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Variables Precipitating the Extermination of the American Bison

Working Paper No. 68

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Abstract: This inquiry seeks to establish that innovations in tanning technology advanced by Europeans in the late 19th century accelerated the destruction of the bison, and subsequently the downfall of bison-reliant indigenous groups of the Great Plains, especially. The North American bison is considered as a crucial natural resource in the plains region of North America. What this inquiry seeks to emphasize is that advancements in technology, coupled with a growing demand for bison hides, contributed to the demise of bison populations. Lastly, this inquiry seeks to examine the near extinction of the plains bison and some of the effects their demise had on bison-reliant tribes.

Journal of Economic Literature Classification Codes: J15, N51, Q31

Key Words: Bison, Great Plains Region, Hide Market, Indigenous Peoples,
Tanning Technology

This inquiry seeks to establish that innovations in tanning technology advanced by Europeans in the late 19th century accelerated the destruction of the bison, and subsequently the downfall of bison-reliant indigenous groups of the region. The North American bison had lived for thousands of years alongside the native people of great plains of the North American continent. The bison population was seemingly endless and apparently unconquerable, at least until the arrival of the European settlers in the 18th century. These animals proved to be a critical resource for the indigenous population living in their proximity—serving their needs for food, shelter, clothing, and economic power. When European settlers arrived on the plains, the population began to decline slowly. A century after these first white settlers arrived, one the greatest extirpations of a species commenced during the decade of the 1870s. In the ten short years of this decade, the population of the bison fell from the tens of millions to just over one thousand.

How a natural resource that proved so integral to the lives and sustenance of the indigenous population that relied upon this animal—could almost completely disappear, has been a concern of historians, conservationists, and economists ever since. Prevailing theory claims that a combination of the expansion of railroads into these bison territories, the United States army's campaign against the Indians, and changes in native hunting practices have all been suggested over the years as the reason behind the slaughter of the American bison. While each of these may

have contributed in some compacity to the decline—demand from the global market played the most central role.

A History of the Bison as a Natural Resource

For ten-thousand years the indigenous people of the plains of North America, lived alongside and hunted the American bison. From northern Mexico, through to the United States, where except for, New England the bison were found in nearly every state, and into south central and western Canada. The bison-reliant tribes of indigenous people such as the Sioux, the Crow, the Apache, the Arapaho, and the Cree to name only a few—hunted and utilized the bison as their primary resource and a focal point of their entire societal identity and culture. In *Buffalo Hunt: International Trade and the Virtual Extinction of the North American Bison*, M. Scott Taylor (2011, 3166) describes how the very first recorded sighting by Europeans of the bison came from Spanish explorers in the early 16th century who wrote of the immense size of the herds of “native cattle” in northern Mexico. The bison have always had an intimidating physical presence, but the size of one bison pale in comparison to the awesome and unimaginable size of the bison herds once roaming the plains of the North American continent.

In possibly the most important written record concerning the demise of the plains bison and the advocacy for their conservation, *The Extermination of the American Bison*, William Hornaday (1889, 390) describes an account from the Colonel R. I. Dodge in which Dodge describes, in some detail, a herd he came across in 1871 that was so massive it is difficult to overstate. The herd was twenty-five miles wide and fifty miles deep, Dodge wrote to Hornaday that he believed the herd had to be at least five hundred thousand in number and described that “this whole vast space was covered with buffalo, looking like one complete mass, the visual angle not permitting the ground to be seen”. Hornaday (1889, 391) suggests that Dodge’s estimation was much too low—as an expert zoologist and primary researcher on the species for the Smithsonian Institute, Hornaday placed the number in this particular herd at closer to four million. The bison’s truly dominating presence within the plains region of North America had been accounted by European settlers and American explorers over decades. In Daniel Botkin’s book, *Our Natural History: The Lessons of Lewis and Clark* (1996, 113), an account from Lewis and Clark’s journals describing an encounter with a bison herd in 1806 is offered, Botkin (1996, 113) notes that; “these [bison] are now so numerous that... we discovered more than we had ever seen before at one time”. Lewis and Clark spotted many herds, and as Botkin accounts they described the view as darkening the whole plains in a “blanket of black robe”.

The buffalo robe, which is the thick, coarse, dark part of the bison hide starting at their upper back and covering their whole head was—for the white settlers—the most useful resource the bison could provide. As Taylor (2011, 3167) suggests, buffalo robe was a commonly traded good in the 19th century, and primarily used for large coats, throws for carriages, and other fur items. To the indigenous bison-reliant groups, the bison provided not just fur, but food and wealth. In their paper *The Slaughter of the Bison and Reversal of Fortunes on the Great Plains*, researchers Donn Feir, Rob Gillezeau, and Maggie Jones (2022, 5) view the bison as foundational and as the most important resource for the indigenous populations of the plains. The bison-reliant indigenous people of the region were highly specialized economically, even though other resources were available and abundant in their environment. This suggests that the bison provided the reliable source of food and wealth that these groups required. The bison-reliant tribes would use every part of the bison. The hides were softened and tanned for clothing, blankets, art, and shelter. The brains were used for tanning processes and as grease. Bones were made into tools, the marrow was eaten, and the stomachs were turned into bags and carrying pouches. Most importantly, was the creation of a mixture called “pemmican”—a mix of dried bison meat with berries and bison fat that would be enclosed in a pouch made from the bison’s stomach. Pemmican could be stored for years and sustained these bison-reliant tribes when they faced

food shortages. Feir et al. (2022, 6) suggests that these indigenous people who relied on the bison were arguably as well-off as their European counterparts. These societies thrived as they lived in a region so rich with the natural resource of the bison that seemly flowed from the land in an endless stream.

Though this inquiry focusses on the plains bison, it should still be mentioned that there were once bison who roamed the lands east of the Mississippi. Beginning in roughly the year 1800 however, the gradual removal of these eastern herds started and by 1830 this bison population was almost entirely eradicated. In the view of Taylor (2011, 3167-68), this bison population declined from habitat destruction and the ever-expanding settlement of Americans heading west—not for the economic value of themselves—but for the value of the land they inhabited. This, as would become clear decades later, was a demise unique to the bison east of the Mississippi and the economic benefit of the bison themselves would become the driving force behind the extermination of the population in the plain regions to the west.

The indigenous people of the plains region began using horses in the 18th century and by the 19th century the tribes that relied on the bison had adapted to hunt on horseback. This greatly increased the effectiveness of their hunting and with rifles beginning to reach the tribes of these plains regions, the natives were able to kill bison in excess. Throughout the early 19th century Feir et al. (2022, 6)

suggest these factors allowed the first trading between the tribes of bison-reliant people and the European and early American settlers. By 1865 the population of bison in the plain region of the United States was estimated to be in the ten to fifteen million range, according to Taylor (2011, 3168). Before tanning innovations, hides that were harvested throughout the year, other than the three winter months, were virtually worthless. After the innovations in tanning technology, the herd south of the Union Pacific Railroad, primarily located in Kansas, Texas, and Oklahoma—the southern herd—was completely decimated by 1879 according to Feir et al. (2022, 7). After the threat from the Native tribes north of the railroad, hunters were able to move into this region and continue hunting massive herds of bison even though they had just witnessed the eradication of the southern herd. According to Hornaday's estimates (1889, 525), the northern herd was almost completely extinguished by 1884.

Technology Advancement and Effects of New Demand

It is important to stress how, up to the 1860's, the bison was of very little economic use to the white settlers pouring into the great plains region. The buffalo robe was only harvested during the coldest winter months as that was when the robe was at its thickest and most dense, and for the remaining part of the year the buffalo was

only hunted for its meat. The entrance of factors such as the railroad did increase the ability to transport buffalo products such as the buffalo robe, but as Taylor (2011, 3167) emphasizes, the railcars of the 1860s were not refrigerated, therefore buffalo meat—the most abundant of the bison’s resources—could only be sold as smoked or salted, severely limiting the bison’s economic potential as a natural resource in the eyes of the settlers and industrial hunters coming to the region. As Taylor (2011, 3171) emphasizes, the only saleable commodity at this point in time, was the bison’s meat—but the transportation limitations and costs limited this market severely. Historical sources all agree that up until the 1870s—with no knowledge of how to tan the bison hide—there was virtually no market for the bison hide.

This would change in 1871 when new technology and tanning processes were established that allowed for the use of bison hide in tanning process and therefore the use of bison hide in a number of leather goods. Bison hide was only taken in the winter months to be turned into buffalo robe and had very limited uses outside of limited fur products. Taylor (2011, 3168) suggests that it was tanners in England and Germany that developed the new method for tanning bison hides into useful leather through a cheap simple commercial process. Tanners had been trying to find a way to use bison hide for some time—once the innovation had succeeded, these tanners and merchants of Europe told hunters in America that they would

take an “unlimited number of hides”. This opened an immense trade in a new kind of leather to the world. This unlimited demand by the European tanners was likely due in large part to the need for sole leather and leather belts used in machinery.

According to Taylor (2011, 3169), European nations at the time were in need of refitting their armies. Bison leather that was created through the new innovation brought by the German and English tanners, was found to be tougher and thicker than cattle hide leather and so was in great demand during this period of outfitting militaries. Also, the mid to late 19th century was a time of industrial boom. Many of the machines being used and in demand during this period used leather machine belts as a key component. Bison leather being thicker and tougher, once again was in higher demand and being a new product with seemingly no end to its supply—the resource seemed most efficient to use as well.

In his paper *The Extermination and Conservation of the American Bison*, Dean Lueck (2002, S621) describes the bison as connected to everything: grasses, drought, wolves, horses, smallpox, European conquest of North America, industrialization, and on and on. It can be assumed therefore that such an interconnected resource to its environment and the wellbeing and economic success of the people around it—would find the creation of its demise in an accordingly large host of environmental and human factors. However, the focus

still centers on this innovation in tanning technology and subsequent international demand in the tanning and leather goods market.

The prevailing theory was that essentially two major factors were the cause of the near extinction of the plains bison, further propelled by smaller factors as well. These major factors were firstly, the expansion of the railroad into the west of the continent and secondly, the efforts of the United States Army to decimate the bison as a strategy in fighting the bison-reliant tribes in the plains region. However, these alternative hypotheses fall short of explaining the surprising rate of which the bison were killed, and how greatly this rate varied over time: one half the bison's peak population was killed in ten years after 1870; while the elimination of the other half took over one hundred years, as Taylor (2011, 3165) accounts. This extraordinary variation in the rate of killing and the numbers killed cannot simply be explained by the US Army's accounts of killing bison in excess on the plains. As Taylor (2011, 3187) suggests these individual accounts from 1872 until 1884, were only in the tens or hundreds of bison at a time. The railroad reached the western parts of the plains and gave hunters access to the bison-roaming areas in 1867—five years prior to beginning of the slaughter of the bison. The southern herd was all but exterminated by 1880, but as Taylor further explains, the northern herd remained until 1884.

The Bison's Extermination and Lasting Effects on Bison-Reliant Tribes

The fate of the buffalo was all but sealed with the advancements in tanning technology when the demand spiked and hide hunters flooded bison territory. As Botkin (1996, 122) describes the rush of new hunters to the plains was similar to the stampede to a new gold strike. These hunters saw the bison as a commodity, like gold, to be removed as quickly and efficiently as possible. Many of these hunters and homesteaders out west saw this as a way to gain riches, but ironically as Botkin (1996, 123) suggests, few ever did get rich hunting the bison.

Exact records of the number of bison killed were neither well preserved nor were they well organized. However, as Botkin (1996, 123) suggests there were most likely at least 1.5 million hides shipped in 1872, a number that would continue annually for over a decade. That is many times as many estimated to be shipped on average in the decade before the innovation in tanning as Taylor (2011, 3163) estimated two hundred thousand to four hundred thousand were shipped in that time. Botkin (1996, 124) gives an account from 1883 when a herd of nearly seventy-five thousand bison crossed the Yellowstone River in Montana, but fewer than five thousand would reach the Canadian border. Killing of this magnitude was not difficult for the hunters, in fact many hunters were not well experienced. Hornaday (1889, 470) described an account of Colonel Dodge who saw over one hundred bison carcasses in a semicircle, all of which were killed by one man from

the same spot, in less than an hour. In the early fall of 1883, when hunters arrived to hunt again, they could not find any bison and thousands of hunters went bankrupt.

As Lueck and Taylor among other researchers argue, the decimation and destruction of the bison could have been avoided in an environment with well-defined property rights, but no such property rights or conservation efforts arose to protect the valuable resource. Lueck (2002, S637) suggests that no one every truly knew how many bison were present until long after the hunting was over. Lueck further suggests that prices for bison hide remained relatively constant: given bison was—in the market—a close substitute for cattle hide and so the hide prices never saw huge shocks. However, as Feir et al. (2022, 7) suggest property rights did exist through signed treaties between the bison-reliant indigenous groups and the white settlers that explicitly prohibited the over-hunting of the bison. Not to mention the thousands of years of Native nations treaties amongst each other and an economy functioning with the conservation and responsible harvesting of this natural resource as foundational to its continued success. To these Native nations the property rights were simply not protected, likely this was promoted by the US Army's efforts to quell the tribes and force the indigenous into reservations.

According to Feir et al. (2022, 8) the last bison hunt of the Sioux indigenous people was in 1882, and in just over a decade the economic and social core of the

great bison-reliant nations was gone. The chief of the Crow indigenous people, Plenty-Coups, was quoted in his biography *Plenty-Coups, Chief of the Crow* by Frank Linderman (1930, 311) stating: "...but when the buffalo went away the hearts of my people fell to the ground, and they could not lift them up again, after this nothing happened". The loss of the bison on these bison-reliant groups was devastating socially and culturally, but also economically.

These groups had spent generations specializing and cultivating an entire society around one resource and the skills required for that resource. The ability to adjust to alternative occupations was constrained significantly for these people after the demise of the bison. As Feir et al. (2022, 9) suggests cattle ranching would have been a plausible alternative use of their skills and land but the governments of North America prevented and made this transition too difficult, reserving those roles to the white settlers moving into the regions. Feir et al. further examined the push of government bodies to put these groups in agriculture, effectively the only economic activity these governments would support—despite the cultural norms and limited historical experience held by these formerly bison-reliant groups. This was a detriment to the group's economic future for generations. They performed poorly at a job they had no experience or cultural connection to and their strong economic standing and negotiating power the formerly bison-reliant groups held in the regions began to diminish. Feir et al.

(2022, 14) has suggested that even the indigenous groups of these regions significant quality of life and height advantage over their European counterparts was almost completely eliminated by 1886. Feir et al (2022, 18) further concluded that the data of height, mortality, fertility, and more in the bison-reliant nations showed a substantial decline in biological well-being after the bison's decline.

Conclusion

This inquiry has sought to establish that innovations in tanning technology advanced by Europeans in the late 19th century accelerated the destruction of the bison, and subsequently the downfall of bison-reliant indigenous groups of the region. Though many variables led to the extermination of the plains bison, most played a secondary role to these innovations in tanning technology which created global demand from the market. The timing of other variables does not coincide so perfectly with the demise of the plains bison as does the timing of the advancements in tanning technology. Therefore, these variables such as the railroads, military strategy, and government policy could not play the central role and must be supporting cases that further promoted the observable tendencies in demand caused centrally by the innovations in the tanning trade. The evidence

from Feir et al. further suggests that this slaughter of the bison was a biologically and economically meaningful loss to the nations that relied on them.

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