Global Deserts: Environmental History in the Arid Lands

Rachel Carson Center

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Sponsors: the Rachel Carson Center for Environment & Society, Ludwig Maximilian University; Temple University; the University of Arizona; the University of California, Davis.

Conveners: Louis Warren (UC Davis), Drew Isenberg (Temple University), Diana Davis (UC Davis), Katherine Morrissey (University of Arizona), Jeremy Vetter (University of Arizona)

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A conference on deserts in global environmental history convened on 14–15 September 2015, at the Arizona Inn in Tucson. The goal of the conference was to examine and discuss, in a comparative and transnational context, a wide variety of topics including (but not necessarily limited to) the changing understandings of deserts by both their indigenous inhabitants and colonizers; the influences of deserts upon human societies; and the impact of human habitation and resource use upon deserts from the pre-modern period to the present. Over four sessions—Empires, Water, Agriculture, and Science and Other Forms of Magical Thinking—participants explored topics such as mining, water, irrigation, tourism, scientific research, cultural ideas of deserts and schemes for turning them green.

All papers were pre-circulated two weeks in advance of the meeting. At the conference, a designated commentator selected from among the participants opened discussion on each paper. General discussion among the participants followed.

Session 1: Empires

DIANA DAVIS opened with her paper entitled "Deserts and Declension: The Surprising Case of the Middle East." The arid lands of the Middle East and North Africa were the earliest deserts known to the West. The notion that deserts in the Middle East were created by deforestation and overgrazing emerged only during the age of European exploration and imperialism. Although noted for being dry, rugged, and remote, "they were not conceived as ruined or deforested spaces, nor regions where crops should be expanded." Some early observers noted large herds of cattle and thriving communities in certain locations. The desert, in other words, had multiple possibilities, but was not seen as a landscape in need of "redemption" or reform. The rise of Christianity brought a shift in perception, as deserts came to be perceived as punishment for the sinful people who lived in them. But even until the early nineteenth century, European explorers celebrated the correspondence of Middle Eastern deserts with Biblical description. They hailed deserts for their surprising productivity and avoided declensionism until the Enlightenment and the advent of desiccation theory, which linked deforestation with desiccation and the creation of deserts by people. This theory gained strength in the nineteenth century, and was coeval with a thesis of "Oriental despotism" that came to pervade western writing about the region. During the late nineteenth and early twentieth-centuries, the deserts of the region were seen ever more as artifacts of social chaos, and a justification for imperial rule.

MAYA K. PETERSON discussed the topic of her paper "Bringing Dead Lands to Life: Russian and Soviet Encounters with Central Asian Deserts." Beginning in the nineteenth century, Russian (and later, Soviet) authorities sought to turn arid Turkestan into an arable region for colonization and settlement. Reforestation campaigns ensued, and on an even greater scale, so did reclamation campaigns to resuscitate or reanimate the deserts. The U.S. West served as the primary inspiration for the creation of "the California of Russia" in Turkestan. Many Russian engineers traveled to the United States to study water management, and in the years before World War I, American entrepreneur John Hays Hammons sent engineers to Russia to assist in the irrigation of Turkestan. Although these efforts failed, they gave birth to a shared language of modernization and progress in the U.S. West and Russian Central Asia, and American knowledge of arid lands helped to legitimize Russian rule of Turkestan. The irrigation of Central Asia was closely connected to Russia's "civilizing mission," and the theory that deserts were products of poor governance reinforced engineers and officials in their belief that greening Turkestan would justify Russian rule of the region. Russian and Bolshevik leaders alike appealed to the Orientalist imagination, drawing on the myth of the Assyrian queen Semiramis, a "tsarina" who "made the waters flow" and "transformed the barren land into a fertile land" as precedent for their own efforts. In the Soviet era,

intensification of reclamation led to the draining of the Aral Sea, now "the Aral Desert" to many Central Asians for whom these campaigns have resulted in larger deserts, and interlocking environmental and public health crises, that together constitute one of history's great reclamation disasters.

GARY REGER spoke about his work on "Greeks and Romans in the Sahara Desert—Ideology and Experience." Surveying Greek and Roman literary tropes of the Sahara from the seventh century BCE, Reger's paper explores how they contributed to theories about climate and anthropology in the ancient world. Tropes of aridity, tracklessness/emptiness or solitude, and violence characterize the literary record. These tropes were not completely false, and they were not universal. Moreover, they could be overcome. The Romans created networks of cisterns, wells, and fortifications around them along a new Hadrianic road to ensure ease of travel, "a far cry from the wild, empty desert of our literary texts." Nonetheless, the trope of aridity persisted, particularly for Christian monks who saw it as a test of their spirituality. Although the danger of getting lost and the prospect of solitude informed Biblical perceptions of the desert, monasteries for ascetics in Egypt were located only a few hundred meters from settlements and were themselves the destination of many visitors. Desert roads appear to have had sizable regular traffic and were relatively easy to travel, and the desert was anything but trackless. Greeks, Romans, and Christians all warned of dangerous creatures in the Sahara, but people were more dangerous, as raids and thievery seem to have been far more common. The desert was populated, too, with gods—notably Pan—who ensured the safety of travelers. Nonetheless, the tropes of tracklessness, aridity, and violence persisted throughout the Greek and Roman periods. Whatever their fate on the ground, deserts endured in the minds of the literary world.

EMILY YEH presented the paper "Fighting the Sands in Dzorge: On Causes and Responses to Desertification in the Eastern Tibetan Plateau," a collaborative piece she wrote together with **HUATSE GYAL** and **KELLY HOPPING.** The authors questioned the effectiveness of China's "seemingly perennial war against the encroachment of deserts." Many observers and political leaders call to push back desert that occupies about one-fourth of China and which is said to have been a result of overgrazing and deforestation. But how effective have reclamation efforts been? As part of this campaign, China has planted some 66 billion trees since 1978, but most of these are non-native poplars and aspens, and only about 15 percent of them have survived. Exploring the eastern Tibetan Plateau, the authors have utilized remote sensing, oral histories, interviews, and secondary literature to analyze and test assumptions about desertification of the Dzorge Wetlands on the Yellow River. Warning about the detection of spurious trends, the authors suggested that climate change, drainage, and privatization of the wetlands appear to have reduced moisture and

increased desertification, although a great deal more weather data needs to be collected. Local Tibetans reject overgrazing as a cause of wetland desiccation, and blame instead the effects of mining and the state's campaign of eradication of burrowing pika (whose behavior mixes soil and allows it to retain moisture). Community efforts at desertification control have incorporated the knowledge of local herdsmen and have had some success (albeit limited) in planting grass to restore grassland. Volunteer efforts by Han Chinese students who initiated a campaign to re-plant the region with native grasses were met with local ambivalence and some hostility, and eventually faded.

Session II: Water

MAURITS ERTSEN began the second session by introducing his work "Arid Arenas of the Mind: Exploring Deserts, Irrigation, and Marginality." Drawing on diverse examples ranging from the Hohokam of the ancient U.S. Southwest to the Assyrians and the Zerqa triangle of Jordan, this paper illustrates the ways in which irrigation did not so much transform deserts and their societies as change them at the margins. Irrigators did not create a new, well-watered land, so much as an approximation of "flood-like gifts" that often merely enhanced the effects of seasonal rainfall. Thus, not all irrigated landscapes were like the classic, mostly Asian, examples of fully-saturated, terraced systems, but much more tenuous systems that continued to be bound by desert limits.

STERLING EVANS continued with his paper "Dams in the Desert: An Environmental and Agricultural History of Water in Sonora, Mexico." Starting with the observation that there are now 42 dams (one-third of them high, concrete dams) diverting 32 rivers in Mexico's state of Sonora, this paper seeks to explain how the aridity of the region has transformed culture and society there. Once known as "the faraway desert," Sonora is now "Mexico's Mesopotamia." The state has been a primary actor in this shift: one-fourth of all federal funds for irrigation have flowed to Sonora since the 1930s. The Yaqui Valley makes a particularly useful case study. Yaqui people were removed so that state irrigation projects could subsidize the acquisition of land by corporations and foreign investors. Water flowed to corporate farms as the companies that ran the dams stinted downstream *campesinos.* Salinization of reservoirs, loss of desert biodiversity, pesticide and fertilizer run-off, and other environmental threats plagued the river basins. Evans ended by questioning the perceived hegemony of the state, for private actors and local politicians played a strong role in the placement, construction, and management of dams and irrigation systems.

FERNANDO WILLIAMS concluded the session with a description of his work "Infrastructure and Water Management in the Patagonia Desert: Five Moments in a Landscape History." Tracking five key shifts in water management in the Patagonian Desert, this paper was one of several to raise

a key question for the conference: what is a desert? In the minds of planners and engineers in Patagonia and elsewhere, the desert "stood for barbarism," but over the nineteenth century the Pampas ceased to be desert and the word came to be applied more strictly to Patagonia. The five key shifts included: agricultural colonization and irrigation of the Pampas by a community of Welsh immigrant nonconformists whose operations were taken over by the state in 1943; state-private partnerships in developing dams and irrigation for cities by awarding large concessions to railroad companies in the Pampas; the shift to seeing Patagonia as the desert that needed conquering and the development of state surveys of the region with an eye toward development; the rise of regional planning centered on river basins; and the privatization of state dams followed by the end of the dam era with a new environmental consciousness about their ecological costs.

Session III: Agriculture

ANITA CARRASCO kicked off the third session with an introduction to her paper "The Pipelines of Chuquicamata Mine: Their Impacts on the Atacama Desert and its Indigenous Inhabitants." Carrasco's paper explored how the capture of scarce water in the Atacama Desert by the Anaconda Copper Company transformed indigenous livelihoods as well as the desert itself. The only paper at the conference that was expressly ethnographic, "The Pipelines" explored how mining companies diverted streams to mines through a system of pipelines, desiccating customary water sources, impeding indigenous pastoralism, and at the same time creating new forms of labor, as indigenous people took up work to maintain the pipelines in remote villages. The paradox here is that the pipelines provided jobs for the natives as they destroyed native livelihoods. In the discussion following the presentation, some participants observed that the central paradox of the paper is indeed a key dynamic at the heart of capitalism and colonialism the world over.

ADAM GUERIN continued with his piece "Land, Labor, and Hunger on the Desert Frontier, Morocco, 1925–1939." The European belief that northeast Morocco was desert determined the shape that colonial modernization would assume, inspiring a reform that empowered a French investor in the 1920s to radically transform a region that had long remained insulated from government control. This desert was in fact a complex landscape of micro-ecologies, most of them arid or semi-arid, where communal farming and transhumance formed the lifeblood of the region's nomads. To the state, the term "desert" represented not only a category of land, but of nomadic "pre-modern" ways of life. The French entrepreneur Pierre Maitre, proposed to "modernize" northeast Morocco through applied science in sheep farming and biofuels production, and colonial officials paved the way by labeling the areas as "desert," and *terre morte,* "dead land"—a legal category that made the entire region the private property of the sultan, who then handed it over

to Maitre. Within ten years, regional French officials voiced objections, emphasizing that the region should never have been alienated from its occupants, who had been radically impoverished by Maitre's expropriation of water sources for a development that never materialized. By the 1940s, the land had been sold-on to foreign mining and agricultural firms. The desert embodied anti-modernism, waiting to be swept away by the colonial power; naming the region a "desert" brought disaster to the region's inhabitants as their declining fortunes worsened the impact of drought, famine, and epidemics.

MEREDITH McKITTRICK discussed her paper "The Quest to Abolish the Desert: A History of Schemes on Three Continents." Between 1918 and 1939, the quest to abolish deserts became a global preoccupation. Engineers and geologists proposed diverting rivers to create massive lakes and irrigation in the arid and semi-arid interiors of central Australia, northeastern Brazil, North Africa, and Southern Africa. These schemes emerged in response to existential fears about the future of white people, supposedly threatened by changing climate and racial degradation. Although none of these schemes came to fruition, for decades they preoccupied engineers, planners, and popular media. The scale of the proposals was immense. A German architect named Herman Sorgel proposed abolishing the Sahara by damming the Straits of Gibraltar, creating an inland sea in the Sahara and reducing the level of the Mediterranean to bring regular rain to North Africa—or so Sorgel claimed. Schemes like this had colonial-era precedents; plans to flood parts of North Africa dated back to the completion of the Suez Canal in 1869. In all such cases, proponents misread evidence of water erosion, fossil riverbeds and water channels, and other geological features, as signs of ancient lakes and seas, arguing that their plans would in fact *restore* past environments. To them, nature needed adjusting in order to restore the land to its former state. Moreover, engineers pushing these proposals were often invested in fears of climate apocalypse, and all were invested in "saving the white race," whose survival in far-flung settler states seemed endangered by low (and presumed-to-be declining) rainfall. The future of the white race could, it seemed, only be secured by restoring the desert to an imagined, edenic past.

RUTH MORGAN ended session three with "Dancing in Deep Time: Antarctica and the Climates of Australian Settlement." This paper "explores the ways in which Antarctica has informed settler anxieties about aridity and water scarcity in Australia since the early twentieth century." Antarctica and Australia are the driest continents on earth and their climates are intimately connected, with profound consequences for each. Over the last fifty years, Antarctica is the only continent that has not warmed; westerly winds that once brought rain to southern Australia have moved south, trapping cold air over the Antarctic while desiccating southern Australia. A history of European settlement in the region suggests an interaction between climate and cultural perception.

T. Griffith Taylor delimited southwest Australia's area of "reliable" ten-inch annual rainfall in the early 1900s, and a wheat boom commenced. But farmers, seduced by boosters and a series of wet years, pushed into areas of less regular rain. A glut of grain on the market made farmers all the more vulnerable to the disastrous drought that came in the 1930s. But after World War II, the Australian government again encouraged settlement in lands of marginal rainfall. Scientists began to warn of the likely impacts of climate variability on these farmers in the 1970s, when drying became noticeable. And by the 1990s, scientists concurred that global warming was causing a long-term drying trend in southwest Australia, as moist, westerly winds moved south. As a result, water supplies to the city of Perth have become strained and wheat farmers struggle to produce. The future of Australian settlement hinges, as it ever has, on what settlers can create out of the climate made by the winds that shift between continents.

Session IV: Science and Other Forms of Magical Thinking

KATHERINE MORRISEY and **MARCUS BURTNER** began the fourth session by presenting their piece "Desert Transits and the Global Imaginary: U.S. Arid Lands Scientists at Home and Abroad." From 1890 to 1930, driven by the needs to facilitate irrigation agriculture, investigate arid lands ecology and to promote scientific knowledge, American scientists—often with federal government support—thought globally to solve local problems. They used the Sonoran Desert as lab and litmus test to create intellectual and agricultural models, and used their studies of far-flung deserts, especially in Africa, in efforts to remake the Sonoran. Through an era of shifting scientific, professional intents, they envisioned a global imaginary and swapped plants, seeds, hydraulic technology, and cultural ideas between deserts on different continents. Leading scientists of this movement included Edgar Alexander Mearns, who collected over 30,000 specimens for the American Museum of Natural History and the USDA; Daniel T. Macdougal, who led the 1907 expedition from Tucson to the Gulf of California to transect new scientific ground; Jacob Corwin Blumer and Volney Morgan Spalding whose study of desert plant communities acquired wide influence, and Robert Forbes, who provided new insights into plant and animal life in the Colorado River Delta. These efforts became more pragmatic over time; Forbes in particular, after transplanting North African plants to the U.S., turned his expertise around to work for French colonial authorities in the cotton fields of the Upper Niger River valley. This cross fertilization—the American southwest in Africa and North Africa in the southwest—underscores the power of the global imaginary. Through their transits, these scientists tied the borderlands of the American southwest to colonial projects in Africa. The legacies of their efforts, both cultural and material, continue to the present, from date palms in Arizona to progressive conservation landscapes.

ANDREW ISENBERG followed with his paper "Remaking the North American Desert, 1855–1857: The Introduction of Camels to the 'American Palestine'." The arid and inhospitable deserts that the United States acquired from Mexico in 1848 were unlike any environments that mid-nineteenth-century Americans knew from their own experience. Yet in a cultural sense, Americans were intimately familiar with deserts. To Americans steeped in Scripture, the region was, as Charles L. Brace called it, an "American Palestine;" many Americans likened the new deserts to Biblical deserts characterized by desolation and sin. To conquer this exotic and foreboding environment, Americans looked to an exotic animal: camels—animals that in Scripture are frequently associated with wealth, sovereignty, and military power. In 1855–1856, an American delegation traveled to the Ottoman Empire and acquired seventy-five camels, which were imported to Texas to create an experimental "Camel Corps" within the Army. The project had the support of the Secretary of War, Jefferson Davis; the U.S. Department of Agriculture, which deemed camels a matter of "national importance;" and America's foremost naturalist, George Perkins Marsh. Yet the experiment was a disappointing failure, pointing to the limits of both Americans' cultural vision of the possibilities of the Western environment and to the ability of Old World fauna to thrive in the New World. The failure prompted Marsh to reassess desert land use; by 1864, not only had he abandoned the idea of introducing camels to North America, but he was arguing that camels should be driven from all desert environments in order to initiate the transformation of deserts to forests and farmlands.

LOUIS WARREN continued with his paper "Apocalypse in the Arid Lands: Science, Religion, and Magical Thinking in the Drought of 1886–1896." The arid lands of the United States proved a major impediment to western settlement and American development, and never more so than in the severe drought of 1886–1896. In addressing the severe shortage of rain, Americans turned equally to science, religion, and magical thinking. Corporate executives and western politicians turned at times to rainmakers who claimed the ability to bring water from the skies. Most rainmakers were white men who posed as scientists, but settlers in Nevada were swayed by the weathermaking claims of Wovoka, the Northern Paiute prophet whose visions of world renewal initiated the Ghost Dance Revival of 1889–1890. Of course, Americans also turned to technology and engineering, especially John Wesley Powell's 1890 effort to have the U.S. Geological Survey map and irrigate the arid region. Powell's rationalism seemingly stands out from the spiritual practices flowing through this period, but a closer examination suggests that even the most rational approaches to drought were infused with religion and magic. For all the rationalism of Powell and the reclamationists, a heavy strain of spirituality also ran through their work. Irrigation engineers and promoters like William Ellsworth Smythe saw their work as fulfilling God's injunction to Adam, to "subdue the earth." Partly through Smythe's exertions, irrigation took on a more religious tone in this period;

the word “irrigation” began to share space with “reclamation.” The term that once connoted recapturing lapsed believers for the true church had now come to imply the redemption of the garden from the wilderness. Powell himself eschewed religious inspiration, but even his notions of irrigation belied a deep faith in the utility of rivers for making farms from the desert, and in state-managed development to accomplish it. Arid lands and arid seasons brought on visionary moments, in which Americans were as inspired by magic and religion as they were by science. In our own time, “climate deniers” have inherited the mantle of America’s magical thinkers.

On the night of Sept. 15, three contributors—Sterling Evans, Louis Warren, and Meredith McKittrick—gave public presentations of their work at a panel entitled “Water Schemes in Arid Lands: Global Historical Perspectives.”

-- Louis Warren