Review

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On Behalf of the Wolf: Niche Construction and Indigenous Concepts of Creation

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Abstract

There have been numerous attempts to examine Indigenous cultures from a scientific and evolutionary perspective. In this work, however, there has been little acknowledgment of how the study of biological evolution is changing. I examine evidence of the way Indigenous cultures think about nonhumans and examine concepts of creation and creator figures in relation to Niche Construction, a 21st century evolutionary concept that examines how organisms shape both their own environments and those of other species by studying how Natural Selection can act upon how a most organisms impact the survival and existence of other species. I focus this comparison on how many Indigenous Plains cultures of North America regard wolves as being creator figures within the context of the way they experience their environments. Recent ecological studies have shown that in the 30 years since wolves have been reintroduced to Yellowstone Park this species has reshaped the ecology of many other species in the park ecosystem. I argue that in the belief systems of Indigenous peoples this restructuring is tantamount to an Act of Creation, and that Indigenous Americans recognized that wolves filled both this role, as well as a role in helping Indigenous cultures adjust to the environments of North America as they arrived on this continent over the last 20,000 years. This concept of creation is rooted in ecology and evolutionary biology, and does not involve supernatural anthropomorphic beings the way that Western stories of creation do.

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1. Introduction

Longstanding debate exists among Americans over the importance of evolution, which differs from perspectives found in other European nations [1]. Two major concepts are involved, which are at the heart of evolutionary thinking: *creation* and *relatedness*. The same issues can be found in differences between how Indigenous and Western people comprehend the nonhuman world. These concepts reveal how Indigenous ways of understanding can converge upon Western scientific ways of thinking. Recognition of these similarities could lead towards both Western scientific acceptance of Indigenous Knowledge and increased understanding of evolutionary processes in the 21st Century.

The primary question from a scientific perspective first seemed to be *relatedness*, i.e., should human beings consider themselves part of, and thus related to, the rest of the species that make up the living world? All life forms share a numerous physiological processes along with large aspects of their genetic heritage [2]. If a culture assumes relatedness, its connections to the living world are clear, making it obvious that ethical obligations to relatives is both a logical philosophical development as well as acknowledgment of a scientific phenomenon [3].

Within much of American society acknowledging relatedness to other species would be equivalent to accepting evolution as a genuine phenomenon. Unfortunately, in many people who consider themselves to be religious, acceptance of evolution as an important and real process would

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damage their view of their place in the world, especially concerning their understanding of human beings as having been created separately from other species. In contrast, Indigenous Americans have long considered themselves as being part of overall creation and thus related to nonhumans for thousands of years [3].

The second issue is the concept of *creation* and what it might mean across a range of belief systems. Western belief systems has been set up by philosophers from Aristotle and Descartes to lead human beings to believes that they are separate from the rest of nature [4–6], resulting in denial of relatedness. This line of thinking creates issues when attempts are made to reveal linkages between Western and Indigenous science.

> Bias against the use of the term "creation" (is) so extreme in scientific circles that when (Daniel Wildcat and I were) writing an essay about the belief systems of Indigenous Americans for a special issue of a scientific journal [6], … the editor insisted that we remove any reference to "creation" and "creators" from our essay, on the grounds that this was likely to lead readers into thinking we were "creationists." … the point we were trying to make was that "creation" means different things to different cultures, and that the term "creation" should not be conceded to the religious right because every Indigenous culture has its own concept of a "creator" [3], p 94.

The concept of "creation" can be very different in the spiritual traditions and knowledge of both Western and Indigenous peoples [7]. For example, within the Western scientific tradition, "creation" can be considered an active, ongoing process, e.g., evolution, which in Western cultures is presumed to stand in opposition to Western religious traditions which treat creation as a singular event usually involving an anthropomorphic entity, often designated as "god." In contrast, traditional Indigenous peoples do not consider their "creator figures" as assuming anthropomorphic form, but instead as processes involving interactions between the earth, the sun, and all the continuously changing life forms [3].

The concept of creation in Western monotheistic traditions appears linked to the concept of the "beginning of time," which has no empirical meaning. The Western philosophical tradition emphasizes "when events happened", which is how they define history [8], placing emphasis on dates typically defined in an arbitrary manner. Fundamentalist Christians structure their view of history based on a belief that the earth is less than 10,000 years old. This means they can set the age of the earth by counting backwards from the birth of Christ through the ages of prophets and various biblical figures until they reach Adam and Eve, which in theory allows them to date the age of the earth to a precise day and time [9]. "Young earth creationists" take a more extreme position within which the world was created in six (twenty-four hour) days. Under this view, little exists in the universe except the earth, the sun, and the moon, which implies that the sun must also be less than 10,000 years old, but this point remains unaddressed in their writings and teachings [3].

Western science is much more realistic in assessing the age of the earth, accepting that the universe is several billion years old. There are no conceivable dates attachable to events such as the "Big Bang." There can be no assignment of numerical dates over billions of years. Nevertheless, scientists follow the BC/AD dating system for recent earth history, which commits them to following Christian traditions. In contrast, Judaism, Islam, Buddhism, and Taoism recognize dating systems based on the timing of significant events in their own histories [3].

Examining Indigenous reveals that concepts of "creation" or "origin" generally consider a series of events, which took place in specific locations or "places." where the people in question began to recognize themselves as a distinct culture [3]. These stories generally concern how the culture responded in ways that facilitated their survival. The message for the present culture was recognizing that our ancestors could survive through times which were much more stressful than we are currently facing [3]. The distinguishing feature was that the responses of their ancestors were driven by variability in the environment, combined with major adjustments that allowed them to persist in the face of major environmental changes. For example:

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> "Tribal systems are static in that all movement is related to all other movement...they are not static in the sense that they do not allow or accept change. Even a cursory examination of tribal systems will show that all have undergone massive changes while retaining those characteristics of outlook and experience that are the bedrock of tribal life" [10], p 63.

This ability to pay attention to changes in the environment, and recognize relatedness with other species, leads these cultures to very different concepts of creator and creation than are found within colonizing world views. As indicated above, Indigenous cosmological thought emphasizes recognition that humans are part of nature, which means they are linked to a multitude of other species which shared these experiences over millennia, serving a variety of ecological roles, including functioning as prey (food), competitors, or companions [3]. Understanding the historical basis of these relationships reinforces the linked concepts of relatedness and connectedness [3]. Some of these species were probably exceptionally important, and may have served as originators of cultural traditions. Even more important these species may have altered the way that contemporary members of this culture conceived of themselves.

2. Results and Discussion

2.1. Indigenous Americans and Wolves: Creation as a Process

Indigenous peoples of North America rely on concepts of connectedness and relatedness when identifying entities they associate with the process of creation [3]. One complicating factor is the presence of entities considered to be "tricksters", which can have powerful influences on culture, although they usually act through deception, cunning or even perversion to achieve their goals [11], Chapter 8.

> "Focusing on the trickster seems to appeal to literary critics as … fittingly 'Native.' The … trickster archetype was assumed to be an inevitable part of Indigenous cultures, and … paid little attention to the historical and cultural specifics of why and how particular Indigenous writers were drawing on particular mythical figures. As a result, … trickster becomes an entity so vague that it could serve just about any environment" [12], p 3

One entity often described as both a Creator and a Trickster in North America is Raven (*Corvus corax*) the large Black member of the Corvid family, famous for its intelligence and clever behavior [13–15]. Another such figure is Coyote, the medium-sized Wolf of North America [11], Chapter 8.

Another species of North American mammal has been recognized as a close associate of Raven, Coyotes, and Humans. This was Wolf (*Canis lupus*) the largest cooperatively foraging predator in their environment; also, the species most widely considered to serve as a creator figure among North American indigenous Peoples [11,16]. It is this species upon which I focus in the remainder of this paper, showing why that from a cultural, social, ecological and evolutionary perspective this species was likely to have shaped the lives, traditions, and world view of the Indigenous Peoples of North America. For these reasons, Wolf is often considered a creator figure, but never a trickster.

As an example, "In the Lakota tradition it is recognized that Sugmanitu Tanka Oyate, (wolves), were a nation long before human beings realized and declared themselves a nation" (Manuel Iron Cloud, cited in [17]). Lakota Scholar Joseph Marshall described the relationship between humans and wolves in this fashion:

> The first peoples understood that while they could emulate the wolf and be like the wolf in many ways, they would never actually occupy the place wolf held… They understood that they had power to understand… this capacity set them apart from other species… The first peoples did not see their ability to reason or understand as (making) them superior; … it was simply their key to survival… The first peoples not only survived, they thrived… because they did not seek to dominate, (and) understood that coexistence was the means to

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survival for all species because it was central to the reality of the shared physical world. No one species was dominant in all ways… the wolf certainly was not successful every time they went after prey. Neither was the human hunter. [18], pp 8-9.

Marshall further argues that wolves and humans shared the Great Plains and forest:

Of all the species … on Turtle Island (North America) the two that spread themselves most widely were the first peoples and the wolf. After thousands of years and hundreds of generations of moving over the land, separate tribal identities began to emerge… The wolf, meanwhile, adapted … to life in every kind of environment … existing side by side with the first peoples … The earliest story I recall is of the Dakota hunter who waited in ambush and shot a buffalo … the hunter had to follow the wounded animal …and as …the animal expired, a (female) wolf appeared and warily approached the buffalo … moving only a step at a time… the wolf's demeanor … told the hidden hunter that the buffalo … was safe to approach … expecting her to begin tearing at the flesh … Instead, she went around the carcass until she saw the arrows protruding from the buffalo's side. She sniffed … then sat back on her haunches to carefully test the wind (and then) looked directly toward the hunter …, and then nonchalantly walked away … and disappeared over a rise … after his wife and family butchered the buffalo, the hunter made sure that they left behind choice portions to share with the wolf and her family [18] pp 9-10).

Of all these stories, Marshall's favorite is "The Woman who lived with wolves":

A woman leaves her home in heartbreak and anger… (in) late Autumn and travels towards the village of her relatives. She becomes lost … and faces the prospect of fending for herself or starvation … she is found by a family of wolves, which leads her to shelter and brings her fresh meat … In the Spring (the wolves) let her know that some of her people are moving close … Her relatives are overjoyed to see her, and give her the name Woman who lived with Wolves [18], pp 12-13.

Marshall also wrote about how family structures of a wolfpack of wolves resembled that of a human nuclear family:

The (wolf) family was led by a *bloka*, or 'male', and a *winyela* or 'female', labeled 'alpha' by non-native observers. The bloka and winyela had a litter of young usually every year. Those young stayed after they were weaned and grew to young adulthood. So the core family was several generations of offspring, but only the bloka and winyela mated and bore young. Usually, as the offspring grew into adulthood, they went off to form their own families [19], p35.

Wolves are rare among mammals; because their normal social structure is monogamous family groups. In humans the structure pf social groups is different from other anthropoid species, being more similar to that of wolves than of other apes. This suggests that sharing within social groups may have its origins in observations of wolves conducted by early humans [20].

Wolf-human relationships have also been described for the Cheyenne (*Tsitsista*) Nation, who according to their cultural traditions going as far back as their existence in Eastern Asia, have interacted with and learned principles of living from wolves, [21]. In North America historical accounts described four distinct parts [22]. The second component was the ''time of the 'dogs''' (i.e., wolves), when wolves served both as hunting companions and as beasts of burden, hauling packs and dragging travois. This period was followed by the time of the buffalo, subsequently followed by the "time of the horse", after European contact.

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Tsitsista tradition involves a history of being taught to hunt by two wolves: 1) the male was, ''the wolf *Maiyun*, the species-specific protector spirit of wolves and 2) his female companion'' [21], p82. They were ''master hunters of the grasslands and... protectors of all animals.'' Maiyun taught the human newcomers to hunt on the grasslands [21]. ''As the 'invitation song' of wolves called raven, coyote, and fox to share in their kill, so did Tsitsista hunters call wolves to their kill or set meat aside for their use'' [21], p82.

More recent and detailed descriptions come from George Bent, who operated a trading post on the Upper Arkansas River in Colorado. As a mixed -blood Cheyenne, Bent was regarded as a reliable eyewitness, providing accounts of mid-nineteenth century interactions between Indians and Europeans, which given his heritage represented the tribal point of view, and was verified by other accounts [23]. Bent states:

> [T]he tribe had a great number of large dogs...employed to pack or drag burdens...used just as horses were in later times...These dogs of the olden time were not like Indian dogs of today. They were *just like wolves*, *they never barked, but howled*...old people say that every morning just as day was breaking, the 'dogs' of the camp, several hundred of them, would [gather]...and all howl together.
>
> Antelope Woman (Cheyenne elder) [described] ... the winter buffalo hunts...when all the tribe was on foot (Time of the Buffalo). A herd of buffalo was surrounded by the people (and the ''dogs'') and driven into deep drifts... *If a buffalo got away the dogs set on it and quickly drove it back into deep drifts*... After the buffalo are skinned (and butchered) the dogs (dragged) the bundles of meat over the ice... As soon as the camp was reached, the dogs were released, and … the whole pack rushed back... to the [kill site, and]... feasted on the parts … thrown aside [during butchering]...mother dogs who had puppies in camp would run to the [site], gorge themselves with meat, and then run back to camp and disgorge … meat for the puppies to feed on. Sometimes a mother would make several trips to get enough meat for her litter of young ones [23], pp 9–11.

Group howling can be considered a wolf trait. There are a few dog breeds that are known to howl; however, they are often crossed with wolves, and their howling does not occur within a group context. Mixed species cooperative hunting supports cultural accounts: ''Cooperation with others (was taught) by the one animal that both the people of northern Siberia and the Tsitsistas regarded as the master hunter par excellence—the wolf''' [21], p35. Hunting ceremonies of Siberian Indigenous peoples stress learning about hunting from wolves [21]. As a final touch, description of adult females returning to the kill site, filling themselves and returning to their pups to regurgitate is a wolf trait, dogs rarely regurgitate meat to puppies [11].

Cheynne people felt that some tribal members ''understood the speech'' of wolves [22]. Paying close attention to howling patterns allowed Cheyennes to anticipate events, a skill gained by co-existing with wolves. When Tsitsistas were lost, or near-death, wolves would rescue them [21]. Cheyenne pack "dogs" were large, strong and howled at sunrise like their wolf relatives [22]. Europeans are known to describe canids living with other human groups as ''dogs'' rather than ''wolves'', even when the culture being described does not make such a distinction. The Gros Ventres Nation [24] and the Oglala Sioux Nation had Wolf Societies [25], however, whites mistranslated "wolf" as ''Dog'' in the society's name [25], p48. The warrior society of the Tsitsistas was the Bowstring or ''Wolf'' Soldiers, even though ''Dog'' Soldiers are what is known among people of European ancestry [21,25].

Cheyenne and wolves maintained this relationship with wolves until at least the late 19th Century. After the Sand Creek Massacre, which took place in November 1864, several Tsitsista women accompanied by children escaped. When they felt they were safe they took shelter under a bluff. After it became dark, they were joined by a male wolf, who laid down with them. This wolf

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continued to travel with them, revealing that its behavior was not simply coincidental. One woman spoke to the wolf, saying that they needed food, at which point the wolf led them to a buffalo carcass. This wolf remained with the women and children for more than a month, providing food and protecting them from potential human enemies. Finally, the wolf located a Cheyenne camp, and delivered the women and children. As a reward, this wolf was fed and then departed [26], pp149–153.

The Blackfoot Nation also showed strong cultural links to wolves [27]. Blackfoot elder Brings Down the Sun made this statement after hearing a wolf howl:

We consider the wolf a friend of man, and do not believe it is right to shoot him. We have a saying, ''the gun that fires upon a wolf or coyote will never again shoot straight.'' Did you ever know of a wolf who did not wander? They never stay long in one locality. They raise their young in one place and then go to another. They are continually roving over the country and are always on the move. My father named me Running Wolf, ... I am like the wolf, for I love to roam over the prairies and among the mountains. [29], p434.

Blackfoot credited wolves with revealing new ways to hunt, using buffalo drives before they had horses, as described in the following:

Instead of collecting data on bison, Blackfoot *performed wolves*. They tried to look like wolves and to move like wolves ... They *became* wolves in ceremonies at home in camp, and in the presence of bison herds on the prairie. Blackfoot would have observed that bison reacted to the human performance much as they reacted to wolves. By becoming brothers to the wolf in a symbolic and ceremonial manner, Blackfoot could quickly discover effective means of manipulating bison, without studying bison "objectively" at arm's length. They would have absorbed wolf knowledge, effectively but nonverbally, through performances that could easily be mistaken for purely "cultural" activities by an outside observer [28], p585.

A great deal has been made of Blackfoot use of ''Buffalo Jumps'' where bison are driven over cliffs. Before they had horses, the Blackfoot traveled on foot accompanied by wolves, following buffalo over the prairie, copying hunting methods used by wolves:

At other times (wolves) practice a still more cunning stratagem; they urge their prey up some steep place, beyond which lies a deep ravine or precipice. There they form a half circle about it, closing in continually and redoubling their threats and howls. The poor buffalo, placed between two fires, hesitates a moment at sight of the abyss; but soon, bewildered by the yelping and baying, it attempts the only way to escape from its assailants, jumps off and falls crushed at the bottom of the ravine [29], p603.

Blackfoot were fond of wolves as companions. Traditional Blackfoot will never shoot a wolf, because they are ''good medicine.'' [30], pp5–6. When preparing for hunts they would sleep on wolf skins. They also sang songs to get wolves to join them.

> There is a legend that the Wolf Song first came to the Indians through a warrior who took pity on a dying wolf...the chief of all the wolves and endowed with...power. The spirit of this wolf followed the warrior throughout his life...became his protector and guardian spirit and gave to him the Wolf Song...which he could invoke...in time of danger [27], p243.

If a wolf howled near a Blackfoot hunting party, they responded, ''No I will not give you my body to eat, but I will give you the body of someone else, if you will join us'' [31] pp260–261. One traditional story about hunting describes the following interaction:

> Once there was a Siksikaitsitapi (who)...had but one horse...on this day he had a kill. He cut up the meat and packed it on his horse (and) left enough for a good meal for...the wolves. On the way back home he ran into a pack of wolves...on their way to the remains of his kill...later, he ran into an Old Wolf...having a hard time keeping up with the pack. The hunter stopped and offered the choicest cut to the Old Man (Wolf) and told him, ''By the time you get there, there may be nothing left for you to eat''... (the Old Wolf) replied, ''I am

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> in a hurry, those ahead are hungry. I need to get there...they will not start without me. You see, I am the Grandfather. You will receive a gift for your generosity.'' Later the hunter was very fortunate in his hunting [32], pp35–36.

As with the Tsitsista, the Blackfoot also have an historical period the "Era of the Dog" (*Iitotasimahpi Iimitaiks*), which is considered to be the "time of the ancestors,", i.e., from the origin of the culture until European contact [32], pp8–14. This preceded the time of the horse, when people depended upon their dogs (wolves), who were given great respect because they were companions possessing both spirit and consciousness [32].

The Blackfoot retain traditions stemming from ''Wolf Man'', "an ancient story describing direct instruction and teachings wolves gave humans, some regarding behavior and social structure, others specific to hunting practices." These stories are integrated into Blackfoot social and spiritual life [28,33]. One example is The Legend of the Friendly Medicine Wolf:

> This...happened many years ago. The Blackfoot were moving camp... While passing through a hill country, a large party of Crow Indians...hiding in the ambush, attacked the line...Before the Blackfoot warriors came to their defense, the Crows...carried away some women prisoners... a young woman named *Itsa-pich-kaupe* (Sits-by-the-door) was carried on horseback...over two hundred miles...(where) she was (given) into the care of his wife, an older woman. Itsa-pich-kaupe was so closely watched she could find no chance of escape...One day, when the Crow man was away...the Crow woman conversed with Itsa-pich-kaupe in the sign language, saying,
>
> 'I overheard my husband say they are planning to kill you. I feel sorry and will help you to escape tonight when it is dark'...She loosened the bottom of the lodge covering from the pegs and, giving Itsa-pich-kaupe a pair of moccasins, a flint and small sack filled with pemmican, and pushed her outside. Itsa-pich-kaupe traveled all that night...When daylight came she hid in the underbrush. The Crows tried to follow but could find no tracks... she saw a large wolf following her. At first she was frightened and tried to run, but her strength was gone and she sank down exhausted. The wolf stood watching her, and then crept nearer and nearer until he lay at her feet. When Itsa-pich-kaupe arose to walk, the wolf followed and when she sat down again to rest. He lay down by her side. She besought...; 'Pity me brother wolf! I am so weak for food that I must soon die. I pray for the sake of my young children that you will help me' ...the wolf trotted to the summit of a high butte, where she sat watching. He disappeared, but soon came back, dragging a buffalo calf he had just killed...After roasting and eating some of the meat, she felt stronger and started on, but her feet were so bruised and torn that she could scarcely walk. When the wolf drew near, she placed her hand on his broad back, and he seemed glad to bear her weight...the wolf helped Itsa-pich-kaupe, hunting every day and kept her supplied with food, until he brought her safely home. When they entered camp together, Itsa-pich-kaupe led the friendly wolf to her lodge, where she related to her family the story of her escape...(and) besought the people to be kind to the wolf, and to give him some food...The faithful wolf...came every evening to the summit of a high butte, where he sat gazing down at the lodge where she lay. Her relatives continued to feed him until he disappeared, never to return [27], pp473–476.

One theme emerges from all these findings, i.e., when a wolf acts to guide and provide for people, it is always fed in return. Food, especially meat, was a primary currency among these peoples of the plains, therefore, feeding a stranger is equivalent to a reward of cash or valuables. There are

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scholars of European ancestry who contend that the first wolves to associate with humans scavenged around camps waiting for scraps [34,35]. In contrast, Indigenous Americans voluntarily shared food with wolves. These traditions describe a time that dates back to the initiation of friendly relationships between humans and wolves [21], and represent more accurate descriptions of the beginning stages of this relationship than speculations by EuroAmerican scholars limited by assumptions of dominance-based relationships between humans and wolves.

In the creation story of the Anishinaabeg (Ojibwe Nation), wolves are considered family members, referred to as brother or sister. There is also a tradition that says whatever happens to the wolves (*Ma'iingan*), will also happen to the Ojibwe [36,37]. They traveled the world together speaking the same language [37]. Wolves serve as a symbol of Anishinaabeg culture and tradition. According to Lac Courte Oreilles Anishinaabe elder Edward Benton-Banai, the relationship between Ma'iingan and the Anishinaabeg began when:

> Original Man began to notice that all the animals came in pairs … yet he was alone. He spoke to *Gitchie Manitou* (the Creator) and asked, "Why am I alone?" "Why are there no other ones like me?" Gitchie Manito answered, "I will send someone to walk, talk and play with you." He sent Ma-en'-gun (the wolf). With Ma-en'-gun by his side, Original Man again spoke to Gitchie Manito, "I have finished what you asked me to do. I have visited and named all the plants, animals, and places of this Earth. What would you now have me to do?" Gitchie Manito answered Original Man and Ma-en'-gun, "Each of you are to be a brother to the other… both of you are to walk the Earth and visit all its places." So, Original Man and Ma-en'-gun walked the Earth and came to know all of her. In this journey they became … like brothers... When they had completed the task … they talked with the Creator once again. The Creator said, "From this day on, you are to separate your paths. You must go your different ways. What shall happen to one of you will also happen to the other. Each of you will be feared, respected and misunderstood by the people that will later join you on this Earth." And so Ma- en'-gun and Original Man set off on their different journeys [38], pp7-8.

Ma'iingan, is considered sacred to the Anishinaabe Nation as well as an important figure holding cultural significance for members who hold traditional beliefs. Wolves are important because human spirits are shared with wolves. Anishinaabe viewed Wolf as the pathfinder or teacher because it has always been a guide for them, a guide to the spirit world and to this world (37). Mike Wiggins, chairman of the Bad River Ojibwe tribe in Wisconsin, stated that "the presence of wolves in the woods is sacred and tangible. They are a gift" [37]:

> "Many Anishinaabeg … in the states of Minnesota, Wisconsin, and Michigan object to the state-sanctioned wolf hunting because of their long-standing religious and ecological relationship to wolves as relatives. In the Anishinaabe creation story, the Creator Gitchi Manitou sent Ma'iingan, or Wolf, as a brother and companion to the original human, where the lives of Anishinaabe peoples and wolves would forever become intertwined" [37], p.vii.

Power and traditional ecological knowledge in Anishinaabe culture originates from non-human sources, where humans must establish relationships with other-than-human beings to survive and achieve *bimaadiziwin*, or "the good life." Wolves are considered a source of power, knowledge, and well-being for humans, which suggests that they are valid models of potential ways in which humans may develop ecological models and environmental relations [37].

Anishinaabe strongly believe killing a wolf will be like killing one of them. Kurt Perron, President of the Bay Mills Indian Community in Michigan, states that, "as we see the wolf returning, or gaining strength, just like we, as Ojibwe Anishinaabe people have, we see that relationship. So that's what concerns us with the hunt, it's almost like you're hunting our brothers" [37]. Ma'iingan

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is understood to be one of the first teachers to the Anishinaabeg, which implies that humans rely on knowledge given by non-human beings. "To the Anishinaabeg, all animate beings participate in societies like humans do, with Ma'iingan in particular a role model for clan-based living" [37], p5. "Since Ma'iingan is considered to be the parallel (or brother) to the Anishinaabe, it is reasonable to suggest that Anishinaabe environmental knowledge and relationships are … inspired by wolf behavior" [37], p7.

The Anishinaabe relationship with the wolf is an excellent example of a non-anthropocentric model of environmental knowledge and religiosity because of Ma'iingan's significance in Anishinaabe culture [37], p 4. Through stories, clan membership, and culture, the wolf is woven into the spirit and identity of Anishinaabe people [37]. When Anishinaabe people are asked to put population goals or harvest quotas on Ma'iingan, they see it as analogous to putting goals and quotas on their human relatives, i.e., unthinkable [39], p2. In 2010, the Red Lake Band of Ojibwe in Minnesota, became the first Indigenous Nation to adopt a plan for wolf management, designating all of the band's 843,000 acres of land as a wolf sanctuary.

Wolves are also crucial components of the ceremonial and spiritual traditions of coastal nations of the Pacific Northwest, such as the Makah, Quilleute, and Nuu-chal-nuulth [40], where they represent important clans or phratries of First Nations of the Pacific Northwest. *Laxgibuu* or *Laxgyibuu* (variously spelled) are names for the Wolf "clan" in Tsimshian, which are considered analogous or identical to identically named clans among neighboring Gitxsan and Nisga'a nations. The name derives from *gibuu,* which means wolf in the Gitxsan and Nisga'a languages. In Tsimshian the word is *gibaaw (gyibaaw or gyibaw),* but Tsimshian still use the word *Laxgibuu* for Wolf clan [15], p72.

The *Kluckwalle* (*Qua-ech'*) is a multi-day ceremony that reveals how these cultures considered wolves to be the dominant species in the local ecosystem. One informant states: "The wolf is the bravest of any animal in the woods. They are the killers. They don't fear anything, which is why they can run the country undisturbed. That is why the wolf is chosen…. The spirit of Kluckwalle is something separate that comes to each person…" [39], p 48. The Quileute people say that mythical creatures Dokibatt and K'wa'iti created the first humans by transforming wolves into humans [40,41].

2.2. EuroAmericans and Wolves 1: A Legacy of Fear and Hatred

I have written extensively about the relationships between Europeans and EuroAmericans and wolves in my previous books [3,11]. I do not wish to revisit this topic in extensive detail; however, I will discuss some major points and more recent work, including responses by EuroAmerican Wolf Biologists to the material presented in our work [42].

The roots of the difference in attitudes lie in religious traditions. In Western cultures monotheistic religions emerged from a pastoralist cultural tradition where metaphors related to livestock dominated attitudes towards nature [3], Chapters 3 and 5. In Europe and the Middle East, predators were seen as threats rather than as relatives, because they might kill your chattel (a word derived from cattle, but also applied to sheep, goats, pigs, and horses; [3], p39. Ironically, dependence on living closely with livestock also led to the establishment of animal-originated pathogens, which have regularly devastated human populations [43].

The medieval Christian Church was uneasy about the influence that predators had on cultures from the Slavic East to Celtic Britain [44,45]. It is important to keep in mind that, until the last millennium, medieval Europeans practiced spiritual traditions which acknowledged animal spirits, with both bears and wolves serving as totems and on coast of arms [45]. Medieval Europeans wore nonhuman themed regalia, including animal skins, they "imitate(d) animal cries and behavior, dance actively until they enter a state where they abandoned their human state, and finally reach the spirit world" [11,45]. It is crucial to keep in mind that medieval Europe was a continent without big cats, which had been exterminated during the time when Western Civilization was represented by Greek culture.

The Roman Catholic Church attacked spiritual associations between Europeans and nondomestic animals. While the church was working to increase its hold on European imaginations,

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clergy demonized European shamanic traditions and rituals, especially because many of these warriors wore wolf skins, including into battle [45]. Early coats of arms employed bears and wolves as heraldic symbols. The Church pressured "nobles" into replacing these with the extinct lion and the imaginary dragon. The respect with which these early European warriors held bears and wolves frustrated the Middle Age Christian Church, which characterized native predators as dangerous animals, linked to Satan. This led to consistent attacks on bears and wolves, which even led to trials where animals were tried, and usually convicted, of various crimes. After exterminating bears in many areas, the church focused hostility against wolves. Christians were encouraged to hate wolves, a tradition emerging from the argument, endorsed by Augustine, Aquinas, and Descartes, among others, that animals lacked souls [45]. To Medieval and Enlightenment Christians humans assuming close relationships with nonhumans was considered an abomination.

By the time of the Enlightenment in the 17th century, wolves had become the ubiquitous enemy of "civilized" European society. As a result, exterminations were carried out, with wolves extinct in England during the sixteenth century, in Scotland by 1684, in Ireland by 1770, in Denmark by 1772, in Bavaria by 1847, in Poland by 1900, in France by 1927, and over almost all the United States by 1950 [3,11].

For more detailed information, I recommend Coleman's *Vicious: Wolves and Men in America* [46] and McIntyre's *War against the Wolf: America's Campaign to Exterminate the Wolf* [47]. Coleman's title does not refer to the wolves themselves, but to the savagery with which Europeans attacked and slaughtered wolves. McIntyre's title speaks for itself. To anyone who cares about animals these books read like accounts of a holocaust.

Most sadly from my perspective, research conducted by my research group [11,16] was criticized by David Mech, an important American wolf biologist [48], and a person I admired when I began work on wolves in the 1970s. In his 2019 arguments, Mech revealed himself to be a frightened old man, espousing neocolonialist attitudes, arguing that states should control their own wolf populations, which basically meant extermination in the Intermountain West, e.g., policies being carried out today in Wyoming, Wisconsin, Idaho, Minnesota, and Montana. Regretfully, we found it necessary to deconstruct Mech's arguments, where he made false arguments about rabies and wolf attacks [42]. Perhaps the most telling of Mech's attitudes is revealed in his own description of his reaction to being investigated by a male wolf on Ellesmere Island:

> He even frightened me, the *one time in my then forty-six years studying wolves that I had been afraid of one*…when Brutus ambled around behind me where I could not see him, I had second thoughts…for a minute or two, *I became truly frightened*. … for the first time in my life I (was) truly afraid of a wolf, … I had thought, that I might jump or whirl around, possibly triggering some predatory move. … *Each second Brutus stayed behind me seemed endless* until he finally moseyed back around to my side where I could see him. He then strolled some twenty feet from us, lay down and howled. *My fear was all for naught and I ended up feeling foolish* [42], p53, emphasis added.

I regretted learning that one of my early role models was finally revealing feet of clay. Brutus was no threat to Mech, the only threat lay in his colonized mindset, which led to pointless fear.

2.3. EuroAmericans and Wolves 2: Niche Construction and Creating Functioning Ecosystems

In a much more encouraging light, I turn to recent developments in Evolutionary Ecological thought that converge on Indigenous perceptions, and reveal why Indigenous plains and Northwestern Forest cultures regarded wolves as functioning as ecological creators. Over much of the 20th century, ecologists debated over whether ecological systems tended to be driven from the bottom up, i.e., by plant productivity, or from the top down, i.e., by predators and their "negative" impact on prey populations.

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In the 21st Century there has been increased focus on the repatriation of apex predators, leading to discovery that apex predators are important in the structuring of ecosystems by impacting populations and behavioral characteristics of large herbivores, which creates impacts throughout the entire ecosystems [49]. One major repatriation involved the reintroduction of wolves into Yellowstone; 70 years after they were extirpated as part of a government anti-predator program [50]. In 1995 fourteen wolves from Alberta were moved into three acclimation pens, and allowed to acclimate for two months prior to their release. In 1996, another seventeen wolves were placed in four acclimation pens and released four months later [51].

Within five years of this reintroduction, the impact that wolves had on populations of elk, *Cervus elaphus*, and Quaking Aspen, *Populus tremoloides*, were highly conspicuous [51,53]. Wolves altered patterns of movement by elk, primarily by forcing them to change browsing patterns, and foraging behavior. Aspen stands located within high wolf-use areas had significantly lower frequency of defecation by elk in the mesic upland steppe and the combined mesic upland steppe and riparian/wet meadow habitat types. Elk foraging behaviors quickly changed in response to increased risk of predation, with the result that mean aspen sucker heights were significantly taller in areas of high wolf-use than in areas of low wolf-use [51].

In addition, another predator, Coyotes (*Canis latrans*) changed behavior near wolf dens. When near wolf dens, coyotes used areas of denser vegetational cover, i.e., pine or sage, compared with habitats covered primarily by grass, forbs or sedges– where they foraged in areas away from wolf dens. This led to major increases in populations of small mammals, particularly voles (genus *Microtus*), during a long-term study on plots located within three km of the wolf den, whereas there was no change in these populations over time for more distant plots [52].

While wolves were altering the Yellowstone ecosystem, a new idea was spreading throughout the field of Evolutionary Ecology called *Niche Construction*, which is defined as:

> the process whereby organisms actively modify their own and each other's evolutionary niches … includ(ing) the building of nests, burrows, mounds … alteration of physical and chemical conditions; the creation of shade, influencing wind speed; and the alteration of nutrient cycling ... When such modifications alter natural selection pressures, evolution by niche construction is a possible outcome [53].

Thinking in terms of Niche Construction provides new ways to understand relationships among species, along with ways of revealing the impacts that arise, even unintentionally, because niche construction involves both positive and negative impacts [54]. Niche construction refers to modification of both biotic and abiotic components in environments via trophic interactions and the physical "work" of organisms, including new perspectives on metabolic, physiological, and behavioral activities of organisms [55,56].

It is important to keep in mind that the majority of interactions between species in nature are positive [3], as described by Gordon Smith, an individual not trained in science, who became one of the master breeders of wolves and wolf dogs:

> … difficult as captivity could be for wolves, in many ways living wild was worse: regular hunger, combined with the danger and harassment directed at wild wolves by humans, created a stressful environment that often made them fearful and insecure… the ideal situation for wolves was living with humans—not in a cage but in a secure relationship where their needs were met through their interaction with humans or, as he describes it, "men hunting in groups, flanked by wolves in a common pack" [57].

Smith describes a form of social interaction that was probably common between humans and wolves throughout most of modern human evolutionary history as humans and wolves helped to shape the niche that each occupied through their mutual interaction [11], which shows how one species can impact the ecology of another. This describes the current interaction between tribal

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nations and wolves on reservations which have become sanctuaries where wolves can coexist with humans without fear

Smith' statement needs to be understood in the context of the tribal accounts presented in Section 2.1, i.e., that wolves and humans depend upon one another, especially when times are difficult [11]. If women and children need a guardian when times are difficult, Wolf will be there, providing food and serving as a protector [11,16,18,25]. These difficult times are when new cultural traditions are created [3]. Wolf, the being Indigenous Americans regard as their brother or sister [37–39] can guide you, showing you how to survive the toughest times [21,28,30]. This is not simply a one-way interaction, however, because as Smith points out [57], wolves do better when humans are their allies, especially in the face of the hatred directed at both of them by the Colonizers [45–47]. When wolves were exterminated, humans brought them back. The tribes celebrated this recovery [39] because their toughest and most reliable ally had returned [40]. It is no accident that the wolves which survived in the lower 48 states until contemporary times, were in the northern corridor: Minnesota, Michigan's Upper Peninsula, northern Wisconsin, and North Dakota. These are the lands of the Anishinaabe, the Lakota and Dakota, the northern Cheyenne, the Blackfoot, i.e., all tribes who regard wolves as crucial elements of their cultural traditions (see above).

The concept of niche construction emerged from the writings of Harvard biologist Richard Lewontin [58] who argued that organisms do not passively adapt to conditions in their environment, but actively construct and modify environmental conditions that may influence other environmental sources of selection. I spent time in Lewontin's lab group at Harvard in the early 1980's, and we discussed implications for Indigenous cultures. Lewontin was very interested in Indigenous cultures and worked with faculty at Northwest Indian College outside of Bellingham, Washington in the late 20th and early 21st centuries when he was publishing his book, *The Triple Helix*, [59] which expanded on his 1983 paper [58].

In Section 2.1, I provided accounts through which various Indigenous American nations described their positive interactions with wolves (there seem to be no accounts of negative interactions). A set of criteria have been proposed to test for the presence of niche construction (Criteria 1 and 2) and to determine when it affects evolution (Criterion 3):

1. An organism must significantly modify environmental conditions.
2. Organism-mediated environmental modifications must influence selection pressures on a recipient organism.
3. There must be an evolutionary response in at least one recipient population caused by the environmental modification. [59]

Niche Construction emerged from creative thinking by Western scientists, however it converges on Indigenous concepts of relatedness and connectedness (3), especially when linked to the concept of how Trophic Cascades shape ecosystems [49–53].

> …through ecological spillovers that occur in the process of modifying their own niches, organisms can also change the niches of other species in an ecosystem. Where these spillovers are effectively coupled to other species they can lead to coevolution. Thus, niche construction has the potential to percolate through ecosystems and precipitate multiple evolutionary and coevolutionary events. In NCT, it is possible for *one:many*, *many:one*, and *many:many* relationships to occur between niche-constructing populations and other populations that coevolve as a result of the niche construction [55], pp 5-6.

A clear example of a many:one relationship has been demonstrated empirically through the revelation that wolves are important in shaping ecosystems, not only through predator prey interactions, but through indirect effects on plant growth and form, and on other species that inhabit these altered plant communities, even including the dynamics of abiotic elements such as stream ecology [51–53]. Thinking in this fashion reveals why Indigenous peoples in North America could

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regard wolves as creators. The humans recognized that the presence of the wolves impacted not only humans and prey, but many, if not all, species within an ecosystem.

In belief systems grounded in connection and relatedness among species, and even abiotic features, this is the role of a creator figure, who would not be supernatural or all powerful, but simply one species among many that creates impacts both direct and indirect that shape multiple species coexisting within a place, sharing resources. Indigenous people considered themselves to be predators like wolves, however they recognized that the wolves were the elder and more experienced hunters [3,11,20,21,37]. They did not worship wolves, but respected them, and relied upon the reciprocal relationship between their species that allowed the humans to survive [3,18]. This is a sophisticated way of understanding creation emerging from within cultural traditions of Indigenous peoples. Under niche construction both genetic and ecological inheritance (i.e., legacies of selection pressures previously modified by niche construction can be considered to interact forming "niche inheritance." Maternal, epigenetic, *and cultural* inheritances can be examples of such inheritance) [55], Table 2.

Culture greatly amplifies the capacity for niche construction, as well as the ability to modify selection pressures. In situations where cultural traits are transmitted in an unbiased fashion from parent to offspring, cultural niche construction will have a similar effect to gene-based niche construction [60]. Cultural niche construction with biased transmission may often have a greater impact than gene-based niche construction, because cultural processes operate more rapidly than natural selection. As a result, cultural niche construction can have more profound consequences than gene-based niche construction [61]. In the case of humans and wolves where both species reveal cultural activities, e.g., transmission of hunting and prey capture techniques, social dynamics within families over generations [3,11,16,18–20,28,38,40,42] the combined behavior of both species can be considered as true cultural evolution in the Darwinian sense [62].

3. Final Conclusions

Indigenous American Tribal Nations consider removal of endangered species status for wolves, combined with hunting of wolves, as 'destruction of their culture' and a violation of their human rights [63]. As far as they are concerned, harm to wolves jeopardizes religious and spiritual freedoms, treaty rights, and tribal sovereignty. These arguments are framed in relation to removal of legal protections for wolves as denying the rights of indigenous peoples "to maintain and strengthen distinctive spiritual relationship with their traditionally owned or otherwise occupied and used lands, territories, and waters and coastal seas," combined with the obligation of States to 'give legal recognition and protection' with "due respect to the customs, traditions and land tenure systems of the Indigenous peoples" [63]. This frames the human/wolf relationship as an essential treaty right which must be honored by all people.

The dynamics of Indigenous relationships with wild animals go beyond the materialistic dimension, and should be considered as rooted in a deeper and holistic ontology which recognizes, and has reverence for, the interconnectedness of all life [3,63]. This integrated relationality guides interactions with (animal) brothers and sisters, which 'enhance and preserve' ecosystems, while also recognizing and valuing the spiritual essence of all entities, which may pass into other lifetimes. Each animal is assumed to have a protector spirit, which may choose to punish those who abuse, or do not respect, the animal or others of its kind [3,6,16,18,30,37]. These beliefs reveal why Indigenous peoples can regard culturally important non-human species as creator figures, who they do not worship, however, they expect that these species should be allowed to exist so they can continue to support one another through the future of this ever-changing world.

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