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Wind Cave Bison Station

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Narrative – a story: the art of storytelling

Culture – the set of shared values, goals, and practices of a particular society

Cultural narrative – the art of expressing a particular society’s shared values, goals, and practices in a way that causes them to endure
This thesis will explore the potential of designers to contribute to and expand upon cultural narrative. Through the lens of the Lakota Sioux culture, the project explores the indelible link between how we build and how we see the world. The tipi is used to understand and explain many aspects of the Lakota culture. The goal is to build an architecture that embodies traditional values of stewardship, spirituality, and unity with nature. This will be manifested through a project in the sacred Black Hills of South Dakota. Within the context of Wind Cave National Park, the project embodies Lakota beliefs about how society and nature are related. A retreat acts as a counter-memorial to the Lakota culture, exploring the power of the built environment to convey cultural meaning. Understanding the inherent tension when cultures clash, the project seeks to walk the razor's edge between tourism and reverence.
“There is something in us, as storytellers and as listeners to stories, that demands the redemptive act, that demands that what falls at least be offered the chance to be restored.”

- Flannery O’Connor
Narrative and culture are intimately intertwined. Cultures give birth to narratives and narratives help to preserve cultures. Nowhere is this more powerful and apparent than in the act of building. Through their craft, architects represent significant myths and values. Hugo’s archdeacon asserted that “This will kill that! The book will kill the edifice!” However, built form has been and continues to be an important part of cultural narrative. Designer Tony Fry argues that there is “simply no clear dividing line between the culture we dwell in and the dwelling of the culture within us.” A people’s way of life is expressed in their built environments.

What happens when this way of life is disrupted or forced to evolve? Can design adapt to convey a cultural narrative in a new way? Can a marginalized culture find redemption through an evolving built form?

Armed with this language, the Lakota Indians wrote cultural narrative through the tipi. For centuries, the Lakota lived nomadically on the American Plains telling their significant stories through their dwellings. These indigenous people used the tipi for sacred symbolism, to chronicle events, and ultimately to narrate their existence. Today, many of the Lakota have been relegated to reservations and the culture is struggling to survive.

“Architecture began like all writing. There was first the alphabet. A stone was set up and that was a letter, and every letter was a hieroglyph, and every hieroglyph supported a group of ideas, which were like the capital to the pillars. Later on words began to be formed... Occasionally, when there was plenty of stone and a wide area, a whole sentence was constructed... Architecture thus developed side by side with human thought... and all this floating symbolism became fixed in an eternal, visible, and palpable form.”

-Victor Hugo, The Hunchback of Notre-Dame
The United States’ dealings with the Native Americans is one of the blackest parts of history. As the frontier continued to push westward, the white man systematically took control of the lands of these indigenous people, often without sympathy or discretion. As the maps on the opposite page indicate, the period from 1860-1890 saw a concentrated effort at what President Andrew Jackson termed “Indian Removal”.

Dee Brown describes this period as “an incredible era of violence, greed, audacity, sentimentality, undirected exuberance, and an almost reverential attitude toward the ideal of personal freedom for those who already had it.”

It is during this period that the struggle between the United States and the Lakota Sioux of the Great Plains took place, and ultimately led to these Natives being confined on reservations where many of them remain to this day. This story is ugly and complex, as is outlined in the timeline that follows.

“‘When I was older, I learned what the fighting was about that winter (1866) and the next summer. Up on the Madison Fork the Wasichus had found much of the yellow metal that they worship and that makes them crazy, and they wanted to have a road through our country to the place where the yellow metal was; but my people did not want the road. It would scare the bison and make them go away, and also it would let the other Wasichus come in like a river. They told us that they only wanted to use a little land, as much as a wagon would take between the wheels; but our people knew better. And when you look about you now, you can see what it was they wanted.”

- Black Elk, Sioux medicine man

Maps showing migration of Native Americans onto reservations
Indigenous bison population Bison population, 1820-1830

Met with the formidable resistance of Sioux warriors led by Crazy Horse and Sitting Bull, the United States resorted to a means of indirect genocide. The Plains Bison was an integral part of Sioux life, acting as their primary means of food and clothing. In 1870, American hunters had begun to exterminate the bison from the plains with General R.I. Dodge noting, “Every buffalo dead is an Indian gone.”

Likewise, in 1871 Secretary of the Interior Columbus Delano told Congress, “I would not seriously regret the total disappearance of the buffalo from our western prairies, in its effect upon the Indians. I would regard it rather as a means of hastening their sense of dependence.”

In 1890, the number of Bison on the American Plains had gone from a pre-Columbus level of an estimated 60 million down to 750. The effect this had on the Lakota’s way of life can not be overstated.

Maps showing near extinction of the North American bison population

“That fall, they say, the last of the bison herds was slaughtered by the Wasichus. I can remember when the bison were so many that they could not be counted, but more and more Wasichus came to kill them until there were only heaps of bones scattered where they used to be. The Wasichus did not kill them to eat; they killed them for the metal that makes them crazy, and they took only the hides to sell.... And when there was nothing left but heaps of bones, the Wasichus came and gathered up even the bones and sold them.”

- Black Elk
Red Cloud's War ends in Treaty of Ft. Laramie, the Great Sioux Reservation is established

Carlisle School opens, Lakota youth sent off reservations to get an American education and become "civilized"

Gold discovered in Black Hills

Great Sioux Reservation broken up into three smaller reservations: Pine Ridge, Rosebud, and Standing Rock

Indian Citizenship Act gives full U.S. citizenship to all Native Americans

Battle of Little Big Horn, General Custer defeated by Sioux

Bison slaughtered on Plains, indigenous population of 20 million reduced to around 850

Massacre at Wounded Knee

Protected, free-range bison herd started at Wind Cave National Park with 14 animals donated from the Bronx Zoo

Oglala Lakota College founded, first institution of higher learning on Pine Ridge Reservation

Bigfoot Memorial Riders conduct 100 year remembrance ceremony for the Massacre at Wounded Knee, Lakota nation resolves to move forward in healing

Birgil Kills Straight and Steven Newcomb publish "Toward an Oglala Lakota Constitution", put forth contemporary Lakota values in writing
Neither longing for an ideal past or an unreachable future we invent out of necessity to make sense of a world which doesn’t...combating formlessness, looking for that which is legible, purposeful...

Rather than reinforcing dominant values, we seek recombinations and juxtapositions that might appear to be contradictory – allowing the unrepresentable to be perceivable...moving away from stable alignments toward open ended solutions.

– Thom Mayne††
Patkau Architects describe the act of building as “a critical cultural act that engages our most fundamental desires and aspirations.” Architecture can be viewed simultaneously as art, technology, social service, and environmental agent. The expression of built form can convey many things about those who build it and the time and place in which it is built. In his book Integral Sustainable Design, Mark DeKay points out the inherent difficulty that arises when architects think about a building from many perspectives. He argues that many buildings do well in terms of energy performance, but lack the cultural meaning that ties it to a specific people and place. Done with care, design has the potential to be ecologically responsible while also putting forth a culture’s significant myths and values. No greater example of this synthesis exists than the tipi.

Stanley Vestal comments in the book The Indian Tipi, “The American Indian was strictly a practical man. But he was also a born artist.” Through an examination of the traditional way a tipi was made, constructed, dwelled in, and transported, one can begin to understand its importance in the cultural narrative of the Lakota people. Specifically, the tipi carries cultural significance by way of metaphor and performance as it embodies the way the Lakota people view and dwell in the world.
The word tipi comes from a combination of the Sioux words ti, meaning to dwell or live, and pi, meaning used for. From that, one can surmise that a tipi is used to live in. Along with being functional, the tipi is full of rich cultural meaning.

For the Lakota, their entire understanding of the universe is contained in the tipi. It embodies the understanding of the connection between the physical and metaphysical realm. The past, present, and future are represented by the first three poles of the tipi. After these have been tied together and raised, seven more poles are placed in a circle around these, moving clockwise. Each of these poles is a cosmological or spiritual metaphor – the seven stars in the Big Dipper constellation, for instance.

In Lakota tradition, everything that has to do with life and creation happens in a series or cluster of four. When one multiplies four by the seven lodge poles placed around the anchor poles, one arrives at the understanding that there are twenty-eight days between months or moons. When the ten poles used to erect the tipi are added to the two poles used to support the flaps for energy control, one arrives at twelve, the number of months in a year.

The point at which the poles are tied is called the vortex, and it connects the Lakota to the spirit world. The ancestors who live in that world also dwell in the upper reaches of the tipi. The way the tipi is often taken down and put back up serves as a reflection of creation, or the explosion and implosion of life. It represents the sacred circle, the never-ending cycle of life.
When it is time to make new tipis, the braves in the band chop down a necessary amount of fir pine trees. These include trees of varying heights and widths. The correct amount of poles are cut and then set aside to dry, requiring some rotation periodically to keep them straight.

The braves then strip the trunks of leaves and small branches and cut the trunks to the length of a tipi pole. Once the poles have been made, the braves go on a bison hunt to acquire hide for the tipi coverings.

After the hide is removed from the animal, the women in the band stake them down and scrape off any remaining bits of meat on the inside of the skin. This is done using a thin piece of metal or sharpened bone.
The women then flip the hide over and use the same tool to remove the hair from the outside of the hide. The dark layer of skin underneath the hair is also removed, exposing a thin layer of white which is carefully removed and used in a fine soup.

The bison’s brains and liver are boiled and then the liquid mix is applied to the hide. The hide is then folded up in a square bundle and set aside for a few days.

After the waiting period, the hide is unfolded and stretched between a wooden frame. It is still damp, and the brain and liver mix is scraped off and the hide is washed with water until completely clean.

Next, the women go over the entire hide with a sandstone. This makes the hide very soft to the touch.

Though now soft on either side, the hide still fairly rigid. To make it more pliable, the women run it back and forth over a taught rope which has one end tied around a tree and the other staked into the ground.
It is now time to stitch together several hides to make a cohesive tipi covering. This process starts by laying two tipi poles on the ground and squaring them off.

Several hides are then stretched over the poles and stitched together.

This process of piecing together is continued until an entire tipi covering is made. The covering is then ready to be painted.

The process of constructing the tipi starts with the three main tipi poles that represent the past, present and future.

The three main poles are tied together at the top with a rawhide rope and raised up so that they stand freely. This is the structural framework for the rest of the tipi.
The rest of the poles, usually seven or fourteen, are leaned up against the three main poles. This form completes the vortex and provides the skeleton around which the tipi covering is stretched.

When it is time to put up the covering, a tipi pole is attached to the middle seam of the covering with rope and then hoisted up into place, leaning up into the vortex like the other poles.

The covering is then pulled around the frame. Care is taken so as to make sure the covering is in the proper place in regard to the vortex, ground, and cardinal directions.

A small child is responsible for climbing up on the tipi to place short pieces of bone or wood through pre-cut slits. This holds the covering taught and creates a front door.

Next, the wind flaps are raised by the placing of two more poles. The last step in the erection of the tipi is the staking down of the covering to the ground. Usually, small pieces of cherry wood are used for this purpose.
When it is time to move camp, the various parts can be quickly disassembled. The hide is folded up and the poles are bundled together. The bundles are secured by sliding ropes through small holes burned in the ends of the poles.

All tipi elements can then be attached to a wooden drag known as a travois. These are pulled by horses across the landscape. Depending on the size of the tipi, it could take anywhere from two to six horses to transport it properly.

The band travels in a line led by the elders.
In addition to its beauty and powerful symbolism, the tipi is to be noted for its ecological responsibility and climatic sensitivity. The tipi is designed in such a way that it is comfortable to live in year-round, in any weather. During the hot days of summer, the women would remove the stakes holding down the tipi covering. Then they would take forked branches from a box-elder tree, cut four or five feet long, and place the forked ends through the holes along the bottom of the tipi covering. This elevated the edge enough to allow wind to pass through the space while also increasing the amount of shade. When a thunderstorm was looming, the sides would be lowered and the stakes driven back in place. The forked branches could then be used on the interior as extra bracing for the long tipi poles against the strong winds.

In the winter, a fire could be burned in the center of the tipi to keep the occupants warm. Smoke would not accumulate inside because the flue is open at the top. Snow and sleet rain were repelled by the thick buffalo skin, keeping occupants warm and dry. Tipis were usually set up facing east. At the top, the tipi had two flaps used for windbreaks. If the wind blew too hard from the south, the flap on that side could be raised, and vice versa with the north. In case of rain the flaps could be closed down and secured to a stake in the ground.

Other tents are hard to pitch, hot in summer, cold in winter, badly lighted, unventilated, easily blown down, and ugly to boot. The conical tent of the Plains Indians has none of these faults. It can be pitched, if necessary, by a single person. It is roomy, well ventilated at all times, cool in summer, well lighted, proof against high winds and heavy downpours, and, with its cheerful inside fire, snug in the severest winter weather.

- Stanley Vestal

drawings above courtesy of Luther Standing Bear
“By affecting contextual and temporal stimuli, qualities of light, temperature, sound and smell, architecture can foster subconscious connection to the visitor’s experiences, creating a resonance in their memories of time and condition.”

– Katherine Ambroziak

A retreat will serve as a counter-memorial to the Lakota way of life and dwelling. As a counter memorial, it will hold interpretive value rather than literally telling a story. Counter memorials anticipate and allow for various and spontaneous reactions to the design. They are most effective through active interpretation. An individual begins to understand their responsibility to their own time and place in history as they experience the design. This calls into question phenomenological aspects of interaction and begs the question: how does one craft experience as well as form? Calling into question the nature of the sacred and allowing them to sense it, visitors find the special embedded in the everyday.
With this in mind, the retreat is a place for people from various backgrounds to gain an understanding of the Lakota way of life through built form. It will seek to use light, temperature, sound, and smell to convey the beliefs and ethics of the Lakota people. It can be read as cultural narrative and will provide an opportunity for active interpretation, as visitors will have the opportunity to participate in the harvesting and preparation of bison meat. The site will also host the annual Lakota Sun Dance ceremony in late summer, providing yet another opportunity for cultural exchange.

The project aims to engage the visitor, regardless of age or familiarity with the Lakota, in such a way as to create a “resonance in their memories of time and condition”. Ultimately, these experiences will help to celebrate and preserve the Lakota culture.

**SPATIAL BREAKDOWN**

**Inn**
- administration space for staff - 400 ft²
- community gathering space - 1000 ft²
- unit for single / couple (1-2 people) - 300 ft²
- unit for a family (4-6 people) - 500 ft²

**Sun Dance**
- appropriate site area and design- 10 acres
- elements for the construction of sweat lodges and the Dance Lodge

**Bison Station**
- appropriate acreage + fencing - 5 acres
- area for slaughter - 800 ft²
- area for processing / cleaning meat, hide, etc.- 600 ft²
- area for storage of meat, hide, etc.- 400 ft²
- pens for holding bison prior to shipment - 500 ft²
The Sun Dance is one of the Lakota’s most sacred religious ceremonies. It is performed every year in late summer as part of their religious duty (Standing Bear, 113). It is a sacrificial dance in which a brave receives a wound which causes his blood to flow while he dances before the sun. He can perform the ritual for several reasons: to fulfill a vow, to secure supernatural aid for himself or another, or to receive supernatural powers.41

The essentials for the ceremony are:—
1. The constituents.
2. The conditions.
3. The stages.
4. The time.

The constituents are:—
1. The dancers.
2. The Mentors.
3. The assistants.
4. The people.

The conditions are:—
1. Provision for the ceremony.
2. Preparation of the dancers.
3. Consecration of the equipment.
4. Establishment of a ceremonial camp

The stages are:—
1. Announcement of the candidacy.
2. Instruction of the Candidate.
3. Occupation of the ceremonial camp.
4. Dancing the Sun Dance.

The time is:—
1. When the buffalo are fat.
2. When new sprouts of sage are a span long.
3. When chokecherries are ripening.
4. When the Moon is rising as the Sun is going down.42

RESPECTING AN OLD RITUAL
When it is time for the Sun Dance to take place, all Lakota that have been invited make the journey to the appointed location. It is during this time that the preliminary camp forms. Traditionally, the camp is made up of the various bands camping in a large circle opening south according to rank, with the band that initiated the ceremony given the place of honor. This camp will be maintained for a four day period, during which preparations for the ceremony must be made, including the purification of the dancers in sweat lodges.

When the first four day period comes to a close, those Lakota who are worthy to appear before the face of the Sun begin to set up the ceremonial camp. Those who are either unworthy or non-Lakota must stay in the preliminary camp during the ceremony. The ceremonial camp has the Sacred Spot as its center and its opening toward the sunrise. Once the Sacred spot is established, the women set up the tipis, which can now be placed anywhere in the camp except the entrance, and erection of the Sacred Lodge begins.

The door of the Sacred Lodge faces south and is located a specific distance from the center of the camp. This distance is on axis with the entrance to the camp and is equal to sixteen intervals of four paces each. This line marks the Sun Trail of the camp. Traditionally, the Sacred Lodge is a very large tipi with new poles.
Simultaneous to the building of the Sacred Lodge is the construction of the Dance Lodge. The Dance Lodge is a circular covered space that surrounds an uncovered space with the Sacred Spot as its center. The circle opens to the south. Traditionally, the covered space is made by placing two rows of forked poles in the ground, with the inner row as tall as a tall man can reach and the outer row as tall as a short man can reach. Other poles are then laid from post to post, and other poles across these. This provides support for a covering of leafy branches. Poles are tied from post to post of the outer ring so that an outer wall of branches can be fashioned as well. Once the Sacred Lodge and Dance Lodge are complete, the Sun Dance ritual commences the following morning. This lasts for three days, after which the temporary structures are disassembled.

The project will seek to aid in the rituals during both the preliminary and ceremonial camp periods. Through overall site design and mobile and transportable elements that can be used for construction of the sweat lodges and Dance Lodge, the project will respond to the demands of both ritual and place.
In 1911, as a response to the dwindling population of the bison on the plains, the American Bison society searched for places to start free-roaming bison herds. Wind Cave National Park was chosen as one of the first places for the bison to return to the wild. The New York Zoological Society donated 14 bison to start the herd at Wind Cave. Today, there are about 450 free-ranging genetically pure bison in the park. Out of this herd, bison are regularly supplied as stock to other areas of the country looking to start or maintain a herd. In addition to this, some bison are given to local tribes for cultural and religious purposes via the InterTribal Bison Cooperative. (FWS timeline).

As part of its program, the project will introduce a bison station to serve in the round up and distribution of these animals in the Wind Cave herd. Through this, visitors will be provided an interactive cultural experience as they are able to participate in and witness various parts of this process. In its own way, this annual process will serve as a new kind of ritual and will provide another layer of cultural meaning for the inhabitants of the site.
Perhaps going hand in hand with the mobility of the tipi is the attitude that it takes toward the landscape as a whole. It can be packed up and moved at a moment’s notice without leaving any lasting mark on the earth. This attitude of stewardship and touching the earth lightly is both admirable and replicable. The Harvest Moon Domicile by Studio Indigenous is a contemplation on a dwelling that fits into the patterns of nature. Its form is taken from wind data, surmising that its effect on the land would be so minimal as to not affect any existing patterns of air flow, ground cover, or wildlife migration.50

Crosson Clarke Carnachan’s Hut on Sleds seeks to provide all the amenities of contemporary life with the ethic that the entire project can be moved and relocated on a whim. It functions independent of water and electricity from any exterior source. This project is a helpful reference when thinking about notions of mobility and temporality that are raised by the tipi itself.51
Orongo Station is a 3,000 acre sheep station on the coast of New Zealand. Designed by Nelson Byrd Woltz Landscape Architects, the project is a response to diminishing site resources as a result of unregulated sheep farming. The designers were sensitive to existing cultural frameworks of the indigenous Maori people. Tribal earthwork constructions and structures for defense and food storage were preserved and revealed through various means within the site. Since its completion, Orongo Station has served as a national model for sustainable land management.

Antione Predock designed the World Mammoth and Permafrost Museum in the Republic of Sakha, within the Russian Federation. The building itself is “a landscape abstraction from myths of Sakha cultures and their spiritual predecessors.” The museum seeks to combine physical presence with implied mythic and spiritual crossovers. The Mammoth’s rugged resistance to the Siberian climate provided guidance on how the building adapts to the environmental forces around it. The project draws complexity from the museum’s dual goals of research and education. When seen glowing on the horizon, the building becomes an invitation for exploration and participation.

Balmori Associates’ Arc Wildlife Crossing in Denver, Colorado is a helpful reference when thinking about how animals and people will move through the site simultaneously with vehicles. The Wildlife Crossing deals with these intersecting flows by creating a new shape from the landscape and lifting the path of animals up and over the path of the car. This is a flexible system and ethic that can be adapted to respond to various ecosystems and site conditions.
The project is located in Wind Cave National Park, near Hot Springs, South Dakota. The park is in the southeastern portion of the Black Hills. This region of low mountains are considered by the Lakota as sacred. The Black Hills carry significance because of their link to game animals and ideas of emergence, their connection to sacred caves and springs, and their ties to ceremonial observances such as the Sun Dance. The counter-memorial stands as a critique to the recent history of the Black Hills, and specifically Wind Cave National Park. While the bison have begun a return to their former prominence, there are still no signs of the ethic of stewardship and unity with nature that allowed the Lakota to exist in the Black Hills for centuries without harming it.
The Wind Cave National Park Visitor Center is located 11 miles north of Hot Springs, South Dakota. This area is in a ravine below the level of the park’s grasslands. The visitor center is part of a complex of buildings that serve visitors and park personnel. Located just to the east are three retention ponds that resulted from mining within the site. 35
Wind Cave itself, after which the park is named, is one of the world’s largest caves, with over 150 miles of discovered underground path all under one square mile of land surface area. The large amount of underground air leads to barometric winds at the cave’s one natural entrance. The cave is held in Lakota mythology as the origin of the bison upon which their way of life is based. This cave is located directly below the proposed site.
A station sits atop the hill as one makes the approach to the visitor center.

The visitor center provides a vista of the rolling hills, a small museum and history exhibit, and a connection to the cave via a walking trail.
A series of cabins that house park staff sit across the street from the visitor center, in the midst of pine trees.

The elevator building connects from ground level down to one of the caverns in Wind Cave and is used by the cave’s visitors at the end of their tours.
05_Forming
Formally, the project will explore ideas like layers of shade and transparency, operable elements, and skin as structure. These will be combined with concepts of temporality, connection to the heavens, and touching the ground lightly in an attempt to create an architecture that is a continuation of the Lakota cultural narrative.
**BIBLIOGRAPHY**


2. Ibid


13. Ibid.

14. Ibid.


16. Ibid.

17. Ibid.


20. Ibid.

21. Ibid.


24. Ibid.


32. Ibid.


37. Ibid, 14.


39. Ibid.

40. Ibid.


42. Ibid.

43. Ibid.

44. Ibid.

45. Ibid.

46. Ibid.


57. Ibid.