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"To make a garden spot of one of the dreariest places on the planet": Federal reclamation on the Zuni and Navajo reservations 1883-1914

Christian W. McMillen

The University of Montana

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"To Make A Garden Spot of One of the Dreariest Places on the Planet": Federal
Reclamation on the Zuni and Navajo Reservations, 1883-1914

by

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B.A. Earlham College, 1993

presented in partial fulfillment of the requirements

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In the late nineteenth and early twentieth centuries, the power of irrigation to redeem the arid portions of the American West and make it habitable and productive country became akin to gospel. As the gospel of irrigation caught on, the Indian Service began to see the possibilities that reclamation held for not only redeeming barren land, but for modernizing Indians. The Navajo and Zuni Indians were two of the first peoples to be subject to the Indian Service’s plans to turn the desert into a garden. Between 1883 and 1914 the Indian Service tried time and again to make irrigation work. In the last fifteen years of the nineteenth century efforts at irrigation were amateurish, ad hoc affairs. But after the turn of the century, the Indian Service got serious. The Blackrock dam on the Zuni reservation came to dominate irrigation efforts in the Southwest. The fifteen years on either side of the new century were markedly different. Drought plagued the Southwest in the late nineteenth century, and wet years characterized the first decade and a half of the twentieth. The change in the climate paralleled perfectly the change from amateurism to professionalism in the Indian Service’s irrigation efforts. Drought lulled the Indian Service into thinking that it could control Southwestern streams. But the increase in rainfall and streamflow in the twentieth century saw to it that their waterworks projects continually were damaged. I explore the change in policy from small projects to large ones and the effect the change in the climate had on those projects and Indian Service policy.

As important as the change in the weather was to rendering the waterworks projects useless was Indian resistance. Each year was marked by cycles of ritual, as well as hunting and agricultural regimes. The Navajo and Zuni allegiance to their annual cycles, when combined with the change in the weather, saw to it that the projects would never be successful. Adequate Zuni and Navajo labor could never be secured. Indian agency in determining their own history is a major feature of the thesis. The Indian Service failed to take into account both the environment and Indians in designing their agricultural utopia. Both saw to it that their plans were unsuccessful.
Acknowledgments

As any student in a masters program knows, funding for research, to put it mildly, is limited. Having picked a topic that necessitated traveling far from Montana I was then very lucky to be awarded a Smithsonian Institution Graduate Fellowship. During the summer of 1997 I was afforded the chance to pursue the research for this thesis full-time. I owe a special thanks to my two hosts at the Smithsonian: Marc Rothenberg and Pamela Henson. They were unflagging in their assistance.

Dan Flores and David Emmons have read various versions of papers and chapters of the project along the way and their criticism has left its mark. Now it's my turn, they say, to really take on the documents and stretch my presently conservative conclusions. I agree, thanks for the advice. Tom Roy signed on as the third reader and provided me with insightful comments, too.

Stephanie Tatel moved to Missoula with me and endured a year and a half of my agonizing over my work: thank you.

This is all dedicated to my parents.
Reclamation and Redemption: Indians, the Indian Service, and the Gospel of Irrigation

Each year as the snow in the mountains of the Colorado Plateau melts, dormant arroyos and tiny washes awake from hibernation and for a short time they water the desert floor. Again in the summer, when the monsoon season hits the country, after a brief rest, these same stream beds are called to action. The combined power of wind and water forms the region’s unique topography. But the floods that wash over northern Arizona and New Mexico each year have eroded and reshaped more than the physical landscape. They washed away great plans to transform the desert into a garden.

Late nineteenth and early twentieth century Indian policy, in part, was patterned around turning Indians into self supporting communities. Virtually all the western Indian peoples endured the same process; sedentary farming would end what appeared to be nomadic ways, and, along with the Dawes Allotment Act, free up valuable land for white settlers. Indians would come to value private property and embrace the market economy, too. But across the West, one last act of benevolent paternalism was necessary: the construction of irrigation projects. In 1898, N.S. Walpole, the agent for the Pueblo and Jicarilla Agency in New Mexico, optimistically declared that a dam on the Zuni

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1 For the boundaries of the Southwest and geologic history see Donald Baars, Navajo Country: A Geology and Natural History of the Four Corners Region (Albuquerque: Univ. of New Mexico Press, 1995); for a lengthy discussion of the boundaries of the Southwest, see James W. Byrkit, “Land, Sky, and People: The Southwest Defined,” Journal of the Southwest 34 (1992): 257-387, see especially 283-301.


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reservation would forever obviate the need for Government assistance and “they would have thousands of bushels of grain for market and thus live decently.” Walpole’s enthusiasm was echoed across other reservations: Irrigation projects would redeem Indians and make them better prepared for the rigors of the twentieth century.

In the late nineteenth and early twentieth centuries the Indian Service crisscrossed the Southwest designing irrigation projects for needy Indians. Largely spawned by benevolent intents, the projects were nevertheless plagued by a variety of problems. In the three and a half decades I will examine, the Indian Service attempted to build several projects for the Navajo and Zuni Indians. On the Navajo reservation, the Indian Service planned both large and small waterworks projects; at Zuni, one major dam was to suffice for all of their water needs.

The history of irrigation development on the Colorado Plateau between 1880-1915 falls into two distinct phases. They break at roughly the turn of the century. In the first phase, Indian Agents were just beginning to get to know the country. In fact, the Pueblo Agent administered the Zunis; they did not have their own Agent until 1902. Indian Agents—many of whom in the nineteenth century were patronage appointments—had little or no experience with anything resembling engineering, much less Indians, but they tried their hand at reclaiming Southwestern waterways for the benefit of Indian peoples. The Agents were naïve, but generally had good intentions. Too, an almost
biannual turnover of Agents made it tough for any one Agent to get to know the country. As each Agent cycled through the reservations he would have to learn anew the exigencies of desert living.\(^5\)

From the first, reclaiming water was associated with redeeming Indians. A permanent water supply would finally plant the Navajo, for example, in one place. Because white settlers were moving into the region, Navajos could not continue to wander the country in search of water. At Zuni, Agents found sedentary agriculturists. They had settled along the Zuni River and near several springs, but were not using the water to its full potential. If they could manage to put more land under cultivation possibly they could grow a surplus and have enough to sell at market. At the very least, growing more food would lift them out of their apparently destitute condition.

Putting Indians to work was another benefit of building waterworks on the reservations. Teaching Indians the value of work was, to be sure, no less a goal than reclamation. Indeed, the leading conservation journal of the day, *Forestry and Irrigation*, took this position. In 1903, an anonymous author wrote,

> While the object is to give the Indian productive farming land, it has been the custom, with very few exceptions, to employ him in every way possible on the work. The idea is to give him manual training, to teach him to build and care for a ditch, to create a market for his labor, and make him work for a daily wage, even though he be paid to work for his own advantage.\(^6\)

When the Indian Service tried to manage water, they also tried to change Indians into citizens of the modern world through work. Their goals were twofold: transform

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\(^5\) Ruth Underhill found that between 1869 and 1902 there were fifteen different agents on the Navajo Reservation, giving them little time to understand the yearly cycle of floods, or much else, for that matter. Ruth Underhill, *The Navajo* (Lincoln: Univ. of Nebraska Press, 1956), 169

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waterways into tools of more efficient production and change Indians into workers, and thus model participants in the twentieth century. That is, by reclaiming rivers and streams they sought to redeem Indians; by putting the rivers to work they would put Indians to work. The dam at Zuni employed almost exclusively Indian workers and was thought of as an ideal way to train local Indians—Navajos, Apaches, and Pueblos, as well as Zunis—the value of a hard day's work. The documents are rife with the rhetoric of redemption. These were the modest designs of the Indian Service.

In this first phase Agents had little or no idea what they were doing. Harnessing the power of southwestern streams proved more troublesome than they had envisioned. Part of the urgency that the Agents felt was brought on by the extreme aridity of the Colorado Plateau. In the last quarter of the nineteenth century a millennial drought desiccated the Southwest. Naturally enough, agents took the drought for normal conditions. And because they could not imagine any other weather scenario they worked furiously to compensate for the drought by building waterworks for the Indians. That Indian Agents with little or no experience in the desert misread the landscape and made mistakes should come as no surprise.

But nature in the Southwest was a merciless foe for the Indian Service. When the nineteenth century gave way to the twentieth, the cycle of drought that withered the Southwest for two decades—and left behind immense gullies and a thirsty desert—was replaced by a series of wet years—the beginning of the second phase of irrigation development. This climatic pulse coincided with the Indian Service's plans to move from

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7 See note 9, especially Schulman.
small reclamation projects designed to reclaim ephemeral streams and move to grand waterworks on the Colorado Plateau. Heavy and destructive flooding became common after 1902, when more regular rain started to fall on the region. And in 1905 New Mexico experienced its wettest year to date. The drought fueled the fire of reclamation, and the floods of the first decade of the new century doused it.

The two phases of irrigation development are broken by this sudden climate shift. The level of optimism that peppers the documents in the nineteenth century is remarkable indeed. But by the time that major rains began to return to the Colorado Plateau, and the march of the twentieth century was well underway, attitudes, and circumstances, had changed. Optimistic naïveté marked late nineteenth century designs, while professional, bureaucratic concerns drove efforts in the early twentieth.

The increase in rainfall and flood severity was not the only factor that kept irrigation projects from succeeding in the region. John B. Harper, eventually in charge of most waterworks projects on the Colorado Plateau, was obsessed with the massive Blackrock Dam on the Zuni reservation. In his single-minded focus to finish the dam he neglected damage done to other projects that were also affected by the severe flooding. Harper’s and the Indian Service’s development at Zuni led to the underdevelopment

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8 The Hopi, Jicarilla Apache, Utes, Pueblos and many more also had irrigation works planned and, in some cases built, for their respective reservations.
elsewhere. Finally, and perhaps most importantly, the tenacity of the Indian peoples regarding their ceremonial and agricultural schedules kept projects from progressing at a pace that would satisfy the engineers. Throughout the year various exigencies of the Indians’ lives brought work to a standstill. The construction of the Blackrock Dam, for example, ground to a halt each year as the Zunis prepared for Shalako, the winter solstice ceremony. Harper was forced to accommodate all of the various ceremonial, hunting, and planting schedules of the Indians he employed. While the Irrigation Division hoped for a cheap and docile labor force, what they got were discrete cultural groups operating on somewhat related, but distinctly different, annual schedules. Thus, irrigation projects on the Colorado Plateau were largely at the mercy of the combined forces of nature and Indian cultural vigor, and, to a lesser extent, John B. Harper’s relentless pursuit to finish the Blackrock Dam.

In general, then, the focus of the thesis will be to track the history of irrigation efforts on the Navajo and Zuni reservations between 1880-1915. The dates are not chosen arbitrarily. No concerted effort was made by the government until the early 1880s to reclaim water on Indian land on the Colorado Plateau. The final date marks a turn away from large annual expenditures on projects on Indian reservation as the country geared up for World War I. Also, after 1915 the weather took another turn. But within that time frame there are some specific issues that I would like to explore. I have chosen to use climate as framing device because the weather so profoundly affected the history of these projects. During the drought, the climate seemed to dictate one kind of behavior; after the turn of the century, and the return of regular rainfall, another course of action was necessary.
As Indian Agents got to know both the country and the Indians during the drought they made a host of assumptions regarding Indian life. Navajos were strictly nomads—the Free Riders of the Plains, as one Agent called them; the Zuni never strayed from their villages. Zunis were harmless, peace loving people, "docile and ignorant," waiting to be redeemed by the Indian Service. On the other hand, the Navajo were "wild Indians" in need of discipline. But all of them were found wanting. If a permanent water supply could be secured, the Indians would have all they needed. As I have said, the Navajo would then settle in villages and the Zuni would pull themselves out of poverty.

Frederick Hoxie characterized the last twenty years of the nineteenth century as a period of reform, a time to assimilate Indians into the white mainstream. Indians could be remade in the white man's image in short order through fundamental changes. Agents would lead by example and Indians would follow; they were merely at an inchoate stage of development. In the case of the Navajo, for example, if they would end their nomadic ways, the energy they put into wandering the country with their sheep could be focused on building villages and raising crops and selling wool at market. But the Indian Service first had to prove it to them. The reform impulse Hoxie identifies fairly assesses the situation on the Colorado Plateau in this time period. Agents were frequently frustrated by Indian ways, but they remained optimistic about the eventual success of their reform efforts.

Optimism was not enough, however. Even during conditions of drought the Indian Service underestimated the power of water. Too, they did not understand that Indian lifeways could not be changed in a generation. Older ways of knowing nature, of managing water, could not be supplanted by dams and rationally ordered agricultural
designs. The Indian Service made plans based on the presumed docility of Indians and the malleability of water. The last twenty years of the century were a period of reconnaissance marked by small reclamation projects and trial and error. It was a time of learning for the Indian Service. The impressions of Indians that I mentioned above were formed as Agents began to filter out amongst the reservations. As they did so they gathered information on where reclamation projects could be situated. The Indians Service planned no big projects during this time. But the drought that marked the last twenty years of the century impressed upon the Agents just how precious water was on the Colorado Plateau.

The initial focus, then, is this period of reconnaissance. As agents fanned out across the country in these years they gathered the baseline information regarding how they would proceed with reclamation projects. This period is one marked by optimism and naïveté based on scant experience on the Colorado Plateau. The Indian Service employed few professional engineers during the nineteenth century. The projects that they did undertake can be safely characterized as failures. But to ascribe this to malicious intent or some sort of malfeasance on the part of the Indian Service would be wrong. Rather, the men who filled the position of Agent had good intentions; what they lacked was any conception of how to reclaim the desert. And the drought that desiccated the Colorado Plateau only made their mission seem that much more important.

This first part of the thesis, the reconnaissance phase, will be, essentially, a narrative. I intend to set the stage for events that took place during the first fifteen years of the twentieth century. To understand the twentieth century it is imperative to have a clear picture of what went on in the nineteenth. All the impressions of the Indians on the
Colorado Plateau were made in the last twenty years of the nineteenth—in regards to their water needs—and information regarding the physical environment was gathered, too. Thus, when work began in earnest during the early years of the twentieth century, the Indian Service was operating on information gathered in the first phase of irrigation history. And as circumstances changed, that information quickly became worthless. For example, making judgments about where to build dams based on stream flow collected during the 1890s was useless during the high flood periods of the first decade of the twentieth century. Assumptions concerning the docility of the Indian labor force were also rendered void. Indians would not compromise their ceremonial lives to become day laborers. When the Indian Service decided to build major waterworks projects on the Colorado Plateau they found that much of what they learned in the late nineteenth century did not apply to the changed conditions of the early twentieth.

It is essential to describe just what the Indian Service did find. As well, in order to contrast it with the twentieth century, emphasis will be placed on the amateurish, ad hoc way of proceeding with reclamation. The Indian Service designed these projects as cultural and environmental engineering. They were built to control both people and the environment in such a way that the Indian Service could then turn its back on both. That is, the Indian Service wanted to create self sustaining communities on the Colorado Plateau that would no longer be dependent on the government. What they hoped for was both a docile native population that would adopt white farming practices, and a pliant nature that would allow them to do so. The Indian Service did not consider local environmental and cultural exigencies in making their plans for irrigation projects. And
that was their fatal mistake when they entered the twentieth century, and attempted projects on a heretofore unimagined scale.

If the nineteenth century is marked by optimistic naïveté, and a not a little blundering, then the early twentieth is a great contrast. Except for the blunders, that is; they only got worse. As the Indian Service designed larger and larger waterworks, their naïveté gave way to professionalization, and optimism was replaced by the realities of building large reclamation projects in the desert. Professional engineers took the place of individual agents, and the Indian Service soon had its own Irrigation Division. Progressive Era reformers dictated much that happened in this phase of irrigation history. Reclamation on a large scale was beginning to be thought of as a way to make much of the West inhabitable. After the turn of the century, irrigation became a larger, regional issue, even a national concern. And though few historians have done so, projects on Indian reservations must be factored into this national context. In the nineteenth century individual Agents ran reclamation efforts. They were not part of a national scheme; they were merely trying to satisfy the needs of the particular reservation they oversaw. When they saw fit, they asked for money to build small dams or ditches. In the twentieth century, Agents no longer occupied such a position. Irrigation efforts were now run by a professional class of engineers, and the Indian Service allocated annual appropriations in the hundreds of thousands of dollars. The Indian Service became ensconced in the gospel of irrigation.\(^\text{10}\)

\(^{10}\) For projects on a more regional scale, the importance of irrigation for Indians, and brief sketches of various projects see, Frederick Hoxie, *A Final Promise: The Campaign to Assimilate the Indians, 1880-1920* (Cambridge: Cambridge University Press, 1992, reprint of the 1984 University of Nebraska Press edition), 169-171; Donald L. Parman, *Indians and the American West in the Twentieth Century* (Bloomington: Indian Univ. Press, 1994), 22-23; Pisani, Chapters 7 and 8 in *Nationalizing the Waters*, Janet
The history of irrigation development among the Navajo and Zuni Indians is one marked by failure. What I intend to demonstrate is that the government did not always run rampant over nature or Indians, rendering them both defenseless and defeated. On the contrary, irrigation efforts on the Colorado Plateau demonstrate cases where the Indian Service misunderstood both nature and Indians, with costly results. The pace of irrigation efforts was guided by Indians and nature. Ultimately, the Indian Service had little control over the outcome of their projects. I will show how the climate change and the cultural vigor of the Indian people of the Colorado Plateau kept irrigation efforts from being successful. When the focus of development became the Zuni dam, all other projects fell by the wayside. This resulted in neglect, underdevelopment, and a loosening of control over the Navajo and their eventual transformation back to pastoralism. Climate and Indian cultural resilience were not the only factors that guided this story—politics and economics have a part, too. No two factors alone can ever explain history. But in the research that I have done they stand out, overwhelmingly, as barriers to Indian Service plans for the region.11

Historian Steve J. Stern characterized the conquistadors’ sixteenth century “discovery” of the Americas as a quest for a series of utopias—wealth, high social status, and successful Christian conversion of Indians. All were visions of utopia, but they competed with one another. More important than the conquistadors’ mutual antagonism

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McDonnell, "Land and Water: Federal Irrigation Projects on Indian Reservations," in The Dispossession of the American Indian, 1887-1934 (Bloomington: Indiana Univ. Press, 1991). Pisani’s is the only one of these books not to be exclusively an Indian history that takes into account Indians in the irrigation movement of the early twentieth century. His book, when published, will be the most thorough account of federal efforts to reclaim Indian land—two chapters are devoted to the subject.

11 Climate has changed history on the Colorado Plateau before this, too. See Robert C. Euler, George J. Gumerman, Thor N V. Karlstrom, Jeffrey S. Dean, Richard H. Hevly, “The Colorado Plateaus: Cultural

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over their visions of what the New World should be, however, was "the formidable array of Indian initiative and responses." Just as in early America, in the American West Indian agents and reformers envisioned a utopia—settled Indians in self-supporting farming enterprises. But there were also conflicting visions of that utopia: were the Navajo farmers or were they pastoralists, for example? But they all knew that reclamation of water would redeem Indians; Indians would become independent farmers and learn the value of private property and hard work. If this worked the Indian Service could turn its back on Indians; they would no longer be dependent. To be sure, Indian Agents were not conquistadors, but just as "indigenous responses unraveled European expectations" in the sixteenth century, so too did they in the late nineteenth and early twentieth centuries. Centuries before reclamation efforts began on the Colorado Plateau "Amerindian peoples fully engaged the struggle to define what the conquest meant." And in the period that I will cover they were no less engaged in that struggle. Not consciously engaging Indians in the struggle, and I would add the environment to Stern's calculus, proved fatal to the Indian Service's utopia.¹²

In American environmental history there are few works that provide one with models for how to engage Indians actively in history. Too often they are a foil for the destructive behavior of white Americans—before whites came Indians lived in harmony with nature and their lives should be used as object lessons. Environmental history frequently lapses into descriptions of a lost and pristine world that existed when only Indians and nature graced the planet—the Indian past is mined for examples of how to

Dynamics and Paleoenvironment: Prehistoric cultural changes on the Colorado Plateaus were contemporaneous with environmental changes," *Science* 205(1979): 1089-1101.
live in the present and the future. The impression is that Indians tiptoed across the earth until the boots of white America stomped over them and the environment. In one of the best known environmental histories of reclamation, Donald Worster does this very thing. In *Rivers of Empire*, the Zuni and other Indians are used as symbols of harmony with nature; their way of living with the desert was harmless. But once capitalism moved west, destructive ways of knowing nature supplanted peaceful ones. Indians in his story are used only to juxtapose two ways of knowing and using nature: precapitalist and capitalist. We really learn little about Indians. Indeed, they seem to be thought of as inextricable from nature. Were we to take this version of Indian history as solid and unshakable there would be little reason for trying to find ways in which Indians managed to engage in their own history, for Indians and their ways of knowing nature appear to be gone.

I try hard not to be guilty of the sins listed above. My hope is not to paint a picture of good guys and bad guys. The engineers and agents in this story are most often guilty of arrogance born from ignorance. They appear hapless, to be sure, but, hopefully, not evil. The story plays out on the Indians’ home turf, whereas the whites are on foreign ground. Thus, what happens is often more a learning experience and shock to them than it is to the Indians. They are perpetually flummoxed by the weather, Indian ceremonial

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13 Donald Worster, *Rivers of Empire: Water, Aridity, and the Growth of the American West* (New York: Oxford Univ. Press, 1985), 32-36. I realize that Worster was not writing Indian history and should not be taken to task for a book that he should have written but did not. But on the other hand, one imagines that all vestiges of what he calls the local subsistence mode are wiped out. We differ. I imagine the history of the West, or anywhere for that matter, as a series of layers, a palimpsest, and those layers continually nose their way to the fore and then retreat, and vice-versa. The past never simply vanishes.

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life and agricultural and hunting practices. Both the Indians and the whites must respond to each other.

No good history evolves in a vacuum. Debts are owed to previous work. And in this thesis, I will draw on two works that have provided me with substantial capital. The notion that there are competing visions of what nature is, and that those differing visions serve to inform environmental history, has been explored recently in two books, Mart Stewart’s ‘What Nature Suffers to Groe’: Life, Labor, and Landscape on the Georgia Coast, 1680-1920, and Louis Warren’s The Hunter’s Game: Poachers and Conservationists in Twentieth Century America. Both Stewart and Warren demonstrate, in vastly different geographical spaces, that nature means different things to different people. Different ways of knowing nature often clash and serve to produce outcomes other than the one intended by the dominant group—planters and conservationists, respectively. Both works demonstrate how local responses unraveled particular utopian visions.

Stewart and Warren write into their stories people who are often not accorded agency in determining their own histories. In Stewart’s case, slaves direct their own history as much as the planters do and vice-versa; in Warren’s book, the poor, Italian immigrants, and Indians foul up the plans of twentieth century conservationists by defiantly utilizing nature—in this case hunting—in ways in which they have for generations, contrary to the visions of the conservationists. And in both books, environmental forces, some man-made and some not, direct history. Not taking into account differing ways of knowing nature, and understanding the world at large, proved fatal to both conservationists and planters. This thesis takes the same position: the Indian
Service's utopia on the Colorado Plateau was thwarted by Indian responses and by the natural environment, both of which the Indian Service mistakenly thought could be controlled or, alternately, did not consider. In this case, it is not merely that Indians and the environment have not been accorded adequate agency by historians, but they were not factored in when the history was being made. Thus, there is a dual burden: writing them into the historiography and, at the same time, retrieving them from history.¹⁴

On the sea coast of antebellum Georgia, historian Mart Stewart found that in order to wrest a profit from the land planters needed to "maintain an ordered equilibrium of social relations to sustain the fragile ecological ones." The folk beliefs of the slaves—some brought from Africa, others that metastasized in America as Christianity seeped into their religions—were thought of as foolishness by their masters. Concerns over health and the origins of diseases, for example, struck master and slave very differently. In an instance when several slaves took sick on the Butler plantation, and a dozen or so died on a neighboring plantation, slaves and masters took the root cause to be two very different things. Slaves believed that they had been cursed by a conjurer; the plantation's head driver; the overseer, on the other hand, thought this was nonsense, and put the sickness down to one of the many "fevers" that periodically befell the human population

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¹⁴ Agency, of course, does not mean that nature and people act with calculated precision in every decision they make, aware of the consequences at all times. Indeed, nature has no consciousness, per se. Rather, human and natural agency plug into a structure that is built as much by their actions as anything. Anthony Giddens has written, "Human agency and structure...are logically implicated with one another. Structure is the very medium of the 'human' element of human agency. At the same time, agency is the medium of structure, which individuals routinely reproduce in their activities." I merely add, not indefensibly, the environment to the medium of structure in determining history. Anthony Giddens, Social Theory and Modern Sociology (Stanford: Stanford Univ. Press, 1987), 221; Giddens, who has written widely on the subject, defines agency thusly, "Agency concerns events of which an individual is the perpetrator, in the sense that the individual could, at any phase in a given sequence of conduct, have acted differently." The Constitution of Society: Outline of the Theory of Structuration (Berkeley: Univ. of California Press, 1984), 9.
in this malarial environment. But whatever the cause the result was the same: a contested version of what the disease meant. And this threatened the fragile equilibrium of the plantation.\footnote{Mart A. Stewart, ‘What Nature Suffers to Groe’: Life, Labor, and Landscape on the Georgia Coast.}

Slaves, Stewart avers, wanted to retain control over matters concerning their bodies, while masters sought to manage not only the slaves production, but also their reproduction—a realm that slaves were reluctant to let outsiders into. Competing interests over health and reproduction, Stewart maintains, resembled contestations over the environment. “The clear distinctions that [planters and overseers] made between the spiritual and the material worlds and between humans and their activities and the working of the natural world were not commonly made by slaves.” When the equilibrium of social relations was threatened, problems with production occurred on the plantation. Slaves knew the environment better than the planters. Little in nature was outside their ken, thus keeping that balance was essential to the successful operation of the plantation. In an environment as tough to work as the tidewater of the Georgia coast, control over labor was as essential as control over the environment; but planters rarely maintained total control over either one. Competing versions of the natural and spiritual worlds saw to it that the process of manipulating the environment and people was a constant process of negotiation between master and slave. It is the conversation, indeed, at times the argument, that takes place between culture and nature that shapes history. Neither one acts upon the other without a rebuttal; both have agency. The Indian Service encountered similar problems on the Colorado Plateau. Discussing Stewart’s work on the Georgia coast serves to show that problems between competing versions of nature,
that result in attempts at social control, occurred not only in Indian America, but elsewhere as well. Both on the Georgia coast and on the Colorado Plateau equilibrium of social relations was rarely achieved. And, on the Colorado Plateau, this kept the irrigation enterprise from being successful.¹⁶

Louis Warren’s *The Hunter’s Game* also manages to give agency to nature and other, often silent voices in conservation history. Conservation of hunting grounds in the public interest—to keep them out of the hands of the elite—was not the democratic process that the consensus on conservation history would have us believe.¹⁷ *The Hunter’s Game* traverses three disparate geographies and tells three different stories. But they all convey that in the United States, over the last century, there were local, unique ways of knowing the natural world and that those ways were, in the main, supplanted by extra-local control. And that extra-local control was primarily federal or state government. Warren argues in this wonderful book that local commons—natural space that was “managed” and used for the benefit of a local population—has been taken over by a centralized power that has tried to implant a single, national way of knowing nature. And in each case this has meant that certain groups get marginalized: the poor, immigrants, and Indians. In Warren’s story, local uses of hunting grounds gradually gave way to extra-local control of those hunting grounds. What was once a local commons, governed by local custom, was subverted by a national conservation agenda that tried to

¹⁷ See, for example, Samuel P. Hays, *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1890-1920* (Cambridge: Harvard Univ. Press, 1959). Hays recognizes that the top down way that conservation leaders envisioned resource planning working often clashed with local interests. But these were white interests, often local elites. At the very least he was speaking of local property owners, something the poor Italians and Indians in Warren’s book were not. For a good criticism of
create a national commons. Warren's book tracks the story from state control to an admixture of state and national control to one of complete national control. In each of the three case studies—Italian immigrants in Pennsylvania, Apaches and Navajos in New Mexico, and Blackfeet in Montana—extra-local interests tried to and did supplant local ways of knowing nature. But it was a bit more complex than that. In all three cases, local white elites gleefully went along for the ride if it meant curtailing access to hunting by any one of the above mentioned groups. Thus, it was more than a contest over redefining local hunting grounds, it was battle over access.

Conservationists wanted to preserve hunting grounds for the common man, and in the case of Glacier National Park, they wanted to curtail hunting altogether. In all three case studies Warren demonstrates that the utopian notion of the conservationists—limiting access essentially to white hunters who could afford the cost of a license—unraveled as contingencies they did not expect kept creeping up on them. At Glacier, conservationists tried to create a natural utopia, a "world of people on the outside, [and a] world of nature on the inside." But boundaries do not quite work that way, and the effect of restricting hunting was an ungulate irruption that devastated park fauna. The Park Service even resorted to feeding the deer and elk to keep them from starving and away from Indian hunters outside the Park. Eventually, once the Park elk population reached critical mass, the Park Service chased the animals out of Glacier to be hunted by the same Blackfeet they were trying to protect the deer and elk from in the first place! Lack

of understanding of previous, local ways of using nature proved fatal to the Park Service's utopia. It was rendered a pipe dream.\textsuperscript{18}

This thesis follows Warren's and Stewart's leads. Local responses—from both the environment and Indians—to extra-local forces kept the irrigation enterprise from being successful. The Indian Service's inability to achieve social and ecological equilibrium because of conflicting ways of conceiving of the natural world also proved disastrous. The agricultural utopia that the Indian Service envisioned on the Colorado Plateau failed to engage Indians actively in the process. The Navajo and Zuni, however, directed events more than the Indian Service could have ever imagined. As Steve Stern said, failure to engage the Indians proved disastrous.

To Indian agents in the late nineteenth century, the semi-arid Colorado Plateau was like no landscape they had ever seen. The dryness, wind, and lack of green vegetation evoked feelings akin to hostility in many of the agents. The scarcity of water was frightening to many of them. More than one considered the land barren and useless. D.M. Riordan, agent on the Navajo reservation in the early 1880s, thought the Navajo country to be the "most worthless land that ever laid out-doors. It is wholly a sandstone mesa country, with occasional patches of valley land susceptible to cultivation by the rude Indian methods. It is almost waterless—in fact, a barren, rocky desert....The face of the country is almost entirely rock. Rock everywhere." Rarely, if ever, did they marvel at the landscape. In almost all instances they saw the Colorado Plateau in negative terms. Officials of the U.S. government rarely had anything but contempt for the landscape of the Southwest. Indeed, the hostility felt toward the region kept it from being heavily explored and administrated. Only after white population skyrocketed did the U.S. government take an active role in administering the region. Before 1890, to be sure, there was a military presence in the region, but the government's limited resources saw to it that other, more profitable, less hostile regions of the West got attention. After 1890, and the increase in trade because of the railroad and mining, the region was taken more seriously. As irrigation gained currency, the Southwest was looked on in a different

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1 D.M. Riordan quoted in Herbert Welsh, "Report of a Visit to the Navajo, Pueblo, and Hualapais Indians of New Mexico and Arizona" (Philadelphia: Indian Rights Association, 1885), 37.
light. But the initial lack of interest in the Southwest was due, in large part, to perceptions of its climate, physical environment, and Indian population.  

In the 1880s, agents were very eager to get reclamation works underway. But the semi-arid climate was tricky: it at once intensified the pace of irrigation efforts and fooled the agents. The lack of frequent rain and the presence of few permanent streams and springs convinced agents that they needed to build waterworks. However, when rain did fall it came in torrents. Ephemeral streams that lay dormant much of the year came to life during the two rainy seasons: December-March and June-August. The attendant floods washed out the small dams and ditches the agents built. They repeated this cycle year after year throughout the first phase of irrigation history. Their desire to see the desert bloom, and the constant turnover of agents, blinded them to the yearly cycle of rain and flooding. The agents’ conceptions of the climate are of particular importance, for it was their impressions that guided irrigation efforts in the region. They had very little information to go on in this early phase of irrigation history, and they generally made their decisions based on their impressions.

Early Spanish visitors to the Southwest, particularly the Colorado Plateau country of New Mexico, found the climate, except for the cold winters, to be favorable. They remarked on wide valleys and grasslands that would make for good pasturage. Abundant streams were noted, too. Probably coming as they did from the arid and semiarid regions of Mexico and Spain, the climate of New Mexico did not impress them as significantly different. The climate of Mexico, and even parts of Spain, prepared them for the conditions in New Mexico. But when Anglo arrivals from the East, they formed wholly

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2 Robert Wooster, "'A Difficult and Forlorn Country': The Military Looks at the American Southwest.
different impressions. Explorers in the early 1850s found the region barren and devoid of economic prospects. They noted that grass was abundant in places, and scarce in others. In 1849, Lieutenant J.H. Simpson, on an exploratory mission of the Navajo country, said that one would have a hard time looking on the country “without a sense of loathing.” Early white explorers of the region, concerned with grass and water for their stock and themselves, make good sources of information regarding environmental conditions—if only impressionistic ones. The diaries and official reports of explorers gathered and analyzed by Luna Leopold reveal a Southwest at best marginal. Account after account reports on the difficulty in finding forage and water. But other, conflicting impressions could be formed, too. Only a few years after Simpson, other Anglos from the East remarked on the salubrity of the climate. W.W.H. Davis, U.S. Attorney in New Mexico, said that a better climate could not be found anywhere in the world.3

What accounts for these wildly varying accounts? Geographers Yi-Fu Tuan and Cyril Everhard argue that a sudden, but brief, shift in the climate in the early 1850s changed the appearance of much of New Mexico. In Santa Fe, for example, there was fully three times as much rain in both 1854 and 1855 as there was in 1850. Thus, two different observers, only a few years apart, were able to have quite varied impressions of the landscape due to a marked increase in rainfall. This may seem an obvious conclusion to draw. Naturally, two different people coming to New Mexico at different times under different weather conditions would report varying impressions. But more important than that, it illustrates the fluctuation of New Mexico’s climate and exemplifies a common

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phenomena later in the century: As the turnover of Indian agents occurred on an almost biannual basis in the 1880s and 90s, they gathered quick, impressionistic views on the climate of the region. A dry summer alarmed agents; a wet one delighted them. Like Simpson and Davis, agents following in the heels of one another could have varying impressions of the climate. Gathering any long term impressions of what New Mexico’s climate was like seemed impossible. None of them stayed long enough to gather any strategies for how to deal with the capricious climate. They formed opinions generally devoid of value when it came time to plan major reclamation projects. Herbert Welsh, not an agent himself but president of the Indian Rights Association, was hopeful that “the approach of the civilization and the introduction of the railroads are producing some modification of the climate here, as they seem to have done in other parts of the West.”

If this was the kind of information that planners had to go on—a slightly modified rain follows the plow prediction—then successful reclamation projects would be unlikely. As mentioned in the introduction, when the climate did take a noticeable turn toward a series of wet years at the turn of the twentieth century, the lack of captured information, and often contradictory impressions, proved damaging to reclamation efforts.

During the last quarter of the nineteenth century a drought desiccated the Southwest. In the last half-millennia only one other drought has been worse, that between 1573-1593. But the dry cycle that visited the Southwest between 1879 and 1904

was the longest running. Less rainfall fell during the previous cycle, but the modern
drought was longer in duration. Exacerbating the modern drought was the presence of
sheep and a greater human population.\(^5\) Within the major drought there were anomalous
years, to be sure. And the agents who came to the Colorado Plateau, of course, had no
idea that they were enduring a string of the driest years of the last millennia. After 1905,
the region experienced its longest run of wet years. Again, there were dry years
throughout, just as there were yet years during the drought. However, the two general
trends of dry, then wet, can safely be established.\(^6\)

Most importantly, the dry and wet trends closely parallel the movements of the
Indian Service in the area. In the last twenty years of the nineteenth century agents first
attempted reclamation. As the effects of the drought—livestock reduction, disappearing
springs—began to be noticed the Indian Service determined that more needed to be done
to secure water than individual agents could do with limited resources. What little
information agents did capture during the nineteenth century only prepared them for
drought. But providence was not on the side of the Indian Service. Plans for a major
dam on the Zuni reservation were made during the drought, but construction of the
Blackrock Dam coincided precisely with the cycle of increased rainfall and flooding. As
ad hoc efforts gave way to professional ones, drought was replaced by rain and floods.
The shift in climate and the deepening of commitment to irrigation converged in the
early twentieth century. And this had serious implications for reclamation. Costs

\(^5\) On the increase in sheep, see Denevan, "Livestock Numbers...".
\(^6\) Schulman, 43-46, and see note seven in the introduction for further evidence of the drought and
subsequent wet years.
escalated year after year as more rain and flooding destroyed waterworks on the Zuni and Navajo reservations.

The drought years of the late nineteenth century gave way to ill informed predictions of stream flow. Because no long term monitoring had been done, combined with a general refusal to tap Indian memory of weather, the Indian Service had scant data to go on in planning reclamation projects. There is no doubt that the Navajo, for example, could have provided the Indian Service with at least some information on the climate. Their knowledge of the cycles of the weather and the character of rain, for example, might have given the Indian Service some indication of the mercurial nature of the weather. The Zunis' and the Navajos' intimate knowledge of plant life, what grew where and under what conditions, would have proved useful to the Indian Service. The Navajo identified more than one type of the rain. In some years, or in different seasons the male rain—heavy, and often destructive—fell; and in others, the female rain—light, and good for crops—dampened the ground. It is possible, maybe even likely, that the Navajo and Zuni had a storehouse of collective memories regarding when in the past different types of rain fell, or when plants dependent on one type of rain or another did well or poorly. This type of information was not written down; it was embedded in the knowledge that was collected over centuries of living on the Colorado Plateau. In calculating how much rain would fall each year, and hence the capacity of the reservoir at Zuni, the single most important factor was the "character of the rain storms." The water planners needed to know just when the heavy rains fell, and how heavy they could
be. That is, they needed to know: when did male rain come and when did female rain come?  

The lack of information concerning the climate led to costly errors. In 1903, after making an inspection of the Zuni dam site, W.H. Code, then an inspector for the Indian Service and later Chief Engineer of the Irrigation Division, concluded with great confidence that the highest floods his calculations could predict for the Zuni River would be a mere 3,000 to 4,000 cubic feet per second. By 1907, after witnessing four seasons of destructive flooding, he changed his tune and estimated that 9,000 cubic feet per second was a conservative figure. Code's initial estimate was only based on well informed guesses, however. Code felt that he could rely only on the few white residents in the area for any anecdotal evidence of stream flow. The well spring of information that was captured over the centuries by the Indians in the region was not tapped by Indian agents or Irrigation Division water planners. Rather, year after year, they seemed intent on reinventing the wheel, or rather the humid East, and not looking to the long term residents of the region for guidance regarding the climate.  

After twenty years of drought the Indian Service was hardly prepared for the torrents of rain, and attendant freshets that filled the region's waterways in the first decade of the twentieth century. The climate change dampened irrigation plans. W.H. Code, Chief Engineer of the Irrigation Division of the Indian Service, reported that the

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8 W.H. Code to the Secretary of the Interior, 13 April 1903, Box 212, SC 190, RG 75, NA; W.H. Code to John B. Harper, Superintendent of Irrigation, 28 December 1907, Box 212, SC 190, RG 75, NA.
weather conditions of 1905 were the worst “known to the oldest inhabitant of New Mexico.” One long term observer of the Southwest, Matilda Coxe Stevenson, wrote from Taos in 1906 that she had never experienced such high winds and rains as she did that summer. And John B. Harper reported that the whole “face of the country is changed.” He wrote later that summer, “since the end of September 1904, the entire southwest has been having a period of great and frequent storms and unusual weather conditions, and this has added greatly to the difficulties and uncertainties of the [irrigation] enterprise.”^9 The drought of the last century was over. And the Indian Service was faced with a new challenge; where once drought made their work seem crucial, heavy rain and flooding now stymied their efforts.

Infusing the history of climate into human history is a tricky business. Personally, I have been warned not to take slight fluctuations outside of the “normal” variegated weather on the Colorado Plateau as scientific proof of a climate change.10 I would counter that impressionistic data gathered concerning climate can be more important, as argued above, than a scientifically proven climate change. In using climate as a causative factor in history there are limitations that exist and methodological problems that are difficult to overcome. Climate cannot be looked at in a vacuum; the risk is too great of making deterministic conclusions. Climate is never the only factor involved in altering history. Indeed, in many discussions of the role of climate in history, extreme caution is advised. In particular, historians are wary of ascribing any significance to

^9W.H Code to the Secretary of the Interior, 12 December 1905, RG 75, SC 190, Box 212, NA; Matilda Coxe Stevenson to William Henry Holmes, 7 July 1906, Stevenson Correspondence, 1890-1918, Box 6a, NAA; John B. Harper to CIA, 5 July 1906, #41728, Box 212, SC 190, RG 75, NA; Harper to CIA, 8 January 1906, #67729, Box 212, SC 190, RG 75, NA. For sources regarding the climate change see note 9 in the introduction.
short term climatic change. The common wisdom says that if quantifiable data cannot be gathered that proves that climate was indeed a factor in affecting history than we would be better served dismissing it, or, at the very least, listing it as one of many factors determining history. In using climate as a pivot point in this story I have tried to use caution. I do not think that the short term climatic pulse that occurred at the beginning of the twentieth century was the only variable in shaping Navajo and Zuni history. But it was very important.¹¹

Short term climate change gets short shrift in discussions of climate and history. Economic historian Jan de Vries is skeptical of its influence on historical events. Short term “exogenous shocks” likely have no effect on economic history, just as the history of bank robberies surely have no effect on the history of banking. Acknowledging his remarks as sarcastic and overstated, de Vries, nevertheless, remains unwilling to look at short term change as anything but descriptive and speculative. In his estimation, gathered from the insights of Emanuel LeRoy Ladurie, societies settle back into a “normal” routine after short term pulses, and their effects remain difficult to detect. The reluctance that Ladurie and de Vries share on this issue comes from their insistence on studying long-term trends. As de Vries say, “The possibility that long-term changes in

¹⁰ Personal communication from William R. Baron, 29 July 1997, in author’s possession.
climate might play a role in historical explanation constitutes the most exciting
dimension of climate history.” According to de Vries, too often studies of short term
climate change fall into the “harm done” mode of thinking; they merely describe how
deleterious a climate change was. (I would add that the converse could be true, but agree
that most describe harmful effects.) And the ultimate irrelevance of this type of study is
proven, in the end, by the fact that societies adapt. Thus, studying short term change
serves little or no end but to describe conditions at a given moment in time. But that
given moment in time can have lasting effects. If the short term pulse can be shown to
suggest, or prove, lasting effects, then it should be considered as more than a blip on the
historical record. Thomas Hall has drawn an apt metaphor. If we can think of social
change as a ratchet and pawl mechanism, then short term climate change can be shown to
have lasting effects. Hall’s metaphor applies to levels of incorporation but can be
applied to other situations. It works like this: a technology or exogenous shock, for
example, is introduced into a society, or band, and if it comes at the right moment in time
then the outside force can be very hard to resist. It introduces changes that alter history
in fundamental ways. Once the Comanche acquired horses the ecology of their hunting
grounds became so drastically changed that reverting back to foraging became
impossible. There is always some slippage, but reversal becomes more and more
difficult. I would include short term climate change, at particular historical moments, as
having potential to act on this principle. The short term climate change forced the Indian
Service to reevaluate reclamation projects and its relationship with the Zuni and Navajo.
Additionally, it led the Indian Service, as I will show, to overstock the Navajo reservation with sheep as they realized the folly of reclaiming Navajoland.\(^{12}\)

devRies’s thinking smacks of some sort of excessive, backwards relativism. That is, in it most extreme form, relativism posits that all instances, or thoughts, or value systems, have equal merit and thus none can be judged better than another. If we accept de Vries’s way of seeing short term climate change then no short term change can have any significance. And that’s not relative to one another, that’s the category as a whole. If all “societies in the long run adjust,” then there is no point in studying short term change because we already the know the outcome (in a general, not a specific, sense). Not all cases have their own merits that need to be weighed regarding peculiar, local circumstances. Rather, historians should dispense with short term studies because adaptation will occur and it is that adaptation that should be studied. I agree that the adaptations to climate changes should be studied, but so, too, should short term climate change. The reluctance to study short term change strikes me as odd. One could argue that any “exogenous shock,” such as war, will eventually subside and societies will adapt. But, first of all, isn’t figuring out what those short term changes are an important task? If we are to figure out in what ways societies adapt, is it not imperative that we find out what events they are adapting to? On the Colorado Plateau, in the early twentieth century, the Indian Service attempted to adapt to a semiarid environment. What they did not know was that they were, in fact, adapting to a short term climatic change—the 1879-1904 drought. The drought was, of course, part of a series of climate changes tracked over the course of nearly seven centuries. When the Indian Service attempted adaptation,

another climate change occurred, this time in the form of a series of wet years. They
adapted to this, too. Understanding how this climatic change forced the adaptations that
it did strikes me as the important task. Too, as I have said, the agents and engineers
living the history considered what was going on important, and retrieving their
impressions of the relevance of the climate change is crucial.

Short term climatic change in this instance has singular importance. Indian
policy was evolving at such a rapid pace during this time that otherwise insignificant
events like a short term climatic change could have profound effects. Fifty years in the
past a short term change may not have had lasting effects; Indians would have adapted.
But as the Indian Service shifted from policies that discouraged large-scale reclamation
efforts to ones that embraced them—based largely on a national movement that endorsed
reclamation—the climate changed. The shifts in Indian Service policy were
accompanied by sudden changes in the climate. Institutional change paralleled
environmental change. And this is why this short term change is important; it can be
directly linked to another, contemporaneous historical change. This is, of course, a
historical coincidence. But it may point to the need to further consider short term climate
change as an important shaper of history.

II

On the surface, increase in rainfall may not appear to be dramatic. An inch
difference between one year and the next, either up or down, when spread out over a
whole state or region is a meaningless statistic. To say that the Colorado Plateau experienced either an upward or downward trend only takes on meaning when one examines local conditions. One needs to look at local examples, judged upon local topography, settlement patterns, and in the case of this study, irrigation development, to be able to gauge the impact of seemingly incremental average increases in rainfall. As Luna Leopold cautioned, "It should be remembered that annual values of precipitation may obscure short-period features in the rainfall pattern which in themselves might have great significance."\(^{13}\)

If one examines the rainfall statistics for Tuba, Arizona, at the western edge of the Navajo Reservation, one would see that between 1897 and 1913 the mean annual rainfall is a mere 5.30 inches. That's not much. However, upon closer examination of the monthly rainfall, and the shifts in which month that rain comes, one finds illuminating information. In November 1905 and 1906, for instance, 2.5 to 3.0 inches of rain fell, when compared with other Novembers in which somewhere between a trace and 1 inch fell. And remember, November falls outside the normal rainy season. Take another example: In January of 1907, 2.0 inches of rain fell at Tuba, but the mean given is .49 for 1897 to 1913. One-half inch of rain is not a destructive amount, but two surely is if waterworks projects are in the way of the inevitable floods that that much rain would likely produce. And in most years, again, somewhere between a trace and 1 inch of rain fell on the desert at Tuba.\(^{14}\)


The same is true for much of the rest of the Colorado Plateau: While mean annual increases may not appear significant, local changes, that happen to be in some of the same places that the Irrigation Division was building waterworks, could be enormous. Increases in local storms, of course, affected stream flow, and thus, flooding patterns. The Little Colorado River at Holbrook, Arizona is a good example. In November 1905, the mean flow of the river was 1,159 acre feet, higher than any other month of the year, but not too much higher in this wettest of years. The mean, of course, is the average of the high and the low. And the low for November was a trickle of 30 acre feet. But the maximum flow was a staggering and devastating 20,180 acre feet! You could add up the flows from 1905-07 and still not approach the flow for that one month.¹⁵

Along with climatic records, the anecdotal evidence of the change in climate is overwhelming. In fact, it is arguably more important than the tree-ring, streamflow, or rainfall records. Because the weather changed so dramatically in such a short time, Indian Service employees working in the region noted it, almost without exception, in their correspondence. It affected their day to day operations. Work had to be stopped and costs ran way over budget due to flooding, for example. Using this kind of evidence, not in lieu of, but to bolster official records, only makes the case stronger. To the agents and engineers on the ground, there was a climate change. The sudden change in the

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¹⁵ Gregory.
weather did affect operations and influence policy decisions.\textsuperscript{16} Citing the climate change as the pivot point in the history of irrigation development on the Colorado Plateau comes from the anecdotal evidence. One could conceivably examine rainfall records alongside expenditures on waterworks projects and make some guesses as to how the weather affected decisions. But the correspondence leaves no doubt; the climate change affected engineers’ and agents’ decisions and behavior.

As we will see in the discussions of the waterworks projects at Navajo and Zuni, these local increases in rainfall and attendant flooding had devastating effects on the irrigation enterprise. As mentioned earlier, the Zuni River, which through most of the late nineteenth century contact period was considered the ideal source for a permanent water supply, became a torrent when significant rain fell on the Colorado Plateau. In 1902, the second year of surveys for the Blackrock dam, the Colorado Plateau, according to Schulman, experienced the driest year of the twenty-six year drought. Little water coursed through the Zuni River that year. But when a short term, intense change in the weather arrived, it spelled disaster for the Zuni dam, as well as other projects. The change forced the Indian Service to critically evaluate projects on the Colorado Plateau. It appears that they considered the change signs of a permanent condition—the same assumption they made about the drought in the closing years of the previous century. At the very least, they began to wonder if ever they could get a handle on the climate of the Colorado Plateau. With the return of wet weather, the Navajo reservation could be more

\textsuperscript{16} William R. Baron, in very good essay on the value of American climate history states, “A source of climate data that is perhaps richer in detail and has a better geographic distribution than instrument records is qualitative documentation found in such sources as diaries, almanacs, old newspapers, and periodicals.” Of course, I would add correspondence. William R. Baron, “Retrieving American Climate History: A Bibliographic Essay” \textit{Agricultural History} 63(1989):7-35.
heavily stocked with sheep. The consequences of the overstocking of the Navajo range are out of the scope of this study. But the origins of the overstocking come out of this era. The Indian Service had always recognized that sheep and pastoralism were important to the Navajo, but they insisted on developing irrigation works for farming. Now, after the improvement of the range, a renewed commitment to helping the Navajo in their pastoral pursuits marked Indian Service reclamation policy among the Navajo. Shifting perceptions of the climate made this possible.

In the late nineteenth century the Indian Service made a concerted effort to get to know the Navajo and their homeland. This era of discovery led them to deign the reservation and the Navajo worthy of reclamation. The Zunis, on the other hand, while scrutinized by anthropologists, did not come under close Indian Service examination. Waterworks did not receive the full attention of the Indian Service until the first years of the twentieth century. The dry, parched looking, arroyo scarred Colorado Plateau alarmed Indian agents. Something needed to be done to turn it into a garden.
Many Horses learned from his father and namesake, the Navajo leader Ganado Mucho, to reserve a healthy amount of skepticism for prophets and medicine men among his people. In the decade after their captivity at Bosque Redondo, and the failure of that experiment, the Navajo returned to their homeland, now a much shrunken area and a reservation, and tried to regain harmony with their world. But the disaffection that many felt at the loss of life and livestock, possibly lubricated by alcohol consumption, caused unrest. As a result, a wave of witchcraft washed over the reservation in the late 1870s. Navajos and white authorities hunted down scores of witches. Ganado Mucho killed even his own uncle in an effort to quell the fervor. Ganado Mucho and Manuelito, another Navajo leader, killed between them an estimated forty witches. Ganado Mucho was an advocate of peace with whites and the recent unrest threatened to unravel the fragile trust that had been achieved.¹

Ganado Mucho, consequently, did not trust medicine men—whom he considered no better than witches—and urged his son to be wary too, warning him not to fool with witchcraft. But in a moment of fragility, when Ganado Mucho was dying, his son spent the bulk of his fortune on the services of a medicine man to banish from his father the evil spirits that lay within him. He sold his herds of cattle, sheep, and horses. The fortunes of Ganado Mucho and Many Horses vanished. Ganado Mucho chastised his son

¹ Underhill, 160-161; Garrick Bailey and Roberta Glenn Bailey, A History of the Navajos: The Reservation Years (Santa Fe: School of American Research Press, 1986), 33-34; Edward H. Spicer, Cycles of Conquest:
and told him that medicine men have no supernatural power. They are merely charlatans, he assured his son. To his death Ganado Mucho remained firm. Many Horses listened to his father, and when confronted with a prophet in his own time, acted accordingly. Perhaps he was chagrined by the loss of his fortune. In any case, in death his father convinced him to associate prophets and medicine men with witchcraft.  

When the Ghost Dance swept across the Great Plains and elsewhere in the West, preaching the immanent elimination of the white man and the return of the Buffalo, it also had a brief life on the Navajo reservation, although manifested in different form. In 1890, Nnazi, a Navajo prophet and medicine man, preached to the Navajo that they had fallen out of harmony with their old customs and traditions. And because of this their grass had gone bad and their herds were diminishing in number. Drought plagued the reservation because of Navajo apostasy. Nnazi made a pilgrimage to the sacred San Francisco Mountains where Changing Woman revealed this to Nnazi. After consulting with Changing Woman, he was transported to the middle of the ocean where he met with White Shell Woman. She confirmed that the drought and bad grass were punishment for abandoning old ways and "forgetting about the gods of their fathers." White Shell Woman chose Nnazi to lead his people back to harmony. After returning from the mountains, Nnazi told his story and he gained a following among the Navajo. Many people saw the bad grass around them and their lean herds and took Nnazi's words for the truth. He began to create quite a stir. Additionally, during 1890, an outbreak of a

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2 The details of this story come from Leopold Osterman to William Henry Holmes, Bureau of American Ethnology (BAE), Letters Received (LR), National Anthropological Archives (NAA), Smithsonian
throat disease resembling diphtheria killed 800 Navajos, possibly adding to the troubles on the reservation. Clearly something was wrong in the Navajo world.³

Many Horses soon heard of Nnazi and having been well trained by his father took him for a fake, or perhaps a witch. He confronted Nnazi and asked him for proof of his meeting with White Shell Woman. Nnazi could produce nothing tangible. The only evidence he could offer was the obviously denuded range. Many Horses branded him a liar and a schemer only out for power and personal gain. He said that if he truly did meet with White Shell Woman, then she, too, was a liar. The reason the grass is so bad—Many Horses would at least admit that—was because the Navajo had larger herds and they had eaten all the grass. The Navajo had done nothing wrong. Many Horses ignored the issue of apostasy and put it all down to more animals.

The story is instructive, but must be read with caution. Leopold Osterman, the man who recorded the story, had great respect for both Many Horses and his father. He marveled at their keen intelligence. But what he seemed to like most in Ganado Mucho and his son were their progressive values. Medicine men and prophets could not fool them. They were men of sound mind and both had led their people away from belief in the superstitions of witchcraft. Osterman took down faithfully what each man told him. And he took for truth Many Horses' story. Clearly, Nnazi was a false prophet who only sought the approval of his people. Osterman tells us, in what is clearly his voice and not Many Horses', that Nnazi saw in the fervor over the Ghost Dance an "opportunity of gaining prestige and profit." Many Horses' possessed nobler goals. He would take no

Institution (SI), "Recollections of Dine Tsosi and other Navajo leaders," 24 June 1907. The information is taken from interviews done with various leaders of the Navajos and their reflections on their lives.
part in believing that the current drought and bad grass was any sort of retribution on the part of the holy people for Navajo lapses in faith. On the contrary, he knew exactly what it was: too many animals.

But Osterman concedes that Nnazi did indeed gain a following. Nnazi’s followers’ faith in Nnazi’s story was spawned by the obvious condition of the grass and the herds. As before, when Ganado Mucho ran witches off the reservation, there was genuine trouble. When Ganado Mucho took care of witches in his time it was in conjunction with increased raiding activity. The delicate peace with whites was threatened. Witchcraft only added to an already tense situation on the reservation. In 1890, when the son mirrored the father’s behavior, there was also real trouble. The range was in dire shape. After many years of low rainfall and increased gullying, the increase in sheep was finally taking its toll. And the Navajo could see that something was amiss. Figuring out just how the Navajo dealt with the problem is hard to do. Records of their reactions to the environmental crisis are few. But the above story does provide us with a small window into the Navajo reaction to a very real problem. It was a problem that some Navajo ascribed to falling out of balance with their religious life. Others, like Many Horses, blamed the situation on too many sheep. Indian Agents did not know what to make of the disaster. Most took the low rainfall of the 1880s and 90s as normal. Although they could see that there was a problem, they did not think the conditions anomalous.

But whatever the cause of the drought and the resultant poor condition of the range, it was obvious to Navajos and whites alike that there was a problem. White

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efforts at confronting the problem of the drought had proved fruitless, and in some Navajo circles the drought caused a crisis of faith. Ad hoc reclamation efforts on the Navajo reservation had done little to stem the effects of low rainfall. Before 1890, the Indian Service put little effort into waterworks projects on the Navajo reservation. After 1890, when the drought really began to take its toll, the Indian Service was forced to examine the situation on the reservation critically. But inertia and concerns elsewhere led the Indian Service to neglect the Navajo reservation for much of the 1890s. Only after the turn of the century did large-scale projects get serious consideration.

As the final two decades of the nineteenth century wore on the effects of the drought discussed in the last chapter began to take their toll on the Colorado Plateau. Indian Agents moved into the region and found themselves confronted with a parched landscape. Securing water for the Navajo became a primary concern. But they did not understand—how could they have?—that the region was undergoing a millennial drought and their feeble attempts to control water would ultimately fail. By the 1890s, several projects had been tried, none had been successful. The 1890s were a decade of reconnaissance. The U.S. Army surveyed Navajo reservation in 1889 and 1892, scouting for water and future reclamation possibilities.

When the Indian Agents first arrived on the Colorado Plateau they approached irrigation with aplomb. Building a series of flumes, diversion ditches, or dams on virtually any type of stream or in any narrow canyon was widely held to be an easy task. The fruits of their labor would be Indians who could farm for the market, and at the very least for subsistence. D.M. Riordan, the agent at Fort Defiance, on the Navajo
Reservation, wrote, in 1883, that he was fervently trying to "make a garden spot of one of the dreariest places on the planet... [which would] move to lift up the Indians here (in a material way)." But there was little or no systematic plan; the agents were not engineers and were newcomers who stayed too little time in the country to get to know it. The same mistakes were repeated year after year as the revolving door ushered in and out one agent after another.⁴

In these early days of irrigation development very little money from the annual appropriations of the Indian Service was available for waterworks. Irrigation had not yet become a permanent feature of the Indian Service's annual budget and would not for another ten years. At this point, irrigation development was done on a case by case basis where Agents saw fit to attempt reclamation. Because irrigation did not yet have the appeal that it later would have the Indian Service was reluctant to spend money on projects that had potential for failure. The federal government was not yet in the business of reclamation and was thus skeptical of its benefits. Agents interested in irrigation, hoping to assuage the fears of the Commissioner of Indian Affairs, contended that they could irrigate plenty of land for little expense. However, due to their inexperience Agents made mistakes both in reading Indians and the land which led to the waste of money and energy.

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⁴ D.M. Riordan to Secretary of the Interior, 12 May 1883, #9378, Box 138, Letters Received (LR), RG 75, NA; the first money allocated for water development on Indian land was in 1867 for the Colorado River reservation. Janet McDonnell, *The Dispossession of the American Indian, 1887-1934* (Bloomington: Indiana Univ. Press, 1991), 71.


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The Navajo reservation was one of the first places that the Indian Service attempted reclamation. In the 1880s, agents worked hard on several projects. But they met with little success. The first was D.M. Riordan. He assured the Commissioner of Indian Affairs that “there are a number of places on the [Navajo] reservation where an expenditure of a few hundred dollars would render large tracts available for farming in the Indian manner.” He warned that this must be done soon, however, because gullying had cut away valuable farm land, leaving much of the area around Fort Defiance a “sandy waste.” If, however, he could get started right away he was confident that whatever he built would last for all time and provide such excellent results that the fears of the Commissioner of Indian would be put to rest. Too, Riordan requested that the Indian Service send a man out to inspect the reservation for other waterworks projects. He was optimistic about the possibilities of irrigation on the reservation and eager to get reclamation underway.⁶

Things started to go wrong almost immediately and it became clear that more than a few hundred dollars was necessary to build waterworks. The streambed in front of the schoolhouse at Fort Defiance, Riordan’s original hope for a water source, had been cut to a thirty five to forty foot deep arroyo. Water could not reach as far as the schoolhouse; it all sunk into the sand far upstream. Where once Navajos cultivated fields was now sand deposited far down stream. The arroyo had become so entrenched that it

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⁶ D.M. Riordan to CIA, 23 April 1883, #8080, Box 135, LR, RG 75, NA; Secretary of the Interior to D.M. Riordan, 3 May 1883, #8259, Box 136, LR, RG 75, NA. The literature on gullying in the Southwest is best reviewed in Tuan, “New Mexican Gullies”; also see William Denevan, “Livestock Numbers in Nineteenth Century New Mexico, and the Problem of Gullying in the Southwest,” *Annals of the Association of American Geographers* 57 (1967): 691-703; and Luna Leopold’s examination of the literature on exploration in the Southwest as a tool for tracking vegetation change is quite useful, “Vegetation of Southwest Watersheds in the Nineteenth Century,” *Geography Review* 41(1951): 295-316.

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had eaten the surrounding fields. Riordan quickly shifted gears. After several scouting trips he settled on a spot a mile up from the agency headquarters in Bonita Canyon. He would let gravity deliver the water to the school. But the narrow canyon he intended to dam carried through it a stream so powerful that after a rain it "carried all the solid matter that water can." Riordan did not seem to consider that this silt choked stream, the one that cut the arroyo in front of the school in the first place, could not be held back by the simple earth and log structure that he planned to build. Nevertheless, he estimated that he would have the dam up and working by July, 1883, in time to collect water from the rains of the monsoon season.\(^7\)

As Riordan explored the canyons around Fort Defiance in April and May, Navajos who had been in the foothills with their flocks moved back into the valleys to get ready to plant. When the full moon of May came and the leafing of the aspens in the mountains, it was time to start farming. Around Fort Defiance, when Pleiades appeared in the night sky it was time to go to the fields and the natani, or local headman, declared it time to plant. During early June the Navajo needed to be in their fields to plant beans, squash, corn, and muskmelons and watermelons. By the time warm weather set in stores from the winter were usually running low. It was imperative that they begin the annual planting. The Navajo had to have their crops planted by the beginning of July if they were to have a good harvest for the year. The only rain that they could rely on, in most years, came in July and August, thus if they did not have their corn planted by early July they courted disaster.\(^8\)

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\(^7\) D.M. Riordan to the Secretary of the Interior, 12 May 1883, #9378, Box 138, LR, RG 75, NA.

Riordan had not counted on any of this, and, thus, by June of 1883 he was not so sanguine. Frustration set in because he did not understand that the exigencies of living in the desert demanded that the Navajo get to work on their crops. To his mind, if the dam was built they would not have to rely on the capricious climate. But to the Navajo, the climate was anything but unpredictable. Indeed, success in agriculture was based on a strong command of the ritual surrounding it. The particulars of the climate any given year were far less important than the precise knowledge of ritual surrounding agriculture. The predictability and faithful application of ritual would insure a good crop. Clearly, then, the dam was far less important to the Navajo than it was to Riordan. But the Navajo were Riordan’s labor force and he had not counted on them being unavailable for work until mid-July. After all, he had not spent a summer in Navajo country yet. He was forced to wait.⁹

The Navajos belief that proper application of ritual would insure a good crop goes a long way to describe the crisis of 1890. Naturally, if they experienced year after year of poor crops and low rainfall, calling into question their faith would be a consequence of the drought. Seen in this light, Riordan’s efforts at dam building would have little effect on the Navajo if they believed that command of water was based on command of ritual. The permanent structure that Riordan wanted to build made no sense in a view of the world that was cyclic. Permanence, in the form of the dam, was arrogance. On a ritual level, the dam would subvert the annual agricultural rituals; on a more practical,
everyday level, it made no sense. Floods would wash any dam out that could be built with present technology. Thus, the construction of a permanent dam was probably thought of a foolishness by the Navajo, if they gave Riordan’s efforts any thought all. In any case, when Riordan turned to the Navajo to help him build the dam, they instead went to their fields.

At the beginning of July, Riordan’s plans took a series of blows. The dam had to be moved because Riordan mistakenly chose to build the dam on a base of quicksand. He found the ruins of several other dams and was determined that his would not meet the same fate. He soon located a spot further upstream. He envisioned a dam “forty two feet high when finished and if it stands one freshet will last as long as the Navajo tribe does.” (If Riordan’s prediction had been true they would have been doomed.) His estimate for the project climbed to $6,300, and he now hoped to have the dam ready for next season. But in the beginning of August, a flood raged through the narrow canyon, and washed away Riordan’s efforts, and probably enlarged the arroyo in front of the school. He asked for more money. Thus, between the spring and summer, the cost of the dam skyrocketed from a few hundred dollars to over $9,000.\(^\text{10}\)

That autumn the dam fell further into disrepair. In September, when the Navajo needed to harvest their corn all else became secondary. And at the beginning of the new year, in October, food storage began in earnest. Harvesting was over, now it was time to get ready for the winter. Riordan, again, lost the bulk of his labor force. Flooding ruined the work in February, and by spring the dam was in a shambles. Riordan tried his best to

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\(^9\) Hill, 52; D.M. Riordan to the Secretary of the Interior, 15 June 1883, #10747, Box 141, LR, RG 75, NA.
\(^10\) D.M. Riordan to CIA, 3 July 1883, #12533, Box 145, LR, RG 75, NA; D.M. Riordan to CIA, 27 September 1883, #18191, Box 157, RG 75, NA.
remain hopeful, but had a hard time masking his disappointment. Moreover, he was worried that if the school at Fort Defiance did not have a clean supply of water soon, one of the Navajo children would die. Whether he was overstating the urgency of the problem or not, I cannot say. What he was concerned with, however, was that if anyone perished in one of the school buildings then the Navajo would not go near it for fear of the spirit of the dead. Riordan realized that if he did not accommodate the Navajo's belief system his life would be made that much harder. To a large extent the agent had to live on Navajo terms. After almost two years on the reservation, Riordan was finally starting to realize this.¹¹

D.M. Riordan lasted only a few months longer on the reservation. He tendered his resignation that summer and left. It is easy to be critical of Riordan; his many mistakes make him an easy target. But he oversaw a massive territory and got little help with the work at hand. He lived in squalor at Fort Defiance. He performed his job with unflagging dedication until the pressures of overseeing such a massive reservation became too much. Herbert Welsh, head of the Indian Rights Association, called Riordan "one of the most valuable officers employed in the Indian Service. He was a model Indian Agent, possessing qualities rarely united in one man." Welsh's comments are valuable because he was a well respected and influential shaper of Indian policy and reform in the late nineteenth century. To him, Riordan's case was simply emblematic of the problem across the entire reservation system. "The Indian Agent is the pivot of the Indian problem. Upon him more than upon any one man rests the solution of the

¹¹ D.M. Riordan to CIA, 21 January 1884, #2017 and #2018, Box 173, LR, RG 75, NA; D.M. Riordan to CIA, 10 March 1884, #4865, Box 179, LR, RG 75, NA; D.M. Riordan to CIA, 10 April 1884, #7384, Box 185, LR, RG 75, NA.
question." By forcing men such as Riordan out of the Indian Service—by having them live in horrid conditions and oversee vast territories alone—the Indians were the real losers, according to Welsh. But the ill conceived efforts of men like Riordan insured that the Indian Service, for the time being, had little influence over the Navajo. One man could not affect much change among thousands of Indians. But Welsh’s concerns were well founded. Riordan did not get much institutional support for his efforts, and, as we shall see, he was not the last agent to leave the Navajo reservation after only a short time.¹²

John Bowman arrived in the summer of 1884 and started the cycle anew. Bowman, despite great plans for developing waterworks projects, lasted less than two years and saw none of his plans come to fruition. Like Riordan, Bowman thought the Navajo a strong, deserving people. He advocated the allocation of large amounts of money to be spent on developing water on the reservation. “These Indians are certainly the most deserving [in the region], both on account of previous good behavior, as well as their recent efforts towards helping themselves and advancing toward civilization. This tribe is now in the right mood and condition to make a long stride in the right direction.” If the Navajo could make one crucial evolutionary leap, the long stride, they would be fit to operate in the white world. Riordan had wanted to induce in the Navajo the spirit of competition in order that it might inspire in them a love of personal gain. Likewise, Bowman wanted to spend $20,000 on irrigation projects to develop individual farmsteads. The long stride that each man wanted the Navajo to make was the one toward love of personal property so cherished in white society. Bowman thought, like

many of his contemporaries, that Indians could be made over into whites in short order. He knew that it would be a lot of work. But it appeared that Bowman had not learned a thing from Riordan’s failures when he wrote the Commissioner of Indian Affairs that the best way to hold back water and build reservoirs was by “erecting slight dams with plow and scraper, across some canyon or arroyo.” He soon learned that the slight dams he envisioned would be washed away by the first flood; what had not worked for Riordan would not work for him. Ironicaly, he conceded that a like number of white men would have a hard time wresting a living from this barren land.\(^\text{13}\)

Bowman was but a blip in Navajo history, but he represents a strain of thought that was prevalent among Indian Agents of the time. He believed that the Navajo were essentially a redeemable people. His attitude is representative of the optimism of the era. But Bowman, and his failures at reclamation also bear out the Indian Service’s continued reluctance to invest in waterworks.

Almost like clockwork, by the summer of 1886 there was a new agent, Samuel S. Patterson. Without fail, he set about to see what he could do about securing water for the Navajos. Patterson was the first Agent, at least explicitly, to attempt to use irrigation as social engineering. To be sure, both Riordan and Bowman before him advocated sedentary agriculture and wanted to instill a respect for private property, but neither were as clear as Patterson in their reasoning.

Patterson banked on the hope that by developing springs the Navajo would stay close to the reservation. Reasoning that it would be better to remain in one place with

\(^{13}\) D.M. Riordan to CIA, 27 September 1883, #18193, Box 157, LR, RG 75, NA; John Bowman to CIA, 26 August 1884, #16714, Box 205, LR, RG 75, NA; John H. Bowman to CIA, 10 October 1884, Box 211, LR, RG 75, NA; for the redeeming qualities of private property see, Hoxie, _A Final Promise_. 19.
permanent water than to wander about in search of springs, Patterson sought to shift the Navajos' annual pattern of summering and wintering in different parts of their homeland. He wanted them to stay on the reservation. He concluded that, "the matter of scarcity of water in the summer and pasture in the winter is one cause of these Indians shifting about so much instead of having more permanent dwelling places as would seem better for them." Oddly enough he was right. The Navajo did shift from place to place as the limits of a particular locale were stretched, or as the season demanded it. But it was not aimless wandering. The Navajo did not simply pack up at any given movement and sniff out the country for water. (Indeed, in places around Lukachkai and in the Chinle Valley, most Navajo practiced sedentary agriculture, only placing secondary interest in stock raising.) When the Navajo new year began in October and the harvesting was completed, pinon nut gathering began as did the move to foothills to be near wood for the winter. Following this, depending on how early the winter set in, the Navajo would then move away from their fields to the winter hogans. The men would then leave to deer hunt, usually toward the beginning of November. They had good reason not to remain permanently in one location. Resources were scattered about Navajo country.14

But Agents like Patterson saw their mobility as aimless wandering. Despite recognizing their reasons for moving—the matter of scarcity of water in the summer and pasture in the winter—he wanted them to stay put within the legal confines of the reservation. That appears to have been a goal equal to the respect for private property. The Navajo needed to learn how to respect the boundaries of the reservation. But as long

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14 Hill, 15-16; Samuel S. Patterson to CIA, 9 August 1886, #21697, Box 328, LR, RG 75, NA; Patterson to CIA, 1 September 1886 and 2 September 1886, #23926 and #23927, Box 335, LR, RG 75, NA; White “Navajo Economy and Culture,” in The Roots of Dependency.
as their herds continued to increase, and the drought continued to desiccate the land, the
Navajo could not remain settled for the entire year in one place. The debate over the
perceived nomadic nature of the Navajo would be of great import in the coming years.
Observers of the Navajo continued to label them nomads even as they remarked on the
importance of agriculture on the reservation.

This was always the fatal mistake of the water planners in these early days: they
recognized that the Colorado Plateau was semi-arid country, but they could not see that
the Navajo had developed, over the centuries, strategies to deal with their environment.
The agents’ plans to dam washes they found dry in the late spring and early summer, but
that became torrents of rock and mud and water whenever rain or snowmelt coursed their
way through them, were fatally naïve and based on scant experience in the region. The
Navajo practiced floodwater farming where it was practical to do so, but never believed
in the folly of building permanent structures. W.H. Code, twenty years later,
characterized the work at Fort Defiance as a failure. He contended that Fort Defiance
was the “point where probably more money has been expended in temporary work...with
less to show for it, than at any other school I have visited in the west.” Strong words
indeed from the chief engineer.15

These three agents of the 1880s were sure that the Navajo were quite capable of
evolving into moderns. They believed in the innate ability of the Navajo to progress;
they did not buy into rigid racial determinism, but rather they were part of a new
generation of reformers and agents who believed that through good works and example,
Indians would survive and flourish into the next century. But they did not last very long
and were able to affect little change. Too, the Indian Service was not yet ready to put such faith in waterworks projects, and, thus, they did not have the institutional support they needed. Conversion to the gospel of irrigation would have to wait until close to the next century. The Indian Service still considered these early projects ones done on a local scale and not part of a national plan.

The experiences of the agents in the 1880s, to an extent, discouraged much development in the nineties. But agents on the Colorado Plateau still batted about the possibilities of irrigation development in earnest. In 1889 the army sent Lt. John M. Stotsenburg out to Navajo country. Stotsenburg was detailed to the reservation to perform a reconnaissance mission in search of water. His lengthy report, written after more than two months spent in the saddle wandering the Navajo backcountry, was rich in detail regarding current Navajo farming practices as well as future possibilities.

Stotsenburg, like others before him and many after him, concluded that the Navajo were “stock raisers and to secure grass they wander about a good deal.” He went on, “In prosecuting the work I have learned that it is a matter of doubt whether the Navajo Indians would ever live on or farm the land after water for irrigation and stock was improved. It being merely a matter of fancy with them where they live and how long they will sojourn there.”16 Despite his reluctance to believe in their ability to stick with agriculture, he visited nineteen locations across Navajo country and found farms at every

15 W.H. Code to the Secretary of the Interior, 6 September 1905, Box 109, General Correspondence (GC), Irrigation Division (ID), Series 653, RG 75, NA.
16 John M. Stotsenburg to the Adjutant General, Department of Arizona, 7 April 1889, 20 April 1889, and 6 July 1889, Box 209, SC190, RG 75, NA. These several different versions of this report at the National Archives all appear to have the same contents. They appear to be copies of the original from April of 1889. I am using contemporary spelling of names of places and people unless they appear in quotations, in which case I retain the original spelling.
one. Too, he suggested developing water in places where Navajos had settled, "not because these were always considered the best but because several families had chosen these places as their homes and had farms or had done some work on them. They will work these place more willingly than elsewhere." Clearly Stotsenberg could see that the Navajo did not merely wander the country; they did establish permanent, albeit seasonal, homes.

What clouded his vision, and led him to determine that the Navajo were only pastoralists, was the amount of cultivated land. That is, where the Navajo had eighty acres under cultivation, Stotsenberg dreamed of eight hundred. Too, the Navajo did not sell the produce from their farms, like they sold the wool from their sheep. His sights were set on the market, while the Navajo were content with a mixed subsistence economy of farming and stock raising.17

The Stotsenberg report is fascinating and should be considered in brief detail. It is the first of its kind: a report solely for the purpose of investigating irrigation possibilities. It provides insight into not only Navajo farming, but white views on Navajo life. Stotsenberg, on the one hand, was a keen observer, but on the other, he was, unsurprisingly, myopic. For example, Stotsenberg characterized the Navajos that he encountered as unwilling to fool with permanent irrigation works. They were too lazy, he said, and unwilling to work. They lacked the industry to undertake such projects. But, without a hint of irony, he advised in his report against permanent irrigation works because "they would either wash out in a freshet or fill up [with silt] as they did at Washington Pass or Fort Defiance." Laziness was not the concern; Stotsenberg warned
the government against wasting money on futile projects. Where the government would be acting out of efficiency, the Navajo were merely lazy.\textsuperscript{18}

Where and when necessary, the Navajo had practiced flood water irrigation for centuries. In the Navajo origin story, after First Man and First Woman peopled the earth, their descendants began to farm utilizing a dam and an irrigation ditch. And evidence points to their prevalence across Navajo country. Indeed, it should come as no surprise that some form of water diversion would be needed in order to wrest a living in a semiarid landscape. Thus, when Stotsenburg claimed that the Navajo “have, as a rule, little or no idea of irrigation,” his comments took on a specious tone.\textsuperscript{19}

But the Navajo may have been taking the agents for fools. His report implies, though he did not know it, that the Navajo took advantage of the agents. After advocating simple, impermanent structures—brush dams of the sort that the Navajo clearly knew how to use—Stotsenburg laments the fact that the Navajo were not educated in the ways of taking care of such structures. Whenever one threatened to give way all one had to do was throw a shovel full of dirt in and it was fixed, so he claimed. But the Navajo could not even do that. They preferred to sit back and watch the hard work of the agent go to waste, and then ride “fifty to a hundred miles to tell the Agent.” The agent, of course, was then compelled to come and rescue the poor Navajos who could not even use a shovel properly. Perhaps the agent, feeling sorry for Indians who

\textsuperscript{17} ibid.
\textsuperscript{18} ibid.
could not master such a simple operation, would bring food from one of the trading posts on the reservation.

Stotsenburg posed the obvious question: If they could not get a grasp of the concept behind a brush dam, then how could they be expected to be responsible for anything more elaborate or permanent? Of course, the evidence does not prove the point, but were the Navajo consciously playing dumb—surely they could fix a brush dam—just to waste the time of the agent? To what end would they try and play the agent in such a way? It does seem odd that rather than fix a structure with which they were surely familiar they would let it be washed away. It is possible that they did this merely to irk the agent. A more likely answer is that the small brush dams were inadequate or that they were built in areas Navajos did not favor for cultivation, thus they saw no reason to maintain them. Of course, this is difficult to prove. But Stotsenburg gave the lie to his own account. When inspecting the Chinle Valley, he advised against trying to dam Chinle creek with anything resembling a permanent structure. The creek shifted its course too much, thus making such a project impossible. Stotsenburg, again with no irony, suggested that the preferred method of taking advantage of the water would be with impermanent brush or dirt dams “as the Navajo do when they want water”! Obviously, then, the Navajo were familiar with irrigation.20

This is not just a simple case of nineteenth century ethnocentrism. Stotsenburg’s account should not be read as simply the account of one more misguided white man trying to do his best for the Indian. To be sure, it was that. But more importantly, it is instructive of Stotsenburg’s utter blindness, and by association the blindness of the Indian
Service. With no sense of contradiction or irony, Stotsenburg, in one instance, dismisses the Navajo as unable to grasp the intricacies of irrigation, but then suggests that in developing waterworks that the Indian Service follow the lead of the Navajo. Again, as when Peterson realized that the Navajo country was conducive to transhumance—surely not his word—and that the Navajo therefore had good reason to move around, Stotsenburg, too, could see that the Navajo had grasped how to utilize water in the desert. Both men admitted, Stotsenburg through his own contradictions, that the Navajo were indeed capable. But there was such an impenetrable wall of misunderstanding between them that nothing effective could be done. If in fact the Navajo were purposefully fooling the agents, and to me it seems likely they were, they were complicit in this morass of misunderstanding. For the time being, the size of the reservation—Stotsenburg, by his own admission, only saw a quarter of it—the lack of personnel, and the reluctance of the Indian Service to embark on any large-scale reclamation plans, kept waterworks projects to a minimum. The agent at Fort Defiance, C.E. Vandever, approved of the Stotsenburg report, only adding that he knew that even more families farmed on the reservation than Stotsenburg reported. But, nevertheless, Vandever felt that Stotsenburg was thoroughly qualified for the work and was pleased that the “[Indian] Department has chosen so efficient a gentlemen to perform this much needed and laborious task.”

Stotsenburg was not alone in his vision to increase Navajo cultivation. In 1891 John Wesley Powell, at the time heading both the Bureau of Ethnology and the U.S. Geological Survey, identified no less than 250,000 acres of potentially irrigable land in

20 Ibid.  
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the Chinle Valley alone, and in the northern part of the Reservation, along the San Juan River, he proclaimed that 35,000 acres was irrigable land. Powell was enthusiastic about the possibilities for reclamation on the Navajo Reservation. He was confident that, opportunities for water storage and irrigation are to be found in numerous places. The topography of the country throughout is favorable to the location of reservoirs among the head-waters of the various streams....All of these canyons open out ultimately on broad plains and valleys, covered with rich deep soil, which is at present covered with a dense growth of sage brush giving evidence of its fertility....The reservoirs can usually be constructed at comparatively little cost, as they will be located in canyons, and will usually require dams of but moderate length, the rock for the construction of which can be blasted out of the sides of the canyons at the dam sites.22

But Powell’s enthusiasm for developing the San Juan River area and others on the reservation waned when he learned that only $10,000 had been appropriated for irrigation in 1891. That would not be sufficient to build the kind of waterworks that Powell envisioned; only a large dam could hold back the San Juan River and make it a profitable venture. All the waterworks that Powell envisioned for the reservation were large projects, just the type that the Indian Service was not prepared to undertake. Powell was familiar with the Stotsenburg report and favored his approach: the development of small, local projects. If there was not the will or the money really to reclaim the reservation, then small works would have to do for the time being.23

This kind of vision for the San Juan River country was not limited to Powell. By the time Powell weighed in on the idea of reclaiming the San Juan, the Indian Service had hired James Francis as an Additional Farmer. Francis, and others in his position across the West, oversaw farming in select farming districts, rather than overseeing an

21 C.E. Vandever to CIA, 3 May 1889, #12367, Box #209, SC 190, RG 75, NA.
22 John Wesley Powell to CIA, 6 February 1891, 11 November 1891, #4962, Box 209, SC 190, RG 75, NA.
entire reservation. Francis was a little less grandiose than Powell, but he, too, believed that farming would redeem Indians. Francis was convinced that the construction of waterworks on the reservation would forever end nomadic ways.²⁴

Visions like those of Francis and Powell would have to wait until the twentieth century, when the will existed to attempt large-scale projects. Throughout the remainder of the 1890s, agents concerned themselves with only a few minor irrigation projects. They mostly fretted over what to do with off-reservation Navajos. Turning Navajos into farmers took a backseat to solving the range problem. However, this only amounted to so much talk. During the nineties grass became scarcer and scarcer as drought and increases in population—Navajo, Anglo, and animal—began to take their toll. As whites moved into the area in ever greater numbers, Navajos living on the public domain became something of a nuisance and the source of many complaints. Developing water, then, became a way to try to keep the Navajo on the reservation. Again, the lack of a cohesive policy kept waterworks projects from ever really going beyond impotent efforts.

Still primarily considered wandering nomads, the Navajos who lived off the reservation, in particular, needed to be corralled along with their sheep. In 1890, the Indian Office instructed C.E. Vandever that his primary duty was to “immediately take energetic and proper steps to keep the Indians...within the limits of the reservation and to return roving Indians to the reservation.” Vandever did not need to be told of the friction developing between the white cattlemen and the Navajo; he was fully aware of the potential for a violent clash. He was largely sympathetic to the plight of the Navajo and

²³ C.E. Vandever, Indian Agent to CIA, 3 May 1889, RG 75, NA, SC 190, #12367, Box 209; John Wesley Powell to the Secretary of the Interior, 24 November 1891, RG 75, NA, SC 190, #42406, Box 209.
²⁴ James Francis, Additional Farmer to CIA, 29 December 1891, RG 75, SC 190, NA, #1193, Box 209.
had little tolerance for cowboys whom he termed "by-product[s] of civilization." Despite his disdain for the "bloodthirsty man midwives," Vandever knew that something had to be done. And, despite encouraging signs that the Navajo were developing respect for private property and permanent homes, Vandever still worried that the task of making them understand "our scheme of restricted land holding" would be near impossible. Only if sufficient water could be developed would the Navajo remain on the reservation and stave off the impending tempest.25

The Indian Service began to see that irrigation might have possibilities on a large scale. In 1891, $200,000 was allocated for the Crow reservation and $30,000 for a general water development fund. For the next several years the Indian Service allocated between $30,000 and $40,000 for general projects, and, of course, maintenance and continued construction on the large Crow project. Commissioner of Indian Affairs, T.J. Morgan, supported the irrigation efforts. But he realized that expert guidance was necessary. "I am... of the opinion that the money could be expended to better advantage, if the appointment of a competent engineer to superintend the work were authorized by law." Although the Indian Service was beginning to be converted to the gospel of irrigation, professionalization was still a long way off. But Morgan's interest in irrigation led to another survey of the Navajo reservation, this time in 1892.26 The U.S. Army still led the effort. And, again, it was a reconnaissance mission; no work was done, just information gathered concerning where irrigation and stock water development would be

26 Condition of the Navajo Indian Country, 52nd Cong., 2nd Sess., 1893, S. Ex. Doc. 68, Serial 3056, 1-50.
profitable. Too, the continued drought had left the Navajo in worse condition than they had been in years, according to the agent.\textsuperscript{27}

The crux of the matter was keeping the Navajo on the reservation. And water development was the way to do it. Nomadic Indians were a menace; they were a danger to both themselves and the growing white population. The Pueblo Agent even complained about wandering Navajos. It seems that they were grazing on Zuni lands and the Agent was worried about potential violence. Now, the Indian Agents on the ground, and the Commissioner in Washington, both came to see that irrigation could greatly aid their situation. Irrigation development would foster sedentary farming, and stock water development would curtail seasonal movement in search of water and grass. The redoubtable C.E. Vandever, ever optimistic, said that "this method would tend to cure the roving habits of the Navajoes [sic] and advance them in civilization....If this tribe is to be restrained within the reservation, all the portions available for agriculture must be made productive."\textsuperscript{28}

But tension always existed between those who wanted water developed solely for stock and those who believed farming was best. Clearly, Vandever and James Francis, the Additional Farmer, had faith in farming. In 1894, however, the Indian Service hired its expert, an engineer from Staunton, Virginian, E.C. Vincent. He agreed that farming would work wonders for keeping the Navajo in one place, but owing to the topography of

\textsuperscript{27} On the allocations see ARCIA, 1890, 1891, 1892, 1893, 1894, 1895, 1896; quote from ARCIA, 1892, 92; on the drought and condition of the Navajo see, ARCIA, 1893, 1894. But these reports should be taken with a grain of salt. C.E. Vandever was replaced by E.H. Plummer in 1893, and Plummer had a wholly different outlook on the future of the Navajo. Where Vandever saw progress, Plummer found backwardness and hopelessness. Two such varying impressions speak as much to actual condition of the Navajo as they do the suspect nature of the agents' reports.

\textsuperscript{28} ARCIA, 1892, 581; N.S. Walpole to CIA, 22 November 1898, #53471, Box 102, SC 190, RG 75, NA.
the reservation it was a folly ever to think that much of the reservation was cultivable. Despite his disbelief in farming he did construct several reservoirs designed to irrigate crop lands. Vincent’s reluctance to bank on farming came, again, from the common perception that the Navajo were aimless wanderers. To Vincent, on the reservation for just a year when he submitted his report, the Navajo were not cut out to be farmers. “He inherits love of leisure from his ancestors. He wants neither care, work, nor responsibility. His easygoing, shepherd life is far more to his like than farming.” Vincent went further to say that the nomadic life had caused much strife among the Navajo. He averred that their holding water sources in common for stock had led to a “survival of the fittest” mentality. Only the strongest would get the proper amount of water for their sheep. And nomadic life, of course, meant that the Navajo had no permanent homes; home was merely a matter of where one found oneself at day’s end.29

Vincent shared with agents in later years, as we shall see, a desire to increase stock on the reservation. There was enough water available, if it could be developed properly, to insure the growth of the herds. Farming was never going to work to any great extent on the reservation, according to men like Vincent. But often the left hand seemed not to know what the right hand was doing. In the same Annual Report, the agent reported that, again, the Navajo had suffered terrible losses of stock due to drought and a particularly hard winter. He emphasized concentrating on farming; stock raising was too mercurial an enterprise! According to the agent, Vincent was unfit for the task, and the money that the Indian Service allocated for waterworks was going to waste. By

29 ARCIA, 1895, 25.
the following year, 1896, E.C. Vincent had been dismissed. And according to the agent, the "benevolent designs of Congress had not been accomplished."^30

The above examples serve to illustrate the still very unprofessional manner in which the agents and the Indian Service went about getting water for the Navajo. E.C. Vincent was hired finally to bring a modicum of expertise to the enterprise, but he proved unfit for the job. And conflicts existed between those who believed in farming as the solution or further stocking of the range. It really depended on the persuasion of the observer. Men like Vincent, a very recent transplant from the humid East, could not be expected to understand the exigencies of farming on the semiarid Colorado Plateau. To him, livestock was the obvious solution in what to him appeared to be a sea of grass. This caused immediate friction between him and the agent, Constant Williams, who believed that farming could work.

Waterworks projects on the Navajo reservation during the last twenty years of the nineteenth century never got beyond this stage of ad-hoc development. Vincent, the first professional to attack the problems, attempted to construct permanent dams at several places on the reservation. They met with the same fate as the earlier dams at Fort Defiance. Freshets washed away permanent structures. As the century closed, little had been accomplished on the reservation, save one thing: a greater sense of urgency regarding water development. The severe drought was not over. The Indian Service's commitment to water development on the Colorado Plateau was not serious enough yet to affect real change. But with the new century, the Indian Service's level of commitment to irrigation deepened and a cadre of professional engineers emerged to try

^30 ARCIA, 1895, 118; ARCIA, 1896, 112-113.
to solve the problems of water development on the Colorado Plateau. The Indian Service’s interest in irrigation did not, of course, germinate in a vacuum. Throughout the 1890s and into the first years of the twentieth century, irrigation became a much talked about solution for settling the arid West. Irrigation could be employed to fulfill the American destiny of spreading out over the entire country; new lands, heretofore going to waste, could be made productive. Irrigation was not only a way to redeem Indians, making them productive members of American society, but a way to redeem all of the West. With the passage of the Reclamation Act in 1902, the United States, on a national level, committed itself to large-scale waterworks. And the Indian Service jumped on board. 31

Navajos, too, needed convincing of the sobering effects of civilization; they needed to see that what the white man had in mind was, indeed, better than their life of “wandering” the Colorado Plateau. But it would be hard to convince them of that at such a distance from civilization. And one agent could not hope to prove to the Navajo the benefits of white civilization. Additionally, white civilization at-large needed to see that Indians were still, on the cusp of the twentieth century, largely frozen in time. Indians, since the Centennial Exposition in Philadelphia, had been trotted out by the government and put on display. But by the 1890s the practice was as much for the benefit of the Indians as much as a show piece for white audiences. At the 1893 Columbian Exposition in Chicago, Indians from tribes across the country, “displayed” by either the Indian

Service or the Bureau of Ethnology, were examples of, respectively, assimilable peoples, or examples of the country's primitive past. The tension between the two representations is worth noting because the Navajo fit perfectly into both constructions: they were, on the one hand, frequently characterized as the most fit and able Indians, or vilified as raiders and chastised for being wild, nomadic Indians. Thus, they could be models of assimilation or examples of the primordial past. In the twentieth century this tension would have to be eased; one or the other interpretation would have to prevail. The country was ready to shed the skin of the past and Indians who represented that past needed to be shucked off with it.\textsuperscript{32}

The object lesson of Chicago traveled a two-way street. White America could get a glimpse of either Indians on their way to civilization or Indians from a time now, thankfully, gone. But Indians, too, could see for themselves what white America was like. Several Navajos went to the fair, at the expense of the Indian Rights Association, in Hosteen Deete Sahghy's words, "for the whites to see and [for the Navajos] to see the whites." The fair seemed to work the appropriate magic on the three Navajos from whom we have accounts; they were singularly impressed with what they saw on their journey. The white world was, indeed, better than the Navajo. All the way to Chicago the Navajos could see that the "white people were taking care of the earth...Look at our country; we ought to be ashamed of it. Look at the difference." The white world was managed for the benefit of the people, Hosteen Bagota seemed to be saying, whereas the Navajo world was laying in waste. And without doubt one lesson the trip was designed to instill in the Navajo was the white way of farming. As they traveled across the

\textsuperscript{32}Hoxie, 88-89.
Midwest to Chicago the farms along the way impressed them, as did the amount of work whites put into their farms. "They don't lay around in the sun; they work all the time....The Indians looked to see how it is done; how the white people do the work. We seen for all the Navajoes [sic]." Indeed, they had. By all accounts, if we are to take these testimonies literally, the Navajo had been convinced of the value of white civilization.\(^{33}\)

In the early twentieth century, the Indian Service began to take reclamation on Indian reservations seriously. But as they did so, the Navajo were not the only Indians on the Colorado Plateau who were in need of waterworks. Their neighbors, the Zuni, long neglected by the Indian Service, came under close scrutiny. Before exploring the parallel history of Navajo and Zuni irrigation development, a brief examination of Zuni is in order.

\(^{33}\) ARCIA, 1894, 1044-1045. More than these three Navajos went to Chicago, but it is their testimonies that were recorded.
From Waffle Gardens to the Blackrock Dam: The Zuni Reservation, 1883-1900

From a distance of more than a century it is easy to look back in amusement at agent Ben Thomas’s request for sixty dollars to sink a well on the Zuni reservation to provide them with water enough to fulfill their needs. The astigmatism that we experience glancing back in time is probably less profound than the myopia Thomas suffered as he observed the Zuni from a fair distance himself: the agent in those days was stationed in Santa Fe and had little or no contact with the Zuni. It is likely that when Thomas requested the money he had never set foot at Zuni. His vision of what the Zuni needed was clouded indeed. More realistic, but still way off the mark was the plan of the teacher and missionary at Zuni, J.H. Wilson. Where the Zuni River narrows just north of the main village, as it flows through black lava rocks, was the ideal spot for a dam, Wilson thought. Wilson estimated that the dam could be up and running, built with local supplies and cheap Indian labor, at a cost of eight hundred dollars. The reservoir that would form behind the dam would supply water for 8000 acres of farm land and would “render fertile and valuable a tract which otherwise is almost barren and useless.” Perhaps the Zuni would then see the value in such projects and be encouraged to build them on their own. As was the hope of Indian agents in those days, they would lead by example and the Indians would follow. Additionally, the Zuni would have so much leisure time when their dam and ditches were finally built that they could enjoy the reservoir as an aquarium! Wilson’s enthusiasm was palpable. But he really did not know what he was doing, nor did his “expert engineer,” Douglas Graham, the local trader. As

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of 1883 the railroad had not yet reached Gallup, forty miles north of Zuni, and the project was put on hold due to lack of materials and labor.¹

Throughout the late 1870s and the early 1880s, the boundaries of the Zuni reservation were not entirely clear. Determining the needs of the Zuni—how much land would be adequate for farming and stock raising—was pressing business for the Indian Service. The land grant that they had received from the Spanish was contested and white settlers were moving into the region, threatening Zuni title. The Zuni’s water needs were an important feature of these discussions. The three villages that the Zuni went to each year to farm were essential for their well being—they included the most reliable water sources. Thus, keeping them part of Zuni land became an important feature of working out the boundaries of the reservation. But also important was developing alternate sources of water. James Stevenson of the U.S. Geological Survey, and husband of Matilda Coxe Stevenson, recognized, too, that the black lava rocks were the ideal spot for a dam. Developing a dam at this location would enable the Zuni to cultivate more land near their “permanent” home of Zuni village. But Zuni village was not really a permanent home; it was more of a religious center. The Zuni returned to the main village each year for Shalako and to spend the winter. Developing a dam to curtail movement between the villages would alter the Zuni’s annual schedule. But in these discussions regarding the boundaries of the reservation, the dam remained merely an idea. No work was undertaken to survey the site, much less begin construction. The ideas tossed about regarding reclamation at Zuni in the period before 1900 bore no fruit. The spot that the

¹ B.M. Thomas to CIA, 17 November 1882, #21085, Box 109; 26 March 1883, #6033, Box 130, LR, RG 75, NA; J.H. Wilson to B.M. Thomas, 26 March 1883, #6300, Box 131, LR, RG 75, NA; B.M. Thomas to CIA, 17 April 1883, #7413, Box 134, LR, RG 75, NA
dam would eventually go was picked, but this was a small achievement, indeed. The Indian Service appeared eager to build a dam, but the will was not there.²

Not far to the northwest, D.M. Riordan was echoing Wilson’s and Thomas’s enthusiasm at Fort Defiance. But like the projects at Fort Defiance, the Zuni dam was ill fated from the start. The Indian Service was not yet willing to get in the business of reclamation. At Zuni, serious discussion of the dam would have to wait another fifteen years.

After these stalled efforts, interest in reclamation projects at Zuni slacked off. They did herd sheep, but never in the numbers that the Navajo did; thus the main concern at Zuni was not keeping wandering nomads in place. On the contrary, the Zuni were settled agriculturists who lived in permanent homes in four very distinct Pueblos—Zuni, Ojo Pescado, Ojo Caliente, and Nutria. The nexus of activity was Zuni, while the other three served as seasonal agricultural villages. While at Navajo, agents would not readily accept Navajo agriculture; at Zuni agriculture and irrigation went hand in hand and had done so before the arrival of the Spanish in the sixteenth century. The most common type was floodwater irrigation. The Zuni built check dams, diversionary dams, and small mud walls around their fields, all in an effort to guide water from the intense summer storms and run-off from snowmelt. Around Nutria, Ojo Pescado, and Ojo Caliente, there were permanent springs, and diversion ditches were constructed to direct water onto the fields. A third method of farming was also practiced: the waffle garden. Zuni women constructed small, waffle like embattlements around individual plants to conserve water.

² "Zuni Indian Reservation in New Mexico and Arizona," Ex. Doc., #11, 48th Cong., 2nd Sess., 1884, James Stevenson to the Secretary of the Interior, ? April 1884. This is a twenty-nine page collection of letters and executive orders referring to the boundary problems on the reservation.
This was normally done close by the Zuni River in order that water could easily be brought up by hand and deposited on individual plants. In the large fields watered by floodwater irrigation the Zuni grew corn, while in the smaller waffle gardens, specialty crops like onions, peppers, squash, and pumpkins were cultivated. The Zuni laid in crops for the coming year in order to prevent shortages.\(^3\)

Throughout the 1880s and 90s, while the Indian Service worked furiously, but to little avail at Navajo, the Zuni did not even have their own agent. And irrigation works were not the first priority of the Indian Service. But by the late 1890s irrigation development was, again, considered; this time the idea was here to stay. Drought on the Colorado Plateau forced the Indian Service to reconsider reclamation. The discussions that took place in the late 90s on the Zuni reservation resembled those of the early 80s at Fort Defiance. It was as if a loop tape had run its course and was being played again. The Zuni, like the Navajo before them were now found wanting. According to the accounts of the agents in the area and the Indian inspectors who came through the reservation, the Zuni anxiously awaited a dam. "They are very poor and their means of subsistence very limited, owing to the lack of water upon their lands....[T]hey are very anxious to have their lands irrigated" noted Indian Inspector Duncan. The bulk of the Zuni's time was "taken up with prayer and offerings to the god of rain. This dam would obviate all this distress." The time was ripe to undertake such a project. Both Duncan

and the agent for the Pueblo and Jicarilla Agency, N.S. Walpole, had heard rumors that a
dam had been discussed before, but for some reason had not been built. Duncan
confessed to having no way of finding out whether this was true or not, but he and
Walpole believed that $10,000 had already been allocated for a dam. Of course they
were referring to the ill fated dam discussed in the early 1880s at Zuni.4

The dam at Zuni, which would become known as the Blackrock Dam, was widely
discussed in the late 1890s. A.C. Tonner, the Commissioner of Indian Affairs, forwarded
Inspector Duncan's report to the Secretary of the Interior and advised that another, more
detailed inspection be made of the reservation. In 1899 Walter H. Graves was dispatched
to the Southwest to make a wide ranging inspection of many reservations and the water
conditions upon them. In the report that Graves filed with the Secretary of the Interior he
found all of the Pueblo Indians in dire shape; they were living on the farthest margin of
existence. San Ildefonso Pueblo had not been able to grow crops for the last few years
owing to old, decrepit ditches. They had been forced to sell "their crude pottery" and
take what work they could get. He found similar conditions at all the Pueblos. But Zuni,
with the largest population, was in the worst shape of all.5

Graves found the ceremonial life of the Pueblos fascinating, and he blamed it, in
part, for their piteous conditions. The Pueblo Indians seemed to devote all of their time
to "supplicating or propitiating some of their innumerable Deities for rain or favorable

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4 N.S. Walpole to CIA, 22 November 1898, #53471, Box 212, SC 190, RG 75, NA; Report of Inspector Duncan in A.C. Tonner, CIA to the Secretary of the Interior, December 12 1898, #50177, Box 212, SC 190, RG 75, NA; B.M. Thomas to CIA, 17 April 1883, #7413, Box 134, LR, RG 75, NA.
5 Walter H. Graves to the Secretary of the Interior, 24 November 1899, #57989, Box 212, SC 190, RG 75, NA.
weather.” He hoped that the energy spent in their ceremonial pursuits could be redirected to fruitful labor.

The time and effort consumed in the ceaseless and bewildering rites and ceremonies of these people—believed to be essential to secure the little moisture that is necessary to pull through their meagre [sic] crops—if properly applied with sufficient water for irrigating their lands, would produce enough to supply their wants and more.⁶

The ceremonial schedule of the Pueblos, especially Zuni, became a constant source of irritation and befuddlement for engineers and agents to come. Rain came each year, but the quality of the rain was dependent on the “generosity of the proper Deity,” according to Graves. The rain might be too violent one year and come all at once, or be unevenly distributed, but with a dam the generosity of the gods would no longer be a concern.

But a dam could not replace religious ritual. The tension between ritual and work thus became almost palpable. The ceremonial life of the Zuni, designed in large part around insuring sustenance through understanding and paying heed to the seasons of the year, could not be subverted overnight. Where the inspectors and agents saw chaos and disorder in ritual—a waste of time and energy—the Zuni were trying to wrest order from their world. Agents and engineers wanted to reorder the Zuni world, but in the disorder of ritual, the Zunis possessed precious autonomy from the white world. In fact the dam, per se, was not an issue with the Zuni, but attempts at altering religious life posed a real affront. Indeed, Governor Chaves of Zuni said, after construction had been underway for several years, that the dam was welcome, but efforts at changing Zuni religious practices were strictly forbidden. Religion was the one realm of the Zuni world that was off limits.

⁶ ibid.
As Governor Chaves asked, “How can a man be a man and have two religions?” The dam could be seen as a way to subvert religious life. If it were there to obviate the need for the bewildering canon of religious practices that the Zuni engaged in, then it was designed to undermine Zuni religion. And in that case, the Zuni would not tolerate it. As long as they could work on the dam at a pace that was guided by their ceremonial and agricultural life, then all was well. But as soon as labor demands got in the way of religious obligation there was a problem, a clash of values. John Harper did not like it, but nonetheless understood that for their “innumerable dances and ceremonies...they will stop anything.”

The 1880s and 90s were not years of great activity on the Zuni reservation regarding waterworks. The Indian Service was busy with the Navajos. But after the turn of the century, the Indian Service shifted focus away from the Navajos and redirected their energy into the Blackrock Dam. In the first decade and a half of the twentieth century, the Indian Service made up for the lack of attention they gave the Zuni in the late nineteenth century. The work at Zuni, in fact, eventually took precedence over all other work and the Navajo irrigation efforts would fall into disrepair. Very quickly in the early years of this century irrigation became one of the main features of Indian Service policy on the Colorado Plateau. It is to that complicated time that we now move.

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7 A.C. Tonner, CIA to the Secretary of the Interior, 13 December 1898, #50177, Box 212, SC 190, RG 75, NA; Walter H. Graves to the Secretary of the Interior, 24 November 1899, #57989, Box 212, SC 190, RG 75, NA; Matilda Coxe Stevenson to William Henry Holmes, 25 February 1907, MCS file, Box 6, NAA; John B. Harper to CIA, 8 August 1906, #69742, Box 212, SC 190, RG 75, NA. I borrowed the notion of autonomy in disorder from Mart Stewart’s insightful essay on, among other things, how slaves ordered their world under the attempted control of their masters on Georgia rice plantations. Mart Stewart, “Rice, Water, and Power: Landscapes of Domination and Resistance in the Lowcountry, 1790-1880,” *Environmental History Review* 15(1991): 47-64, 57.
The gulf that separates reclamation efforts in the twentieth century from those in the nineteenth is vast. If an engineer working in 1905 were somehow able to travel in time back even as recently as the 1890s and hire on to one of the several Navajo reclamation projects he would be entering a different world. Waterworks projects were at such an inchoate state in the late nineteenth century that the experts of the twentieth would probably scratch their heads and wonder what it was the amateurs of the nineteenth were up to. When W.H. Code claimed that the efforts at Fort Defiance were among the biggest failures of the Indian Service, he did not direct his vitriol against the agents on the ground. Rather, his venom was reserved for the bureaucracy of the Indian Service. Because so little planning had gone into the projects, limited Indian Service funds had been wasted and reclamation gained for itself a bad name. By 1905, things had changed. Professionals, like Code himself, now worked for the Indian Service and its newly minted Irrigation Division. The amateurish world of the nineteenth century faded into the past and the professionalism of the twentieth took its place.

As the Indian Service embraced the gospel of irrigation—a new thing for the entire federal government—it had to construct the bureaucratic apparatus to accommodate large-scale waterworks projects. No longer would individual Agents be able to handle the demands of reclamation. The Indian Service hired its first two professional engineers, aside from the failed attempt in the 1890s on the Navajo
reservation, in 1900; by 1905, a small cadre of engineers worked for the Indian Service. W.H. Code was the peripatetic first Chief Engineer and oversaw all of the work of the Irrigation Division from his headquarters in Los Angeles and on field inspections covering thousands of miles of the American West. Additionally, the Irrigation Division broke the West into five irrigation districts and the Navajo and Zuni reservation fell into District 5, which included New Mexico, southern Colorado, Utah, and northern Arizona.¹

As the nineteenth century gave way to the twentieth, and the Indian Service made the shift to professional reclamation efforts, a new era began. Gone were the simple attempts of the previous twenty years when agents operated under conditions of relative drought, constructing minor projects. By the turn of the century, plans were made for major waterworks on Indian Reservations in the Southwest and elsewhere. As the water engineers and Indian agents entered the new century, they did so having learned few lessons from the past. They attempted projects that were larger and more expensive than had ever been contemplated. As a result of having captured little or no information about regional climate variation, they failed to consider possible environmental changes. Drought was all they could imagine. Too, Indian labor was relied upon for constructing these massive waterworks. While the Irrigation Division hoped for a cheap and docile labor force, what they got were discrete cultural groups operating on somewhat related, but distinctly different, ceremonial and agricultural and hunting schedules. Where before the Indian Service discounted Indian knowledge on how to water the desert, they now expected their labor. But the ritual cycle of the Zuni was not going to be subverted in order to build a dam, nor was the Navajo grazing, hunting, and planting regime. The

¹ For a sketch of the basic structure of the Irrigation Division see, McDonald, *The Dispossession of the*
change in climate at the local level and the cultural vitality of the Navajo and Zuni peoples conspired to dash many of the dreams of the Irrigation Division.²

The history of reclaiming the Navajo and Zuni reservations gets more complicated as the Indian Service’s plans become grander and grander and their bureaucracy simultaneously grew. Appropriations for irrigation in the nineteenth century were a relatively simple matter: an agent either got the money or he did not. If $1,200 was allocated for reclamation on the Navajo reservation, it was not taking away from money that could have been spent at Zuni. Before there was an irrigation budget, money either came out of general reservation allocations or were special outlays based on the merits of each case. More importantly, the amounts doled out were small. Not so in the twentieth century; yearly budgets in the hundreds of thousands of dollars became common. And by 1911, the Indian Service was spending more than $1 million on waterworks. As the first decade of the new century wore on, the Irrigation Division began to become more concerned with the investments they had made than they were with reclaiming land for Indians. The amount of money that was spent on the Zuni dam, for example, led the Irrigation Division to try to protect that project rather than more evenly distributing funds to all projects on the Colorado Plateau.³

With a general and very finite budget the Irrigation Division had to decide on the relative merits of particular projects. Now, money spent one place was money not spent another. Projects in District 5, all operating from the same budget, essentially competed

American Indian, 75-76.

² Pisani, Nationalizing the Waters, chapters 7 and 8; for importance of religion in the Pueblos, see Dozier, The Pueblo Indians of North America, 90, 104-105.
for funds. Engineers working on local projects submitted their budgets to the Chief Engineer, who then submitted them to the Commissioner of Indian Affairs and on down the line to the Congress. Larger projects, of course, got more money, but as we will see, often to the exclusion and neglect of smaller ones. On the Colorado Plateau, the Navajo and the Zuni projects were at the mercy of this system. The Indian Service spent in favor of the Blackrock dam, in terms of money, energy, and expertise, and this led to the neglect of the Navajo. As the Irrigation Division worked to build the Blackrock dam and control the flooding that was destroying it, they ignored circumstances on the Navajo reservation. As discussed in the Navajo chapter, the Indian Service was vexed constantly by the question of whether the Navajo were fit for farming or were purely pastoralists. The developments in the first decade and a half of the twentieth century settled the debate. As spending went way over budget on the Zuni dam, and wetter years visited the Colorado Plateau, the Irrigation Division determined that the Navajo were indeed stockraisers and money spent on irrigation projects was money wasted.

The projects on the Navajo and Zuni reservations became so intertwined that their history, in some respects, is a common one. To be sure, circumstances were peculiar to each project, but they were both affected by the change in the weather and the shift from amateurism to professionalism in the Indian Service. Shortly after construction began the Blackrock Dam started to soak up such a large portion of the resources of the Irrigation Division of the Indian Service that each year little was left for other projects. In 1908, W.H. Code asked for an extra $25,000 to be added to the appropriation for Indian

^ House Doc. #203, 62nd Cong., 2nd Sess., 1911, Serial 6324, p.2; for the cumulative costs of waterworks projects for the period in question see, Irrigation Projects on Indian Reservations Etc., House Doc. #1286, 63rd Cong., 3rd Sess., 1914, Serial 6891, McDonald, 76-78.
irrigation, to be used exclusively for the Blackrock Dam. He feared that if the extra money was not granted other irrigation projects in the area would suffer. That is, $25,000 would be spent on the Blackrock dam regardless of whether or not Code got extra funds; he simply hoped that additional money would be found so that he could direct some of it towards the Pueblo and Navajo reservations. The Blackrock Dam had cost the government so much to date that Code thought it best to keep going and "not be stopped until sufficient lands are fully covered with a distributing system to afford the Zuni Indians a full opportunity along agricultural lines." As more and more flooding wreaked havoc in the region, more and more money was pumped into the Zuni project. Eventually money was spent just to keep the project going and to justify previous expense. By 1910 $371,477.30 had been spent on the dam and it needed further repairs. The Commissioner of Indian Affairs found himself "loathe to recommend further appropriations," but was willing to do so "in order to protect the large sum of money already invested in the dam." By siphoning off so many of the resources of the Irrigation Division, the development at Zuni contributed to, but did not cause, the underdevelopment at Navajo. The Irrigation Division, primarily because of John Harper's obsession with Blackrock, neglected projects on the Navajo reservation.4

The Navajo were the object of great scrutiny during the last quarter of the nineteenth century. The Indian Service devoted much time and energy to transform them into settled agriculturists—to be sure, much of their energy was spent in ruminating on the possibilities that agriculture held for the Navajo and less in actual effort. But after

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the Blackrock Dam, along with the Hogback ditch on the Navajo reservation, began to soak up all resources the Irrigation Division began to question whether or not the Navajo were suited to farming after all. Eventually, the Irrigation Division abandoned efforts at reclaiming the Navajo reservation for agriculture. The government decided to stock their range further with sheep and fully develop a pastoral economy. After more than a quarter century spent trying to turn the Navajo into farmers, the Irrigation Division decided that they were not agriculturists. It appeared easy for the Irrigation Division, once plans started to go awry, to reclassify the Navajo. Perceptions of them had, thus, turned 360 degrees. They went from being nomads to farmers and back again. The Navajo became, again, "wild" Indians.

As the Irrigation Division was making this decision, more and more instances of Navajo encroachment on Hopi land crept into the record. The "peaceful" Hopi need protection from the "wild" Navajo. Impressions made of the Navajo during the late nineteenth century eventually won out over efforts to turn them into farmers. And the events of the first decade and a half of the twentieth century—the climate change and the resultant failure of the Blackrock Dam—which led to the Navajo being reclassified as shepherders resulted in the eventual overstocking of their range. When the Indian Service began to realize that the Navajo country could not be reclaimed on a large scale they took the recent wet conditions as an indicator of, again, normal climate. The wet years provided good forage for stock. In the first fifteen years of the twentieth century the Navajo range was stocked with more livestock than it had ever been before.

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Increased pressure from off the reservation by non-Indian ranchers contributed to the decline in range quality. By the time the Navajo had, again, become purely pastoralists, conditions had changed.\(^6\)

I am not suggesting that the Zuni necessarily benefited from the construction of the Blackrock Dam. Rather, the dam became the primary project in the region and all other waterworks projects were subordinated to it. The dam became the object of improvement and development, not the Zuni people. The lack of useful information collected in the nineteenth century led the Indian Service to attempt projects that they were unprepared for. The Indian Service never tapped their greatest resource for advice on how to live in the desert: the Navajo and Zuni people. This chapter, then, will be a joint history of the projects on the Navajo and Zuni reservations.

As discussed in the Zuni chapter, interest in irrigation rapidly picked up pace in the late 1890s. To the Indian Service, a dam was now an imperative. And by 1901 surveys of irrigation possibilities were well underway. Heading the effort was John B. Harper, the Superintendent of Irrigation on the Jicarilla and Pueblo Indian Reservations. Harper was in charge of irrigation efforts in the Pueblos, and eventually the Navajo Reservation, until his death in 1908. Throughout his tenure in the Southwest Harper never cared to understand Indians, nor did he like them very much. He was constantly...

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\(^6\) "Between 1893 and 1900 there was a precipitous decline in stock numbers followed by an equally rapid recovery between 1900 and 1915 that brought the total stock number to their highest level since the Navajos were placed on the reservation." Richmond and Baron, 219; see also Ian Cambell, "Climate and Overgrazing on the Shonto Plateau, Arizona," *Professional Geographer* 22(1970):137. Cambell posits that the overgrazing problem on the Navajo reservation was, indeed, a problem, but that climate as a factor, rather than simply inefficient Navajo shepherds, is too often overlooked; on the increasing pressure from off the reservation and additional information on the stocking of the range see, White, 229-231; see also Lawrence C. Kelly, *The Navajo Indians and Federal Policy, 1900-1935* (Tucson: Univ. of Arizona Press, 1968):104-114.
vexed by their ceremonial life and he had little patience for "Indians who cannot tell one end of a steel pipe from another." But Harper possessed boundless amounts of energy and maintained unflagging dedication to the work at hand. During 1901 Harper surveyed the Zuni Reservation, got to know the other Pueblos, and built a small ditch at San Ildefonso. He was keyed up about the prospects of irrigation development, and found the Indians grateful for the good work that he did.\(^7\)

Harper is one of the central characters in this story. No other individual had as much control over the projects as he, and no one was more obsessed with getting the Blackrock dam up and running. Harper’s impressions of the Zuni are some of the most valuable that we have. He possessed none of the arrogance, or interest for that matter, of anthropologists and thus his characterizations of the Zuni, and the other Indians he employed, are the candid remarks of a man who worked with and lived with the Zuni for nearly eight years. He was not consciously observing them, but he needed to know the habits of the Zuni in order that he could be an effective supervisor. After all, he was their boss, of sorts. Although of a different sort, Harper’s tenure among the Indians of the Southwest, and Zuni in particular, was just as valuable for insights into Indian history as those of some of his more famous anthropological contemporaries, among them Matilda Coxe Stevenson. Harper was not concerned with discerning the inner life of the Zuni or getting at the meanings behind their ceremonies. On the contrary, it seems as if he could have cared less, except for when Zuni religious life got in the way of work on the dam. And Zuni religious life frequently got in the way. Harper was a dedicated correspondent;

\(^7\) John B. Harper to CIA, 25 January 1901; 12 April 1901; 17 June 1901; 1 July 1901, Box 212, SC 190, RG 75, NA, SC 190.
his letters number in the hundreds. They are the basis of the history of irrigation development that follows; no other better chronicler exists.

After spending six months among the Pueblos, Harper concluded that the Zuni were most in need of a dam; according to him, they had the largest population and were the poorest. Harper provides the first intimations of the precedence of the Zuni dam over other projects when he suggested that work in the other Pueblos be put on hold until the Zuni work could be finished. But until the Indian Service made firm plans for Zuni he had work to do in the other Pueblos and spent much of 1902 at Cochiti, Sandia, and Zia Pueblos. By the beginning of 1903 Harper had drafted formal plans for the Zuni dam. W.H. Code sent a report to the Secretary of the Interior in April, approving Harper’s suggestions, and in July $40,000 was allocated for the dam. Code confessed ignorance in several matters concerning the Zuni dam. He was most concerned with the fact that a gauging station had not been built at Zuni when the dam project was first contemplated. Now only guesses could be made concerning the flow of the river and run-off from the mountains. Code was concerned that adequate data did not exist to determine whether or not they could fill a reservoir or even how big to make one. Nevertheless, both he and Harper calculated, based on the size of the watershed and the average of fifteen inches of rain per year, that the reservoir would fill six times during the year. But this would depend, Code admitted, on the “character of the rain storms.” Code counted on the rains that fell in July and August to be the principal source of surplus water for the reservoir. He did not consider the possibility of rains coming at different times of the year, greater than average snowpack, or the summer rains increasing in intensity. Plans were
underway for the largest project yet contemplated on the Colorado Plateau with
guesswork as the data.®

Harper spent the next year solidifying plans for the dam; by the summer of 1904
work had begun. And by August Harper ran into what would be, along with the weather,
one of the most intractable obstacles: problems with Indian labor. The “greatest
difficulty [with constructing the dam is the] unreliability of Indian labor.” Harper
concluded that the Zuni’s best attempt was but a poor imitation of real work. According
to Matilda Coxe Stevenson, summer solstice ceremonies began in the third week of June
that summer—presumably they did each year—and the rain priests were occupied, as
was much of the rest of the village, for the rest of the season. Despite the government’s
promises to deliver water on a permanent basis, the dam was not built yet and the Zuni
were still going to pray for rain. Reporting to Code that first fall, Harper was stymied
first by the Zuni who went to harvest; then by the Navajo who had been away all fall,
variously “eating green corn, then to harvest and now they are on a deer hunt.” Harper
lamented that scarcely any work was accomplished owing to the dearth of Indians. In
November, when the annual Shalako dancing season began at Zuni, Harper found that
work ground to a standstill until the following spring. By 1905 he had learned the
rhythm of the Zuni year, “In the spring they go out on their farms and stay until about the
first of July, planting, shearing sheep &c., they then come in and want to work until
September first when the harvesting and dancing begins again.” Each fall, as it became
time to harvest or hunt, Harper counted on losing most of his workers; when Shalako

8 John B. Harper to CIA, 12 July 1901; 14 April 1902, 12 August 1902, 10 August 1903, Box 212, SC 190,
RG 75, NA; W.H. Code to the Secretary of the Interior, 13 April 1903, Box 212, SC 190, RG 75, NA;
Thomas Ryan, Acting Secretary of the Interior to CIA, 22 July 1903, Box 212, SC 190, RG 75, NA.

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season started, Harper had to stop work entirely. Harper had reliable Indian labor, it seems, during a window of about two months during the summer. What the agents on the Navajo reservation had learned twenty years before, Harper was now learning: seasonal obligations—hunting, harvesting, and ceremony—would persist despite his plans to the contrary.9

Over the next several years Harper focused singularly on the Blackrock Dam, letting the calls of agents on other reservations go unheeded. As the work at Zuni slowed down in 1904, massive floods washed out the ditches that Harper had built at Cochiti and San Ildefonso. Along the northern border of the Navajo Reservation, on the San Juan River, flooding also washed out ditches. Samuel Shoemaker, Supervisor of Constructed Ditches and Special Disbursing Agent on the Navajo Reservation, estimated that the repairs to the ditches would run “high into the thousands.” And in the years to come, Harper rarely found time to tend to any problems besides the ones that he encountered at Zuni.10

The flooding that washed out the ditches at Cochiti and San Ildefonso signaled not only a new pattern of flooding in the region, but a new phase in irrigation history on the Colorado Plateau. At the beginning of 1905 Harper wondered if the weather would not curtail work on the dam to the point where little would be accomplished. And throughout that year, Harper commented on the “unprecedented storms and floods.” He wrote Code in May and said, “I have not tried to describe the conditions here for a long

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9 Matilda Coxe Stevenson to W. H. Holmes, 30 June 1904; 30 August 1904, Box 6, MCS file, NAA.; John B. Harper to CIA, 31 August 1904; 7 November 1904, Box 212, SC 190, RG 75, NA; Harper to Code, 24 October 1904; 29 November 1904; 30 November 1904, Box 118, GC, ID, RG 75, NA; Harper to CIA, 27 July 1905, #60861, Box 212, SC 190, RG 75, NA.
10 Samuel Shoemaker to CIA, 29 October 1904, Box 210, SC 190, RG 75, NA.
time, not that language was lacking, but because it would sound incredible to anyone not experiencing it and particularly so to one familiar with the Southwest.” Harper worried on and off about the prospect of a “record breaking flood.” But by April he was confident that the Zuni watershed would not be affected by the storms and floods that wreaked havoc in the rest of northern New Mexico. He was shocked, then, in May when a flood raged through the Zuni River and did several thousand dollars worth of damage to the dam. But after the rains passed and the country was again dry, Harper felt sure that such weather was “not likely to be again encountered and I do not see that anything of future value can be gained by extending the discussion of it.” Despite Harper’s cavalier attitude, by the end of the year he noted that winter storms started earlier and even though “it was hard to conceive that floods like those of last spring could be expected again this [coming] year” he predicted that they would.\(^\text{11}\)

Harper’s reluctance to see the possibility of another destructive season of flooding does seem odd. But, remember, to him the high rains of the year were an anomaly. His keen observations did not pick up on Zuni concern for the weather; he only mentioned that they disliked working in wet and cold conditions. Had weather like this visited the Colorado Plateau before, thus, this time, leaving the Zuni rather blasé? They probably knew that heavy rain in the late fall and winter would make for an auspicious spring: good crops and good wool from their sheep. One has to wonder, did the Zuni, like Harper, take the weather to be an anomaly or was it something they recognized? It is difficult to do anything but speculate

\(^{11}\) John B. Harper to W.H. Code, 24 February 1905; 10 April 1905, GC, ID, Box 118, RG 75, NA; John B. Harper to CIA, 3 May 1905, #36382, Box 212, SC 190, RG 75, NA; Harper to Code, 5 August 1905, GC.
Harper was clearly concerned for the future of the dam. If the coming winter was a repeat of the previous one, then real trouble could be expected. Because of Shalako and the coming winter storms Harper proposed calling work off until May. This was an extreme response to extreme conditions. Harper could not face another winter of storms and flooding. He warned Code that the weather must be considered now in planning the dam. The inference, of course, is that the weather was not factored in until this point. Heavy rain was expected in the summer, but not in the winter months: He admitted as much; there was no precedent for this type of storming in the late fall and winter. "Without the gift of prophecy" Harper said he could not know what the weather would do, but another winter like the one of 1905 would ruin the work. Capricious weather and Zuni religious life—contingencies not considered until they began to get in the way—were unraveling the Irrigation Division's plans. Code, masking the seriousness of the problems encountered in the 1905, wrote the Secretary of the Interior that everything was under control, but admitted that "unforeseen contingencies" pushed the cost way above original estimates. It seems Code had to try to save face in front of the Secretary, but in the correspondence between him and Harper, fear for the future of the dam was evident.

In October, 1905 Harper raised the estimate for the dam to $100,000. And ironically, his misfortune led to Zuni prosperity. The rain of the past year had provided for good crops. The Zuni had no incentive to work on the dam. The same was true for the Navajo laborers whom he relied on: wool prices were high and thus there was little need to work. What was bad for Harper was good for the Indians. Not only the weather

ID, Box 118 RG 75, NA; Harper to CIA, 27 July 1905, #60861, Box 212, SC 190, RG 75, NA; Harper to Code, 1 December 1905; 31 December 1905, Box 118, GC, ID, RG 75, NA.
itself stonewalled the work, but now the resultant good crops and Indian prosperity might stand in the way, too. Harper could not win.13

During 1904 and 1905, along with the project at Zuni, the Irrigation Division again surveyed the Navajo Reservation. The story gets complicated at this stage. Between 1905 and 1914, the Navajo and Zuni Reservations would, in effect, compete for the finite resources of the Irrigation Division. The Irrigation Division attempted major projects on both reservations, the Hogback ditch on the San Juan and the Blackrock Dam on Zuni River. Floods plagued both projects, and costs escalated year after year.14 As a result of the limited resources available to the Irrigation Division, the engineers made decisions concerning the fate of the projects, and, hence, the fate of the Indians. John B. Harper’s singular focus fostered a cycle of neglect. After Harper’s death the Irrigation Division tried to play catch-up on the Navajo Reservation.

In 1904, as the work on the Blackrock Dam got underway, the Irrigation Division surveyed irrigation possibilities on the Navajo reservation. And W.H. Code hoped that the same mistakes that the Indian Service made in the past would not be repeated. This time, with a thorough survey of the reservation by professional engineers—not army officers or amateurs—the reservation might get reclaimed. And the San Juan river region in particular came under Indian Service scrutiny as a potentially productive agricultural area. John Wesley Powell’s vision of building a large irrigation project on the river

12 John B. Harper to W.H. Code, 1 December 1905, Box 118, GC, ID, RG 75, NA; W.H. Code to the Secretary of the Interior, 12 December 1905, Box 212, SC 190, RG 75, NA.
13 John B. Harper to W.H. Code, 10 October 1905, Box 118, GC, ID, RG 75, NA.; Harper to Code, no date, Box 118, GC, ID, RG 75, NA.
14 For detailed cost figures see H.F. Robinson, “Project Histories of the Pueblos of New Mexico,” 1913, Special Reports and Related Records, Series 657, Irrigation Division, Box 97, RG 75, NA; Annual District and Project Reports, 1909-1913, Series 655, Irrigation Division, District #5, Box 41, RG 75, NA.
started to take shape. The will to spend the money was now there. The San Juan River had traditionally provided good farming land for the Navajo, and George Butler, the General Superintendent of Irrigation, said that the San Juan was the best prospect for reclamation on the entire reservation. But recently, the ditches along the river had been neglected. Owing to a drought in the region, the Navajo left this portion of the reservation in search of work. And, as a result, the amount of farming done along the San Juan diminished. Too, the agent recognized that the drought was taking its toll on the Navajo's herds. "On account of the lack of sufficient rain or moisture in the hills and on the mesas the feed for sheep and goats...is becoming less and less abundant each year and makes this source of their revenue very uncertain." A solution was necessary.\textsuperscript{15}

W.T. Shelton, the agent at San Juan, fixed his sights upon what he saw as the untapped potential of the San Juan River. The Navajos living along the river had always taken advantage of its waters, but Shelton saw that the river had far greater potential. If the water now flowing through the San Juan could be handled properly, Shelton claimed that he could double the number of Navajo families now farming along its banks and end their nomadic ways. "It is my intention to encourage and assist the more intelligent of the mountain Indians, now depending entirely upon their herds, to take up and improve the farms along the ditches." Once again, plans were being made to tame the "Free Riders of the Plains," to settle them in permanent homes. Shelton's faith in the Navajo led him to slough off offers of assistance from the Indian Service; only in the event of a

\begin{footnotes}
\item[15] Samuel Shoemaker to CIA, 30 May 1904, #6043, Box 210, SC 190, RG 75, NA; George Butler, Supt. of Irrigation to CIA, 24 June 1904, #55848, Box 210, SC 190, RG 75, NA; W.H. Code to CIA, 26 July 1904, #8039, Box 210, SC 190, RG 75, NA; W.T. Shelton, Supt. San Juan Training School to CIA, 20 August 1904, #58517, Box 210, SC 190, RG 75, NA; George Butler to CIA, 24 June 1906, SC 190, Box 210, RG 75, NA.
\end{footnotes}
flood could the Navajo not handle the work. Shelton had been at the San Juan School only one year and was not used to the cycle of the river. The heavy rains that fell all across the Southwest in the fall of 1904 sent a freshet down the San Juan in October and ruined the ditches that he had worked so hard on. Consequently, at the beginning of the new year, the irrigation projects proposed by the surveys of the previous summer were now approved. The San Juan had demonstrated its power, not only for irrigation but for destruction. Unfortunately, the coffers were tapped and the plans would have to be put on a hold for the year. 

A couple of brief, but salient, examples from the Rio Grande Pueblos will help to illustrate Harper’s obsession with the Blackrock dam and the neglect of other projects. As work progressed through 1906 on the Blackrock Dam, signals appeared at the Pueblos that Harper was not giving them their due—after all, he was in charge of projects in the whole region and this included the Pueblos. The floods that overflowed the Rio Grande and its tributaries in 1904 and 1905 left in their wake destroyed ditches at many of the Pueblos. C.J. Crandall, Superintendent of the Pueblo Agency, hoped that Harper would be able to visit Cochiti, Santa Clara, and San Ildefonso Pueblos in the coming months to assess the damage and make recommendations for repairs. The situation was dire, for “many of the Pueblos raised but little last year.” Irrigation ditches were essential: without them the Pueblos had no way of watering their fields. But Crandall found that Harper, over the last two years, had spent the bulk of his time at work at Zuni. He had

\[16\] Shelton to CIA, 20 August 1904, #58517, Box 210, SC 190, RG 75, NA; CIA to Secretary of the Interior, 24 January 1905, Box 210, SC 190, RG 75, NA.
not inspected the other Pueblos since before the heavy rains of 1904, and thus was unable to see the gravity of the situation.  

Harper visited in April, but told Crandall that he could not get to the work until the end of the summer; there was too much to do on the Blackrock Dam. Of course, summer was the crucial planting and rainy season. If Harper neglected the Pueblos for another summer, the consequences would likely be harmful. Crandall was getting worried and wrote the Commissioner of Indian Affairs that if the ditch was not rebuilt soon the “Pueblo Indians of San Ildefonso will be in a short time in the same condition that they were five years ago[when the ditch was first built]—destitute. Early in May, as Harper got work under way at Zuni, a massive flood came down the Rio Grande and finished off what was left of the San Ildefonso ditch. The flood washed away any hope of getting a crop in for the year. Oddly enough, as Crandall worried over the Indians at San Ildefonso, Harper was complaining again about Zuni and Navajo prosperity. The rain of the last two years, combined with the high price of wool, provided both with such good crops and abundant cash that they were too independent, again, to work on the dam. At San Ildefonso, where for centuries they had been able to farm on their own, the situation was dire. Now that the Indian Service had made promises to fix the ditches that they had built, the Indians came to rely on their assistance. But when help did not come, disaster ensued. Dependence on Indian Service technical know-how seems to have lulled the San Ildefonso into helplessness. The broken promises of the Indian Service regarding irrigation were largely due to Harper’s neglect.

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17 C.J. Crandall to CIA, 19 February 1906, #17912, Box 212, SC 190, RG 75, NA.
18 It is interesting to note that Crandall felt compelled to write the Commissioner; it indicates that he could not rely on Harper to concern himself with the other Pueblos. C.J. Crandall to CIA, 13 April 1906, #34064,
At San Ildefonso the recent rains filled the Rio Pojoaque and irrigation from it was possible. But in the event of a dry season, the ditch on the Rio Grande would have to fixed. Harper warned that the Pojoaque did not run in dry years, and “when the inevitable dry cycle returns they must have water from the Rio Grande, or do without.” Of course, Crandall feared that Harper would not help and San Ildefonso would have no water. He worried that if immediate action were not taken San Ildefonso would shortly find itself without crops. However, Crandall realized the Government had spent a lot of money thus far on the ditch, some $7,000, and that anything they built now might not last long. Additionally, he noted that even if they lost their crops, many of them worked anyway in beet fields and lumber camps, and “ten of them having been attached to a wild west show at Cony [sic] Island last summer...brought home round about $1000.” Thus, the loss of their subsistence from agriculture was mollified by their entrance into the wage system.\(^{19}\)

One should not be tempted to blame this situation entirely on Harper’s neglect. Indeed, many Indians in the Southwest were involved in the wage economy. But I do want to suggest that there is a link between Harper’s preoccupation with the Blackrock Dam and the lack of development at San Ildefonso. In fact, San Ildefonso Pueblo would go without water development entirely. In 1908, H.F. Robinson, Superintendent of Irrigation and Harper’s replacement, recommended that no waterworks be built at San Ildefonso owing to the cost and the small population. By 1910, Robinson found that,

\(^{19}\) C.J. Crandall to CIA, 31 December 1906, Box 212, SC 190, RG 75, NA.
The result [of my decision] has been that the San Ildefonso Indians have been without water for about five years excepting the flood water they secure from the Pojoaque River. They now are unable to raise much in the way of crops, and this year being very dry, what they did plant is rapidly drying up, although the rains which are just beginning may save them. The entire male population of the Pueblo is away earning money to keep their families from starvation.20

Robinson suggested spending $4,000 on a temporary ditch from the Rio Grande, otherwise, “the San Ildefonso Indians have practically no other hope of sustenance other than leaving their town and going to work.” With the hindsight of only a few years, Robinson saw the link between choosing to spend money in one place and not another. The work on the Zuni Dam was contributing to the underdevelopment of the other Pueblos.

The same was true on the Western Navajo reservation. Located on the periphery of official Navajo land, with its headquarters at Tuba City, this section of the reservation was routinely neglected by Harper. In fact, the Commissioner of the Indian Affairs was forced to intervene and urge the Irrigation Division to attend to matters in this remote section. Harper had had little time for the Navajo reservation. And by 1908, Stephan Janus, the Superintendent was fed up. He had repeatedly asked that reclamation work be done. By the summer of 1908, he bypassed the Irrigation Division and wrote directly to the Commissioner of Indian Affairs and complained that a lot of money had been spent investigating the water supply but that no work had ever been done. The situation was dire. Lack of water was forcing the Navajos who lived out in this section of the reservation to encroach on Hopi land, and this would continue until reclamation work was done. But Janus’s calls went largely unheeded. The Irrigation Division did not have

20 H.F. Robinson to W.H. Code, 5 August 1910, GC, ID, Box 112, RG 75, NA.
time to tend to the type of small projects—a dam across Moenkopi wash—that Janus wanted them to; the dam at Zuni was taking all of their time and resources. All he could manage was a small dam that washed out time and again.\(^{21}\)

If 1906 was a good year for the Zuni and the Navajo crops and wool, it was a bad one for John B. Harper and the Blackrock Dam. In December, Harper wrote, “We have had an abominable season since the first of April—either sand storms or floods most of the time.” Harper reported that the whole of the Southwest had been hard hit by storms over the past two years; he blamed regional flooding for the destruction of roads and railroad bridges and the formation of the Salton Sea, in California. Due to recent prosperity, the Zuni and Navajo were too independent and would not work on anything resembling a reliable schedule. Harper lamented that “the indirect results of the abnormal seasons have been fully as serious to us as the direct ones.” He found, again, that the pace of work on the dam proceeded as the weather and the Indians—Navajo and Zuni both—allowed. When the dancing began at Zuni “what you will do is not what is necessary or what you want to do, but what you can. This thing of having your work depend on the whims of ignorant savages is not as pleasant as it might be.” Pleasant or not, the annual cycle that had been in place for ages prevailed over the imposed order.

\(^{21}\) CIA to H.F. Robinson, 30 March 1908, GC, ID, Box 109, RG 75, NA; Stephen Janus to CIA, 9 July 1908, GC, ID, Box 118, RG 75, NA; Stephen Janus to W.H. Code, 4 August 1908, GC, ID, Box 118, RG 75, NA; Stephen Janus to W.H. Code, 30 September 1908, 4 November 1908, GC, ID, RG 75, NA; CIA to W.H. Code, 24 November 1908, GC, ID, RG 75, NA; Stephen Janus to W.H. Code, 12 January 1909, GC, ID, RG 75, NA; C.R. Olberg, Acting Chief Engineer, to Stephen Janus, 18 January 1909, GC, ID, RG 75, NA; Stephen Janus to C.R. Olberg, 23 January 1909, GC, ID, RG 75, NA; W.H. Code to Stephen Janus, 4 February 1909, GC, ID, RG 75, NA.
that Harper and the Irrigation Division tried to foist on both the environment and the Indians.²²

When work commenced in April, 1907, Harper had to contend with a small labor force. By the middle of the summer work was up and running, but in August destructive flooding shut the project down for two weeks. And by September, the Zuni were in their fields harvesting corn. Harper reported that the corn was ripe early that year and thus the Zuni had no incentive to work. Additionally, he had come to realize that, indeed, each autumn, the Zuni left for their fields. The rest of the fall was a slow one. As was the custom each year, the Zuni abandoned work on the dam late in the season. In early December, Harper noted that "there are only twenty men at work today and tomorrow the Chalico [sic] dance begins and there will be a succession of dances from this time until spring. For a few days we will have no men, and after that the prospect is very discouraging." At the same time, workers from other Pueblos left to attend to their ceremonial schedules. And to top it all off, Harper, again, noted that the Indians in the region were too prosperous that year to want much work. The recent rains were washing out ditches and dams and rendering the Navajo and Zuni too prosperous to want work. This two pronged assault on irrigation efforts insured slow progress.²³

At the San Juan Agency, the government built ditches were in a shambles. The Commissioner of Indian Affairs hoped that Harper would be able to get to the Navajo Reservation, but the work at Blackrock kept him busy. By this time the agents working

²² John B. Harper to W.H. Code, 16 July 1906; John B. Harper to W.H. Code, 26 December 1906, GC, ID, Box 119, RG 75, NA; Harper to CIA, 24 January 1907, #11218, Box 212, SC 190, RG 75, NA.
²³ John B. Harper to W.H. Code, 7 September 1907; 4 October 1907; 4 December 1907, GC, ID, Box 119, RG 75, NA; Harper to C.E. Albing, acting Chief Engineer, 9 December 1907, GC, ID, Box 119, RG 75, NA.
on the Navajo Reservation were upset; the areas that they oversaw had been neglected for too long. In 1907 the Indian Service sent a Special Agent, R.S. Connell, to inspect the work done thus far on the Navajo reservation and to see about the complaints of the Agents. He reported to the Commissioner on the sad state of affairs at the San Juan school.

Connell first noted that the San Juan school was foolishly located on the bottoms of the San Juan river.

A western man who had seen the devilish freaks of such rivers as the Rio Puerco, Rio Grande, and the San Juan, would never have put a school on the bottoms, between the bluffs of one of these rivers. At one time the channel is on one side of the bottom and the next time you see it in the middle, and perhaps another it will be across on the other side. It stays in one place just long enough to give a tender-foot time to get a nice home started where the river channel had once been and in time will be again.\(^{24}\)

Connell clearly recognized the capricious nature of the river, something that the Irrigation Division’s engineers failed to do. Connell found the status of the Indian farms along the river “deplorable.” The ditches built by the government’s “so called irrigation experts” were an utter failure, and “spoiled the ditches that the Indians had previously made.” Connell appeared to understand that the Navajo who farmed along the San Juan knew that the river shifted, and that is why, year after year, they built new ditches. Any attempt at permanency would have resulted in frustration and failure. Connell’s report pointed out, again, the need to utilize captured information about the environment. And that could not be done by a stream of ever shifting agents who tried to control an ever shifting river.\(^{25}\)

\(^{24}\) R.S. Connell to CIA, 11 April 1907, GC, ID, Box 106, RG 75, NA.
\(^{25}\) ibid.
Connell went further and said,

The Government irrigation experts not only ruined the Indian ditches, but no headgates were properly put in by these men and the river in freshets came through them with such force that it cut deep gullies in them and in some places the river changes its course and [cuts] a channel down the big government ditches. For miles down the river are scattered dead fruit tress and orchards, showing that these Indians were once prosperous and thrifty farmers. The Indians are very much discouraged from this and feel that the Government has not treated them fairly. They say that all of their farms are ruined except two.^[26]

Years of bungling efforts on the San Juan left the Navajo without profitable farms; attempts to force them to settle permanently in places along the river were ill conceived and ill fated, and small scale diversion ditches were no match for the San Juan.

While Connell may have recognized that the Navajo were better suited than the Irrigation Division to planning waterworks on the San Juan in the past, his sights were set on the future. Had Connell arrived on the Navajo reservation in the 1880s he would have been well suited to the task; he knew that the Navajo understood the foolishness of attempting permanent structures. But he was of a different generation. Now was the time to attempt a permanent project. The Navajo had done an adequate job in the past, but they could not be expected to construct anything of permanence. Connell was, to be sure, sympathetic to the Navajo, but, like the rest of his generation, he believed in progress. It was time to abandon the old ways for modern ones. If the “theoretical experts...whose long suit is on paper” could be shoved aside and a man “who builds irrigation works on the ground” be found, then a permanent way of tapping the riches of the San Juan would soon be at hand. Connell identified the area where the San Juan runs
between high cliffs, the Hogback, as the ideal place to divert water through a tunnel and thus irrigate twenty thousand acres of fertile land. The river would not be able to change course as it ran between these cliffs, thus the problem would be solved. As the Irrigation Division made plans to channel water through the Hogback and thus control the San Juan, they also planned to control the Navajo. Water would follow a rigid trajectory and so would the Navajo. Connell wondered why the irrigation experts had not seen this spot before him; he answered his own question: “Because if they would use nature, their work would not show up so well on paper.”

In March, 1908 John B. Harper took ill and suddenly died. The dam proper at Zuni was finished early in the year. Only the ditches to supply water to Zuni fields needed to be completed. Harper had lived to see the dam become a reality, but not to see it in action. Before he died, however, he recommended holding off on the San Juan project. Ostensibly, he felt that the ditch could wait, but W.H. Code admitted to the Secretary of the Interior that, in fact, Harper had miscalculated and the Blackrock Dam had again gone over budget. Money needed to be diverted from the San Juan project and directed toward the Blackrock Dam. Code hoped that other projects on the Navajo and Hopi reservations, besides the one on the San Juan, would not suffer. Code allowed that Harper, in his zeal to see the Zuni dam completed, had neglected other projects. He acknowledged the cries from the Navajo and Hopi agents, and “hope[d] that there will be no further cause for complaint from that section.”

26 ibid.
27 ibid.
28 W.H. Code to the Secretary of the Interior, 17 March 1908, GC, ID, Box 119, RG 75, NA.

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Throughout 1908, the work at Zuni and on the Hogback ditch remained relatively idle. No money, for the moment, was available to complete the Zuni dam, or to begin the Hogback project. In October, H.F. Robinson, Harper's successor, estimated that the Blackrock Dam was going to cost an extra $40,000. At the same moment that Robinson reported to Code that the project at Zuni was far from complete, a flood raged down the San Juan and washed out the ditch that Connell had so roundly criticized. And at the end of the year the Secretary of the Interior wrote the Secretary of the Treasury and recommended that the extra money be spent on the Zuni Dam; otherwise what had been spent thus far would be wasted. Thus, the Hogback project was put on hold for a little while longer; the Navajo farms along the San Juan stood in disrepair and not a single acre was irrigated under the Zuni irrigation project. The Irrigation Division’s plans were not going as planned.29

Code and Robinson started to notice, soon after Harper’s death, that work on projects other than Zuni had suffered. Both men admitted that Harper spent too much time on the Blackrock Dam, and had not allocated sufficient funds or personnel to the other reservations. Robinson accused “Mr. Harper [of] putting his entire time and attention to the Zuni dam, [and] all of the other work has been badly neglected for the last three or four years.” What’s more, neither Code nor Robinson seemed to have noticed this before. Code urged Robinson to push work ahead on other projects, with the exception of the Hogback, so that the $30,000 left in the fund would not be returned to the treasury in July, the end of the fiscal year. Code also warned Robinson that “the Indian Irrigation cannot go on in the old free way, where the engineers seemed to be

29 H.F. Robinson to W.H. Code, 12 October 1908, GC, ID, Box 119, RG 75, NA; Secretary of the Interior
responsible to neither man or god.” The implication was, of course, that they had been answering to no one, that money was spent at the whim of the engineer. To be sure, Harper had been answering to no one; he spent the money he was allocated as he saw fit. Thus, problems with the institutional structure of the Irrigation Division helped along the neglect at sites other than Zuni. To prevent circumstances like this the Commissioner of Indian Affairs instituted a system of quarterly financial reports designed to keep better tabs on the notoriously profligate Irrigation Division.\(^{30}\)

Code and Robinson were now in a rush to prioritize; they had to “decide on the relative values” of the various projects. Indeed, Code was loathe to proceed with large-scale projects on the Navajo reservation. He thought it wise to wait and see how successful the Zuni dam was before taking on any other major waterworks. Code was beginning to question the feasibility of reclaiming Indian land on the Colorado Plateau. After finally realizing that Harper had siphoned off almost all the funds each year for the benefit of the Zuni dam, it was apparent why little had been accomplished on the Navajo reservation. Because of the overspending on the Blackrock dam, little money was left for other projects and Code confided to Robinson that the “gigantic San Juan scheme...looks like a pipe dream,” and wondered could $10,000 to $12,000 more be

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\(^{30}\)W.H. Code to the Secretary of the Interior, 27 November 1908, GC, ID, Box 109, RG 75, NA; H.F. Robinson to W.H. Code, 2 April 1908; 20 May 1908, GC, ID, Box 103, RG 75, NA; W.H. Code to Robinson, 7 April 1908, GC, ID, Box 103, RG 75, NA; Code to Robinson, 10 July 1908, GC, ID, Box 103 RG 75, NA. Because of space limitations I am only discussing the Hogback project, but Harper’s neglect was also felt at Fort Defiance and on the western edge of the reservation at Tuba. For information on the other projects on the reservation see Samuel S. Shoemaker, Supervisor of Constructed Ditches and Special Dispersing Agent to CIA, 30 May 1904, SC 190, Box 210, RG 75, NA. This nine page report gives a basic outline of the progress being made on other projects on the reservation. See also, George Butler, General Superintendent of Irrigation to CIA, 24 June 1906, SC 190, Box 210, RG 75, NA. Butler’s nineteen page report is full of detail regarding irrigation across the entire reservation.
diverted to the Zuni Dam. After all, Code said, "these Indians [the Navajo] are good herdsmen, and can always obtain a good living from their sheep." Robinson agreed.

I fully concur in your views that the [Navajo and Hopi] Indians are herdsmen and not farmers. It is shown that they are many of them anxious to have a chance to put a little corn etc. but none of them will put in more that they need for their own immediate uses. Their flocks are more valuable than their crops, and to find grazing they must of necessity be nomadic. Stock water is of greater necessity than irrigation water. A large amount of money has been spent for the latter, and the net results are infentesimal [sic] as yet.

The consequences of Code’s and Robinson’s conclusions are difficult to gauge. Over the next several years the little major work was done on the Navajo Reservation; most energy was thrown into surveying underground sources of water for stock raising. Herbert Gregory, a geologist for the U.S. Geological Survey on loan to the Irrigation Division to help out with underground water surveys, helped Code and Robinson come to this conclusion. In his estimation, Navajo country was not suited to farming; the Navajos’ land should be developed for stock raising. And his opinion held sway with the Indian Service. Thus when he recommended “that the region be developed for stock, especially sheep; that no large irrigation enterprises designed for agriculture be undertaken,” the Indian Service was disposed to listen.

The Hogback ditch, however, would be constructed. Cries from W.T. Shelton throughout 1909 finally pricked up the ears of the Irrigation Division. Shelton’s earlier aversion to the Irrigation Division gave way after the flooding in the fall of 1908. It was now time for a major project on the San Juan; temporary structures failed too often.

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31 H.F. Robinson to W.H. Code, 20 May 1908, GC, ID, Box 103, RG 75, NA; W.H. Code to H.F. Robinson, 6 November 1908, GC, ID, Box 103, RG 75, NA.
32 H.F. Robinson to W.H. Code, 10 November 1908, GC, ID, Box 103, RG 75, NA.
Code was tired of being criticized for the Division's efforts on the San Juan. "The Engineers of the Indian Service have already come in for a great deal of criticism due to the failure of the ditches heretofore constructed [on the San Juan], and any work that we do there now should be built so that it would stay." Robinson hoped the money allocated for the Pueblos could be sacrificed in favor of the Hogback project, the Commissioner of Indian Affairs and Code agreed, and the project was approved.\(^{34}\)

Of course, there were immediate problems. Within a couple of months after construction began Robinson observed that the San Juan river was at its highest stage in fifteen years and wondered would the present plans be sufficient to control the river. In September floods raged down the San Juan and devastated the project. Plans had to be altered month by month as contingencies no one had planned for kept popping up. By the following summer Robinson estimated that the project would cost $134,371.45.\(^{35}\)

Not coincidentally, the same week in early September that flooding visited the San Juan, severe flooding also filled the Zuni river. The Blackrock Dam, after initially hopeful reports to the contrary, was badly damaged. W.H. Code estimated that $125,000

\(^{33}\) Herbert E. Gregory "Water Resources of the Navajo-Moki Reservation," NARA, GC, ID, Box 110.
would be needed to salvage the project. By the end of the 1909, five years after construction began on the dam, no land was irrigated.36

But the Irrigation Division would not take responsibility for the damage done to the dam. They blamed it on nature. The reasoning went like this: If problems of this sort could have been predicted maybe then the dam would not have been attempted; to protect a dam from the sort of flooding that was now reducing it to rubble might have made it prohibitively expensive. What the Irrigation Division was saying was that if they knew it would have been such a disaster they would not have tried in the first place. It is this sort of logic that is so instructive. If the Indian Service had really thought about and planned the projects they attempted, something they seem assiduously to have avoided, then they may have realized the folly of their efforts. If they had initially factored in contingencies such as massive floods, then they might not have gone ahead with the project. As late as 1910, adequate stream flow records for the Zuni River did not exist, making work, at this late date in the enterprise, still smack of guesswork.

The flooding that devastated both the Zuni dam and the Hogback ditch had a sobering affect on W.H. Code. In the summer of 1910, with the Blackrock dam still in disrepair, he wrote to the Secretary of the Interior looking for more money, but, above all, for sympathy. If he had known that the project was going to cost so much, with so little to show, he would never have built it; but, in the meantime, more money was

36 H.F. Robinson to W.H. Code, 7 September 1909 (telegram), GC, ID, Box 119, RG 75, NA.; W.B. Hill, asst. engineer to Code, 13 September 1909 (telegram), GC, ID, Box 119, RG 75, NA; Rollin Ritter, asst. supt. of irrigation to Code, 13 September 1909, GC, ID, Box 119, RG 75, NA; W.B. Hill and W.H. Saunders, asst. engineers to Code, 16 October 1909, GC, ID, Box 119, RG 75, NA; Code to the Secretary of the Interior, 29 October 1909, GC, ID, Box 119, RG 75, NA; for the flooding on the Zuni see H. F. Robinson, Flood on the Zuni River, Arizona, September 6, 1909, Water Supply Paper 269, 206-210; on the lack of stream flow data see J.M. Martin, acting Chief Engineer, to W.H. Code, 28 March 1910, Box 120, GC, ID, RG 75, NA.
necessary in order that the funds already spent would not go to waste. Code's primary concern had become protecting the Indian Bureau's $300,000 investment. Code still did not address the lack of planning and the ignorance of the Irrigation Division. Code could be humble, but never did he try to ascribe blame to anything or anyone but the forces of nature or Indian intransigence. By this time, it was clear that he was in despair. He had signed off on all of Harper's requests for money and more time, rarely questioning his work. Now, he was afraid it was all for naught.\footnote{W.H. Code to the Secretary of the Interior, ? June 1910, GC, ID, Box 120, RG 75, NA; for further evidence of the need to take money away from other projects see W.H. Code to the Secretary of the Interior, 29 October 1909, Box 119, GC, ID, RG 75, NA, W.H. Code to CIA, 18 April 1911, Box 120, GC, ID, RG 75, NA.}

Flooding revisited the San Juan River in the fall of 1910 and 1911, further curtailing work on the Hogback project. Robinson claimed that the flooding of 1910 was worse than the previous year. But the flooding of 1911, in Robinson's estimation, beat both years. The damage to the ditch was so severe that engineers were pulled off projects elsewhere in the West to assist with inspecting the destruction. Code seemed ready to give up when he wondered "if a maximum high water mark can ever be determined upon" for the San Juan river. Part of the problem, again, was ignorance concerning local conditions.\footnote{H.F. Robinson to W.H. Code, 9 October 1909, 26 October 1909, 27 October 1909, GC, ID, Box 106, RG 75, NA; "Extract from Report of Edward G. Gerbsbach, Superintendent of construction in charge of the work at the Hogback Canal," 9 October 1909, GC, ID, Box 106, RG 75, NA; Code to Hill, 28 October 1911.}

Throughout 1912, both projects experienced further problems. The Blackrock Dam was operating in a limited fashion by the summer of 1911, but promptly after it started to be put to use, siltation on a grand scale became a problem. The reservoir was so quickly filling with silt that it was being rendered useless. Again, this appears to be a
contingency that Code had not considered. After realizing that the reservoir was so soon filling with silt, he warned that this would be a problem all over the Southwest. That this would come as a surprise to the chief engineer is odd indeed. But from Code's correspondence and tone, it seems as if the sediment carried by streams in the Southwest, or anywhere for that matter, had not previously been considered as a limiting factor in storing water. In the 1880s or 90s, as the Indian Service began its reclamation efforts, this kind of oversight was expected, but not seven years into a major project. At the Hogback ditch, flooding once again wreaked havoc, this time in the spring of the year. For the Hogback, 1912 was a bad year. No further construction was attempted; the whole year was spent repairing the damage done over the previous year! Additionally, W.T. Shelton reported trouble rounding up a labor force: the Navajo were out lambing and planting, as they were that time every year. Eventually he employed his reservation police force to coerce Navajos into working on the ditch, albeit with little success. These two projects, both so costly, were bearing little fruit. 39

Heavy rains and flooding continued over the next few years. In 1914, for example, Robinson reported that the usual summer storms began to fall in May rather

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39 On siltation of the reservoir see Rollin Ritter to W.H. Code, 22 June 1910, Box 120, GC, ID, RG 75, NA; H.F. Robinson to W.H. Code, 2 July 1910, Box 120, GC, ID, RG 75, NA; W.H. Sanders, engineer, to W.H. Code, 3 October 1910, Box 120, GC, ID, RG 75, NA; W.H. Code to the Secretary of the Interior, 18 October 1910, 5 January 1911, GC, ID, RG 75, NA. The siltation of the reservoir became a huge problem in later years, but is out of the scope of this thesis and is covered in detail elsewhere, see T.J. Ferguson, "The Impact of Federal Policy on Zuni Land Use" in Seasons of the Kachina: Proceedings of the California State, Hayward, Conference on the Western Pueblos, 1987-88, edited by Lowell John Bean (Menlo Park, CA: Ballena Press, 1989), 103; Thomas Wessel, "Phantom Experiment Station: Government Agriculture on the Zuni Indian Reservation," Agricultural History 61 (1987): 1-12; for the Hogback see Salter, asst. engineer to J.J. Granville, engineer, 27 March 1912 (telegram), GC, ID, Box 106, RG 75, NA; Hauke, 2nd. asst. CIA to Granville, 27 March 1912 (telegram), Box 106, GC, ID, RG 75, NA; Granville to CIA, 28 March 1912 (telegram), Box 106, GC, ID, RG 75, NA; Hauke to Granville, 1 April 1912, Box 106, GC, ID,
than July, “and our work has suffered considerable damage in consequence.” He claimed that July, 1914 was the wettest July New Mexico had ever seen.\(^4^0\)

Work on the Hogback ditch slogged away year after year, but it would never reclaim the 35,000 acres that John Wesley Powell had hoped for, or even the 20,000 acres that R.S. Connell claimed. And the siltation of the reservoir at Zuni rendered the Blackrock Dam almost useless.

These two projects never lived up to the expectations of the Irrigation Division. Lack of planning, Zuni and Navajo cultural obligations, and a capricious environment all conspired to make unworkable the Indian Service’s agricultural utopia. As America became more industrialized, the Indian Service was still entranced by the agrarian myth. Indians, like the rest of America, could be made whole citizens by learning the value of tilling one’s own soil. Richard Hofstadter once said that “the agrarian myth came to be believed more widely and tenaciously as it became more fictitious.” This was indeed true for the Indian Service. As farmers’ status began to decrease in the American economy and image, the Indian Service tried, in an almost backwards move, to create a new class of farmers. The Indian Service believed in a vast fiction in the Southwest: Indians were not capable of farming on their own, and it was the Indian Service, born out of an agrarian empire, that could make them realize the fruits of civilization. Not only did the Indian Service buy the myth, but it tried to indoctrinate Indians. In the end, the reverse was true. Myths about docile Indians, misperceptions of the environment, and a

\(^{40}\) H.F. Robinson to W.M. Reed, Chief Engineer, 17 July 1914; 25 July 1914, Box 104, GC, ID, RG 75, NA.
blind faith in the power of agriculture to civilize the Navajos and Zunis dashed waterworks projects on the Colorado Plateau.\textsuperscript{41}

Conclusion

Indians and the environment are frequently represented in the literature as defeated entities. The histories of both often have predictable plot lines and endings: before the white man came all was well; after contact both were crippled and eventually defeated. When Indians and the environment are written about together, they are portrayed as innocent victims of white cupidity, stupidity, and, often, malice. Alternately, Indians are often thought of as inextricable from nature. This is too simple a tale.¹

The Government did not always run rampant over nature or Indians, rendering them both defenseless and defeated. On the contrary, history is far more complex than that, and the Blackrock dam and the Hogback ditch demonstrate cases where the Indian Service misunderstood both nature and Indians, with costly results. In these two cases, the forces of the natural world and the exigencies of the Navajo and Zuni cultures kept these projects from being successful. Resistance to the efforts of the Irrigation Division did not come from either the environment or the Indians in a calculated fashion. Rather, as the waterworks projects got under way the forces of nature and the strength of centuries of accumulated cultural vigor kicked in and made work difficult, if not impossible. Again, the notion of agency comes into play. Indians on the Colorado Plateau exercised agency not so much as a contemplated response to changing

¹ William Cronon, "A Place for Stories: Nature, History, and Narrative," *Journal of American History* 78(1992): 1347-1376; Cronon describes what I am talking about as a declensionist narrative, one in which the "plot ultimately falls rather than rises," and the outcome is decidedly negative, 1357; for writing Indian environmental history see Richard White, "Indian Peoples and the Natural World: Asking the Right
conditions, but merely as all people do: they carried on with day to day activities that provide the structure for history and social change. W.H. Code summed up very nicely this idea when he realized that "their dances offer charms at all times not found in the monotonous round of daily toil." In this case, Zuni agency merely meant that they chose to dance, when they could have chosen to do otherwise. Carrying on with the prescribed ritual cycle of the year was not only charming, it was essential. And Code was right: working on a dam could not be nearly as satisfying, meaningful or, indeed, as fun as dancing. Thus, the Zuni choice to dance and not work was a utilization of their agency, but it fit into the structure of everyday life. The environment, too, merely carried on as it always had. It was only when the Indian Service attempted to alter previous ways of knowing nature that a clash occurred and we see Indian and environmental agency as resistance.¹

It might be tempting to look for calculated responses of resistance to the Indian Service's efforts. And if the search revealed a concerted effort to resist, then more research would be necessary to explore the motivations and shape of that response. For the time being, however, carrying on with the annual cycle that had developed separately from Indian Service efforts was the only evident response. The character of the responses, both from nature and from the Zunis and Navajos, to the Indian Service's reclamation efforts has shaped this thesis.

¹ W.H. Code to the Secretary of the Interior, 12 December 1905, Box 212, SC 190, RG 75, NA. There is evidence that could be fleshed out with further research that might support the hypothesis that the Zuni did resist in a more calculated manner. Over the years of Matilda Coxe Stevenson's ethnological research, 1880-1915, she noticed that rituals got longer and came more frequently; she also reported new rituals. There is no sure way of knowing whether this is related to the dam building, but the coincidence in timing is suggestive. On agency, see note 14 in the introduction.
Reluctance to embrace wage labor over domestic, subsistence labor is common phenomena among precapitalist peoples. Michael Taussig describes this phenomena as a clash between use-value and exchange-value modes of production. Making money as a worker on a dam and then being able to spend it on “things”—exchange value—holds far less meaning than planting corn to eat and honor as the stuff of life—use-value. Adherence to traditional use-value production rather than leaping into the wage economy always baffled the Indian Service. That is, why would Navajos continue to repair a small dam year after year when they returned from the mountains with their sheep when it was time to plant, if they could have a permanent dam that would supply water year round? John B. Harper was vexed perpetually by the Zuni when they would abandon work each winter to participate in Shalako. If the dam was built, adherence to ritual would no longer be necessary. The dam would replace ritual as the ordering agent in Zuni life. Rather than praying to the gods, one only had to keep the spillway clean. But agents and water planners who had been in the country only a short time could not expect simply to reshape forces that had been ordering life for centuries, or longer.  

More than simple reluctance to engage in a wage economy that was circling around them like a flock of vultures, waiting for the old ways to wither away, was the Zuni and Navajos immersion in a mode of production that did not embrace overproduction. Their economic orientation was not for the market; it was for use-value, not exchange-value. To be sure, by the 1890s the Navajo sold wool and blankets in exchange for cash; and some Navajos and Zuni left the reservation for wage work. But reorienting agriculture to produce for a market and abandon ritual in favor of ordered

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3 Michael Taussig, *The Devil and Commodity Fetishism in South America* (Chapel Hill: Univ. of North
water flow from a dam or ditch was another matter. The Indian Service was not able to manage water in the way they intended, and thus was unable to manage Indian life.\(^4\)

By the end of the period in question, contemporaneous reaction indicates that the Irrigation Division was doing more harm than good. They had wasted precious resources and had little to show for it. Indians may or may not have learned the value of work in the white world; that’s difficult to quantify. But it is certain that the reclamation efforts of the Irrigation Division were a failure. In 1913, Matthew M. Murphy, a long time, but disgruntled, employee of the Indian Service, spoke his mind in a letter and memorandum to Arizona Senator Henry F. Ashurst. The target of Murphy’s vitriol was the Irrigation Division, in particular the Blackrock dam on the Zuni Reservation. After witnessing years of destructive flooding continually washing out the project, and costs escalating year after year while production went down, Murphy attacked this white elephant with aplomb. His assault on the Indian Service strikes the reader as nothing short of apostasy. He pulled out of his quiver a battery of charges that in their perspicuity and candor reveal a project that was doomed from the start. Murphy’s insights into the reasons for the failure of the project reveal, for the contemporary environmental historian, issues that plagued not only the Zuni project, but others in the Southwest. Murphy wanted to launch a full investigation of the Irrigation Division, with himself at the helm. He was so sure that he would expose their wasteful ways that if he did not, he would resign from the Indian Service in “disgrace.”\(^5\)

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\(^5\) Matthew Murphy to Senator Henry F. Ashurst, 8 May 1913; 16 May 1913, Box 120, GC, ID, RG 75, NA.
Murphy’s sympathies clearly fall on the side of the Indians. Murphy contends that at the time the dam was authorized, the Zuni were prosperous and seemed to have a command of the environment. Why, then, did a dam seem imperative? The Indian Service, of course, did not ask them if they wanted the dam and Murphy avers that the Zuni never displayed a shred of interest in the project. Additionally, Murphy touches upon the flooding that wreaked havoc on the dam. He wondered: Why, if the dam was supposed to hold back floodwaters from spring run-off and summer downpours, the only type of water that normally flowed through the streambed, did the engineers building the dam not have an adequate understanding of the power of Southwestern freshets? According to Murphy, and I think that the record bears out his claim, the Indian Service began work on the dam really having no idea what they were up against. That floodwaters were to fill the reservoir behind the dam did not alert them to the possibility that those same waters might be destructive, not productive. After a systematic reading of the Annual Reports of the Commissioner of Indian Affairs, Murphy contended that in direct relation to worsening conditions at Zuni—continued flooding, siltation, and Indian disinterest—the Commissioner’s discussion of the project went down. It appeared that the Zuni dam was becoming an embarrassment. When the project was going well, the Annual Reports had lengthy, glowing, detailed descriptions of the success of the dam; as costs escalated, with little land under cultivation, the reports on the dam became virtual footnotes.

To Murphy, the Blackrock dam was a colossal waste of money. It was a project that the Indians did not want and did not need. While Murphy’s comments may be those of a disenchanted government employee, they do have value. With very little hindsight,
he picked up on several of the large themes that I have addressed. Most importantly, he understood the related issues surrounding the Indian Service's refusal to consult the Zunis which, in turn, ignored centuries of captured information regarding wresting a living from the Colorado Plateau and led the Irrigation Division to attempt a project in an environment that they barely understood. Too, Murphy grasped that the Blackrock dam, year after year, took precedence over other projects and was the bulk of the Irrigation Division's budget which meant that the Irrigation Division shunted aside other projects. Murphy seemed to think that, as do I, that the Irrigation Division's fatal mistake was its arrogant ignorance of Indians and the environment.\(^6\)

But, of course, Murphy's criticism did not go unanswered. W.M. Reed, superintendent of irrigation, responded with equal vigor to Murphy's critique. His arguments were sound, too. He claimed that conditions in the Southwest were changing so rapidly—increases in population, prime grazing lands falling into private hands—that the Indian Service was honor-bound to see to it that the Navajos and Zunis had adequate land from which to make a living. Indians did not realize that conditions were fast changing and that their lifeways would soon be obsolete. "Left alone, unaided and uninstructed he would not have foreseen the approach of such conditions and would have realized them only when he found himself facing starvation." Indian Service prescience would save the Navajos and Zunis.\(^7\)

\(^{6}\) *Ibid.*  
\(^{7}\) W.M. Reed, "Memorandum on Matthew Murphy's discourse on Commissioner's and others' mismanagement of Zuni Indian affairs," 26 April 1913, Box 120, GC, ID, RG 75, NA. That Reed's memo is dated several weeks before Murphy's letter is not a discrepancy. Murphy's report on the dam was written before Reed's response; I am simply using a copy of his report attached to his letter to Ashurst, which was sent after Reed's response.
Indeed, conditions were changing and few of the new settlers in the Southwest had much concern for the fate of the Indians, especially Navajos wandering about with their flocks. Reed was right, to a point, in saying that the Indian Service had the interests of the Zunis and Navajos in mind, but he did not address the mistakes made on the dam. He allowed that John Harper was too optimistic concerning how long it would take the dam to be finished and how much it would cost. But he was disposed to put down the failure of the dam in 1909 to nature and not Irrigation Division mistakes.

Reed was reluctant to accede to any of Murphy's criticisms. Had he done so he would have been indicting the agency he oversaw. While Murphy's report reveals some of the broad contours of the problem, Reed's response highlights one crucial problem: Irrigation Division refusal to see their own complicity in the failures of the dam. Throughout the period, the Indian Service, and later the Irrigation Division specifically, always found fault with the Indians or with the environment. Maybe this is not too surprising. But when held up against Zuni and Navajo participation in this story, the Indian Service comes off as having no say. Indeed, they position themselves in the story as merely being at the whims of the Navajos, Zunis, and the environment. I originally set out to show that the combined strength of the Zunis, Navajos, and nature guided waterworks efforts on the Colorado Plateau between 1883 and 1914. I was confident that this premise was a plausible one. It seems, however, that the engineers and bureaucrats of the Indian Service and Irrigation Division had done a far finer job of proving that themselves.

The story has no absolute closure; it is merely a part of a larger, more intricate narrative. But by taking a magnifying glass to a discrete portion of Indian history in the
Southwest, I hope to have fleshed out some of the complexity of Indian environmental history. Judging exactly what types of social change occurred among the Zuni and Navajo demands a longer-term analysis and a different lens through which to view the history. My modest goal has been to show that the Zuni and Navajo, and, of course, the environment, played a very active role in determining what type of social change did occur. The Indian Service was, to be sure, a vehicle for that change. But, and even often by their own admission, they directed the history less than the supposedly passive vessels of their wisdom: the Navajos and Zunis, and the natural world of the Southwest.
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