deep alluvial deposit nearly to the brink of the falls. This is not the largest, but the highest mound near the Calumet Cliffs being 35 feet in diameter at base, fully 6 feet high, and standing as it does above the boggy channel (which is 6 or 8 feet deep at low water) and covered with a dense and tall growth of

herbage looks much higher. This rank herbage and very tough turf seriously annoyed us in starting at the Western side, but once opened the loose dark alluvial soil handled well except adhering to our Spades, and by vigorous effort 3 men soon opened a broad trench to the bottom of the loose dark earth, and another crossing it in the center. Projecting through the sod was found one angular rock 2 feet long nearly as wide and 9 inches thick sitting nearly endwise in the center, a similar one flat ways beneath it and then a pile of them of various sizes but generally smaller commingled with fragments of pipestone, and very much decayed fragments of both human and Coyote bones, but no skeleton of either entire, but the only charcoal or ashes found at the cliff. These were under the pile of stone which were not then, if they ever had been, arranged as a stone coffin although equal in fitness to some of which I have seen them made. Some of the pipestone was covered but with it was found the stone perforater marked 94 in my collection of 1882. [end page 8]

No. 7 This mound is across the sloughy stream and somewhat nearer the Cliff than no. 6 and like it is a circular conical one, 30 feet in diameter at base and 4 feet at its greatest height.

A trench opened 3 feet wide from the South side of this mound to and throwing out [i.e. throughout] its central portions, only revealed the usual dark adhesive alluvial soil, and in the center a small pile of angular chips, and smaller fragments of pipestone, and traces of decayed bones.

As this was also the result of the recent researches of Messers Bennett & George in adjacent mounds I went 2 miles North Easterly and after pacing and sketching the large circular Earthwork, and some smaller crescent shaped ones went to mound

No. 8 This is simply a bastion like enlargement of the embankment of the large circular Earthwork at one of its numerous unique angles, and is now about 4 feet at its greatest height 25 feet wide, and somewhat more along the embankment which in both directions is much Smaller. A broad trench cut directly across this mound, developed only a bank of loose alluvial earth lighter in color and less adhesive than those at the Cliff, but unlike them destitute of angular rock, pipestone and bones.

No. 9 I found this a circular oval topped mound within the great circular Earthwork measuring 20 feet at base and 4 high. [end page 9]

[pages 10 and 11 missing]

Remarks.

In the foregoing dry record of facts and figures in connection with the past seasons researches of the mounds at Pipestone, description of the Country, Cliff, and Quarry, the history of its present, and legends of its past occupants or visitors; as well as my own theories regarding these mounds, their age, or their builders, have been purposely omitted. For the first of these reference is made to the Illustrated works of the Artist Catlin, the official reports of the explorer Nicollett [sic]; and my own work of Border Legends now in the press; and the last, I will proceed to briefly state. The anomolous feature of the case, is, that the location of one of the historical-

ly, and legendarily most cherished and frequented haunts of the Aborigines of North America, [is] in a region among the most destitute of timber of any of its habitable portions. Of the ceaseless stream of Pipestone seeking pilgrims who for countless ages have visited the Sacred Quarry, very many must have died at this Mecca of their wanderings - and, - at least before their relatively recent possession of horses - were from necessity buried in the vicinity; and I deem it a subject of great Ethnological interest [as] to where, and how, it was done.

The rolling Coteau region despite its fertility [end page 12] is from its elevation arid and climate more destitute of timber than the great prairies of Illinois ever were, notably along its few and transient streams, and there is neither history or tradition when there was a tree to the square mile in the Pipestone region, or even a thicket of bushes for camp fuel, except a narrow fringe among the crags of the Calumet cliffs, which is ever so kept down by fire, or by Indians for fuel that I have never during 40 years, seen a growing sapling large enough for use in the construction of a lodge, or of a burial scaffold, above the reach of wolves. This absolute want of timber which has ever prevented the sustaining [of] an Indian town, and consequently regular burial places nearer than that of the Sisseton Sioux at Flandreau 10 miles west, on the Big Sioux river in Dakota must have also ever seriously restricted the construction of burial scaffolds and also cremation of the dead. To the statement that these pilgrims were prairie Indians, and hence burial scaffold builders, who would not bury the corpse, but only the bones subsequently in the earth, I reply, that not all or perhaps the most of them as many were occupants of the Great Lakes or other Eastern regions, who habitually bury mostly in the earth and hence likely to do so at the Calumet Quarry whereas shown all the circumstances favored that mode and hence the removal [of] the corpses [from] there [end page 13] or the adoption of any other mode of burial including cremation, under peculiarly unfavorable circumstances, entirely improbable and hence graves or burial cairns of the abundant material at hand, in mounds by those preferring them - or all combined - would in the lapse of centuries accumulate in the vicinity of the Sacred Quarry. In this view I am sustained by the authors above referred to, by the Indian legends. My own previous observations, and, the recent researches, to the extent of proving that these mounds are the work of man, but I frankly admit are far short of my anticipations, in Skeletons tools weapons and ornaments actually found in them. And here I venture a fact and a suggestion. I am informed by high authority that at different periods of the Sioux war in Minnesota during the Rebellion, detachments of troops (who had facilities for obtaining fuel) encamped for successive days or weeks, at this Indian reservation. These were mainly residents of those regions, incensed alike at the guilty and the innocent, the living and the dead, of the detested race some of whom had perpetrated demonic atrocities upon their friends, and with such feelings, abundant time and tools, wreaking vengeance upon the race by upturning their graves and burial mounds, and securing relics [end page 14] was alike a pastime and a boast. From the fact of their being upon the reservation of a band ever mainly friendly, and

semicivilized, these excavations were mainly refilled, and hence their external appearance, and the commingled situation of the material of the mounds and the want of relics found in them, which theory although not wholly satisfactory to myself is all I can offer until further researches sustain or disprove it.

Another pertinent inquiry regarding these mounds is do they bear evidence of being the work of a race older or different from those found there by Whites? To this I unhesitatingly answer no! whatever may be true regarding the age or the builders of the Great flat topped mounds, ditches and embankments of the lower Mississippi valley, the unique pottery and stone coffins around Cairo, the Effigy mounds of Wisconsin, or the hard cored conical mounds throughout our Country; in these at the Calumet Quarry I find neither in the form, arrangement, material, or contents, anything differing from what the present race of Indians certainly [has] done in one of the largest of these mounds and might reasonably have done in all, at no very remote period of time. No custom of the Indian race was more universal, than that of smoking the [end of page 15] Calumet pipe of peace of which far the most common, widely disseminated, and valued were from the Sacred Quarry.

Pipes, and fragments of this material occasionally found in graves, or in intrusive burials in the outer and softer portions of the hard cored mounds, in or beneath which I have never found or know of others having found, a single Sacred Calumet, or even fragment of the rock from the Sacred Quarry - and I deem it of interest to bear this in mind in future researches and inquiries, as having an important bearing upon the relative age of this class of mounds, and the general dissemination of Calumets from the Sacred Quarry.

Circular and Crescent Earthwork
2 Miles from
The Sacred or Calumet Cliffs.

I am not certain that Catlin saw these works although they are situated near the great war trail from Flandrau [sic] and the Sacred Quarry to the Minnesota, then called St. Peters River. In 1838 Nicolett [sic] describes two circular Earthworks each 2000 feet in circumference with their entrances fronting each other. [end page 16]

In 1842 then in ignorance of his visit I was led by a Chippewa Indian comrade to the crescent shaped works and then to the large circular one with the view of judging their fitness for defense if necessary from the Sioux and hence noted them particularly, and not deeming them defensible with our small party, we did not in our subsequent retreat attempt to reach them or to make a stand in a similar circular work a mile or two Northerly of it, which I have not since seen, but learn that such a work in that direction is now under cultivation. The location, form, and size of the circular work hereinbefore shown so nearly agrees with Nicolett's [sic] description as to leave no doubt of its identity but the description of the other circular work in or near the location of the crescent shaped works is not so easily reconciled [and] speaks an error or omission in the copy or press, or another circular work which I have never found. My observation was so careful, and recollection remains so clear that although I took

no notes at the time of my first visit, I have no hesitancy in vouching that these embankments are now so much lower than they were at that time, as to indicate they are modern works, but certainly older than claimed by an aged Yankton Sioux who recently claimed to Mr. C.H. Bennett of Pipestone that he was [end of page 17] present when they were constructed by his people in their great war with the Eastern Indians for the possession of the Sacred Quarry about 80 years ago. As this tallies well with the closing conflicts of that war it is probable he may have helped defend, but certainly did not help build them as 40 years ago there was little or no more evidence of excavations for the earth of the embankments than there is at this time, which is scarcely perceptible.

Some of the Chippeways of our party claimed to have been there during that war, and certainly well knew their location and character, and planned in reference to them in case of an emergency before leaving Mankato, but did not claim to know when or by whom they were built.

From all these evidences it is clear to my mind that these works are mainly modern, constructed by the Sioux, or other Indians during their long and ferocious conflicts for possession of the once Neutral ground of Nations at the Sacred Quarry after the Sioux sought sole control, which both history and tradition prove to have been since they obtained horses and firearms, or at least knives and hatchets of the whites; and probably and one or both parties were aided by them or by half-breeds and their tools in the construction of these works. I do not deem this position shaken, by the fact which I concede that the contents of Mound No. 9 in the large circular [end page 18] work indicate an earlier date, as the site is a natural one for a defensive battle, being between a commanding spur of the Great Coteau Des Prairies near its southern end and afoul of the Sloughy creek, and these modern warriors may have chosen to entrench around, and defend the grave of some great chieftain, or to use it as a lookout in a somewhat depressed portion of a treeless plain. I had neither the time or instruments to show the exact angles, or all of them but the size and general outline agrees well with a tracing recently made and sent me by Mr. Bennett as well as the size and circular form given by Nicolett [sic] and may be relied upon as essentially correct.

The roll of full sized copies of etchings are from a few of the countless numbers found upon the vitreous flesh colored rocks around the huge granite boulders between which, tradition and history alike prove, the Indians believed was the residence of the two Genii guardians of the Sacred Quarry and to whom propitiatory offerings were always made before attempting to secure a fragment of this rock and hence the etchings, are doubtless the totem marks of the respective nations or their clans, and are accurate as they [were] carefully copied by a far better artist than myself from the impressions upon thick soft paper well pressed upon them. [end page 19 and end of Pipestone narrative; the remainder relates to SE Minnesota's Houston County and was not transcribed]

[Last page of Norris manuscript includes the following notes:]

List of Enclosures.

No. 1 23 Pages of manuscript report of mounds & c.

No. 2 1 Map of Minnesota with localities of works opened marked thereon

No. 3 1 Small map of the Calumet Cliffs & Quarry

No. 4 1 Long roll of totem tracings

No. 5 11 Sketches of painted totems

No. 6 1 Letter to Prof. C. Thomas

APPENDIX C

TRANSCRIPTION OF THEODORE HAYES LEWIS' NOTES RELATING TO THE PIPESTONE PETROGLYPHS

The transcribed notes that follow were made from a microfilmed version of the original handwritten notebook in which they appear, plus a typescript copy which also appears on the same reel (reel 7) of the microfilm publication (Minnesota Historical Society 1991). Pagination of the original notebook and the microfilm frames on which the notes appear, as well as the frame number where the typescript is to be found, are shown as three numbers separated by slash marks, the whole enclosed within brackets. Thus, the notation "[3/705/750]" indicates that the transcribed material that follows appears on page 3 of the original notebook, and also on frame 705 of the microfilm publication; the typescript version appears on frame 750.

Lewis' original tracings, made in the manner described below, also exist at the Minnesota Historical Society. Alan R. Woolworth (personal communication, November 10, 1998) advises that the 79 Native American glyphs are depicted on 15 sheets of thin yellow tracing paper, each measuring 20 by 30 inches. An additional sheet depicts the famous Nicollet inscription made on the rock ledge near Winnewissa Falls in 1838. Newton H. Winchell published redrawn and reduced versions of the 79 Native American glyphs in his monumental work, *The Aborigines of Minnesota* (Winchell 1911:Plate 8). The Nicollet inscription appears on page 565 (Plate 9) of Winchell's book.

In his discussion of the Pipestone petroglyphs, Winchell (1911:562-566) also published verbatim, or nearly verbatim, many of the notes that follow.

1. Lewis' description of how petroglyphs were recorded by him:

[3/705 and 706/750] The pictograps [sic] described in this book, whether on boulders or rock ledges, have been copied the natural size, by first marking around the margins of the grooves with a very soft lead pencil, and then laying the greased side of a sheet of tissue paper over them. If the surface of the boulder or ledge was smooth or nearly so, simply rubbing the outer side of the paper lightly with the hand, was sufficient to get a good negative impression. Removing the tissue paper and placing it on a sheet of thick white paper, I then traced the positive lines.

On rough surfaces I first marked around the margins of the grooves, as described above, and then laying the paper over them, traced the outlines as seen through the paper, while it was in place on the rock.

The space between the lines [4/707/750] (on the paper) represents the actual width and shape of the groove.

The short notches or irregularities in the outlines are caused by the irregularity of the surface in most cases, and it is impossible to copy them in such away [sic] that the roughness of the surface of the rock will not be shown in the line.

In reducing the pictures to a smaller scale, the smaller notches in the outlines should be straightened, and the blured [sic] portion should be ignored, running the line at those points with the general trend of the well defined line.

The original tracings were not made with a [5/707/751] view of reducing them by photography, and they are entirely unfit for that purpose.

In order to be thus reduced, there should be new tracings made from the original tracings, following the above rule for making reductions, and making the lines on the new tracings uniform in width.

T.H. Lewis

2. Lewis' description of the Three Maidens and nearby petroglyphs:

[43/727/772] The Three Maidens

SE - SW - 1 - 106 - 46

Pipestone Co Minn

There are 6 large granite boulders lying close togother [sic] in the valley of Pipestone creek, east of south from the quarries, and west of south from the falls. The three largest are called the "Three Maidens", and they range in size from 60 to 65 feet in circumference and from 10 to 12 feet in height above the surface of the soil, but from the surface of the quartz upon which they rest they are from 12 to 14 feet in height. The smallest boulder is 33 feet in circumference and 4½ feet high. There are no pictographs on the boulders as has been stated. (Over)

[44/728/773] Pipestone Pictograps [sic]

SE - SW -1 - 106 - 46

The Three Maidens rests [sic] on red quartzite, the colors of which range from dark red to light pink. The pictograps [sic] are carved on the quartzite, at and around the base of the 6 boulders mostly on the south side, but there were a few on the North side and on the quartz between the boulders. The surface of the quartz slopes slightly at various angles, and there are numerous seems [sic] or cracks that divides [sic] the surface into small slabs of various sizes with irregular outlines.

The pictographs are of three classes.

1st those made with some round pointed implement.

[45/728/773] 2nd those made by hacking or cutting, as with a narrow bitted chisel.

3rd Those that were first pecked or cut out, and then smoothly polished.

The latter are apparently the oldest, and they are much harder to trace, and made doubly so, by other carved lines covering or overlaping [sic] them.

It is impossble [sic] to determine the date of any of them for in some instances, a part of a figure appears very ancient, and other portions seem to be of a more recent date, but a careful examination with a glass, of the work in both parts shows it to be one and the same.

The overlaping [sic] and intermingling of the figures would not necessarily

mean that they were of different dates, nor would difference in workmanship indicate it, for the [46/729/774] figures may have been placed there on the same day by different individuals.

List of Tracings

1 Slab 2x2½ feet owned by C.H. Bennett (2 sheets)

Fig 1 bird with hart [sic]

" 2 man

" 3 some kind of a 6 leged beatle [sic]

" 4 part of a bird

" 5 circle

" 7 nondescript

" 8 animal (rabbit?)

" 9&10 shaped like pins

" 1 to 4 overlaping [sic] each other more or less

2 Slab 1½x2 feet

" 11 man

3 Slab 1x2½ feet

" 12 animal also part of No 13

4 Slab 2x2 feet

" 13 bird with hart [sic], and also snake snake [sic] attached to wing

5 Slab 1½x2 feet

" 14 man with outspread hands

[47/729/775]

6 Slab 1x2 feet

Fig 15 -man

7 Slab 1½x3 feet - 6 in group

" 16 -bird track

" 17 -bird

" 18 -animal

" 19 -animal

" 20 -nondescrip

" 21 -charging buffalo

8 Slab 1½x1½ feet

" 22 -bird with attachment to wing

9 Slab 1x1½ feet

" 23 -animal

10 Slab 1x2 feet (group)

" 24 -perhaps a lizard

" 25 -turtle

" 26 -bird track

11 Slab 1x2 feet

" 27 -turtle

12 Slab 2x2 feet

28 -nondescript

29 - "

30 - "

13 Slab 1x2½ feet (group)

31 -bird

[48/730/776]

Fig 32 nondescript

14 Slab 1x1½ feet (group)

" 33 animal

" 34 bird

" 35 animal

" 33 to 35 overlaping [sic] more or less

15 Slab 1x2 feet

" 36 man with uplift hands

16 Slab 1x2½ feet

" 37 man

17 Slab 1x1 foot

" 38 animal

18 Slab 2x2½ feet (group)

" 39 turtle

" 40 turtle

19 Slab 1½x1½ feet

" 41 animal

" 42 nondescript

20 Slab 1½x2 feet

" 43 woman

21 Slab 1x1 foot

" 44 bird track

" 45 " "

22 Slab 2x2½ feet

" 46 man

[49/730/776]

Fig 47 -dragon fly

23 Slab 1½x2 feet (group)

" 48 -man

" 49 -woman defending her virtue

24 Slab 1½x2 feet (group)

" 50 -man

" 51 -bird

" 52 -bird track

" 53 -nondescript.

25 Slab 1½x1½ feet

" 54 -man

" 55 -man or cross.

" 1 to 55 copied Aug 9th 1889

26 Slab 1x1 foot

" 56 -bird

" 57 -animal

27 Slab 3x3 feet (group)

" 58 -man

" 59 -nondescript

" 60 "

" 61 "

" 58 to 60 inclusive overlap.

28 Slab 2x4 feet

" 62 -animal

[50/731/778]

Fig 63 nondescript

" 64 "

" 63 & 64 connected

29 Slab 2x4 feet (group)

" 65 animal

" 66 horned turtle

" 67 moose

" 68 bird

" 69 animal

" 70 animal

" 69 & 70 connected

" 56 to 70 inclusive copied Aug 10th 1889

30 Small slab

" 71 man with horns

31 Small slab

" 72 woman

32 Small slab

" 73 shaped like a horse-shoe

33 Slab 1x2 feet

" 74 nondescript

" 75 "

" 76 "

34 Slab 1x1½ feet

" 77 turtle

[51/731/779]

35 Slab 1x2 feet

Fig 78 -nondescript

" 79 -man

" 71 to 79 inclusive copied Aug 14th 1889

The grooves are from 1/8 to 3/8 of an inch in depth.

Note that Lewis' list of the individual glyphs omits mention of number 6. This is probably an unintentional omission, as glyph 6 is illustrated on Plate 8 in Winchell's volume (1911).

APPENDIX D

THE PIPESTONE INDIAN SCHOOL CEMETERY

Local oral history (Sigstad 1970:10; D. Stevens interview with A. Bird) maintains that deceased students from the Pipestone Indian School were buried in a small cemetery located within the present boundary of Pipestone National Monument. However, little documentation of this reputed cemetery has been found, and only two archeological clues to its general location exist. One of these is the concrete base of a marker erected in 1934 after the cemetery is believed to have fallen out of use. John S. Sigstad (1970:19) found the concrete slab six inches below the ground surface in one of his two test excavations at site pp16 South (now Locality 16b; see this volume, Chapter 9). The other clue is a mound in which a deceased Indian School student is said to be buried. Sigstad (1970:10) recorded it as site 21PP17, now Locality 17 (pp17).

Probably the most definitive documentary evidence of the cemetery is a single-page form completed by a Works Progress Administration worker, Erland Argetsinger, in June 1937, long after the cemetery fell into disuse. The form, a copy of which is on file in the Pipestone County Historical Society,[1] states that the dates of the first burials in the cemetery are unknown and that the cemetery was abandoned in 1904. The stated reason for abandonment of the cemetery is that "the Indians are now buried in Woodlawn Cemetery or sent home." It further states the total number of burials to be nine, comprised of four students at the Indian School, three white children, and two adult Native Americans. The sources of the information presented on the form are identified as "Mrs. Joe Taylor, an old Indian woman now living at Flandreau, South Dakota; Miss Winifred Bartlett, Pipestone; and J.W. Balmer, Superintendent of Pipestone Indian Training School." The form also states that no records for the cemetery are known to exist and that the records of the Indian School were destroyed by fire in 1932.

Some additional documentary evidence relating to the cemetery can be found in local newspaper articles. Notices of the death of three Indian School students were published in the *Pipestone County Star* newspaper between 1896 and 1903. The first of these (*Pipestone County Star*, June 19, 1896) reports the first death at the school and probably the first burial in the cemetery:

> Annie Tappinnatis, a 12 year old scholar at the Government School here, died last night, after a long illness. Annie was one of the first class to enter the school and has been a very studious scholar. She has been failing for a long time, but has had the very best of care at the school. Annie had no home, and was buried this morning at 11 o'clock in a new cemetery which was laid out on the reservation by Supervisor Rakstraw and Superintendent Harris, just **north of the falls**. The funeral services were conducted by Revs. Henderson and White, of this

[1] The authors are indebted to David Rambow for a photocopy of the form from his personal files.

Figure D1. Locality 17, the reputed historic burial mound recorded by Sigstad. (MWAC 642/ PIPE 180, 14-02:06)

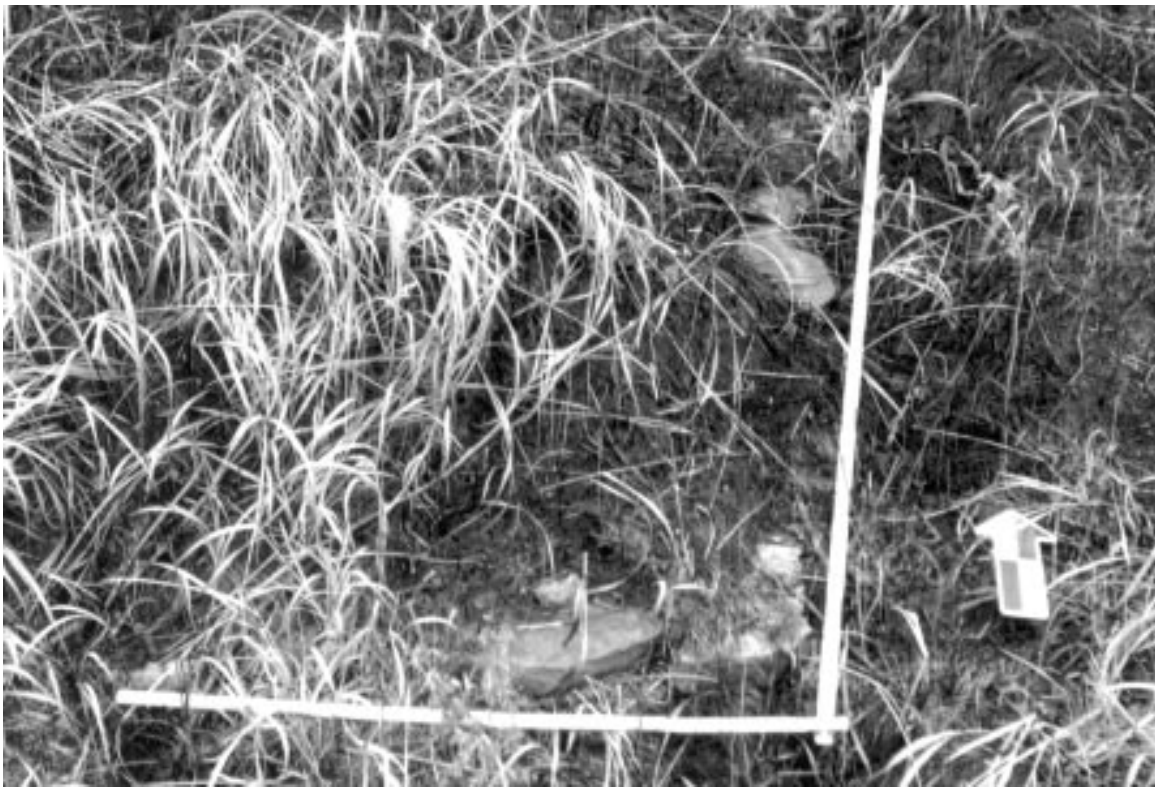

Figure D2. Partially exposed stone alignment bordering southeast edge of Locality 17, the reputed historic burial mound recorded by Sigstad. The stone edging was observed by Glen Livermont, Pipestone National Monument staff, in 2001. (MWAC 946/PIPE 188)

> city, and were very impressive, each one of the scholars seeming to share in the sorrow cast over the school by the death of Annie. This is the first death that has occurred at the school, which shows that good care is taken of all the pupils. [emphasis added]

One of the presiding clergy was the Reverend J.T. Henderson, who was a supply minister at the Pipestone Presbyterian Church from May 10 to September 1, 1891, and minister-in-charge there from May 1, 1892 to September 1, 1898 (Rose 1911:338). Reverend White has not been identified.

The second burial in the cemetery took place eight months later (*Pipestone County Star*, February 19, 1897):

> The second death in the history of the Indian school here occurred on Saturday evening, at which time Mabel Campbell, died of consumption. Mabel was 11 years of age, an orphan, and was one of the first class of scholars to enter the school when it was opened. Her remains were buried this afternoon in the little cemetery on the reservation.

Her given name is recorded as Mabell in the Register of Deaths in the Pipestone County Courthouse.

The fifth death at the school, and the last recorded interment in the school cemetery, occurred early in 1903, as reported in the *Pipestone County Star* on January 23 of that year:

> **DEATH AT INDIAN SCHOOL**
>
> Yesterday occurred the fifth death that has occurred among the students at the Pipestone Indian School in the history of the institution. The victim in this case is little Florence Resler, a 7 year old girl, whose home is in the northern part of Minnesota. She died of pneumonia. The interment will be made in the burying lot on the school grounds.

The third student who died at the school was Mary LaRose, whose body was sent home for burial (*Pipestone County Star*, February 13, 1897). No information has been found about the fourth student who died at the school, and it is not known if he or she was buried in the school cemetery or elsewhere.[2] The Register of Deaths lists only two of these deaths, those of Tappinnatis (spelled Taponatis in the Register) and Campbell. Consequently, the total number of interments made in the cemetery is not known, although the newspaper accounts suggest that at least three students were buried there.

[2] Don Stevens, an historian in the Midwest Regional Office of the National Park Service, Omaha, Nebraska, informs us that student death notices published after January 23, 1903 all indicate that the bodies of the deceased were either sent home for burial or do not identify the place of burial (note to Thiessen, January 5, 1998). Dr. Stevens has graciously shared the results of his archival research for an Historical Resource Study of Pipestone National Monument, in progress at the time of our research. Shortly before her death, Dr. Stevens recorded an interview with Ailene Bird. She shared her recollections of having seen the cemetery, but a transcript of that interview is not yet available.

The cemetery fell into disuse at some undocumented time after 1903 and its location became overgrown with brush.[3] It was later cleared of brush, however, and a marker was erected in memory of the deceased students in 1934 (Mitchell 1934:28-29). This effort was part of a plan proposed by J.W. Balmer, superintendent of the school. In a December 27, 1933 letter to the Commissioner of Indian Affairs, Balmer proposed creating a "Park Area" in a portion of the school lands, and requested funding from the Indian Emergency Conservation Works program, one of the New Deal work-relief initiatives. In the letter, he asked for money to enclose the "Indian Burial Grounds" within a fence:

> (D) Enclosing Indian Burial Grounds will require nearly twenty five rods of new fence. This area is now included in the grazing land of the reservation and is marked by only a few stones laid on the surface of the earth. There are certain Indian traditions, which to the early colonist of tribal fame, are held sacred in the minds of many of th [sic] present day Indians and relate back to the history of this little cemetery. The erection of a fence around this plot will preserve the traditions so rapidly disappearing.
>
> The fence will be constructed of wire supported by steel posts and should have a small gate. The wire proposed would be extra-heavy farm fence 48 inches in height surmounted with two strands of barb wire. The gate would not exceed four feet in width. The estimated cost for fencing the Burial Ground is $101.00[4]

Balmer's letter was accompanied by a map on which a rectangle was sketched northwest of Winnewissa Falls. The label "Indian Burial Ground" appears near the rectangle.

Although the land proposed for a "Park Area" was still under Bureau of Indian Affairs administration in the mid-1930s, discussions were underway that would result in the establishment of Pipestone National Monument in 1937 under the aegis of the National Park Service (Rothman and Holder 1992:58-74). The area originally proposed for this purpose totaled 81.75 acres.[5] This was increased to 110.6 acres in order to include

[3] On September 30, 1927, a citizen of Pipestone, George P. Gurley, testified in a deposition that he knew the location of "old graves" at the quarries, but stated that he had been unable to locate them a couple of years previous (U.S. Court of Claims 1927:263). Since Gurley referred to about a dozen "mounds," he may have been recalling archeological mound features reported at various places near the quarries by earlier visitors such as Norris and Holmes, and not the Indian School cemetery.

[4] J.W. Balmer, Superintendent, Pipestone Indian School, to the Commissioner of Indian Affairs, December 27, 1933, National Archives and Records Administration, CCC-ID General Records, 1933-44, Pipestone Box No. 172, File 40754-1933-34, Vol. 1.

[5] A.E. Demaray, Acting Director, National Park Service, to the Commissioner of Indian Affairs, May 15, 1935; and William Zimmerman, Jr., Assistant Commissioner of Indian Affairs to James W. Balmer, May 31, 1935; both in National Archives and Records Administration Record Group 75, Box 18, File Pipestone 11113-1932-307.2.

two additional tracts, the smaller of which encompassed the cemetery area.[6]

The work to create the "Park Area" proposed by Balmer was conducted in 1934 and was described in an article published near the end of that year (Mitchell 1934)[7]. With regard to the "Indian Cemetery," Mitchell (1934:28) states:

> A touching thing about the restoration was the discovery, in the prairie nearby, of the remains of an old Indian cemetery. Only a few graves were distinguishable; they had been covered by brush for years. When the IECW boys cleared the place off they decided that they wanted to erect some sort of monument to those dead nameless tribesmen of theirs. Permission was given them. They set up a simple shaft of the red stone, using their own design and carved on it the two words, "Peace Forever."[8]

Photographs reveal the marker to have been generally of an obelisk shape and constructed with stone and mortar (Mitchell 1934:29; *Pipestone County Star*, October 27, 1994; photograph by George Brent, March, 1950, in the files of Pipestone National Monument). One photograph in the collections of the Minnesota Historical Society (MP5.9 PS6 r1, negative 1152-A) bears a caption that reads "PEACE MONUMENT IN CENTER OF INDIAN CEMETERY PIPESTONE, MINN. N825". The marker was removed at some undocumented date after 1950 but prior to 1963 when its base was demolished (Betty McSwain, Chief of Resources and Interpretation, Pipestone National Monument, personal communication to Thiessen, October 31, 1994).

The marker and the surrounding rectangular area thought to encompass the cemetery are depicted on National Park Service maps of the 1940s (McSwain, personal communication to Thiessen, October 31, 1994; Nickel and Frost 2000:Figs. 1-3). An offshoot of the park's interpretive trail led to the marker, and the interpretive trail booklet stated the following lore about the "Peace Monument" (photocopy of page 6 of the booklet used in 1950-1952, provided by McSwain to Thiessen, October 31, 1994):

> 5. PEACE MONUMENT "Y". The left trail leads through an ancient Indian burial site to the Peace Monument. Traditionally you are now standing within the first American site dedicated to Eternal Peace-an area that even the fiercest of the warring tribes regarded as an oasis free from strife and combat. Just beyond the Peace Monument is another well preserved Indian Burial Site.

[6]Ibid. The former letter was accompanied by a map depicting the proposed boundary deviation around the cemetery area.

[7]See also B.G. Courtright, Special Agent, to Louis R. Glavis, Director of Investigations, Division of Investigations, Department of the Interior, May 28, 1934, National Archives and Records Administration, CCC-ID General Records, 1933-44, Pipestone Box 172, File 40754-1933-344. This letter was apparently written while the work was underway.

[8]The inscription actually read "PEACE FOR EVER" (photograph in Pipestone County Star, October 10, 1994, page 7A). The authors are indebted to David Rambow for pointing out this information.

Evidently by the 1950s the lore of the cemetery had become a blending of the perception of it as a place of eternal rest for the dead and the concept that the catlinite quarries were a place where hostile peoples could meet in peace to quarry the stone. The other "Indian Burial Site," also depicted on the trail guide map, is a single mound that remains to this day. In 1965 Sigstad (1970:10) recorded it as site 21PP17 (now Locality 17). He related some undocumented oral history regarding the mound: "According to local informants, it marks the grave of a former student of the nearby Indian school" (Sigstad:1970:10). Elizabeth P. Sigstad, John S. Sigstad's wife and assistant during the 1965 survey, noted on the site form: "Local Indian source says mound contains 1910 Burial of Indian school girl" (site form on file, Midwest Archeological Center). In 2001, the mound was observed to be at least partially bordered with Sioux quartzite rocks (see this volume, Chapter 9). The mound was not disturbed by excavation.

In 1965, Sigstad (1970:19-20) excavated two 5x5-foot excavation units near the former marker location in an area he designated as site pp16 South (now Locality 16b). A concrete slab, probably part of the base of the former monument, was encountered in the eastern half of the northern excavation unit at a depth of 6 to 18 inches (Sigstad 1965:40; 1970:19). Two minute potsherds were found in the soil above the slab, along with numerous pieces of catlinite, chipped stone tools and debitage, bone fragments, and iron objects of relatively recent origin. These materials were judged to be from a disturbed context (Sigstad 1970:19). Additional cultural debris was found beneath the concrete slab (Sigstad 1970:19-20).

During the 1998 archeological inventory work in the park, six whole and four partial 20x20-meter gridded areas in the suspected cemetery location were magnetically surveyed with a fluxgate magnetometer, and electrical resistivity data were collected from two whole and two partial 20x20-meter grid blocks as well. No grave shafts were detected by these non-invasive techniques. This investigation has been summarized by Nickel and Frost (2000). The magnetic survey is believed to have revealed a former fenceline north of the monument base and a pathway that led to the monument (Nickel and Frost 2000:7), and the latter former landscape feature may also have been detected in the electrical resistance data (ibid.:10).

Today (2000) the location of the "Peace Monument" is marked by a depression in which an orange-painted iron pipe has been driven. This feature, coupled with early National Park Service maps of the Monument, allows the approximate area of the presumed cemetery to be relocated. However, few substantive details about the cemetery are available in the scanty documentary records or local oral history, and little archeological evidence of it has been encountered other than the concrete slab that Sigstad found during excavations at pp16 South. Additional documentary research about the cemetery should be pursued. The back files of the *Pipestone County Star*, available at the Pipestone County Historical Museum, should be searched more systematically and thoroughly than has been possible before now. Examination of Pipestone Indian School records available at the Great Plains Region of the National Archives and Records Center in Kansas City

and the Genealogical Society of Utah may also reveal further information about the cemetery (Kirkham n.d.:106).

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APPENDIX E

EARTHEN ENCLOSURES IN PIPESTONE COUNTY, MINNESOTA

Two archeological features, in the form of earthen enclosures purported to have been constructed by Native Americans for purposes of defense, were reported by nineteenth-century travelers about two miles east and slightly north of the catlinite quarries. Oral tradition links at least one of them to the struggle for control of the quarries by one or more subdivisions of the Sioux or possibly other native Plains people.

It is possible that George Catlin may have seen one or both of these earthworks during his 1836 visit to the quarries. In his *Letters and Notes on the Manners, Customs, and Conditions of the North American Indians* (Catlin 1973, 2:166), he mentioned the "Graves, mounds, and fortifications that lie in sight," but unfortunately did not elaborate further on these features that he claimed to have observed.

Two earthen enclosures were definitely encountered two years later, however, by the exploration party led by Joseph N. Nicollet. Nicollet recorded the following about them in his journal entry for June 29, 1838 (Bray and Bray 1976:72):

> Toward noon we see traces of a recent passage of buffalo on this prairie, and we soon stumble upon a circular breastwork about 2,000 feet in circumfer-

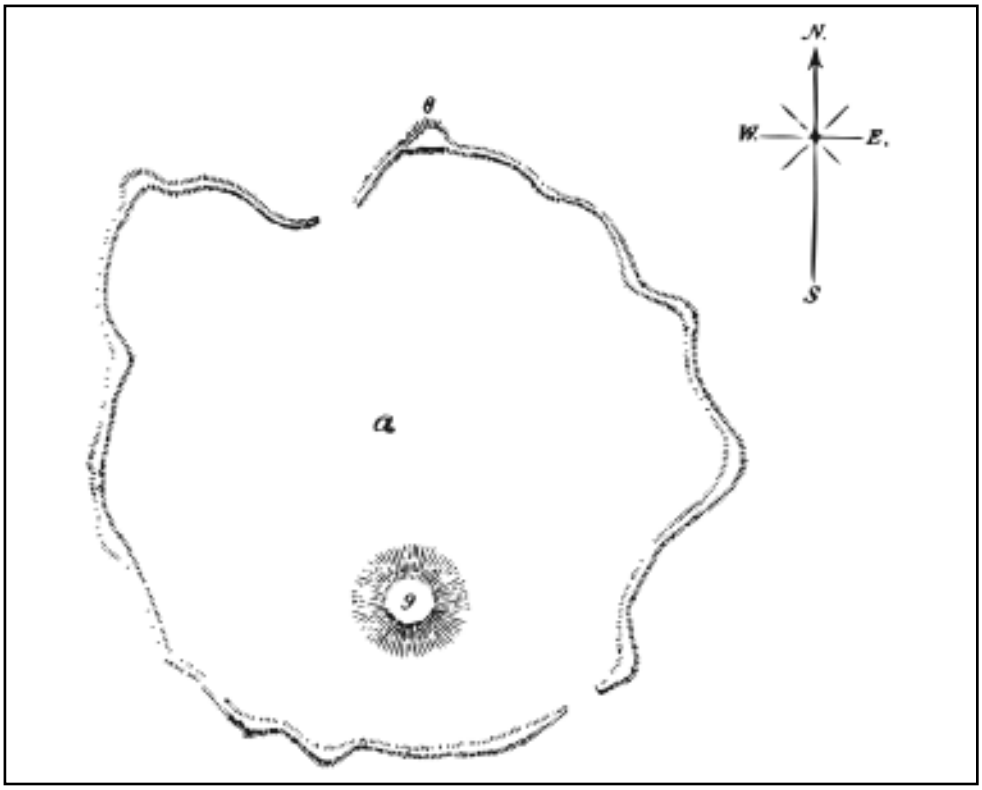

Figure E1. Map of the circular enclosure and mound east and north of the catlinite quarries, observed by J.N. Nicollet in 1838 and investigated by P.W. Norris in 1882 (after Thomas 1894:44).

> ence that is evidently the work of man's hands. The parapet that surrounds it is made after the manner of the plains Indians, just high enough to cover the bodies of those who defend it from within, lying down and using a gun or a bow and arrow. The principal entrance is still marked by the lodges of the chiefs and important men who, according to custom, always occupy the position that shows the direction from which their enemies come. Two miles farther on we find a second encampment like the first. Although the system of fortifications was in neither case complicated, it indicated there had been long talks and the issue of the matter may have been war. The small number of graves evident within the forts showed that the parties remained here some length of time, but that a serious battle did not take place. The Sioux have lost the tradition of these camps; they suppose that they served to end the difficulties which divided the Teton and the Yankton.

In his official report, Nicollet (1843:14-15) described these earthen features slightly differently, as follows:

> On our way, after having reconnoitred [sic] distinct marks of a buffalo path, we unexpectedly fell upon a circular breastwork of about 2,000 feet in circumference, and sufficiently elevated to protect the bodies of those who are defending themselves within. The principal entrance is still marked by the places where the chiefs or principal personages of the nation had their lodges; the situation of these always indicating, not only the main access to the camp, but also the direction whence the enemy was advancing. Two miles further on, accordingly, we met with another camp of a similar character. As the system of fortification was on neither side more complicated than just described, it would seem that they had been erected during a long talk, the result of which might lead to a war; whilst the small number of tumuli that are found within the breastwork would seem to imply that both parties remained in presence for some time, though there was no important battle fought.
>
> The Sioux have lost the reminiscences of these camps, and merely conjecture that they were occupied during the settlement of difficulties between the Titons and Yanktons.

Nicollet's manuscript map of his travel through this region, reproduced as Plate 83 in Wood 1993a and as a redrawn version in Figure 1 in Picha 1993, shows two x-like symbols, each labeled "Sioux Fort," along his route of travel east and north of the quarries.

Approximately an hour and a half after encountering the first of these enclosures (at about noon), Nicollet's party arrived at the quarries (Bray and Bray 1976:72). Consequently, allowing some of this hour and a half as time for Nicollet to inspect both features before

proceeding on, it can be concluded that the two "Sioux Forts" must have been quite close to the quarries indeed. The total distance traveled on June 29 between Nicollet's camp on the East Rock River, also shown on his manuscript map, and the quarries is stated as 13 miles, and the two enclosures are depicted as much closer to the quarries than to the previous night's campsite.

The enclosures were next mentioned in print in an 1878 article in a nearby newspaper (*Marshall Messenger*, June 28, 1878, page 1), which contained a brief note about them:

> An old fort is reported to have been discovered in Pipestone County, about 3 miles from Pipestone City. It has earth works regularly thrown up. It is claimed to be 100 years old, and to have been built when war raged between the Yanktons and Teutons [sic].

Obviously, by "Teutons" is meant the Teton Sioux, the westernmost of three divisions of the Dakota nation (Howard 1980). The attribution of the enclosure to conflict between the Yanktons and the Tetons is probably based on Nicollet's earlier statement.

A newspaper article published the following year contained more information about one of the enclosures, obtained firsthand from a mixed party of Yankton and Flandreau Sioux who visited the quarries for the purpose of quarrying catlinite (Rose 1911:246, footnote 2; Thiessen 1998:47). The *Pipestone County Star* on July 24, 1879 carried a brief article on page 3 about an interview between Charles Bennett of Pipestone and two Yankton chiefs, Strikes-the-Ree and Fat Mandan. It reads in part:

> Charlie Bennett had a long interview and talk with Old Strike, head chief of the Yanktons, and Fat Mandan one of the sub-chiefs, one day last week, and through the able interpreter, Mr.. Eastman, gleaned a number of interesting facts concerning their lives and points of interest pertaining to the quarry. It was learned that the old line of breastworks two miles east of town, was built about 90 or 100 years ago by the Sissetons, who at that time were at war with the Omahas, who then claimed the quarry, one of the causes of the war being a strife for possession of the quarry.

This statement attributes the enclosure in question specifically to the Sissetons, but it does not describe the location of the enclosure in detail, making it difficult to identify it with either of the enclosures described by Nicollet. It is interesting to note that a number of Omaha oral traditions attest to the presence of that tribe as residents in the Big Sioux drainage, sometimes specifically near the catlinite quarries, where they fought with enemies sometimes identified as Sioux (Thiessen 1998:3-11, 37-46; see also Thiessen 2004).

An earlier firsthand observation of the two enclosures was made by Philetus W. Norris, who saw one or both of them on at least two different occasions over a period of time spanning approximately 40 years. The first time was in 1842 or 1843 when he traveled to the quarries in company with five

Chippewa Indians and a Frenchman (Appendices A and B, this volume; also see Norris 1877 and Thomas 1894:44 for the discrepancy regarding the dates of Norris' visit). In 1882, he again returned to the quarries, this time as one of the hired excavators for Cyrus Thomas' Division of Mound Exploration of the Smithsonian Institution (Thomas 1894:42-44; Appendix B, this volume). During this final visit, he dug into ten mounds in the vicinity of the quarries, two of which were associated with one of these enclosures. He discussed these excavations in a handwritten report to Thomas (Appendix B):

> No. 8 This is simply a bastion like enlargement of the embankment of the large circular Earthwork at one of its numerous unique angles, and is now about 4 feet at its greatest height 25 feet wide, and somewhat more along the embankment which in both directions is much smaller. A broad trench cut directly across this mound developed only a bank of loose alluvial earth lighter in color and less adhesive than those at the Cliff, but unlike them destitute of angular rock, pipestone and bones.
>
> No. 9 I found this a circular oval toped [sic] mound within the great circular Earthwork measuring 20 feet at base and 4 - high.

At this point in his text, page 9 of Norris' handwritten report ends. Unfortunately, most of his observations about mound 9 and all of them about mound 10 were on pages 10 and 11 of his report, both of which are missing from his original manuscript in the National Anthropological Archives (Appendix B). However, Thomas (1894:43) synopsized Norris' information in his comprehensive report on the mound explorations of the Smithsonian:

> No. 9 is a circular mound inside the earthwork, 20 feet in diameter and 4 feet high. In this was found a single skeleton lying at full length upon the right side, head north, on the original surface of the ground. It was covered with a layer or pile of stones about 2 feet thick, and was so much decayed that the bones and even the teeth crumbled to dust when exposed to the air. No implements or ornaments were found with it except a flint lance head, some arrow points, and two or three rude scrapers which were near the breast.

Norris placed an excavation in one of the crescent-shaped mounds lying to the east of the enclosure, but found nothing there:

> No. 10 is merely an enlargement of the west horn of one of the circular works lying east of the large inclosure, of which more particular mention is made hereafter. Its diameter was found to be 20 feet; height, 3 feet. Nothing of interest was found in it.

On pages 16-19 of his handwritten report, Norris offered a few observations and much speculation about the same enclosure and a group of curvilinear mounds across a "sloughy creek" to the east (see diagram in

Thomas 1894:44 and Winchell 1911:09). In a rambling narrative which alludes to the information given to Charles Bennett by Strikes-the-Ree and Fat Mandan three years previous, he also referred to his 1842/43 observation of the same earthwork (Appendix B):

Circular and Crescent Earthworks
2 Miles from
the sacred or Calumet Cliffs-

> I am not certain that Catlin saw these works although they are situated near the great war trail from Flandrau [sic] and the Sacred Quarry to the Minnesota-then called the St. Peters River-In 1838 Nicollet describes two circular Earthworks each 2000 feet in circumference with their entrances fronting each other.
>
> In 1842 then in ignorance of his visit I was led by a Chippewa Indian comrade to the crescent shaped works and then to the large circular one with the view of judging their fitness for defense if necessary from the Sioux and hence noted them particularly, and not deeming them defensible with our small party, we did not in our subsequent retreat attempt to reach them or to make a stand in a similar circular work a mile or two Northerly of it, which I have not since seen, but learn that such a work in that direction is now under cultivation. The location form and size of the circular work hereinbefore shown so nearly agrees with Nicolett's [sic] description as to leave no doubt of its identity but the description of the other circular work in or near the location of the crescent shaped works is not so easily reconciled [and] [bes]peaks an error or omission in the copy or press, or another circular work which I have never found. My observation was so careful, and recollection remains so clear that although I took no notes at the time of my first visit, I have no hesitancy in vouching that these embankments are now so much lower than they were at that time as to indicate they are modern works, but certainly older than claimed by and aged Yancton Sioux who recently claimed to Mr. C.H. Bennett of Pipestone that he was present when they were constructed by his people in their great war with the Eastern Indians for the possession of the Sacred Quarry about 80 years ago. As this tallies well with the closing conflicts of that war it is probable he may have helped defend, but certainly did not help build them as 40 years ago there was little or no more evidence of excavations for the earth of the embankments than there is at this time, which is scarcely perceptible.

Norris implies that he saw the second enclosure also in 1842, but did not see it subsequent to that time. He reports hearsay information that the second enclosure was under cultivation in 1882. His rendition of the information from Strikes-the-Ree and Fat Mandan does not correspond closely to that stated in the *Pipestone County Star* article published only a week after Bennett's

meeting with the two chiefs. Norris attributes construction of the enclosure to the Yanktons, while the *Star* article not only does not mention the Yanktons as its constructors, it states that the feature was built by the Sissetons. Norris also asserts that the enclosure is more recent than is stated in the *Star* article (80 vs. 90 or 100 years old). Norris likely met Bennett during his 1882 visit to the quarries, but there is no way to know the nature of any oral information he may have obtained from the latter, other than what is stated in his report to Thomas. In that report (Appendix B), Norris goes on to state that the Chippewas of his party knew of the enclosure before their arrival at the quarries in 1842/43, but did not know who had built it:

> Some of the Chippeways of our party claimed to have been there during that war, and certainly well knew their location and character, and planned in reference to them in case of an emergency before leaving Mankato, but did not claim to know when or by whom they were built.

Norris (Appendix B) offers unsupported speculation about who built the enclosure and the nearby mounds, and why it is located where it is. He concluded that these earthworks had been built with the help of white men or mixed-bloods, reflecting a common ethnocentric prejudice of the time. More interestingly, he indicates that he received a map or diagram of the enclosure from Bennett:

> From all these evidences it is clear to my mind the [i.e., that] these works are mainly modern, constructed by the Sioux or other Indians during their long and ferocious conflicts for possession of the once Neutral ground of Nations at the Sacred Quarry after the Sioux sought sole controll [sic], which both history and tradition prove to have been since they obtained horses and firearms, or at least knives and hatchets of the whites, and probably one or both parties were aided by them or by half-breeds and their tools in the construction of these works. I do not deem this position shaken, by the fact which I concede- that the contents of Mound No. 9 in the large circular work indicate an earlier date as the site is a natural one for a defensive battle, being between a commanding spur of the Great Coteau Des Prairies near its southern end and a ford of the Sloughy creek, and these modern warriors may have chosen to entrench around and defend the grave of some great chieftain, or to use it as a lookout in a somewhat depressed portion of a treeless plain. I had neither the time or instruments to show the exact angles or all of them **but the size and general outline agrees well with a tracing recently made and sent me by Mr. Bennett** as well as the size and circular form given by Nicolett [sic] and may be relied upon as essentially correct. [emphasis added]

Possibly the "tracing" provided to Norris by Charles Bennett, a founding citizen of Pipestone who had a keen interest in antiquarian matters, was repro-

duced as Figure 4 by Thomas (1894:44; also reproduced in Winchell 1911:109). Thomas (1894:43-44), who synopsized information furnished directly to him by Norris, described these "circular and crescent earthworks" as follows:

> These interesting works are situated about 2 miles a little north of east from the quarry; a plan of them is given in Fig. 4. It is not certain that Catlin saw these works, although they are situated near the great war trail from Flandreau and the pipestone quarry to the Minnesota (formerly St. Peters) river. Nicollet, however, noted them in 1838, and makes special mention of two circular enclosures, or "camps," as he calls them, estimating the circumference of one at 2,000 feet.
>
> The shape of this inclosure, which appears to be the only complete one in the locality is shown at a. The circumference, according to Col. Norris' measurement, is 2,386 feet, the wall varying in height from a few inches to 4 feet. It has two well-marked and distinct openings, or gateways, one at the north, the other at the southeast, besides smaller and less evident ones. In the southern half is the mound No. 9, heretofore mentioned.
>
> The crescent-shaped embankments, which are roughly sketched in the figure, are about half a mile east of the large inclosure. They are simply earth embankments of slight elevation and are possibly parts of unfinished works. ...Col. Norris thinks he saw in 1842 the second inclosure mentioned by Nicollet, but did not find it in 1882.

Francis La Fleshe, an Omaha tribal member, wrote a letter on January 15, 1883 to F.W. Putnam of the Peabody Museum, in which he stated that the Omahas had knowledge of one of the earthworks near the catlinite quarries:

> The Omahas say that three miles east of the pipe quarries there is a mound about nine or ten feet high and very large, surrounded by a large ring of earth piled up, and it is supposed that in that mound are buried the remains of warriors and their weapons of defence. [Putnam 1884:181]

The description of a mound enclosed by an earthwork suggests that this may refer to Norris' Mound 9, which he dug into the previous year and found a human skeleton and some chipped stone implements. It is difficult to judge whether La Fleshe's statement reflects traditional tribal knowledge or whether some of the Omahas had heard of Norris' discovery by the time that La Flesche wrote to Putnam.

Theodore H. Lewis, in collaboration with Alfred J. Hill of St. Paul, recorded and mapped thousands of mounds and other archeological features as part of the Northwestern Archaeological Survey during the latter part of the nineteenth century (Lewis 1898; Dobbs 1991; Haury 1993). He visited the catlinite quarries in 1889. On August 12th of that year, he mapped one of the enclosures (Northwestern Archaeological Survey

1991:Roll 2, Field Notebook 7, frames 90-92, 191-193). Winchell (1911:108) published a map of the enclosure based on the measurements and segmented drawings recorded by Lewis; however, the detailed correspondence with Lewis's field data is not great and it is not known if Lewis later compiled a complete map of the enclosure that might have been the basis of the one published by Winchell.

Lewis noted that the average width of the wall in 1889 was 18 feet and its average height was one foot (Northwestern Archaeological Survey 1991:Roll 2, Field Notebook 7, frames 91, 193). The total circumference, computed from the lengths of individual segments measured by Lewis, is 2422.5 feet (Northwestern Archaeological Survey 1991:Roll 2, Field Notebook 7, frames 191, 193). Lewis recorded the enclosure's legal location as the N½ NW¼ Section 5, Township 106 North, Range 45 West (Northwestern Archaeological Survey 1991:Roll 2, Field Notebook 7, frame 90; Lewis 1889b), which gives either of the enclosures a specific location for the first time in any of the recorded evidence about them.

A letter that Lewis (1889b) wrote to Hill on August 12, the day that he surveyed the above enclosure, mentions that he had also made notes on a second "fort:"

Pipestone, Minnesota, Aug. 12th 1889

Alfred J. Hill Esq.
St. Paul, Minn.

Dear Sir,
This morning I surveyed the fort on N½-NW-5-106-45 of which there are some 2500 feet of embankments. Rain drove me in so this afternoon I copied the [sic] notes for both forts (In _____) and herewith enclose them...

This may refer to the second earthwork that Nicollet observed in the vicinity of the quarries, or it may refer to a similar feature he observed at the Blood Run Site near Sioux Falls, South Dakota, on July 31, 1889, a few days before he surveyed the feature near Pipestone. His Field Notebook 7 (Northwestern Archaeological Survey 1991:Roll 2) contains measurements and diagrams for both the Pipestone and the Blood Run enclosures, but is not likely to have been the enclosure that accompanied his August 12 letter because it contains entries made after that date.

Despite the observations about the enclosures that were recorded during the nineteenth century, twentieth-century archeologists have found no trace of either enclosure on the ground. After a June 26, 1945 visit to the legal location recorded by Lewis, University of Minnesota archeologist Lloyd A. Wilford noted that he observed no evidence of the enclosure (typescript note on file, Minnesota State Historic Preservation Office, St. Paul):

Memo on Pipestone County - June 26, 1945

Made a thorough search for the enclosure surveyed by Lewis in 1889, Winchell p. 108, said to be on the N½ of the NW¼ of Sec 5, T. 106-45. Winchell has the description correct from the Lewis notes. The area was in corn (very small) and very favorable for observation. I could find no trace of the enclosure, and the men who have owned the farm for several

> years had never seen it nor heard of it. Since the embankment was only one foot high in 1889, and was already under cultivation, it can be presumed that the succeeding 55 years of plowing have obliterated all traces of it.

Wilford completed a University of Minnesota archeological site form (on file, Office of the State Archaeologist, St. Paul, Minnesota) for the reported enclosure, on which he noted that he "could find no trace of it; probably plowed down." He assigned the number "PP1" to the site.

In 1978 archeologist B. Olson, affiliated with the State Historic Preservation Office at the Minnesota Historical Society, visited the same location and completed a Society site form for 21PP1 on July 26 (on file, Office of the State Archaeologist, St. Paul). On it he or she noted that the site could not be located and that both the present tenant and the owner of the land reported finding no artifacts.

In the absence of any modern data about either of these enclosures, recorded by trained archeologists, it is difficult to offer any substantiated conclusions about the nature, age, or authorship of these features. The enclosure mapped by Lewis and published by Winchell (1911:108) is most likely the same enclosure depicted on the unattributed map also published by Winchell (1911:109). Consequently, thanks to Lewis' careful record-keeping, the location of one of the two earthen enclosures reported by Nicollet is known, although tangible, surviving evidence of it is lacking. If the unattributed map published by Thomas (1894:44) and Winchell (1911:109) is the diagram that Bennett gave to Norris, which is possible because Thomas had at his disposal all of Norris' information, presumably including Bennett's map, then the enclosure recorded by Lewis is the same as that excavated by Norris in 1882. The location of the other enclosure reported by Nicollet is unknown, although it presumably lies a short distance either to the northeast or to the southwest of the feature recorded by Lewis, judging from Nicollet's map of the region.

Both Nicollet and Norris attributed the purpose of these enclosures to military defense in time of conflict. Winchell (1911:109, 110) disagreed with their interpretation that the enclosures were built exclusively for warfare, and compared them with palisaded villages known from the Minnesota River valley, suggesting that they were habitation sites. The enclosure recorded by Lewis contained a circular tumulus (mound 9) in which Norris excavated and reported finding an extended human skeleton, together with "a flint lance head, some arrow points, and two or three rude scrapers which were near the breast" (Appendix B; Thomas 1894:43; see also Winchell 1911:110). The collections at the U.S. National Museum contain a chert biface, a chert drill, and a large side-notched chert biface or projectile point collected by Norris during his work near Pipestone, but there is no documentation to associate them with the artifacts he found in mound 9 (Table 7.2). Norris also excavated a portion of the northern embankment of the enclosure, but did not find any artifacts (Appendix B; Thomas 1894:43; see also Winchell 1911:110). If mound 9 is associated with the enclosure and not

simply coincidentally located within it, then the complex of the mound and the embankment may have served a mortuary purpose in addition to whatever other function it may have had.

The age of the mound investigated by Norris and Lewis is said, on the basis of oral information from two aged Yankton men, to have been on the order of 80, 90, or 100 years prior to 1879, which would place construction of the mounds sometime around approximately 1779 to 1799, but there is no way to confirm that information. There is no archeological evidence bearing on the age of either feature.

Candidates for the builders of the mounds are variously implied by oral information, filtered through an interpreter and other non-native writers, as including the Sissetons (Strikes-the-Ree in the *Pipestone County Star* article), Tetons (Nicollet), Yanktons (Nicollet and Norris), the Sioux in general (Norris), and "Eastern Indians" (Norris). If Strike-the-Ree's story told to Bennett is not interpreted literally (*Pipestone County Star*), his mention of the Omahas may make them candidates as well.

Although similar enclosures are known to have existed elsewhere in the upper midwest (cf. numerous examples in Winchell 1911), it is interesting to note that Lewis recorded several other earthen enclosures in other localities, including the Blood Run Site in northwestern Iowa (Northwestern Archaeological Survey 1991:Roll 2, Field Notebook 7, frames 68-73; Lewis 1890; Thomas 1894:38-39; Henning 1982:Maps 12-13, pages 38-40) and near the present-day towns of Niobrara, Wynot, Hartington, and Ponca in northeastern Nebraska (Wood 1978). Four of these five features have not been located and are presumed to have been obscured by cultivation. However, one, the Ponca Fort Site, has been excavated and is believed to be the remains of a Ponca settlement dating to the 1790s (Wood 1993b). The Poncas are close cultural and linguistic relatives of the Omahas, with whom they are believed to have once been one people before the Poncas separated from the Omahas sometime prior to 1785, when the Poncas are first identified by name in historical sources (Fletcher and La Flesche 1992; Wood 1993b). The fact that all seven of these enclosures-the two reported by Nicollet, the one at Blood Run, and the four reported by Wood-occur in territory once occupied by the Omahas and Poncas (Thiessen 1998), and the convincing attribution of one of them to the Poncas on the basis of archeological, historical, and traditional evidence, enhances the possibility that the Omahas/Poncas may have been responsible for constructing these features.

It is unfortunate that most of these reported enclosures have not been located and that surface evidence of most of them is likely to have been obscured by a century or more of agricultural practices. Clearly, if these enclosures, or any surviving subsurface portions of them, can be relocated, they would be an important and rare resource for future research. Perhaps some evidence of them exists beneath the present-day surface and will someday be revealed by application of non-invasive geophysical methods of subsurface investigation, coupled with the results of systematic examination of available aerial photographic imagery.

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