

Myth as True History: Medicine Wheels and Landmarks as Boundary Markers of the Lakota World

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Abstract

This investigation examines physical, spatial and temporal characteristics of Native American medicine wheels located on the Northern Great Plains of the United States. Direct evidence for date and purpose of construction and use of medicine wheels is limited. As architectural symbols of native science, the structures are understood to be metaphors for native knowledge and creative participation with the natural world in both theory and practice, serving as bridges between the inner and outer realities. However, reasons for the respective location, meaning of architectural design, date of construction, and identification of people who constructed each medicine wheel generally remain unknown. An exception is Cloud Peak medicine wheel located on the west flank of the high point of the Bighorn mountain range in Wyoming, and shown to have been constructed by the Lakota tribe no earlier than about 1700 AD. Documented Lakota migration onto the Great Plains beginning during the early 17th century was reviewed to trace the timeframe and areal extent of the tribe's occupation of the region. Major regional and local physiographic features of the

Northern Great Plains were identified as they relate to Lakota traditional ecological knowledge (TEK). The tribe's history and culture, including mythology, cosmology, were reviewed from ethnographic records and documents addressing tribal history and sacred lifeway. Field observations were made of medicine wheel sites and physiographic features on the Northern Great Plains and adjoining regions of known import to the Lakota and other tribes which occupied the region during late prehistory. Observations and measurements of Cloud Peak medicine wheel, the Jennings site in east central South Dakota and additional archaeological sites of significance on the Northern Great Plains, and proximal relationships between those sites and major topographic and hydrogeologic features of the region suggest these features share common spatial, cosmographic and mythological relationships with the spiritual center of the Lakota world at Bear Butte, South Dakota. Based on locations of Cloud Peak medicine wheel and the Jennings site, physiographic and ecological characteristics of those locations and two additional sites of archaeological significance, and ethnographic records of Oceti Sakowin and Lakota TEK it is concluded these features compose primary elements of an Earth-scale sacred hoop delineating the physical boundaries of the traditional Lakota world. This sacred hoop was conceived, designed and built to include most of the Northern Great Plains region and traditional territory of the Lakota in particular. The hoop is interpreted to have been constructed soon after Lakota occupation of the Northern Great Plains by the late 18th century.

1. Introduction

Paleoindian sites on the Northern Great Plains are well documented with known chronology dating to the Clovis culture (11,200 to 10,900 years before present). Evidence suggests that occupation in the region varied in intensity through the time of early historical contact by the mid- to late-1700s (Warren, 1885; Mails, 1990; Sturtevant, 2001; Doerner, 2007; Albers, 2003). The

Northern Great Plains cover more than 280 thousand square miles (730 thousand sq km) of the central and western interior of the North American continent, spanning five U.S. states (Figure 1) and southern portions of two Canadian provinces. Prior to Western cultural development beginning about 200 years ago, the region supported numerous varieties of grassland birds, deer, elk, pronghorn antelope, bear, wolf, bison, and many other large species numbering in many tens of millions. In the US, major physiographic features of the North Great Plains include western, unglaciated portions of Missouri Plateau in southeastern Montana, southwestern North Dakota, northeastern Wyoming, and western South Dakota; eastern, glaciated portions of the Missouri Plateau in northeastern Montana, northern and eastern North Dakota, and east-central South Dakota (including the Missouri Couteau); the Black Hills of extreme eastern Wyoming and southwestern South Dakota; and the High Plains of southeastern Wyoming, southwestern South Dakota, and western Nebraska (including the Sandhills) (Figure 1).

Native American medicine wheels constructed of cobbles and boulders are encountered in a variety of shapes, sizes, and locations across the Northern Great Plains (Brumley, 1988). Direct evidence for the date and purpose of construction and use of medicine wheels is limited, and likely requires recognizing and understanding cultural associations of individual features beyond the immediate margins of the wheel itself, including the ecological context within which they are situated (Brumley, 1988). As architectural symbols of native science, medicine wheels are understood generally to be metaphors for native knowledge and creative participation with the natural world in both theory and practice, serving as bridges between the inner and outer realities, with those realities expressed in traditional Plains Indian culture by the medicine wheel structure (Cajete, 2000; Burley, 2012). The phrase ‘medicine wheel’ does not describe adequately the intent of graphic symbolism represented by the architectural form of such structures. The Lakota name for a medicine wheel is *cangleska wakan*, meaning sacred (or powerful or mysterious) spotted

wood, and relates to a stick tied at the ends to form a circle or hoop, intended to represent sacred relationships between humans, Earth, the cosmos and creator of the universe (Burley, 2012) (Figure 2).

Brumley (1988) suggests a general definition for medicine wheels, provides a classification of such features based on structural characteristics documented for sixty-seven wheels, and outlines empirical information associated with each medicine wheel within the context of eight subgroups defined therein. Subgroup 6 medicine wheels are characterized by a prominent central stone cairn surrounded by a stone ring, and having two or more stone lines extending from the stone ring to the cairn (Brumley, 1988). Of the sixty-seven medicine wheels evaluated by Brumley (1988), only three structures (4 percent) are categorized within the Subgroup 6 classification, including Bighorn medicine wheel located on the west flank of the Bighorn Mountains of north central Wyoming, the Jennings site in east central South Dakota, and the Majorville Site located along the Bow River in south central Alberta.

Western scientific understanding of the purpose, construction and use of Subgroup 6 medicine wheels is limited at best (Brumley, 1988). Bighorn medicine wheel has been well documented through excavations and mapping (Grey, 1963; Wilson, 1976; Wilson, 1981) and based on ethnographic evidence, construction and use of that site have been attributed to the Shoshoni, Crow, Cheyenne and Kiowa (Allen, 1913; Grinnell, 1922; Hunter and Fries, 1986; Wilson, 1976; Wilson, 1981). Information concerning the Jennings site is limited to the wheel's physical and local geographic setting (Abbott et al., 1982; Rood and Overholser Rood, 1983). No ethnographic or archeological evidence is provided from previous investigation of the Jennings site (Brumley, 1988). The Majorville site is significantly disturbed, although descriptions and analyses of the site are available (Calder, 1977; Brumley, 1988). Nonetheless, the purpose of constructing that feature remains unclear; there is insufficient data for drawing a conclusion regarding function of the site

(Calder, 1977).

Burley (2006) describes a medicine wheel located on the west flank of Cloud Peak, the high point of the Bighorn mountain range, about 45 miles southeast of Bighorn medicine wheel. Cloud Peak medicine wheel, discovered in 2003, satisfies all criteria as a Subgroup 6 feature (Burley, 2006) (Figure 3). The site is located near the topographical low point of a valley cross section, which is uncharacteristic of this type of feature (Brumley, 1988; Burley, 2006).

Observations and measurements of Cloud Peak medicine wheel and associated features, along with its location relative to the Jennings site and additional sites of significance on the Northern Great Plains suggests these features share a common relationship to the spiritual center of the Lakota world at Bear Butte, SD. The locations of the Cloud Peak medicine wheel and the Jennings site, physiographic and ecological characteristics of those locations, two additional sites of significance, and ethnographic records of traditional ecological knowledge of Oceti Sakowin and Lakota suggest that these features compose a sacred hoop delineating the physical boundaries of the Lakota world. These artifacts and physiographic features represent portions of a sacred hoop that was conceived, designed and built to cover most of the Northern Great Plains region. The hoop is interpreted to have been constructed soon after Lakota occupation of the Northern Great Plains by the late 18th century.

2. Study Area

The study area includes much of the Northern Great Plains and adjoining physiographic regions of the United States (Fig. 4). It includes most of the states of North Dakota and South Dakota, northern Nebraska, eastern Wyoming and southeastern Montana. Major topographic features include the Big Horn and Laramie mountain ranges in eastern Wyoming, the Black Hills in South Dakota and Killdeer mountains in northwest North Dakota. Through the 1830s the area

was occupied by Native American tribes which until then had experienced only limited interactions with White explorers, fur traders and officials of the United States government (Demalli, 1980; Sturevant, 2001; White, 1978; Albers, 2003), although the region is located within the area of the Louisiana Purchase of 1803. The Lakota division of Oceti Sakowin occupied land from the Big Horn Mountains in the west, to the tall grass prairie in eastern South Dakota, and from the North Platte River in central Nebraska to the Missouri River in northwest North Dakota. Tribes including Arikara, Mandan, Crow, Cheyenne, Kiowa, Pawnee, and others occupied portions of the study area at that time, as well. However, the Lakota had displaced those tribes in many portions of the region during the course of the previous century, and Lakota culture dominated the area.

2.1 The Lakota and the Seven Council Places

Oceti Sakowin (Očhéthi Šakówin) is translated from Siouan dialects to mean ‘Seven Council Fires’ or ‘Seven Council Places’ (South Dakota Department of Education, 2012). It is the proper name for Native American people commonly known as the Sioux or Great Sioux Nation.

“*Oceti* is translated as a stove or fireplace however, the term does not convey anything about fire or flame or a light. The focus of the meaning has more to do with the hearth which signifies the autonomy of a home. The established home requires a hearth owned by the *Unci* or the appropriate female. When defining the meaning of *Oceti* it is important to note that it is the contraction of *makoce ti*, which is synonymous for, *Unci Maka* (Grandmother Earth) *Ocaje* (name or lineage) *ti* (to live in an abode). Thus there is an establishment of a matriarchal lineage which indicates tracing lineage from the mother’s side (Douville, in South Dakota Department of Education, 2012).”

“The meaning of *Sakowin* is all digits of one hand and the thumb and pointing finger of the other hand or seven. The number seven is a cardinal number for the Oceti. The number seven is based on the sum of two other cardinal numbers which are considered spiritual numbers; these numbers are three and four. The significance of the number seven is also depicted through the clan system. Oceti Sakowin clans, as a standard were based on the number seven. All clans have seven extended families, each family has seven members. When a clan reaches seven extended members then the eighth member separates (Douville, in South Dakota Department of Education, 2012).”

Oceti Sakowin includes three divisions that are based on Siouan dialects and subcultures. Those divisions include Santee, Yankton-Yanktonai, and Lakota. The Santee (*Isányathi*: Knife) or Eastern Dakota currently reside in extreme east North Dakota and South Dakota, Minnesota and northern Iowa. Yankton and Yanktonai (*Ihánktǎhuyway*: Village-at-the-end, and *Ihánktǎhuywayna*: Little village-at-the-end) or Western Dakota or Wičhíyenan (an endonym meaning "our people, those who are ours" (De Mallie, 1975)) reside in the Minnesota River area; they are considered as ‘middle Sioux’. The term Nakota is a historical name for the Western Dakota although Ullrich (2008) finds it is a misnomer. Each of the three Oceti Sakowin dialects - Nakota, Dakota and Lakota (from *koda* or *kola*) means ‘friend’ or ‘ally’.

The third division, the Lakota (*Lakǎóta*), was historically referred to as Teton (*Thítǎhuyway*: Dwellers on the prairie). They comprise the westernmost of the Siouan language groups, generally located in the central and western areas of North and South Dakota and adjoining areas. The name Lakota comes from the endonym *Lakota* meaning "feeling affection, friendly, united, allied". The seven bands of Lakota include: Sicangu (*Sičhánǵu*, *Brulé*), Oglala (*Oglála*), Itazipcola (*Itázipčho*, *Sans Arc*), Hunkpapa (*Húnkpapǎ*), Hohwoju/Mnikowju (*Mnikǎówožu*), Sihasapa (*Sihásapa*), and Oohenunpa (*Oóhenuǵpa*) (Pritzker, 2000). The proper name of each band includes the band

name, subculture name, and Oyate (meaning ‘people, nation, one large family’ (Lyons, 2007)). For example, one meaning of ‘*Oglála Lakhóta Oyáte*’ would be ‘allied people who scatter one’s own’ (Pritzker, 2000; Douville, in South Dakota Department of Education, 2012). The formal structure of Oceti Sakowin society also includes smaller units including the *tiospaye*, the extended family which often is responsible for familial social support and material assistance.

3. Methods

An understanding the association of Cloud Peak medicine wheel and other sacred sites to the extent of the Lakota world is rooted in the migration history of Oceti Sakowin (and other tribes) into the northern Great Plains, the physical setting of the region, and Lakota culture and mythology. No single source provides a full account of Lakota (and Oceti Sakowin (Sioux) in general) migration from the prairie of the Midwest to the Northern Great Plains and much of the existing history is poorly documented. The setting of Cloud Peak medicine wheel and the Jennings site along with Lakota oral tradition suggest an intimate association with regional physiography. In addition, Lakota myth suggests additional sites of significance are as yet unidentified.

3.1 Lakota Migration and Occupation of the Northern Great Plains

The prehistory of Oceti Sakowin is complex and only a few thorough accounts are documented (Douville, in South Dakota Department of Education, 2012). Therefore, historical, biographical and cultural records were reviewed to trace the timeframe and areal extent of the tribe’s occupation of the region. Much of the outline presented herein of Oceti Sakowin migration and occupation of land during the last 500 years is based on information provided by historical records and ethnographies prepared by colonizers and Western historians documenting Oceti Sakowin culture during the 19th and 20th centuries. As such, that information is acknowledged as

incomplete and likely biased toward views and understandings of the people who first recorded their observations of the land and cultures of native peoples, and conversed with members of various tribes including Oceti Sakowin.

3.2 Regional and Local Physiography

Field observations were made of medicine wheel sites and physiographic features on the Northern Great Plains and adjoining regions of known import to the Lakota and other tribes that occupied the region during late prehistory. Literature was reviewed for descriptions of geomorphology and bedrock features associated with the Northern Great Plains in general, as well as the geology of certain locations chosen based on their proximity to known archaeological sites (such as medicine wheels and other sacred sites) and physiographic features known to have had a prominent role in Native American cultures, often related to topography or hydrogeology of the region. Examples include mountain ranges in Wyoming, the Black Hills, prominent glacial features such as the Missouri Couteau, and major river systems coursing the plains. Additional physiographic details were investigated concerning bedrock minerology, topography, and hydrologic conditions associated with certain features.

3.3 Native American Culture including TEK

Based on preliminary results of Burley (2006), the scope of investigation included research of traditional ecological (or environmental) knowledge (TEK) with particular interest in traditional Lakota culture. TEK may be defined as

“local and holistic, integrating the physical and spiritual into a worldview or ‘cosmovision’

that has evolved over time and emphasizes the practical application of skills and knowledge.

TEK is the product of careful observations and responses to ever changing environmental and

socio-economic conditions: as we now know, adaptation is the key to survival (SER, 2016).”

Literature was reviewed for information regarding known sacred sites and other sites of cultural import to Native Americans on the Northern Great Plains and adjoining areas. Traditional native oral history has multiple components, meanings and variations (Cajete, 2000). Those components include multiple levels of understanding concerning relationships among humans, Earth, the cosmos, and creator of the universe (Burley, 2012). Descriptions of social norms, sacred lifeway, legends and myths of Lakota life on the Northern Great Plains are provided based on review of ethnographies, historical records, biographies, essays and scientific literature prepared between the late 1800s and early 21st century addressing attributes of Lakota culture and TEK of other tribes of the Northern Great Plains. Further research of the literature in this regard was conducted based on results of field observations of medicine wheel sites and physiographic features of the region known to have been important sites to the Lakota and other tribes which occupied the region during late prehistory.

Results of review of the temporal and spatial migration and occupancy of the North Great Plains by the Lakota, documentation of physiographic characteristics of the both regional and site specific features, and information concerning Lakota culture and TEK, were applied to identify relationships between medicine wheel sites, environment and Lakota oral history. Those relationships were analyzed for indications of intent and purpose of Cloud Peak medicine wheel, the Jennings site, and other cultural and physiographic resources of the region.

4. Results

4.1 Lakota History and Ethnography

4.1.1 Oceti Sakowin History of Migration and Occupation

Archaeology does not provide evidence for Oceti Sakowin origins, and reliable information regarding the location of Oceti Sakowin was not available until the 1600s (Sturtevant, 2001). Anthropologists and historians conclude that Oceti Sakowin previously resided in the southeast part of North America as late as the 16th century, and became a nation as they moved into the Midwest by the late 1600s (Hough, 1909; Mails, 1979) (Figure 5a). However, westward migration of Oceti Sakowin from the southeastern United States to the Great Plains is mostly undocumented and speculative. It may have been one of many such westerly migrations by tribes soon after the arrival of Europeans in North America (Mails, 1990). Those movements may have been forced by arrival and spread of diseases resulting from indigenous contact with Europeans along the east coast of North America by the early 16th century (Francis, 2005).

Oceti Sakowin oral tradition indicates tribal origin in the northern lakes region, east of the Mississippi River (Nicollet in DeMallie, 1976). Based on linguistic reconstruction Munson (1975) identifies the homeland of proto-western Oceti Sakowin in the area of southern Wisconsin, southeastern Minnesota, northeastern Iowa and northern Illinois (Figure 5b) and by 1600 Oceti Sakowin arrived at the headwaters of the Mississippi River (Mails, 1990).

Marshall (2006) states the Lakota were a nation consisting of a society with an established nomadic hunting lifestyle in place well before they moved from Minnesota and Wisconsin onto the northern plains.

French Jesuits documented Lakota in Wisconsin and Minnesota in about 1640, and in the Green Bay, Wisconsin, area and the forests of southern Minnesota by 1658 (Doerner, 2007). Oceti Sakowin territory at that time extended from the forests and grasslands of central and southern Minnesota, through eastern North Dakota and South Dakota, and westward to the Missouri River by the mid-1600s, and Lakota and Yankton occupied portions of western Minnesota and eastern

South Dakota by 1680 (Tanner, 1987; Mails, 1990) (Figure 5c).

Southward and westward migrations toward the Minnesota River, North Dakota, and South Dakota are attributed to increased dependence on abundant bison in the grasslands and westward migration by Ojibwa onto land formerly occupied by Oceti Sakowin (Warren, 1885; ARCIA 1849). The migration occurred in two waves, the earlier consisting of Yankton-Yanktonai and Lakota after the middle of the 17th century, and the latter consisting of the remaining Oceti Sakowin after about 1735 (Hyde, 1975). Hennepin (1903) states 'Sioux of the West' encountered during 1679-80 along the Mississippi River walked for four moons (months) from their westward homeland to central Minnesota.

Oceti Sakowin migration into southern Minnesota, up the Minnesota River to Big Stone Lake bordering present day South Dakota, and across the Couteau de Prairies is summarized by Hyde (1975), illustrating readily apparent migration routes such as Sioux Pass across the Missouri Couteau south of the Big Bend of the Missouri River in central South Dakota. Marshall (2006) states Lakota crossed the Missouri River by 1680 and, while the exact timeframe is unknown, the event occurred before Lakota obtained horses. Rather, dogs served to pull loads placed on drag poles, and a usual day's travel at that time amounted to no more than about six to ten miles (Marshall, 2006).

At the beginning of the 18th century Le Sueur (Wedel, 1974), based on discussion with Oceti Sakowin representatives in central Minnesota, refers to the 'Sioux of the West' as hunters that traveled by foot across the prairies located between the Upper Mississippi River and the Missouri River (Doerner, 2007). Lakota followed Cheyenne migration on to the Great Plains during the period of about 1720 to 1750 (Doerner, 2007). Sturtevant (2001) provides a summary of factors influencing the continued westward shift of the Sioux during the 18th century, noting that western Santee, Yankton, Yanktonai and Lakota hunted on the prairie east of the Missouri River by the

mid-18th century. The LaVerendrye expedition encountered Lakota about 50 miles south of present day Pierre, South Dakota, in 1742 (Doerner, 2007) (Figure 5d).

By 1760 Lakota made contact with horses owned by Arikara (Doerner, 2007). Use of the horse ultimately allowed for an expanded size of the lodge, an increase in family size, and a broadening of Lakota territory (Marshall, 2006). The change to Plains culture resulting from introduction of the horse led to development of a surplus economy (Doerner, 2007).

Contact with Cheyenne, Arikara, Mandan, and other tribes on the prairie, in addition to exchange of Indian trade items, European goods, and horses brought significant cultural change to Ojibwa (Gates, 1965; Sturtevant, 2001). Indeed, widespread use of horses benefited the nomadic Sioux as bison became central to their economy and lifestyle. Fools Crow, a Lakota holy man, states "There was considerable change and not a little evolution on this continent; and the great Sioux migration [was] one marking an entire change in the customs and character of a tribe (Mails, 1990)". However, since they had no written tradition and specific changes in life-style resulting from that migration generally remain unknown, the influence of ancient customs on the Plains culture of the Lakota remains in question and difficult to discern (Mails, 1990).

By 1775 the Lakota ranged from northern Nebraska through the west half of South Dakota, and into North Dakota (Mails, 1990). By 1800, Lakota had displaced Crow, Kiowa, Ponca, Omaha, Arikara and Cheyenne. Southern Wyoming was included as Lakota hunting ground by the 1830s, and the Oglala Oyate extended their hunting grounds westward into territory occupied by the Snake Indians and northwestward into Crow country by 1840 (Mails, 1990) (Figure 5e). Lakota, Cheyenne and Arapaho continued migrating westward through the first half of the 1800s as a result of expanding White settlement and the decreasing bison population, displacing Kiowa and Crow from the Black Hills (DeMallie, 1980; Sturtevant, 2001; White, 1978).

Marshall (2006) and Utley (1994) describe Lakota travel and encampments situated alongside

the Bighorn Mountains, north of the Yellowstone River and the Bridger Mountains of Montana, south of the Missouri River in north central North Dakota, and in the east-central region of North Dakota (east of the Missouri River) between the 1830s and 1870s. By 1830 the Lakota were familiar with the Platte River Valley, engaging in raids against Pawnee (Doerner, 2007).

Meanwhile Lakota continued west, routing Kiowa from the Black Hills and Crow from the Powder River basin (Doerner, 2007). By the early 1830s Lakota were "fully transformed from pedestrian to mounted nomads" occupying the Northern Great Plains from the Missouri River to the Bighorn Mountains, and from southern Canadian prairies to the Platte and Republican Rivers (Uteley, 1993).

The Lakota generally had withdrawn from the east side of the Missouri river by 1833, although the James River drainage remained in use as hunting ground by Lakota until the 1860s (Denig, 1961). About this time, Yankton and Yanktonai extended their territory west to the Missouri (Sturtevant, 2001). Also, during spring some Lakota bands moved eastward from winter camps along the Missouri River to the James River area to reunite annually with other Sioux, gathering to affirm their existence, beliefs, sense of self, their place in the world, renewal of their lives and relationships with ceremonies, and reacquaintance with friends and relatives (Sturtevant, 2001; Marshall, 2006).

Maps illustrating the extent of Lakota territory from the time of first encounter with Europeans and Americans during the mid-17th through the mid-19th centuries typically circumscribe an area including northeast Wyoming, southeast Montana, portions of North Dakota and South Dakota west and south of the Missouri River, and that portion of Nebraska located north of the North Platte and Niobrara Rivers (Cash, 1971; Hassrick, 1964; Sturtevant, 2001; Marshal, 2006). Figure 5 illustrates the generally understood extent of traditional Lakota territory based on those accounts.

Across the Northern Great Plains there are certain high points recognized as sacred places by

many tribes, connecting the sky above and underworld below with terrestrial existence between (Lee Irwin, 1994; Albers 2003). The principal topographic feature central to the area is the Black Hills, sacred to Lakota, Cheyenne, Kiowa and other tribes, and traditionally considered to be the center of the Lakota world (Black Elk and Neihardt, 1932). The Black Hills was an important source of natural resources, supplying materials for shelter, food, clothing and medicine. The area also played a central role in spirituality, serving as the site of many sacred traditions and cultural understandings of the relationships between all things (Albers, 2003). For the Lakota, Cheyenne and other nations, the Black Hills were the sacred center of the universe (Albers, 2003; Jahner in Walker, 2006).

Liebman 2002, Albers 2003 include Bear Butte at the north-northwest edge of the Black Hills in the sacred territory.. The importance of the Black Hills, and Bear Butte in particular, to the cultural identity of such tribes as the Lakota and Cheyenne cannot be overstated. The Lakota and Cheyenne revered topographic high points for sites of fasting, praying, and searching for spiritual connections and guidance, and it is Bear Butte where some of the most sacred knowledge was acquired (Schlesier, 1987; Forbes-Boyte, 1996; Forbes-Boyte, 1999; Fire and Erdoes, 1978; Sword in Walker 1980:85). The Cheyenne name for Bear Butte is *Nowah'wus* (sacred hill, or 'Where the people are taught' (Schukies et al, 1993). It is regarded as their most sacred location (Sundstrom, 1997). High elevations brought the Lakota into contact with *Tunkanšla*, [Grandfather] or *Taku Škanškan* [also *Škan*, that power which causes everything to move (Buechel and Manhart, 2002)], universal powers associated with the highest elevations, the winds of the four cardinal directions, and animals that serve as messengers between those powers and people (Albers 2003). Kari Forbes-Boyte (1996, 1999) and Karl Schlesier (1987) argue that Bear Butte was a favored sacred site of the Lakota and Cheyenne because each of the seven sacred elements (land, air, water, rocks, animals, plants and fire) are found there, and Bear Butte was perceived as

forming an *axis mundi* connecting Earth and cosmos. As a physiographic and spiritual center of the world, Bear Butte and other high points in the Black Hills were seen as locations where the “forces of the universe coalesce in powerful and energizing ways” (Albers, 2003).

The Treaty of Fort Laramie of 1868 between the US Government and Oglala, Sicangu and Mnikowoju guaranteed Lakota ownership of the Black Hills, exempting white settlement of the area. However, discovery of gold in the Black Hills in 1874 led to a cultural tragedy as the Lakota were soon removed from the Black Hills. Albers states this separation of the Lakota from the sacred center of their world was not only “a loss of resources to sustain tribal livelihoods and survival, but a catastrophe of cosmic proportions where the very foundations of tribal identities and relationships to the universe were at stake (New Holy 1997, 1998).”

4.1.2 Lakota Myth as True History

Descriptions of social norms, sacred lifeway, legends, and myths of Lakota life on the northern Great Plains between about 1750 and 1890 were provided by holy men and transcribed by ethnographers and others of the 20th century (Black Elk and Neihardt, 1979; Brown, 1970; Mails, 1990; Steinmetz, 1990; Walker, 1991; Walker, 1992; Walker, 2006). Traditional native oral history such as stories of creation and origin has multiple components, meanings, and variations (Cajete, 2000). Those components include physical, intellectual, emotional and spiritual levels of understanding relationships between humans, Earth, the cosmos and creator of the universe (Burley, 2012). Western science often considers these stories to be myths *allegedly* including descriptions of historical events, helping explain a traditional world view, practice, belief, or natural phenomenon, but contain imaginary or unverifiable events. Thus they may be considered unfounded parables or allegories. Yet as Cajete (2000) notes,

“The dynamic, holistic nature of creativity and its reflections in native science are celebrated in a culture’s emergence stories. These guiding stories of the “First World”

mirror the processes of chaos, creative participation, and the metaphoric mind and bring a deep intuitive understanding of the creative process inherent in nature and in human beings. Native myths embody metaphors of natural creativity, imagination, and deep spiritual relationships in a people's long journey of evolution. Native myths chart the development of human beings in relationship to the places in which they have lived. These myths are simultaneously evolutionary, ecological, spiritual, psychological, and creative.”

Is myth, therefore, an account of the true history of a people? According to Ivan F. Star Comes Out, a Lakota elder, “I’ve always held traditional oral history to be as valid as the written word . . . Lakota oral history was transmitted within a definite air of spirituality, truth, and morality. Select elders were the keepers of tiospaye history who used symbols to remind them of specific events (Star Comes Out, 2016).” Further,

“Lakota language has always been an oral language and our ancestors transmitted it aurally through many generations, until now . . . Yes, a living language should adapt to its changing environment if it is to survive . . . Originally Lakota language was not “taught” in the western teacher/student relationship rather it was transmitted within an aural or auditory environment where learners were actively involved . . . Learners relied on their natural sensory functions and thus became proficient. The elder speakers were the established authority (Star Comes Out, 2016).”

Traditional Lakota culture is an expression of Native spirituality in which society is immersed in a sacred lifeway reflecting “a set of core beliefs in the sanctity of personal and community relationships to the natural world, which are creatively acted upon and expressed at both the personal and communal levels (Cajete, 2000).” Native myth, then, is oral history expressing

knowledge of the sacred relationship between people and environment, and containing historic truth embedded at several levels of understanding.

“A Myth of the Tetons as It Is Told in Their Winter Camps” (Walker, 2006) told by holy man George Sword describes from Lakota oral tradition the establishment of the four cardinal directions by the four sons of Tate (Wind), who was created by, and is the constant companion and messenger of Škan (Sky). Part III through part XVIII of Walker's Literary Cycle (WLC) (Walker, 2006) provides additional cultural information and context for that myth, while omitting details of kindred relationships and other information that had been included in the myths as presented by his sources. WLC is a narrative adapted from the traditional myths, developed and formatted in the manner of an epic story (Sturtevant and Jahner in Walker, 2006). The myth and WLC provide descriptions of the locations where each of the four cardinal directions were defined with respect to the home of Tate, and the distance traveled by the sons of Tate between those locations measured in terms of moons (months).

Table 1 provides an outline of the geographic locations and the setting of the four cardinal directions described in part III through part XVIII of WLC and "A Myth of the Tetons as It Is Told in Their Winter Camps" (Walker, 2006). According to the myth Škan allowed *Tate* [wind] to go with his four sons [*Tate Tob*, the four wind spirits of the cardinal directions] to the world and live there. However, there was no direction on the world when Tate and his sons arrived. Tate's home is described as:

“...a round lodge beyond the pines, and his four sons and his little son dwelt with him. The sun shone through the door of the lodge at mid-day and a place in it was for each of his four sons (George Sword in Walker, 2006).”

At a certain time Škan required that Tate command his sons to set the four cardinal directions

on the edge of the world, and the fourth time (the year) would be created upon completion of that task. A feast would be held in honor of the sons. Eventually the four sons of Tate set a direction beginning west of Tate's home, and subsequently to the north, east and south, returning to the point where the west direction is established and then back to Tate's home. The animals follow the sons, who are led by the bear, wisest animal of all. According to WLC, "The bears knew when they were near the center of the world and went before the brothers so that they might be honored guests at the feast (Walker, 2006)."

4.2. Regional Physiography, Lakota Myth, and the Archaeological Record

4.2.1 The Center

Bear Butte, located northeast of Sturgis, South Dakota, is a place of great significance to the Lakota and other tribes. The Cheyenne regard it to be their most sacred location (Sundstrom, 1997). The Lakota, upon establishing their presence across the Northern Great Plains conducted an annual migration to key locations in and around the Black Hills, including Buffalo Gap, Harney Peak, Pe Sla and Devils Tower. The migration was conducted in accord with specific temporal and spatial relationships associated with certain constellations (Goodman, 1992). Each stop along the route included rituals and ceremonies that accorded with oral tradition. The final stop along the route was Bear Butte where national councils were held. The Lakota believe that bears are the most powerful and wisest of animals, leading the four sons in their return to the lodge of Tate at the center of the world when the world was without direction (Forbes-Boyte, 1996; Walker, 2006). Bear Butte therefore is an *axis mundi* connecting Earth and sky, the high elevation prompting contact with the source of life – the power which causes everything to move – expressed by the wind (Kari Forbes-Boyte, 1996; Albers, 2003).

Bear Butte is not only a physiographic feature centrally located within the areal extent of

traditional Lakota territory, it is a Native American sacred site where all elements of the material and spiritual are perceived to come together. It is the location where national councils were held. In addition, it was the last stop during the annual spring migration of the Lakota about the Black Hills in accordance with temporal and spatial relationships observed between Earth and sky, before the people separated into numerous camps that moved out across the plains until autumn (Goodman, 1992).

In this context Bear Butte is viewed as not only at the physiographic center of Lakota traditional territory, but a vital center of Lakota spirituality and sacred lifeway, described in oral history as the lodge of Tate from which the four winds circumnavigated the edge of the Lakota world and set the four cardinal directions.

Within the context of the myth as true history presented above, with the four cardinal directions established at the edge of the Lakota world by the four sons of Tate (Walker, 2006), the region around the Black Hills may be divided into four major physiographic areas: west across the high plains of eastern Wyoming to the Bighorn Mountains (Figure 7); to north to badlands along the Little Missouri and Missouri Rivers (Figure 8); east to the Missouri River and Southern Missouri Couteau (Figure 9); and south across the White River Badlands and the sand hills of Nebraska to the Platte River (Figure 10).

4.2.2 West Quadrant

The primary physiographic feature bounding the west portion of traditional Lakota territory is the Bighorn mountain range (Figure 7). The mountains present a vertical relief of over 2,440 m (8,000 ft) above Thunder Basin National Grassland which stretches eastward to the Black Hills. Cloud Peak with its summit, at 4013 m (13,175 ft), is higher than any point within a 160 km (100 mi) radius, overlooking the vast buffalo ranges of the Powder River, Yellowstone River and

Bighorn basins.

Westerly winds moving over the Bighorn mountains cause clouds to form over the spine of the range, often the first cloud developing at higher elevations above and nearby Cloud Peak in particular. The cloud pattern develops further, extending eastward to bring rains across Thunder Basin National Grassland and the Black Hills farther afield. The annual traditional Lakota ceremonial season begins with spring return of thunder beings (Lakota: *Wakinyan*) from the west, and is announced by the presence of thunder, lightning, and rain (Goodman, 1992). That event generally corresponds with the time of vernal equinox with the heliacal rising of the Lakota constellation of Dried Willow (*Canshasa Ipusye*) (Goodman, 1992). This was the time of the celestial Pipe ceremony and ritual related to rekindling “the sacred fire of life on earth . . . prayers calling back the birds, calling back the animals and plants, and especially a hope expressed that a white buffalo would be found during the coming year (Goodman, 1992).”

4.2.3 North Quadrant

The northern perimeter of traditional Lakota territory, as mapped previously by others, is generally in the region bounded by the Knife River which flows east across west-central North Dakota, and not farther north than the Missouri River (Cash, 1971; Hassrick, 1964; Sturtevant, 2001; Marshal, 2006) (Figure 6). The Killdeer Mountains, located in Dunn County, North Dakota, are the most prominent topographic feature south of the confluence of the two rivers, and immediately south of the badland area along the south side of the Missouri River (Figure 8). The mountains attain an elevation of more than 1,000 m (3,300 ft).

In Lakota mythology, Waziya (or Wazi), meaning ‘Blower From Snow Pines’, is an old man guarding the north and the place of the aurora borealis (Lynch *et al.*, 2010). He creates the icy cold north wind by his breath and he can help bring good fortune or bad (Walker, 2006; Lynch *et al.*,

2010). Wazi had wandered across Earth and walked upon its edge until he had worn a path around the world; he communicated with the stars, asking if they had a message for him as they would rise in the east and set in the west (Walker, 2006). According to WLC and "A Myth of the Tetons as It Is Told in Their Winter Camps" (Walker, 2006), the Four Sons of Wind encountered Wazi at his lodge where shadows are longest; all stones were covered in ice and ice was placed on the trail the Sons were following; there was a great bluff beside the trail, and Wazi's snow covered lodge at that location included lodge poles constructed of icicles. That the Four Sons of the Wind met Wazi where shadows are longest is not surprising. The north perimeter of Lakota territory as understood by historians is at a latitude of about 47 degrees to 48 degrees north resulting in shadows of considerable length even at midday in winter. Descriptions of apparent stones and the trail covered in ice, and Wazi's lodge constructed of icicles and covered in snow, are herein interpreted as indicators of not only the northerly extent of the trail, but alert us of the stark, physiographic conditions of the area. With the lodge of Tate represented by Bear Butte, center of the Lakota World, by extension, Wazi's lodge in the north is represented by a topographic feature situated in the northern quadrant of Lakota territory.

4.2.4 East Quadrant

Lakota generally had withdrawn from the east side of the Missouri river by 1833 (Denig, 1961), and Yankton and Yanktonai extended their territory west to the Missouri (Sturtevant, 2001). However, Lakota continued to use the James River drainage as hunting ground at least into the 1860s, and some Lakota bands moved eastward to the James River area to reunite annually during spring with other members of Oceti Sakowin (Sturtevant, 2001; Marshall, 2006). As with the other peripheral locations of Lakota territory, the pragmatic limit of their territory changed depending on needs of the Lakota and adjoining tribes. Control of such territory was by the

particular occupants at any given time without a declared ownership of the land (citation). That fluidity of control of Oceti Sakowin land might have been most often expressed along the Southern Missouri Couteau (Figure 8).

The low-relief, hummocky topography, prairie potholes, and extensive grasslands of the Couteau represents the westernmost extent of continental glaciation (Omernik and Griffith, 2008; Shjeflo, 1968; Hudson, 2002; Penner, 2016; Richards and Fung, 1969; Clayton, 1967)). The Jennings site is located in Hand County, South Dakota, near the east limit of the southern Missouri Couteau (Figure 9). Situated on a broad, undulating east-facing slope, the surface rises westward with gently rolling topography restricting views of the Ree Heights located farther west. Numerous local topographic depressions contain wetlands and a large lake is located about one half-mile south of the medicine wheel. The location offers a view eastward, across the James River valley and along the east portion of the Missouri Couteau.

The Jennings site is readily accessible from the west via the Missouri River crossing at Crow Creek. , Based on its location near the headwaters of westward flowing Crow Creek with an expansive view toward the east, the medicine wheel could have been be a strategic construct from a geopolitical standpoint. At the same time, recalling that through the 1830s Lakota bands moved eastward from winter camps along the Missouri River to the James River area to reunite annually with other members of Oceti Sakowin, the Jennings site could have also symbolized important cultural ties between the Lakota, Santee and Yankton-Yanktonai in that area.

Brumley (1988) summarizes the physiographic and topographic setting, metric and non-metric characteristics, feature condition and research status of the Jennings medicine wheel based on Abbott *et al.* (1982) and Rood and OverholserRood (1983). The Subgroup 6 structure includes a low stone cairn 2.5 m (8.2 ft) in diameter and located in the center of a 6 m diameter stone circle, with the cairn and circle connected by four stone lines almost equidistantly spaced (Brumley,

1988) (Figure 9). Limited data is available regarding the age, origin and purpose of the site. It has not been excavated and appears to remain undisturbed; no recorded ancillary features or ethnographic evidence are documented for the site (Brumley, 1988).

4.2.5 South Quadrant

Situated in the southwest portion of the Northern Great Plains, the High Plains of northwestern Nebraska include large stretches of grassland and sand hills across which the Niobrara and North Platte Rivers flow east (Figure 8). The North Platte River flows southeast across the west portion of Nebraska before its confluence with the South Platte River in the west central portion of the state. Most of the Sandhills are located north of the North Platte and Platte Rivers and extend across nearly a quarter of the state, while much of the south side of the North Platte River valley is bounded by formations of the White River Group, including the Arikaree Formation forming high, steep bluffs.

Well-known local physiographic features along the North Platte River include Scotts Bluff and Chimney Rock. Scotts Bluff is a high promontory in extreme west Nebraska, rising about 240 m (800 feet) above the North Platte River (Figure 10). NPS (1934; 2007) provides a summary of the natural features of, and historical human impacts to, the bluff and surrounding area. With its sheer cliffs overlooking the adjoining river valley, Scotts Bluff served as a landmark for thousands of pioneers traveling west along the Oregon Trail during the mid-1800s. The bluff's cliffs include 225 m (740 ft) of continuous geologic strata, the most geologic history expressed in any outcrop in Nebraska (NPS, 2006).

The North Platte River flows southeast about 2 km (1.3 mi) north of Scotts Bluff, in a broad valley with adjoining wetland areas and historically prone to flooding. Upland areas bounding the valley were once covered by an almost continuous mixed and short grass prairie. Scotts Spring,

located in Scotts Bluff National Monument and next to the Saddle Rock Trail, was recorded in pioneer diaries as a source of clear drinking water compared to the often turbid flow of the nearby river (NPS, 2006). Historic records document the local presence of large mammals such as grizzly bears, bighorn sheep, bison and elk, while resident populations of smaller mammals, reptiles, amphibians, and numerous bird species are currently recorded within the river valley and adjoining uplands (NPS, 2006).

Chimney Rock, about 33 km (21 mi) southeast of Scotts Bluff, was a landmark for pioneers traveling on the Oregon Trail by the 1840s (NPS, 2016) (Figure 11). It is an erosional remnant of bluffs of Arikaree Formation about 3 km (1.8 mi) south of the North Platte River (NPS, 2009). The upper 100 m (325 ft) of Chimney rock consists of a spire of volcanic ash overlying a conical base of Oligocene Brule Formation (NPS 2009).

A medicine wheel is not documented in the vicinity of Scotts Bluff and Chimney Rock. NPS (2007) states that the plains and bluffs of the area suffered extensive disturbance from the passing of immigrants and livestock along the Oregon trail during the mid-nineteenth century. Rural and urban development has continued to the present, and impacts include loss of vegetation, soil erosion, surface grading, and land development.

5. Discussion

5.1 West Cardinal Direction

WLC describes the steep slope of the mountain that the sons of Tate must climb to reach the summit of the mountain upon which *Wakinyan* (The Winged One, or Thunder Being) resides. WLC also describes the ability of *Eya*, a son of the Wind, to flee down the mountain and overtake his brothers as they set about to build a pile of stones on the trail at the edge of the world. Stones are in plentiful local supply and were used to construct Cloud Peak medicine wheel, the nearby

rock cairn, and ancillary features overlooking Paint Rock Creek, all within a few hundred feet of the existing climber's trail (Burley, 2006). A striking parallel is apparent between the high and rugged Bighorn mountain range producing inclement weather moving east over the high plains, and *Inyan* (rock), the source of everything and creator of Wakinyan. Jahner (in Walker, 1989) notes that WLC stresses the inherent basic order of life including a quality of contrariness that creates an unpredictability allowing for development of wisdom; "the union of Inyan and Wakinyan results in Ksa, or wisdom."

The mythic place defining the west cardinal direction in "A Myth of the Tetons as It Is Told in Their Winter Camps" and WLC (Walker, 2006) correlates with specific physiographic features of Cloud Peak in the Bighorn Mountains of east central Wyoming, and construction of Cloud Peak medicine wheel along Paint Rock Creek on the mountain's western flank (Figure 12). The Bighorn Mountains have a strong orographic gradient, with significantly more precipitation experienced with increasing elevation as upslope winds from the west are cooled, often forming cloud cover and precipitation over Cloud Peak prior to cloud formation over surrounding peaks. Glacial erosion and freeze-thaw action has produced steep bedrock faces surrounding Cloud Peak except for a narrow ridge (sometimes locally referred to as walking the "plank") that connects the peak to a larger ridge bounding the north side of Paint Rock Creek west of the drainage divide. The plank leads to a climber's trail extending down the west slope of the mountain, following the Paint Rock Creek drainage toward the Bighorn River bounding the west side of the mountain range.

Most significantly, the latitude of Cloud Peak is within about 5' 37" (5.62 arcminutes) of the latitude of Bear Butte, a relative difference of only about 10.4 km (6.5 mi) south from the latitude of Bear Butte, while the distance between the two peaks is 300 km (185 mi). The angular difference between true West (azimuth 270°, measured from North) and the alignment between Bear Butte and the top of Cloud Peak, is 1° 59' (azimuth 268° 01' from Bear Butte).

Similarly, Cloud Peak medicine wheel (301.6 km west and 7.00 arcminutes south of Bear Butte) is within an apparent error of 2° 28' south of the actual west cardinal direction from the butte.

Table 2 lists mythic locations of place representing cardinal directions, and azimuths of physiographic and anthropomorphic features such as Cloud peak and Cloud Peak medicine wheel, with respect to Bear Butte. The Sun sets due west each evening of the vernal and autumnal equinoxes, its diameter extending across approximately one half degree at the horizon. Thus, Cloud Peak is situated little more than one degree south of alignment with the Sun during dusk at solstices. As such, Cloud Peak and its associated medicine wheel, placed upon the west flank of the mountain, serves as proximate locations defining the west cardinal direction at the edge of the Lakota world, described mythically in WLC and "A Myth of the Tetons as It Is Told in Their Winter Camps" (Walker, 2006).

For Lakota there is a fundamental, powerful relationship observed between Earth and weather that expresses an essential characteristic of life (Walker, 1991; Goodman, 1992; Douville, 2011). The direction of Cloud Peak with respect to Bear Butte serves not only as the definition of west and the source of the west wind, but the source of earth-cleansing rains and a representation of the source of wisdom described in Lakota mythology (Goodman, 1992, Douville, 2011). It is noteworthy that, similar to recent maps delineating the western extent of traditional Lakota territory along the spine of Bighorn Mountains, the Treaty of 1868 delineates those mountains as the west limit of unceded Lakota land (US National Archives, 1868).

5.2 North Cardinal Direction

"A Myth of the Tetons as It Is Told in Their Winter Camps" (Walker, 2006) states that the sons of Tate built a pile of stones at the door of the lodge of Wazi (the Old Man, or Wizard who lived where the pine forests are located, i.e. north) to represent the north direction. WLC (Walker, 2006)

states that Yata, a son of Tate, placed ice on the trail next to Wazi's lodge to signify the north direction at that location, and that the ice became a great bluff; the poles of the lodge of Wazi were icicles and its covering was snow. Similar to Cloud Peak and Bear Butte representing the lodges of Wakinyan and Tate, respectively, if such lodges are indicative of mountains then the lodge of Wazi may be represented by Killdeer Mountain.

The Killdeer Mountains in west-central North Dakota (Figure 8) are forest covered, steep south-facing bluffs, and the most prominent local topographic feature south of the Little Missouri River, the mountains are significant physiographic features of the north quadrant of historically mapped traditional Lakota territory. The south-facing bluffs of the mountain consist of near vertical bluffs of outcropping Arikaree and White River Groups. Bedding planes within the strata are readily apparent as a result of differential weathering and erosion. The hydraulic conductivity of the Arikaree Formation (Long *et al.*, 2003), suggests it is quite permeable allowing significant seasonal melt water to enter the formation. Seepage to cliff faces forms icings (Veillette and Thomas, 1979; Woo, 2012) as it discharged along the face of the bluffs during winter.

Medicine Hole is a cave or fissure located at the top of Killdeer Mountain. Formation of the cave has been attributed to mass wasting of Arikaree Formation near the southern end of the mountain, resulting in the fissure estimated to have a maximum depth of about 20 meters (70 feet) and trending roughly east-west for about 30 meters (100 feet) (Murphy, 2002). Medicine Hole is an important ecological feature for many Native Americans and is believed to be the portal through which bison emerged onto the surface of Earth (North Dakota Geological Survey, 2012; Federal Writers' Project, 1938). David (1983) states that between 1909 and the latter 1920s his parents observed annual visits or pilgrimages by Oceti Sakowin holy men to the Medicine Hole, where they would drop tobacco and herbs into the cave and conduct ceremonies for departed tribesman.

Medicine Hole is 333 km (208 miles) north of Bear Butte. It is about 32 minutes) 40.4 km (25.1

mi) east of a line extending due North from Bear Butte. The difference between the true due North direction (azimuth 0°) and the alignment between Bear Butte and Medicine Hole is approximately $6^{\circ} 55'$ east of north (Table 2).

About 30 km east of Medicine Hole is the Swenson site (Kuehn, 1988), consisting of a medicine wheel the purpose and origin of which remain undetermined, and the site's relationship, if any, to Lakota culture unknown at this time. The primary northerly alignment of stones extending across and beyond the central stone circle at the Swenson Site is oriented with an azimuth of approximately 4.5 degrees west of North; the purpose of the northerly alignment is unknown. If the structure was originally built to point north toward Polaris at the star's apparent maximum westerly diurnal position (i.e. when because of precession Polaris was at azimuth 355.5°) then the Swenson Site could date to about 1530 AD. The alignment from Bear Butte to the Swenson Site has an azimuth of about $16^{\circ} 43'$. The azimuth of Polaris has changed by about 16° since about 40 BC, many centuries before documented mass migration of Lakota onto the Northern Great Plains and, therefore, based on the documented timeframe of that migration discussed above, the Swenson site does not represent the "north" cardinal direction described in WLC. In sum, the Swenson Site does not appear to be located to reflect accurately the north cardinal direction from Bear Butte nor is it of any known cultural significance in the story of the Sons of Tate.

The Killdeer Mountains and the Swenson site are located south, and within sight, of the badlands and breaks that bound the south side of the Little Missouri and Missouri Rivers. While the badlands and rivers beyond do not preclude travel north of the mountains and rolling hillsides to the east, such travel certainly is hindered by the topography and generally arid conditions found in the badlands. In comparison with grasslands to the south where the physiography encourages travel in any direction, the badlands extending down to the rivers could serve as a potential

geopolitical boundary along which travel is best accomplished along their south boundary or respective river's floodplain or channel. That inhibition to north-south mobility might have influenced the demarcation of Lakota territory south of the badland area and helped to confirm the location of the Killdeer Mountains, and potentially Killdeer Medicine Hole, as defining the north direction and the northerly limit of that territory.

While a medicine wheel site has not been documented at the Killdeer Mountains, the location of Killdeer Mountains and Killdeer Medicine Hole, in tandem with the mythic description of the lodge of Wazi, are strong indicators of the north direction defined by the Killdeer Mountains as described by Lakota mythology, and Killdeer Medicine Hole in particular, with the cave's location at the top of the mountains and the sacred importance of Medicine Hole to Oceti Sakowin and other Native American tribes. Given relative accessibility of the Killdeer Mountains to the public, and documented historical events that occurred in that area, it is possible that a pre-historic medicine wheel would no longer be intact or readily apparent in that area. However, the author observed a medicine wheel located on an east-facing slope about 100 meters east of Medicine Hole during a visit to the Killdeer Mountains in June 2007. According to a member of the Mandan tribe who was at the site at that time to gather herbs, the medicine wheel was constructed recently (within about the last ten years or so), and tribes in the region continue to consider Medicine Hole and the Killdeer Mountains to be sacred places (Anonymous, personal communication).

5.3 East Cardinal Direction

WLC (Walker, 2006) states that after leaving the lodge of Wazi the sons of Tate eventually came to a sandy region where no green thing grew and where there was little water, that they were thirsty, and that they observed mirages, mistaking the mirage for a lake. They followed the mirage, leading them off of the trail they had been following at the edge of the world. After receiving from

an old woman a shell that provided fresh water to drink as they traveled for many days where there was little water, or defiled water, they came to a place where the grass was green and trees were budding their leaves. One evening Wazi instructs Yanpa, one of the sons, to plant a wand along the trail as no rocks were apparent at their location, and a huge oak tree was seen in the morning where the wand had been placed the night before.

These mythic events appear to describe the moraine of the Missouri Couteau as a person traveled clockwise from the north direction, walking across the dry grasses typical of the Couteau in summer. However, upon reaching the west extent of the James River drainage area in east-central South Dakota, the view to the east includes riparian zones paralleling perennial streams, and the west limit of oak forests found in the Northern Glaciated Plains of eastern South Dakota and central Minnesota. Although the Missouri River is often identified as the eastern limit of traditional Lakota territory (Cash, 1971; Hassrick, 1992; Marshall, 2006), as discussed above, cultural and familial relationships with other members of Oceti Sakowin in the James River valley to the east during the 1700s suggest that it was reasonable for Lakota territory to extend east and onto the Southern Missouri Couteau.

While the Jennings site is not located in the vicinity of a mountain or promontory, it is located on a major geographic feature of the northwestern glaciated plains - the Southern Missouri Couteau of east-central South Dakota (Figure 9). This area is characterized by innumerable hills and swales associated with ice-stagnation topography containing prairie potholes, wetlands, small lakes and ephemeral and intermittent lakebeds. Stream drainage is often absent or uncommon. The wetlands and lakes provide significant wildlife habitat, serving as major waterfowl production areas.

The Jennings Site is located about 359 km (223 miles) east of Bear Butte. The latitude of the Jennings site is approximately 5' 33" south of the latitude of Bear Butte, equivalent to a difference

of about 10.1 km (6.3 mi). The difference between the true due East direction (azimuth 90°) and the alignment between Bear Butte and the Jennings Site is approximately $1^\circ 37'$ toward the south (azimuth $91^\circ 37'$; Table 2). The Sun rises due east on the mornings of the vernal and autumnal equinoxes, its diameter extending across approximately one half degree at the horizon. Thus, the Jennings Site is situated little more than one degree (or half of a thumb width held at arm's length) north of alignment with the Sun during dawn of the solstices.

5.4 South Cardinal Direction

WLC (Walker, 2006) describes Okaga, one of Tate's sons, placing a beautiful shell (given to him by Wohpe, daughter of Skan and medium between Wakan Tanka and all things; also known in human form as White Buffalo Woman) on the trail at the edge of the world, and seeing that the beautiful shell had grown to be a tipi rivaling the colors that *Anp* (companion of *Wi*, the Sun) decorated the sky. The tipi shimmered as *Wi* began his journey across the sky.

Profiles of Chimney Rock and certain prominences of Scotts Bluff are similar to that of a tipi, with ridge lines extending toward the apices and the shear faces of exposed bedrock decreasing in width proximal to the top of the respective feature, while varied colors of the minerals and glass shards reflect sunlight. Similar to the west limit of Lakota territory as delineated on recent maps, the south extent of that territory has been mapped along the North Platte River, and the Treaty of 1868 delineates the North Platte River as the outward limit of unceded Lakota land in the vicinity of Scotts Bluff and Chimney Rock.

Both Chimney Rock and Scotts Bluff are located at the southwest end of a curvilinear line of higher topography extending northeast across the Sandhills of Nebraska and along the ridgeline separating the Niobrara River drainage to the north, from the Loup River drainage to the south (refer to Figure 8 for location of the Sandhills). The center of the Sandhills not only separates those

major drainage features, but also is the center of the Sandhill Mixed-grass Prairie vegetation type for the period prior to the 1860s (Kaul and Rolfmeier, 1993) and the Valentine-Elsmere-Tryon soil association characterized by deep, poorly drained to excessively drained, sandy soils derived from eolian sand in valleys and uplands of the sandhills (USDA, 1988). While travel across the sand hills would not be prohibited by topography or other physiographic conditions, a source of readily available water is limited by the sandy, permeable soils along the crest between drainages. In tandem with the location of other tribes such as the Pawnee, Ponca, and others occupying the lower Platte River, lower Missouri River and associated tributaries, the ability of Lakota to control resources southeast of the Niobrara River drainage might have been non-essential, if not rather difficult to achieve. In any case, locations of Chimney Rock and Scotts Bluff appear to represent potentially significant southerly landmarks at the limit of traditional Lakota territory, each situated nearly due south of Bear Butte, readily accessible from the north, and situated along the northwest-southeast trending North Platte River.

Chimney Rock is located along the south side of the North Platte River valley, about 308 km (191 miles) south of Bear Butte. The alignment between Bear Butte and Chimney Rock has an azimuth of $178^{\circ} 49'$ (Table 2). This is equivalent to being off alignment by 20 m/km (106 ft/mi) measured from Bear Butte, well within the width of horizon covered by a thumb width held at arm's length.

Scotts Bluff is located along the south side of the North Platte River, about 295 km (183 miles) south of Bear Butte. The alignment between Bear Butte and Scotts Bluff has an azimuth of $184^{\circ} 33'$ (Table 2). This is equivalent to being off alignment by 79.7 m/km (420 ft/mi) measured from Bear Butte, well within the width of horizon covered by a fist held at arm's length.

5.5 Time Frame for Mythic Description of Place

Historic and ethnographic research documents migration of Lakota onto the Great Plains by about the mid-17th century, their crossing of the Missouri River by between the late 1600s and mid-1700s, occupation of the Black Hills by the 1770s, and further migration into southeast Wyoming and southeast Montana during the 1830s to 1840s. A summary of that migration is illustrated in Figure 4. The migration included use of dogs to assist in the transportation of shelters and other items and materials necessary for life on the northern prairie, allowing for a maximum daily travel distance of no more than 6 to 10 miles per day, and perhaps an average of 5 miles (8 km) per day. Introduction of the horse to Lakota by the latter 1700s allowed for that distance to increase to about 20 miles (32 km) per day, and significantly altered their culture and lifestyle.

WLC and "A Myth of the Tetons as It Is Told in Their Winter Camps" (Walker, 2006) provide a basis for understanding not only the source of the four cardinal directions held by the Lakota, but the setting of those directions with regard to the physiographic characteristics of traditional Lakota territory and construction of medicine wheels potentially demarcating where each direction was defined with respect to Bear Butte, the center of the Lakota world.

In summary, Table 1 itemizes mythic yet accurately detailed descriptions of place as the four sons of Tate walked from the center of the Lakota World to the edges of the Earth to place a marker at each of the four cardinal directions. With Bear Butte (Tate's lodge), South Dakota, serving as physiographic center of the Lakota ritual landscape, the sons placed stones to the West, North, East, and then South, completing their circular route before returning home. The mythic descriptions of place reflect actual physical characteristics of Cloud Peak, Wyoming (lodge of Wakinyan), Killdeer Mountains, North Dakota (lodge of Wazi), the east-facing aspect of the Southern Missouri Couteau, South Dakota, and Scotts Bluff, Nebraska.

The timeframe of development of the myth is not known. However, since the myth provides reasonable descriptions of those actual places, it follows that the mythic description of place did not fully develop until the Lakota occupied land bounded by those four locations, constructing *cangleska wakan* at each of the four cardinal directions at proximal limits of their territory. The horse is not mentioned in the stories. If the myth developed prior to introduction of the horse to Lakota during the late 1700s, then the myth might have developed within a timeframe constrained between the Lakota discovery of the Black Hills by the 1770s, and introduction of the horse to the Lakota before 1800. Based on the documented extent of migration by Lakota toward the west, north and south between 1750 and 1850, their ability to demarcate territorial limits in the four cardinal directions, as suggested in WLC, could well have occurred by the early 1800s, potentially sooner. These constraints for timing of the medicine wheel constructions approximate independent estimates by Burley (2006) and Rick Laurant (personal communication), archeologist for the Bighorn National Forest, for the date of construction of Cloud Peak medicine wheel. If places representing the center and cardinal directions of traditional Lakota territory were identified as cardinal physiographic features by the latter 1700s, then the Cloud Peak site, Swenson site and Jennings site may represent prehistoric archeological evidence demarcating the extent of that territory within a contextual framework including a breadth of social and cultural perspectives ranging from geopolitical boundary markers to structures serving ceremonial, ritual and sacred functions. They helped define the lateral limit of that territory, provided geographical context to the Lakota sacred lifeway and other aspects of culture, and were supplemented by culturally specific study and application of ecological and astronomic observations. The architectural symbolism of the associated medicine wheels, specifically that of the Cloud Peak and Jennings *cangleska wakan*, is an archetypal representation of traditional ecological knowledge concerning the physical, intellectual, emotional and spiritual relationships between humans, Earth, cosmos

and creator (Burley, 2012).

5.6 Qualifying the Four Cardinal Directions

Mythic descriptions of locations where the four sons of Tate (Wind) placed one stone each west, north and south of Tate's lodge, and a wand east of that lodge, are symbolic representations of physiographic features proximal to the periphery of the traditional Lakota world. "A Myth of the Tetons as It Is Told in Their Winter Camps" and Walker's WLC (Walker, 2006) relate actual physiographic features – topographically high locations overlooking the Northern Great Plains and major rivers – each located within 7 degrees (mean using azimuths toward Cloud Peak, Medicine Hole, Jennings Site and Chimney Rock is 2° 56') from azimuths of true cardinal directions from Bear Butte, the mythic lodge of Tate and center of the Lakota World. The story describes in mythic form placement of markers designating the four cardinal directions, actions replicated by the Lakota in constructing Cloud Peak medicine wheel and the Jennings Site, representing two of the cardinal directions. In other words, the *cangleska wakan* are mythic actions made manifest, placed at significant physiographic features of the natural landscape. What is perhaps most surprising is that azimuths directed from Bear Butte toward those natural features do in fact approximate the true cardinal directions, and the associated physical settings are aptly described in myth. This suggests any quantitative error in alignment of those directions during construction of *cangleska wakan* was of little import to the process of identifying and delineating the areal extent of Lakota territory. The territorial limits are defined by specific physiographic features (topographic high points and rivers), and recognition of the sacred relationships between the sky, Earth and life is expressed by placement of *cangleska wakan* in specified geometrical relationship with the geographic center.

6. Conclusions

Traditional oral history of the Lakota describes in mythical format the setting of cardinal directions by the four Sons of Tate (Wind). The directions are defined by detailed descriptions of the physiography at each of four locations where the sons set stones to denote orientation of each direction relative to the lodge of Tate. Cloud Peak medicine wheel and the Jennings site are potential territorial boundary markers constructed by the Lakota subsequent to their occupancy of the Northern Plains by the late 1700s to early 1800s. Each medicine wheel is located along the limit of an area previously mapped as traditional Lakota territory. The medicine wheels are located within a range of about 300- to 359-km (190- to 223-miles) from Bear Butte, South Dakota, and remarkably, less than a half degree of due west and east of that landmark. Based on evidence provided in Lakota mythology and the geographic context of each feature, it is postulated that the medicine wheel sites effectively define the west and east cardinal directions with respect to Bear Butte, the center of the Lakota world. Lakota traditional oral history effectively describes not only mythic placement of cardinal directions upon the Lakota world, but actual locations where the people constructed lithic sacred hoops as symbols representing the power between the land and themselves. While no medicine wheel site is documented at Chimney Rock and Scotts Bluff, Nebraska, those natural features are identified as potential physiographic locations described in Lakota mythology defining the south cardinal direction with respect to Bear Butte. Chimney Rock is almost due south of Bear Butte, and the feature's unusually tall and narrow, needle-like form may have given rise to the mythic description of its creation resulting from growth of a shell. The extent of traditional Lakota territory is refined based on the medicine wheel locations and the regional physiographic and ethnographic context influencing the marked extent of that homeland. Inferred limits of that territory demarcate the physiographic sacred hoop within which Lakota

culture thrived, delineating the boundary of not only traditional Lakota territory, but their ethnicity, traditions and sacred lifeway.

Evidence of Lakota migration across the Great Plains, in tandem with Lakota mythology as described by Walker (2006), suggests that the Lakota myth of fixing the four directions by the sons of Tate was formulated during the latter 18th century or early 19th century and that construction of medicine wheels to demarcate the actual extent of Lakota territory might have occurred at about the same time. That timeframe for development of the myth might represent the latest potential period for the myth to have been fully developed, as it assumes that the myth did not develop until the Lakota were the primary occupants of the region extending from the Southern Missouri Couteau to the Big Horn River, and from the confluence of the Missouri and Little Missouri Rivers to the North Platte River. It remains possible that the myth developed prior to such occupancy by Lakota. Nonetheless, according to the myth, the sons of Tate completed their journey in twelve months (one year). Based on a 2450 km circumnavigation of Lakota territory as depicted on Figure 5, the average rate of travel by the sons of Tate along the edge of the Lakota world would have been about 6.7 km (4.2 miles) per day. Given the myth's descriptions of the son's slow travel and occasional overnight stays without progress along the trail, the estimated rate of travel appears to be a reasonable estimate of the rate that might have been accomplished by Lakota traveling a similar trail during that latter 1700s.

Based on historical and ethnological information, site observations and archeological documentation, the four cardinal directions as described in Lakota mythology appear to have parallels with natural physiographic features supplemented by medicine wheels at two or three of those locations. Those physiographic features include Cloud Peak (west) supplemented by Cloud Peak medicine wheel and ancillary features, Killdeer Mountain and Medicine Hole in particular (north), the Jennings site (east) situated on the Southern Missouri Couteau, and the Scotts

Bluff/Chimney Rock area (south) (Figure 15).

Hassrick (1964) describes the Oceti Sakowin as a ". . . systematic people. They were organizers and classifiers. As the universe was intricately patterned into hierarchies and divisions, so was the nation. Theirs was a form of government, a political concept which incorporated their flair for logic with the pragmatics of successful group-living in a difficult and dangerous world." He notes that "the Sioux had such faith in their national destiny that they haughtily dominated the heartland of the Northern Plains for nearly a century. They made no concessions, few alliances, and many enemies ... They were proud of their superiority and were vigilant in defending it. They conquered relentlessly with a conviction of fortune. They were men among men and a nation among nations (Hassrick, 1964)."

By extension, construction of medicine wheels in association with the cardinal directions might demonstrate the Lakota's "inherently strong sense of possessiveness" (Hassrick, 1964). Hassrick (1964) also states that "in the context of their cultural meaning, there is the suggestion that true wisdom and all it implied - living the Sioux way - was so difficult of realization that many men would normally fail to make the effort. The Sioux way was successful only to the extent that enough men believed in it to make it work." This certainly would have been the case for the efforts in locating and construction the medicine wheels. If the construction of *cangleska wakan* supplementing the natural physiographic features at three of the four cardinal directions indeed serve as boundary markers signifying the west, north and east edges of Lakota territory, then those benchmarks represent a great feat of surveying covering an area of about 2 million square miles (5×10^6 sq km) with remarkably accurate astronomical and linear measurements likely using the unaided eye across hundreds of kilometers, and logging distances measured in terms of days, nights, moons and years. Such an undertaking would require not only planning and organization, but also understanding of the temporal and apparently cyclical movements of the sun, moon and

stars about Earth.

However, medicine wheels also demonstrate an understanding of place and the relationship between artifact, creator and environment. Cajete (2000) states that structures and symbols of Native science, used as a metaphor for native knowledge and creative participation with the natural world in theory and practice, serve as bridges between the inner and outer realities, with those realities expressed in traditional Plains Indian culture by the medicine wheel structure. He notes that the science of indigenous peoples is grounded on an understanding of perspective and orientation. As indigenous ceremonial cultural artifacts, *cangleska wakan* constructed by the Lakota would have been "created with an acutely developed understanding and acknowledgement of the natural elements from which there were created ... each component . . . carefully chosen with regard to its inherent integrity of spirit and its symbolic meaning within [Lakota] traditions (Cajete, 2000)." Through physiographic context of each medicine wheel, and the creative process, artifact and creator being one, the wheels became artistic creations "of seeing ... of being and of becoming (Franck, 1981)."

Limits of Lakota territory about Bear Butte as represented on Figure 15 provide an earth-sized representation of a Subgroup 6 medicine wheel as defined by Brumley (1988), with the stone ring represented by the edge of their territory (delineated by major rivers and drainage divides), two interior stone lines represented by the east-west line between Cloud Peak and the Jennings site, and two additional interior stone lines represented by the north-south line between Killdeer Mountain (Medicine Hole) and Chimney Rock. Similarly, that configuration of natural features can be symbolized by a circle, with Bear Butte at the center and the four features located to the west, north, east and south (Figure 16).

While the azimuth of each of the four actual physiographic locations does not reflect the true cardinal direction, it is evident that the Lakota intention was to describe in the format of myth a

general representation of their territory that could be communicated and readily understood by each person intimately familiar with both the landscape of the Northern Great Plains and the oral history of Oceti Sakowin. Therefore, each discrepancy between the true cardinal directions and mythic descriptions of place should not be understood as error in surveying of the traditional territory. Rather, the myth brings together deeper understanding of relationships between the center and the six directions – West, North, East, South, Above, and Below – as they relate to the sky above, the plane of Earth’s surface, and the ground upon which all life depends (Goodman, 1992; Douville, 2011).

The Lakota apparently constructed a Sacred Hoop, an ‘Earth-scale’ *Congleska Wakan* across the Northern Great Plains. Construct of this perceived structure is mythically described in "A Myth of the Tetons as It Is Told in Their Winter Camps" and Part III through Part XVIII of WLC (Walker, 2006). Lakota, like many other Native American cultures expressed their traditions not only through oral histories. They reinforced tightly woven relationships between humans, Earth, cosmos and creator through various means and media - teachings, examples, ceremonies and prayers (South Dakota Department of Education, 2012). That knowledge was “integrated into ideas, experiences, wisdom, traditions, language and customs. This existential relationship with the environment has evolved through direct experience and contact through centuries of interaction with ecosystems and the environment at large (South Dakota Department of Education, 2012).” The Lakota emplaced that knowledge across the width and breadth of their territory, constructing upon the Earth a *Congleska Wakan* over 400 miles (645 km) in diameter. Deloria (1999) states, “[E]verything in the natural world has relationships with every other thing and the total set of relationships makes up the natural world as we experience it”. This paradigm is expressed in the Lakota prayer ‘*Mitakuye Oyasin*’, meaning “All my relatives,” a reflection of the physical, intellectual, emotional and spiritual relationships that Oceti Sakowin experiences the

environment (South Dakota Department of Education, 2012). It is a symbiotic relationship connecting “Everything above, everything below, everything between (Douville, 2010).”

Lakota and other Native American tribes use the symbol of the Sacred Hoop to represent their respective nation. Defined by specific physiographic features proximal to peripheral major drainage ways including the Big Horn, Yellowstone, Missouri, James, Niobrara and Powder Rivers, traditional Lakota territory may be viewed as the sacred hoop within which Lakota culture thrived into the mid-1800s. That hoop configuration is in keeping with the importance of the circle as a metaphor for all that is natural and where power can be maintained (Neihardt, 1985; Lame Deer and Erdoes, 1994). Powers (1982) demonstrates that "boundaries of Oglala ethnicity are synonymous with the boundaries of religious belief," further stating that "the boundary which delineates Oglala religion, then also delineates Oglala society." From such strong interweaving of society, culture, sacred lifeway and an inherent sense of possessiveness, it should not be surprising that identification of natural landmarks and construction of medicine wheels would be undertaken by Lakota in delineating the boundary of not only their territory, but their ethnicity, religious belief and society, as well. Such undertaking helps confirm the detailed knowledge the Lakota held, and the importance they placed, with regard to the nature of the places they inhabited. The location of the medicine wheels and associated physiographic features may express for the Lakota not only an understanding of regional geography, but more importantly serving as physical emotional, intellectual and spiritual components of their Native science, through what Cajete (2000) describes as "learning the language of place and the 'dialects' of its plants, animals, and natural phenomena in the context of a homeland."

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**- Table 1 -
Comparison of Mythic Descriptions of Place from Walker (2006)
and Actual Physiographic Locations in Traditional Lakota Territory**

Location	Mythic Description of Place	Description of Actual Place
Center of World/Bear Butte	Round lodge beyond the pines; Sun shone through door at mid-day (South); Tate's place of honor at rear of lodge (North)	Bear Butte is a sentinel on the northeast side of the Black Hills, separated from the pine-covered hills located to the southeast, and exhibiting a weathered, sub-rounded topography and footprint; sacred center of the Lakota world; traditional site of Lakota ceremony and ritual including vision questing. Bear Butte Peak Latitude 44° 28' 37", Longitude 103° 25' 41"
West Direction/Cloud Peak, WY	Over a great mountain at the edge of the world and beside the trail that is around it; sky comes down at the trail; clouds at top of mountain (lodge of Wakinyan); very steep and very high; top consists of a level space; huge lodge with upright walls; no door or covering; stone placed on the trail became a huge rock where direction is fixed	Cloud Peak, highest elevation (4,000 m; 13,167 feet) in the Bighorn mountain range of eastern Wyoming; broad, level top; peak often shrouded by cloud cover and inclement weather resulting from alpine convection; steeply eroded slopes resulting from glaciations and freeze/thaw; upper portion of peak viewed from the east appears striped vertically; large boulder situated at apex; most accessible ascent/descent provided by narrow ridge located at west side approach with well-established climber's trail extending down slope along the Paint Rock Creek drainage and leading to the Bighorn River. Medicine wheel is located in Paint Rock Creek valley, near climber's trail and adjacent to large tabular rock. Cloud Peak Latitude 44° 22' 57", Longitude 107° 10' 26" Cloud Peak Medicine Wheel, Bighorn Mountains, WY (Refer to Burley (2006))
North Direction/ Medicine Hole, Killdeer Mountains, ND	After traveling for one moon "We have traveled far yet we are nowhere." Where shadows are longest; before the door of the lodge of Wazi; all stones were covered in ice, so ice placed on the trail; Wazi's lodge was beside the trail; lodge poles were icicles and its covering was snow; ice placed where direction is fixed on trail was a great bluff	Foot travel along the west side of the Bighorn Mountains, following the Bighorn River flowing northward; north of the mountain range, the river continues north to its confluence with the Yellowstone River flowing northeast to the Missouri River in northeast Montana; the Little Missouri River subparallels the Yellowstone River and Missouri River in western North Dakota, generally is bounded by badlands, and empties into the Missouri River north of Dunn County; Killdeer Mountains located south of the Little Missouri River in northwest Dunn County, with tree covered slopes and perimeter bluffs; from its confluence with the Little Missouri River, the Missouri flows east and south across central North Dakota and South Dakota. Mid-continental climate with accumulating snowfall and frozen soil conditions during winter. Killdeer Mountains (Medicine Hole) Latitude 4° 26' 39", Longitude 102° 53' 28"
East Direction/Jennings Site, SD	Travel beside a large lake; trail between the lake and the edge of the world was very narrow; danger of falling into the water; then came to a sandy region where no green thing grew and where there was little water; very thirsty; mirage; grass was young and trees were budding their leaves; nearby forest; no stone found in darkness so place wand in ground; wand grown to be a huge oak tree	The right bank of the Missouri River, from the confluence with the Little Missouri River to Garrison Dam and farther south, generally is bounded by steep terrain and few perennial tributary streams; the river valley is bounded to the north and east by the Missouri Coteau extending southeast and then south across South Dakota; the coteau consists of glaciated terrain with numerous prairie pothole lakes and ponds, many streams and ponds are intermittent or ephemeral and contain alkaline water; increasingly warmer climate toward the south with significant tree cover limited to the banks of perennial streams; cobbles and boulders limited to glacial erratics; western limit of oak species east of the Missouri River. Jennings Medicine Wheel, Hand County, SD
South Direction/Chimney Rock, Scotts Bluff Area, NE	Where great trees grew close together; fruit trees; beautiful shell placed where direction is fixed; grown to be a tipi rivaling the colors with which Anp decorated the sky; tipi shimmered in light of day	Oak, cottonwood and other woody plants common--in riparian zones of eastern South Dakota; transition to sand hills of Nebraska and the Platte River valley; bedrock exposures in western Nebraska including Scotts Bluff situated near the south bank of the North Platte river, consisting of brightly colored sandstone, a landmark during westward expansion in the 1800s. Scotts Bluff-Latitude 41° 50' 16', Longitude 103° 42' 2"
The World	Blue strip around the edge; red stripe from north to south and east to west over its center to form four equal parts; twelve moons of time around the edge of the world; green disk; top of disk (north) is white; mountain at left (west) edge; colors of Anp at right (east) edge; red color at bottom (south) edge	Traditional Lakota territory generally bounded by the Bighorn River to the west; Yellowstone River to the northwest; Missouri River to the north; Missouri Coteau to the east; White River, Niobrara River and sand hills to the south; North Platte River to the southwest; territory centered generally by the Black Hills and Bear Butte; territory extends into northern plains of North Dakota, the Bighorn Mountains to the west, the west side of the James River valley and the west edge of deciduous forest to the east, and colored sandstones exposures in western Nebraska to the south. Approximate length of circumnavigation is 2456 km (1535 miles) equivalent to traveling about 6.7 km (4.2 miles) per day for one year.
Edge of the World	Trail; mountains, valleys, rivers, forests, or plains will sometimes be on one side and sometimes on the other	The perimeter of traditional Lakota territory follows major rivers, the major axis of the Bighorn Mountains, the badlands and dissected valley of the Little Missouri and Missouri Rivers, crosses the Missouri river at two locations (central North Dakota and southern South Dakota), extends onto the Missouri Coteau east of the Missouri River, and across portions of the sand hills of Nebraska; including short grass, mixed grass and long grass prairies, pine forests and riparian woodlands.

**- Table 2 -
Difference between True Cardinal Directions and Azimuths of
Mythic Descriptions of Place with respect to Bear Butte**

<i>Direction</i>	<i>Mythic Location</i>	<i>Physiographic Location</i>	<i>Azimuth (from Bear Butte)</i>	<i>Difference between Azimuth and true cardinal direction</i>
West	Lodge of Wakinyan	Cloud Peak	268° 01'	1° 59'
		Cloud Peak medicine wheel	267° 32'	2° 28'
North	Lodge of Waziya	Killdeer Mountain		
		Medicine Hole	6° 55'	6° 55'
East	Wand placed in ground, becoming oak tree	Jennings Site	91° 37'	1° 37'
South	Shell placed on ground, becoming lodge with colors of Anp	Scotts Bluff	184° 33'	4° 33'
		Chimney Rock	178° 49'	1° 11'

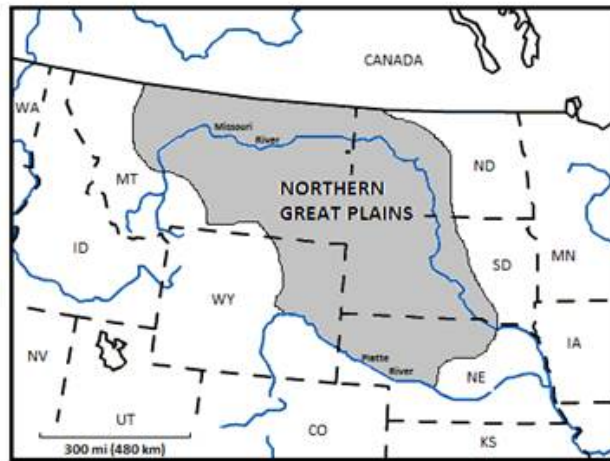


Figure 1: Location map of the Northern Great Plains of the United States.

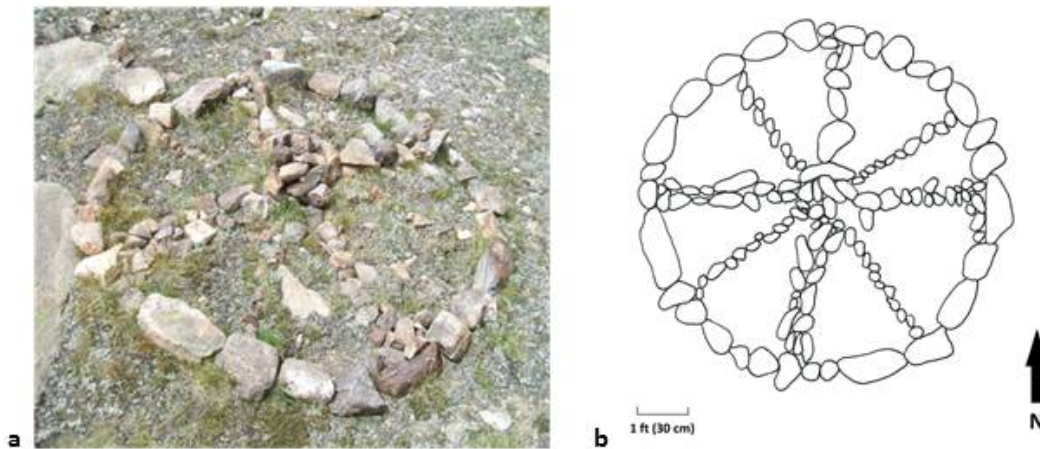


Figure 2: Brumley (1988) defines a medicine wheel as consisting of at least two of the following three components: (1) a central stone cairn, (2) one or more concentric stone circles, (3) two or more stone lines radiating outward from a central point. **a)** Oblique view of Cloud Peak medicine wheel located in the Bighorn mountain range of Wyoming. The medicine wheel is constructed of stones with eight radii extending between the central cairn to the perimeter circle. **b)** Line drawing of Cloud Peak medicine wheel.

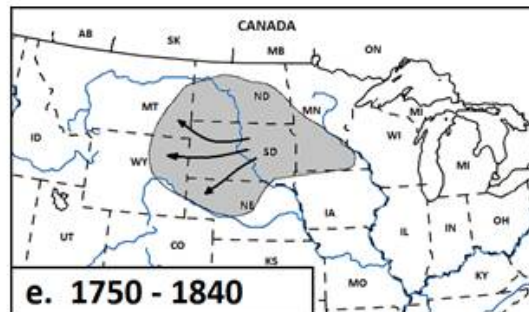
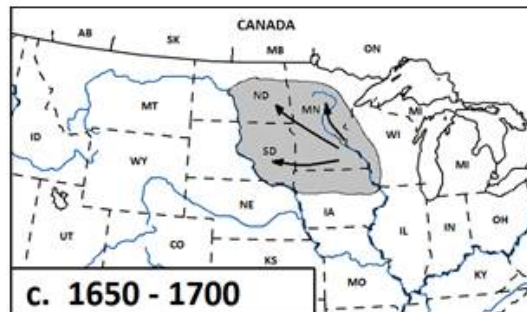
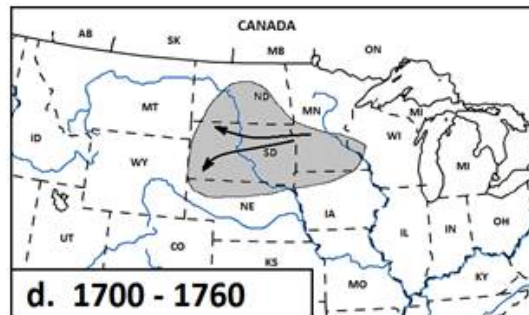
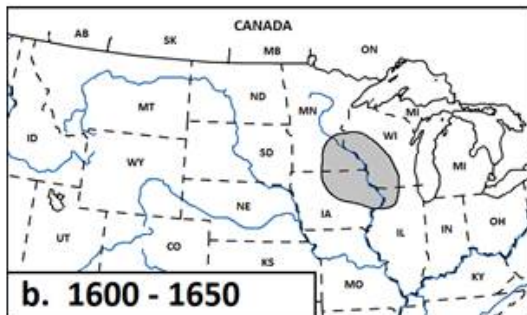
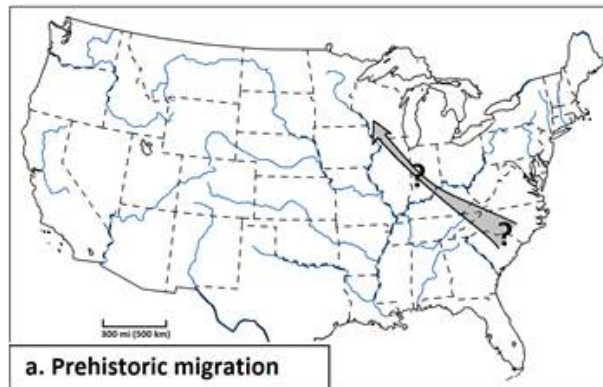


Figure 3: Migration of Oceti Sakowin - **a)** Oceti Sakowin migrated from the southeastern United States to the upper Midwest by the late 1500s. The actual route and timeframe of migration is undocumented. **b)** Oceti Sakowin occupied the area of southern Wisconsin, southeast Minnesota, northeast Iowa and northwest Illinois by the late 16th century. **c)** By the mid-1600s Oceti Sakowin territory included the area of central Minnesota and the eastern Dakotas. **d)** The Lakota division of Oceti Sakowin followed the Cheyenne onto the Northern Great Plains and across North Dakota and South Dakota during the first half of the 18th century. **e)** By 1830 the Lakota occupied land across the Dakota, northern and western Nebraska, and western Wyoming and Montana.



Figure 4: Map delineating approximate extent of traditional Lakota territory during the mid-19th century, based on maps prepared by others (see text for references).

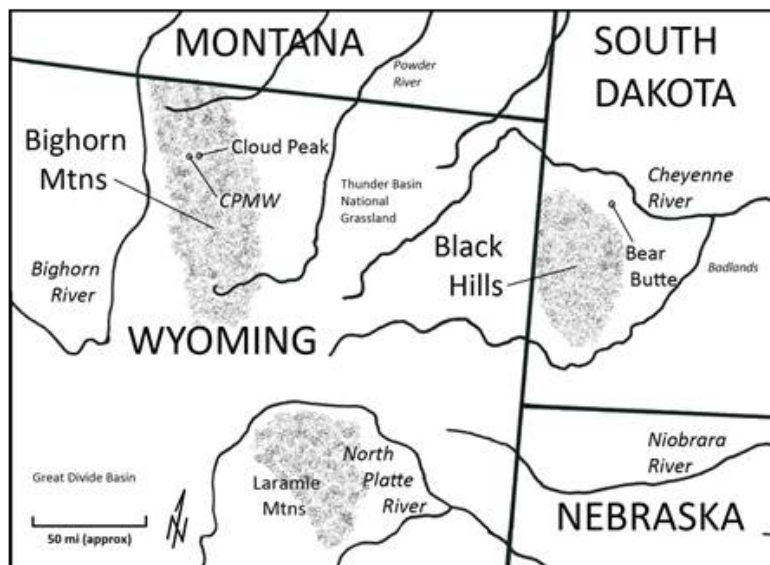


Figure 5: Map of significant physiographic features in the west quadrant of traditional Lakota territory. (CPMW – Cloud Peak medicine wheel).



Figure 6: Map showing locations of significant physiographic features noted in the text in the north quadrant of traditional Lakota territory.



Figure 7: Map showing locations of significant physiographic features noted in the text in the east quadrant of traditional Lakota territory.

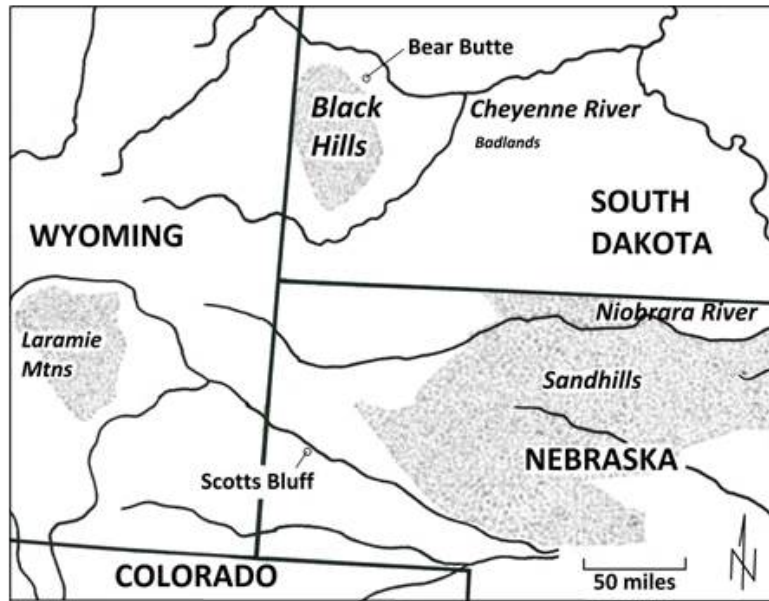


Figure 8: Map showing locations of significant physiographic features noted in the text in the south quadrant of traditional Lakota territory.

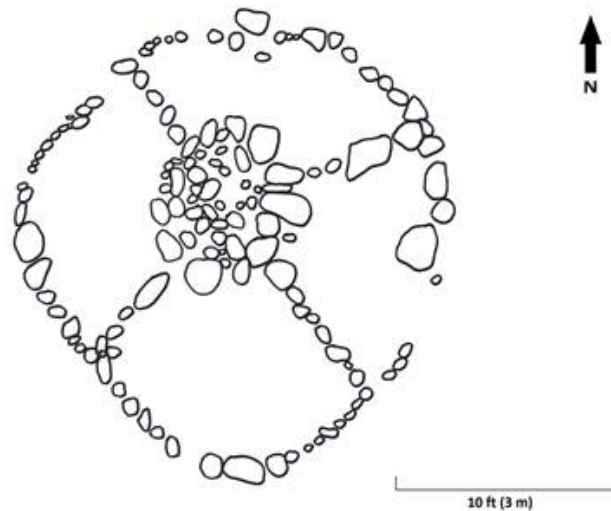


Figure 9: Line drawing of medicine wheel at the Jennings Site, Hand County, South Dakota. Brumley (1988) classifies the structure as a Subgroup 6 medicine wheel. Note construction included a perimeter circle divided into four quadrants; the central cairn has been damaged severely.



Figure 10: Scotts Bluff, in Scotts Bluff National Monument, NE.
(U.S. Air Force photo by Matt Bilden)



Figure 11: Chimney Rock, a National Historic Site
along the North Platte River in western Nebraska.
(Photo by Mike Tigas)

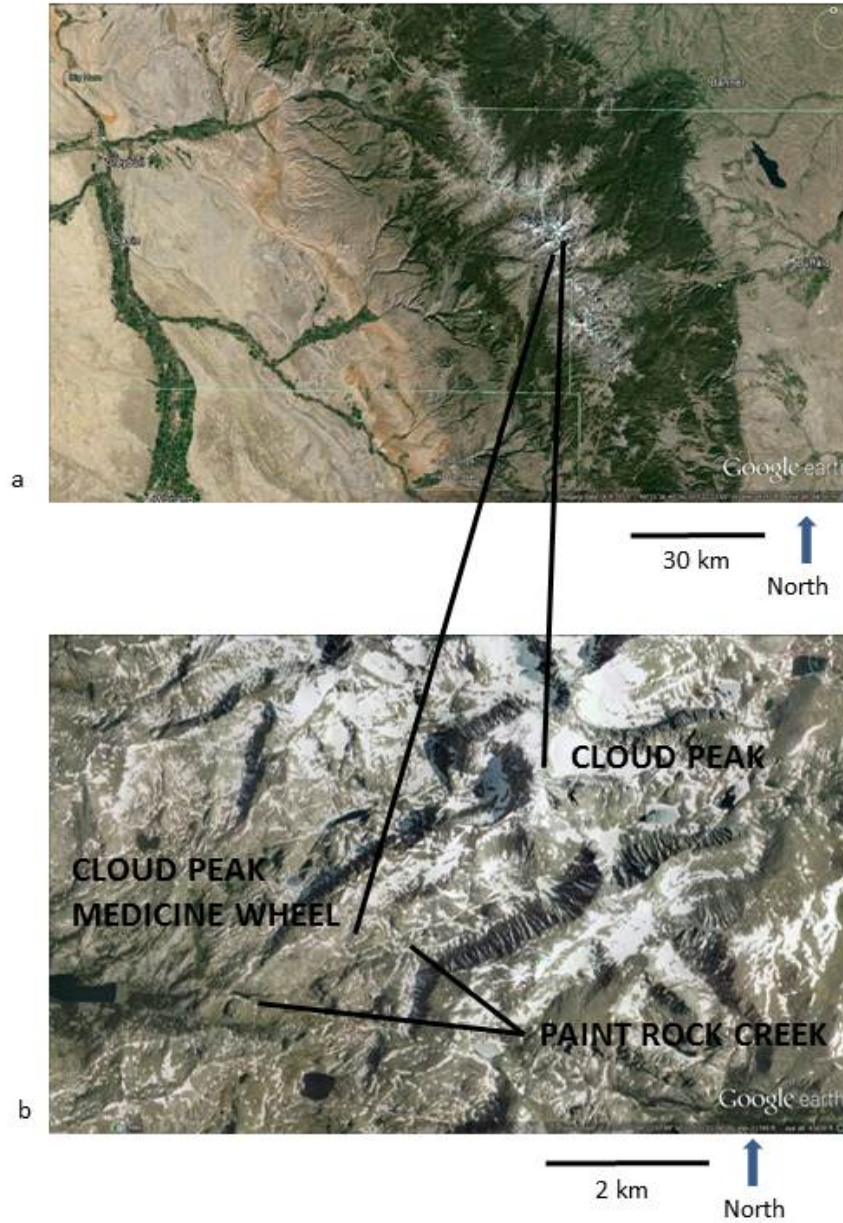


Figure 12: a) Aerial photograph of Bighorn mountain range (right); Big Horn River shown on left. **b)** Aerial photograph of Cloud Peak, showing location of Cloud Peak medicine wheel in Paint Rock Creek valley on the west flank of the mountain. Paint Rock Creek flows west to Big Horn River.



Figure 13: View of the southeast flank of the Killdeer Mountains in northwest North Dakota, looking toward the northwest. Medicine Hole is located at the top of the mountain. Note variable gradients along sideslopes, due to differences in hardness and permeability of sedimentary layers of the bedrock, including portions of the Arikaree and White River Groups.



Figure 14: a) View of the Southern Missouri Coteau at the Jennings Site, east central South Dakota. View toward the west. Note generally level, grass covered ground surface and lack of visible stones. Refer to Fig. 9 for line drawing of medicine wheel at the Jennings Site.

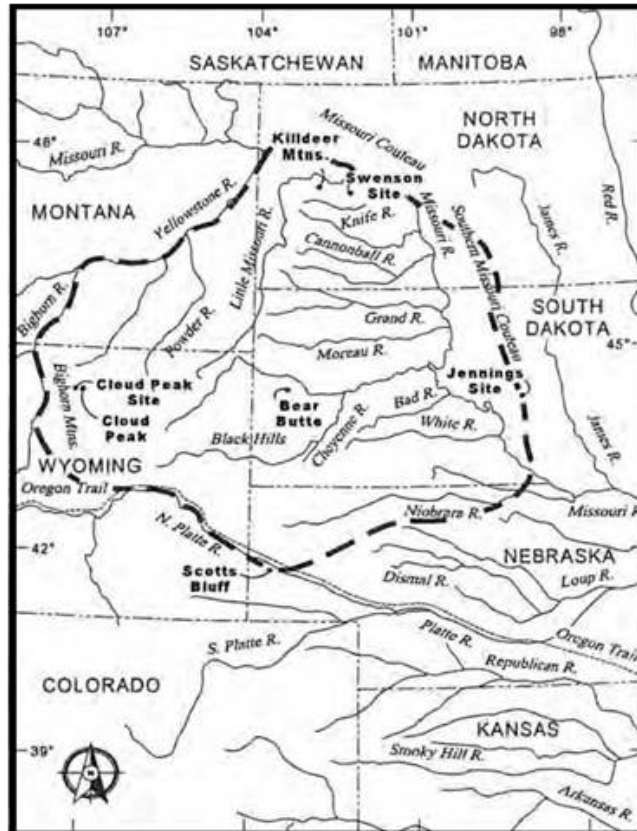


Figure 15: Areal extent of traditional Lakota territory based on historical and ethnological information, site observations and archeological documentation. The four cardinal directions as described in Lakota mythology appear to have parallels with natural physiographic features supplemented by medicine wheels at two of those locations (Cloud Peak medicine wheel and the Jennings Site). The physiographic features include Cloud Peak (west) supplemented by Cloud Peak medicine wheel and ancillary features, Killdeer Mountain and Medicine Hole in particular (north), the Jennings site (east) situated on the Southern Missouri Couteau, and the Scotts Bluff area including Chimney Rock(south).

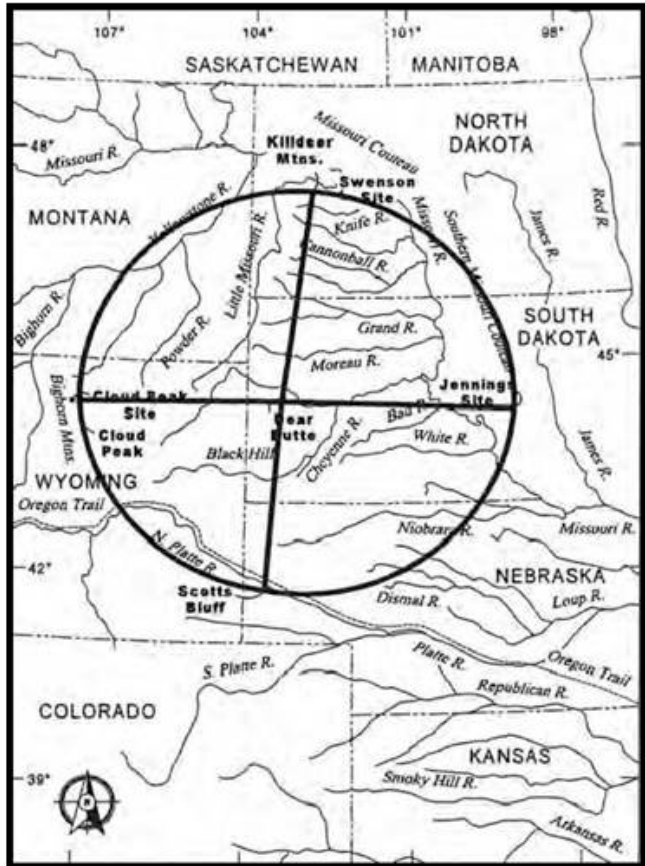


Figure 16: Traditional Lakota territory symbolized by a sacred hoop extending across the Northern Great Plains.