



LOSING EDEN

An Environmental History
of the American West

NEW EDITION

SARA DANT

Foreword by Tom S. Udall

“This is history as it should be written, focusing not only on people but also on the natural environment as it changes through time. The result of that complex interaction has been a saga of conflict, hope, failure, conservation, and sustainability. Everyone who lives in the West should know its environmental history, and the rest of the world should know it too because it offers important lessons for humanity. This book is big in scale and rich in detail, yet written with economy and grace, with a scholar’s judicious understanding, and with a lover’s passion for the place.”

—DONALD WORSTER, author of *Shrinking the Earth:
The Rise and Decline of American Abundance*

“In this fresh take on the history of the American West, Sara Dant tells us why ‘the West as Eden’ has always been a false illusion and how truth-telling of our past might resolve twenty-first-century issues and even provide hope for our future.”

—ROSALYN LAPIER, author of *Invisible Reality: Storytellers,
Storytakers, and the Supernatural World of the Blackfeet*

“*Losing Eden* is no ordinary book. Dant begins with a simple question: At what environmental cost did Americans develop the largely arid West? In answer, she offers an engaging, provocative interpretation of the region’s environmental and Indigenous history, from the primordial past to the present, with an eye toward the future in an era of climate change.”

—MARSHA WEISIGER, author of *Dreaming of Sheep in Navajo Country*

“Sara Dant has created something seemingly unattainable: a one-volume book—full of incisive analysis, wrapped in unforgettable storytelling—that covers the deep environmental history of the American West from twenty-five thousand years ago to today. She delivers an important cautionary tale about the relationship between people and nature, always asking a simple question: ‘At what cost?’ I learned something on every page.”

—DAYTON DUNCAN, author of *The National Parks: America’s Best Idea*

“Sara Dant’s *Losing Eden* is an environmental masterpiece about the American region she holds near and dear to her heart. Whether Dant tackles the problems of aridity, massive wildfires, or climate change, she hits all the right notes. . . . This is a brilliant book, learned to its core, that will stand the test of time. Environmental history at its absolute finest. Highly recommended!”

—DOUGLAS BRINKLEY, Katherine Tsanoff Brown Chair in
Humanities and professor of history at Rice University

“This is environmental history at its best. *Losing Eden* offers a masterful narrative that explores broad-ranging themes and the historical connections, tensions, and contradictions that have defined the vibrant and diverse peoples and environments of the American West, as well as their relationship to one another.”

—ELADIO B. BOBADILLA, assistant professor of
Latinx history at the University of Pittsburgh

Losing Eden

**ENVIRONMENT AND REGION
IN THE AMERICAN WEST**

Series Editors

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**An Environmental History
of the American West**

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SARA DANT

Foreword by Tom S. Udall

University of Nebraska Press Lincoln

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For Dan and Claire

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FOREWORD

Tom S. Udall

In *Losing Eden*, Sara Dant has written a comprehensive book on the American West. She covers everything from its geography through its history to its current configuration. More importantly, however, she has written about the lessons we can take from this story to deal with the existential crises we face today.

This is not necessarily a pretty story, nor is it one in which the human species comes off particularly well. Basically, it is a story of how for the last five hundred years we have failed to understand the true value of the West—the region that allowed us to become by 1900 the most productive economy in the world by virtue of our labor, our capital, and, most significantly, our natural resources.

There was a time, before what Dant calls the “Great Dying”—the hundred years in which up to 90 percent of the Indigenous population was lost to the colonization of the Western Hemisphere by Europeans—when Native peoples largely lived in harmony with their environment. A time when attention was paid to the interconnectedness of all living things. A time when life was based on a subsistence economy sustainable with respect to the demands of the environment of the place. A time when the interests of the community prevailed over individual interests. A time when, in places like the Southwest, watershed communities with communal irrigation systems defined the equitable distribution of water—the essential ingredient.

The Europeans brought instead a market economy that bypassed the checks and balances required to maintain a sustainable economy. Western land became a commodity to be measured and sliced and partitioned and sold off without consideration for its fragile ecology.

The fur trade provides a particularly vivid example of the market economy's focus on "progress and civilization" over respect for living creatures and ecological balance. The contribution of beavers to the overall environment was literally wrecked to make the fur hats fashionable in Paris. In short, as Dant writes, "the sustainability of Native communities became increasingly impossible when demand for merchantable commodities dictated the 'value' of nature."

In the nineteenth century, the gold rush, railroads, and the whole of America's "manifest destiny" overwhelmed the concern for the land itself and the scarcity of water in the West. The Civil War ramped up the Industrial Revolution in the East, making greater demands on the West's natural resources, which added to what became an unsustainable plunder. In the twentieth century, "progress" continued to have priority over sustainability. National policy supported dams and oil production and highways.

It's not that there weren't voices reminding us that the West was precious and must be preserved: Theodore Roosevelt believed our greatest task was to leave the land in better condition than it was left to us. John Wesley Powell believed the fragility of the West could not sustain the greed of exploitation, and John Muir believed appropriation of natural resources beyond need would unbalance the environment. By the 1960s and 1970s there was a sufficiently broad environmental movement to ensure the enactment of federal laws bringing some measure of protection to our endangered natural resources—a national project momentarily stymied by their unbridled exploitation by Interior secretary James Watt in the 1980s. That movement continues to grow and push us toward the development of renewable rather than depletable resources—an existential necessity in the face of the threats of climate change and the earth's sixth mass extinction.

All of which leaves us where?

Dant has hopes for a New West that values conservation in place of an Old West of extraction and exploitation. Essentially, we have no choice but to recognize that the accelerated rate of climate change means we learn to live sustainably or we lose it all. And learning to live sustainably means learning the history of the West and how there was a time when humans knew how to do that.

Losing Eden

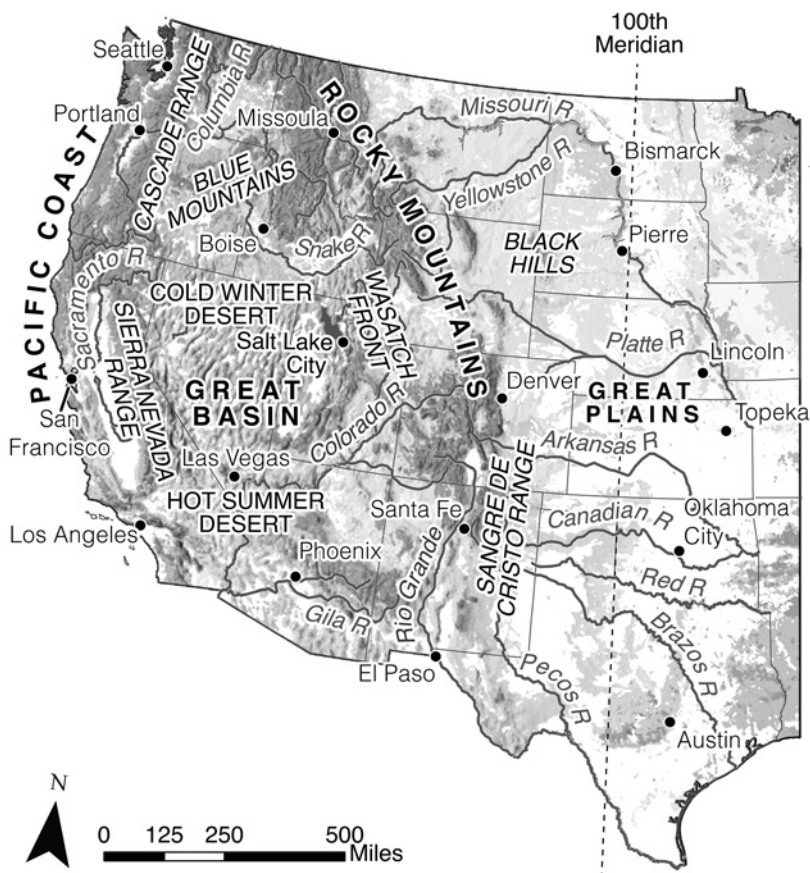
Introduction

The Nature of the West

The American West has long been a region of hope and renewal. Even now, at the vanguard of climate change and emblematic of a planet whipsawed by increasingly violent and destructive environmental crises, the West yet holds the extraordinary promise of modeling a sustainable future for the nation and the world. The writer Wallace Stegner foresaw this possibility, writing that “we are the most dangerous species of life on the planet, and every other species, even the earth itself, has cause to fear our power to exterminate. But we are also the only species which, when it chooses to do so, will go to great effort to save what it might destroy.”

Environmental history is a field of study that emerged in the 1960s and 1970s during the heyday of the environmental movement. As “history,” it is the study of change over time, but instead of focusing on traditional topics like presidents and wars, environmental history examines the evolving relationship between people and nature; it is rooted in place. From this perspective, humans exist *within* nature, not apart from it, and, like all animal species, humans will survive only if we can preserve the health of the habitat in which we live. We both shape and are shaped by the world around us.

There are perhaps as many different definitions of the West as there are westerners, but in this text the term describes the contiguous, continental region lying west of the hundredth meridian. This longitudinal divide separates the more arid West from the more lush East, effectively delimiting



1. The American West. Map by Amber Bell.

an ecological as well as geographical distinction that has affected human interaction with nature over time. Beyond these cartographic boundaries, the West's exceptionalism derives from its unique environment. It is a land of extremes. The highest and lowest temperatures ever recorded in the United States occurred in the West; in the lower forty-eight, the West has the tallest peaks and the lowest valleys; the West also holds national snow records, hail-size records, no-rain records, and even fastest temperature rise and drop records. For Stegner, the West's aridity is essential: "[It] gives the western landscape its character . . . the air its special dry clarity. . . . [Aridity]

puts brilliance in the light and polishes and enlarges the stars . . . exposes the pigmentation of the raw earth . . . limits, almost eliminates, the color of chlorophyll . . . [and] erodes the earth in cliffs and badlands.” There is no way to comprehend the past or present West—and by extension the nation—without understanding the pervasive influence of these powerful forces. As the region’s greatest asset and challenge, the natural West has constantly forced its residents to rethink and reconfigure their relationship with the land.

Far from the wilderness described in earlier histories, the West was never an undiscovered Eden. It is instead an ancient homeland with landscapes that humans have inhabited, modified, and managed for thousands of years. Native peoples generally lived lightly on the land but sometimes pressed it beyond its carrying capacity. When Europeans and later Americans arrived, they were not engaging with undisturbed nature, as so many argued until the 1990s, but these immigrants nevertheless portrayed the West as an Eden or Promised Land destined for their use. By definition, the term “Eden” is synonymous with unspoiled paradise, a pristine utopia of bounty and abundance. For some, the West fulfilled this biblical vision of a land of milk and honey, but for many the region constituted a harsh and unforgiving desert of aridity and struggle, while others envisioned it as a vast expanse of material wealth to exploit and plunder. This fusion of Edenic myth and environmental and economic reality shapes both the past and present, and the title of this book, *Losing Eden*, underscores this complicated relationship, encourages readers to lose this conceit of a virgin continent, and provides a central theme for the work.

The chapters that follow synthesize the West’s complex history and illuminate several key subthemes designed to challenge readers to think critically and deeply about the past. First, as a consequence of the European introduction of a capitalist market system, tension quickly developed between economy and environment, between promoting economic success and development and preventing ecological destruction. As Stegner, who wrote about the West better than anyone, explained, “For at least three millennia we have been engaged in a cumulative and ambitious race to modify and gain control of our environment.”

Many historians have argued that the East's early relationship with the West was colonial and exploitive: extractive industries funneled western raw materials to eastern factories, larger and wealthier eastern financial institutions plundered the West for their own material gain, and eastern lawmakers dictated land policy to largely powerless westerners. Even Bruce Babbitt, a former Interior secretary and a westerner, observed that "traditionally, the American West has been something of a third-world economy based on resource extraction." While there is certainly much truth in these generalizations, the reality is more complicated. Easterners did plunder the West, but so too did many westerners. The natural resources of the West did flow to eastern factories, but they also built western cities and fueled trade across the Pacific. Ultimately, the West has enjoyed a disproportionate flow of federal largesse in the form of railroads, water projects, roads, and public lands, and some of the earliest efforts to conserve and preserve nature in the region came from the East.

The West-as-colony stereotype persists, however, for two essential reasons. First, it has significant foundation in fact, which this text will explore. And second, it is a story that westerners want to hear about themselves because it largely absolves them and places the blame for plundering squarely on eastern shoulders. But rather than ask "Whose fault?," this book encourages readers to consider a far more important question: "At what cost?" Americans have long celebrated progress, material wealth, and technological advancements without considering their true environmental price. This exploit-versus-protect riddle remains a challenge even into the twenty-first century.

A second common thread running through much of the West's environmental history and this book is a cautionary concept called the "tragedy of the commons," popularized by ecologist Garrett Hardin. Hardin argues that individuals acting in their own self-interest will ignore the best interests of larger society and deplete common resources. To illustrate his point, he uses the example of a local community grazing commons, open to all, where each resident could sustainably graze one cow. An individual herder could easily rationalize that the addition of one more cow to the pasture would have no appreciably negative effect on the commons but would bring appreciably greater profit to the herder himself. So long as he is the only herder who thinks and acts this way, the commons remains unharmed and stable. But

the tragedy arises when each herder in the community reaches this same conclusion and each adds another cow to the commons. The individual's contribution does not measurably degrade the commons, but the collective additions result in overgrazing. Even though the individual's intent is not malicious, the effect is nevertheless tragic. As Hardin writes, "Freedom in a commons brings ruin to all."

Hardin's example is oversimplified and abstract, as not all people or groups utilizing community-managed resources (i.e., commons) have careened headlong toward tragedy. In this text, the tragedy of the commons predicament is most useful for explaining the exploitation of open-access resources such as forests, water, air, and grazing lands, rather than the more narrow, legal definition of commons that Hardin outlines. Uniquely in the West, public lands, such as national parks, forests, and reserves, endeavor to counter Hardin's predictions of environmental "ruin" through federally regulated natural resources. Utilizing the tragedy of the commons idea to examine the long-term environmental consequences of the transition from local to national and international economies acts as a powerful metaphor for understanding the environmental problems that arose in the American West, returning again to the "at what cost" question.

Finally, the goal of achieving sustainability, and thereby avoiding the tragedy of the commons, provides a unifying purpose to this environmental history of the American West. Sustainability's objective is the creation of environmental stability and ecological health within the framework of economic development and political systems. It is essential to our survival. Ecologists and scientists have coined the term "Anthropocene" to describe the time period (beginning around 1800 with the Industrial Revolution) when human activities increasingly influenced the physical environments of the earth. Stegner has called us "the most efficient and ruthless environment-busters in history." As we move through the twenty-first century and confront the effects of our long-term exploitation of nature and the challenges of global climate change—undeniable in the West—we must learn the environmental lessons of the past or suffer the consequences.

In the end, we care about what we know. This environmental history of the American West endeavors to connect readers with this place, whether

the West is home, a vacation destination, or merely a source of curiosity. Stegner writes, “If I had not been able periodically to renew myself in the mountains and deserts of western America I would be very nearly bughouse.” Indeed, he calls the wild places of the West the nation’s “geography of hope.” Understanding the whole of the West’s environmental history can help and perhaps motivate us to move forward and sustainably create and maintain the conditions under which humans and nature can coexist in productive harmony. Order may be “the dream of man,” as historian Henry Adams once suggested, but to realize its geography of hope, sustainability rather than Edenic myth must become both the dream and reality of the West.

Note on Content and Structure

To enhance readability and avoid repetition, this text uses the terms “Indian,” “Indigenous peoples,” “Native peoples,” and “Native” interchangeably. When new expressions or specific terms appear, a short definition or description follows immediately. The suggested readings listed at the end of each chapter expand upon the ideas presented in the chapter, allow readers to pursue more in-depth analysis of certain topics, and connect historical interpretations with individual writers and thinkers. A book of this length makes no claim to being comprehensive but instead provides a new perspective for examining the arc of the West’s history; it aspires to inspire. The hope is that readers will come away with not only a heightened curiosity about the world around them but also a more complete understanding of the past, how that past connects to the present, and how we might move forward into the future.

SUGGESTED READING

- Alfred W. Crosby, “The Past and Present of Environmental History,” *American Historical Review* 100, no. 4 (October 1995): 1177–89.
- Mark Fiege, “The Nature of the West and the World,” *Western Historical Quarterly* 42, no. 3 (Fall 2011): 305–12.
- Garrett Hardin, “The Tragedy of the Commons,” *Science* 162, no. 3859 (December 13, 1968): 1243–48.
- Wes Jackson, “Prologue,” in *Becoming Native to This Place* (Lexington: University Press of Kentucky, 1994), 1–5.

- Journal of American History* Round Table Discussion on Environmental History, 76 (March 1990), including Donald Worster, "Transformations of the Earth: Toward an Agroecological Perspective in History"; Alfred W. Crosby, "An Enthusiastic Second"; Richard White, "Environmental History, Ecology, and Meaning"; Carolyn Merchant, "Gender and Environmental History"; William Cronon, "Modes of Prophecy and Production: Placing Nature in History"; Stephen J. Pyne, "Firestick History"; and Donald Worster, "Seeing beyond Culture."
- Patricia Nelson Limerick, "Region and Reason," in *All over the Map: Rethinking American Regions* (Baltimore: Johns Hopkins University Press, 1996), 83–104.
- Walter Nugent, "Where Is the American West? Report on a Survey," *Montana: The Magazine of Western History* 42, no. 3 (Summer 1992): 2–23.
- Sammy Roth, "The American West Went through Climate Hell in 2021. But There's Still Hope," *Los Angeles Times*, December 21, 2021, available at <https://www.latimes.com/environment/story/2021-12-01/american-west-went-through-climate-hell-in-2021-but-theres-still-hope>.
- Wallace Stegner, *Where the Bluebird Sings to the Lemonade Springs: Living and Writing in the West* (New York: Modern Library, 2002). Also "Wilderness Letter," Wallace Stegner to David E. Pesonen, December 3, 1960, available at Eco-Speak, Stanford University, <http://web.stanford.edu/~cbross/Ecospeak/wildernessletter.html>; and "The Marks of Human Passage," in *This Is Dinosaur: Echo Park Country and Its Magic Rivers*, ed. Wallace Stegner (1955; Boulder CO: Roberts Rinehart, 1985), 3–17.
- Paul S. Sutter, "The World with Us: The State of American Environmental History," *Journal of American History* 100, no. 1 (June 2013): 94–119, available at <http://jah.oxfordjournals.org/content/100/1/94.full.pdf+html>.
- Louis S. Warren, "Going West: Wildlife, Frontier, and the Commons," in *The Hunter's Game: Poachers and Conservationists in Twentieth-Century America* (New Haven: Yale University Press, 1997), 1–20.

Losing “Eden”

1

In 1962 biologist Rachel Carson opened her seminal book, *Silent Spring*, with a simple yet profound declaration: “The history of life on earth has been a history of interaction between living things and their surroundings.” Although scientists had long embraced this understanding that humans and nature share a deep, almost symbiotic relationship—they each shape and in turn are shaped by the other—Carson’s book brought this concept of interconnectedness to a wider audience at a critical moment. As our species’ story demonstrates, humans harbor the greatest capacity to inflict damage on and ultimately destabilize and destroy the very environments that sustain us. Over time, evolution has singled out our highly intelligent carnivorous primate as the dominant species in the food chain, but the traits that have ultimately ensured unbounded human success have also inflicted a heavy toll on the natural world. As biologist E. O. Wilson has put it, “Darwin’s dice have rolled badly for earth.” Yet Wilson also argues that there is an instinctive bond between people and other living systems, which he calls “biophilia”—literally “love of life.” And it is this abiding connectedness, he believes, that may yet allow the same big brains that learned myriad languages, developed increasingly effective technologies, and created vibrant cultures not only to prevent environmental catastrophe and collapse but also to facilitate a sustainable balance between the environment, economy, and society.

A close examination of the deep history of the environment in the American West within the larger global context provides a perfect illustration of Wilson's biophilia hypothesis. It reveals how the unique geographies of the West have exerted such a powerful influence on the peoples of this region and how those people, in turn, have shaped and altered this largely arid land over time. The first humans to set foot on the North American continent arrived in the West and constantly innovated. New tools, the advent of agriculture, fire- and irrigation-managed environments, and the development of extensive trade routes were essential to early survival and success in the region and belie the myth of a pristine or Edenic America discovered by Europeans. To be clear, then, Christopher Columbus was not first. He did not discover America in 1492. In fact, Columbus was very, very late.

From about 280 million to 230 million years ago, the earth's land masses were centered on the equator and consolidated into one supercontinent that scientists have called Pangaea ("whole land"). About 175 million years ago, volcanic forces began to break up this gigantic landmass—a process known as continental rifting—into a series of continental plates. As plate tectonics separated the continents, the plants and animals on each began to evolve and adapt to their unique environmental circumstances. Over the ensuing millennia, this evolutionary divergence produced myriad species, including our own human ancestors, who first separated from the progenitors of modern apes in Africa between 5 million and 7 million years ago. By about 4 million years ago, these forebears had evolved the unique trait of walking upright, becoming fully bipedal about 1.9 million years ago. By 1.6 million years ago, protohumans had begun to use flaked stone and teardrop-shaped hand-axe technology to cut wood and meat and to scrape hides, and by approximately 800,000 years ago, they had gained control of fire.

Armed with these tools and weapons, such as wooden spears tipped with stone or bone points, early hunters effectively exploited the changing environments around them to become the most widely distributed large land animals on the planet. These protohuman precursors to our own species, *Homo sapiens*, included *Homo erectus* and Denisovans (primarily in Asia) and *Homo neanderthalensis* (Neanderthals, living in Europe). The first of many subsequent waves of early hominid dispersal out of Africa began as early

as 1.8 million years ago; protohumans began migrating to western Europe about 1.2 million years ago, and Neanderthals emerged there approximately 400,000 years ago.

Significantly, the *Homo* genus evolved during the long Pleistocene epoch, which began about 2.6 million years ago and finally gave way to the current epoch (the Holocene) approximately 12,000 years ago. As noted paleoanthropologist Ian Tattersall writes, “Never had circumstances been more propitious for meaningful evolutionary change than among our highly mobile, adaptable, and resourceful Pleistocene ancestors.” Specifically, throughout the Pleistocene, cycles of expanding and contracting ice caps at both poles of the earth inspired hominids’ evolutionary adaptation to unsettled environmental conditions. These ice ages, or periods of glacial formation and retreat, correspond with the long-term effects of Milankovitch cycles, the term used to describe the collective effects of earth’s tilt on climate as our planet orbits the sun.

Modern humans (*Homo sapiens*), distinguished by their skeletal structure and larger brain size, emerged in Africa approximately three hundred thousand years ago. Competition, cooperation, and carnivory promoted mental growth that in turn expanded brain capacity, producing an increasingly evolved and canny predator. Small groups of *Homo sapiens* ventured first into western Asia and then other parts of Eurasia in a staggered and complex process, arriving in southeastern Asia approximately eighty thousand years ago, in Australia by about sixty-five thousand years ago, and in Europe by about fifty-four thousand years ago. Their big brains enabled them to cope with colder Pleistocene climates, use fire to shape their environment, and hunt larger game animals.

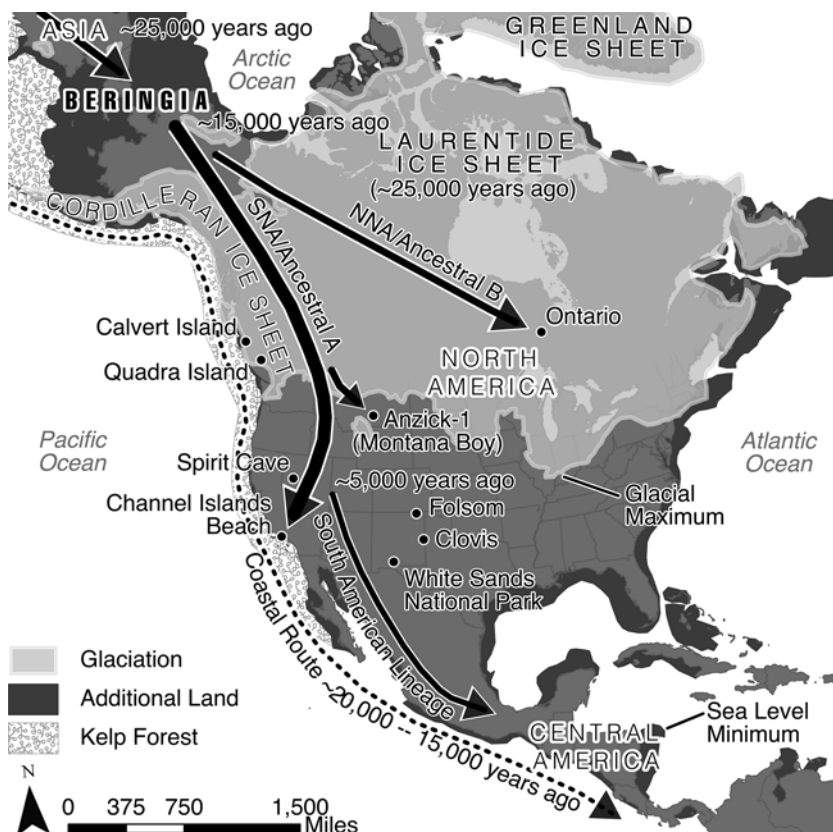
Larger brain capacity also facilitated what some scholars have called the Great Leap Forward, although it was actually more of a long, slow burn of evolutionary language development that led to greater social organization. By about thirty thousand to forty thousand years ago, *Homo sapiens* were capable of storing vast amounts of information, crafting more sophisticated hunting tools (e.g., javelins, flaking flint points), and transmitting this knowledge from generation to generation via elaborate oral history and story and ultimately (much later) written language. In effect, language compressed the entirety

of human experience and wisdom accumulated over thousands of years and deposited it in the brains of the most current generation. All of this enhanced human adaptability. While paleoanthropologists hotly contest the nature of the interaction between *Homo sapiens* and Neanderthals, wherever *Homo sapiens* went, other hominids yielded until *H. sapiens* eventually became the sole surviving species from this once-diverse family tree.

There is still significant scientific debate surrounding the details of human migration into the Americas, but new DNA research and genomic sequencing combined with paleoarcheology and anthropology now suggest that early Siberians began migrating eastward approximately twenty-five thousand years ago. During this period, the earth's climate was characterized by an advancing ice age, with much of the surface water locked up in glaciers. As a result, sea levels dropped significantly and many previously flooded or submerged areas became dry. One of these places was the Bering Strait, which lies between present-day Alaska and Siberia. While the Bering Strait normally cradles the Bering Sea, during the Ice Age, this relatively narrow waterway became a land bridge called Beringia. Extending at times perhaps six hundred to a thousand miles from north to south, Beringia was a landscape of shrubby tundra and scattered stands of trees across which large game animals (megafauna) slowly migrated and human hunter-gatherers followed in pursuit.

Blocked by glaciation from penetrating into the American interior, these seasonal human migrants lived in and around Beringia—modern-day Alaska and western parts of the Yukon—for about ten thousand years, fishing for salmon and hunting hares. Paleoanthropologists refer to this migratory pause as the Beringian Standstill, and during this period three distinct genetic lineages developed in situ: Ancient Beringians, whose genetic signal disappeared, perhaps replaced or absorbed by more recent arrivals, and two basal branches of ancestral Indigenous Americans that geneticists call Northern Native American (NNA)/Ancestral-B and Southern Native American (SNA)/Ancestral-A. Remarkably, as one recent human genomic study noted, “all contemporary and ancient [Native Americans] for whom genome-wide data have been generated before this study derive from either the NNA or SNA branch.”

The Beringian Standstill came to an end about fifteen thousand years ago, when the last of the Pleistocene ice ages began to wane, creating ice-free



2. Migration routes used by First Americans. New DNA research and genomic sequencing combined with paleoarcheology and anthropology now indicate that Indigenous Americans began occupying the continent at least fifteen thousand to twenty thousand years ago. Map by Amber Bell.

corridors and emerging ecological zones teeming with plants and animals that drew these first Americans into the continent's interior. Evidence for this diaspora endures. One day, for example, approximately thirteen thousand years ago, three individuals, perhaps a family group that included a child, strolled along a protected beach on today's Calvert Island in British Columbia. As they walked, their feet pressed into the soft, brown clay of the shoreline, leaving twenty-nine footprints that archeologists discovered in 2014. On nearby Quadra Island, about one hundred miles northwest of Vancouver,

scientists and a delegate from the local Wei Wai Kum First Nation have conducted excavations yielding more than a thousand prehistoric artifacts, described as “rock scrapers, spear points, simple flake knives, gravers and goose egg-size stones used as hammers.”

The significance of these discoveries cannot be overstated. As Nick Ashton, curator of Paleolithic and Mesolithic collections at the British Museum, has argued, such finds support “the idea that the first peopling of the Americas was from eastern Asia at a time of lower sea levels, when the landmasses were larger, but probably with the assistance of sea-faring vessels. The footprints provide a very tangible link to the first Americans.” Then, in 2021 scientists concluded that numerous human footprints at White Sands National Park in New Mexico dated from at least twenty-one thousand to twenty-three thousand years ago and thus were more than five thousand years older than previous evidence had suggested. Likely made by children and teenagers, these tracks suggest a division of labor such that these younger, less skilled individuals were consigned to “fetching and carrying.” The authors of the 2021 study argue that “the overlap of humans and megafauna for at least two millennia during this time suggests that if people were hunting megafauna[,] the practices were sustainable, at least initially. This also raises the possibility of a human role in poorly understood megafauna extinctions previously thought to predate their arrival.” A subsequent 2022 discovery of eighty-eight fossilized human footprints in northwestern Utah, likely dating back twelve thousand years, is further facilitating our understanding of human dispersal across the Americas as well as scientific-Indigenous research cooperation.

Indigenous expansion was rapid, if uneven, and extensive, indicating that these early migrants essentially found no barriers to their progress. Motivated by changing climate and food availability, these first Americans spread human influence to the far corners of the Western Hemisphere in just a few centuries. In addition to expanding their presence over land, other, even earlier arrivals likely followed the so-called Kelp Highway, using small boats to propel themselves to new destinations all along the Pacific coastline. Some scientists have also documented a genetic signal—dubbed Population Y—in two Amazonian groups (i.e., not in North America) that shows a possible connection to Australasians. To explain such a phenomenon, one scientist said

simply, “We have no idea.” Wherever these first Americans settled, though, they adapted to the diverse environments of the continents and developed hundreds of distinct cultures and languages long before Columbus and the Europeans eventually arrived, thousands of years later.

It is important to understand, however, that Indigenous peoples have long rejected assertions that their ancestors came from “somewhere else,” and the reconciliation of Native ancestral knowledge and scientific discovery remains a work in progress. But as Jennifer Raff, an anthropological geneticist, affirms, “Native Americans truly did originate in the Americas, as a genetically and culturally distinctive group. They are absolutely indigenous to this continent.” This integration of insights gleaned from science and origin stories is vital. Like many Indigenous groups, Hopi-Pueblo peoples, for example, believe they emerged from the earth. Maasaw, Caretaker of the Earth, gave his people a sacred quest to find their home, the Center Place. Much as scientists describe a swift human pioneering process across the Americas (rather than a gradual diffusion), Hopi-Puebloans tell of the covenant made with Maasaw to walk in an ever-widening spiral to the farthest corners in order to know the gift of the earth and ultimately to find their Center Place in today’s American Southwest.

Moreover, much of the recent genomic advancement discussed above has been a direct consequence of improving collaboration and cooperation between scientists and Indigenous peoples, such as the Quadra Island excavation and Utah footprints research mentioned previously. Unfortunately, that has not always been the case. In 1940, for example, archeologists excavated the remains of a male, approximately forty years old, shrouded in a rabbit-skin blanket and reed mats, from a place called Spirit Cave, near present-day Fallon, Nevada. For nearly half a century, the Nevada State Museum’s storage facility housed the remains without the knowledge of the local Fallon Paiute-Shoshones. In 1996, when a journal article alerted them to the museum’s collection, the tribe began a long campaign for repatriation. Finally, in 2015 geneticist Eske Willerslev met directly with the Fallon Paiute-Shoshones and received permission to retrieve DNA from a tooth and earbone of the Spirit Cave remains. With the involvement and consent of the tribe, his analysis not only dated the remains at 10,600 years old but also established

the Ancestral-A DNA connection between the ancient Spirit Cave man and modern Paiute-Shoshones. As the tribe said of the study, “[It] confirms what we have always known from our oral tradition and other evidence—that the man taken from his final resting place in Spirit Cave is our Native American ancestor.” To further this syncretism, Willerslev subsequently attended the tribal reburial of the Spirit Cave man in the summer of 2018. “What was most amazing is that it was similar to if you and I were burying a very close relative,” he said. “It’s that emotional even though we are burying a mummy that was living 10,000 years ago.”

Anthropologists and historians have identified and classified three basic phases of human history in the Americas prior to European contact. The term “Paleoindian” refers to the earliest inhabitants and their culture, which dominated from at least 15,000 years ago until approximately 9,000 years ago. As these highly nomadic first Americans diffused rapidly across the continents, they engaged in intensive hunting and gathering, utilized stone tools, and lived in bands of between twenty and sixty individuals. By about 13,000 years ago, this Paleoamerican presence included the Clovis culture, characterized by fluted stone spear points and named after the site in present-day New Mexico where archeologists first discovered their artifacts. Clovis (and later Folsom) peoples ranged across much of the West and incorporated a rich variety of plants and big game animals into their diet.

Approximately twelve thousand years ago, global environmental changes that featured a gradual warming trend and the end of the Ice Age also brought to a close the long Pleistocene epoch. This profound ecological transformation ushered in the Archaic period. During this phase, which predominated until about four thousand to five thousand years ago, Indigenous peoples augmented big game hunting with smaller game, seasonal fruit and vegetable gathering, and fishing. Many Native groups continued to employ this subsistence strategy even after European contact, but others embraced agriculture and animal domestication beginning approximately five thousand years ago. This last phase of precontact history is known as the Neolithic Revolution.

As Indigenous peoples dispersed across the Americas, they encountered a floral and faunal cornucopia. As recently as fifteen thousand years ago, the primeval American West rivaled Africa’s Serengeti Plain. A safari across

that western landscape would have encountered camels, sloths, and saber-toothed cats, herds of elephant-like mammoths and mastodons, and giant early bison and horses, as well as lions, dire wolves, and short-faced bears. However, the environmental consequences of this swift human expansion, in combination with changing climatic conditions, were especially deadly for the continent's animals, unaccustomed and unprepared as they were to confront this new and lethal predator. The result was a stunning bestiary collapse, known as the Pleistocene extinction.

According to many paleoanthropologists, once the Clovis hunters arrived they quickly helped drive the vast majority of these easy-target giants to extinction. This theory, called the "Pleistocene overkill" hypothesis, was first popularized in the 1960s by geoscientist Paul Martin, who argued that early humans had unleashed a "blitzkrieg" on North America's megafauna. Martin argued that people proved such efficient hunters that most of the continent's large mammals went extinct before they could develop appropriate predator responses. Some Native scholars, like Vine Deloria Jr., however, quickly dismissed Martin's "mythical Pleistocene hit men" idea as "simply preposterous." Other scientists have also disagreed with Martin's theory, arguing that since some of these animals were not prime human prey, these massive extinctions likely resulted from climate change in the wake of the last Ice Age. Whatever the cause—and it is most likely a conflation of influences—the massive Pleistocene die-off permanently wiped out more than 70 percent of North America's megafauna, including dire wolves, mammoths and mastodons, gigantic beavers and condors, and even a six-and-a-half-foot saber-toothed Pacific Northwest salmon, in addition to the other animals listed above. Indeed, with the exception of native pronghorn antelope, only those species that had migrated across Beringia, coexisted with humans, and evolved earlier survival strategies, such as elk, deer, and bighorn sheep, avoided this grim extinction fate. This great ecological simplification meant that the West lost much of the wildlife diversity that Africa still retains.

To be sure, scientists have not been able to link the Pleistocene disappearance of all large animals to human predation. Among the most perplexing extinctions of the great die-off is that of the North American horse (*Equus*). Historians and anthropologists have offered numerous explanations for

its disappearance, but none seems quite adequate. Archeological evidence supports the combination of overhunting and climate change as the major culprits for the extinction of mammoths and saber-toothed cats, whose small numbers and long gestational periods limited their populations, yet little evidence exists regarding the disappearance of horses. Scientists believe that until about ten thousand years ago, ancestors of the modern horse dominated the natural environment of North America, constituting as much as one-third of the continent's faunal population. From their American base, these wildly successful inhabitants spread around the world (a reverse Beringia migration) and became, over time, the zebras and wild Asian steppe ponies of the modern era. So, what happened here? How did this obviously successful, stable, significant population crash? Completely? Especially when their habitat, the vast grasslands of the western plains, remained intact?

The usual suspects provide no answers. Paleontologists have found no evidence of, for example, horse jumps, the mass-death kill sites used by early human inhabitants to harvest bison, nor have they found arrow points or hunting implements preserved with fossilized horse remains to indicate hunting as they have with, say, mastodons. Furthermore, if, as some have posited, horses were so susceptible to human predation, why did they live on in other parts of the world? At this point, there seems to be no definitive answer to these vexing questions, although data suggest that horse extinction is most consistent with the activities of Clovis hunters. Regardless of the cause, the consequences of the Pleistocene die-off were definitive. In combination with the slow development of agriculture in the Americas, the absence of big game animals with domestication potential further disadvantaged Archaic Indians in the coming Neolithic/Agricultural Revolution. When pastoral Europeans finally did arrive, they encountered Native peoples who had domesticated only one large mammal (the South American llama, along with the closely related alpaca), a few fowl, and dogs. American Indians utilized no other beasts of burden and as a consequence harbored no real animus against predators like wolves and cougars, but their agricultural development lagged behind that of Europe as a result.

Interestingly, of all the habitable continents colonized by migrant human populations, the Americas were the last to experience the Neolithic Revolu-

tion (Australia never experienced it). The Neolithic Revolution (literally, the new stone age) was the grand human experiment in living with domesticated plants and animals, as well as smelting metallic ores and using stone tools for grinding. So why were the Americas late to the revolution and with what consequences? The Fertile Crescent (comprising present-day Iraq, Syria, Lebanon, and Egypt) represented the vanguard of the Neolithic Revolution, the most critical period of human development. Historians argue that this sweeping geographic arc encompassing the Tigris and Euphrates River valleys of ancient Mesopotamia and the Nile River delta of ancient Egypt formed the cradle of human civilization. It was here, at least eight thousand to twelve thousand years ago, that humans first learned to farm and raise livestock and later to irrigate agricultural fields. Archeological evidence indicates that this agricultural revolution would evolve independently at later dates in several other locations around the world. Everywhere the Neolithic Revolution occurred, it profoundly transformed the relationship between people and the natural world: human populations became less nomadic and more sedentary, produced food more efficiently and in greater quantities, and used the escape from daily hunting and gathering responsibilities to further develop art, culture, math, science, religion, and government. In essence, agriculture allowed humans to appropriate the energy of the sun for their own gain, which spurred cultural advancement.

In the Americas, however, the Neolithic Revolution began slowly and “accelerated tardily,” according to environmental historian Alfred Crosby, leaving Native Americans at a distinct disadvantage when iron- and steel-wielding Europeans finally did arrive. In other words, while Indigenous adaptation and innovation had ensured not only survival but also success and sophistication, European technology would prove ascendant and irresistible in the coming invasion and conquest. Corn offers one explanation, Crosby believes. Because this eventual staple evolved from a grass to a food source so slowly, the populations of the Americas, as well as their innovations, were vulnerable when confronted by wheat-growing Europeans.

Europeans aggressively embraced sedentary agriculture, domesticated animals, and cultivated their farmlands far more rapidly than their Native American counterparts. Why? Population pressure. As human numbers