John Wesley Powell and the Mapping of the Colorado Plateau, 1869–1879: Survey Science, Geographical Solutions, and the Economy of Environmental Values

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In 1869, John Wesley Powell led an expedition down the Green and Colorado Rivers through the Grand Canyon, the last “great blank space” on the map of the continental U.S. In the work of filling in the continental map, Powell and others in an emerging community of government scientists in Washington anticipated a new set of concerns over productivity, order, and the limits of natural resources—including land itself—in the arid lands of the West. This article examines the historical geographical processes through which Powell’s maps of an unexplored region gave way, in roughly a decade, to his maps of proper land use, epitomized by his 1878 Report on the Lands of the Arid Region of the United States, which is still conventionally recognized as a foundational piece in American environmental thought. Focusing on the work of the Powell Survey (1869–1879), as well as Powell’s lesser-known work as a special commissioner for the Bureau of Indian Affairs (1873–1874), the article situates the maps, censuses, and expert advice produced during Powell’s early career as part of a wider traffic of knowledge linking Washington to the western territories. The article develops a broadly materialist geographical analysis to explore how the production of knowledge about people and place on the Colorado Plateau articulated with the westward geographical expansion of systems of value and signification. It thus raises questions about the relations between environmental values, on the one hand, and the scientific and political work of valuing environments, on the other. Key Words: environmental values, governmentality, history of science, John Wesley Powell, property.

Let us not gird science to our loins as the warrior buckles on his sword. Let us raise science aloft as the olive branch of peace and the emblem of hope.

—John Wesley Powell (1882, 70)

In Beyond the Hundredth Meridian ([1954] 1992, 47), Wallace Stegner’s widely read biography of John Wesley Powell, a moment of extraordinary geographical coincidence occurs when, as Powell and his crew are camped at Green River Crossing, Wyoming in May 1869, preparing to embark down the Green and Colorado Rivers through the Grand Canyon on the last exploration of an unmapped region in the U.S., “[T]he first transcontinental train crossed the bridge above them and by its mere passing drew a line between periods of history.” Placing these events together, Stegner marks what seems a profound dual movement in the transformation of the American West: the simultaneous “closing” and “opening” of space and frontier. Interestingly, however, this crossing of paths with the railroad went unremarked in Powell’s own many published accounts of the exploration (1875a, 1875b, 1875c, 1875d, [1895] 1961). If it happened—and there is no reason to doubt it—then the “line drawn between periods of history” was less obvious to Powell than it was to Stegner. But then, throughout his career as an explorer, scientist, and bureaucrat, it was the mapping of geographical spaces and boundaries that mattered most to Powell, not historical ones. This is not to say that he was unconcerned about the “closing” of America’s western frontier, but to specify that he saw filling in the empty spaces of the map, and the construction of boundaries at a number of spatial scales, as practical solutions—in science and in government—to the problems raised by this new sense of geographical limits.

Positioning Powell against this backdrop of the train crossing the western landscape, Stegner had good reason to admire him. Powell spent much of his career arguing for land policies that would reflect the special value of water (and access to water) in the arid lands, and he did so at least in part to protect the region from capitalist irrigation companies and land speculators. In his landmark Report on the Lands of the Arid Region of the United States ([1878] 1962), Powell proposed a new land-use classification scheme for the arid parts of the country based on observed physiographic characteristics. He went so far with this proposal as to include plans for communitarian irrigation districts that would manage the water on a local basis. Long after Stegner (1957, xiv; cf. 1962, 1980, [1954]...
1992) solidified Powell’s place as a hero of conservation thought and an advocate of government science “in the public interest,” Powell’s Report is still widely known, as Benton and Short (2000, 58) put it in a recent anthology, as “the first serious attempt to introduce an environmental sensitivity to federal policy.” Yet much less has been said about the specific contexts and practices through which Powell came to know these environments, or about the purposes that this knowledge was intended to serve.

This article examines the work of survey science, cartography, and expert advice as governmental mediations between Washington and the western territories during Powell’s early career. The period between 1869 and 1879 is of special importance here because it is bracketed on one side by Powell’s first Grand Canyon expedition (which helped to earn him a permanent place in the western surveys and in Washington’s scientific establishment) and on the other by the second printing of his Report and the subsequent consolidation of the four western surveys into the U.S. Geological Survey (USGS). Focusing empirically on what came to be called the “Geographical and Geological Survey of the Rocky Mountain Region,” or the Powell Survey (1869–1879), as well as Powell’s lesser known work as a special commissioner for the Bureau of Indian Affairs during 1873 and 1874, I intend to raise a number of new questions in light of theoretical concerns for what I will call the “traffic of knowledge”: How did the spatial constructions of territory produced through maps, censuses, photographs and other survey techniques mediate or facilitate political relations between the capital and the western territories? How did Powell’s work—and his protoenvironmentalist land system—fit in with (or against) the hegemonic processes of western expansion, including the expansion and redefinition of systems of property, economic value, and land use in arid environments and the related dispossession of Indian lands? And finally, if the Powell Survey—and government science in general—contributed towards the projection of territorial and epistemological control over the region and its native people from Washington, then what normative values governed the practices and findings of the survey itself?

All of these questions are complicated by Powell’s position on most of the issues of his day as a populist and a progressive; they are also complicated by Powell’s rather heroic legacy in environmental thought. In Stegner’s standard text, for example, problematic notions of Powell’s complicity in (let alone his expert advocacy of) the “collection” of Native Americans and their “removal” to reservations are largely left out of the story. Indeed, few connections have been made between Powell’s ethnological work and his ideas about land reform in the West. However, I will argue that, for Powell anyway, such connections were vital precisely because the traditional land-use practices (and social organization) of the Native Americans—not unlike the agricultural capitalists against whom Powell is typically pitted—disrupted the efficient and rational government of nature, territory, and value in the West.

And yet, as historian of geography Preston James (1979, 117) describes it, Powell simply “had an insatiable curiosity about the blank places on the maps, and about the ways of living of the inhabitants of those areas.” It is telling here that the prescriptive nature of the “blank place,” which makes sense only in opposition to a future (and more fully prescriptive) mapped space, is blurred over by James (see Carter 1988; Harley 1988, 1989, 1992; Brealey 1995; Thongchai 1997). How else could the meaning of the “blank places on the maps” shift into actual “areas” where inhabitants live in the very same sentence? As Brian Harley (1992, 532) suggests in a different but related context, “We are confronted with the ultimate cartographic paradox. The map is not the territory: yet it is the territory. In America, cartography is part of the process by which territory becomes. The paper dispositions and anticipations of the map often preceded the ‘real’ geography which we seek so earnestly to triangulate.”

Looking at the processes through which Powell’s maps of unexplored regions gave way to his maps of appropriate land and resource use, I argue that, in the work of territorial expansion, cartography—and, more generally, the fundamentally spatial arrangement of survey knowledge—was an effective form of representation (for the state, if not always for Powell himself) precisely because it excluded so much: namely, the violence that was necessary for Washington to make both its territorial and its epistemological moves west. In turn, the cartographic constructions of territory, and the blurring of distinctions between the map and the territory, made it increasingly possible for Washington’s political and intellectual community to conceptualize the region as a strategic field of intervention and, in many cases, to produce new spaces, boundaries, and classification schemes in the territory itself. However, as I will elaborate in what follows, while such “geographical solutions” as land classification, irrigation districts, Indian reservations, and severalty laws could at times be mapped into the western landscape, the violence that these land systems sought to exclude was not easily mapped out, even through the work of heroes like John Wesley Powell.

Before returning to Green River Crossing in 1869 and the brink of cartographic closure, it is necessary to define more precisely the nature of this work, in Powell’s day
and in our own. The next section thus begins with a brief discussion of the complexity of Powell’s heroism for environmentally minded constituencies, a complexity bound up, I argue, in the overlapping historical-geographical processes of state formation and knowledge production. Building on David Harvey’s (1996) dialectical treatment of the problem of “valuing nature” under capitalism, I begin to elaborate the questions raised above by exploring, in a general sense, the place of science and state environmental management in the development of environmentalism and environmental values in market economies. However, the relationship between economic value and normative cultural values (such as environmentalism) is notoriously slippery (Mitchell 1999, 66–88), perhaps especially so when it comes to assessing the role played by putatively objective, “value-free” science in the evaluation of environmental problems (see Harvey 1974). So, to help make these connections between value and values and to better explain the discursive milieu in which Powell worked, I turn to Michel Foucault’s (1991) notion of governmentality and to related, but more explicitly spatialized, studies of knowledge, power, and the representation of nature and territory (cf. Latour 1987, 215–57; Harley 1988, 1989; Harley and Zandvliet 1992; Edney 1997; Scott 1998; Braun 2000; Hannah 2000; Demeritt 2001), to examine the varied traffic of knowledge engendered by the western surveys and the growing community of government scientists centered in Gilded-Age Washington. By opening Powell’s survey science and his proposals for land reform and federal Indian policies, in this sense, to a revisionist historical geography of knowledge production, this article situates the development of environmental values in Powell’s work alongside the optimizing governmental values of efficiency, order, and productivity and, at the same time, across the last “blank space” on the map of America’s closing western frontier.

**Heroic Science and Environmental Values**

By now Powell (Figure 1) is a hero several times over, so to make the argument I have sketched above is to confront a number of heroic myths about him, and about science and environmental values under government patronage more generally. If Powell first gained acclaim, in the decade following the Civil War, through the success of his Grand Canyon expedition (a story that remains all the more compelling since Major Powell, a geology professor and wounded veteran, accomplished the feat with just one arm), then, in the mid-twentieth century, after boom and bust cycles of resource extraction seemed to validate many of Powell’s warnings about unfettered capitalism in the arid West, Stegner found in Powell a fitting hero for American environmentalism and for an ecologically minded western regionalism. Yet, as the environmental historian Donald Worster (1997a) points out, Powell has also become a hero for some of the more instrumentalist adversaries of contemporary environmentalism: the environmental managers, hydraulic engineers, and government planners residing in state institutions. And both groups, of course, are convinced that Powell would be on their side today (Worster 1997a). As Worster (1997a, 43) puts it, Powell has experienced “the fate of heroes throughout history. Their ideas and achievements get transformed by later generations into cultural symbols that are meant to unify societies and overcome their differences. Heroes exist to bring people together, to rally them around a common cause.”

Or causes. The multiple and even conflicting uses that Powell has been put to are not surprising, for, as Worster (1997a, 43–44) continues, “[H]eroes do more than unify or lead their societies through difficult times. They also embody their societies’ contradictions, covering them over rather than resolving them. Thus, their very work is to transcend contradictions, although in doing so they may work to confuse or obscure.” This is precisely why it is important to re-examine the historical facts.
about our heroes and the contexts in which they worked. The point is not simply to invert the cultural symbolism by turning them into villains (cf. Hess 1997; see Worster 1997b), but rather to recover some of the complexity—and some of the still unresolved tensions and contradictions—that heroism "works to obscure." Before I turn in greater detail to Powell's career during the 1870s and the contradictions embodied in that work, I begin in this section the task of opening Powell's heroics—and, ultimately, his politics—to a geographical critique that emphasizes the mediating role of science, surveys, and cartography in the relations between Washington and the American West. At stake, then, is a reassessment of Powell's place in the historical geography of westward expansion and environmental resource policy, and with it, an opportunity to raise questions that move beyond the vagaries of "environmentalism," "environmental values," and "environmental sensitivity"—which Powell has since been associated with—to ask more specifically about the historically and geographically embedded social processes through which environments are valued.

**Value and Environmental Values**

Examining the relations between political values and environmental-ecological issues, Harvey (1996, 176) remarks that not only is environmentalism capable of serving a broad range of issues, cutting across the traditional ideological spectrum, but environmentalists “also can adapt to diverse political positions while claiming to be beyond politics in any normal sense.” It is in this sense of an environmentalism apparently rooted in the interests of nature itself, rather than in specific sets of political, social, or economic interests, that scientists and other producers of environmental knowledge have long had a special role to play. From the example of two soil scientists writing in 1939 who made the racist, paternalist argument that Africans were incapable of managing their own soil resources, Harvey (1996, 182) identifies an ideology of environmental management whereby

in the name of the environment, all kinds of restrictions should be put upon the rights of “others” while conferring rights (and obligations) on those who supposedly have the knowledge and the high technology to control the problem. While few would now dare to be so blatant [as the aforementioned soil scientists], there is a strong strain of this kind of thinking in World Bank arguments and even in such a seemingly progressive document as the Brundtland Report. Control over the resources of others, in the name of planetary health, sustainability, or preventing environmental degradation, is never too far from the surface of many western proposals for global environmental management. As Harvey’s half-century jump from the concerns of late colonial European scientists to the Brundtland Report’s (World Commission on Environment and Development 1987) recommendations for “our common future” suggests, while the discourses, contexts, and—by all means—knowledge of environments all change, there are important historical and geographical continuities to this ideology of environmental management as well. Questions of whom the environments are managed for and how systems of value and values are reflected in legitimate and normative environmental knowledge are equally valid for interpreting late nineteenth-century anxieties over the “closing space” and diminishing resources of the North American continent as for their mid- and late-twentieth-century planetary corollaries (see Haraway 1989; Brechin 1996; Katz 1998; Neumann 1998).

Obviously, the point here is not to diminish or make light of regional and global environmental problems, whether contemporary or historical. Nor is it to discount the possibilities of scientifically knowing environments in ways that may be or have at times been beneficial to the amelioration of those problems. Rather, I want to call attention (with Harvey 1974, 1996) to the complex relations between the politics of environmental values, on the one hand, and the social processes through which value is attached to nature and environments, on the other. For Harvey (1996, 150), this means “coming to terms with dominant modes of valuation that were initiated practically with the development of capitalism and discursively developed through Enlightenment political economy.” What Harvey (1996, 150–75) has in mind here is more than just a story of nature’s commodification, but the pricing of nature as “natural assets” in money terms—as the only “universal yardstick of value”—is still at the center of his formulation. “Money prices attach to particular things,” writes Harvey (1996, 153; emphasis in original), “and presuppose exchangeable entities with respect to which private property rights can be established or inferred. This means that we conceive of entities as if they can be taken out of any ecosystem of which they are part.” This atomistic mode of valuation, contingent on property rights, is universal but highly unstable, as reflected in the very instability of money as a representation of value in market economies (Harvey 1996). However, if environments are attached in this sense to systems of value and circulation such that they are made susceptible, in Smith’s (1990, 49) memorable phrasing, to capital stalking the earth in search of material resources, then how can natural assets be managed in ways that go beyond the short-term interests of resource markets so as to prevent environmental crises and catastrophes and thus facilitate more long-term capital accumu-
lation? If there is a contradiction in this mode of valuing nature that would tend to make accumulation “unsustainable,” then how has it been resolved—if at all?

One resolution to this contradiction involves the socialization of environmental management. The long-term interests of capital accumulation could thus be looked out for, under publicly subsidized federal management, in their relations to specific environments, resource bases, and so forth. The managers of resources and environments would then require certain kinds of environmental knowledge compatible enough with extant systems of value to help them regulate, to a degree, the ways that privately owned resources could be utilized, or to assist in regulating interaction between private enterprise and the “public lands.” As I will show, Powell remains a complex historical figure because his ideas appeal to that twentieth-century ecological thinking that has sought, in certain respects, to overcome the atomistic modes of valuing nature that Harvey identifies above (see also Mitman 1992); at the same time, Powell’s work contributed to and was at times structured by the expansion of political-economic modes of valuation that facilitated the often destructive work of value extraction from nature.

The extent to which environmental problems and long-term interests can be adequately managed under a system bracketed by this mode of valuation and policy is clearly a matter of debate. However, this dialectical language of contradiction and resolution offers us a theoretical foundation for understanding the development of instrumental environmental resource management in the capitalist state in general, allowing us to inquire further about exactly whose long-term—and whose short-term—interests hold the greatest purchase in the regulation of environments “on the ground.” And yet the story is also more complicated than that. For if, as Harvey (1996) suggests, claims to superior knowledge and technology are indeed key leveraging points for those seeking the rights and responsibilities of managing resources and environments, then we need a better sense of how this knowledge comes about, and how it comes to be embodied in particular institutions. In other words, the socialization of specific forms of environmental management is not at all guaranteed, but must itself be socially and culturally produced.

Governmentality, Washington Science, and the Traffic of Knowledge

It is useful at this point to articulate these concerns for the valuing of environments with the development of the particular forms of state rationality that Foucault (1991) labeled governmentality, a concept that speaks to the historical emergence of “population” as understood in its relations to health, wealth, territory, and other natural and social elements, as a tactical field of government observation and intervention. This is no simple matter, and I will not attempt to summarize it here. For the purposes of this article, the point I wish to elaborate is that this new problematic of government—hinging on the tension between modes of observation used to construct a social or national body (for example, observation of the “regularities” of population dynamics through census-taking and statistics; see Hacking 1991; Hannah 2000), on the one hand, and the ability of the state, through measured regulation, to produce governing “effects” that impel proper conduct according to principles of political economy, on the other—resulted in the formation of new bureaucratic apparatuses and the concomitant development of new forms of knowledge (Foucault 1991, 102–3). This logic has been extended historically to account not just for populations, but also for the construction of knowledges detailing the “natural resources” available to them and, in some cases, in need of expert management (see Braun 2000; Demeritt 2001). The role of the state in the business of valuing of environments, then, becomes something more complex than that of a regulator between the short- and long-term interests of capital, for this very conflict of interests can be seen as a process constituted contingently and reciprocally with state formation and the production of knowledge (Braun 2000).  What is more, governmental observations and theories of regulation—as “mediations” not only between a field of observation and a (potential) field of state intervention but also, in terms of the positive and socially generalized sense of power outlined by Foucault ([1977] 1995), between the authors of governmental knowledge and a wider “public” audience—need not be directed solely by the state itself.

In the Gilded Age capital of Washington, DC, where the increasingly centralized federal state, consolidated under the Republican party during the Civil War, was being cast largely to promote Northern industry and finance along with western expansion (Bensel 1990; Lessoff 1994), new apparatuses for observation and the production of just this kind of governmental knowledge took root like never before in the U.S. (Hannah 2000). Much of the information collected for departments such as those of Commerce, Treasury, Interior, Agriculture, and War had an explicitly geographical character, whether dealing with spatial distributions of commercial activity and population or the regional surveys of the western territories that were accelerated (and later consolidated) so as to quite literally draw the arid lands of the West onto
the American map. At the same time, with this work of geographically ordering the western territories, for everything from topography, geology, and climate to such human geographies as the distribution of Native American populations and language groups and the status of the various treaties in the region, the American map was, in certain ways, affixed to the territory itself.

I will return to this point later in the context of the Powell Survey to examine how fixing the map to the territory worked in practice, and how it failed to do so, for this is the rub of Harley’s (1992, 532) “cartographic paradox”—that mapped territory becomes one sort of space and not another. For now, the point is simply that the regional surveys performed a particular kind of mediation between Washington and the arid lands of the Colorado Plateau. For there was more than a geographical character to the observations, measurements, photographs, paintings, and ethnographic objects that were routed from the arid lands to Washington, where they could be reconstructed—and often made available for public consumption—in maps, books, popular magazines, scientific journals, and museum and exhibition displays. The very movement of survey scientists, and the traffic of knowledge in which they engaged, was geographical work, and only through this traffic of knowledge—between Washington and the West, between science and government, between the natural and social sciences, and across the threshold of the public sphere—did the West take shape in Washington (Kirsch 1999). But “the West,” as an increasingly refined cartographic object, was not the only thing constructed by the maps, measurements, and reports of the surveys; the authority of the survey scientists themselves was also a product of their varied abilities to facilitate this geographical exchange.

Amongst the new cadre of predominantly male, middle-class, and former Union officers lucky enough to collect paychecks as government scientists, it is hardly surprising that a positive philosophy began to flower, best expressed in the proceedings of Washington’s burgeoning scientific clubs and societies and in museum displays (see Hinsley 1994; Stocking 1994; Kirsch 1999; Pauly 2000), based on the bracing conviction that, given the chance, the collection, mapping, and analysis of social and environmental data would lead to a rational basis for social and environmental control. While this advocacy of science (and scientists) in government was undoubtedly self-serving, it was also not without its broader theoretical and political justifications. Many in Washington’s scientific and intellectual community during the 1870s and 1880s were, like Powell, committed Lamarckians who freely extended ideas about the inheritance of acquired characteristics into the realm of social processes and institutions (Darnell 1969; Lacey 1993). And yet clear distinctions were made between the social and biological processes of evolution (see Powell 1882; Ward [1883] 1911), and these distinctions were invested with political implications concerning the role of government in public life. In a discussion of the “natural evolution of industry,” for example, while Powell (1881a, 43) argued that corporations were “the instruments through which nearly all the operations of society would eventually be performed,” he still, in an explicit rejection of then-popular Spencerian arguments for laissez-faire, cautioned that “[T]hey require regulation, and... the principal work of legislation would ultimately be the adjustment of the relations of corporations to the public and to each other.” In the meantime, government science, dovetailing with this vision of regulatory government, could be charged with nothing less than to guide the evolution of the American nation (Lacey 1993; Kirsch 1999; Pauly 2000). So, as the continental frontier gave way to the “closed space” of the map, as Powell’s observations of the physiography and limited agricultural capacity of the arid lands were woven into his calls for more efficient usage of land and water resources, science itself came to be seen—by government scientists like Powell (1882, 70), anyway—as the “olive branch of peace and the emblem of hope.”

What contradictions, then, might such a heroic sense of science cover over? Can the environmental values that came out of Powell’s work, with their basis in scientific environmental knowledge, be understood apart from the optimizing discourses of value on which the work of governmentality was made to turn? Or could scientific expertise, in effect, substitute for politics—or at least facilitate a just politics—for matters as complex (and, as may seem to us today, inherently political) as the distribution of public lands, the distribution and management of water for irrigation, and the social and political control of Native Americans?

These questions are not the same as those posed by Worster about the meaning of Powell’s heroic legacy, but they follow logically. For Worster (1997a, 44), it is the very “contradictions of modernity” that Powell’s heroism covers over: his devotion to scientific and technological progress, efficiency, and improvement together with his romantic sense of the sublimity of nature, the latter borne from the spectacular landscapes of deep geological time that he encountered during his explorations of the Grand Canyon and Colorado Plateau. Powell’s drive for understanding and legislating the limits to the technological control of nature in the West thus seems a fitting compromise. It is in this sense that Worster (1997a, 44) adds that “[W]e moderns... are less prepared than he...
was to reconcile [the ‘contradictions of modernity’] nor are we often even aware that the contradictions exist.”

As suggestive as this proposition may be, the implication here—that any effort to reconcile society’s contradictions is laudable, so long as it is rooted in the presumably shared environmental values of communitarianism, sustainability, and anticorporatism—is troubling, because the problem with Powell, as I will argue, is precisely that he resolved the contradictions of his times, and of the western landscape, too easily; he more or less mapped them away.

From “Great Blank Space” to the 1874 Atlas of the Territories of the United States

The maps from Washington, that put down only what is absolutely, scientifically known, leave a great blank space here of three hundred to five hundred miles long and one hundred miles broad. Is any other nation so ignorant of itself?


The “great blank space” of the Colorado Plateau in 1868 was a cartographic construction; only when the outlines have been mapped can an interior appear empty, ready to be written over with lines and names (Carter 1988). But it was no less real an opportunity for Powell, who was best known at the time, in the intellectual circles of central Illinois, as the self-educated professor of geology at Illinois State Normal University and the curator of the Illinois Natural History Society’s museum who had led amateur natural history excursions to the highlands of Colorado during the summers of 1867 and 1868. For the chance to be the one writing over the great blank space of the Colorado Plateau—even as three government-supported surveys were ongoing elsewhere in the West12—Powell scraped together funding from a number of sources, including the Illinois Natural History Society and the Illinois Industrial University, and arranged for free transport from the railroad companies and free army rations for his exploring party. In fact, these sacks of flour, bacon, coffee, sugar, and dried apples, together with a loan of scientific instruments from the Smithsonian Institution, constituted the whole of Washington’s support for the expedition. Still, as Powell and his crew of nine set out in four boats from Green River Crossing, it must have been obvious to them that the expedition could only succeed in filling in the map of the Plateau by bringing the region to Washington in the form of observations, measurements, and stories.

As Powell later recounted the experience of white-water rapids, boat wrecks, grueling portages, hunger, and despair for the readers of Scribner’s Monthly, a popular journal in which he serialized some of his geographical and ethnological explorations (Powell 1875b, 1875c, 1875d, 1875e), he stressed for his readers that the explorers themselves almost failed to make it out of the canyons. In one scene from the first Scribner’s article, for example, we find Powell stuck on a nearly vertical cliff, which he was ascending with boatman George Bradley to take barometric readings, and hanging onto his life by his one and only arm. “The moment was critical,” Powell (1875b, 306) recalls: “[I]t occurred to Bradley to take off his drawers, which he did, and swung them down to me. I hugged close to the rock, seized the dangling legs, and, with his assistance, was enabled to gain the top.” After this traumatic experience, Powell (1875b, 306) adds, “[W]e walked out on a peninsular rock, made the necessary observations for determining its altitude above camp, and returned, finding an easy way down.”

“Necessary” observations! Here on the pages of Scribner’s in 1875, more than in the subsidized supplies, is the nature of governmentality in Powell’s first expedition.13 That is, the very idea that such a heroic commitment to measuring air pressure and mapping elevation could be necessary reflects a great deal about the seriousness with which the “need” for precise knowledge of the new territory was integrated into the national imagination, for authors and readers alike. Moreover, once Powell arrived in Washington to report on his 1869 explorations to the Congress, the telling fact is not the minimal funding that was doled out before the expedition, but rather just how quickly Powell’s work was incorporated into the momentum of government-sponsored survey science afterwards. Trading on the publicity that the exploration of the Colorado had garnered in the national media (many in the press had speculated that the explorers were lost or dead), Powell wasted little time in finding continued support for his Colorado River survey, this time from the federal government. On 30 August 1869, Powell disembarked from the Colorado River, among six remaining in his exploring party,14 near what is now Lake Mead, Nevada. From there he found his way back to Illinois and, after a number of public lectures, on to Washington. In July 1870, an Act of Congress appropriated for Powell $12,000 “for completing the survey of the Colorado of the West and its tributaries,” though it was clarified for Powell that “No compensation, however, will be allowed for your services as Disbursing Agent” (letter from J.D. Cox to Powell, 11 March 1871, in Letters Received by Powell).15 However, these funds did support an astronomer, an assistant astronomer, and a topographer for “the determination of latitude, longitude, and altitude” (letter from J.D. Cox to Powell, 18 July 1871, in Letters Received by Powell), suggesting, following the limited scientific
results of the first expedition, that more disciplined observations would now be expected in Washington. The following year, a sense of at least semipermanence was attached to the project when Powell was allocated funds “for continuing the completion of the Survey of the Colorado of the West” and was, for the first time, given a salary of “three thousand dollars ($3,000—) annually during the time you are engaged in this work” (letter from J. Henry to Powell, 11 March 1871, in Letters Received by Powell; emphasis added). At this time, Powell was permitted to hire a photographer to “take such views as may be useful in illustrating the topography, geology, etc. of the region surveyed” (Henry to Powell, 11 March 1871).

Appropriations were thus maintained—and, at times, increased or decreased—one year at a time during the 1870s for what was to become the “Geographical and Geological Survey of the Rocky Mountain Region,” or Powell Survey. Fieldwork along the Colorado River, and later extending across the Plateau country in Southern Utah, included trigonometric surveys, topographic mapping, and geological investigations (and limited geological mapping; see Powell 1875a, 1876), but also surveys of botany and ornithology and—with perhaps the greatest zeal from Powell himself—surveys of native vocabularies and grammar, social organization, arts and technology, mythology, and archaeology.

Two points can be made about this transition from Powell’s 1869 exploring party to the Powell Survey proper. First, it is worth calling attention again to the escalation from the initial exploration of the Colorado Plateau to its more sustained survey and appraisal under government patronage. This escalation is not at all surprising given the belated date of the exploration in the context of ongoing settlement of the region, but the point is that the consequence of filling in the so-called blank space was to very quickly assert the need for more surveys and more maps. Along with the Hayden, Wheeler, and King surveys, its rivals for congressional funding at the time, the Powell Survey took up the cause of producing a national “self-knowledge” of the western territories, a knowledge constituted by spatial information that its proponents categorically expected to be of practical value for the army, the railroads, the Bureau of Indian Affairs, and various farming and mining interests. At the same time, this work contributed to the reserves of field experience and collected information on which the expertise of survey scientists such as Powell was based.

Second, the spatial ordering of information that resulted from this work was not merely a reflection of what was already “there” to be surveyed in the West. The cartographic logic traveled with the field scientists. As Department of the Interior Secretary Columbus Delano instructed Powell in a letter of 1 July 1874 (Letters Received by Powell):

In the prosecution of your survey, you will, when necessary, consult such Public Land surveys as have been made under this Department, in the field of your work, for the purpose of connecting the established lines with your system of triangulation, and of accurately designating on your maps the position of mineral claims. You will determine, as far as possible, the boundaries of Territories and Indian Reservations, and mark the same by suitable monuments, and will ascertain the position of all agricultural lands, and of such mineral lands as you may discover, by trigonometrical measurements, placing suitable monuments therefor on the guidance of the Surveyors General of the several Districts which may be explored.

If Indian reservations and mineral and agricultural lands were already there, then they were there in a chaotic state, at least when viewed from the outside. Only by connecting them to “the established lines” of trigonometrical survey, and by establishing monuments to connect the abstract space of the map to the particular physical space of the landscape, could their identity be fixed in place. “It will be borne in mind,” Delano’s letter continued, “that the ultimate design to be accomplished by these surveys, is the preparation of suitable maps of the country surveyed, for the use of the Government and of the nation, which will afford full information concerning the agricultural and mineral resources and other important characteristics of the unexplored regions of our Territorial domain.”

The logic of the instructions was to produce a set of scaled regional pictures of the West that could be sent back to Washington for evaluation and eventual publication, so that the maps and reports could ultimately be made available to “the nation” to facilitate the settling of the region and the exploitation of its resources. This was the cartographic ideal, anyway, that gave the extended metaphor of filling in the map such resonance, much as Edney (1997, 25) describes the reputedly standardized mapping of British India, by which “particular variations and contingencies were subsumed within a ‘house of certainty.’” Since the settlement and capitalization of the arid West were already occurring—in the Powell Survey’s “territory” in Southern Utah, as an endeavor highly circumscribed by Mormon Church authorities in Salt Lake City—the symbolic work of cartography also depended on the status of survey science as practical work. As such, there were practical questions to face: How, exactly, was the region to be scaled down? And what if the maps produced by the four western surveys directed by the War Department and the Department of the Interior did not show the same “important characteristics,” or were not easily combined as part of the same mapped world?
In 1874, these problems were to be resolved through a new **Atlas of the Territories of the United States**, to be produced under the Department of the Interior.¹² As authorized by Congress, the western surveys were now to be “conducted on a uniform system,” oriented towards the preparation of the Atlas. The new “instructions for the government of the Geological and Geographical surveys” created two classes of maps to be produced, “general” and “special” (Delano 1874). The general maps were further subdivided into topographical and geological, both to be made on a scale of four miles to an inch (1/253,440), and to be composed on sheets “twenty-six (26) inches long by thirty-seven inches wide—including the border, & to be folded once” (Delano 1874). Each general map would thus represent an area two and a half degrees longitude by one and one-fourth degrees latitude. Special maps could be graphed at variable scales and were to be made explicitly for the “purpose of properly representing mining districts; mineral, agricultural, pasture, or timber lands; or for other special purposes” (Delano 1874). In addition, steps were taken to ensure cooperation and to “respect the fields of operation” between War Department and Interior surveys (letter from W. Belknap to C. Delano, 23 July 1874, in Letters Received by Powell).

That the Atlas itself was never completed does not detract from the importance of the event, for as we will see, these “instructions for the government of the surveys” were translated into future work in the Powell Survey (including the 1878 *Report*), and the Atlas project was essentially swallowed up by the subsequent consolidation of the four western surveys into the USGS. The effort to create a uniform system of cartography for the Atlas, and for the prosecution of the western surveys more generally, reflected an increased demand in Washington for a spatially legible West that was tied as a matter of course to the prescriptive nature of the surveys. As the instructions for creating “special” maps for a class of productive lands suggests, in the mapping of the American West, the complex relations between spatial representation and reality were made to turn largely on issues of optimal land-use. If the blank spaces of the map made mapping, and then more mapping, seemingly inevitable, then this process of filling in the map—and the perception of closed spaces or frontiers—also called Powell’s attention, as we will see, to a new age of limits to expansion and a corresponding need for the efficient management of land and other resources.¹⁸ And so often obscured by the very idea of optimal land-use—and by the experts who justified that category—was the political question of just who was to be allowed to use the land optimally.

### Geographical Solutions

#### State Projects of Legibility and Simplification

To say that the implementation of new policies for the western surveys reflected a demand for increased spatial legibility of the region in Washington contains, as its corollary, the suggestion that postbellum Washington wished to turn U.S. westward expansion into a more legible process than it had been heretofore. I take this emphasis on legibility from Scott, who argues in his book *Seeing Like a State* (1998, 1–83) that modern state functions as diverse as the standardization of weights and measures, cadastral surveys, scientific forestry, and the creation of permanent last names can all be understood as “state projects of legibility and simplification.” “In each case, officials took exceptionally complex, illegible, and local social practices,” writes Scott (2), “and created a standard grid whereby it could be centrally recorded and monitored.” For Scott, this move—from the complex, illegible, and local to the comparatively simple, legible, and national—is necessarily a reductive process, geared explicitly towards the representation of what interests the state, and it is thus tied closely to the surveillance, regulation, and control of both people and environments. Only by achieving a “synoptic view”—precisely because it is selective and partial—can the state, in turn, impose its own logic of simplification on the reality observed.¹⁹

The “crowning artifact” of these state projects of legibility, Scott (1998, 35) argues, is the cadastral map, for “the very concept of the modern state presupposes a vastly simplified and uniform property regime that is legible and hence manipulable from the center.” His discussion of property mapping is important here because it bears directly on the relations among the perception of closed spaces, the production of value, and the mapping of the American West.

As long as common property was abundant and had essentially no fiscal value, the illegibility of its tenure was no problem. But the moment it became scarce (when “nature” became “natural resources”), it became the subject of property rights in law, whether of the state or of the citizens. The history of property in this sense has meant the inexorable incorporation of what were once thought of as free gifts of nature: forests, game, wasteland, prairie, subsurface minerals, water and watercourses, air rights (rights to the air above buildings or surface area), breathable air, and even genetic sequences, into a property regime. In the case of common-property farmland, the imposition of freehold property was clarifying not so much for the local inhabitants—the customary structure of rights had always been clear enough to them—as it was for the tax official and the land speculator. The cadastral map added documentary intelli-
John Wesley Powell and the Mapping of the Colorado Plateau, 1869–1879

...simplification: still places them under the same rubric of legibility and lands, with the presence of indigenous peoples, but he uses, as the latter commonly corresponded, in colonial the distinction between intensive and extensive land Powell was engaged. Scott (1998, 49) notes, for example, upheaval in property relations.

However, in recognizing that mapping and boundary-making strategies were essential to the need for legibility at supralocal scales, we gain a better sense of just how cartography has worked as a language of state rationality and power. Cadastral maps, in intensively settled regions, and geological and geographical surveys, in sparsely populated regions (especially recently colonized areas), facilitate the reification of a particular ordering or reordering of physical and social space precisely at moments of upheaval in property relations.

And yet, important differences obviously exist between the cadastral survey and the kind of survey in which Powell was engaged. Scott (1998, 49) notes, for example, the distinction between intensive and extensive land uses, as the latter commonly corresponded, in colonial lands, with the presence of indigenous peoples, but he still places them under the same rubric of legibility and simplification:

Where the colony was a thinly populated settler-colony, as in North America or Australia, the obstacles to a thorough, uniform cadastral grid were minimal. There it was a question less of mapping preexisting patterns of land use than of surveying parcels of land that would be given or sold to new arrivals from Europe and of ignoring indigenous peoples and their common-property regimes.

But this is not quite right. Although the notion that such common-property landscapes were socially empty—as defined by the fact that they were not productive for market exchange—was indeed, as Scott (368 n. 99) argues, a powerful idea in the appropriation of native lands in places like Australia, New Zealand, Argentina, and North America, this appropriation was not achieved so much by ignoring previous property regimes as it was—in western North America, at least—by turning the people and their institutions into objects of study. To paraphrase Brealey (1995), it is in this sense that indigenous people could be mapped into antiquity at the same time as they were mapped out of their communal social space. Through ethnology, people, too, could be made legible, and their artifacts, vocabularies and grammars, and censuses of their absolute “numbers” and locations packed off to Washington for evaluation with the rest of the traffic of knowledge.

I suspect that few of these arguments about the construction of a legible West—including the simplifications of nature, societies, and space that were necessary to render them more manageable—would have been very surprising to Powell and his colleagues during the 1870s. Indeed, the point of the western surveys was to make limited observations, through established methods of trigonometrical survey, barometric readings, photography, and so forth, to produce topographical and geological maps, or to construct grammars of native languages to produce philological maps, so as to rationalize control, commodification, and exploitation of the region. The expeditionary skills of field science necessary to map and measure the West and the wisdom or judgment necessary to determine what was important about the region surveyed justified the governmental demand for Powell’s expertise in Washington. “There must be some method of selecting, some method of determining what facts are valuable, and what facts are trivial,” Powell (1882, 68; emphasis original) would later harangue. “The fool collects facts; the wise man selects them.” And what is a map or a regional survey if not a spatial model of selected features? It was only through selectivity that a “synoptic view” of the West could be achieved. When the basis of selectivity was cast in terms of scientific expertise, for the geological as well as the ethnological surveys, then the reorganization of nature and space—and, with it, the history of property—could more easily be seen as objective and apolitical.

Counting and Collecting 10,347 Indians

Early in 1874, Powell was asked, in testimony for the Committee on Indian Affairs, about the origins of his interest in ethnology. “I was interested in some surveys of the Colorado of the West and explorations there,” he (1874, 3) offered, “and in that way I became interested in the language and studied it.” Indeed, Powell’s survey work, which included numerous visits to the native “tribes,” “bands,” and pueblo villages on the Colorado Plateau during the first years of the 1870s, extended easily from the geological to the ethnological; he was exploring the land, it seems, and they just happened to be there. In fact, however, the project of making an ethnological or anthropological survey of the region was, like the special and general maps Powell was instructed to complete under the Department of Interior, an effort to render the place legible through limited observation so that it could be rationalized and controlled. At the same time, not only was the inclusion of indigenous peoples in the same analytical field as rocks and landforms essentially compatible with the natural historical and evolutionary scientific traditions (see Jardine, Secord, and Spa...
in the course of practical government survey work presented few epistemological problems, if any. Powell seems never to have doubted, for example, that his investigations would contribute both to evolutionary studies of languages and their diffusion and to practical questions concerning which tribes could be placed together on reservations (Darnell 1971, Hinsley 1994, Kirsch 1999; see, e.g., Powell 1881b, 1881c).

Powell had been appointed a special commissioner of Indian affairs in 1873. As he reported to the Committee, in that capacity he engaged, along with Special Commissioner George Ingalls, in a census of Numic-speaking Indians (primarily Ute, Paiute, and Shoshone tribes) in the interior West. The intent of their work was to make an inventory of the number and location of Indians in the region and, on the basis of field observations, to recommend how to re-organize the treaty and reservation system with those tribes most efficiently so as to ease conflicts with white settlements. Powell and Ingalls visited sixty-six tribes in the region in the summer of 1873, finding "every man, woman and child" among them, counting 10,347 Indians, roughly half of whom were living on reservations (Powell 1874, 3). It is an oddly precise number, given the fact that, by their own estimate, they visited but half the tribes of the region, besides which, despite Powell’s certainty, it would have been quite impossible to count all of those who did not wish to be counted, especially off the reservations. Clearly, however, Powell was after precise information, so that his policy recommendations might be placed on something of a scientific footing.

As Powell (1874, 8–9) described the status of the tribes to the Committee on Indian Affairs:

There are over 120 tribes of them altogether. They are divided into little bands of from 40 to 300 in each band. . . . The land was all divided among these Indians and over 120 governments formed, and to treat with these Indians and manage them is to deal with 120 chiefs or political organizations. Their condition is something like this: They have been whipped pretty thoroughly and they do not want to come in conflict with the government, and fully appreciate the necessity for them to cultivate the soil. The greater part of that country, except Colorado, is almost destitute of game. Nevada and Western Utah are as thickly settled . . . as Indiana and Illinois in proportion to their agricultural capacities; perhaps more so.

The main problem—which Powell tied to broader issues of settlement and limited agricultural capacities in the Arid West—was that the Indians were being crowded out of their lands, and in the destruction of game they had lost much of their livelihood. As a result, most had been left destitute: “They gather some seeds; beg some; piffer a little, and live in that way” (Powell 1874, 10).

Powell’s solution to this problem—the problem of the Indian “condition” as a problem of government—was a geographical one, couched in the paternalistic language of helping the Indians to help themselves. He called for their complete removal to reservations so as to separate whites and Indians in space. He appealed for funds to induce the Indians to the reservations with promises of land, livestock, and housing.

It seems to me that collecting them on these agencies is to do away with the evils arising from the menace of whites and Indians together. The presence of 75 Indians scattered through a community is sure to bring on difficulties, but remove them to one point by themselves and a great majority of these causes of difficulty will disappear (Powell 1874, 46–47).

To further improve efficiency, Powell also recommended that the number of federal Indian agencies in the region be reduced from eight to four. With this rationalized, more legible system for managing the Indians, Washington would theoretically deal with 4 governments, instead of 120. Yet having witnessed the conditions at the agencies firsthand, Powell was aware of some of the practical obstacles that his system would face. The Mohave Reservation, for example, where nearly 2,500 Paiutes were to be “collected,” included 185,000 acres of land, but Powell noted that most of the territory was composed of desolate, barren mountains, with the exception of ten or twelve thousand acres suited to agriculture. At the Uintah Reservation in eastern Utah, 550 Utes were “only nominally there . . . as they do not remain there because they are not fed” (Powell 1874, 27).

As objects of state projects of legibility and simplification, people clearly presented rather different problems than something like a forest; to paraphrase Scott (1998, 24), trees were not themselves political actors, people were. For example, Powell learned in September 1873 that Kanosh, chief of the Pahvant Utes, “at present doesn’t feel like moving to Uintah this Fall” (letter from T. Callister to G. Ingalls and Powell, 10 September 1873, in Letters Received by Powell; emphasis added). Nevertheless, Powell envisioned a system of social control through spatial strategies of concentration and heightened visibility that would render the tribes more easily managed (see Hannah 1993). Moreover, in a moment of sheer governmental optimism, Powell (1874, 43) asserted that this new order was possible solely with inducements—west of Colorado, at least—without the threat of violence to force the Indians to move: “I think that we ought to withdraw every soldier from that territory. I think that if we would use one-fifth of the money now spent on the military force for subduing the Indians, in
subduing them in another way the question could be settled without any difficulty at all.”

Then, for perhaps the only time in Powell’s lengthy testimony, a trace of the Indians themselves seems to come through, as Powell (1874, 44–45) adds: “The word soldier has become a bug-a-boo to the Indians. The old women use it to frighten the children. They think them a strange race of men, whose business is to kill people; who care nothing for social life and have neither wives nor children. Their presence is a standing menace and is a source of trouble and disease.” This comment hints at a history of government violence against Indians in the region (while also casting Powell in the sympathetic role that he envisioned for himself as a special commissioner). Yet this history of violence is precisely what is excluded from Powell’s plan; not mentioned in his testimony, for example, was the fact that the “Blackhawk War” (1865–1867) had immediately followed the extinguishing of Indian land rights in the Utah Territory and their attempted removal to the Uintah reservation in the first place (O’Neil and Sylvester 1969; Nielson 1998). It is not that Powell was unaware of the violence that went into the making of the places he encountered, nor even that he was not genuinely concerned with the Utes’ plight, but rather that this history was irrelevant to the spatial logic of his work. The present condition of the tribes (“whipped pretty thoroughly”) stands in for historical dynamics because this is the nature of the census as a statistical account of where people are at one moment in time. Throughout the transcripts of Powell’s testimony, there are parenthetical stage directions where Powell refers to a map of Indians, agencies, and reservations in the territories. These are necessary gestures for Powell, because counting and collecting 10,347 Indians is a story best told spatially.

Of course, since the conditions that Powell observed were historically (as well as geographically) constituted through relations of power and violence, it is not surprising that the logic of his proposed system should break down where questions about land use and property rights remained in question. In this respect, Powell (1874, 30) noted that “There are certain complications about the Indians of Colorado.” The problem was that the Utes of western Colorado Territory had achieved a favorable treaty acknowledging their rights to 13 million acres, or almost the entire region west of the Rockies (roughly one-third of the state), in addition to a substantial cash payment. However, recent discoveries of gold and silver in the area, in addition to excellent timber, agricultural potential and other mineral resources, had initiated a reconsideration of the treaty by the federal government. Though a newer treaty had been struck which withdrew some of the land from the Reservation on which there were mines, there was no way, Powell argued, of preventing white miners and settlers from scouring the rest of the region, which would, in turn, lead to the problems associated with the failure to separate whites and Indian communities in space. As Powell (1874, 31–32) saw it:

“...It is impossible to keep white people out or to protect 1500 or 1600 Indians in the possession of 13,000,000 acres of land where there is gold, silver, iron, coal, petroleum and forests. . . . There is some excitement about these mines. There were a great many people out there last summer prospecting the country and I have every reason to believe that next summer there will be three where there was one last. They will crowd out the Indians unless they are protected by a great fence.

If there was any inclination to leave this land to the Utes, then, the expense of maintaining the Utes’ land rights in Colorado made the treaty untenable (“You cannot stand by the promise,” Powell [1874, 39] advised). In a practical sense, as Powell’s allusion to the great fence made clear, it was unthinkable. It is important to recognize that it was as much in his recognition of the practical limits of government as in his recognition of its strengths that Powell advocated this consolidation of the reservation system. As Powell saw it, given the necessity of westward expansion and settlement, the reservation was the best place for Indians to maintain a survivable resource base, under U.S. government protection, as they necessarily shifted to farming for their living.

And yet Powell also recognized, despite this ideal, that the Utes living in Colorado would not be easily “collected.” In contrast to the status of those in Utah, “These Indians do not want to cultivate the soil,” he (1874, 32–33) said. “They have never been whipped. We have never had any war with those Indians. They have not felt the power of the government and want to keep their country.” Powell also noted that the Colorado Utes were armed, and known for their horsemanship and the quality of their horses. There had been indications that there would be a war, as there had been, in fact, since Powell had begun his work in the West in 1868 as an amateur natural historian; violence had always existed simultaneously with the surveys. Yet while this present threat of violence could not be excluded from Powell’s Indian census of 1874, Powell did rationalize breaking the treaty with the Utes in Colorado, and their removal to a smaller reservation, not by reason of military conquest but rather on the basis of their failure to exploit the land optimally. At least this was the logic elaborated in his 1878 Report on the Lands of the Arid Region of the United States, With a More Detailed Account of the Land of Utah.
Legibility, Value, and the
“Physical Characteristics of the Arid Region”

If, in Powell’s census work for the Bureau of Indian Affairs, producing spatial legibility of the Utes, Paiutes, Shoshone, and other native people living in the interior West was a necessary step in information gathering towards the *apartheid* solution that he proposed, then this work needs also to be understood as part of his larger-scale geographical solutions to the problems of settlement, order, and value in the “Arid Region” as a whole.24 As Powell ([1878] 1962, 8) put it frankly in his preface to the *Report*, “It was my purpose not only to consider the character of the lands themselves, but also the engineering problems involved in their redemption, and further to make suggestions for the legislative action necessary to inaugurate the enterprises by which these lands may eventually be rescued from their present worthless state.”25 What sets Powell apart from most of his contemporaries was his position that this redemption should be accomplished without degrading the environment as a long-term productive resource, on one hand, and without further empowering capitalist irrigation companies, land speculators, and other corporate interests, on the other. Powell is a populist in this project—he speaks in the interests of “individual farmers,” “men of small means,” and “poor men”—and there are undoubtedly important lessons from his fusion of what we might call scientific advocacy with populist interests. However, Powell’s populism resides chiefly in a particular vision of government science. The *Report*—as, it would turn out, the final treatise of the Powell Survey’s decade of work on the Colorado Plateau—was a product of Powell’s organization and synthesis of survey knowledge in Washington. As such, it reflects a strong wish for the traffic of knowledge to move in both directions, so that the ideas of government scientists in the capital could be fixed to the arid region itself through land classification and regulation of property regimes, as a means of promoting rational land use.

In the political context of the Hayes administration’s reform platform, Powell thus intended, on the authority of the regional scientific expertise of his survey, “to set forth the characteristics of these lands and the conditions under which they can be most profitably utilized” ([1878] 1962, 16). According to Stegner (1962, xxiv, xxv), the resulting *Report* was a “revolutionary proposal for the classification, survey, and disposal of the western lands” and “the classic statement of the terms on which the West could be peopled.” However, this statement demands closer scrutiny, for even as Powell’s ecological sensibility may hold important historical lessons for resource managers and land use planners, there are important silences in Stegner’s reading of Powell that ultimately obscure the (actually rather clear) spatial and governmental logic of the *Report*.

The *Report* was meant as a general description of and prescription for the Arid Region as a whole, encompassing roughly 40 percent of U.S. territory, but it focused empirically on the lands of the Utah Territory; Powell’s ([1878] 1962, 16) philosophy was to “discuss first a somewhat limited region in detail as a fair type of the whole.” Thus, as illustrated on a color-coded, fold-out map of the Utah Territory (Figure 2) tucked into the back of the *Report*, Powell divided all lands into three “great classes”: irrigable, timber, and pasturage. Irrigable lands, shaded green on the map, included only low-lying areas close to streams, a quite limited area which, in Utah at least, constituted just 2.8 percent of the land surface. Located in the higher plateaus and mountains, timber lands covered 23 percent of the territory, though just 12.5 percent of this was constituted by standing timber; the map made this contrast all the more striking by shading standing timber in blue and the “Area of Timber destroyed by Fire” in red. Everything in between the low irrigable lands and the high timber regions was called pasturage, though the quality of these lands for livestock grazing was acknowledged to be highly variable. In addition, Powell included two special classes of lands: coal and mineral. The entire Arid Region, Powell argued, should be classified in this manner—at minimal expense, save for the geological mapping of coal regions—through more extensive survey work.26

The *Report* was an extraordinary “state project of legibility and simplification,” spanning a key moment in the transition from “nature” to “natural resources” in the Arid Region; it was extraordinary, that is, in so far as it complicated the project, to a degree, by developing a more geographically sophisticated field of observation and intervention than the “arbitrary” rectangular system that preceded it ([1878] 1962, 50). In counterpoint to the geometric, Jeffersonian grid of 160-acre homestead farms developed in the context of the humid eastern half of the continent, Powell argued, the arid lands of the West demanded a different land system, one that recognized not only the limited agricultural capacity of the region but also the vital importance of water rights to production. Powell’s land system conformed to topography, not geometry. He proposed that irrigable farmlands be parcelled into smaller, 80-acre, irregularly shaped units that would maximize access to streams, while pastureage farm homesteads should be enlarged to 2,560 acres, also parcelled into irregular units to match the shape of the land (and preferably with a small, contiguous piece of irrigable land).
Figure 2. “Map of Utah Territory Representing the Extent of the Irrigable Timber and Pasture Lands,” 1878. Courtesy, Library of Congress. This color map, with its still incomplete southeastern corner of the territory, was included as a fold-out in Powell’s (1878) Report on the Lands of the Arid Region.
Powell’s system of land classification was thus intended as the foundation of a new system for ordering “private entries” into the public lands in the Arid Region, a system that he hoped to operationalize through the congressional bills included in the Report’s second chapter that authorized the organization of new, communally managed irrigation and pasturage districts of homestead settlements.27 “Practically, all values inhere in the water,” he argued ([1878] 1962, 50), “and an equitable division of the waters can be made only by a wise system of parceling the lands; and the people in organized bodies can well be trusted with this right, while individuals could not thus be trusted.” Powell recognized that individual property rights, under extant forms of regulation, contributed to the susceptibility of arid regions to problems of capital agglomeration, a process that was already becoming apparent, in parts of the settled West, where irrigation companies acquired water monopolies ([1878] 1962, 53; see Worster 1985).

For his biographer Stegner, who also edited the enduring 1962 edition of the Report, Powell’s blend of environmental knowledge, anticorporate populism, and trust in government, local and federal, became the stuff of heroism, a recipe for the making of environmental values rooted in the American Western experience. Powell’s concerns about the future of the Arid Region resonated with the West that Stegner knew in the mid-twentieth century (Worster 1997a), and the Report became, for Stegner, the basis for a grand counterfactual of environmental values—all the more poignant for the fact that Powell’s bills (and his land system) were ultimately neglected by Congress. Yet in Stegner’s (1992, viii) telling, with its slightly naive rallying cry of if only we had listened to Powell bubbling up from the past, Powell’s “attempts to impose order on whatever he touched, and especially on the development of the western states whose problems he knew as no one in his time knew them” are cut only into the heroic figure of Powell himself, the “personification of an ideal of public service.” Powell, writes Stegner (1957, xiii–xiv), “added whole new branches to science and revitalized others, and created federal bureaus dedicated to practicing them in the public interest.”28 The “public,” however, has a rather expansive role to play in all of this: government scientists produce expert knowledge of the public lands in the public interest, and this public service results in the apparently obvious public good of beneficent government science determining the most appropriate uses of the public lands. For Stegner, Powell’s heroism rests on this rather murky sense of a public in whose interests Powell speaks, by virtue of his wisdom, values, and scientific objectivity. But who counts as the public (Marston 1990; Mitchell 1995)? Plainly not the native people that Powell had counted in the region just a few years earlier, including those who were dispossessed of their communal lands so that those lands could be made “public” in the first place.29 Indeed, when we add to Stegner’s notion of “the public interest” the economic, “free-market” sense of publicity—that is, in terms of an institutionalized land market—it is clear how the very condition of publicity might serve to underwrite the dispossession of Indian lands.

Clearly, were it up to Powell (and of course it matters a great deal that ultimately it was not), the process of assigning value to nature and space in the western territories would have been regulated in quite different ways than it has been, reflecting not only a greater concern for long-term environmental degradation but also some of the populist, anticorporate ideas that have been noted. However, it is also important to recognize in Powell’s Report the ways that his geographical solutions were structured, as if by unwritten rules, by what I have called the governmental values of efficiency, order, and productivity. In his first chapter on the “Physical Characteristics of the Arid Region,” Powell ([1878] 1962, 37) argues that the “growth and prosperity of the Arid Region will depend largely upon a land system which will comply with the requirements of the conditions and facts briefly set forth.” Yet included with these “physical characteristics” is the land classification system described above, and the entire chapter is so thoroughly imbued with the language of value (e.g., of grasses in pasturage lands, timber, and irrigation farming in general; cf. [1878] 1962, 16, 24–25, 27, 29–30, 32) as to make categories of future economic worth and worthlessness inseparable from the observed physical characteristics of the land.

This infusion of optimizing governmental values into nature is nowhere so clear as in Powell’s discussion of timber resources in the region, for here questions of land use converged with the problem of still “uncollected” Indians that Powell had dealt with in his earlier work as a special commissioner. Though the timber areas showed evidence of heavy deforestation from forest fires—as demonstrated, Powell indicated ([1878] 1962, 26), with a “glance at the map of Utah” (Figure 2)—Powell believed this problem could be resolved through more effective management. For this, he drew on his field experience in the contracting spaces of the West ([1878] 1962, 28):

In the main these fires are set by Indians. Driven from the low-lands by advancing civilization, they resort to the higher regions until they are forced back by the deep snows of winter. Want, caused by the restricted area to which they resort for food; the desire for luxuries to which they were strangers
in their primitive condition, and especially the desire for personal adornment, together with a supply of more effective instruments for hunting and trapping, have in late years, during the rapid settlement of the country since the discovery of gold and the building of railroads, greatly stimulated the pursuit of animals for their furs—the wealth and currency of the savage. On their hunting expeditions they systematically set fire to forests for the purposes of driving the game. This is a fact well known to all mountaineers. Only the white hunters of the region properly understand why these fires are set, it being usually attributed to a wanton desire on the part of the Indians to destroy that which is of value to the white man. The fires can, then, be very greatly curtailed by the removal of the Indians.

Thus, while Powell argued that the Indians’ use of fire was not malicious—not a “wanton desire” to assault value itself—he also argued that it was plainly irrational from the standpoint of optimizing resource use in the Arid Region. And he ([1878] 1962, 29) was quite clear about for whom, and for what kind of new economic geography, the forests were to be protected:

“[O]nce protected from fires, the forests will increase in extent and value. The first step to be taken for their protection must be by prohibiting the Indians from resorting thereto for hunting purposes and then slowly, as the lower country is settled, the grasses and herbage of the highlands, in which fires generally spread, will be kept down by summer pasturage, and the dead and fallen timber will be removed to supply the wants of people below. This protection, though sure to come at last, will be tardy, for it depends upon the gradual settlement of the country; and this again depends upon the development of the agricultural and mineral resources and the establishment of manufactories, and to a very important extent on the building of railroads . . .

“A division of labor is necessary,” Powell ([1878] 1962, 35) added, “and special timber industries will be developed, and hence the timber lands must be controlled by lumbermen and woodmen.” By setting total limitations on the practices of the displaced Indians, then, the forests and other lands in the region could be put to wiser use, without limitations.

If there is a contradiction here, then it is resolved, for Powell and implicitly for Stegner, by the logic of optimal value. It is curious to note that, despite a flurry of editorial footnotes in the Report (for example, [1878] 1962, 27 n. 4, criticizing Powell’s claim that “no limitation to the use of the forests need be made” from a conservation standpoint), Stegner has no comment at all concerning any of Powell’s calls for the removal of Indians from timber areas (cf. [1878] 1962, 28–29, 35, 113). This aspect of the Report—and of the land system that Powell planned—has largely fallen out of the received story of Powell’s career, or worse, has been dissolved into Powell’s “insatiable curiosity” about the inhabitants of the “blank places on the map” (James 1979). The mobilization of scientific expertise, whether in the interest of environments or that of future generations of Americans living in the Arid Region, thus appears as something separate from the processes of conquest and dispossession. This speaks precisely to the question of what heroism works to obscure. And by seeing Powell chiefly as a hero of environmental values, we tend to lose sight of the contexts in which he worked, and of the questions to which he spoke. How, Powell asked, should the Arid Region be valued, classified, and redistributed? How should the lands be governed so as to optimize the worth of the territory from within, for the benefit of the social and political body of the U.S.? And how can scientific knowledge of the arid environment (and of the people living there) contribute to the realization of these goals?

And so, having elaborated the highly contextual and ontologically inseparable quality of the discourses of value and of natural environments in Powell’s Report, we return to Harvey’s (1996) point: that control over the resources of others, justified in terms of preventing environmental degradation or maintaining “sustainability,” is a powerful subtext underlying many western proposals for environmental management. Indeed, it is but a short step from Powell’s rationale for the “land system needed for the arid region” to say that, for example, the Utes of Western Colorado are wasting resources through their extensive land-use practices, or, for that matter, that they have no interests in mining and therefore no legitimate claims to the gold and silver on the 13,000,000 acres promised them in Western Colorado. The “terms on which the West could be peopled” (Stegner 1962, xxiv) depended on the reorganization of the West’s earlier inhabitants and their inefficient land-use practices, and the language of value—that is, of future worth—whether expressed through land-classification maps or calls for forest protection, provided a useful grammar for this kind of work, for Powell as well as for his eventual opponents in government, because it was so readily accepted as to seem a natural part of the map and the physical landscape alike.

And yet, in reality, of course, important differences existed between the map of the Colorado Plateau country and the place itself. While a decade of work by the Powell Survey could be used to bring the Arid Region back to Washington—in bits and pieces, observations and measurements, maps and photographs—and thus to spatially reconstruct the place as a field for strategic government intervention, the move from the map of geographical, geological, and ethnological features to the
map of proper land use—the move from Washington back to the territory—was at times hotly contested. Even though Powell, in his geographical solutions to the problems of western settlement, could appeal to the logic of value to simply map violence away, since the actual imposition of settlement could only be achieved through relations of power realized in particular places, the violence of Indian “removal” was not easily mapped out of the landscape itself, as we will see in the next section of this article.


The first edition of the Report, printed chiefly for congressional uses, consisted of 1,800 copies. Early in 1879, a second edition of 5,000 was published, with minor revisions, and the book garnered widespread appeal among reform-minded politicians, bureaucrats, and scientists in Gilded Age Washington (Davis 1915; Stegner 1962).31 While the Report provided a striking, if not comprehensive, new description of the Arid Region that served to counter still commonplace “rain follows the plow” arguments, and while Powell’s land system and his proposals for irrigation districts at least entered the conversations of government in Washington, Congress did not enact the proposals. Perhaps, as Stegner asserts, they were indeed too “revolutionary.”

Yet the Report did a great deal for Powell’s status, not least among the National Academy of Sciences, the agency to which another of Powell’s proposals—this one for the consolidation of the four western surveys under the Department of Interior—had been referred by Congress. The War Department had argued that topographical surveys and mapping were best consolidated, following European precedents, as a military operation under the Army Corps of Engineers. However, Powell’s arguments, sanctioned by the National Academy, held sway in Congress, where it was decided, as William Morris Davis put it a generation later (Davis 1915, 47), that “the uses of our public domain would be much more largely in the way of peaceful settlement than of warlike campaigns.” In March 1879, the United States Geological Survey was established, and, with Powell’s support, geologist Clarence King was named its first director.

At the same juncture, building on appropriations for the continuation of his ethnological research, Powell established what was to become the Bureau of Ethnology within the Smithsonian Institution.32 The Smithsonian and the National Museum, for which Powell had begun collecting native artifacts as early as 1869, had for long been in the business of collecting, classifying, and displaying Indian material culture, so it was an obvious institutional setting from which to continue the work of educating the nation about “itself.” However, the ongoing justification for the Bureau—and, indeed, a good deal of its early agenda—were also rooted in the kind of practical fieldwork and census taking that Powell had carried out as a special commissioner. Powell intended his new “Bureau”—a title that he apparently selected himself, and in no formal sense a department of government (Worster 2001)—to provide scientific information useful for government, while at the same time advancing anthropological and evolutionary theories on the basis of fieldwork carried out mainly in the West. Though Powell (1881c, 1882) believed that the social or “anthropic” sciences had not yet reached a systematic “stage” of development, he trusted that a new cadre of experts to examine Indian languages, religion, mythology, tribal government and social institutions and to chronicle the complicated status of U.S.-Indian treaties would contribute both to effective government and to easing the Indians’ transition into American civilization. As Powell (1881d, xiv) put it in the Bureau’s first Annual Report:

In pursuing these ethnographic observations, it has been the endeavor as far as possible to produce results that would be of practical value in the administration of Indian affairs, and for this purpose especial attention has been paid to vital statistics, to the discovery of linguistic affinities, and the progress made by the Indians towards civilization, and the causes and remedies for the inevitable conflict that arises from the spread of civilization over a region previously inhabited by savages.33

It would be easy to exaggerate the practical significance of this work. Government power over the Indians had not always depended on ethnological knowledge and would certainly have persisted without it. Besides this, of course, it was in the Bureau’s interest to accentuate the practical aspects of its research in its reports to Congress. Indeed, a glance through the Bureau’s early reports shows greater attention to rather expensive color reproductions of Indian pottery than to matters of practical administration. Yet it would be wrong to separate the Bureau’s apparently benign work—for example, classifying material objects, or its primary task under Powell, that of developing a definitive map of Indian language groups—from the work of collecting vital statistics and other more “governmental” duties. What matters here is the construction of the Indians as objects of the Bureau’s epistemological control, and with it, the legitimating vocabulary provided by these early government social scientists. As with the lands of the Arid Region, wise management depended on expert classification.
However appealing the idea of an applied ethnology in Washington in 1879, Indian Agent Nathaniel Meeker was experiencing great difficulties at the time in his efforts to convert the Utes of Western Colorado—about whom Powell had reported "certain complications" to the Committee on Indian Affairs in 1874—from a mounted, hunting way of life to a sedentary, agricultural existence. Meeker, an economic refugee from the Greeley (Colorado) agricultural colony, was stationed at the White River Ute Agency, located in Powell Park in western Colorado (named after Powell himself, who had spent time in the area while preparing for his Colorado River expedition during the winter of 1868–1869). By most accounts, Meeker's missionary zeal for transforming the Utes served to exacerbate the kinds of tensions that Powell had identified in 1874—that is, the problem of Indians who not only did not wish to farm, but also did not fear the "power of government" (Powell 1874). The violent conflict that ensued was also made to turn on the issues of efficient land and resource use that concerned Powell about the Arid Region as a whole.

In September 1879, 200 cavalrymen were dispatched to the White River Agency. Depending on the source, they were sent either to arrest some White River Utes accused of starting a forest fire while hunting or, at the request of Meeker, for protection after he had been attacked in the course of an argument with Utes who contended that Meeker was plowing too much horse-pasture land. Whatever the case, the cavalry was ambushed by an army of some 300 Utes on 29 September. The same day, twenty-five Utes took over the White River Agency, killing Meeker and seven employees and taking three women and two children hostage for twenty-three days. After the Ute rebellion was put down with army reinforcements, the events at the agency—which became known as the "Meeker Massacre"—provided the rallying cry for the complete removal of the Utes from the new state of Colorado and the virtual extinguishing of their land rights in the state.

The Uinta Valley is peculiarly adapted to the purposes of an Indian Reservation. On the West, South, and partly on the North it is surrounded by a system of elevated mountains which are uninhabitable, while on the East it is bounded by Green River. It is thus separated by mountain walls from white settlements on every side except a small settlement on Ashley's Fork. Powell then expounded on the necessity for spatial solutions—removal, segregation, and new forms of boundary-making—to the kind of Indian problems associated with the Meeker Massacre:

All of our Indian troubles have arisen primarily and chiefly from two conditions inherent in savage society. The first is that the land belonging to an Indian clan or tribe is dear to it not only as a region from which it obtains subsistence but chiefly because it is the locus of its religion. The Indian religion is localized. Every spring, creek and river, every valley, hill and mountain as well as the trees that grow upon the soil are made sacred by the inherited tradition of their religion. These are all homes of their gods. When an Indian clan or tribe gives up its land it not only surrenders its home as understood by civilized people but its gods are abandoned and all its religion connected therewith, and connected with the worship of ancestors buried in the soil; that is, everything most sacred to Indian society is yielded up.

Such a removal of the Indians is the first step to be taken in their civilization. Such removal is made necessary by other conditions existing in rapid settlement of the country by civilized people. (Powell to Teller, February 1880)

The settlement of the Arid Region by millions of civilized people, Powell argued, should not be held up because of the "superstitions of a small number of savages," but he maintained, at the same time, that "justice" and "charity" could be extended to the Indians within the reservations (Powell to Teller, February 1880). If removal from sacred lands and enclosure within reservations was the first step to civilizing the Indians, then the second step, according to Powell (in league with Quaker Indian agents and other reformers of the day), was to undermine traditional land practices with "allotment" or "severalty" laws dividing communal lands on
the reservations into lots of individual and family property. Powell recommended this final boundary strategy to Senator Teller as a crucial step in the Utes’ progress toward civilization. Indeed, for Powell, the progress of human evolution was at least potentially another matter of governmental sovereignty. In this sense, federal scientists like Powell served as liberal governmental subjects, advocating policies to establish the effects or conditions for enabling Indian development through the creation of new a new “disposition of things” (Foucault 1991, 93), such as reservations gridded with private property lines.

And yet, Powell’s advocacy of land allotment for the Indians tells us a great deal more about what the new Bureau of Ethnology’s director, in his enthusiasm for spatial and geographical solutions, did not understand about his own complicity in the expansion of dominant modes of valuation into western lands and resources. For with allotment, which was given the force of law across the U.S during the 1880s and 1890s (see Wishart 1994; Marks 1998), a capitalist land market was expanded into Indian reservations that had previously been set apart, at least to an extent, from the demands for productive and efficient land use called for in Powell’s Report (and in terms of the Homestead, Desert Land, and Timber Cultures Acts, which more or less regulated the transfer of public lands into private property in the West).

However prescient Powell’s sense of the ecological limits of the Colorado Plateau, and however progressive his calls for a land-reform system that would take these limits into account, his advocacy of allotment as a spatial fix to the practical and theoretical (i.e., evolutionary) problems posed by the Utes and others illustrates the failure of his geographical solutions to account for both the history of violence and the dynamics of value, as they were attached to land and land use, in the western U.S. As Wishart (1994, 187–238) has shown in his study of the dispossession of the Nebraska Indians, even as allotments were often considered desirable by those Indians who accepted them as a means of legally holding on to at least some of their land (in a context of broken treaties and shrinking reservations), more often than not the allotted land passed out of Indian ownership within a few decades. The same conditions of urgent poverty that compelled the Indians to accept the allotments forced them later, under the brutal logic of the public market, to sell their land (Wishart 1994). Indeed, the Utes at Uintah seemed to have understood these dynamics far better than Powell, their supposed advocate, when they categorically refused the allotments offered them in 1880. Against their wishes, however, lands were eventually allotted to them as an imposition from Washington, and when they refused these lands in favor of communal practices, Mormon settlers began to occupy many of the best agricultural lands within the reservation starting in 1905 (Nielson 1998). The ultimate result of the severity policy—at Uintah, in the Indian Territory in Oklahoma, and on many other reservations—was to provide justification for opening the reservations to new land rushes for the unallotted as well as the allotted lands.

Surveyed, mapped, classified, enclosed, bounded, and fragmented at a number of spatial scales, the “great blank space” of the Colorado Plateau was merely an interim cartographic condition.

Conclusion

Kearns (1998, 378) recently called for the development of an explicitly political historical geography wherein “what we learn about the world should inform our choice of appropriate political and moral stances.” “Thus there is a connection,” in this interplay of facts and values, “between a belief in plausible worlds for the future and the exploration of counterfactuals in history. . . . Because we think we understand why various options were closed down in the past, we achieve some sense of the difficulties that might attend their pursuit in the present” (Kearns 1998, 380–81). Here the counterfactual is itself a part of the story: if only we had listened to Powell. Powell’s work and its retellings continue to inform the present as an embodied heroic ideal of environmental or ecological values—an ideal, as I have shown, that takes some of its legitimacy from oversimplified notions of “science in the public interest.” The premise of this article has been to complicate that heroic ideal, but in doing so to clarify some of its contradictions, through a broadly materialist (and openly revisionist) geographical critique of Powell’s varied work, mainly during the period between 1869 and 1879. By situating Powell’s career and his texts as part of a wider traffic of spatial knowledge linking the western territories with Washington—from the exploration of the Colorado River to the Powell Survey to the Report to Powell’s directorship of the Bureau of Ethnology—we gain a richer sense of just what constituted the public interest, and what constituted science, in this context.

More specifically, I have examined how the expansion of scientific knowledge of people and place on the Colorado Plateau articulated with the westward geographical expansion of systems of value, values, and significance. The questions that this study raises, then, are concerned not only with how certain options were closed down in the past (i.e., why we did not listen to Powell and adopt his land system for the Arid Region), but also with why we at times did take his advice, especially
which Powell has since been associated, possible. Or, to put it another way, only by fixing the map of who mapped the West to make it legible from the capital. Conservation thought and scientific land management, like Powell, associated with the origins of American thought and scientific land management, who mapped the West to make it legible from the capital. Or, to put it another way, only by fixing the map of to the territory itself were the environmental values, with which Powell has since been associated, possible.

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Notes

1. More famously and more controversially, Powell also directed the USGS from 1881 to 1894, and with it, the irrigation survey project that ultimately led to his resignation from the USGS due to opposition from western senators. He directed the Bureau of Ethnology (see below) from 1879 until his death in 1902.

2. Although the term “progressive” is commonly reserved for those working in the Progressive Era of the early twentieth century, I refer to Powell as a progressive here, first, because his advocacy of science in government in many ways prefigured this period, and second, as discussed elsewhere in this article, because his work was underpinned by a strong sense of biological and social evolution as (distinct) progressive processes (Powell 1882; see Coleman 1966; Hinsley 1994).

3. Brealey (1995) uses the phrases “mapping in” and “mapping out” in a somewhat different manner to describe the treatment of First Nations members in British Columbia, who were mapped into history so that they could be effectively mapped out of the territory itself.

4. The “ideology” of environmental management is not meant to imply so-called false consciousness. Rather, as Neil Smith (1990, 15) puts it, “Ideology is not simply a set of wrong ideas but a set of ideas rooted in practical experience, albeit the practical experience of a given social class which sees reality from its own perspective, and therefore only in part. Although in this way a partial reflection of reality, the class attempts to universalize its own conception of the world.” While the class basis of instrumentalist environmental management is by no means clear-cut, this definition of ideology can quite suggestively be applied to the perspectives of scientific land and resource management with which Harvey is concerned here.

5. For a thoughtful review essay that does question whether or not contemporary environmental problems are taken seriously enough in Harvey (1996), see Williams (1998).

6. Braun (2000, 12) puts it concisely, “Foucault argued that in Europe, between the sixteenth and nineteenth centuries, the question of ‘how to rule’ shifted from a problematic of ‘sovereignty’ (how to protect the fragile link between the Prince and his territory) to a problematic of ‘governmentality’ (how to optimize the relationship between ‘men and things’, so as to make the forces of the state increase from within).” See also the essays (including Foucault 1991) collected in Burchell, Gordon, and Miller (1991). For more explicitly geographical readings of governmentality, see Demeritt (2001), Hannah (2000), Murdoch and Ward (1997), and Ó Tuathail (1994). Looking at Gilded Age America, Hannah makes a useful contrast between Foucault’s overlapping concepts of governmentality, biopower, and discipline. He argues that the recognition that both knowledge and regulation on the part of government are necessarily limited, yet still operational in terms of establishing (often indirect) modes of social control, is what sets governmentality apart from broader disciplinary practices.

7. In his recent study of the geological survey carried out by George Mercer Dawson in late nineteenth-century British Columbia, Braun (2000, 23) has extended Foucault’s brief discussion of environments in connection with governmentality (“the territory with its specific qualities, climate, irrigation, fertility, etc.” [Foucault 1991, 93]) by insisting that “the social construction of nature and political rationality belong within the same analytical field.” He argues that nature was never simply there as an object for political and economic calculation, but rather that these forms of governmentality coevolved historically and geographically with changing scientific constructions of what nature is. It must be noted here that pointed differences exist between Harvey’s (1996) sense of valuing nature and Braun’s (see Braun 1998, 2000; Harvey 1998). And yet, I want to clarify that I do not see any necessary theoretical contradiction here in articulating Harvey’s Marxian analysis of the valuation of nature and environments with Foucault’s notion of governmentality; not only are both sets of ideas made to turn on questions of how to optimize value according to discourses of political economy (with Harvey, as we have seen, more concerned with the practical than the discursive aspects of this process), but both also—if in different ways—are concerned with the centrality of the state in mediating this pro-
8. It is worth invoking again an oft-quoted passage of Foucault’s ([1977] 1995, 194): “We must cease once and for all to describe the effects of power in negative terms: it ‘excludes,’ it ‘represses,’ it ‘censors,’ it ‘abstracts,’ it ‘masks,’ it ‘conceals.’ In fact, power produces; it produces reality; it produces domains of objects and rituals of truth. The individual and the knowledge that may be gained from him”—and here we may substitute the “natural resources” with which Foucault was less concerned—“belong to this production.”

9. My language here is indebted to Bruno Latour’s (1987, 215–57) core-periphery model of “centres of calculation” and “cycles of accumulation,” which is used to explain the dynamics of knowledge construction in colonial and imperial field sciences. For Latour, this process is characterized by the traffic of “immutable mobiles”—observations, measurements, maps, specimens, or anything that travels well—from the space of the field to the cosmopolitan sites of the core, where the observations can be combined in novel ways (including more complete maps) so as to expand knowledge on the basis of this “accumulation.” As Braun (2000) argues, subsequent voyages of discovery, then, carry with them new ways of seeing nature that were unthinkable during a previous cycle. Though this model is useful, it has been critiqued for its failures to attend to the actual, often spontaneous dynamics of scientific practices and knowledge construction in the field (cf. Bravo 1999; Sorrenson 1996). For reasons I will discuss below, this study makes more explicit use of another core-periphery-type model, Scott’s (1998, 1–83) notion of “state projects of legibility and simplification.”

10. Washington’s scientific community was far more provincial in an intellectual sense but far more national in a governmental sense than the Boston/Cambridge scientific community of the period, another group influenced by Lamarckism that has been well illustrated in Livingstone’s (1987) biography of Nathaniel Shaler. Not surprisingly, it was Washington’s scientists and intellectuals, working in the departments and bureaus and the Smithsonian Institution far more than in universities, who were chiefly responsible for developing governmental visions of science in the U.S. While some university scientists, like Harvard’s Alexander Agassiz, would later criticize Powell’s agencies for their “indiscriminate publications” (Livingstone 1987, 40)—an attack on the very publicity that was intrinsic to governmental science—many others, including Shaler from Harvard and Othniel Marsh from Yale’s Sheffield Scientific School, had their research supported under Powell’s expansion of the U.S. Geological Survey during the 1880s (see Worster 2001, 383–436).

11. There is nothing inherently wrong, of course, with efforts to foster an explicitly regional sense of shared values along these lines. As Kearns (1998, 401) points out, the kind treatment that Stegner has generally received from “new western historians” like Limerick (cf. 1993)—and we can add the related pairing of Powell and Worster to this regional grouping—owes much to such shared values and a shared sense of the “urgent wish to teach the lessons of the contradiction between unrestrained economic expansion and the limits set by aridity and finite resources.” However, the lessons of contradiction are varied, and they run the risk—as Harvey (1996) argues about environmentalism—of adapting to diverse political positions while at the same time claiming to be beyond politics in a normal sense. Kearns’ (1998, 386–92) critique, suggesting that Worster oversimplifies the relations between big government and localities by failing to account for the ways in which certain local forces make use of government resources, underscores one problematic aspect of shared regional values as the basis for environmental politics. Worster’s (2001) new biography of Powell, a weighty six-hundred-page tome, has clearly become the definitive source on Powell’s life, far surpassing Stegner’s ([1954] 1992) classic hagiography in its historical scholarship and measured analysis. And yet, unlike the essay discussed elsewhere (Worster 1997a), the biography is disappointingly aloof from historiographic and theoretical issues, and it arguably underplays Powell’s scientific contributions in both geology and philology. Additional biographies of Powell include Davis (1915), Darrah (1951), and James (1979).

12. These included the War Department’s “Survey of the 40th Parallel” under Clarence King and its “U.S. Geographical Surveys Beyond the 100th Meridian” under George Wheeler, along with the Interior Department’s “U.S. Geological Survey of the Territories” under Ferdinand Hayden. On the exploration of the American West, see Goetzmann (1993) and White (1993).
than continental) space, on the one hand, and with a Social Darwinist sense of tooth and claw competition, on the other. Confronted with the continental closure of American space, Powell also took an evolutionary view of these transformations of space, as I will discuss in the context of Powell’s optimistic beliefs about Indian reservations. However, unlike Ratzel and Mackinder, he did not fully naturalize the process, thus leaving more room for expert government regulation. On the development of geographical thought relating closed or contracting spaces to the need for increased national efficiency, see Bassin (1987); Coleman (1966); Kearns (1984); Ó Tuathail (1992).

19. Braun (2000, 41 n. 11) criticizes Scott’s (1998) model for its presentation of precise numeral data to the Committee on Indian Affairs contrasts markedly with some of the debates internal to the Smithsonian Institution, where Powell was a central figure, even before his role as Director of the Bureau of Ethnology, in the Contributions to North American Ethnology series. For example, in one exchange with Stephen Powers, an ethnologist of California Indians, Powers ultimately conceded to Powell’s wish to reduce his estimates of the Indian population there by exactly half (letter from Powers to Powell, 3 November 1876, MS 3122, Smithsonian Archives).

20. I use the term “Indian” in this section for narrative consistency with Powell’s testimony.

21. It must be noted that this presentation of precise numeral data to the Committee on Indian Affairs contrasts markedly with some of the debates internal to the Smithsonian Institution, where Powell was a central figure, even before his role as Director of the Bureau of Ethnology, in the Contributions to North American Ethnology series. For example, in one exchange with Stephen Powers, an ethnologist of California Indians, Powers ultimately conceded to Powell’s wish to reduce his estimates of the Indian population there by exactly half (letter from Powers to Powell, 3 November 1876, MS 3122, Smithsonian Archives).

22. In common with many government reformers of his day, Powell understood the removal of Indians to reservations in Lamarckian evolutionary terms: reservations could be seen as developmental spaces where the Indians could gradually evolve into civilized people. As Powell (1875e, 677) rationalized to Scribner’s readers, these scientific views placed him squarely in the center of two skewed ideological extremes: [A]nd so the people are divided into two great parties, one crying for blood, and demanding the destruction of the Indian, the other begging that he may be left in his aboriginal condition, and that the progress of civilization may be stayed. Vain is the clamor of either party; the march of humanity cannot be stayed; the fields must be made, and gardens planted in the little valleys among the mountains of that Western land, as they have been in the broader valleys and plains of the East, and the mountains must yield their treasure of ore to the miner, and, whether we desire it or not, the ancient inhabitants of the country must be lost; and we may comfort ourselves with the reflection that they are not destroyed but are gradually absorbed and become a part of more civilized communities.

23. Despite federal efforts in the direction of Indian agency consolidation in Nevada and Utah, Powell’s problem of centralizing collection and protection was not resolved at this time, although, as we will see, the concentration of the Colorado Utes at the conjoined Uintah and Ouray reservations in Utah was strongly pursued following the “Meeker Massacre” in Colorado in 1879. Smaller, geographically scattered reservations remained in the western landscape and were later expanded (see Marks 1998; Worster 2001, 261–96).

24. The “Arid Region” was defined as the area, chiefly west of the one-hundredth meridian, with less than twenty inches of annual rainfall.

25. The Report was first submitted in the spring of 1878. A second edition, published the following year, corrected typographical and minor factual errors. The Report also contained chapters on specific drainage systems by Powell Survey field scientists Gilbert, Dutton, and Thompson, and a chapter on land grants by W. Drummond, Jr.

26. For the mapping of mineral regions, Powell favored the existing system, which is to say, to let the miners and mining companies do their own classification, in a sense, by trial and error. By 1881, however, when he would take over the directorship of the U.S. Geological Survey, Powell supported more extensive geological mapping of the entire Public Domain.

27. The Report was submitted to the House of Representatives, via the Department of Interior, on 1 April 1878, and was referred to the Committee on Appropriations two days later. The bills, essentially directed towards reform of the existing Homestead, Timber Cultures, and Desert Land Acts, were submitted to the House of Representatives by a California congressman, but were quietly tabled without hearings. On the relationship between Powell’s irrigation districts and the communal practices of Mormon settlers, see Worster (2001).

28. For a more balanced assessment of Powell’s scientific contributions, see Davis (1915).

29. As Bensel (1990) points out, the public land market, though subsidized by the military expenditures of conquest in the West, was a consistently profitable income source for the Congress during much of the nineteenth century. On the relations between public land sales and the often grossly unfair “market” rates given to Native American tribes in exchange for land, see Wishart (1996). Powell favored, at least ideally, the removal of public lands from the market, to be classified by government scientists before being opened for public distribution. This ran counter to the (direct) interests of agricultural capital and politicians in the West to such an extent that, when Powell later actually obtained the power to hold up land sales during the course of an 1888 irrigation survey in the Arid Region, the ensuing conflict with western senators eventually led to Powell’s resignation from the USGS in 1892.

30. It is also significant that Powell relies here on his ethnological expertise to contrast the “primitive condition” of the Indians with a less pure current state in which hunting technologies and the luxuries of civilization have created, as this...
passage suggests, something of a “false,” half-civilized economy of fur for the Indians. Years later, Powell removed some of the blame for deforestation from the Indians (Worster 2001).

31. Both editions were published through the Government Printing Office. On the Government Printing Office and the importance of other “surfaces of emergence” to the discourses of American governmentality, see Hannah (2000).

32. By operating under the Smithsonian, Powell probably hoped to insulate his fledgling scientific agency from the political fray associated with annual congressional appropriations. The Bureau was renamed the Bureau of American Ethnology in 1894, reflecting the regional focus of its work. Oddly, this change in nomenclature occurred shortly before the Bureau sought, with quite modest success, to expand its field of observation to American colonies in Hawaii and the Philippines. See Darnell (1969) and Hinsley (1994).

33. This passage, reprinted in the Bureau’s report, was in fact excerpted from the 1877 report of the Geographical and Geological Survey of the Rocky Mountain Region.

34. Nielson (1998) tells the story of the forest fire, while Marks (1998) and O’Neill and Silvester (1969) state the latter case. My account of the ensuing events draws from these three texts, which generally agree on the rest of the facts.

35. Certain hunting rights were allegedly to be maintained, and a small reservation was later established in the southwest corner of the state.

References


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