The Impact of the Natural Phenomena
of the Greater Yellowstone Ecosystem
on the Mythology of Shoshone Indians

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Preface and Acknowledgements

This shout out goes to the man in the pork pie hat.
Thesis Statement

I will demonstrate the impact of the unique natural phenomena of the Greater Yellowstone Ecosystem on the belief systems and mythology of the Sheep Eater people, a subgroup of the Shoshone Indians who inhabited the area. Central to my methodology is the comparison of Sheep Eater stories and myths to the mythology of their relatives, the Panamint Valley /Saline Valley Shoshone. The two groups share a common ancestor through the Paiute people, who split up to become the Shoshone and migrated eastward into the Greater Yellowstone Ecosystem. By comparing the mythology, folklore, and stories of the two groups who are located in two distinct ecological regions, I will prove that mythology is directly influenced by the surrounding environment and ecosystem.

In order for readers to fully understand the magnitude of the impact the natural landscape can have on a group of people, we must first examine how the area came into existence including how natural landforms and features were made. We must also explore how humans migrated to North America and how the Paiute people of Southern California evolved into the Shoshone. By reviewing archaeological evidence and sites across the Southwestern United States, readers will be able to follow the path the ancient Shoshoni took from the Southwest to Wyoming; eventually residing in the heart of the Greater Yellowstone Ecosystem at what would become Yellowstone National Park. A brief time must be spent evaluating Shoshone culture and daily life. Finally, the myths of both Shoshone groups, the Saline/Panamint Valley Shoshone and the Shoshone Sheep Eaters, will be presented, compared and contrasted, and evidence from the surrounding ecosystem will be drawn to show a direct correlation between the landscape and mythology, proving that the landscape and surrounding environment does impact myth.
This senior honors thesis is unique for many reasons. It spans a wide range of methodologies including volcanology, geology, migration, ecology, mythology and religion. It employs archaeology and geology while incorporating elements of both sociology and anthropology. Not only does it revive feelings of nostalgia for an age before human was bothered with modern technology, and the Wild West was very much alive, but it calls readers to question their own cultural mythologies and beliefs. It asks readers to reflect on ways in which their own beliefs are influenced by the surrounding landscape, whether natural or human-made. Perhaps most important it presents a scientific account a very personal one because of my direct relationship with the area. I spent two consecutive summers in 2012 and 2013 doing original archaeological fieldwork in the area while working in Yellowstone National Park.

Yellowstone National Park holds a special place in my heart. Following in the footsteps of my grandfather, father, and uncles, I spent two summers working for Xanterra Parks & Resorts, a privately owned United States resort management company within the national park system. I called Yellowstone my home, and my back yard was literally the grand canyon of the Yellowstone. Moving from the suburbs of Philadelphia to living on top of the world’s largest super volcano was beyond eye opening and a culture shock to say the least. I met people from all over the country and all over the world that changed my life in ways unexplainable by words. My inner soul was truly touched by the majesty and splendor of the mountains, pine-fresh air, and gurgling, dazzlingly colored hot springs. I had a very personal, one-on-one experience with Yellowstone; one that I wish everyone could have with nature just once in their life. It’s a world removed from the world that has no cell phone service, no television, and no radio. The whole landscape and lifestyle of the west that was captured in old western movies is still very much alive. Hiking in the woods, not knowing what is around the next corner is thrilling, frightening
and exciting all in one emotion. Or maybe it’s just the elevation that drives everyone a little mountain mad. Yellowstone is a treasure that people have been flocking to for thousands of years; Native Americans and tourists alike.

After reading this thesis, it is my goal that readers will have a new found interest in the original inhabitants of this country and be stirred enough to walk off the beaten path, get back in touch with the natural world, and be more aware of the impact that our surrounding areas, environment, and technologies have on our daily lives. By enforcing the link between nature and myth, perhaps some may even want to visit the area itself one day. As the world’s population continues to grow, the earth is running out of sustainable space and resources. Each year the amount of available land for development is decreasing. We are also expending nonrenewable resources such as coal and oil that cannot be replenished. The United States is sitting on top of an oil field that stretches from South Dakota to Idaho, with Yellowstone resting in the middle. There is no doubt in my mind that one day this place held sacred by so many will be threatened or even in jeopardy of losing land to the search of oil and more resources. It is my hope that readers will become more aware of the need for conservation and to want to preserve the largest remaining fully-intact ecosystem in the world for future generations to learn from and enjoy.
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1. **What is the Greater Yellowstone Ecosystem?**

In order to understand the impact that the Greater Yellowstone Ecosystem (GYE) had, and continues to have, on its residents, we must first recognize what it is, where it’s located, and why it is important. An ecosystem is an interacting community of living organisms and their physical environments. This includes living plants, animals, fungi and bacteria, predators and prey, the trees, grasses, flowers, shrubs, herbs roots, rocks, rivers, streams, lakes and other physical features including mountains, hills, valleys, and in the case of Yellowstone, its geothermal features including hot springs, geysers, fumaroles and mud pots which are all fueled by the underground super volcano. An ecosystem is comprised of both living and nonliving things and changes in the habitat or species who occupy it can have major effects and consequences on the surrounding environment and the beings that are dependent on it for survival.

The Greater Yellowstone Ecosystem is one of the last remaining and largest intact ecosystems in the world (Schullery, Paul). In layperson’s terms, it is one of the largest areas of land that has been least effected directly or indirectly by the hand of humans. The GYE is located in the western United States of Montana, Wyoming, and Idaho. It is approximately 28,000 square miles, which is roughly equivalent to the size of Maryland. The boundaries of Yellowstone National Park, which resides within the GYE, were drawn arbitrarily in 1872 when the park was first opened in an attempt to include all of the geothermal features in the region. At this time, the park was considered the entire ecosystem, but during the 1970’s, the grizzly’s bears range in and around the park became the informal boundary of the park as the
griz is the ecosystem’s largest predator and regularly wandered outside of the park’s boundaries. At that time the ecosystem was roughly four million acres. In 1995, the grey wolf, an endangered species whose numbers were dwindling in the park, was reintroduced in larger numbers. The apex predator had many significant impacts on the park, one that grizzly bears did not have to work so hard for food as they scavenged off of the wolf’s kills and carcasses. The more abundant food supply for the grizzly bear led to an increase in population and an increase in its roaming range, so the boundaries of the GYE are constantly changing. Today the estimated size is 20 million acres.

The ecosystem is also home to many more animals including the iconic American bison, elk, deer, big horned sheep, moose, coyotes, the ever elusive mountain lion, foxes, badgers, pine martins, beavers, rabbits, ground squirrels, ravens, osprey, bald eagles, swans, geese and ducks, and finally fish including the cut throat trout, Montana grayling and the Montana whitefish, just to name a few. These animals all call not only the park but also the entire ecosystem home. They are nourished by the mountain streams and fresh grasses and plants, and they make their homes out of caves in the sides of mountains, overturned trees, and sleep in the meadows and lakes. Ferdinand V Hayden is recorded saying in the 1871 expedition to Yellowstone that he believed in, “setting aside an area as a pleasure ground for the benefit and enjoyment of the people…. that (Yellowstone) should remain as free as the air or water” (Merrill; 208.). It was apparent then that Yellowstone was a
unique treasure that should be set apart and spared being carved up to “make merchandise out of such a beautiful specimen” (Merrill; 208). The park itself is 2,219,791 acres, is comprised of one two-lane, figure eight shaped road that stretches 140 miles, and hosts ten small villages for camping, food, gear and supplies and educational visitor centers.

I can verify that besides wooden boardwalks and sidewalks around major attractions, road signs, road upkeep and general trail maintenance, the park is generally left in its natural state and most closely resembles how nature and the environment would be if humans had no contact or impact on the area. It is almost like looking back through a sliver of time to when human contact was limited to Native Americans, before industrialization or migration westward had occurred. It is still very much an untamed wilderness where an inexperienced hiker or tourist could easily be harmed or even killed walking over a thin-crusted thermal feature, tempting a bison to charge, falling off a cliff, getting swept away downstream in mountain runoff, or even getting struck by lightning. In a world where humans are virtually in control of nearly everything in their life, they have yet to come close to controlling Mother Nature, and she is quick to claim her children back to the earth from which they were born if you do not respect the wildlife or the environment.

The Greater Yellowstone Ecosystem is extremely important to this thesis because it was the home of the Shoshone Indians, specifically the Sheep Eaters, who lived within its constraints. Throughout the thesis the natural surroundings, background, and landscape of the Greater Yellowstone Ecosystem will be described and evaluated in terms of its relationship to the mythologies of the Native Americans who resided there. The unique characteristics of the park are unparalleled throughout the rest of the world, and through the discussion and comparison of Shoshone Sheep Eater mythology to the mythology of their ancestors, the Saline and Panamint Valley Shoshone, a relationship between the landscape of the Greater Yellowstone Ecosystem as
well as the Death Valley Ecosystem (where the Panamint and Saline Shoshone can be found) will be observed.
2. The Creation of the Greater Yellowstone Ecosystem

The creation of the greater Yellowstone ecosystem, the area encompassing Yellowstone National Park, has taken place over millions of years. The Yellowstone area’s major claim to fame is that it is situated over top of one of the world’s largest super volcanos; a super volcano which is responsible for much of its geothermal activity. It is believed that over time, the shifts in the earth’s tectonic plates has moved the north American plate where the Yellowstone area is now located over top of a mantle plume where hot rock nucleates at the core-mantle boundary deep in the earth’s crust. This area is often times referred to as the Yellowstone Hot Spot or the Yellowstone Super Volcano. Super volcano is the term given to volcanos that have the capacity to, or have had an eruption of magnitude 8 on the Volcano Explosivity Index (VEI), meaning the measured deposits for that eruption is greater than 1,000 cubic kilometers (240 cubic miles) (USGS). The hot, molten rock rises through the earth’s mantle and intrudes into brittle rock under the surface of the earth as a hot, mobile and deformable material. This hot, subterranean magma system is the basis for most of the volcanic activity in Yellowstone as it is responsible for most of the caldera forming eruptions. (Choi, Charles Q.)

The super volcano underneath the Yellowstone
area has erupted at least three times in history, and each eruption has contributed to the creation of the larger Yellowstone Caldera (USGS). A caldera is a large depression in the earth that forms as a result of collapsing land after a volcano erupts. When a volcano erupts and the magma chamber of the volcano is emptied, the emptied chamber walls can no longer support the weight of the volcanic crust above, and it collapses inwards. The Yellowstone caldera is made up of three smaller calderas: the Island Park caldera, the Henry’s Fork caldera, and finally the Yellowstone caldera. The Island Park caldera was formed after the Huckleberry Ridge explosion that took place roughly 2.1 million years ago. The Island Park caldera’s ashfall is the source of the Huckleberry Ridge Tuff (type of rock consisting of consolidated volcanic ash), and covered an area of over 2,500 km³, roughly spanning from Southern California to St. Louis, MO (Wood and Kienle, 1990; 263-267). The Huckleberry Ridge explosion is thought to be the largest known eruption in the Yellowstone Hotspot's history. Scientists now believe that the eruption that created the two-million-year-old Huckleberry Ridge deposit was actually at least two different eruptions that occurred about 6,000 years apart (Choi, Charles Q).

The Henry’s Fork caldera is the most visible to the naked eye of all three calderas. Although it is the second oldest of the three calderas, it is also the smallest. Measuring at 18 miles long by 23 miles wide, it was formed during the Mesa Falls explosion 1.3 million years ago, and is the source of the Mesa Falls Tuff (Christiansen, R.L., 2001; 145). Finally, the Yellowstone caldera was formed as a result of the Lava Creek explosion that happened most recently 640,000 year ago. These three calderas come together to form the Yellowstone caldera, which is now roughly 34x45 miles wide. When standing or driving on Dunraven Pass (el. 8878ft. between Canyon Village and Tower) one can crudely make out the edges of the caldera which is now overgrown with lodgepole pines. Steam, which many novices mistake for forest fire smoke,
rises from the caldera floor in areas where geothermal pools and geysers lay hidden in the back country. Volcanic rock including basalt, obsidian, and rhyolite are just some of the remaining igneous rocks left over inside the park and the surrounding Yellowstone area as a reminder of the volcanic activity of the past. (Christiansen, R.L., 2001; 145)

Yellowstone National Park also has the largest concentration of active geysers and thermal features in the world. There are estimated to be over 10,000 thermal features in the park, including geysers, hot springs, fumaroles (also known as steam vents), and mud pots (see Geothermal Features & How they Work). None of these features would be in existence if it were not for the underground volcanic activity that created the Yellowstone area. Geothermal features are often created naturally in areas where rainwater and snow melt can penetrate the earth and seep down thousands of feet into the earth’s crust and be indirectly superheated by the hotspot below. Most of the time, this happens along fault lines or where lava has previously flowed (Smith, Robert Baer, and Lee J. Siegel. 2000; 73). When heated to the right temperature, the water pressure builds up and forces the now superheated water back to the surface of the earth in the form of hot springs, geysers and steam vents. Most of the water ejected is around 200° when it leaves the earth’s crust, but the outside air temperature of the earth rapidly cools the water. The earth’s crust around many of the thermal features is very thin and can be very dangerous to humans and animals alike. It is not uncommon for a bison or tourist to walk over to a feature’s edge for a closer look and the earth break away into scalding hot water (Arrandale, 2007; Web).
Hot springs are one of several geothermal features that can be found in Yellowstone national park. A hot spring is formed when cold water from rain or snow melt seep through porous rock and cracks in the ground to a depth of close to 10,000 feet where it drips and flows onto rocks heated by the magma below Yellowstone Park. The water is heated to temperatures of around 400 Fahrenheit but it remains in a liquid state due to the pressure of the rocks above. This superheated water is less dense than cooler water and more buoyant. As a result the superheated water can rise back towards the surface, dissolving silica and other minerals along the way. When the water finally reaches the surface it deposits some of the silica along the edges of the hot spring giving it a light colored edge (See Yellowstone National Park Geothermal Features). While sometimes the redeposited minerals in the water give the hot springs their color, often it is thermophiles, or heat-loving bacteria, that thrive in the environment that give off brilliant colors. For example, the red, yellow and green colored rings around Grand Prismatic are produced because of bacterial mats surrounding the feature. (Brock, Thomas D. 1994)

Geysers are basically hot springs that erupt. Eruptions are caused by a buildup of underground water and pressure that forces superheated water that gets stuck in the earth’s surface. When enough pressure is attained, the water will shoot out of openings in the earth’s surface. Some geysers shoot off water only a foot in the air, while other geysers can erupt and shoot water over 300 feet into
the air. Steamboat geyser is currently the world’s largest active geyser and is located in Yellowstone (Nordstrom, Kirk D. Steamboat Geyser). Its recorded heights of over 300 feet, and eruptions have lasted as little as 3 minutes or as long as 40. Steamboat last erupted July 31, 2013, but previously had not erupted since 2005. This is proof that geysers can remain inactive for a long time. Earthquakes caused by tectonic shifts can often times change the ‘internal plumbing’ of Yellowstone, rendering some geothermal features to go dormant or all out extinct, while other times creating new ones over fault lines. Yellowstone is a constantly changing environment (United States. National Park Service).

Fumaroles, more popularly known as steam vents, are the hottest geothermal features in Yellowstone. Water in steam vents is boiled to a temperature underground that is so hot, the water automatically turns to steam when it enters earth’s atmosphere. The result looks like steam or smoke rising from holes, or vents, in the ground. A hissing noise results from the directing of the high pressured gases and steam through narrow channels in the earth’s crust. Roaring Mountain, which is located on Grand Loop Road between Norris and Mammoth Hot Springs, is a perfect example of a giant steam vent- steam billows up from the grey mountainside and a loud hiss can be heard from across the street. I have witnessed this for myself.

Mud pots are hot springs that appear to contain very little water. The water which mud pots do
contain is very acidic, and it dissolves nearby rocks into small pieces of clay and dirt. The materials mix with the water to create a very acidic mud. The bubbling of the mud is not because the mud is very hot, but rather because of steam and water being forced up by pressure from the superheated underground. Fountain Paint Pots, in the Lower Geyser Basin at Yellowstone, offer views of some of the best mud pots on the planet (See Yellowstone National Park Geothermal Features).

Not only does the climate and elevation effect what can and cannot grow in Yellowstone, but so, too, does the quality of the soil. The Yellowstone ecosystem is naturally rich in nutrients. From nutrients left over from ash to minerals and deposits in the acidic soil, the natural environment which has been left over from volcanic activity has left an ecosystem that thrives on the naturally occurring nutrients in the ground.
3. Climate Change and Glaciation

No matter how much humans develop and progress further in the future, we are still learning about the human past, where humans came from, or how they began to inhabit the entire world. Scientists have found genetic evidence that a population of people, whose skeletal remains were anatomically modern homo sapiens, migrated from Siberia to Alaska during the last ice age approximately no earlier than 30,000 years ago (Goebal, Ted et. all. The Late Pleistocene Dispersal of Modern Humans in the Americas; 1497). The Pleistocene era is a geological time frame which earth was much colder in some places, and much of the Northern Hemisphere was covered in glaciers. When water freezes, it expands in both width and height. So much of the seas were absorbed by the glaciers that the bottom of the Bering Sea, or the sea floor, was actually visible and accessible (Yukon-Beringia Interpretive Center). At that time Beringia was an area that spanned from Siberia to modern day Alaska and had no glaciers because the climate was too dry and there was little snowfall or accumulation. Prehistoric animals such as the wooly mammoth and short faced bear, who humans at the time would have hunted, were abundant resources in the area. The archeological evidence suggests that the humans first "widespread" habitation of America occurred during the end of the last glacial period around 16,500–13,000 years ago (Bonatto et all. 1997) During this time, the Paleo-Indians traveled in a series of migrations to North America via the Bering Strait. At the end of the last glacial period, the changing climate of the earth melted the glaciers, and the
Bering Strait was covered with water. Whoever had migrated to North America by that time could not travel back by the land bridge, and it is assumed that the new inhabitants of North America migrated south and west to warmer climates while following the big game migration patterns, assuring that hunting would be more abundant. In 1959, Phil C. Orr, Curator of Anthropology and Paleontology at the Santa Barbara Museum of Natural History discovered the remains of a human in the side wall of Arlington Canyon on Santa Rosa Island off of the coast of California. The remains, named Arlington Springs Man, were estimated to be 10,000 years old. In 1989, thirty years later, Dr. John Johnson, Curator of Anthropology, and Don Morris, Channel Islands National Park archaeologist, initiated a project to re-evaluate the age of the Arlington Springs remains. By using a portion of the excavated femur bone, radiocarbon dating aged the bones to be 13,000 years old and revealed that the ‘man’ was actually a woman (Johnson, John R.; *Ancient Bones May Rewrite History*; 2012). It is estimated that this 13,000 year old person was one of the last people to cross the Bering Strait into North America as the age of the bones coincides with the ending of the last ice age, but it is widely debated as whether this woman crossed by foot or perhaps crossed the sea and went down the coast by boat (Johnson, John R.; *Ancient Bones May Rewrite History*; 2012). Arlington Springs Woman, as well as other skeletal remains, such as Kennewick Man and Buhl Woman that have been discovered in North America, is one of the most important examples we have that, through scientific testing, proves when North America began being populated by ‘modern’ humans. (Johnson, John R.; *Ancient Bones May Rewrite History*; 2012).

Since the end of the last ice age the climate of the Greater Yellowstone Ecosystem has not changed much. The climate is greatly influenced by altitude; higher elevations in the park are generally colder than lower elevations in the park. Higher elevations experience more
temperamental changes in weather than do the lower elevations, with random thunder and rain storms, occasionally high wings, and even snow storms in the summertime. Yellowstone does experience four seasons with normal highs reaching between 70-80°F and highs in the winter usually between 0-20°F. Lows in the winter can easily drop below zero into the negatives with the average low of -20°F. The Yellowstone region is very dry with relatively low to no humidity. Precipitation ranges from 15-80” a year depending on the location in the park. During the winter, snow accumulation ranges from 150” at lower elevations to over 300” in higher elevations (Western Regional Climate Center; 2014). Through research techniques like dendrochronology, scientists have been able to infer about the climate of the Yellowstone region dating hundreds, even thousands of years in the past, so we know that the first Paleo-Indians to enter the area and call it home probably experienced similar weather patterns in Yellowstone like what current visitors to the park still experienced today.
4. Methods and Techniques - How do we know who was in North America and When?

There are many methods that scientists use to determine who was in the Greater Yellowstone area and for how long. It is believed that the first inhabitants arrived around the Yellowstone region roughly 10,000-8,000 BCE. Scientists know this because of various dating methods that can be used on physical remains and items left behind. There are two different categories that dating methods fall into: relative dating and absolute dating. Relative dating is the science used to determine the approximate age of an artifact without necessarily determining the artifact’s absolute age. There are four general principals to relative dating:


**The Principle of Original Horizontality** states that when sediments are laid down on Earth’s surface, they form horizontal or nearly horizontal layers (Foundational Concepts). Generally, the further down into the earth’s layers you go, the older the dirt is, and subsequently, the older the artifacts found in that dirt will be. Stratigraphy studies these different layers of sedimentary rock as they accumulate over top of each other over time.

**The Principal of Lateral Continuity** further supports the **Principal of Original Horizontality** by stating that the rock layers extend for some distance over Earth’s surface—from a few meters to hundreds of kilometers, depending on the conditions of deposition. Because of this, scientists are able to relate different layers to the same time frame even if the areas being
studied are far apart. This method cannot always be relied on though, as geological phenomena, as well as human presence, has been known to rearrange the different layers of dirt.

**The Principle of Superposition** states that as layers accumulate through time, older layers are buried beneath younger layers. If a scientist can identify the oldest layer, most of the time the layers that form on top can be placed in chronological order. But on occasion, the sequence of layers that have been deposited can be disrupted and upset the chronology of the sediments. For example, human construction has been known to dig up fossils or artifacts and displace them in younger or older sedimentary rock than the item might have originally belonged. Tectonic plate shifts can also change the underground strata, say, if an underground cliff or shelf is pushed up and through a younger layer of rock. These are just a few examples of weakness in the **Principal of Superposition**, and it should not be used as the sole method in determining the age of an artifact or sample.

Finally, the **Principal of Faunal Succession** states that fossils and other artifacts can be predicted to be found through the same stratigraphic successions in different areas all over the world. In this case, if scientists are looking to dig for Clovis points in North America, scientists would look in the same sediment layer in Texas as they would in New Mexico because this is the universal time period all over North America when the Clovis culture existed. *(Foundational Concepts)*.

Relative dating is an estimate of how old an item is. In other words; to figure out the exact age of an item, artifact, or geological sample, scientists use absolute dating methods that determine the most precise age of the item being dated within a margin of error. Absolute dating methods aim to give a numerical age to an artifact, however, the term ‘absolute’ is misleading in
that scientists cannot be sure of exactly or precisely when the artifact was made ‘to a tee’. Using several different methods, many of which use chemicals, scientists can put a numerical age on an artifact. In contrast, relative dating puts artifacts in a chronological order based on how deep in the earth they are found. One of the forms of absolute dating which does not require the use of chemicals is dendrochronology. Dendrochronology is reading the growth rings in a tree’s trunk to determine the age of the tree when it was cut or fell down. Every year, the tree grows another ring, and these rings are visible by taking a horizontal cross section of the trunk. In years where there is plenty of rainfall and nutrients for the tree, the rings grow bigger. For years of drought, the rings are smaller and closer together. Scientists are able to take cross-sectional samples from different trees growing in the same area and compare the patterns of growth rings to trees where scientists know their definitive age and come up with an almost dead-on precise age for the tree, sometimes even to the exact calendar year they were formed (McGovern, PJ. "Dendochronology Science in Archaeology: A Review." Cornell University, 1995. Web; 79-142). The fun thing about dendrochronology is that you do not have to be a scientist to perform the science. One can simply walk outside and find a stump and count the circular rings as they grow on the inside of the tree trunk.

Radiometric, also called radioactive, dating is another absolute dating technique that involves dating a rock, artifact, or bone, based on the comparison of radioactive isotopes found in elements of the item to the isotopes half-life. Carbon dating is a type of radioactive absolute dating method. Over time, plants and animals absorb isotopes of carbon-14 break. This can be in the form of breathing it in from the atmosphere or consuming it in the form of plants. When the animal dies, they stop taking in carbon-14, and it immediately starts to decay at a fixed rate. Carbon-14 decays into Carbon-12. The amount of time which it takes for C-14 to decay into C-
12 is called a half-life, and the half-life of C-14 is about 5,730 years. By comparing the amount of C-14 still in the artifact to the amount of C-12, scientists can estimate a numerical age in years to the artifact found. Radioactive dating has become a very prominent dating technique in the archaeology community since it was discovered in 1949. (Plastino, 2001; 157-161).

Just as there are problems in relative dating, absolute dating is not without its faults. In radioactive dating, if a sample is too small, there may not be enough carbon isotopes in the sample to carry out an effective dating test without ruining the specimen in its entirety. Great lengths have to be taken to make sure the specimen, when unearthed, does not come into contact with atmospheric carbon that could contaminate the specimen and skew the dating results. Radiocarbon dating can be used to date samples that are tens of thousands of years old, but it does not necessarily work well for more recent samples and artifacts that are less than 5,000 years old, and it gives scientists less of a precise measurement of time.

Potassium-Argon dating is another absolute dating method, but it is used to date archaeological materials that are extremely old in the geological record. An isotope of potassium, K-40, decays into argon gas over time, A-40. By comparing the amount of K-40 to A-40, scientists can estimate the age of rock in the earth. In Yellowstone, for example, potassium-argon dating of sanidine, a crystal-like mineral found in some soil, from the Huckleberry Ridge Tuff by Dr. J. D. Obradovich in 1970 revealed the sample to be about 2 million years old. (United States. Department of the Interior. Geological Survey. 8 Sept. 2008. Web.). Again, this practice is weak when using it to test the age of younger rocks and gives skewed, inaccurate results.

Obsidian hydration is a rather new absolute dating technique that was invented in 1960, but recent additions to the science in 2002 have made it a booming new dating technique for
artifacts made of obsidian. Obsidian is a volcanic glass that is made when lava cools at a rapid pace. When the lava cools, a very hard, black, glossy material is left over that, while very hard, can still be chiseled into stone tools like knives and projectile points. When the underground Yellowstone volcano erupted in the past, lava spewed out onto the surface of the earth and rapidly cooled, turning into obsidian (USGS, Obsidian, web.).

The best example of obsidian in the Yellowstone area is at Obsidian Cliff, which can be viewed on Grand Loop Road between Mammoth Hot Springs and Norris Geyser Basin. When obsidian is cut, the portion of rock that is exposed to air absorbs a thin film of water along the cut edge. Over time, the water builds up in layers along the rim of the cut, almost like scar tissue covering a wound. By comparing the number of layers of water film that accumulated on the surface to the rate at which the film adheres itself, scientists can get a rough estimate of when an object was shaped from the obsidian.

In 2002, scientists introduced secondary ion mass spectrometry, which focuses a beam of ions at the edge or film adhering to cut obsidian, and then analyzes the number of secondary ions that rebound off the surface (Riciputi, L. R. et all; (2002); 1055–1075.). This practice has made obsidian dating more precise, and more scientists are now prone to use it when dating obsidian artifacts such as arrow heads, spear tips, or knives.

Today, visitors are no longer allowed to climb or hike Obsidian Cliff. In the past 150 years, settlers and visitors to the park quarried out hundreds of tons of obsidian to use as raw materials to the point where one could hardly recognize the face of the cliff. Humans love the flat, shiny, smooth and sharp material today just as much as they did then, as visitors still pocket away small stones as keep sakes and souvenirs from their trip (I did). Before settlers reached the
Yellowstone area, Native American plains Indians were also fascinated with obsidian and fashioned it into knives, cutting implements, spear points and arrow heads. In fact, obsidian from the Yellowstone area was so well prized that plains Indians traded it with other tribes across the plains. Scientists believe this to be true because obsidian was dug up at the Cahokia Mounds in Missouri that has been traced back to its sources at Obsidian Cliff in Yellowstone (Timothy R.Pauketat - Nancy S.Bernard. 2004; 11). Obsidian was a highly sought after trade item since it traveled so far across the country (1,000 miles) and by foot (horses had not been introduced yet). The obsidian hydration dating technique was used to date these specific samples of obsidian.

Dating methods in the 21st century are much more sophisticated. Scientists and archaeologists are able to use relative dating and absolute dating methods and techniques to put an age to not only artifacts but also to soil deposits and mineral samples. More artifacts and bones have been found in the greater Yellowstone area, but within Yellowstone Park itself, very few artifacts have been found. Minerals that are deposited in the soil from geothermal features prevent many plants from growing in the area that otherwise would grow in that climate. The minerals in the soil raise the pH of the soil, making it acidic. Acidic soil dissolves organic material left over in Yellowstone Park, so artifacts that are made out of bone or wood decay rapidly (Sanders, Paul H. Prehistoric Land-Use Patterns within the Yellowstone Lake Basin). Any wooden or bone tools or artifacts that would have been made between 6-10,000 BCE years ago have a greater chance of already being dissolved into the earth because of the soil’s acidic nature. Most of the artifacts, however, are made out of stone. Stone does not deteriorate in the acidic soil conditions within Yellowstone Park. Arrow heads and spear points made of obsidian have been found within the park. In 1959, when the Mammoth Hot Springs post office was built, an obsidian Clovis point was found that dated to 10,000 years (National Park Service). Tipi
rings, which are giant circles in the ground made of large boulders, that were put in place to stake down tipis by Native Americans, have also been found in valleys in Yellowstone park, as well as the surrounding Yellowstone area (Livers, Michael. Stone Circles in Yellowstone, 2012). These are just a few of the examples of stone artifacts that we have specifically from Yellowstone National Park that prove that Native American’s inhabited the area at the end of the last ice age, roughly 10,000 years ago.
5. **Migration – Inhabiting North America**

Today, the descendants of these people are referred to as Native Americans or Native American Indians. These prehistoric Paleo-Indians migrated eastward from what would have been a much lower coast line on the west coast and made their way south and eastward, probably following hunted animal herds and edible fauna. Later in the thesis we will examine archaeological trade routes that further support the migration path that Paleo-Indians took when migrating eastward. Early Paleo-Indians were hunter-gatherers; small, nomadic groups of people (normally family or clan members) whose subsistence practices fulfilled needs on a daily basis, not planning ahead for the future. They would both hunt and gather in order to acquire nutrients and sustenance. Hunting ranged from big game animals like elk and bison, to small animals like rabbits and birds. Gathering, on the other hand, included collecting edible foliage like nuts, seeds, berries and roots that were abundant from the ground, however, when an area was depleted of its resources (both animals and plants), the group was forced to migrate. These Paleo-Indians would migrate across the country, different bands would split off from one another, and eventually the separate bands would develop into the pre-Columbian tribes of North America (Assembly of First Nations, 2009; web)

Tribes are a social division in a traditional society consisting of families or communities linked by social, economic, religious, or blood ties, with a common culture and dialect, typically having a recognized leader. (Tribe, 2014; web). Tribes were groups of families or kinship bands living together to help each other succeed at fulfilling hunter and gatherer duties. The more people there were in a band, the more help there was available to complete the daily duties needed to survive. More food could be hunted or gathered, and in the end there was a greater chance at survival for all. They migrated and adapted to different climates all across the country,
they used the most prehistorically advanced tools, and created a unique identity for themselves which would eventually evolve into each tribe’s specific culture. They developed their own languages; ways of dressing, social stratifications and standards, norms and deviations, and finally each tribe had their own unique spiritual and religious beliefs as well as rituals that were used to explain their ways of life (Davis, 1994; web).

The age-old question that has plagued the human condition still haunts us today: where did humans come from and why are we here? This question has sought to been answered over centuries and generations. Where did we come from, why are we here, what is our purpose, what is the meaning of life and where do we go when we die are just a few thoughts to meditate on. Many different groups of people today use religious doctrines to explain the phenomena of life, and this is no different for the Paleo-Indian. Although we have no written records from any Paleo-Indian cultures, oral traditions have been passed down through Indian lifelines for generations, and only in the past 400 years since Europeans discovered North America and its inhabitants has the onset of writing been introduced to the Indians to record their histories, culture, folklore and religious beliefs including their mythology. In asking themselves these age old questions, these bands of people relied on their surroundings to answer these questions. What they were witnessing in real life they had no explanations for, just like they had no explanations or answers for their purpose, and so since the two coincided, they used the tangible forces they could see (their natural surroundings and environment; in the case of Yellowstone - geothermal features, mountains, lakes etc.) to explain their existence. As Indians
migrated eastward, their surroundings completely changed, and so too did their explanations for how these surroundings came to be. Yellowstone itself was a crossroad for many Native American tribes as they migrated eastward or decided to remain in the area depending on their nomadic tendencies. For these reasons each tribe’s respective region where they were drawn to because of the natural resources became both historically and culturally important to the identity of said tribe, as their mythologies, stories and folklore became intricately tied to the land regions that the groups migrated through. In our comparison of the mythologies of the different Shoshone groups we will see that the different environments that the different tribes occupied or migrated through are inextricably linked to the mythologies of the people who call those regions home. (Hurlbut, 2011:23)

6. The Paiute People
As sea levels rose, Paleo-Indian migrated inwards on the North American continent as they followed big game herds and moved on to areas rich in natural resources. As early as 13,500 (11,500 BCE) years ago, Paleo-Indians began settling along the coast of what is now the state of California (Catherine Anne Cavanaugh; Michael Payne; Donald Grand Wetherell (2006). *Alberta formed, Alberta Transformed*. University of Alberta. P. 9). California is unique in the development of humans in North America especially because of its widely varied climate that is hospitable to many different animals and plant life; it varies from Mediterranean and desert to sub-arctic depending on elevation, latitude, and proximity to the coast. Coastal and Southern parts of the state have a Mediterranean climate, with somewhat rainy winters and dry summers. It is due to this rather tranquil climate that so many animals flourished in this area, and subsequently tribes followed them and ended up settling in many areas in California, too. Prior to European contact, California Indians had 500 distinct sub-tribes or groups that consisted of 50 to 500 individual members (Pritzker, Barry M. (2000). *A Native American Encyclopedia: History, Culture, and Peoples*. Oxford: Oxford University Press; 112.). Because of the temperate climate and easy access to food sources, approximately one-third of all Native Americans in the United States were living in California at one time (Starr, Kevin. *California: a history*, New York, Modern Library (2005); 13.).

The Paiute people are one example of a tribe that developed and flourished in California, spreading throughout the state and eventually other parts of the country. The Paiute people spoke a numic group of the Uto-Aztecancan language branch which united the tribe across the country. Different groups of Paiutes settled in different areas of California, yet shared similar cultural practices even though they did not always share genetic relationships or political connections (Fowler, 1978; 435-465). One particular group of Paiutes settled in the southern-most part of
California in the Mojave Desert. The Mojave Desert, however, is one of the more temperamental regions in the country let alone the state of California. The area experiences extremes in weather daily as well as seasonally; the area has the lowest elevation in North America with Death Valley at -282ft below sea level, but it also has elevation as high as 5,000ft. Death Valley has recorded some of the hottest recorded temperatures on the planet where in the summertime the temperature often exceeds 120° degrees Fahrenheit. At night, especially in the winter, temperatures are below freezing at an average of 20° Fahrenheit. Another extreme of the area is the lack of rainfall. The Mojave Desert itself receives less than 13” of rainfall per year. At higher elevations, rainfall is higher but it falls in the form of snow. During the spring and summer months when the temperature is rising, the snow on top of the higher elevations and mountains melts, causing flash flooding and temporary lakes and streams. This temporary water source is crucial to the survival of the plants, animals, and people in that area. Migrating birds drop fish eggs off of their feathers into these temporary waters which grow into fish that were another resource for the people and animals that live there. The flora and fauna of the area was well adapted to the extreme environment, too. Creosote, Chia seeds, ephedra, mistletoes berries, and barrel cacti are just some of the desert region plants that played a huge part in supporting life in this area. What could not be eaten or ground into flour was used to get water or even made into tools and jugs. Some animals resided in the area seasonally, others year round. Animals are more dependent on water for survival than plants, thus they have to avoid the heat as much as possible in warmer months to conserve as much water and energy as possible. Most animals are active during dawn and dusk when the sun is least intense and retreat into cooler, moist burrows or shelters during the heat of the day, and these patterns were copied by human inhabitants for survival as well. (Fowler, 1978; 435-465).
The geology of the region is very unique, too. It is characterized by basin and range topography, alternating between narrow faulted mountain chains and flat arid valleys or basins, even desert regions. Depending on the weather and time of the year, the flora, fauna and even courses of streams would change annually.

For such an unpredictable area, it is surprising to believe that people inhabited it at all. The specific group of Paiute people who inhabited the Southern California desert environment is referred to as the Southern Paiutes. The Southern Paiute traditionally had 16 to 31 subgroups, bands, or tribes (Kelly, Isabel T. and Catherine S. Fowler. "Southern Paiute". D'Azenvedo, Warren L., vol. ed. *Handbook of North American Indians: Great Basin, Volume 11*. Washington, D.C.: Smithsonian Institution, 1986; 394.) who were all linked by a common language and similar cultural traits. The culture that developed for the Southern Paiute evolved out of the desert region. Customs developed because of and surrounding the desert environment. For example, the clothing that the Southern Paiute developed out of the desert environment directly reflects the weather and climate of the region. During the day clothing would be light to let cover the skin to avoid the sun, and during the night it had to be thick and warm enough to withstand below freezing temperatures. The Paiute made wickiup structures as shelters to protect them from the sun and elements also including the wind and cold. They were made of grasses, sticks, and branches solidified with mud. They were not meant to be permanent structures because of their highly mobile lifestyle.
that relied so much on seasonal hunting and gathering. They paid little attention to subsistence farming because of the harsh environment that could not always support large amounts of crops.

The Southern Paiute are especially known in their community for their wonderful baskets, ceramics and clothing including moccasins as well as many other household and ceremonial tools that were made from resources in the surrounding area (http://www.fs.usda.gov/detail/Dixie/home/?cid=fswdev3_006718). These cultural artifacts are very important because of how rare the resources are in that area, which drives up their value, especially for items and artifacts before the contact period.

The Paiute people are products of their environment: their immediate surroundings had huge impacts on all parts of their life, some even concerning life and death. Resources like water, plants, and animals were limited and thus very valuable. The Southern Paiute are held in especially high esteem because of their resilience and their ability to adapt to their surroundings. The location was often times harsh and hostile, yet they were completely at its mercy for survival. The unique geographic features and climate had a huge, lasting impact on every aspect of the Paiute people’s lives. Those who could not cope with the harsh environment or way of life either split off from the Paiute people to live in more hospitable, habitable environments, or, quite frankly, died. In a harsh environment where resources were limited there was no room for someone who was using more resources than the environment could support.
Although the Southern Paiute people, for the most part, resided in Southern California, they did branch out to other parts of the country. They radiated fairly close to their place of origin, staying in what is today neighboring states that would have been separated by geographical landmasses and features like mountain ranges. There are still large populations of Southern Paiute people today in Utah, Nevada, and parts of Colorado. Sickness and disease, enslavement, and government regulations have severely hindered the population of the Southern Paiute people from the 1800’s to present day, but prior to these relatively ‘modern’ interferences was another factor that contributed to the loss of the Paiute population. Members of the Southern Paiute tribe who could not survive in the desert region environment, whether it was because of the heat, lack or resources or lack of water, split up and regrouped out of the desert and into the valleys of the surrounding mountain ranges. Two of the valleys in the Mojave Desert were prime candidates for habitation: Saline Valley and Panamint Valley, both a part of the Sierra Nevada mountain range. Saline Valley is a large, deep and arid valley in the northern corner of the Mojave Desert.
in California. Where the Paiute settled in the Saline Valley was in the rain shadow of the mountain, which protected the people from incoming weather systems. The Panamint Valley is located in the northeast of the Mojave Desert and connects the Panamint mountain range with the Saline Valley. (Fowler, 1978; 435-465).

The valleys offered more of a variety of life for the Paiute who relocated there. The Saline Valley is comprised of a large dry lake, meaning it is only full with water for part of the year. The land is made of a series of salt flats that consist of fine-grained sediments infused with alkali salts. The lakes themselves never get too deep; in fact, the sun is so strong in this area that it evaporates the water, leaving behind a thin layer of salt on the dried up earth. The west end of the lake supports a salt marsh, which contains a variety of plant and animal life including different species of birds and specially adapted root vegetation and grasses that can tolerate the high concentration of salt in the water. The Panamint Valley lies in a north-south direction linking the Panamint mountain range to the Saline Valley. It is a hot and arid climate, and the basin floor is a nearly leveled lake plain, gently sloping so that the floor easily collects water. The Panamint Valley is high in salt concentration, similar to Saline Valley, and is host to an array of vegetation including grasslands filled with verbena, Indian ricegrass, pickleweed, and saltgrass, and shrubs including brittlebush, creosote, white bursage, desert holly, and greasewood Bristlecone pine, Curlleaf mountain-mahogany, and limber pine (http://digital-desert.com/ecosections/322ae.htm).

Many of these shrubs were used in the process of making wickiups if they could not be consumed or used to harvest water. Streams are dry most of the year, but during rain storms and when the heat caused mountain runoff water collected rapidly and drew a crowd of patrons including animals and humans. Water is the main source of life, so where water is, life will exist
out of it. Because many of the water sources in the valleys were not permanent and it was unpredictable when another rainstorm may come, creeks, lakes, and ponds let alone marshes were crucial to the survival of plants, animals and humans in the region. (Fowler, 1978; 435-465).

The Paiute who moved into the Saline and Panamint Valleys soon began to be known by a different name. They referred to themselves as the Valley People, or in the numic language group, the Shoshone, to distinguish themselves from “the People”, the Paiute in the desert environment. The Shoshone people evolved out of the Paiute people. They both still continued to share the same language base and some cultural traits, but as their environment changed so too did parts of their culture. The Valley was able to support a more varied and slightly more dependent life source than the desert was as far as animals, water and plant life was concerned. The mountains kept in the heat of the day after the sun went down, making the climate slightly warmer at night in the summers, yet still during winter months higher elevations would have been colder and experienced periodic snowfall. The Mojave Desert contains the lowest point below sea level in North America in Death Valley, but Saline and Panamint Valleys are a lot higher in elevation, ranging from 2,000ft to 11,000ft (http://digital-desert.com/saline-valley/). Trees were more abundant in the valley than in the desert for making tools and fires out of wood. Different crafts were able to be made, or conversely, were not able to be made with the change in natural resources between the two regions. The Panamint and Saline Valley Shoshone are also recognized as the Timbisha Shoshone, meaning red rock face paint, which was used in ceremonies that symbolized where the tribe got its strength: the earth and multiple groups existed at the same time in the valleys. (http://www.nps.gov/deva/parkmgmt/upload/TribeOverview.pdf),
In the Valley, men were able to use trees to make bows and stone-tipped arrows, enabling hunting to be much more efficient. Women collected plants and made baskets out of the long grasses on the valley floor. In some parts of this area today basket making is still practiced. Fragments of ceramic vessels have been found at higher elevations, suggesting that perhaps these ceramic bowls, vases and containers were made at lower elevations were clay would have been more readily available and brought to higher elevations (http://www.pcas.org/documents/V481and2Spoonhunter.pdf). This also suggests the continuing relationship and trade between the Paiute and the Shoshone.

As the Shoshone further developed as an independent people from the Paiute, changes in culture began to emerge. It is evident that the two groups lived in very different environments, one in the desert and the other in a high elevation valley, and these different landscape environments had profound effects on how the culture developed. From the food that was available, the plant life, and neighboring animals as well as the different geographical features like mountains, sand dunes, salt flats and dry lakes, all of these instances influenced the Shoshone’s daily routine, how they interpreted life and how they assumed their roles as children of the earth. This will be particularly evident when the mythology of the Saline and Panamint Valley Shoshone is compared to the mythology of the Sheep Eater Shoshone, relatives of the Timbisha 800 miles away who migrated from the Mojave Desert northeast over the Rocky Mountains to the Greater Yellowstone area. (Fowler, 1978; 435-465).
8. **The Archaeological Record**

The Shoshone were nomadic hunter-gatherers, just as the Paiute, and followed their game herds wherever they roamed. Just as the Timbisha Shoshone emerged from the Paiute people, groups of Shoshone who had retreated into Saline and Panamint Valley eventually continued the dispersal eastward. This was probably a combination of following the big game herds and looking for more resources that were readily available and easily accessible. The Shoshone archaeological record stretches from their point of origin in Southern California as far east as Wyoming and parts of Montana. It is debatable when migration started and when the Shoshone settled in the Greater Yellowstone area (GYE), but there are at least two theories that suggest when the Shoshone would have first started their migration and how early they would have been in the Yellowstone area. (Loendorf, 2006; 16-22)

The Lamb model was proposed by linguist Sydney Lamb in 1958. While studying Great Basin languages he proposed that, based on changes in vocabulary and estimates of words loss through time, the Numic-speaking Shoshone groups had migrated from their homeland in the Southwest in a three-pronged formation across the Great Basin areas of California, Nevada and Utah (Loendorf, 2006; 18 pg.). In regards to the Sheep Eaters in the Greater Yellowstone area, it seemed as though the Shoshone seemed to migrate along the middle prong of the fork. This migration path would have led from Death Valley National Monument to what became their homeland in the area surrounding Yellowstone National Park; he estimated that the Shoshone probably left Southern California en route to migration in 1000AD, and tribes probably reached Wyoming by 1200AD. Many archaeologists accepted Lamb’s model because archaeological
surveys and excavations indicated that the distribution of Shoshone pottery and possible
Shoshone rock art followed approximately the same migration route at the same point in time
(Loendorf, Lawrence A. Stone, Nancy Medaris. Mountain Spirit: The Sheep Eater Indians of
Yellowstone. University of Utah Press, 2006. Pg. 18.) As the archaeologists traveled further
backwards in time, a reduction in the number of Shoshone sites was evident, starting roughly in
1000AD, proving that there could have been a large-scale out-migration of Shoshone from the
Death Valley area during this time. Highly respected Swedish Anthropologist Ake Hultkrantz, an
expert on Sheep Eater ethnohistories, concluded from this evidence that Shoshone groups had
arrived in Wyoming less than 1,000 years ago (pg. 18).

Not all archaeologists believed the Lamb model. Some archaeologists believed that the
Shoshone had ancient roots in both Wyoming and Idaho going back perhaps 5,000 years or
more. At the forefront of this argument was Smithsonian Institution archaeologist Wilfred
Husted. He believed that based off of excavations at the archaeological site Mummy Cave and
the presence of the Wahmuza projectile point, the Shoshone must have been in the area no early
than 5,000 years ago (p.18). Idaho archaeologist Richard Holmer and his colleagues decided in
1986, that the best way to determine what happened in the past through the direct historical
approach, an excavation technique that began with searching for secure historical knowledge
and worked backward in time from there (Shoshone-Bannock Culture and History Richard N.
Holmer, Martin Boudreau, Idaho State University, Swanson/ Crabtree Anthropological Research
Laboratory Idaho State University, 1986 - Bannock Indians:358). At one site in particular, what
went on to be known as the Wahmuza site, Holmer
found
beads,
musket balls, and a particular stone tool. What was unique about the stone tool was that it was contained in nearly every stratified layer through the earth going back over 3,500 years. This stone tool was named the Wahmuza projectile point and was thought to be used on the end of a lance. The point began being recognized in different archaeological sites along the supposed Shoshone migration route and in multiple layers of the ground. The Wahmuza point is important because its significant presence over a long time period represents the presence of a lengthy, continuous, unbroken cultural tradition (pg. 19).

By applying the direct historical approach archaeologists were able to identify specific Shoshone artifacts and assume that underlying material found directly beneath it also belongs to the same Shoshone culture. This technique was most important in the discoveries that took place at Mummy Cave on the North Fork of the Shoshone River east of the eastern entrance to Yellowstone National Park. The cave wall is an overhang cut into the side of a cliff and would have provided protection from the elements including rain, snow, sun and wind, and the wall would have reflected heat from fires. The cave is situated so that naturally very little water reaches the interior. The dryness of the area has helped preserve artifacts over the past few thousand years. When the area was excavated, 38 separate occupation layers from different time periods were uncovered, measuring a total of 33 feet down into the ground. At nearly every level the archaeologists surveyed, they found the same type of Wahmuza point over and over mixed in with remains of animal bones and long extinguished camp fires. Perhaps even more important, and if not, at least more exciting was the discovery of a mumified human remains in Layer 36. The mummy, nicknamed ‘Mummy Joe’ was found alongside an unusual amount of perishable artifacts including leather, feathers, basketry and wood. After radiocarbon dating it was found that Mummy Joe had died around 800AD, making him over 1200 years old. This finding would
support the Lamb model, that Shoshoni Indians entered the area between 1000-1200 years ago, but because the Wahmuza point was found with the body and in every subsequent layer dating as far back as 9,000BC and most recent as the year 1500AD, it suggests that Sheep Eater relatives have been present in the park much longer than the Lamb model’s suggests, overthrowing Hultkrantz’s assertion that the Shoshone began settling in Wyoming only 1,000 years ago. (Loendorf, 2006;19)

There is one final twist in the archaeological record that opposes the Lamb model and further helps to support the Mummy Cave theory. Approximately 16 miles east of Mummy Cave, south of Cody, WY, at a site called Legend Rock petroglyphs were made in a mixture of different rock art styles, but the on most abundant type was in the Dinwoody tradition (Loendorf, 2006; 20). The Dinwoody petroglyph tradition has been shown to have a clear cut and unambiguous association with the Sheep Eater Shoshone (Francis and Loendorf, 2002; 97-104). A sample of charcoal from the petroglyphs was taken and radiocarbon dated to an age of 2000 before the present. When this data is combined with a variety of other relative and chronometric dates from excavations at the site, the Dinwoody petroglyph tradition appears to be between 3,000-4,000 years old. This age is both older than Mummy Joe and older than the Shoshone were even thought to be in the area according to the Lamb model. (Loendorf, 2006; 21)

The archaeological record is important in studying the Shoshone and the Sheep Eater branch because we are able to learn more specifically about their way of life, how they lived, and what they ate. Archaeological sites, ruins, remains and remnants are the record of a time period where
there is no written record of how life was, so excavating for physical remains is the closest we can get to understanding how life was. It is scientist’s job to interpret remains and come up with answers using the left over evidence to figure out why things were the way they were in the archaeological record, for example, why Paleo-Indians may have resided in one location or even why buildings or shelters might have faced certain directions. By linking together items found at different sites we can conclude how migration patterns and routes took place, and we can observe what items the migrating bands carried with them or left behind as garbage. Even the smallest artifact left behind can contain a great deal of knowledge, whether visible or invisible to the naked eye, so all artifacts from these sites are very important when it comes to interpreting items found and trying to date the site. (Loendorf, 2006; 22).
9. Shoshone Sheep Eaters

The different tribes and groups of Shoshone who occupied the area west of the Rocky Mountains are often times described or named after their specific geographical location or areas where the group was most likely to roam and hunt in. The Timbisha were referred to by the valley or mountain range they inhabited (ex. Saline Valley, Panamint Valley). East of the Rocky Mountains, however, the way in which the Shoshone are referred to changes, especially in the GYE. Instead, they are referred to by the food source the group consumes on the most regular basis. The GYE, where many Shoshone groups settled, has a wide variety of food sources, from plants to animals and fish. If one particular group of Shoshone frequently fished, they might be referred to as the Agaidika, or salmon eaters. Different names of tribes sprang up depending on what they ate; Kuchundika, the bison eaters, Yambadika, the root eaters, Kamudika (rabbit eaters) and Hukandika (seed eaters) just to name a few. What is important about these names is that they could easily change depending on the diet of the group. For example, if Sheep Eaters were to descend to lower elevations to hunt bison, they would be referred to by outsiders (people not a part of their group) as Kuchundika, even though their primary source was sheep. This makes it harder to distinguish particular groups from one another because the act of changing the group name is the same as changing your last name periodically with what you ate, where you moved, or your occupation today. (Janetski, 2002; 40-42).

The Sheep Eater (Tuka Dika) tribe was a band of Shoshone Indians who lived sustainably in the lands we now know as Grand Teton, Yellowstone, Wyoming, Montana and Idaho. They traditionally spoke the Shoshone language; part of the Numic language branch of the Uto-Aztecan family, same as their ancestors the Paiute people. The Sheep Eaters were a semi-
nomadic people; they hunted and gathered in balance with the climate, topography, flora and fauna of the land. The Sheep Eaters were sometimes referred to as toyani, or ‘mountain dweller’ by other Shoshone, and this is important because it serves as another way to identify the group instead of solely based on their diet. The Sheep Eaters lived at high elevations in both mountains and valleys in the Greater Yellowstone Ecosystem, but particularly favored the area that now occupies the National Park. They traveled in small groups of no more than five families but sometimes as groups as small as 5-7 people. Sheep Eaters were observed occupying the clefts of the rocks in the 1832 as the United States Army moved across Wyoming under Captain Benjamin Bonneville exploring the area and setting up trade networks and trading posts, but most notably were known for the wickiups covered in deer skins that they made out of the otherwise useless lodgepole pine, whose interior trunk is twisted in such a way that the wood cannot suitably be made for much else. (Janetski, 2002;40).

The Sheep Eaters were one of the more respected Shoshone tribes by other groups. They were fine craftsmen and made some of the best quality clothing out of big horned sheep’s skins. They were also known for their winter clothing as higher elevations were colder and snowier than lower ones. The Sheep Eaters not only consumer the big horned sheep, they recycled every bit of it. Bones were used to make tools, horns were used as drinking and storage vessels, and ligaments were used in conjunction with straight, flattened horns to make some of
the strongest hunting bows in the area. A soft stone called steatite was also harvested and carved out to make bowls and other stone tools. The Sheep Eaters used other resources in the area to carry out life, and a big resource was obsidian. Obsidian is created when lava cools at a rapid pace, leaving behind a glossy black rock that can be carved to make arrow heads, knives and even jewelry. The Sheep Eaters used obsidian to make arrow heads for their bows and knives for hunting, cutting and carving. The Sheep Eaters traded their obsidian and obsidian tools with other neighboring tribes, and obsidian that has been directly traced back to Obsidian Cliff in Yellowstone National Park has been found in Indian archaeological sites as far east as Ohio (http://www.greateryellowstonescience.org/files/pdf/ys1_cannon.pdf). Men generally did the hunting while women dug roots and gathered greens and berries found abundantly in summer months. They would move almost continuously during the summer, following the food supply as it ripened. In the winter they would occupy semi-permanent camps in a location where game would be abundant. They used snowshoes to give them mobility and speed advantage over the large game animals which would break through the deep snow and be trapped. They also constructed traps from fallen wood into which they would drive small groups of animals (http://www.hanksville.org/daniel/misc/sheepeters.html).

Sheep Eaters believed in animism, a paradigm that does not separate the supernatural from the natural world. They believed that every being, living or inanimate, had a spirit, and we actual living beings. In this worldview, strangely shaped rocks, animals and human beings are all ‘animated’, or given life, by an indwelling spiritual power. Sheep Eater religion was ecological in focus, for the spirit entities embodied in the meteorological forces and various animals were seen as controlling the dynamics of their mountainous, geothermal environment (mountain spirit pg. 37). Physical and spiritual phenomena were both part of a hierarchy with the sky and things
happening in it at the apex of the hierarchy and things that happened on the surface and the ground and even below at the bottom of the hierarchy. Not all spirits were equal in power, for example, mountain medicine spirits lived high in the mountains and gave lots of healing power to Sheep Eater medicine men – the Sheep Eaters lived high in the mountains among the spirits, absorbing some of their power (mountain spirit pg. 38). Sheep Eaters were not afraid of the geysers and thermal features as many rumors have said, in fact, thermal features were viewed as having great, powerful water spirits that could be either good or bad (mountain spirit pg. 39).

Yellowstone's geyser basins were important destinations for ceremonial and medicinal reasons; the thermal features and their spirits were respected because of their ability to heal as well as the possible danger they represented (http://www.nationalparktravel.com/yellowstone_history.htm).

In Peter Nabokov and Lawrence Lowendorf’s research novel, *Restoring a Presence*, research and consultations with many Shoshone tribal members revealed ancient secrets about the Sheep Eater’s relationship with the thermal features, saying that thermal waters, mud, and minerals were used extensively by their people for their healing properties (p. 8 and p. 278). Other native consultants disclosed that many Shoshone Indians, especially prominent chiefs, had been buried along with their horses and possessions in the hot springs, while a Nez Perce tribesman stated that the hot springs had been used for cooking food (Nabokov & Loendorf, 2004, p. 278 and p. 282).

The Sheep Eater’s environment was completely opposite of that of the Paiute people. The Greater Yellowstone Ecosystem is more diverse in both plant and animal life, and though the weather can be a bit unpredictable at certain points of the year in the park, it does not nearly go through the daily extremes that desert environments do. Some parts of the GYE receive four meters of snow a year in the winter time, so water is not nearly as much an issue in Yellowstone
as it is in Death Valley. This gives the Shoshone, and specifically the Sheep Eaters, more freedom to move around the area and less dependence on one area alone because animals, forage-able plants and water can likely be found nearby. Because of the differences in region, climate, environment, landscape and the plants and animals found here, the Sheep Eaters reacted and responded differently in their practices and customs than the Paiutes. A different culture emerged out of the subalpine forest of the GYE than the Mojave Desert environment. Although physical remains have been studied and show directly how the environment made an impact on the lives of those who live there, studying and comparing the mythology of the two groups of Shoshone will show how the landscape had effects on the way the people perceived their surroundings and interpreted, or came to the conclusion, of how their surroundings came to be, which is otherwise intangible and we have no physical remains of.
10. Myth, Legend, and Folklore

In 1804, only a year after President Thomas Jefferson bought the Louisiana territory from the French which more than doubled the size of the United States, Meriwether Lewis and William Clark were commissioned on a mission to document resources found, map the newly acquired territory, find a practical route across the continent, and establish an American presence where British and other European trappers had previously been exploiting the land of natural resources, especially pelts and furs. Lewis and Clark’s expedition and their encounters with various Indian tribes across the territory greatly changed the way many Native American tribes were viewed, specifically tribes who occupied what would eventually become known as the greater Yellowstone area. With Sakajawea, their Shoshone Indian woman guide, Lewis and Clark were able to observe and record information regarding different tribes’ lifestyles, customs, traditions, and social codes that each lived by. Sakajawea was able to act as an interpreter between the explorers and the encountered tribes, relaying that the expedition was peaceful and meant no harm to the Indians they encountered. The expedition was able to live within close proximity to Indian nations and learn first-hand the ways of their peoples. In the winter months, they would have observed traditional dresses, learned some of their wintertime hunting strategies, and heard traditional stories, myths and legends told around campfires in tipis and lodges. (Allen, 1916; 366). The expedition relayed this information back to President Jefferson when they returned to the east coast in 1806, which in turn presented it to Congress. It is not to say that Lewis and Clark were the first whites to encounter Indians west of the Mississippi. Jesuit missionaries had been in the area working with Natives since the 17th century (Greeg, 2000, Preface). However, these accounts became some of the earliest, most well documented written accounts of Native American mythology.
Today it is synonymous when one thinks of Indians to imagine the culture that goes along with them. Because of the early stories that were shared about their beautifully crafted buckskin clothing adorned with beads, their long hair tied back with feathers, and their finely crafted stone and bone tools, these stereotypical images are among the first that come to mind when the topic of Native Americans surfaces. Their cultures are so distinct and different from traditional Christian culture that they are almost a novelty. Many native tribes attribute the source of their customs and traditions to age old stories that have been passed down orally from generation to generation. These stories are in the forms of myths, legends, and folklore that describe not only where traditions came from, but they are the histories of where the people came from, how they got on earth and to the area they inhabit, and how they were instructed to live. Many non-Indians hear the tales and judge them as unreal, that they are simply fiction or imaginary, but to Indians themselves these stories are truth, their religion.

To question Native American myth would be the same as questioning Christian biblical stories as false. In order for non-Native American Indians to understand this, a great deal of ethno-cultural empathy is needed in order to understand the feelings and beliefs of those who are ethnically and culturally different from themselves.

Professor Alan Dundes of the University of California Berkley states, “A myth is a sacred narrative explaining how the world and humankind assumed their present form” (Dundes, 1984;1). Myths are stories with purpose; they are explanatory and offer clarification on some of the age old questions of creation: where did the universe come from? How did people come to look as they do now? What causes a storm or clouds? Myths are tales that are told to describe the unexplainable occurrences and events in the natural world. For Native Americans, myth is usually accepted as truth. Myth is a part of Native American religion; it is part of tradition to
pass it down from generation to generation, usually orally, because none of the native languages of America had a writing system until the arrival of Europeans. Myths are regarded as true accounts of historical happenings, but what separates myth from fact is generally the myth is so farfetched from reality that it is inconceivably unbelievable: myths often recount stories of gods or supernatural spirits who perform outrageous seemingly impossible feats of strength, cunning, and power, whether it’s physical or magical. (Campbell, 1997; 107).

Myth, legends, and folklore are all closely related types of traditional stories (Alan Dundes, 1984; 5-29). While myths customarily focus on supernatural heroes, legends, on the other hand, feature humans as main characters though still overcoming some type of adversary. Legends are regarded more as historically true, yet not totally authenticated. Legends revolve around stories that are more probable to happening than a myth, yet still, the main character can either overcome the adversity or succumb to it. Not all legends and myths have positive outcomes. Some characters have faults which are ultimately their downfall and cause bad things to happen, or in the least, are allegorical for ideas, concepts or even natural phenomena. Finally, folklore not only encompasses myth and legend, but also traditions, customs, and beliefs of a group of people. It can include art, literature, knowledge and practices, all passed orally from generation to generation. These instances can be material or intangible. Myth and legend are considered folklore, but not all folklore is considered myth or legend. Although all three are considered significant and deeply rooted in the culture of a group of people, there are very fine distinguishing lines between the three. (Campbell, 1997; 107-110.).

It is important to note that there were at one point in time over 500 tribes in California alone; all of these tribes are different, speak different or in the very least, similar languages. (Pritzker, 2000; 112) California has already been evaluated, and we know how varied the
landscape was. At one point in time there were thousands of tribes stretching across North America, all living in different environments with different backdrops all across the nation. Each tribe faced its own issues regarding food, water, resources, space and, of course, social and political issues. As people migrated into different regions they witnessed different geological formations, natural wonders, and spectacular land formations that were completely different from the places they had since migrated from. Not having explanations for the new landscapes or how they came to be would be both strange and scary to a group of people who had never witnessed anything like that before, and this added to the stress of survival and understanding the world they lived in. Myths were developed and used to try to explain, clarify, and understand the happenings in the natural world they had no justifications for. When comparing myths from different groups on the same subject, many times they are very different, and in others, very similar. Myths can be influenced by many different factors, but the largest is clearly the landscape as it is the dominant background of the Native American; the earth provides the sustenance of life, therefore all life revolves around it and trying to understand it and guarantee it continues to provide for the people who rely on it most. As the landscape, as well as the tribe and language, across the country changes, so too, does the myth, in both small and large ways – from details to the main action of the myth.

The variation in myth is important to study as well. It proves that there is not just one correct answer to a question you do not know the answer to. Variation demonstrates that mythology can be a matter of perspective, similar to today’s science and religion. Science is constantly being reinvented with advances in technology and new discoveries, difference religious councils meet across the world to evaluate different doctrines, update them to modern standards, and weigh the consequences of choices that are either morally right or wrong. Science
and religion are two other devices the human race uses to answer the same age old questions that Native American mythology does: where did we come from, why are we here, and how did the world assume its present form? There is never just one answer or way to solve a problem; anyone can take these different perspectives, combine them in any way they wish, and create for themselves their own version of how they believe the present came to be. The beauty of this is that there is no right or wrong answer, and everyone regardless of tribe, race or gender can create and interpret their own belief system in order the further understand the human condition.

11. The Greater Yellowstone Ecosystem: A Landscape influencing Culture

Norwegian botanist and paleoecologist Knut Fægri once wrote, “The cultural landscape can only be understood by its antithesis: untouched, unspoilt nature” (Fægri, 1988). To understand this phrase, the word “cultural landscape” must be dissected. While the word ‘culture’ has many broad, accepted definitions, to anthropologists human culture is more or less intangible. According to English anthropologist Edward Tylor, culture is, “the complex whole that includes knowledge, belief, art, morals, law, customs, and any other capabilities and habits acquired by man as a member of society” (Tylor, 1871; 1). Culture is the full range of learned
human behaviors patterns; it is the sum of the characteristics that define a group of people. This includes religion, rituals, music, food, clothing and dress, language and even architecture and tools. Every group or society of people on earth has some type of culture that defines them.

Culture is a universal; although it may vary from different groups of people, every group of people has some kind of culture that defines them. French sociologist Emile Durkheim and French anthropologist Claude Levi-Strauss both discussed cultural universals as elements, patterns, traits, or institutions that are common to all human cultures worldwide, however, how they are expressed in specific cultures is different (Schacter, Daniel L, Daniel Wegner and Daniel Gilbert. 2007. Psychology. Worth Publishers; 26–27). Culture is not genetic; though it may be passed down from generation to generation, this is because it is taught – it has to be learned. Culture is not inherited through genes, and it is constantly changing with the passage of time and the inventions of new technologies and the changing surrounding landscape.

Landscapes are also variable in their definition. Landscapes can be visible, physical areas of land that are characterized by the presence of nature, or they can also include man-made or altered settings. Natural landscapes include landforms like mountains, hills, valleys, bodies of water like rivers, lakes, ponds, streams or even oceans, and sometimes can even include weather patterns like lightning and tornados. Physical, natural landscapes have been forming since the earth was created, and even today landscapes are changing through environmental processes and human presence.

Natural, environmental factors and forces constantly change the environment. Natural forces like rivers and glaciers that carve out canyons, wind and water that can erode mountain tops and even extreme examples of nature like earthquakes, mudslides and volcanic eruptions can change entire natural areas. Lightning strikes can cause forest fires which are necessary for burning off
undergrowth and dead vegetation to give new seedlings room to grow. As we will soon examine, the landscape of Yellowstone is constantly changing; 600,000 years ago, the entire face of the greater Yellowstone area was changed when a volcanic eruption spewed out lava that flowed so strongly it carved out parts of the 24-mile long Grand Canyon of the Yellowstone. Later the canyon was blocked three different times by glaciers, and each time a part of the glaciers melted, runoff further carved away at the canyon (USNPS, *Canyon Area Natural Highlights*. 2014; web). Plants and animals are also important natural factors that can change the face of landscapes. Invasive plant species that are introduced to new environments can take over entire areas and deplete the area of resources such as nutrient-rich soil and oxygen, making it hard for other species to survive. Bacteria and fungi eat away at decaying animals and dead foliage, beavers dam streams and lakes, and animals such as elk and bison eat shrubs, plants, and foliage to help control plant populations and make room for smaller plants to reach sunlight (USNPS, *Environmental Factors*. 2014; web). Even birds spreading seeds through their scat can contribute to landscapes and the changes they face.

Landslides have been extremely important to the habitation and development of different cultures of people over the millennia of human existence. Without fruitful landscapes that are habitable to humans, humans would cease to exist. Environments do not adapt to humans, rather, humans have to adapt to the environment or else face the disappearance of the species. Try going outside in shorts on a sub-zero degree day and asking the weather nicely to warm up and see if you’re alive in eight hours. Nature is one of the last forces on earth that humans do not have control over and are completely subject to. It has been this way since the dawn of time. Humans have to adapt to their ever-changing landscape, and if they cannot adapt, they must move to another corner of the earth where they can adapt. Not every landscape on the face of the earth is
the same, and each different group of people who populates a specific region has learned to adapt to living in that environment in a specific way. Therefore, all different groups of people have learned to adapt to different environments in different ways, and those who have successfully adapted continue to survive today. People who adapted to desert life have adapted differently than those who have adapted to mountain life. In humans, adaptations include different diets, shelters, clothing styles, hunting practices, languages and even genetics. Adaptation has played a huge role in human evolution (Stanford); landscapes and the natural changes they undergo have consequences for both the animals and people who live there, and in return, these adaptations to the landscape have directly affected the culture of the people who live there.

Cultural landscapes, as defined by the World Heritage Committee, are, “properties that represent the combined works of nature and man” (UNESCO, 20012; 14). There are three accepted categories of cultural landscapes:

1) Landscapes deliberately designed and created intentionally by man, for example, New York City

2) An “organically evolved landscape” which may be a “relic (or fossil) landscape” or a “continuing landscape”, or explained more easily, a landscape that combines natural features with human intervention. For example, UNESCO refers to the West Lake of Hangzhou, a World Heritage Site in China, as “an idealized fusion between humans and nature” because of its predominant natural beauty and the inclusion of historic man-made relics that coexist, one without harming the other.

3) Landscape areas that are least evidently ‘shaped’ by people, yet are highly valued. Further, this last type of landscape is an “associative cultural landscape” which may be valued
because of the “religious, artistic or cultural associations of the natural element”. These types of landscapes show little to no intervention by man, and are very close to the way nature intended them to be. There are no towering skyscrapers, dams that recycle water, or historic relics. They simply are how they have been, how nature has shaped the landscape over millennia. Many national parks in the United States National Park Service were created based on this notion: that the landscape be preserved as-is and tampered with as little as possible.

UNESCO, 2012; 14

During the Washburn Expedition to the Yellowstone and Firehole Rivers in 1870, the men who ventured to this area were so touched and moved by its awesome beauty and majesty that they were moved to protect the area from being destroyed by the hand of human. Cornelius Hedges is recorded in first superintendent of the park and Washburn party member Nathanial P Langford’s diary as saying that, “he did not approve of any of these plans – that there ought to be no private ownership of any portion of that region, but that the whole place ought to be set apart as a great National Park, and that each one of us ought to make an effort to have this accomplished” (Simpson, 1999; 167).

To this day, the Greater Yellowstone Ecosystem, which encompasses the world’s first national park, remains to be one of the last largely intact temperate ecosystems in the northern hemisphere with as little physical human influence as possible while still making the park accessible to visitors. The park itself is a good representation of a modern landscape which is least evidently shaped by people, yet highly valued.

Cultural landscapes reflect a relationship between people and their natural environment over time. Landscapes, their character and quality, help define the self-image of a region, its
sense of place that differentiates it from other regions of the world (Hobbs, 2013; 402). Cultural landscapes are a combination of both the physical, natural scenery of a region and the intersection of a culture of a people, a culture which is often times determined, shaped and influenced by the natural surrounding landscape; it reflects a synthesis of people and place, providing a sense of identity to those who live there. Almost all landscapes have cultural associations because almost all landscapes have been affected in some way by human action or perception.

12. A comparison between the mythologies of the Saline and Panamint Valley Shoshone to Sheep Eater Shoshone

1) The Creation of the World and the Origin of the People

Myths surrounding the creation of the world explore how the earth and the people on it came to be. Before people as we know them today came into existence, in many Indian myths tell of a place before humans, where the spirits of animals, plants, and even natural forces as well as creatures like ghosts or what would be today referred to as some type of monster. Since both the ‘worlds’ where the Panamint and Saline Valley Shoshone lived and the Sheep Eater Shoshone lived were extremely different it would be logical to think that their myths regarding how their
world and the people in it came to be would be different. Interestingly enough, they are both very similar and have many differences that make them unique and are direct reflections of the environments they lived in.

The Panamint Valley Shoshone’s myth regarding the creation of the world states that before, the whole earth was covered in water, but it quickly dried up and water became sparse. This is reflective of the environment they live in; the salt flats on the desert floor could accumulate a lot of water very quickly if it rained, but because of the heat and drainage of the land it also evaporated or dissipated very quickly, returning to the barren landscape. Coyote is wandering through the desert and very thirsty; he comes upon a maiden with water, asks her to share with him, and she reluctantly invites him home for water and food with her mother. Coyote is a prominent figure in many Indian myths, and just like the Indians, Coyote was adaptable to many different environments including the desert and subalpine forest like in Yellowstone, but he still needs water to survive. Coyote rapes the maiden, producing small human-like offspring that the maiden puts in a jug and hands over to Coyote, telling him if they ask for water not to take the lid off the jug because they will escape. Coyote does not heed the maiden’s warning and lets the top off the jug near a creek and all the humans escape. They drink all the water, steal coyote’s hunting weapons and take over the area. This shows again how crucial water is to a desert environment and how life would have evolved around and out of it. (Steward, 1943; The Origin of the people, web.)

In the Sheep Eater version of the myth, a father, mother and son are walking across the already made land when the whole area erupts into heat and smoke (Clark, 1966; 172). Yellowstone is filled with many different geyser basins whose hot springs and geyser waters get so hot that steam floods the earth and is so warm it could be mistaken for the heat of a fire. The father tells
the family that if they continue to walk through the smoke they will eventually reach the other side, saying, “Do not look back at the fire. No matter if it’s burning your heels, do not look back”. While walking through, the mother can feel the heat biting the end of her skirt. When she looks back to see how close the fire is, she is turned to stone. If the family had been walking through a geyser basin, it is possible that she could have walked too closely to the edge of a pool or even over thin crust and fell into a hot spring, literally boiling herself alive. I believe this may be the underlying message in the story, especially because of the next part that comes after. The son then decides to get a walking stick to guide them through the field of smoke, and subsequently, every place the boy touches down his walking stick the flames and smoke went out so that the father and son could pass through unharmed. The stick in real life could have been used as a walking stick to see where the edge of hot springs were and to hit the ground to see if they were sturdy enough for people to pass over or go around. At the end of the land of flames and smoke the father and son reached a clearing when the entire earth began to fill with water. The father and son made themselves very small so they could float on the foam of the water. Geographically I believe this is important in the story because we might actually be able to locate this on a map of Yellowstone. On the Grand Loop Road, which links the villages of Yellowstone, there is an area of intense geothermal activity called the Mud Volcano area where mud pots, fumaroles and hot springs are all very active. The Yellowstone River runs to the left of the geothermal area going south towards from the canyon and eventually you will run into Lake Yellowstone, the largest lake at high elevation in America. Geothermal areas can often times be very harsh microenvironments with acidic soil that nothing can grow in, but ten feet away grass and shrubs will grow. This myth could have been derived to explain the areas changed so fast. Finally, the father and son hold a contest between the animals of the water, and
eventually the beaver is able to swim to the bottom of the lake, scoop up some mud, and the father creates the rest of the world out of it including the people. He created the mountains and the valleys, the rivers and streams; he created their home. (Clark, 1966; 172-174)

2) The Theft of Fire

Fire is an important element to the human existence. Fire is used for heat, warmth, light, and to cook. It was used to clear land and even scare away predators. Both groups of Shoshone have similar myths to how their fire was obtained, but again, each myth is dictated a little differently because of the environment where the group is located. In each myth, the animal people have to steal fire from someone else, it was not given to them by any one or any being, and they did not invent or discover it for themselves. What is interesting is that both myths are not only affected by their environment but the animals found in that environment, too.
Both the Panamint and Saline Shoshone share the same myth on the theft of fire. A lizard is lying on a rock when a tule of ash falls from the sky. Because they did not have fire in this part of the country, hummingbird flew up into the sky to look for the source of the ash. Hummingbird spotted a party of people dancing around the fire in the distance. Coyote arranges a group of people to go to the party and investigate the people and the fire. He stations the people of his own tribe in various positions like a train of people backwards to their camp. While the people who owned the fire were celebrating around the fire with dance, Coyote dressed himself in a disguise with milkweed strings covering his head. He then purposefully set his false hair on fire and ran away with it back towards his camp. The owners of the fire began to pursue Coyote, and when they got close Coyote passed off the fire to one of his own people like a relay back towards their camp. The pursuers caught every one of Coyote’s people – including Coyote - and killed them. Rabbit was the last with the fire. He made it hair to stop his pursuers and climbed to the top of a large smooth rock. Rat heard Rabbit crying, so he took the fire from Rabbit, carved a niche out of the mountains near Lida and ran to the summit. The fire burned his chest, which is why it has a red spot there. He eventually scattered down the fire from atop the mountain in the brush so that now if anyone needs fire they can get it out by making a fire drill of the brush.

(Steward, 1953; The Theft of Fire – Panamint Valley. Web.)

The sheep eater myth is virtually the same myth, but it has been adapted by the people to the environment they’re from. The animals and natural surroundings are specific to where they’re located; you find hummingbirds and lizards in the desert environment, but you do not find them in high elevation subalpine forests like Yellowstone. In the Sheep Eater myth, Coyote is sitting on top of a mountain when he sees the smoke from a fire far away. The mountains and hill tops in Yellowstone are more dispersed than in Saline and Panamint Valley where they are more
concentrated and easily seen. Smoke and steam is very visible from higher elevations, and it’s even possible to see smoke and steam from geysers and forest fires miles away. Coyote holds a council where he finds out that the Crane people are the owners of the fire – in the Saline/Panamint myth, they are not given a name other than the ‘people’. Coyote and his group go down to the camp where they are received with open arms and invited to eat and dance with Crane’s people. Jack Rabbit plays the flute at the party, lulling Crane and his people to fall asleep, when Coyote and his group steal the fire using a headdress and they also steal the Crane people’s food source which is tied up in a tree. The headdress is made out of local grasses to the GYE, as the headdress in the opposite myth would have been made from grasses local to the desert environment. Another side note is the Crane people’s food source. This is not mentioned in the other myth, probably because food was a lot scarcer and not stored in mass amounts as the heat and lack of water would probably spoil it. Tying food into a tree is still a prominent practice for campers today as food does not attract or is eaten by bears and other woodland animals. This might be one of the earliest example of the practice, however, the Saline/Panamint Shoshone would not have practiced this nor recorded it in their myths because bears are very rare if not absent from the desert environment.

When the Crane people woke up and found that their fire and food were gone, they set out in pursuit of Coyote’s people. Crow flew in the air with the food, and the animals set in motion a relay to get the fire to the top of the mountain. Crow was caught by Crane, so crow stashed the stolen food in his foot, willed it to rot off his body, and the foot took off into the mountains, spreading seed and food in all directions. As Crow is dying he wishes for snow to cover his foot’s tracks, and this is why it is so hard to find food in the winter time. Eventually, ground squirrel acquired the fire and carried it so close to his chest he burnt his hair, which is why it is
red today. This is also an important fact because both Saline/Panamint Valley and the GYE have different species of ground squirrels. Ground squirrel threw the fire off the top of the mountain, spreading it to everyone in the world below, and Crane, knowing there was nothing more he could do, turned into the bird we know him as today and flew up the Yellowstone River to be solitary and view the fire from above. Jack Rabbit, who used his flute for bad when Coyote’s group robbed the Crane people, turned around and used it for good and brought all the people back to life who had been killed in the pursuit of the fire. (Clark, 1966; 177-179)

Both myths reflect the same process it took for people to get fire, but there are many circumstances that affect the details of each myth. These specifics are reflected in each tribe’s specific environment and dominant landscape. Lizard would have never seen smoke from atop a mountain because the tribe lived on the Valley floor. Consequently, the Sheep Eaters lived in the mountains at high elevation and could see for very far distances. Not only did the landscape have direct impacts on mythologies, but each had its own advantage or disadvantage that contributed to the success of the tribe. Higher elevations gave leverage for sight in the GYE, while in Saline/Panamint Valley higher elevations were an advantage for protection and hard to get to.
3) The Ninnimbe

Specific to the Sheep Eaters are a mythological people called the little people or in Shoshone, the Ninnimbe. A pioneer in the Wind River country, Wyoming, once came upon several ancient yet small dwellings made of sticks and stones held together with mud, high up in the rocks near the sources of Muddy Creek. He spoke with several old Indians and was told that the structures had been made before the Shoshone even came to the region: they were the homes of the Ninnimbe, or the little demon people (Clark, 1966; 180-183). The Ninnimbe were two to three feet high, strong, and fearless, but usually these little people were invisible. They were, “stealthy stalkers, expert hunters, and good fighters, but sometimes fell prey to eagles…. And were afraid of paint” (Clark, 1966; 181). The Ninnimbe were known for shooting their deadly poison arrows and causing misfortune to those the arrow hits. The Shoshone living in the Greater Yellowstone area often times blamed the Ninnimbe occurrences and events that they saw or happened that could not otherwise be explained. If someone were to get sick, disappear or have bad luck happen to them, it was thought that the Ninnimbe caused it to happen. If a Shoshoni becomes ill, his horse lame, his wife runs away with another man, or if his horse gets loose, it is the result of the Ninnimbe shooting their invisible arrows. The Ninnimbe were also thought to be responsible for the petroglyphs at Legend Rock (Clark, 1966; 181). Sometimes the carvings spoke at night, and if you looked directly at them you would anger the Little People, so to protect yourself should you go to pray at the site you should cover yourself in lots of paints that generally would have been made out of the minerals from nearby hot springs and thermophiles. (Clark, 1966;183)

The myth of the Ninnimbe can be looked at from two different perspectives. The first perspective is that when the Shoshone arrived in the GYE, they may have realized that they were
not the first to inhabit the area. Archaeological investigations have proved that migration happened over a series of time, so perhaps when the Shoshone arrived they thought they would find their ancestors but instead found remains and no people. Not knowing or understanding where their predecessors were, they came up with the Ninnimbe as a scape goat or an excuse for the disappearance of their predecessors. The Ninnimbe would have also been a tactic to scare children or adults who did not want to listen to authority, for example, to scare children from wandering off alone where they could be seriously injured or killed by animals or the dangerous thermal features; they would threaten that an invisible force could still harm you. Similar mythological creatures are still employed today, for example, in New Jersey the Jersey Devil, in Mexico the Chupacabra, or even the boogeyman or sandman in American culture.

Another take on the myth is that the myth is actually describing the Sheep Eaters themselves from another Shoshone’s point of view, or perhaps even another Indian tribe’s point of view as local neighboring tribes such as the Nez Perce also have myths about little demon people (Lawrence, 2007; 18). The Sheep Eaters fit some of the descriptions of the Ninnimbe, living in the mountains, appearing at will, and making fine winter garments out of skins and furs (Clark, 1966; 181). Strangely, mummies have been found in Wyoming caves that were no more than 20” tall when they died; the most prominent mummy was discovered by gold prospectors in 1932 in a cave in northern Wyoming buried sitting cross-legged with his hands folded on his lap. Some have even thought that these could be the pygmy progenitor of the American Indian (Lawrence, 2007; 15). If this is from a different tribe describing the Sheep Eaters, it would also prove that different tribes also created myths influenced by their surroundings to explain things they had no other explanations for. It was a common practice, and just as tribes had myths explaining the bad, they also had myths explaining the good, for instance, the Nez Perce also had myths about
little people who brought good luck (Lawrence, 2007; 17). The Saline and Panamint Valley Shoshone do not have myths regarding people that may have been in the Mojave Desert area before them because their direct ancestors, the Paiute, were probably the first to inhabit that area after the immediate migration to North America.
13. Challenges

As with any research project, many challenges were faced from the beginning of this thesis that was unavoidable. It must be noted that science, itself is evolving with new, more accurate technology, thus what we “knew” is not what we “know”. We have growing evidence and remains of the migration from Beringia that it is still uncertain when exactly proto-Indians migrated to North America, how many came, how many waves came, and when migration stopped. Technology so far has not advanced to the point where we can effectively survey and excavate under water where scientists believe substantial remains could be found, so there is still a possibility that more is to be discovered. What supports this statement even more is an unfortunate truth that, while destroying our planet, is revealing more about our historic past. Global warming is having many different effects on our planet; one of the consequences of global warming is that glaciers and ice sheets in Siberia, Alaska and parts of Canada are melting away, leading to sea levels rising, but on the other, hand is revealing almost perfectly intact relics that migrating proto-Indians dropped behind them on their migration route into North America. We have such few remains of our past that it is possible there is still either much to be discovered or too much is too far gone, and we will forever be left to speculate about our past.

There are also challenges in respect to each group being studied. For example, Southern California is a very dry and arid region making it perfect for preserving artifacts. In Yellowstone, the soil is so acidic that many artifacts would not survive being buried for long periods of time, regardless of the fact that it’s also a relatively dry climate. Stone artifacts including obsidian points and arrow heads last longer than bone and wood artifacts and are easily dated. There are still challenges that are posed about migration and contradicting evidence as to how early the Shoshone even settled in the Wyoming and GYE area.
The problem with collecting myths from tribe members is that many of these myths were never formally written down until the 1930s. North American Indians did not have any sort of writing system, so all types of myths, dogmas, mantras, and beliefs were all handed down through oral tradition. This gives way for many errors to occur in the passing down of myths: think of the grade-school game whisper down the lane, what the first person says is always distorted by the time it reaches the last person. In the term of myth, there is always a chance that from the original version getting passed down through generations that at some point the myth was altered. However, it is more important that the meaning of the myth be passed; if the story around the myth alters it is probably less important as long as the meaning is understood.

Some myths were never even written down. There are numerous examples of tribes being wiped out because of disease and warfare, and it is probable that the tribes were wiped out before myths were expressed and written down. When the United States acquired the land in the Louisiana Purchase 1803, the government sent scouts traveling westward to explore the land and record any Indians they encountered and record it on a map. These encounters exposed the Indians to diseases they had no immunity against. The French and Indian War, led by the United States, specifically targeted Indians, ripping them away from their land by forcibly putting them on reservations or fighting in an unequal battle to the death simply for their lands. At one point the American government, in an attempt to appear empathetic to the Native American strife, gave them blankets during a cold winter that were infused with small pox. That same winter the government systematically wiped out the buffalo, a key source of food, clothing, and tools for the Native Americans. By eliminating their food source, the government effectively eliminated the Native American’s way of life, forcing them to rely on the government if they wanted to survive (Williams, History of the Relationship between the Indian and the Buffalo, web).
Many tribes were relocated to reservations, large areas of land that are managed by a Native American Tribe under the United States Department of the Interior’s Bureau of Indian Affairs. They have some sovereignty where the tribe’s council has jurisdiction over the reservation, leaving them to make and enforce some of their own rules and laws, or to even allow casinos to exist. There are about 310 Indian reservations in the United States, but there are over 550 recognized tribes by the government, meaning that not every tribe has its own reservation. This means that some tribes have their own reservations, some tribes are forced to share reservations, or others do not live on the reservation at all. Wind River Indian Reservation, 2011/2012

The Wind River Reservation is an Indian reservation located in the Wind River Basin in central western Wyoming. The Wind River Indian Reservation was established for the Eastern Shoshone Indians in 1868, but it is now shared between the Eastern Shoshone and Northern Arapaho tribes. Of the population in 2011, 8,177 were Arapaho and 3,737 were Shoshone on 1,880,000 acres of Tribal Land (Wind River Indian Reservation, 2011/2012). When these two tribes were forced to live together and occupy the same spaces, send their children to the same schools, and go to the same tribal council meetings to discuss laws and politics, there was ultimately an inevitable clash of cultures. By living in such close proximity and sharing so many parts of life it is inevitable that they must have shared myths, folklore and legend amongst each other. In a sort of swapping and exchanging of stories, tribes would have recounted similar stories to each other, borrowed some parts of other myths and replaced them in their own myths. This would explain why myths about the same subject often times depict different animals as main characters, or perhaps how different events take place in the same stories, yet in the end, the message is always the same. Myths became hybrid blends of two different myths recounting
the same events in two different stories. This means that the myths that we believe belong to specific tribes could in fact not be being remembered correctly at all.

Finally, according to some sources, the myths regarding Yellowstone were never supposed to be revealed. Historian Hiram Chittenden, who worked in the park when it was first opened, said that he could not find out much about what the Indians thought about Yellowstone, nor what they had told whites about it in the past. “It is a singular fact in the history of Yellowstone Park that no knowledge of the country seems to have been derived from the Indians…Their deep silence concerning it is therefore no less remarkable than mysterious,” (Chittenden, 1895; 8;99.). John Hamilcar Hollister visited Yellowstone in 1883, and published an account of the trip in 1912. In his account, he states the now disreputable story of the Indians fearing the geysers, but he also says something very important in our study of myths regarding the Indians who lived in the Yellowstone area. He wondered why he could not find any Indian legends of Yellowstone, and published this statement:

“There are few (published) Indian legends which refer to this purposefully unknown land. Of these I have found but one (other than for the Indians-fearing-the-geysers story) and that is this – that no white man should ever be told of this inferno, lest he should enter that (Yellowstone) region and form a league with the devil, and by their aid come forth and destroy all Indians. Hence, the trappers who were the first white men to enter these western lands, learned little or nothing (about Yellowstone) from that source (the Indians)”

Hollister, 1912: 145

(Lee, 2002; 40-43)

Hollister does not tell us where he first heard this supposed legend of Yellowstone, nor does he say which tribe it refers to, but it is hard to prove or disprove. The fact that he states he heard this in his 1883 trip to the park, which is very early in the park’s history, and while there were probably still Indians living in the park area suggests validity. The first white American to have any knowledge of the park was John Colter, a member of the Lewis and Clark expedition who
branched off to do his own independent fur trapping. He befriended Crow Indians and described his encounters with geysers, bubbling mudpots and steaming pools of water. His reports of these features were often ridiculed at first, and the region was somewhat jokingly referred to as "Colter's Hell". No one believed that such a region existed in 1804, and it was not until 1869, 65 years later, that the Folsom-Cook-Peterson Expedition went to the explore and investigate the area. Indians of tribes as far east as Ohio were aware of the Yellowstone region, and we know this because obsidian from Yellowstone was unearthed in Hopewell territory in Ohio, which is evidence of an extensive trade network (Cannon, 1993, 7). It is clear that Indians of different tribes thousands of miles apart were aware of Yellowstone while the white man had no idea of its existence.

After examining all of this, it seems that Native Americans purposefully kept Yellowstone a secret, perhaps for religious purposes, making sure it remained undiscovered, untouched, and undeveloped. If Natives never wanted the area to be discovered, of course they would never reveal their mythology surrounding the area. Revealing mythologies, folklore or stories would entice outsiders to want to find the area and explore it. The Native Indians who lived there held the area in high esteem; it was a sacred place that was holly and filled with spiritual significance. If what Chittenden and Hollister say is true, then it is possible we do not know all of the myths concerning the Yellowstone area, and it is possible that some may have even been kept secret for so long that they have long been forgotten.
14. Conclusion

After briefly reviewing the components of the natural phenomena in the Greater Yellowstone Ecosystem and how they came to be, it is hard to argue that it is not one of the most unique, fascinating, and simultaneously mysterious places in the country let alone the world. Yellowstone National Park specifically is home to over 300 geysers and over 10,000 thermal features, which is over half of the earth’s known geothermal features. They have been created over thousands of years, and show no immediate sign of stopping. It is an area that is so different and strange compared to any other region in the world that humans occupied at the time that even to this day over three million visitors flock to the park each year to witness the wonders for themselves. By creating this concept of place, readers can only begin to create a visual sense of what it is like to stand in front of a hot spring, steam vent, mud pot, or even a 10,000ft mountain, but this does not include the other physiological senses like smell, sound, or other exterior stimuli that are associated with, for example, high elevation pressure, temperature and weather, or even climate. By comparing the mythology of both the Panamint and Saline Valley Shoshone to the Sheep Eater Shoshone of Yellowstone, we see how myths are greatly shaped by the two very different landscapes and surrounding ecosystems. If it were not for the two extremely different settings, there would be relatively few differences between myths from the different tribes on the same events or happenings witnessed in the natural world. It is very clear that there is a correlation between the natural landscape and the mythology of the region, and it’s only with the contrast between the desert climates that the Saline and Panamint Valley Shoshone live in and the high-elevation mountain climate of the Shoshone Sheep Eaters that the mythologies begin to diverge based on those natural landscape differences.
Although the dominant landscape largely influences the setting and order of events in either of the tribe’s myths, it would be unjust not to mention the other influences on these myths. After researching and studying these myths and the regions they come from, I have learned that they are also largely influenced by the fauna and flora of the area, too. For example, different animals, whose habitats are limited to each respective tribe’s region, only appear in the myths of tribes who live in that region. For example, you find Hummingbird as a character in many Panamint and Saline Valley myths, but you do not see or hear of Hummingbird in Sheep Eater myths, even in both of the tribes’ same myths. Hummingbirds are not found in the cooler, high elevation climate where the Sheep Eaters’ resided, and thus, they would not have had a name nor a character for Hummingbird to fill in their stories. Coincidentally, Sheep Eater myths include animals such as beavers and fish, who reside in or near water, where Panamint and Saline Valley Shoshoni myths do not include these characters because their desert environment does not regularly support water, nor would it support those creatures to live there. The animals, their spirits, and the characters they take on and represent in myths are respective of the region they’re from, just as the setting of myths is reflected by the surrounding landscape of the tribe who resides in the region.

Indigenous native plant-life including trees, shrubs, flowers, roots, berries, bushes, and other plants are equally represented corresponding to the Shoshone mythologies of certain regions. In fact, Shoshone Sheep Eaters were highly respected among other local tribes to the Greater Yellowstone Ecosystem for their access to special plants, herbs and flowers that grew at higher elevations, which were used for medicine purposes and ritual practices. Again, the desert climate that the Panamint and Saline Valley Shoshone evolved out of supported different plant life that had adapted to the environment, and so the different tribe’s mythologies developed also
according to the different plant life that had adapted to their respective environments, as well as the people who inhabited them.

Myths have been recorded and passed down along many generations for hundreds, even thousands of years. It is hard to find the exact root of why these myths were generated, but when you realize that many of the myths are cultural universals, meaning that almost every over band of people on the planet has a similar story explaining the same phenomena, you start to question how these different groups thousands of miles apart came to the same or similar conclusions about events in our world’s past. Perhaps, it has been suggested, that these myths are representations of distant human memories that have long since been forgotten, and yet have been revived and slightly distorted according to each respective group of people’s surroundings.

Myths, folklore, and legend may change with the passage of time, but in the end, the meaning and point that is meant to be brought across remains the same. In some cases, these altered story lines may even lead to altered messages, but their purposes have always been to teach and instill values to the next generation. Today myth, legend and folklore continue to lace our societies, even though we have come very far from nomadic tribes traveling the plains of North America. These myths are even still to this day reflective of our environments: city sky scrapers do not have thirteenth floors, but if you do not live in a city this myth would not pertain to you. The Jersey Devil or Big Foot is another example of a myth or legend that has been passed on for generations to explain cattle kills, missing children, and strange occurrences, but again, if you conversely live in a city with no woods or swamps, you would not have myths regarding their existence or incidents that have occurred around them. Today myth is still echoed in our environments, no matter natural or human-constructed. We use these myths as substitutions for
circumstances and events that we as humans do not understand or have explanations for; crop circles on farms, things that go bump in the night.

As for the Paiute people, the Saline and Panamint Valley Shoshone, and the ancestors of the Sheep Eater Shoshone, their traditions very much live on in the modern day. Many tribes reside on reservations, and their stories can now be passed on not only verbally but also physically in the form of writing, picture books, recorded songs, art, and even movies. These tangible forms of myths help modern day Native Americans connect with their ancestral roots and assure their culture will continue to survive. No matter how far the human race advances technologically, they will also continue to evolve as people, and find new ways to apply the meanings and symbolism found in these ancient myths and stories to their everyday life. Stories may change and be altered, but the meaning and message they carry remain the same. Myths are a part of the human condition; they encompass the unique features of being human in the quest to find out where humans came from, how we evolved, what the meaning of life is, and also help us to understand the broader cultural and social arrangements that make up human lives and the curiosity that inevitably comes with it. These qualities are particularly human and make us distinct from any other life form on this earth. We should be proud of our myths as they are one of our defining features in who we are and where we come from.

Without further research, whether ethnographic, archaeological, or anthropological, it is impossible to understand where we came from as a people and to truly understand the forces that define us. At the completion of this senior thesis I will be attending graduate school at the University of Montana to conduct further research on the Greater Yellowstone Ecosystem including Yellowstone National Park. I believe that the Yellowstone area played a large role in the development of Native American plains tribes and their mythologies, and that the park was a
huge foundation of resources for our earliest settlers as there is evidence of Yellowstone obsidian that has been unearthed as far east as Ohio, suggesting an extensive trade network across the country. Although there are many challenges regarding research in the Yellowstone area, I still believe there is much yet to be discovered as only 1% of back country caves have been mapped or explored, only a third of waterways have been explored, and only within the last six years has the back country been surveyed and mapped of all its waterfalls in its entirety. The park is too vast and locked in snow for the most part of the year for most adventuring to occur, and finally, the park was created so early in our nation’s history that people simply stopped exploring; the highlights of the park overshadowed further examination of the 2 million acres of land. Areas along the 100-miles long Lake Yellowstone shore are currently being excavated for early Indian occupation by the Montana Yellowstone Archaeological Project, and new discoveries are being made every year about the park’s earliest inhabitants (MacDonald, 2014. Web). It is only a matter of time before a great discovery is made in North America that will change the course of human history as we know it, and I believe this will happen without our lifetime.


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