

## The Cartographic Heritage of the Lakota Sioux

This article serves as an introduction to traditional cartographic tools and techniques of the Lakota Sioux people of the northern Great Plains. The study reveals that the Lakota created maps and utilized other cartographic tools that, while not following a western system of coordinates, grids, and scales, were nonetheless accurate instruments for navigation to important routes, landmarks, hunting grounds, and sacred sites. The tools and techniques utilized included oral transmission of cartographic data, stories and songs in the oral tradition, stellar cartography, hide maps, petroglyphs, earth scratchings, and various other physical and spiritual markers.

It is safe to say we know very little about maps and mapping in indigenous cultures.....there is the persistent European and Euro-North American problem in overcoming the Cartesian dualism of mind and world.....

Robert Rundstrom (1991:2)

For over two centuries, the American Indian has been the subject of continuous study, empathetic interest, cultural curiosity, and romantic idealism. Cartographers, like anthropologists, linguists, and historians, have focused their attention on the American Indian. The greatest share of this cartographic focus, however, has analyzed maps that Indians verbalized or sketched at the request of soldiers, fur traders, mercantilists, and interested others. Lacking in historical American Indian mapping studies are works that focus on maps made by indigenous peoples specifically and solely for use by those indigenous peoples. As noted by Woodward and Lewis (1998), the reasons for this particular oversight in indigenous cartographic scholarship are many: the lack of cartographic artifacts with which to study and analyze, and the confines of western thinking as to what—physical artifact, song, poem, dance—makes a “map”, to name a few.

From the author’s experience, the primary reason for neglect of the subject lies in pre-conceived EuroAmerican notions of what constitutes “authentic” or “reliable” information. With few exceptions, American Indian peoples held records of their experiences, histories, and beliefs in a highly organized oral tradition, told and retold with remarkable accuracy to countless generations through time. Language was not simply a means of gathering or passing on information, but a vibrant, changing, creative force (White Hat, 1999b; Foley, 1998). The word was vital, a dynamic vehicle used to relate tribal customs, record histories, narrate creation stories, instruct the young, invoke spirits for assistance, entertain the people, and pray. In some American Indian cultures, words were also viewed as “animate, generative beings”, carrying great power (Lincoln, 1983). In the past, however, it has been all too common for researchers to

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INTRODUCTION

dismiss these oral histories and traditions as “pre-literate”, and therefore consider them less accurate and less authentic than those stories, songs, and poems written down and committed to paper. Somehow, as mankind became more literate, distinction and value became attached to those literate members of society, while those who were not lettered found their oral traditions discredited and suspect, often labeled as “primitive” and worse, unreliable (Lord, 1991). It has been documented, however, how long stories and songs passed in the oral tradition may be kept without being written down, whereas many literary persons cannot remember their grocery lists without scribbling them on the back of an old envelope. As noted by Dunbar Ortiz (1977), “For the European or the American, the oral tradition is weak. They do not pass on information very accurately, so they believe this is true of everyone.” (100)

Thankfully, modern scholars of oral tradition warn strongly against this old misconception of the written word being more trustworthy—more authentic, more reliable—than the oral tradition. Because of this renewed appreciation for the oral tradition, the oral cartographic heritage of American Indian peoples has also begun to enjoy a renewed sense of validity.

When one considers both the oral tradition and nomadic nature of Plains Indian societies, and imagines their need for varied cartographic tools and techniques, the need for more scholarship on this aspect of Indian mapping becomes readily apparent. This paper seeks to bring together disparate fragments of cartographic and geographic data imbedded in larger works on Lakota culture, oral traditions, and American Indian cartography, combining those fragments with other analyses to begin work on the cartographic heritage of the Lakota Sioux.

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#### THE LAKOTA

The American Indians that this study concerns itself with call themselves the *Lakota*, as distinguished from their relatives the *Dakota* and the *Nakota*. Lakota, Dakota and Nakota are all dialects of the same Siouan language, each name meaning “allies” in their respective dialects (Hassrick, 1964). Though the dialect spoken by the Lakota varied slightly from that of the Dakota and Nakota in sentence structure, use of vocabulary, and pronunciation, the differences were not significant enough to impede communication. Four separate tribes—the Mdewakatonun, Wahpeto ᠮᠳᠠᠪᠠᠳᠠᠨᠤᠨ, Wahpekute, and Sisitun—spoke the Dakota dialect, while another two tribes—the Iha ᠬᠠᠲᠤᠨᠠᠨᠤᠨ and Iha ᠬᠠᠲᠤᠨᠠᠨᠤᠨ—spoke Nakota (White Hat, 1999b). Together with the Tito ᠬᠠᠲᠤᠨᠠᠨᠤᠨ, the only tribe that spoke the Lakota dialect, the seven tribes formed a loose confederation called the *Oceti Sakowin*, or the “Seven Council Fires.” This was the proper name for the collective peoples. The name “Sioux,” as they were commonly referred to, was a misnomer and a distorted abbreviation of an Anishinaabe (Ojibwe) word meaning “snakes” (Buechel, 1939). Given this fact, it is perhaps not surprising that the Lakota, Dakota, and Nakota people of today generally prefer not to be called “Sioux.” It is because the people are typically known by this name, however, and have been written in the history books as such that I include the name in my title.

Jesuit reports from *circa* 1640 place the Oceti Sakowin people in the Upper Mississippi River Valley, living in present-day Wisconsin, Iowa, Illinois, and Minnesota (Swanton, 1952; Terrell, 1971). They were Woodlands peoples, subsisting in the forested environs by hunting, fishing, and gathering such foodstuffs as roots, berries, and wild rice. The western migration of Europeans from coastal Canada and colonial America in the

early 18<sup>th</sup> century, however, upset the balance of power among the various tribes of the larger Great Lakes area. The colonial powers coaxed and coerced tribes for furs and cooperation by providing them with trade goods, including guns and ammunition. Alliances between the Europeans and tribes such as the Huron and Iroquois led to numerous battles and skirmishes for control of lands and resources, and effectively displaced many tribal peoples who were not able to protect and defend themselves against this new firepower. The Oceti Sakowiŋ people were forced out of their eastern homelands and into the Upper Missouri River Valley when the French armed the Anishinaabe against them (Schell, 1968; Buechel, 1939).

Though the exact years of their further westward migrations are not known with certainty, it is known that the Lakota and their relatives transformed themselves from a Woodlands culture into a Plains culture with amazing speed and stunning, unparalleled success (Terrell, 1971). Royal Hassrick, a noted Sioux historian, suggests that the Oceti Sakowiŋ tribes accomplished this remarkable transition in less than fifty years (1964). It is certain that the astonishing rapidity and success of this shift would not have been possible, however, without the arrival of the horse on the Upper Great Plains, *circa* 1740; the importance of this animal to the Lakota people, especially, can hardly be understated (Hassrick, 1964).

The Lakota were the most numerous and far-ranging of the Oceti Sakowiŋ tribes, traversing and occupying the land east from the Big Horn Mountains to the Missouri River, and north from the North Platte River to the lower Canadian prairie (Figure 1). As one of the most powerful and mobile tribes on the northern plains, however, the Lakota influenced a much larger territory, their presence being felt as far as the Rocky Mountains, the plains of central Kansas, and the Great Lakes. Indeed, given the strength, success, and reputation of the Lakota Nation at its height (*circa* 1830s-1860s), their influence was felt as far as the halls of Congress in Washington, D.C.; of all the Plains tribes, the Lakota were the most resolute in resisting EuroAmerican incursions upon their land (Hassrick, 1964; Terrell, 1971; Sioux Nation Black Hills Act, 1986).

This resolution to maintain their traditional way of life led the Lakota into conflict with both soldier and settler on many occasions and on many fronts during the first half of the 19<sup>th</sup> century. Despite a successful end to hostilities and peace negotiation with the U.S. Government in 1868 at the Second Treaty of Fort Laramie, the discovery of gold in the Black Hills in the mid-1870s led to a tremendous influx of white miners and settlers onto the Lakota lands ceded to them by the treaty. The Lakota and their Plains allies fought back, but despite victories like the Battle of the Little Bighorn in 1876, the Lakota were subdued and forced onto reservation lands. A last, desperate effort to rid the land of the white man resulted in the massacre of hundreds of Lakota men, women, and children at Wounded Knee Creek in December of 1890, effectively marking the end of armed Lakota resistance to the U.S. Government (Hassrick, 1964; Dunbar Ortiz, 1977).

Like other nomadic tribes of that expansive and topographically diverse area, the Lakota required specific, accurate, and timely information regarding the spatial constructs of their world: locations of food sources, spiritual sites, seasonal camps, friends, and enemies. Their world was structured upon their knowledge and use of spatial information, and the ability to communicate and understand it ensured nothing less than their survival as a people.

Not unlike virtually every other North American Indian tribe, the Lakota had no written language, and therefore maintained a highly efficient,

## Traditional Range/Sphere of Influence of the Lakota Sioux



Figure 1. Traditional Lakota Sioux range and sphere of influence at the height of their power, circa 1830-1860. Source: *American Indian Almanac*.

highly organized oral tradition (Lincoln, 1983; Warhus, 1997; White Hat, 1999b). In other words, the primary transmission of the tribe's cultural traditions, social values, and legends was spoken or sung, and passed down through the generations in such a manner. It was the Lakota's conviction that their oral traditions had their basis in fact. That these facts were relevant to the present generation permitted and assured transmission of those traditions.

### Structuring Their World

#### STELLAR CARTOGRAPHY

The Lakota had a well-developed and distinctive cosmology, adapted to their needs for ritual and sustenance (Miller, 1997). The stars were *wakaŋ*, a term that involved power or contact with the spiritual world and something mysterious, holy, and incomprehensible. They were the "holy breath" of *Wakaŋ Taŋka* ("Creator," "Great Spirit," "Great Mystery"), and represented sacred speech that was explained through myth and ritual (Siŋte Gleska College, 1990). The stars played multiple roles in the Lakota cosmology. They were at once supernatural people of the sky, portals and paths to the afterlife, calendars, and written "scriptures" of sacred stories (Hassrick 1964; Siŋte Gleska College 1990). They were also cartographic guides, representations of the physical landscape mirrored in the heavens and essentially the Lakota's greatest, most accessible and, in their perception, most accurate map. The Lakota closely watched the ordered movements of the constellations, the planets, and the sun, which allowed them to construct the accurate celestial calendars needed to conduct their vital and necessary religious rites (Dugan, 1985; Williamson and Farrer, 1992). It was at those times when the solar and celestial bodies came together that

specific ceremonies were performed in specific places. As the sun moved clockwise through the constellations, the Lakota people moved clockwise through the sacred Black Hills. Their annual pilgrimage mimicked the sun's path on earth (Siŋte Gleska College, 1990; Sioux Nation Black Hills Act, 1986). During the three months between the vernal equinox and the summer solstice, the sun moved through four Lakota constellations that corresponded to four places in the Black Hills. The four ceremonies performed—the Pipe Ceremony, Welcoming Back the Thunders, Welcoming Back All Life, and the Sun Dance—were life-renewing rites, and therefore the most important of the calendar. It was important that the tribe, or representatives of the tribe, be at the proper Black Hills location when the sun entered the corresponding constellation because the Lakota believed that the ceremonies were performed simultaneously in the heavens by the *Maghpie Oyate*, or Cloud People, (Hassrick, 1964; Jumping Bull, 1999; LaPointe, 1976). The concept of “mirroring”—what is below is like what is above—was symbolized by the inverted triangle characters that appeared in Lakota pictographs. Though the triangle symbols used in the picture writings were flat, it was more accurate to perceive them as three-dimensional cones, as in the glyph illustrating Figure 2. The earth “cone” (bottom figure) and the star “cone” (top figure) combined to represent the mirroring belief (Siŋte Gleska College, 1990).

Use of the triangle symbol to represent stars or earth landforms was not uncommon in Lakota picture writing, and understanding this particular glyph is key to interpreting Lakota perceptions of space and navigation through that space. The symbol itself was used to reflect several different Lakota constructs. For instance, it described the correlation between the earth and the sky features and also the relationship between the sun and the dancers participating in the life-renewing Sun Dance.

The triangle ideogram also reflected the sacred construction of the Lakota's primary lodging structure, the *tipi*, or more correctly, the *tipestola* (Siŋte Gleska College, 1990; White Hat, 1999b). The Lakota believed that the construction of a tipi was more than the building of a shelter, something to keep out the wind and the cold; it was a map of their world, a microcosmic representation of the universe. Construction began with three poles, set in the ground and against each other to create a cone or a “vortex,” mimicking the star “vortex” of the mirroring idea. This reinforced and affirmed the connection between the Lakota, as earth people, with the sky as well as the Cloud People. Seven more poles were added, symbolizing the seven directions. These directions were sacred, each endowed with powers, colors, personalities, and spirits: they lent stability and order to an otherwise chaotic world (Irwin, 1994; McGaa, 1990). Two more poles were added, enabling the tipi to both vent and take in air, thus symbolizing the give-and-take relationship between humans and the spirit world. Finally, the tipi frame was covered in buffalo robes. The buffalo was seen as an animal of the sun, life-giving and life-preserving. So in living inside the tipi, the people perceived themselves as living within the sun, within a star (Irwin, 1994; Siŋte Gleska College, 1990).

The Lakota calendar was constructed by extensive, experienced, long-term naked eye observations and interpretations. Because following the movements of the celestial bodies was so important to the people for navigational and spiritual purposes, there were within each tribal community special men designated as the *Wica'hpi yuha ma'ni*, or “The People Who Walk With the Stars” (Young Man Afraid of His Horse, 2000). It was they who noted and recorded such phenomena as meteor showers, comets, and lunar and solar eclipses (Figure 3), as well as regular celestial patterns like the movements of the planets, moon, and sun. These

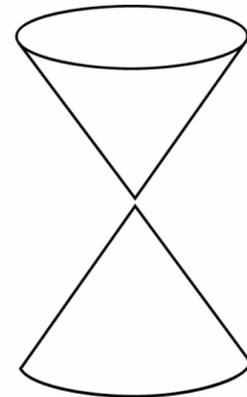


Figure 1. Symbol used to explain "mirroring" of heaven and earth()

Figure 2. Symbol representing the concept of "mirroring". Reproduced by permission from Siŋte Gleska University.



Figure 3. A meteor shower as recorded in *The Flame's* (Lakota) winter count—"U" shaped figure represents the Moon. Source: Mallery's *Picture-Writing of the American Indians*.

events and celestial appearances provided sacred order and consistency to the people's yearly living. The *Wica'hpi yuha ma'ni* tracked the sun's position among the stars by watching both the set of a constellation to the east of the sun and the rise of the adjacent constellation to the west of it the next morning (Siñte Gleska College, 1990; Williamson and Farrer, 1992). Careful observation of the constellations and mental notation of their heliacal movements allowed the Lakota to accurately predict the equinoxes and solstices, and thereby be in place for their spiritual rites and festivals.

#### CARTOGRAPHIC USES OF LANGUAGE

In order to successfully obtain, analyze, retain, and pass on cartographic information, it was essential for nomadic American Indian peoples to have two things in particular. The nomadic lifestyle was one of nearly constant movement—as such, a descriptive language capable of transmitting details crucial to the success of that mobility (landscape description, resource location, movement itself) was absolutely essential, for it assured their continued existence as a people. Indispensable, as well, was the powerful memory and observational training necessary to perceive and accurately commit spatial phenomena to memory. The Lakota had both of these. As observed by Powers (1986), “The creation of language, both sacred and secular, was an ongoing process with the Lakota; they loved their language and loved to analyze it, play games with it, remember it, and create it.” (6) For the Lakota, language was not simply a means of gathering or passing on information, but a vibrant, changing, creative force (Foley, 1998; Lincoln, 1983; White Hat, 1999b). The word was both a critical instrument and a skill, something learned, practiced, and involving consequences and punishments for improper use. The ability to understand was just as important as the ability to describe; in other words, the job of listening was thought to be just as demanding as the act of narrating (Foley, 1985). Certain mnemonic devices were useful, but the primary transmission of an oral spatial description still depended upon the skill of both the listener and the conveyor.

When teaching a young Lakota navigational tools and methods, he or she was strongly implored in all ways to understand fully the earth upon which he or she lived, knowledge that would only come through close observation. Children were asked to go out and look around, visualizing in their mind both what was, and what would be; where they were, and where they would be (Jumping Bull, 1999). This type of activity was an important element in developing a sense of place and placement. Rundstrom (1990) suggests that Indians were not naturally or instinctively better mappers than the rest of the world's peoples; it was in the “specific actions” taken during travel and how their mental organization, memorization, and recall was facilitated that was important to the Lakota's development of a sense of place. The importance of observation of the natural world was stressed to Lone Man as a young adolescent, as evidenced by the conversation he related to Frances Densmore *circa* 1915 (Jahner, 1987):

“When I was a young man I went to a medicine-man for advice concerning my future. The medicine-man said: ‘I have not much to tell you except to help you understand this earth on which you live. If a man is to succeed on the hunt or the warpath, he must not be governed by his inclination but by an understanding of the ways of animals and of his natural surroundings, gained through close observation.’ The

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medicine-man told me to observe my natural surroundings, and after my talk with him I observed them closely. I watched the changes of the weather, the habits of animals, and all the things by which I might be guided in the future, and I stored this knowledge in my mind.” (55)

Storytelling and song were vital components of the Lakota’s oral tradition, ancestral voices remembered and reinvigorated by new voices. It was in the repetition of stories and songs that traditions and recollections of past events and places became part of the band’s collective memory (Dunbar Ortiz, 1977; Vansina, 1985). The Lakota had scores of stories and songs in their tribal repertoire, a testament to the incredible memory skills of the storytellers and singers. Not surprisingly, Lakota stories and songs reflected the spiritual and nomadic nature of the tribe, often containing many references to the directions, journeys across the prairie, animals, the winds, hunting, and conflicts (Densmore, 1918). The Lakota embraced their nomadic way of life, and particular campsites held nostalgic memories for them just as certain places hold strong or pleasant recollections for people today.

The Lakota language was rich with words used to describe the landscape. As such, it provided very accurate and precise words and definitions that could be used for navigational purposes. The Lakota also gave names to the physical features of their landscape; these names, however, sometimes differed depending upon the time of year or season. A single place might have up to four different names, tied to either the physical appearance or social and spiritual usage of the place (Table 1). Use of a particular name was predicated upon the context in which it was spoken. Take, for example, the Black Hills in what is now western South Dakota. In most private or social settings the name *Re Sapa* (“Black Ridges”), or, more commonly, *Paha Sapa* (“Black Hills”), could be used

	<b>Common</b>	<b>Proper</b>	<b>Formal</b>	<b>Sacred</b>
Black Hills	<i>Re Sapa</i>  (Black Ridges)	<i>O Onakinzin</i>  (Sheltering Place)	<i>Wamaka Og’naka</i> <i>I’Caŋte</i>  (The Heart of Everything That Is)	<i>Hocoka yapi</i>  (The Center)
Harney Peak	<i>Paha Pestola</i>  (The Peak)	<i>Ox’kate Paha</i>  (Mountain of the Playful Thunder Beings)	<i>Hiŋhaŋ Kaga</i>  (Owl-Maker Butte)	<i>Opahata I</i>  (Mountain At the Center Where He Comes)
Devil’s Tower		<i>Mato Tipi/Tila</i>  (The Bear Lodge)	<i>Hu Nump Otiwita</i>  (The Home Sanctuary of Wisdom)	<i>Mato Tipi Ta</i>  (Bear Lodge’s Sacred Pipe Mountain)

Table 1. An example of common, proper, formal, and sacred place names assigned to Black Hills formations by the Lakota. Source: Sioux Nation Black Hills Act.

to identify the place. If a more proper term of special respect were called for, the hills would be referred to as *O Onakinzin* ("Sheltering Place"), perhaps in reference to the protection the forested areas provided Lakota winter camps. *Wamaka Og'naka I'Caŋte* ("The Heart of Everything That Is") was a very formal name, denoting great spirituality. Finally, *Hocoka yapi* ("The Center") was the ultimate sacred name, reflecting the Lakota belief that the Black Hills was the center of the universe. This term was only used in the deepest of spiritual settings, and perhaps only within the Hills themselves (Sioux Nation Black Hills Act, 1986). It was essential that a Lakota be familiar with these ways of naming places; proper navigation of his physical landscape depended on it. Certainly, strict Lakota etiquette required proper usage of names: for the Lakota, one of the most humiliating situations was to be found speaking improperly or incorrectly (Black Elk, 2000; Hassrick, 1964).

The Lakota language also adopted and incorporated many terms for cartographic objects and concepts not traditionally found in the Lakota world, many times at the persistent request of outside persons who attempted to put down the language in written form. Few cultures actually developed writing from within their own society. Those cultures that did often found that written phonetic and grammatical restrictions crippled or lessened their culture's diverse oral discourse (Lord, 1991). According to Lewis (1998), "Word lists and dictionaries of Indian languages compiled after contact tended, at least until recently, to be unrepresentative of complete vocabularies, omitting many words that were not important in the contexts of Indian-European discourse. Conversely, Indian languages developed new words for embracing European categories." (63) This observation holds true for the Lakota dialect. For example, *A Dictionary of the Teton Dakota Sioux Language* (originally published in 1939) lists *mako owapi* as "map," made up of the root words *mako* ("earth") and *owapi* ("figured, written"). The lexicon also lists *mako gmigma* as "globe," combining *mako* with *gmigma*, meaning "to go round like a wheel" (Buechel, 1939; White Hat, 1999b). These words were not part of the traditional Lakota vocabulary, but rather were created by the Lakota to accommodate EuroAmerican objects and concepts. It is, however, an example of how Lakota people continued to be consulted and asked to bestow names on newly introduced technologies. It hints at the language's flexibility (Powers, 1986; White Hat, 2000).

#### SPATIAL PERCEPTIONS AND MENTAL MAPPING

The Lakota's perception of space was notably different from that of EuroAmericans (Irwin, 1994). Their world was perceived and experienced through a complex interaction of personal history, tribal traditions, and relationships between other tribespeople and the animal and natural resources they depended upon (McGaa, 1990; Warhus, 1997).

A fundamental organizing principle of Lakota visionary topography was direction. Direction was not a principle derived from coordinates of latitude and longitude, but a spiritual, dynamic form of cosmological orientation. The directions included not only the literal direction, but also realms of significance that were structured through visionary experience, ritual movement, object use, and oral narratives (Irwin, 1994; Siŋte Gleska College, 1990). The Lakota recognized seven directions: north, south, east, west, up, down, and center. Each direction included a fluid complex of qualities and powers emphasizing colors, particular beings, physical spaces, and stories that are ingrained in Lakota dogma and oral tradition (Hassrick, 1964).

The primary direction of the Lakota worldview was the center, which could be and was at once anywhere and everywhere (Sundstrom and Fredlund, 1996). The importance of the center—the center-place as a sacred pivot, a physical landmark, or structuring of the world with one's own group at the center—was a common belief in many American Indian cultures, and not simply unique to the Lakota (Nabokov, 1998). A spiritual center could be created by praying with a sacred pipe to the seven directions; any place where a visionary experience occurred or was invoked became a center and a place of power. The sacred pipe, which was itself a center and at the center, facilitated these visionary experiences (Irwin, 1994).

An individual's perception of the earth allowed him to create his own mental map, detailing his perceptions of and experiences within his known world. Some places were known from first-hand experience, acquired through personal travel and reconnaissance across the plains; considering the Lakota's large range of terrain, this personal mapping in itself would be impressive. The Lakota also knew detailed information and descriptions of places unseen and far away, as complex mental images of new places were formed with the information obtained from speaking with both members of other tribes and Oceti Sakowin people. Places that otherwise might have remained little more than names were fleshed out, described vividly and in deep detail. These "verbal reconnoissances" enabled the people to identify phenomena outside their considerable traditional range, including the location of food, material resources, various tribes, and the furthest incursions and settlements of the ever-encroaching American nation.

An individual's own mental map detailed his perceptions and experiences within his known world, but his maps could also be informed, enhanced, and altered by the spiritual experience. In the Lakota world, the spiritual took precedence over the physical. An example of this can be found in a map constructed by Amos Bad Heart Bull sometime between 1890 and 1913 (Blish, 1967; Sundstrom, 1997; Lewis, 1998; Siŋte Gleska College, 1990). The Bad Heart Bull map depicts the sacred Black Hills by using pictographic representations—ideograms—to denote eight sacred physical features, all within the confines of a red clay valley that encircles the Black Hills. This valley is known to the Lakota as *Ki Iŋyaŋka Ocaŋku*, or "The Racetrack," as it was here that the two-legged beings defeated the "four-leggeds" for control of the world. One feature included by Bad Heart Bull within the Racetrack, however, is in actuality not physically within the red clay valley. *Mato Tipila*, better known to EuroAmericans as "Devil's Tower", is a prominent landmark that is outside of the Racetrack by nearly sixty miles.

What was important about this fact was the clue that it gave concerning Lakota perceptions of spaces. By including Devil's Tower within the confines of the valley on his map, Bad Heart Bull was reflecting the Lakota belief that everything that is on the earth is "mirrored" in the sky, and vice versa; each Lakota constellation had a corresponding landmark on the earth, so in turn each landmark had a corresponding star or constellation in the heavens (Siŋte Gleska College, 1990; Young Man Afraid of His Horse, 2000; Jumping Bull 1999). The Lakota constellation that corresponded with Devil's Tower was *within* the celestial equivalent of the earthly Racetrack, the *Caŋ Gleska Wakaŋ*, "Sacred Hoop." Therefore, in placing *Mato Tipila* within the earthly Racetrack on his map, Bad Heart Bull was acknowledging the supremacy of the spiritual world over the physical landscape (Woodward and Lewis, 1998).

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Though the Lakota people were far-ranging at the height of their dominance, increased constriction and inhibition of movement before their final relegation to the reservations played havoc upon their spatial perceptions. As the people were forced to become more and more sedentary, they were further separated from their traditional nomadic routes in space and time. Speaking Lakota and practicing traditional cultural ways was forbidden, and the number of elders who had personally traversed the routes decreased, many dying without passing on the information to the next generation. Over a relatively short period of time, these factors combined to ensure the number of places accurately remembered grew fewer and fewer. For example, the Dakota were relegated to eastern reservations on the northern plains; because of this, their perceptions of the west grew blurred. Eventually they perceived the Black Hills to be huge mountains, more like the Rockies than the forested, moderately-sloping granite hills they are. Conversely, the Lakota, who were placed on the dry western reservations, remembered eastern rivers and lakes as being much larger, transfiguring the glacial lakes and rivers of northeastern South Dakota and Minnesota into bodies the size of Lake Michigan and the Mississippi (Black Elk, 2000). The isolation and restriction of the reservation system interrupted the traditional Lakota way of obtaining and transmitting spatial information, thereby corrupting the Lakota's sense and perception of space.

### Physical Cartographic Tools and Techniques

#### PICTURE WRITING

As observed by Rubin (1995), "Visual imagery is perhaps the most powerful and widespread factor in mnemonic systems." (62) Though the Lakota had no written language, they did utilize pictographs, petroglyphs, characters, symbols, and stylized figures to convey information, and so developed a recognized "cultural system of symbolism" (Corum, 1975; Mallery, 1893). These designs could be found on animal hides, cliff faces, rocks, bone markers, or scratched into the earth, and were used to identify particular bands, record sacred visions or stories, indicate sacred spaces, denote tribal or individual events, and transmit cartographic data. Employed in lieu of a written language, the figures presented were generally synopses of a much greater event or idea that could not be successfully or completely portrayed by solitary figures. In these cases, the figures served as mnemonic devices for prompting the oral narrative that was meant to accompany the symbol. The most common example of this practice was the Lakota *winter count*, a pictorial record of important yearly events kept on a tanned hide by the tribal historian. Repetitive use of certain figures led to their abstraction, as with this example of figures (Figure 4) use to denote the Lakota as the *Pte Oyate* or "Buffalo People" (Mallery, 1893; Sioux Nation Black Hills Act, 1986). Use of these stylized images accurately communicated information, and at the same time prevented the loss of power or integrity that was taken away from a thing when it was depicted too realistically (Douville, 1999).

Tanned animal hides were used for many different types of recordings (Hassrick, 1964; Lewis, 1998). Perhaps because of their size and curing qualities, buffalo or deer hides were most often selected to construct winter counts, tipi covers, clothing, and other items of day-to-day life. Natural earth colors of green, black, yellow, and red were mixed with animal fat to make paints, and applied with a small bone, rock, or willow branch to create the desired image or pattern (Corum, 1975).

*"Visual imagery is perhaps the most powerful and widespread factor in mnemonic systems."*



Figure 4. Abstract and realistic "signature" mark indicating the Lakota as the Pte Oyate, the "Buffalo People". Source: Sioux Nation Black Hills Act.

## HIDE MAPS

The Lakota also cured hides to create maps (Black Elk, 1999; Siŋte Gleska College, 1990; White Hat, 1999a). This traditional cartographic practice had been all but forgotten until the revelation of a map in the mid-1980s, and discovery of it startled even Lakota researchers and scholars (Lewis, 1998; Siŋte Gleska College, 1990). Since then, the existence of at least two and perhaps three other maps has been revealed; unfortunately, these maps are not available for examination, so no in depth description or analysis of them is possible at this time. The maps were traditionally entrusted to medicine men, and seem to have served mostly as mnemonic prompts for personal recollections and educational tools for instructing the young (White Hat, 1999a). In the aftermath of reservation relocation, people were fearful of keeping things belonging to the old ways. In many instances, the maps were buried with their keepers when they died (Douville, 1999; White Hat, 1999a). With the maps disused and removed from public view, knowledge of them disappeared amongst most of the people. These days, existing maps are kept secret. They are rarely shown to others and never outside of the Lakota community; those Lakota to whom they are entrusted have been specially tutored to interpret them. This is important, since without proper instruction the hides may not even be recognized as maps, especially to western eyes used to identifying a map by its various western elements (Black Elk, 1999; Siŋte Gleska College, 1990; Sioux Nation Black Hills Act, 1986; Young Man Afraid of His Horse, 2000). Thus it is possible that other hide maps exist, perhaps in museum archives or private collections, and that these maps have not yet been recognized for what they are. That possibility raises some concern about the condition of these hides; even the best-tanned and well-protected skins may only last a decade or so before they begin to deteriorate. At some point, such maps need to be re-copied onto newer skins if their information is to survive (Douville, 1999; Woodward and Lewis, 1998).

Persons who have glimpsed the maps describe them as either earth maps (mapping features of the physical landscape), star maps (mapping positions of celestial bodies), or a combination of the two (Black Elk, 1999; White Hat, 1999a). The best account of one of these maps was described by a Lakota who was only allowed a very brief glimpse at the hide many years ago, and who has not been invited to look at it again since that short encounter—because of the nature of this experience, the author honors the individual's request to remain anonymous. The observer describes a joint land/sky map, referred to as the *Mar'piya Makoce Xina*, or the "Robe of Heaven and Earth", painted in color on a large buffalo robe. Mapped on the robe are some of the most sacred Lakota sites in the Black Hills. A large marker of two triangles, one on top of the other to form a shape not unlike an hourglass, represents the North Star and the Black Hills. The presence

*"In the aftermath of reservation relocation, people were fearful of keeping things belonging to the old ways."*

of this particular glyph indicates the “mirroring” belief, and signals that the map does not simply show earth landmarks but star configurations as well (Black Elk, 1999; Sinite Gleska College, 1990; Sioux Nation Black Hills Act, 1986). Upon the robe are scattered red and blue symbols: red symbolizing points in a valley or junctions of rivers or streams and blue denoting mountains, hills, or other landmarks (Sioux Nation Black Hills Act, 1986). Further study and analysis of the map would undoubtedly prove very interesting and insightful; however, as stated previously, it is not readily available for scrutiny.

#### SPATIAL MEASUREMENTS

The Lakota, like other Plains tribes, computed distances based on a day’s journey, a day being either from sunrise to sunset, or sunset to sunrise; in other words, the modern twenty-four period constituted two days from the Lakota perspective (Ewers, 1977; Sundstrom and Fredlund, 1996). The possibility exists, however, that the Lakota also had a spatial measurement system; this is not a phenomena so far encountered or documented in literature pertaining to American Indian mapping. Charlotte Black Elk is a great granddaughter of Nicholas Black Elk, whose life and experiences were chronicled by John G. Neihardt in *Black Elk Speaks* (1932). An authority on Lakota oral traditions, Ms. Black Elk maintains the Lakota measured larger distances in *taŋsuŋ*, a measurement roughly equivalent to seven miles (Black Elk, 1999; 2000; Sioux Nation Black Hills Act, 1986). Apparently, this spatial delineation was based on practicality. The nomadic Lakota bands considered it the minimum space needed to ensure that each group had sufficient access to wood, foodstuffs, water, and grazing areas without either significantly stripping or depleting these resources for the following year or infringing on another band’s resources. Such spacing was, of course, dependent upon the terrain and climatic conditions of the season, but it was a good general rule of thumb. The practice also appears to have been observed in the establishment of permanent reservation settlements, as noted on the Pine Ridge Indian Reservation (Black Elk, 1999; Oglala Lakota College, 1985; White Hat, 1999a).

The larger distance measurement of seven miles, as opposed to that of one mile, was also more practical when considering the vast distances of the plains and prairies. In his mapping expedition of 1838, the French geographer Joseph Nicollet came upon some Siouan-speaking people—most likely Dakota rather than Lakota—and in the course of conversation asked where their next village site lay. He was told there was another village four *taŋsuŋ* downstream. Nicollet records that he and his company walked a distance of both four kilometers and four miles without locating the settlement. Finally, when they had gone nearly thirty miles, they came across the village the tribesmen had spoken about. Rather than ascribing a spatial association to the word, however, Nicollet concluded that the word *taŋsuŋ* was another term meaning “far” (Black Elk 2000; Bray and Bray, 1993). In doing so, Nicollet became yet another early EuroAmerican who had difficulties in translating or accepting American Indian geographical knowledge outside of the context of EuroAmerican scientific mapping.

#### MARKERS

The Lakota made use of other cartographic techniques and tools, some intended to be short-lived and others more durable. Locational boundaries were often identified by painted markers, such as trees or rocks. The only

*“The possibility exists, however, that the Lakota also had a spatial measurement system; this is not a phenomena so far encountered or documented in literature pertaining to American Indian mapping.”*

designated entrance to the Pipestone quarry in what is now southwestern Minnesota, for instance, was delineated by trees painted with a red stripe. This quarry was hallowed ground for many Plains Indian peoples, as the soft red catlinite stone found there was used to carve sacred pipes, a vital component of most all religious ceremonies (Brown, 1953; Hassrick, 1964). Though the quarry was open to all, those who were not Ihaŋktuŋ wanŋ Nakota (the protectors of the Pipestone) knew by the tree markings that they must wait on the periphery before being invited to enter the quarry. They were further required to participate in a cleansing ceremony, acknowledging the spirituality of the place and their respect for it; the cleansing ritual also protected the site from contamination (Oglala Lakota College, 1985).

As camps moved from place to place, it was sometimes impossible to wait for young men to return from various journeys. If routes through the area were known to be familiar to the returning parties, there was no need for any sort of indicator besides a directional one (Warhus, 1997). In this case, a signpost pointing in the direction that the camp was moving would be erected at the old village site. Because several bands may have been camped within a short distance of one another, symbols identifying the particular band that was on the move were included on the signpost in an attempt to avoid any possible confusion with other groups. Usually a pictograph representing the name of the group's headman would be used, along with additional hoof marks and travois pictographs indicating movement (Figure 5). The marker was fashioned from a buffalo shoulder bone and attached to a short stick (Hassrick, 1964).

Occasionally cairns (small rock piles) or large rocks would be encountered while traveling across the prairie. These stone markers served several different functions. The rocks could indicate the boundary between two territories. Often the people left them as directional markers, indicating which trail was followed. Sometimes, however, these cairns were set up as decoys to throw off an enemy pursuit, especially if a Lakota band was traveling close to unfriendly territory (Jumping Bull, 1999). In the pre-horse days, buffalo were killed when tribespeople on foot closed in and ran the animals over cliffs; an often-used cliff had specific stations designated by rock piles, indicating where the people must begin to tighten their perimeter around the herd (Hassrick, 1964). Circles of rock were constructed at vision quest sites, which those Lakota who were not seeking a vision avoided out of respect for the "sources of mysterious power" (Sundstrom, 1997). Rock piles were also built to shield warriors from the enemy's sight when they scouted their rival's position and strength. These vision quest cairns and shield piles, however, were most likely found on higher hills or bluffs, and not out on the open prairie where a moving camp was more apt to run across them.

The most ephemeral cartographic tool utilized by the Lakota was maps traced upon the earth. For quick referencing and explanation, a map could be sketched in the dirt or sand with a stick or finger (Ewers, 1977). Many times these sorts of maps were drawn by leaders when they needed to coordinate a raid but were unwilling to leave evidence of their passing behind, especially when in hostile territory (Hassrick, 1964).

#### PETROGLYPHIC MAPS

Pictures, symbols, or other artwork pecked, carved or scratched on natural rock surfaces are called *petroglyphs*. Many Lakota contend that several of the rock petroglyphs (*iŋŋanŋ owapi*, "rock writing" or "stone inscribing") found in the southern Black Hills are hieroglyphic stone writings done by

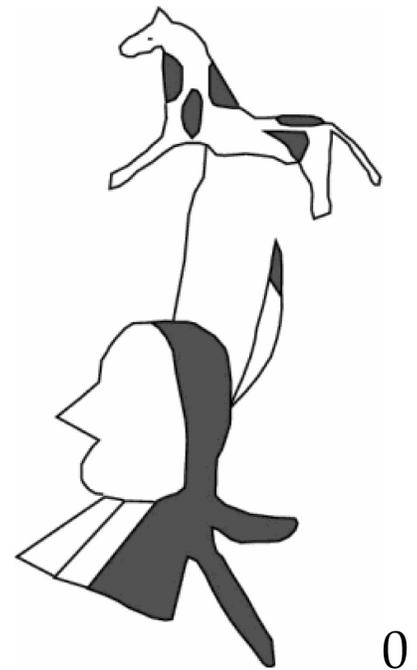


Figure 5. Pictograph representing a man named Spotted Horse. Source: Mallery's *Picture-Writing of the American Indians*.

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the Lakotas themselves, and that some are maps. While it is certain that some American Indian rock art is maplike—portraying features resembling trails or landscape contours—difficulties in interpretation, dating, and authenticity leave this particular assertion open for debate. That these rock art displays are considered sacred locations today, however, is not disputed (Jumping Bull, 1999; LaPointe, 1976; Lewis, 1998; Nabokov, 1998; Sundstrom, 1997; Woodward and Lewis, 1998).

Various petroglyphs have been interpreted to represent supernatural worlds and spiritual interpretations of dream and memory; others were said to have supernatural powers attributed to them (Woodward and Lewis, 1998). Some Lakota believed that the petroglyphs were carved out by ancient peoples, or that they were predictions or warnings given to the people by spirits from the spirit world, foretelling war, spiritual encounters, the coming of animal helpers, or good hunts. It is also said that the inscriptions were done only at night by unseen carvers, to be read and interpreted in the morning light by medicine men (LaPointe, 1976). Ghost Head, a Lakota medicine man, was said to be able to predict the success of hunting and war parties by referring daily to a cliff upon which signs appeared to him, while the Lakota leader High Horse looked at petroglyphs and predicted the coming of the horse (Jumping Bull, 1999; Hassrick, 1964).

Two particular rock art sites in the Black Hills could possibly be ceremonial star charts. Each contains a cluster of small triangles, similar to the “mirroring” representations used on the hide maps to indicate astronomical and geological phenomena. Both sites also contain “mysterious” glyphs that cannot be directly “read” like other pictographic or petroglyphic art. Perhaps these sites suffer from the iconographic development described by Mallery (1893), in that the symbols were at first representations of identifiable images, but in time “became converted into ideographic, emblematic, or symbolic designs, and perhaps became so conventionalized that the images of the things designed could no longer be perceived by the imagination alone.” (584) Proper interpretation of the petroglyphs, if they are earth/star maps, would probably require decipherment by a medicine man or other trained individual; an account of this deciphering, if there has been one, has not been recorded (DeMallie, 1984; Sundstrom, 1997). The lack of American Indians trained in—or perhaps it is a lack of access to American Indians trained in—the proper interpretation of petroglyphic and pictographic figures inhibits the accurate translation of many rock art sites. As noted by Sundstrom and Fredlund (1996), “If animal pictographs were used to represent places on rock art panels, researchers would likely interpret them as pictures of animals, not maps.” (8) It is the old pitfall of not fully understanding the American Indian concept of map and the modes of spatial symbolism used to denote geographical detail and data. In any case, many of the rock art figures in the Black Hills undoubtedly contained an oral component that contextualized the images, and it is possible that component has long been forgotten.

## CONCLUSION

This paper has focused briefly upon the cartographic heritage of the Lakota, an American Indian tribe of the northern Great Plains that historically lived a way of life contingent upon movement and navigation. Though the Lakota did not generate a written language, as such, the oral traditions passed on and cultural system of symbolism developed did serve to produce viable and accurate cartographic tools and techniques. The fluidity and descriptiveness of the language allowed cartographic and geographic information to be passed through everyday conversation, stories, place-

naming techniques, and songs. Close observation of celestial movements and topographical phenomena enabled the Lakota to create markers, and maps—both physical and mental—which allowed the people to successfully navigate both their spiritual and physical planes.

Absent from research concerning American Indian maps were analysis of those maps made by native peoples for use by themselves; this paper revealed that the Lakota created hide maps for their own use, utilized a complex symbolic system, and possibly developed a method of spatial measurement and delineation. While few studies of oral tradition have focused upon oral cartography as such, this study suggests how the precise, descriptive, and adaptable language of the Lakota was well-suited for accurate and specific descriptions of spatial phenomena. The work begins to fill in a gap in traditional Lakota cultural studies by bringing together disparate fragments of cartographic and geographic data embedded in larger works, combining these fragments with another analyses to start to understand the cartographic heritage of the Lakota Sioux.

Future research specific to Lakota cartography should include a more in-depth look at their spatial measurement system; if it can be studied and verified further, it will prove to be an exciting new chapter in American Indian cartography, as the number of indigenous scales known to EuroAmerican researchers is very few. Unfortunately, less likely is the possibility that a researcher will have the chance to study one of the hide maps known to be in private possession. An opportunity such as this could reveal new insights into traditional Lakota spatial construction, provided that cartographer had shed his or her western ways of thinking about a map and was able to approach the experience with open eyes. Though researchers continue to become more and more aware of and vigilant against the ingrained biases with which we approach native maps, we must constantly remind ourselves of that which we stand to lose should our efforts at “overcoming the Cartesian dualism of mind and world” fail—namely, the cartographic exploration of another world.

Though many facets of traditional Lakota cartography are only beginning to be examined and explained, Nabokov (1998) encourages further study of all indigenous peoples cartography, noting that the “...cosmographies and cosmograms that Native Americans produced in order to orient themselves in worlds were just as real to them as those Rand McNally interprets for non-Indians today.” (249)

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