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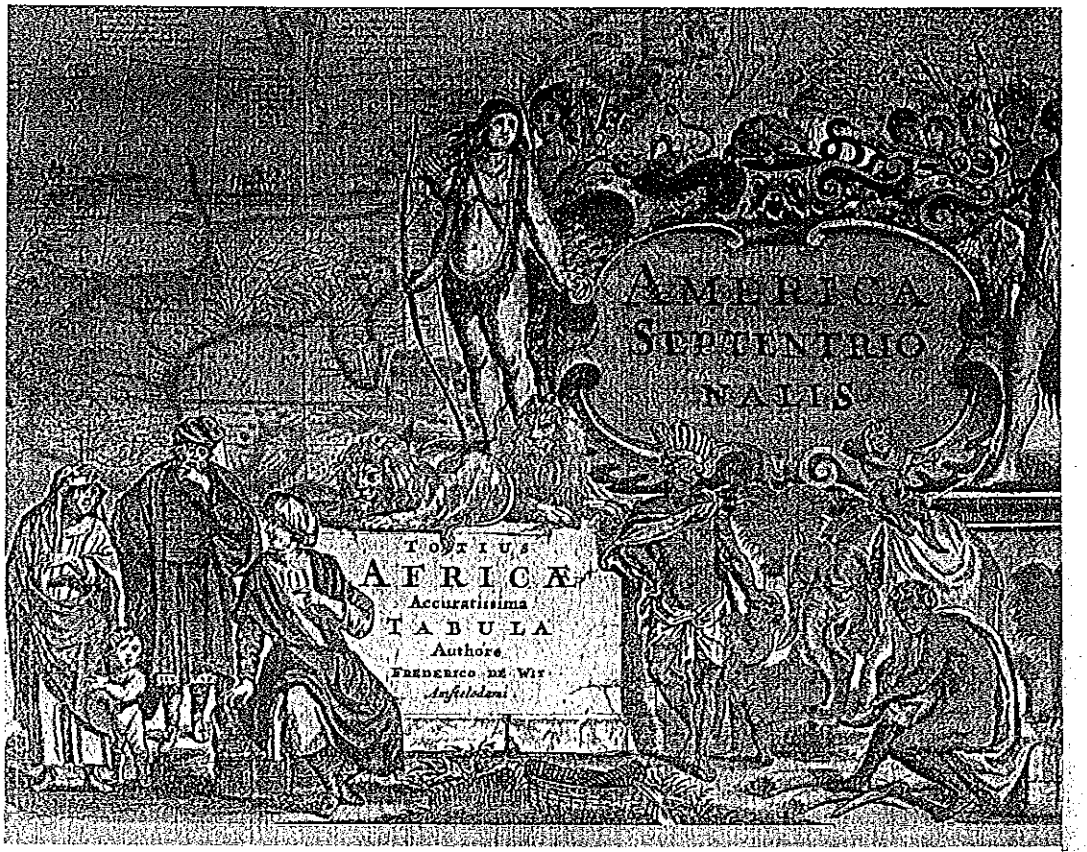
Indigenous Knowledge and the Environment in Africa and North America



SERIES IN ECOLOGY AND HISTORY

CHAPTER 6

Navajos, New Dealers, and the Metaphysics of Nature

Marsha Weisiger

"THE TALK about grazing conditions was not true," asserted Frank Goldtooth in the early 1970s. "There was plenty of vegetation and water. The ranges and valleys were covered with tall grass and beautiful flowers." The elderly Diné (Navajo) man recalled the traumatic New Deal era of the 1930s, when officials with the U.S. Bureau of Indian Affairs (BIA) and the Soil Conservation Service (SCS) pressured Navajos to slash herds in an effort to conserve severely overgrazed rangelands on the Navajo Reservation. Located on the Colorado Plateau, the reservation encloses some twenty-five thousand square miles at the intersection of Arizona, New Mexico, and Utah. Goldtooth had helped implement the program to reduce livestock and restrict stockowners to circumscribed areas, but looking back, he concluded that the government program had been misguided. Federal conservationists had misread the land and the relationship of the Diné to it.

The Diné themselves, he told his visitor, long conserved the range by moving in an annual cycle, yet government policy-makers, disdainful of traditional ways, disrupted those patterns, and in so doing they degraded the land. In the old days, he explained, "the people moved with their sheep whenever and wherever they wished with the seasons." It seemed clear to

him, in fact, that the Diné knew how to live in harmony with the land. "A homesite," he explained, "is not good when a family lives in the same place too long. The vegetation is tramped on too much, and it never gets a chance to grow again. Long ago, moving with the stock from one place to another was much better than what we do now. It gave the vegetation time to grow again."[1]

But in the 1930s, federal conservationists portrayed a landscape much different from the one Goldtooth remembered. Rather than reporting lush vegetation, John Provinse, an official with the Navajo Service, exclaimed in a radio broadcast that anyone "could look around and see that great barren areas existed on the Reservation, that the grass was short and becoming shorter, that the wind was whipping sand out of dry washes and from barren spots and piling it up into sand dunes, that there were gullies everywhere." Provinse described a weary waste of sheet erosion, exotic and unpalatable vegetation, and large areas of grassland, once in excellent condition, but "now so denuded of grass that they will scarcely support a saddle horse."[2]

Each of these narrators told a radically different story about the land, and each presumed an utterly different solution, much as Jacob Tropp found in the Transkei (chap. 5 this volume). For Provinse and the conservationists, the earth was eroding before their eyes. Only a drastic cut in the numbers of livestock and a written permit tying each stockowner to a particular piece of land would restore the grasslands and avert disaster. Many Diné disagreed. Like Goldtooth, they maintained that the land remained healthy, that the problem was temporary drought. It was as though Goldtooth and Provinse saw completely different landscapes.

Two sets of "experts," one scientific and one native, offered diametrical descriptions of the land. Each reflected different values and understandings about the way nature works and the relationships of humans to nature. Conservationists employed scientific theories of equilibrium, succession, carrying capacity, and arroyo development to depict the Navajo range as seriously overgrazed. Diné, by contrast, drew on their understandings of cosmology, the mosaic of landscapes, and the interrelationships between livestock and land learned through generations of experience grazing the southern Colorado Plateau, and they concluded that they were witnessing nature's cycle: rain would follow drought, and all would be well again. Neither the Diné nor the New Dealers fully grasped the complexities of nature. Each, no doubt, held pieces of the puzzle, but neither could see the value of the other's.

Today, the Navajo Nation is, if anything, in worse shape than it was in the 1930s. Conservationists managed to bring livestock numbers down to

the so-called carrying capacity, and yet they failed to stem the process of desertification. Grazing and periodic drought brought a spiraling decline in the ability of the soils to produce their historical forage, so that by the late 1950s, a decade of severe drought, range conditions crossed an ecological threshold, the point at which an ecosystem becomes irreversibly changed.[3] The result has been a chronically degraded range.

One key to understanding what went wrong with the program to save the soil on the Navajo Reservation lies in the disjuncture between these two stories of land, native and scientific. Each narrator related a conception of the world that the other found incomprehensible. That was not necessarily an unbridgeable divide, for they shared common ground—the desire to maintain some sort of "balance of nature"—although the means to that end certainly differed. Federal authorities alone, however, had the plenary power to prescribe their view of nature. They largely ignored or even dismissed the Navajos' understandings of the natural world and their local knowledge of the land.[4] By "local knowledge," I do not mean the modern, strategic deployment of "indigenous knowledge," as such. Indeed, that phrase would have puzzled Navajos in the 1930s. I mean, instead, the experiential and often practical knowledge that the political theorist James C. Scott calls "mētis."[5] Ignoring local knowledge, along with Diné epistemology and cultural issues, had important consequences. The Diné resisted and rejected the range conservation program, and so the conservationists proved unsuccessful in actually restoring the range.

In developing their program for the Navajo Reservation, New Deal conservationists told themselves tales of a precipitous decline from a formerly luxuriant grassland to a wretched wasteland. These scientific storytellers were not unique, of course. We may like to think of science as an objective, nonideological pursuit, and yet all science (including the scientific data I myself use in this essay) is socially constructed among communities of scholars, who consciously or unconsciously bring to their work values, experiences, and assumptions that shape their conclusions, even though they may tell themselves otherwise.[6] That does not mean that soil scientists fabricated fables, in the sense of purposeful falsehoods. On the contrary, they narrated stories about the land that seemed to them most plausible, in light of the evidence that they found most persuasive. Nonetheless, the credibility of that evidence depended on their point of view.

The conservationists believed that Navajo rangelands had been overstocked for more than fifty years. By 1930, William Zeh, a BIA forester, concluded that erosion was spreading like a cancer across the reservation. He argued that the Navajos' 1.3 million sheep and goats exceeded the range's

carrying capacity by a factor of two or three. And that shocking figure excluded the large numbers of Navajo horses, as well as cattle, mules, and other stock. In light of such disparities, he wrote, erosion was "inevitable." Zeh worried that the reservation would become uninhabitable, forcing the government, as legal guardian, to either relocate Navajos onto new lands or support them on the dole.[7]

In early June 1933, Commissioner of Indian Affairs John Collier asked Hugh Hammond Bennett, head of the newly created Soil Erosion Service (later renamed the Soil Conservation Service), to spearhead a study of erosion on the Navajo Reservation. Bennett's study consisted of a whirlwind tour lasting less than a week, but everywhere he looked, he saw destruction. All in all, he estimated that some 70 percent of the land suffered from serious erosion. Even beyond the denuded areas around hogans and watering holes, ground that once supported blue grama and galleta grasses now yielded mostly snakeweed and other toxic or unpalatable plants. Sadly, he predicted, a large part of the range would never fully recover.[8]

Before long, the SCS, working in cooperation with the BIA and the Biological Survey, sent a legion of experts to the reservation to describe, measure, classify, and analyze the land. Range technicians, soil specialists, engineers, agronomists, and biologists—many of them among the best in the region—swarmed across Navajo Country. They studied the soil, the range, and the forests. They recorded the topography, drainage patterns, and vegetation. They documented Navajo land use and identified potential dam sites and arable soils. Perhaps most important, these troops of trained professionals *measured* the land, reducing the mesas and canyons, the forests and badlands, the meadows and arroyos, the grasses, forbs, and shrubs to a series of numbers in an effort to arrive at a precise, scientific calculation of the range's carrying capacity.[9] These numbers then became the cornerstone of the stock reduction program.

Reduction, however, was already well under way when the first comprehensive studies of the reservation began to roll off the typewriters. Two qualities of these reports are most striking: their focus on riparian areas and their narrative structure. Collectively, these studies told a story that went something like this: In the beginning, the alluvial valleys had been covered by heavy stands of grass. During torrential rains, these grasses slowed the runoff, allowing the water to spread across the valley floors and trickle slowly into the loamy soils. But the Navajos allowed their sheep to overpopulate the land. Overgrazing removed the vegetation or reduced its vitality, which led to an invasion of unpalatable and poisonous weeds,

exposed the soil to the wind, and encouraged flows of water to cut great gullies, washing the red soil through the watershed of the Colorado River.[10]

This story of a decline from an Edenic pastoral landscape contained a large measure of truth. Grazing does invariably alter the environment, and overgrazing can and did accelerate erosion and bring desertification. When livestock continuously defoliate favored forbs, grasses, and shrubs, they eventually kill the native vegetation they prefer and encourage the invasion and spread of less-palatable plants, both native and exotic. As vegetation density decreases, larger areas of soil are exposed to the baking sun, making them more arid. And as the patches of bare ground become wider, the wind begins to carry away the topsoil. Trampling hooves also compact soils, thereby reducing aeration and water infiltration and encouraging runoff and sheet erosion. Overgrazing, then, can destroy the land, just as the soil conservationists narrated it.[11]

And yet, all stories—whether they trace progression toward a better life or tell of decline toward something worse—take their starting point from a set of assumptions and values that consciously foreshadow the conclusion. A story of catastrophically eroding lands necessarily begins with a healthy environment, or one that is at least stable. As any dramatist knows, such a happy beginning is a necessary prelude to a compelling plotline of tragic declension. The conservationists, however, had little actual knowledge of the condition of the land before the Diné began grazing their livestock on it. Instead, as they constructed their stories about Navajo Country, the scientists relied on assumptions about the land's historical condition that they barely acknowledged and never scrutinized.[12]

Following the influential theories of the pioneering ecologist Frederic Clements, the scientists assumed that the stands of shrubs extending across the reservation had invaded once lush grasslands, and they defined those plant communities not dominated by grasses as degraded. Clements, whose "climax theory" shaped ecological studies for more than a generation, argued that mature vegetation communities remain stable, or in a state of equilibrium, unless disturbed by something like fire or overgrazing. Following a disturbance, a given vegetation community would redevelop through a series of stages until it again reached its mature or climax state. According to Clements, the sagebrush-dominated lands of the Colorado Plateau—which he called "sagebrush savanna"—were the product of overgrazing. In its pristine, mature state, he contended, the region was predominantly grassland.[13]

Mid-nineteenth-century descriptions of the land also swayed the conservationists. Comparisons with early travel accounts persuaded them that

the carrying capacity had dropped by one-third to one-half since the reservation was established in 1868.[14] However, a close reading of early explorers' accounts suggests that travelers generally focused attention on riparian areas and springs—a small fragment of the overall landscape—where they found good forage and water for their horses and mules. The scientists' story of an overgrazed range, then, relied in part on the misguided notion that a more ideal pastoral landscape once characterized all of Navajo Country.

Consider the account written in 1857 by Lt. Edward Beale, whose descriptions of a well-watered pasture of plenty had a marked effect on conservationists' perceptions of the historical landscape. In a publicity pamphlet, the BIA juxtaposed passages from Beale's journal, written along a proposed wagon route paralleling the Little Colorado River, with images by government photographer Milton Snow. These pictures, according to the BIA, told "a story of wasted rangeland, crumbling walls of mud, and nature thrown out of balance by man's wanton misuse of his resources." Beale's rhapsodic descriptions of verdant meadows, "undulating prairie land, covered with grass," and easily passable rivers contrasted sharply with photographs depicting "giant fingers of erosion," unpalatable snakeweed, and arroyos "cutting the country like a knife." The differences offered "graphic proof," in case the reader missed the point, "that no cycle of drouth, but man's stupid misuse of nature's resources, made the Beale Trail what it is today."[15]

And yet government officials were quite selective in choosing the lieutenant's words to construct a dramatic story of environmental destruction, aimed at mollifying congressional critics of the stock reduction program. They omitted those elements of the historic landscape that might have muddied their picture of decline from Eden. Beale found abundant greasewood, as well as grama, indicating shrub-grasslands, not pure pastures. And while he described most of the terrain as flat or gently rolling, he also encountered deep gullies.[16] It's worth noting, too, that Beale's route generally followed stream courses; thus, most of the good grazing he described was in riparian areas or around springs. Snow's photographs leave no doubt that the grassy meadows along these rivers had vanished by the 1930s, but they also imply that vast areas of the reservation extending away from these streams were part of the same story.

But we know little even now about the historical conditions of that larger mosaic of shrub-grasslands, woodlands, and badlands. Only a few travelers ventured off the riparian trails. Lt. Joseph Ives, for example, had surveyed the area earlier that same year, prior to the summer monsoons,

but unlike Beale, he struck off toward the Hopi villages. Along that path, he wrote, "the scene was one of utter desolation. . . . There was not a spear of grass, and from the porousness of the soil . . . it was impossible that there should be a drop of water."[17] It would be hard to deny that Snow's powerful photographs documented the desertification of the southern edge of Navajo Country, but his selective viewpoint revealed and reinforced a somewhat distorted understanding of the changes that had taken place since Beale's journey.[18]

Historical observations shaped soil conservationists' perceptions in one more important way: washes and streams that travelers described as shallow in the 1840s and 1850s had become deeply entrenched by the early 1900s, following a boom in the Navajo livestock population. This pattern could be seen across the West, which witnessed an explosion in the numbers of cattle in the late nineteenth century. Government scientists thus assumed that arroyos, from ten to one hundred feet in depth, constituted unambiguous evidence of overgrazing on the Navajo Reservation.[19]

Although the only evidence that livestock had *caused* southwestern arroyos was the coincidence in timing, these scientists dismissed a competing theory that climate change had initiated gullying. Two noted geologists, Herbert Gregory and Kirk Bryan, attributed the arroyos to climate, noting that they appeared to be universal across the Colorado Plateau, even in areas left ungrazed because of the absence of stock water, and that similar episodes of arroyo cutting had occurred around 1100, long before the introduction of livestock.[20] Similarly, the geomorphologist John Tilton Hack, who studied the ancient sand dunes near the Painted Desert, suggested that the role of grazing was minor, compared with long-term geological processes that had been structuring this region for thousands of years. Scientists with the SCS, led by the renowned climatologist C. Warren Thornthwaite, rejected these arguments, finding no evidence of a new trend toward drought that would cause severe erosion in the absence of overgrazing.[21]

Scholars have since concluded that climate change—a long period of intense drought followed by a new pattern of high-energy, convective summer storms—likely initiated the network of arroyos that even now scar the land. According to the tree-ring data, severe drought in the 1870s, 1880s, and especially 1899–1904, weakened plants. Not since the 1660s—and before then, the 1250s—had the region suffered such painful drought. Then came an abnormally and prolonged wet period, from 1905 to 1920—the likes of which had been unseen for nearly a century—when intense summer downpours brought flash flooding. As roiling waters surged through

once shallow washes, weakened plants no longer held the soil in place, allowing water to carve away at the upstream heads, undercut the banks, scour channels, and thereby lengthen, widen, and deepen trenches. And as gullies cut deeper into the earth, they lowered the water table below the shallow roots of native bunchgrasses and encouraged the spread of more xeric plants with long taproots.[22] None of this information on precipitation was available in the 1930s, but the evidence offered by the esteemed geologists Bryan and Gregory provided clues.

Thornthwaite, however, was absolutely right in one important particular. Navajo Country did not experience deep drought during the 1930s, according to the tree-ring record. True, there were droughty years, especially 1934 (the century's warmest) and 1936. But generally speaking, the region received average rainfall over the course of the decade. What made it *seem* so dry was the marked contrast with the extreme wetness of previous decades; a generation of Diné had grown up during an aberrant period when rainfall and snow were well above average. But beginning in 1925, a shift in atmospheric wind patterns brought a steep decline in the availability of moisture, unprecedented since the last millennium.[23] Climate change thereby transformed the landscape, chiseling arroyos deep into the earth and robbing desert grasses of life-sustaining water, but that change began much earlier than the 1930s. No doubt, heavy grazing exacerbated this process by weakening and thinning vegetation. But in rejecting the role of climate change, conservationists simplified a more complicated story.

Federal conservationists, then, made a number of problematic and contested assumptions as they constructed their stories about the Navajo range. Nonetheless, their studies reveal that overgrazing at least *accelerated* the course of natural erosion by removing and killing vegetation that might otherwise hold the soil in place. The conservationists exaggerated the Navajos' role in causing erosion, and yet their studies leave little doubt that overgrazing contributed significantly to the sorry state of the land.

Why, then, did the Navajos not see it?

Federal conservationists seemed baffled by that question, but what is striking in their reports is how little they tried to understand the one variable that mattered more than anything: the Navajos themselves. BIA Commissioner John Collier, to be sure, was fairly knowledgeable about Navajo culture and society, and he realized that the conservation program's success depended, in part, on even more knowledge. Unfortunately, Collier proved unable to secure the appropriations necessary to hire anthropologists until 1935, well after stock reduction began to transform the Diné economy.[24] Still, even if Collier had managed to initiate cultural research far earlier, it seems doubtful whether it would have made much difference. His own insistence on "practical" information impeded any effort to understand Navajos on their own terms.

Overseeing the anthropological effort was Eshref Shevky, who held a doctorate in experimental medicine but had no background in Navajo ethnography, no formal anthropological training, no interest in traditional academic questions about customs, beliefs, myths, or kinship. That kind of information, in his opinion, was useless for developing a workable range management program. Instead, he insisted on "hard facts."[25] The questionnaires he designed for his study, known as the "human dependency survey," asked for quantifiable information about population, economic resources, income distribution, and little else.[26] It read more like a census schedule than an instrument for discovering meaningful information about Navajos or their relationships to the land.

To his credit, though, Shevky hired a pair of dedicated anthropologists, Solon Kimball and John Provinse, who endeavored to understand Navajo culture on its own terms by using a more ethnographic approach to their research in one part of the reservation, as a pilot project. They spent time with Navajo families, talking with the men and observing how their families functioned. That effort helped them to recognize what they called the "land-use community," clustered groups of families related through women who shared the same range, worked cooperatively at such tasks as shearing and dipping sheep, and joined together for ceremonies. But before Kimball and Provinse could expand their research into other areas of the reservation, their superiors within the SCS suspended their work, allegedly over petty turf issues.[27]

Even Kimball and Provinse remained ignorant of many of the most important aspects of Navajo culture, despite their efforts to understand indigenous land use. Kimball would later defend his limited knowledge, arguing that information on Navajo thought and cultural dynamics was either unavailable or "*irrelevant to the problems of an action program.*"[28] The claim that this information was unavailable ignored the presence of Father Berard Haile and Gladys Reichard, two of the century's authorities on Navajo culture, both of whom had for some time been delving into Navajo religion, kinship, and social organization. Nor was information on Navajo thought and culture irrelevant. Haile's and Reichard's insights could have helped Kimball develop a richer understanding of Navajo life and thought. By ignoring the importance of cultural information on seemingly esoteric matters such as spiritual beliefs, the New Dealers created an incomplete picture of Navajos and their relationships with livestock and land.

Importantly, they failed to adequately consider that Navajos might have their own tales to tell about their relationships with nature. Those stories expressed a view of the natural world gained through keen observations of a stingy land that nonetheless nurtured them as hunters, gatherers, farmers, and, later, shepherds for at least four centuries. And yet, Diné, too, misread the landscape, often ascribing the desolate condition of the range solely to drought or spiritual disorder. Like the scientists, they had an incomplete understanding of the rapidly changing ecological conditions of the first half of the twentieth century. Few were even willing to acknowledge that a more xeric landscape required a different strategy for managing the range. Still, they possessed a local knowledge of the land, an experiential understanding that the soil conservationists largely ignored.[29]

Diné were intimately familiar with their environment, and they expressed it by descriptively naming every clump of trees, every spring and seep, indeed every locale, no matter how minute. These word pictures mapped the landscape in ways that no line drawing could ever capture. Not surprisingly in this arid land, Diné emphasized places where water may be found. Tó Dínéeshzhee', or Kayenta, describes "waters spread out in rivulets, fan-like." Tó Haach'i', or "water is scratched out," describes a sandy creekbed where water can be dug out by hand. And Dibé Bichaan Bii' Tó, meaning "sheep manure spring," locates an apparently popular watering hole. Diné also observed the plants on which they depended, and their names for plants both discriminated between species and generalized among allied species in ways that Western science echoes. Those names told stories about the plants as well, describing not only their physical characteristics but also, for example, their value for healing and for feeding livestock.[30] In naming nature, Diné delineated the richness that they saw in a landscape that outsiders often viewed as impoverished waste.

Diné knew nature not only through their connections with the physical environment but also through their ties to the metaphysical world. Blessingway, perhaps the most important of the Diné ceremonies, framed their understanding of the relationships between livestock and land in much the same way science framed the way that federal conservationists comprehended their environment. Blessingway recounts the epic story of creation and chronicles the life of Changing Woman, the most revered of the Holy People and, significantly, the being most identified with the earth. According to that saga, Changing Woman first gave life to sheep and goats, and in the process created the plants that cover the ground. As the sheep and goats were born, their amniotic fluid soaked into the soil, and from the moistened earth, vegetation grew.[31] In that way, plants and animals multiplied together.

Like the conservationists, Diné recognized that plant life had become increasingly desiccated and sparse by the early 1930s, but they had a fundamentally different understanding of the underlying problem and the appropriate solutions. Most believed the problem was drought. Drought had come and gone periodically since the 1870s—and even long before that—and this era, while prolonged, did not seem different. Where soil conservationists saw dead grass and shrubs, Diné saw dormant vegetation that would revive with rain. And Diné responded as they always had. When drought caused corn crops to dwindle, Diné traditionally slaughtered more sheep and goats for food, and they bartered animals, wool, and pelts for grain at trading posts. In consuming livestock, Diné decreased their herds and extended webs of reciprocity as stockowners shared their bounty with poorer kin. Diné also typically responded to drought by moving long distances to find better forage. In the early 1820s, for instance, drought spurred the Diné leader Narbona to move his family and his flock of some 2,250 sheep and goats more than two hundred miles from the eastern slopes of the Chuskas to the western edge of the Hopi mesas.[32] Drought brought hardship, but the shepherds always coped somehow.

Many Diné believed that underlying the apparent drought of the 1930s was a more fundamental disorder, *hóchxǫ*, or spiritual chaos. Such disorder sprang from imbalances in the social relationships among people, between humans and the Holy People, or between humans and the nonhuman world, disequilibriums that only ceremonies could set aright. If hóchxǫ was drying up the rain and causing the plants to wither and die, the most important action that Diné could take was to perform Blessingway and other ceremonies to restore order, or *hózhǫ*. Hózhǫ is the central concept of Diné philosophy. Although often glossed as "beauty," essentially, it refers to the balance or harmony or perfection that surrounds all life, animates the universe, and brings long life and happiness. Diné do not imagine hózhǫ as a static condition; it requires continual maintenance through ritual action. When things become disordered, people restore order, or hózhǫ, by singing Blessingway, which reenacts creation, not figuratively, but literally. This process of re-creation through Blessingway is an important concept that those of us who are not Diné sometimes find difficult to grasp. For Diné who follow the traditional ways, mind and matter are inseparable. Thought, speech, and song *actually create physical reality*.[33]

Traditionally Diné exercised control over their world through thought and speech. In Blessingway, for example, things occur when people think

or talk about them, particularly when they repeat a request four times. The spiritual healers known as *hataalii*, moreover, cure their patients by reenacting creation through song. And even ordinary people in their everyday lives could make things happen, good or bad, through the simple act of thinking or talking about them. Praying for rain would make it rain, and people could ensure the health of their horses and sheep or even expand their herds by singing the proper Blessingway songs that reenacted the creation of livestock. This faith in the power of ritual songs persisted through the 1930s and much longer.[34] To the Diné way of thinking, Blessingway songs were—and are—crucial to the well-being of their animals and the land.

Consequently, as drought seemed to grip the reservation and stock began to starve, Diné responded with a flood of ceremonies. This outpouring of ritual struck scientists as mere superstition; songs could do nothing to increase forage. William McGinnies, director of the reservation's land management program, barely contained his disdain when he observed that "forage production . . . can in no way be increased by prayers or religious fervor."[35] But Diné had a different understanding of the environmental problems they were experiencing. A Diné woman from around Farmington, New Mexico, revealed that one of the Holy People, Banded Rock Boy, visited her and explained the reason that the rains no longer came: "We do not live the right way anymore," she reported. "People have forgotten the right way to live and everyone *thinks the wrong thoughts*." And Banded Rock Boy prescribed the solution, as well: "The people should hold ceremonies," he told her. "They must pray for things to be good again."[36] If livestock were a gift of the Holy People, then surely the wanton destruction of that gift would bring misery. Importantly, many like the woman from Farmington believed that the people had forgotten the right way to live, had forgotten how to sing the right songs, and so the earth tilted off balance.

Just as New Dealers viewed these ideas as wholly irrational, Diné thought stock reduction itself seemed anything but logical. It flew in the face of everything they understood about their world. Many saw the root of the problem in stock reduction itself. Listen to the story that Gambler Woman narrated:

> Before the reduction period there was a lot of grass, and I think it was the stock reduction that caused our pasture vegetation to be reduced. . . . The Anglos are not telling the truth when they say that the reason for the stock reduction was too much livestock and not enough vegetation to provide for it. There was an abundance of greasewood and other vegetation. During the mid-summers[,] vegetation, like the sunflowers, colored the place. . . . There is very little now for a sheep to take a bite of. All this is due to the lack of precipitation from above. Maybe they reduced that, too.[37]

This story expressed a common conception among Diné. Many had a completely different sense of the timing of environmental change than the conservationists had. Soil scientists viewed the degraded range as the result of an ecological decline that reached back to the 1880s, but Diné, recalling a recently luxuriant land, believed that desertification began only in the 1930s. Many viewed the land in a light refracted through the prism of memory. Some likely looked back to the particularly wet period between 1905 and 1920, years when Fred Deeschii'nii had seen grasses "so tall in some areas that all you could see was a horse's back."[38] They remembered patches of land in especially well-watered places at higher elevations and in relatively pristine areas without stock water, for the effects of grazing were unevenly distributed across the landscape. Many saw a correlation between stock reduction and the advent of an extended drought, but they saw them in that order, as cause and effect, transposing the actual course of events. Viewing the landscape through the lens of their spiritual beliefs, they reasoned that, in mercilessly slashing livestock, the New Dealers created hóchxǫ, or chaos, and thereby dried up the rain.[39]

Diné blamed drought, disharmony, and the arrival of the conservationists themselves for the decline, while they defended their own stewardship with descriptions of lush vegetation. In doing so, they overlooked environmental changes that had been taking place since the early twentieth century, in part because the incremental scale of those changes eluded day-to-day observations. Many failed especially to acknowledge that growing numbers of people and flocks placed intense pressure on the forage, thereby reshaping the relationships between plants, soils, and water. At the same time, in telling themselves that the problem was temporary drought, they did not recognize that long-term climatic conditions were changing, any more than the conservationists did. Diné needed to adjust their herds to relatively droughty conditions over the long term. New conditions called for new ways of imagining their world.

Diné had long imagined that world as a mosaic of grasses, forbs, and brush through which they maneuvered with age-old movements that conserved and even created forage, but those seasonal shifts became

increasingly difficult by the 1930s. Transhumance probably *had* conserved the range, at least through much of the second half of the nineteenth century, and expansion into new lands had delayed the day of reckoning. After all, if nutritious forage had declined rapidly as they built their herds, the incredible boom in the numbers of livestock could not have occurred, because the land could not have sustained high rates of reproduction. Between 1868 and 1930, the Diné population itself multiplied fivefold, from about 8,000 to perhaps 39,000 people; and their herds increased perhaps fifteenfold, from about 50,000 to nearly 750,000 sheep and goats. But the efficacy of transhumance began to change in the 1880s and 1890s. Over time, Diné population growth and the encroachment of Anglo and Hispanic ranchers on the periphery began to limit the amount of range available to each family, and seasonal movements became constricted.[40] As a consequence, even by the early 1880s, Diné shepherds found it harder and harder to find new forage. Eventually some began to complain openly that the reservation was overgrazed and demanded an extension of the reservation boundary to give Diné exclusive rights to much of the public domain on the periphery.[41] But this proposed expansion could not really solve this population problem, since Diné families and Anglo and Hispanic ranchers already occupied those lands.

Competition for forage was bound to place intense pressure on ecological systems. Many Diné observed the changes, even if they did not fully recognize the cause. Ernest Nelson inadvertently documented the effects of overgrazing when he described the reservation's lush range conditions before government meddlers destroyed everything: "You could see the golden blossoms of sunflowers growing for miles and miles around," he reminisced. There was lots of grass, he recalled, but also "pigweed grass grew thickly everywhere you looked."[42] Without realizing it, Nelson confirmed what the conservationists saw. Overgrazing had encouraged the spread of both native and exotic weeds, like pigweed, which thrives on disturbed, denuded soils. It brought locoweed, which colored the land with beautiful flowers, but poisoned the livestock that ate them.

Diné, of course, were well aware of which plants sickened their stock and avoided those areas where large stands of toxins thrived, but there were also weeds that they welcomed. Many of the plants that thrived on overgrazed ground—native plants such as sunflowers, greasewood, snakeweed, and rabbitbrush—had cultural meanings as medicines, food, or dyes. Diné women, for example, prized rabbitbrush for dying blanket wool, as well as for curing headaches and treating colds, and they used snakeweed to treat

snake and insect bites, headaches, and cuts.[43] One culture's field of noxious plants was another's pharmacopoeia.

The Diné and the conservationists looked at the world through cultural lenses that shaped their understandings of the land. Neither group fully understood nature's contingencies and complexities, though they acted as though they were certain they did. Each told themselves a profoundly different story about the earth and the proper way to care for it. Many of us, educated in the catechism of science, are inclined to accept the conservationists' tale. And yet both narratives, native and scientific, can be used to explain today's poor range conditions. For conservationists, the denuded range itself was proof of the damage wrought by overgrazing. But it is interesting that those Diné who believed that stock reduction itself unleashed chaos across the land also pointed to the range as proof.

Federal authorities possessed the power to impose their story on the Navajos, and yet they never quite grasped the symbolic meanings embodied by livestock, meanings that would linger long after sheep no longer meant much economically. Livestock offered long life and happiness; they were the substance of Diné thoughts and prayers. The conservationists and even the BIA anthropologists never saw the point of understanding those prayers. They never saw the point of understanding the ceremonies and traditional stories. As far as they were concerned, those stories were merely esoteric "myths" and "legends," with no meaning for conservation. Had they listened to those stories, they would have discovered a great deal about the Navajos and their ways of knowing nature.

Indeed, in retrospect Solon Kimball mused that the conservationists might have framed a program around the fundamental Diné belief in hózhǫ, a concept not all that unlike the scientific notion of equilibrium.[44] Finding common ground, of course, would have required the conservationists to set aside the notion that Western science offers all the answers, indeed the only answers, to ecological problems. That would have been, perhaps, too much to expect, but all systems of knowledge seek to explain the same physical reality of the nonhuman world, and it is hubris to believe that only Western science comprehends the workings of nature. As the biologist and cultural theorist Donna Haraway has remarked, nature does not speak through scientists, like a ventriloquist, unmediated by culture. Western science, like Diné metaphysics, is a product of culture.[45]

The conservationists possessed important knowledge about the workings of the natural world, but so, too, did Diné ways of knowing nature offer wisdom. Diné, for example, perceived the "discordant harmony of nature," to borrow the ecologist Daniel Botkin's phrase, something that scientists

are just now beginning to grasp. They knew that hózhǫ and hóchxǫ, order and chaos, were both inherent to the natural world.[46] No doubt, their spiritual metaphors did not fully comprehend the complexities of nature any more than the New Dealers' mechanistic metaphors did. Both imagined an idealized nature, and both sought to control it, one through technology, the other through ceremony. Both believed in a kind of homeostasis. But unlike the conservationists, who thought that nature remained static in the absence of human disturbance, the Diné fathomed the flukiness of the natural world.

When New Deal conservationists dismissed Navajo understandings of nature, they made a grievous mistake. For when the next administration turned the range management program over to the Navajos, they relinquished the reins to people for whom conservation had come to seem anathema. Even today, traumatic memories of stock reduction complicate efforts to conserve the range. As one Diné employee of the Navajo Department of Forestry observed, most people now will not "touch grazing issues on the reservation with a ten foot pole."[47] The program that might have been a means to restore hǫ́zhǫ came to be viewed as the origin of a seemingly perpetual state of hóchxǫ.

Notes

1. Frank Goldtooth, interview in *Navajo Livestock Reduction: A National Disgrace*, ed. Ruth Roessel and Broderick Johnson (Chinle, AZ: Navajo Community College Press, 1974), 98–107. The bureau has been called the Indian Service, the Office of Indian Affairs, and now the Bureau of Indian Affairs. For simplicity, I use the present name throughout this essay.

2. John H. Provinse, "Physical Condition of the Reservation," Window Rock, October 18, 1938, pp. 1 and 4, folder 20, box 1, Thomas Dodge Collection (MS 33), Department of Archives and Manuscripts, Hayden Library, Arizona State University, Tempe.

3. Tamzen K. Stringham, William C. Krueger, and Patrick L. Shaver, "State and Transition Modeling: An Ecological Process Approach," *Journal of Range Management* 56 (2003): 106–13; and Brandon T. Bestelmeyer et al., "Development and Use of State-and-Transition Models for Rangelands," ibid.: 114–26.

4. The federal government held plenary power over the Navajos and most native groups. Chief Justice John Marshall famously defined Indian tribes as "domestic dependent nations" whose relationship to the federal government was "that of a ward to his guardian." *Cherokee Nation v. Georgia*, 30 *U.S. Reports* 1 (March 18, 1831).

5. James C. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven, CT: Yale University Press, 1998), 4–7.

6. On the social construction of grasslands ecology, see Ronald C. Tobey, *Saving the Prairies: The Life Cycle of the Founding School of American Plant Ecology, 1895–1955* (Berkeley: University of California Press, 1981).

7. William H. Zeh to J. P. Kinney, May 19, 1932, Central Classified Files (CCF) 301.14 Range Management, Navajo, Prior to June 1, 1941, box 166, Forestry and Grazing Division, Record Group (RG) 75, National Archives, Pacific Region (NARA-PR), Laguna Niguel, California; Zeh, "General Report Covering the Grazing Situation on the Navajo Indian Reservation," in U.S. Congress, Senate, Committee on Indian Affairs, *Survey of Conditions of the Indians of the United States*, pt. 18, *Navajos in Arizona and New Mexico*, pp. 9123–27, 9131.

8. [H. H. Bennett], "Report to the Navajo Council by Conservation Advisory Committee for the Navajo Reservation," 1933, pp. 2–4, folder 3, box 18, U.S. Soil Conservation Service Records (MSS 289), Center for Southwest Research, Zimmerman Library, University of New Mexico, Albuquerque. From 1933 until 1935, the agency was called the Soil Erosion Service; for simplicity, I use its subsequent name, "Soil Conservation Service," throughout this essay. My information on plant characteristics is based on: William A. Dick-Peddie, *New Mexico Vegetation: Past, Present, and Future* (Albuquerque: University of New Mexico Press, 1993); William W. Dunmire and Gail D. Tierney, *Wild Plants and Native Peoples of the Four Corners* (Santa Fe: Museum of New Mexico Press, 1997); Frances H. Elmore, *Shrubs and Trees of the Southwest Uplands* (Tucson: Southwest Parks and Monuments Association, 1976); Robert R. Humphrey, *Arizona Range Grasses: Their Description, Forage Value, and Management* (Tucson: University of Arizona Press, 1970); "Living from Livestock" (Natural Resources Conservation Service, n.d.); James Stubbendieck, Stephan L. Hatch, and Charles H. Butterfield, *North American Range Plants* (Lincoln: University of Nebraska Press, 1981); and Tom D. Whitson et al., eds., *Weeds of the West* (Newark, CA: Western Society of Weed Science, 1996).

9. McGinnies, "The Problem of Soil Erosion on the Navajo Indian Reservation and Methods Being Used for Its Solution," 1936, p. 5, folder 11, box 8; Hugh G. Calkins and P. D. Matthews, "Report on Proposed Erosion Control Methods, Navajo Reservation," January 18, 1935, pp. 5–8, folder 37, box 7, both in SCS Records, UNM.

10. See, for example, McGinnies, "Problem of Soil Erosion," pp. 1–2; and Charles W. Collier, "Soil Conservation in the Navajo Country," *Soil Conservation* (SCS) 1 (October 1935): 1–2.

11. For a thorough discussion of the effects of overgrazing, see Marsha Weisiger, *Dreaming of Sheep in Navajo Country* (Seattle: University of Washington Press, 2009), chap. 6.

12. William Cronon, "A Place for Stories: Nature, History, and Narrative," *Journal of American History* 78 (1992): 1347–76; also see Diana K. Davis, "Potential Forests: Degradation Narratives, Science, and Environmental Policy in Protectorate Morocco, 1912–1956," *Environmental History* 10 (2005): 211–38.

13. Frederic E. Clements, "Nature and Structure of the Climax," in *Foundations of Ecology: Classic Papers with Commentaries*, ed. Leslie A. Real and James H. Brown (Chicago: University of Chicago Press, 1991), 59–97; Clements, "Plant Indicators," "Climaxes, Succession and Conservation," and "The Relict Method in Dynamic Ecology," all in *Dynamics of Vegetation: Selections from the Writings of Frederic E. Clements*, ed. B. W. Allred and Edith S. Clements (New York City: H. W. Wilson, 1949), 91, 96, 189, 204, 206. For background on Clements and his influence on soil conservationists, consult Donald Worster, *Nature's Economy: A History of Ecological Ideas* (Cambridge: Cambridge University Press, 1994), chap. 11; Tony L. Burgess, "Desert Grassland, Mixed Shrub Savanna, Shrub Steppe, or Semidesert Scrub? The Dilemma of Coexisting Growth Forms," in *The Desert Grassland*, ed. Mitchel P. McClaran and Thomas R. Van Devender (Tucson: University of Arizona Press, 1995), 51–56; and Jason G. Hamilton, "Changing Perceptions of Pre-European Grasslands in California," *Madroño* 44 (1997): 311–33. For the Soil Conservation Service's expression of equilibrium theory in Navajo Country, see "Land Management in the Navajo Area," [draft of pamphlet, c. 1937], CCF 300, box 117, Navajo Area Office, RG75, NARA-PR.

14. Provinse, "Physical Condition," pp. 4–5.

15. H. C. Lockett and Milton Snow, *Along the Beale Trail: A Photographic Account of Wasted Range Land* (Lawrence, KS: U.S. Office of Indian Affairs, 1939), 2–3, 12–19, 48–49.

16. U.S. Congress, *Wagon Road from Fort Defiance*, Executive Document 124, Serial Set 959, 35th Congress, 1st Session (1858); the quote is from p. 40.

17. U.S. Congress, Senate, *Report upon the Colorado River of the West*, by Joseph C. Ives, Executive Document, 36th Congress, 1st Session (1861), 117, 128.

18. Passing references to the long-standing history of overgrazing since the late nineteenth century can be found in Calkins and Matthews, "Report on Proposed Erosion Control Methods," p. 3, UNM, and "Justification of Present Plan of District Range Control," Reference File of Commissioner John Collier, 49–54, box 11, RG75, National Archives (NA), Washington, DC.

19. Herbert E. Gregory, *Geology of the Navajo Country: A Reconnaissance of Parts of Arizona New Mexico, and Utah*, U.S. Geological Survey, Professional Paper 93 (1917), 130–31; U.S. Department of Agriculture (USDA), *Western Range: A Great but Neglected Natural Resource*, Senate Document 199, 74th Congress, 2nd Session (1936), 119, 308–12; Calkins and Matthews, "Report on Proposed Erosion Control Methods," pp. 4–5, UNM. Also see, for example, H. F. Johnson and Lucian A. Hill, "Work Report, Soil and Erosion Survey, Land Management Unit No. 4," 1936, pp. 17–18, folder 32, box 8, SCS Records, UNM. C. Warren Thornthwaite, C. F. Stewart Sharpe, and Earl F. Dosch offer an excellent discussion of channel-cutting in *Climate and Accelerated Erosion in the Arid and Semi-Arid Southwest with Special Reference to the Polacca Wash Drainage Basin, Arizona*, Technical Bulletin No. 808 (USDA, 1942), 95–99.

20. See, for example, Gregory, *Geology of Navajo Country*, 131–32; Kirk Bryan, "Recent Deposits of Chaco Canyon, New Mexico, in Relation to the Life of the Pre-Historic Peoples of Pueblo Bonito," *Journal of the Washington Academy of Sciences* 16 (February 4, 1926): 75–76; Bryan, "Date of Channel Trenching (Arroyo Cutting) in the Arid Southwest," *Science* 62 (1925): 338–44. Also see Stephen A. Hall, "Late Quaternary Sedimentation and Paleoecologic History of Chaco Canyon, New Mexico," *Geological Society of America Bulletin* 88 (1977): 1593–618; and Yi-Fu Tuan, "New Mexican Gullies: A Critical Review and Some Recent Observations," *Annals* (Association of American Geographers) 56 (1966): 591.

21. John T. Hack, "Dunes of the Western Navajo Country," *Geographical Review* 31 (1941): 240–63; D. G. Anderson, "Range Management Branch Report, Land Management Unit No. 3," January 1938, p. 11, vol. 7, box 1; and Anderson, "Range Management Report, Land Management Unit No. 1," May 1937, pp. 6–7, vol. 3, both in Soil Conservation Service Collection (AZ 124), Special Collections, University of Arizona Library, Tucson; C. W. Thornthwaite, C. F. S. Sharpe, and Earl F. Dosch, "Climate of the Southwest in Relation to Accelerated Erosion," *Soil Conservation* (SCS) 6 (1941): 300–301; Thornthwaite, Sharpe, and Dosch, *Climate and Accelerated Erosion*, 123–24.

22. William L. Graf offers an excellent history of the study of arroyo development in "The Arroyo Problem: Palaeohydrology and Palaeohydraulics in the Short Term," in *Background to Palaeohydrology: A Perspective*, ed. K. J. Gregory (Chichester: John Wiley, 1983), 279–302. The literature on southwestern arroyos is vast. Particularly useful is Denevan, "Livestock Numbers in Nineteenth-Century New Mexico, and the Problem of Gullying in the Southwest," *Annals* (Association of American Geographers) 57 (December 1967): 691–763; Richard Hereford and Robert H. Webb, "Historic Variation of Warm-Season Rainfall, Southern Colorado Plateau, Southwestern U.S.A.," *Climatic Change* 22 (1992): 239–56; and Luna B. Leopold, "Rainfall Frequency: An Aspect of Climatic Variation," *Transactions* (American Geophysical Union) 32

(1951): 347, 350–51. For a countervailing argument regarding environmental changes in southeastern Arizona, however, see Conrad Joseph Bahre, *A Legacy of Change: Historic Human Impact on Vegetation of the Arizona Borderlands* (Tucson: University of Arizona Press, 1991), esp. chap. 5.

23. Western Regional Climate Center (http:www.wrcc.dri.edu/summary/Climsmaz.html), precipitation tables for Chaco Canyon, Crownpoint, Farmington 3NE, and Shiprock; Paul R. Sheppard et al., "The Climate of the US Southwest," *Climate Research* 21 (2002): 229–30. Fort Defiance and Kayenta also recorded especially dry growing seasons in the 1930s.

24. Collier to H. H. Bennett, December 20, 1935, CCF 31777-1935-344, Cooperative Plan for Soil Conservation with the Dept. of Agriculture, RG75, NA; Lawrence C. Kelly, "Anthropology in the Soil Conservation Service," *Agricultural History* 59 (1985): 140.

25. Kelly, "Anthropology in the Soil Conservation Service"; also Kelly, "Anthropology and Anthropologists in the Indian New Deal," *Journal of the History of the Behavioral Sciences* 16 (1980): 14; "Sociological Survey of the Navajo Reservation: A Statement of Procedure," Regional Conservation Bulletin No. 32, Conservation Economics Series No. 5, May 1936, pp. 8, 15, folder 18, box 8, and BIA, Division of Socio-Economic Surveys, *Statistical Summary: Human Dependency Survey, Navajo Reservation and Grazing District 7*, 1940, box 10, both in SCS Records, UNM; Emma Reh, "Navajo Consumption Habits (for District 1)," draft report, October 24, 1939, Navajo Consumption Habits folder, box 32, U.S. Soil Conservation Service Records (MS 190); Rio Grande Collections, Branson Library, New Mexico State University (NMSU), Las Cruces; Kimball, "Land Use Management: The Navajo Reservation," in *The Uses of Anthropology*, ed. Walter Goldschmidt (Washington, DC: American Anthropological Association, 1979), 65–66, 69–70.

26. Kimball, "Land Use Management," 65–66, 69–70; "Sociological Survey Procedure," p. 15, UNM; BIA, *Statistical Summary: Human Dependency Survey*, UNM; Emma Reh, "Navajo Consumption Habits (District 1)," NMSU.

27. Kimball, "Land Use Management," 72–75.

28. Kelly, "Anthropology in the Soil Conservation Service," 141; Kelly, "Anthropology and Anthropologists in the Indian New Deal," 16; Kimball, "Land Use Management," 64–67, 73–75, emphasis in original. Also see Solon T. Kimball and John H. Provinse, "Navajo Social Organization in Land Use Planning," *Applied Anthropology* 1 (1942): 18–25.

29. James C. Scott perceptively explores the contours of indigenous, practical knowledge—mētis—which, he holds, can be acquired only through practice and "represents a wide array of practical skills and acquired intelligence in responding to a constantly changing natural and human environment." See Scott, *Seeing Like a State*, 311–41.

30. Alan Wilson and Gene Dennison, *Navajo Place Names: An Observer's Guide* (Guilford, CT: Jeffrey Norton, 1995). For a similar, yet more thorough, analysis of Western Apache epistemology, consult Keith H. Basso, *Wisdom Sits in Places: Landscape and Language Among the Western Apache* (Albuquerque: University of New Mexico Press, 1996). For Navajo "ethnoscience," see Washington Matthews, "Navajo Names for Plants," *American Naturalist* 20 (1886): 767–77; and Matthews, "Natural Naturalists" (unpub. ms. read before the Philosophical Society of Washington, October 25, 1884), in *Washington Matthews: Studies of Navajo Culture, 1880–1894*, ed. Katherine Spencer Halpern and Susan Brown McGreevy (Albuquerque: University of New Mexico Press, 1997), 193–201.

31. Slim Curley, Version I, in *Blessingway*, ed. Lelan C. Wyman (Tucson: University of Arizona Press, 1970), 245–46.

32. See, for example, Kay Bennett, *Kaibah: Recollection of a Navajo Girlhood* (Los Angeles: Westernlore Press, 1964), 240–41; Walter Dyk, *Son of Old Man Hat: A Navaho Autobiography* (1938; reprint, Lincoln: University of Nebraska Press, 1966), 104–13, 129–31, 153–58, 173–78; Franc Johnson Newcomb, *Hosteen Klah: Navaho Medicine Man and Sand Painter* (Norman: University of Oklahoma Press, 1964), 11–12.

33. My rather cursory discussion here draws heavily on Gary Witherspoon, *Language and Art in the Navajo Universe* (Ann Arbor: University of Michigan Press, 1977), p. 9 and chap. 1. My discussion of hózhǫ and hóchxǫ is also informed by Milford B. Muskett, "Identity, *Hózhǫ́*, Change, and Land: Navajo Environmental Perspectives" (PhD diss., University of Wisconsin, Madison, 2003), 136–37, 159–60. The role that thought, speech, and—by extension—breath play in creating reality can be seen throughout Blessingway, but consult especially Frank Mitchell, Version II, in *Blessingway*, ed. Wyman, 354–55. I am also indebted to James C. Faris in "Taking Navajo Truths Seriously: The Consequences of the Accretions of Disbelief," in *Papers from the Third, Fourth, and Sixth Navajo Studies Conferences*, ed. June-el Piper (Window Rock, AZ: Navajo Nation Historic Preservation Department, 1993), 181–86.

34. See, for example, Slim Curley, Version I, in *Blessingway*, ed. Wyman, 248–64; Henry Zah, in *Navajo Livestock Reduction*, ed. Roessel and Johnson, 122.

35. W. G. McGinnies, "The Agricultural and Range Resources of the Navajo Reservation in Relation to the Subsistence Needs of the Navajo Indians," May 12, 1936, pp. 2-3, folder 11, box 8, SCS Records, UNM.

36. Don Watson, "Navahos Pray for the Good of the World," *Mesa Verde Notes* 7, no. 1 (1937): 16–18. Emphasis mine.

37. Ason Attakai, in *Navajo Livestock Reduction*, ed. Roessel and Johnson, 129.

38. Fred Descheene, in *Navajo Livestock Reduction*, ed. Roessel and Johnson, 194.

39. See, for example, John Arthur and wife, interview, July 5, 1953, folder 135, box 5, Collier and Ross field notes, Dorothea C. and Alexander H. Leighton Collection (MS 216), Special Collections, Cline Library, Northern Arizona University, Flagstaff. This viewpoint is a constant refrain in the interviews published by Roessel and Johnson in *Navajo Livestock Reduction*; see especially pp. 131, 146, 150, and 172.

40. Nancy Shoemaker, *American Indian Population Recovery in the Twentieth Century* (Albuquerque: University of New Mexico Press, 1999), 33. My figure on the magnitude of the increase in Navajo stock is necessarily hypothetical. It assumes that there were approximately fifty thousand sheep and goats by the early 1870s, including the number belonging to those who never went to the Bosque Redondo; that number is no more than a guess (see Weisiger, *Dreaming of Sheep*, chap. 6). The figure for 1930 includes lambs and kids.

41. Dyk, *Son of Old Man Hat*, 129–43; Petition to President from Chin Lee Valley, [ca. 1924?], box 30, folder 6, Franciscan Papers (AZ 500), Special Collections, University of Arizona Library, Tucson.

42. Ernest Nelson, in *Navajo Livestock Reduction*, ed. Roessel and Johnson, 159.

43. Clyde Kluckhohn and Dorothea Leighton, *The Navajo* (Cambridge, MA: Harvard University Press, 1946), 30–31.

44. Kimball, "Land Use Management," 65.

45. Donna J. Haraway, "Universal Donors in a Vampire Culture: It's All in the Family: Biological Kinship Categories in the Twentieth-Century United States," in *Uncommon Ground: Toward Reinventing Nature*, ed. William Cronon (New York: Norton, 1995), 323.

46. Daniel B. Botkin, *Discordant Harmonies: A New Ecology for the Twenty-first Century* (New York: Oxford University Press, 1990), 127.

47. Patrick Gordon Pynes, "Erosion, Extraction, and Reciprocation: An Ethno/Environmental History of the Navajo Nation's Ponderosa Pine Forests" (PhD diss., University of New Mexico, 2000), 172.

CHAPTER 7

Cherokee Medicine and the 1824 Smallpox Epidemic

Paul Kelton

IN JUNE 1824, an alarming message came to Cherokees and Christian missionaries residing at Springplace, a Moravian boarding school in northern Georgia. Smallpox had struck communities in western North Carolina. Both Cherokees and missionaries worried about this ominous news. They feared that the lethal disease was on its way into Georgia, and both took actions to halt the spread of the epidemic. Missionaries obtained vaccine and vaccinated some 130 Euro, Afro, and Native Americans.[1] Meanwhile, an estimated 300 to 400 Cherokees would have nothing to do with the missionaries' medicine and instead flocked to one of their own religious leaders, who held the *Itohvnv*, or "smallpox dance." This ceremony involved seven nights of praying, fasting, and taking indigenous medicines. The missionaries of course dismissed practices such as the smallpox dance as ancient superstitions and concluded that their speedy action had halted the spread of the disease, which, fortunately for all those around Springplace, had remained away. Many Cherokees, however, gave credit to their own medicine for stopping an impending tragedy.[2]

Although coming to an anticlimactic finish, the 1824 smallpox epidemic presents a window to discuss three of the major themes presented in this volume. First, the Cherokees' smallpox dance demonstrates the