

Federal Reclamation in the Twentieth Century: A Centennial Retrospective

The Reclamation Act of 1902 dedicated proceeds from the sale of public lands in the western half of the United States to the construction of irrigation works. Proponents of the legislation promised on the floor of Congress, that “worthless” lives trapped in the tenements of eastern cities could be reclaimed along with “worthless” desert land in the West. Congress required the farmers who benefitted to repay the cost of irrigation works over ten years, so the program was expected to be self-supporting. By the time Theodore Roosevelt left office in 1909, two dozen projects had been launched, at least one in every state and territory, but none had been completed. With notable exceptions, those projects did not live up to expectations. Federal reclamation never became self-supporting, and some projects came to resemble rural slums. Not until the 1930s, when the “High Dam Era” gave the bureau responsibilities for providing water and power to cities as well as farms, did it become the most important federal agency in the West. From 1930 to 1970, the water and power provided by the bureau transformed the region, but since 1970 the bureau has been but a shadow of the robust agency that once dammed the West.

This paper focuses mainly on two periods of bureau history, its first decade and the quarter-century from the end of World War II to about 1970. I make three basic arguments: first, that in 1902 the Reclamation Bureau and its leaders were motivated more by nineteenth than by twentieth-century values; second, that the Reclamation Bureau did as much to decentralize power

over water as to consolidate it in Washington; and, third, that federal reclamation died as much because it failed to sustain its original ideals as because it ran out of places to build dams, suffered from the constraints of economic retrenchment, or fell prey to the environmental movement.

When Congress adopted the Reclamation Act in June, 1902, it launched potentially the biggest public works program in American history. Harper's Weekly proclaimed that "the bill aims at substantial and enduring effects upon the broader economic development of the nation. There was and still is in some quarters an ill-judged disposition to regard it as of merely sectional interest: but in the true analysis its significance is national not local....A hundred million [irrigated] acres will give homes for a million families, and afford sustenance for many times that number." New York City's Christian Work applauded the new national program as "one of the stupendous tasks of the opening century....The first year of the Roosevelt administration has been rendered not more notable by the determination to build the Isthmian Canal than by the passage of the bill to water the dry lands of the great American West." Philadelphia's Inquirer lamented that "the only ultimate regret will be that so beneficent a work was not sooner undertaken," and the New York Times applauded the bold new legislation as the last phase in the conquest of a continent: "The irrigation plan is but adding to the general resources of the nation in furtherance of the impulse which has carried our vigorous race from the little fringe along the Atlantic to the shores of the Pacific and far into Asian waters."¹

To be sure, the opponents of the legislation quickly reigned in the bureau's grand ambitions. Eastern and Midwestern farm organizations feared that the rapid expansion of irrigated land in the West would return the nation to the agricultural depression of the 1890s. Inevitably, they

argued, adding 100,000,000 acres to the nation's farmland—an area roughly the size of California—would depress crop and land values. Why not reclaim abandoned land in the East, they asked, land closer to the nation's major cities? Why should prospective farm families have to pay the cost of moving two or three thousand miles to deserts far removed from agricultural markets? Farm organizations such as the National Grange found a strong ally in the U.S. Department of Agriculture, which consistently opposed the national reclamation program. And many easterners within Congress feared that even though the Reclamation Act promised that reclamation would be paid for from sales of public land, and from reimbursement of the cost of the hydraulic works by the farmers who benefitted, the day would come when the West demanded money from the general treasury, following the precedent of nineteenth century river and harbor bills. Another concern was that the program would benefit established farmers and private landowners in the West more than those who settled on "virgin land." Few large tracts of arable public land remained, even within the deserts of the West, so the bureau would have to make accommodations with private landowners. In short, even in 1902 support for federal reclamation was thin and brittle.²

The misconceptions of the bureau itself compounded the lack of widespread support for the new program. At first, Reclamation Service engineers assumed that all desert land was fertile, given enough water. So strong was this conviction that on many projects the soil was not tested until years after the project had opened. Much of that soil—20 or 30 percent on some projects—had to be abandoned, at great cost to individual farmers as well as to the nation. Then, too, Reclamation Service officials assumed that most desert land would require only one acre-foot of water a year—a supply of water sufficient to cover the land irrigated a foot deep—while

most land required three to five times that amount. On many projects, farmers complained that the government could not deliver the water they needed. Another misconception was that the appetite for land within government projects would remain strong for decades to come. After all, the nation had absorbed over 400,000,000 acres of new farm land in the decades after the Civil War as the Great Plains were opened to agriculture. The Reclamation Service could not anticipate changes in technology, agriculture, and the sheer cost of farming that would make virgin land far less attractive in the twentieth century than it had been in the nineteenth. Nor could it foresee how the standard of living of those who lived in America's large cities would increase. Federal reclamation had been launched with the expectation that it would provide a subsistence to small farmers. But by the 1920s, the new consumer economy had redefined the "good life" in the United States, and farm families began to emulate the living standards of urbanites.

Let me begin by challenging the idea that, as part of the Progressive Era's conservation movement, the Reclamation Act represented the ethics of "science," or helped to create the "modern" American state. These are important arguments, foundation blocks of the "organizational synthesis" popularized by historians such as Samuel Hays and Robert Wiebe in the 1960s, and an interpretation that still has considerable appeal to historians of the United States. "The modern American conservation movement grew out of the firsthand experience of federal administrators and political leaders with problems of Western economic growth," Hays wrote in Conservation and the Gospel of Efficiency, "and more precisely with Western water development."³ Like silviculture, hydrology was a new science that promised the rational, orderly use of natural resources. It also promised to promote bureaucratic planning by experts

and reorder a constellation of political institutions around the executive branch of government.

Yet this interpretation fails to recognize the strong links between the Reclamation Act and nineteenth century laws and values, particularly the Homestead Act (1862). In 1800, Congress had permitted settlers and speculators to purchase public land on credit, with up to four years to pay. That law proved to be a disaster. Those who purchased the land quickly fell in arrears on their payments. Congress granted many extensions before it excused their debt completely. A century later, in the four years that preceded adoption of the Reclamation Act, most westerners favored using river and harbor appropriations, or proceeds from the sale of grazing permits or timber on the public lands, to pay for the construction of dams and canals. Using proceeds from public lands, and requiring farmers to repay construction costs, was a compromise. In a 1914 letter to Secretary of the Interior Franklin K. Lane, George H. Maxwell, the publicist most responsible for pushing the Reclamation Act through Congress admitted: “We accepted ... repayment from the land because it enabled us to get our bill through. Those who understood political conditions never believed the money would be paid back.” From the beginning, federal reclamation was regarded by many westerners as what we would today call an “entitlement program.” Government farmers, and the many private landowners who owned land within government projects, resisted repaying their debt to the government long before the hard times of the 1920s and 1930s hit the West.⁴

Federal reclamation looked to the past in many other ways as well. The most fateful early decision made by the Reclamation Service was to launch too many projects too soon. This typified distributional politics: no public works program could be launched that did not distribute benefits as widely as possible. The Reclamation Act required that 51 percent of the

proceeds of public land sales be spent within the state or territory in which that land had been sold. Yet the Reclamation Act did not require that so many projects be launched so soon. That was a political decision made by President Theodore Roosevelt. Late in 1901 or early in 1902, Roosevelt warned against undertaking too many government projects at once: “It would be unwise to begin by doing too much, for a great deal will doubtless be learned, both as to what can and what can not be safely attempted, by the early efforts, which must of necessity be partly experimental in character. At the very beginning the Government should make clear, beyond [any] shadow of doubt, its intention to pursue this policy on lines of the broadest public interest. No reservoir or canal should ever be built to satisfy selfish personal or local interests.”⁵

Yet Roosevelt soon changed his mind. When the Reclamation Act passed Congress in June, 1902, Democrats as well as Republicans took credit for the legislation. Indeed, it was Francis G. Newlands, a maverick Congressman from Nevada but nominally a Democrat, who sponsored the bill in the House of Representatives. The Republican Party was dominant in most parts of the West, but Roosevelt expected that Arizona, New Mexico, and Oklahoma would soon join the union, and he wanted to maintain the West as a stronghold of his party. Therefore, two weeks after passage of the Reclamation Act, TR advised the Secretary of the Interior that “instead of starting on a few large [model] enterprises, I should think it would be best to divide up the work among the different States as fairly [that is, widely] as possible.” Smaller projects could be completed more rapidly, insuring that the benefits of federal reclamation would be felt before TR left the White House. The greatest public works program undertaken in the history of the United States would be indelibly associated with Theodore Roosevelt and his party.⁶

Perhaps the strongest link to the past was in the attitudes Reclamation Service officials

exhibited toward the farmers they served. The first director of the Reclamation Service, Frederick Haynes Newell, had never designed an irrigation system when he assumed that job. The ethics of science and efficiency did not dominate Newell's thinking, and he regarded federal reclamation as an experiment in social Darwinism. Some had to fail so that others could succeed. Newell's chief rival to head the reclamation program, Elwood Mead, deeply believed in social planning, but Newell did not. Few of the first settlers on government projects lasted a decade, but Newell denied that the Reclamation Bureau had any responsibility for their failure lack of success. The fault lay with the settlers. "The characteristics of present settlers are in many respects entirely different from those of the older pioneer communities," he complained in 1912. "[T]here is not the spirit of cooperation which ruled the early pioneers." In his 1916 textbook on irrigation, written just after he left the Reclamation Service, Newell noted that more than 75 percent of the first settlers on federal irrigation projects had fled the land within a few years of entry. He concluded:

The irrigators as a body are not only inexperienced, but many of them are disappointed in that they have expected easier things. Thus they do not always appreciate the efforts made in their behalf. There has been attracted to the locality [the arid West] a considerable number of men who have never made a success elsewhere; these attribute their failure to make good under the new conditions not to their own inability, but largely to the faults of the country or system....He is attracted usually by glowing accounts of the relative ease of acquiring wealth in the West, and with erroneous ideas concerning the conditions to be met...There has thus arisen a class which has been called the "professional pioneer," always seeking for something a little better or for conditions

where life will be easier; staying in any locality only a few months and then again seeking El Dorado.

And in 1922, Newell proclaimed that “The reasons for success or failure lie not so much in climate, soil, or markets, but rather in the character of the landowner, his experience, strength, health, and especially the ‘will to win,’ or possession of qualities which distinguish the pioneer.” The biggest problem with federal reclamation, in Newell’s mind, was that the virile rural population had gone soft. Newell’s ideas—and they were shared by many of his lieutenants--were anachronistic in an age when the cost of setting up a new farm had soared and when city life looked increasingly attractive to the nation’s rural residents.⁷

Another part of the organizational synthesis is the argument that conservation and federal reclamation helped to centralize power in Washington. In 1906, the publication Forestry and Irrigation, which largely spoke for the bureau, editorialized that “There is probably no law on the statute books which puts in the hands of a single official of government such unlimited powers of expenditure as the [Reclamation Act.]”⁸ The Reclamation Act gave the secretary of the interior power to select projects, determine the size of farms, withdraw from entry the public lands needed for farms or towns, purchase or condemn existing dams and canals, approve construction contracts, and set the amount each farmer owed the government as well as operation and maintenance charges. During the administration of Theodore Roosevelt, however, most important decisions were made by the president or in the offices of the Reclamation Service. Neither the secretary of the interior nor the director of the U.S. Geological Survey, of which the service was a part until 1907, ever vetoed a project proposed by the Reclamation Service.

Most historians look at conflicts between Congress, the secretaries of the interior, and settlers

on government projects as dominant themes in the Reclamation Bureau's history over the first three decades of this century. The bureau's relationship with the states has been largely ignored, in part because that relationship does not square with the pervasive view that the bureau simply imposed its will on the West. Yet after 1910 or 1911, the Reclamation Service's chronic lack of funds persuaded it to seek assistance from the states, and more often than not resistance to cooperation came from the states rather than from officials within the Reclamation Service. One of the most important amendments to the original Reclamation Act, the Warren Act of 1911, allowed the Reclamation Service to sell surplus water to owners of land outside the government projects, blurring the lines between federal and private water projects. Proponents of the legislation argued that the West's major rivers contained few ideal reservoir sites and that the Reclamation Service could often build a dam that would serve twice as much land as could be irrigated within a government project for little more money. Therefore, the Warren Act permitted the Reclamation Service to contract with private companies, water user associations, or irrigation districts to pay either for part of the dam, or part of the water stored behind the dam. In either case, since the money would be paid into the reclamation fund, providing water to private irrigation projects would produce another source of income. This law proved enormously important to the Reclamation Bureau, and by the 1950s the federal government watered nearly as much land outside its projects as within. In the Snake River Valley, for example, the Jackson Lake Dam at the head of the river provided water to privately irrigated land as far west as Twin Falls, as well as to the government's Minidoka Project near Rupert.⁹

As early as 1904, William Ellsworth Smythe, Francis G. Newlands, and other friends of federal reclamation proposed using irrigation districts to supplement the funds available to the

Reclamation Service, particularly in states like California, which offered few opportunities to construct government projects on the public domain. Irrigation districts, which were institutions created by the state with the power to tax the land within their boundaries and issue bonds to pay for hydraulic works, would turn the Reclamation Service into a construction agency responsible for reducing the cost of construction and ensuring the quality of dams and canals—or so Smythe hoped. However, the Reclamation Act of 1902 gave the Interior Department no authority to build such hybrid projects, and within Congress easterners and midwesterners balked at expanding the scope of the law. Moreover, many westerners feared that federal reclamation meant federal control over their surplus water.¹⁰

In 1915, a Reclamation Service official drafted a plan to create a second reclamation fund exclusively to construct dams and canals within *private* irrigation projects, but nothing came of it.¹¹ World War I offered the best opportunity for cooperation. At the end of the war, in anticipation of post-war unemployment, Secretary of the Interior Lane proposed a massive program to put 50,000 returning veterans to work clearing stumps, leveling land, laying out townsites, and building houses, barns and roads. His bill proposed a partnership between the states and central government. The states could donate unimproved land to the federal government, leaving reclamation and settlement to the Reclamation Bureau, or they could pay at least one-fourth of the entire cost, from purchasing the land to building houses, barns and roads. The legislation required the states to create soldier settlement boards to screen applicants and to administer the completed projects. The states would also provide returning soldiers with agricultural training, sharing that cost with the federal government. Particularly after crop and land prices began to fall in 1919, the Lane legislation fell victim to the post-war economic slump

and the absence of grassroots support for reclamation or planned settlements.¹²

Throughout the 1920s, the Reclamation Bureau encouraged the western states to play a larger role in federal reclamation, but the states refused. State politicians argued that providing irrigated land was a national responsibility, that there was no demand for more irrigated land, that hybrid projects would threaten state control over water rights, and that constitutional debt limitations prevented the states from buying land, preparing it for cultivation, or constructing irrigation and drainage works. Oddly enough, hybrid projects had the greatest appeal in the state's rights South, not the West. Since the early years of federal reclamation, the Reclamation Bureau had wanted to extend its operations to include swamp and cutover, as well as arid lands. In 1918, Secretary of the Interior Franklin K. Lane, with the encouragement of the Reclamation Service, persuaded Congress to appropriate \$100,000 to study the reclamation of wastelands in the South. President Woodrow Wilson heartily endorsed the plan. Additional expenditures followed in 1926, 1927, and 1928. In 1926, a committee consisting of representatives from the federal and state governments, along with private interests, selected four potential project sites. Congress, however, balked at opening new farmland during a time of agricultural depression.¹³

Congressional appropriations for public works increased dramatically during the 1930s, and as the bureau's budget soared its appeals for state aid all but disappeared. Power did increase in Washington as a result of the high dam projects undertaken in the 1930s, but state and local institutions of water management also proliferated. Boulder Dam is a case in point. The Metropolitan Water District, formed to carry water and power to Los Angeles from the Colorado River, used the irrigation district—a state and local institution—as a model. Even though the Reclamation Bureau operated Parker Dam—the origin of the aqueduct from the Colorado River to

Los Angeles--it used funds provided by the MWD. The MWD was also a bridge between the federal government and private utility companies. Apparently, the bureau got the idea of using power revenue to finance Boulder Dam from William Mulholland and E. F. Scattergood, the latter of whom had designed and supervised the water and power systems of Los Angeles. Homer Hamlin, who served as Los Angeles City Engineer during the 1920s, was one of the first to conceive of a multiple-purpose dam in Boulder or Black Canyon, and in 1929 F. E. Weymouth, who had been chief engineer of the Reclamation Bureau under A. P. Davis, was chosen to head the MWD. Weymouth hired many former employees of the Reclamation Bureau who had left government service during the Harding scandals of the 1920s. Here again, the line between federal, state, and private institutions is very blurry.¹⁴

Thus far I've focused on federal reclamation in the first few decades of the twentieth century. The conventional wisdom among professional historians is that Boulder Dam and the other great dam projects conceived during the 1930s, including Grand Coulee and Shasta, resurrected the bureau's reputation at the expense of the family farm and the rural West. During the 1930s, this interpretation runs, the bureau turned its attention to western cities, and World War II increased the importance of the urban West. But that interpretation is at best misleading. The bureau did much more than build high dams during the 1930s. By 1941, there were 46 Bureau of Reclamation irrigation projects in the West and another 27 under construction. That was more than double the number of projects in 1920, and preliminary surveys had been completed on an additional 48 projects. There was a surprising growth in irrigated land after 1935. From 1920 to 1935 the amount of land irrigated by the bureau increased only modestly--from 1.2 million acres to 1.6 million. By the end of World War II, however, the bureau irrigated twice as much land

within the government projects as in 1920.¹⁵

The Reclamation Bureau had good reason to publicize the glamorous high dams more than its irrigation projects because the chronic and intractable problems it had encountered during the Progressive Era remained. Farmers everywhere suffered from the depression of the 1930s, but nowhere were times harder than on most of the government projects. There were big differences between such successful projects as the Yakima and Salt River and those in Montana. But a 1940 survey of the projects settled between 1931 and 1940 revealed desperate poverty. Sixty per cent of the original settlers on the Vale-Owyee Project in eastern Oregon had left their farms, or leased their land to others. Seventy-five percent of the homes on that project cost less than \$350, and half had two rooms or less--even though the average-size farm family numbered five. Forty percent of those Oregon families could not afford to dig a well, so they carried their drinking water five miles or more, and many common diseases, including typhoid fever, went untreated because the settlers were too poor to hire a doctor. On the other hand, many conditions remained beyond the Reclamation Bureau's control. A 1936 study of 136 farmers who had settled on the Klamath Project along the California-Oregon border in 1927 revealed that most who left their farms had homesteaded for speculative reasons, fully expecting to sell out, or they were lured away by the city, or pushed away by old age, illness, or divorce. Not all farmers who abandoned government projects did so because they had "failed," or because they lacked experience or capital.¹⁶

Nevertheless, for all its problems, the dream of the family farm remained strong in the years following World War II. Most historians who have written about the bureau after the war have failed to recognize the idealism that animated its leaders, at least from 1945 to 1953. In those

years, the Interior Department was filled with New Dealers who wanted to build a better world, including Harold Ickes, Abe Fortas, Oscar Chapman, Michael Straus, Arthur Goldschmidt, and Stephen Rauschenbush. Many smaller irrigation projects were designed as much to provide supplemental water outside government projects—to farmers who irrigated but suffered from inadequate water supplies—as to open new land to cultivation. However, the Interior Department hoped to settle 45,000 returning veterans and their families on the government projects—the biggest of which would irrigate one million acres of “virgin land” within the Columbia Basin—opening nearly as many new farms as had been settled from 1902 to 1945.¹⁷

But the bureau’s objectives were not always consistent, and jobs, power, and water for cities often worked at cross purposes with the homestead ideal. At the end of the war, as during the 1930s, the paramount concern was jobs. Officials in the Interior Department concluded that a permanent increase in public works spending would not just prevent the United States from lapsing back into the depression as the nation converted to a peacetime economy, but would provide sustained economic growth and serve as an antidote to the boom and bust cycles inherent in capitalism. Secretary of the Interior Harold Ickes predicted that 14,500,000 would lose their jobs at the end of the war. Such agencies as the Reclamation Bureau, Corps of Engineers, Forest Service, and Soil Conservation Service had plans for plenty of worthy projects that they could begin within three months of the war’s end. In April 1945, the bureau proposed to Congress 415 irrigation and multiple-purpose water projects in 17 western states. State-by-state the number varied, from a modest 5 projects in Washington to 96 in Montana, and from 101,000 acres in Utah to 2.2 million acres in California. These projects were expected to add 11,000,000 acres of new land to cultivation and provide supplemental water to nearly as many acres of old land. That

was twice the amount of land irrigated in 1945. Secretary of the Interior Harold Ickes—who had headed the Public Works Administration during the New Deal—estimated that the post-war work would provide one year’s employment for at least 1.5 million returning veterans.¹⁸ The bureau’s budget went from 50 million in 1946, to 120 million in 1947, to 200 million in 1948, to over 300 million in 1950. Gone was the idea that dams and canals should be built using the proceeds from land sales or oil leases. Reclamation had become a symbol of national economic growth, and a method to avoid future depressions.¹⁹

But federal reclamation meant much more than jobs. Interior Department officials argued that federal reclamation could help win the Cold War, just as the power it produced had helped to win World War II. Nevertheless, Secretary of the Interior Oscar Chapman feared, in his words, that the United States ran “a grave danger of saddling ourselves with a straight military economy. If that happens we shall find that the old economic freedoms which give American life so much of its richness have disappeared. We shall be supporting an enormous budget, with a huge proportion for defense, and yet find ourselves poor as church mice where our great basic programs are involved. Yet those programs—irrigation and land development projects, proper care for our national park system, intelligent development of our river systems, and so on—are the things which make the difference between the rich cultural society we are used to and a pinched, Spartan existence which is inevitable under a straight military economy. For instance, we are nearing the ceiling on the growth and stability that can be achieved by our Western States without increased, broad-scale irrigation and related water resources development.”²⁰

Since 1920, a dramatic demographic change had occurred within the West. Parts of the region lost population during the 1930s, but overall the 11 states of the Far West gained 60

percent as compared to a 24 percent increase in the entire population of the United States.

During World War II, the difference was even more pronounced. The population of the Far West increased by nearly 18 percent while that of the nation as a whole increased less than one percent. Much of that increase occurred within California, Oregon, and Washington, and those states continued to grow at a rapid rate after the war. From 1940 to 1950, their population increased at a rate three times faster than the nation as a whole.²¹

The West's population boom promised to prevent the Reclamation Bureau from returning to the dark years of the 1920s. But most of the region's population growth during World War II was due to war industries, and officials within Interior feared that as those industries disappeared the West would return to an extractive economy, one that attracted raw material producing companies that could profit the cheap power no longer used in such defense industries as ship or plane building. Arthur Goldschmidt, who headed the Interior Department's Division of Power at the end of the war, thought that the region held a disproportionate number of "rural, low income groups." People who lived at or near the subsistence level, in his judgment, "do not contribute to the national welfare or to a healthy economy in any region." He wanted to use cheap hydroelectric power to decentralize industry in the United States so that every part of the nation, in his words, contained a "balanced economy, a combination of agriculture and industry based upon the natural resources of the region itself....Colonies are out-of-date as mere sources of raw materials and as markets. They are economic anachronisms." During World War II, many British economists and sociologists traveled to the United States to inspect the Tennessee Valley Authority. One visitor, Julian Huxley, likened the American South and West to the colonial problem of the British in Nigeria.²²

Arthur Goldschmidt called for large-scale planning in the West. At the end of the war, however, powerful opposition surfaced within the West to expanding the “TVA-idea” or river basin planning. While the Reclamation Bureau often sold large water projects as part of the defense effort during the Cold War, they also deepened suspicions about planning and “big government.” The 1948 Republican platform called for sharp reductions in foreign and domestic spending, and it opposed the creation of “all-powerful Federal socialistic valley authorities.” By 1952, the New Deal had become “creeping Socialism” to conservatives within the Republican Party, and planning had become associated with Communism. In September, 1950, on the floor of the United States Senate, Senator William Knowland of California charged that Secretary of the Interior Oscar Chapman, Commissioner of Reclamation Michael Straus, and Assistant Secretary of the Interior William Warne, “have a scarlet left-of-left record that extends back many years, even to the early years of the New Deal.” As early as 1938, Knowland charged, Chapman belonged to the American League Against War and Facism. “This outfit,” the senator proclaimed, “has been officially branded as a simon-pure and unchallenged transmission belt of the Communist Party in America.” Another employee of the Interior Department, H. Stephen Rauschenbush, was, according to Knowland, “probably the chief prophet of modern American Marxism.”²³

Senator Knowland notwithstanding, no federal bureau had greater prominence in the West during the 1950s than the Reclamation Bureau, and it is interesting to consider why such a powerful agency faded from the limelight so rapidly during the last few decades. Several explanations have been offered, each of which has merit. The environmental movement certainly played a part. In the post-war years, many members of the Sierra Club, Audubon, and other

environmental groups considered themselves conservationists. Their battle was over where dams should be located, not the construction of dams per se. Dams should not flood land in national parks or national monuments, nor should they imperil the West's scenic wonders. Some historians think that the battle against dams in Echo Park, the Grand Canyon, Glen Canyon and other parts of the West played a large part in creating the modern environmental movement.²⁴

Later, in the 1960s and after, environmentalists began to oppose *all* dams. On some rivers, particularly the Columbia and Snake, massive numbers of fish perished because dams depleted oxygen, reduced water temperatures upstream in reservoirs, increased temperatures in the sluggish water downstream, and limited the ability of rivers to dilute sewage and other contaminants in the water. At the least, dams contributed to the prolific growth of algae, at the most to eutrophication. Water projects also had a profound effect on the habitat of terrestrial animals, contributed to the buildup of alkali, salts and other dangerous elements in the soil (including selenium) and to groundwater depletion. Yet the environmental movement did not kill dam-building in the West. More significant than opposition to water projects from groups outside government was opposition to new dams and canals from federal agencies concerned with water quality and wildlife habitat. In the 1970s, R. L. Coughlin of the Federal Water Quality Administration publicly charged that the Bureau of Reclamation was the prime source of water pollution in the Far West. While the U.S. Department of Agriculture and the Corps of Engineers had been strong critics of the Reclamation Bureau during the early decades of the twentieth century, by the 1970s many other agencies opposed the bureau, notably the Fish and Wildlife Service and the Environmental Protection Agency. In the battle over the Garrison Diversion Unit in North Dakota, they were joined by President's Council on Environmental

Quality, the State Department, the Office of Management and Budget, and the General Accounting Office.²⁵

Marc Reisner has provided another answer to the question of what happened to federal reclamation. To Reisner, the collapse of the Teton Dam in 1976, built on a tributary of the Snake River in 1975 despite warnings from U.S. Geological Survey engineers of unstable rock and earthquake hazards in the region, symbolized the end of the dam-building era. When sections of that structure dissolved and washed away, eleven people died, 15,000 were left homeless, 13,000 cattle drowned, the flood stripped topsoil from 100,000 acres of prime farmland, and property damages reached one billion dollars. The Reclamation Bureau had built 240 earth fill dams west of the Mississippi, and this one was the first to fail. A commission of nine engineers spent six months investigating the causes of the disaster and concluded that the bureau had been at fault for using a highly erodible soil for the dam's core and for failing to seal the structure to the rock at either end properly. The wisdom and justice of building dams had been questioned many times before 1976, but seldom had the engineering skills and judgment of the Reclamation been called into question.²⁶

The Teton Dam rested on an earthquake fault, which meant that bedrock was far below the surface debris and sediment. Dam safety was a serious matter because many streams had been plugged so many times that the collapse of one dam would take out a series of structures, producing massive floods, extensive damage, and thousands of deaths. The entire Columbia River had been dammed, except for a fifty-mile stretch near the Hanford nuclear power plant, and in California every major stream save one had been dammed at least once. If Glen Canyon Dam gave way, for example, the resulting flood would destroy Boulder and Davis dams as well—with

devastating results to southern California. To be sure, the Teton Dam collapse did not persuade Congress to reexamine wasteful expenditures on public works. If it had, President Jimmy Carter would not have compiled his famous “hit list” of water projects in 1977. Yet this episode did demonstrate a fundamental hydrologic truth: since the deep canyons of the West had all been dammed, new projects had to be constructed at far less desirable sites. And safety was not the only issue. Once the deep canyons were gone, new dams threatened to flood as much farmland as they irrigated. Reisner concluded: “As Fontenelle [on the Green River in southwestern Wyoming] was an inferior site compared with Flaming Gorge, as Glen Canyon was inferior to Hoover, as Auburn was vastly inferior to Shasta (but six times more expensive, even allowing for inflation) the Bureau was now being forced to build on sites it had rejected forty, fifty, or sixty years earlier. It was building on them because while the ideal damsites had rapidly disappeared, the demand for new projects had not.” The Teton Dam failure raised questions and doubts about many of the projects the Bureau had on the drawing boards, particularly Auburn Dam, which had been authorized for the North and Middle forks of the American River 30 miles north of Sacramento. Less than a year before the collapse of Teton Dam, a 5.9 earthquake hit near Oroville on a seismic fault thought to be dormant. Bureau of Reclamation studies required by the State of California estimated that complete failure of a dam at the Auburn site would flood 750,000 people, inundate the state capital, and close five military bases. Even though more than 200 million dollars had been spent on the project, work was stopped and President Carter added the Auburn Dam to his list of rejected projects.²⁷

It is wrong to suggest that all, or even many, of the dams built by the Bureau of Reclamation in the 1960s and 1970s were unsafe. It is not wrong, however, to suggest that the cost of those

dams greatly exceeded their economic benefits and that bureau personnel *consciously* doctored the figures to make each dam look as attractive as possible. The Teton Dam was not just built in a bad place. Its cost far outweighed its benefits, and like many projects built during the 1960s and 1970s, it benefitted relatively few water users. When the bureau first proposed the project, it used an interest rate of 3 1/4 percent in calculating benefits even though the rate that prevailed when work began was 5 3/8 percent. Yet even at the lower rate, the benefit to cost ratio was less than one—meaning that taxpayers spent more money building the project than it could return to water users.²⁸

The Reclamation Bureau manipulated figures in many ways, as did the Corps of Engineers. Not surprisingly, most projects cost far more than original estimates. To reduce construction costs on paper, the bureau used prices that had prevailed five or ten years earlier. It also added “write off” benefits not recognized during the pre-World War II years, such as recreation, habitat improvement, or pollution abatement. Then, too, the bureau often stated power revenue from dams as constant, even though revenue from that source generally declined over the life of the dam. In 1964, Senator William Proxmire of Wisconsin examined 380 pending water projects in the United States, some of them Corps of Engineers projects. He found that more than half had benefit to cost ratios of less than two, and he noted that “I have consistently found that projects with an alleged benefit-cost ratio of less than 2 to 1 provide returns less than their cost. Costs of public works are invariably much greater than originally estimated because of poor estimates and inflationary pressures.”²⁹

The most common method of padding benefits, however, was to use an artificially low interest rate. For most of the 1960s, the bureau used 3 1/8 percent, which Congress had set as a

benchmark in 1962. However, the actual rate at which the government borrowed money in the middle to late 1960s was closer to five percent than three, and the difference between the two figures became enormous when a project was amortized over 50 or 60 years. As Richard Berkman and Kip Viscusi noted in the influential Ralph Nader study of the bureau, by 1969 the cost of all the projects constructed by the bureau ran nearly three times the original estimates.³⁰ Nevertheless, despite creative accounting techniques, by the 1960s many large projects still had a cost to benefit ratio of less than one. The Garrison Diversion Project in North Dakota and the Central Arizona Project were glaring examples.³¹

One reason that damage to the environment did not play a larger role in bringing the high damage to an end was that environmental groups attracted more public support by attacking waste and subsidies than by trying to protect nature. The economist Paul Taylor estimated that within the Central Valley Project the federal subsidy amounted to \$92,320 for a farm 160 acres in size, and in parts of the San Joaquin Valley many farms were 2,000 to 3,000 acres in size. The Westlands Water District was formed in 1952. The San Luis Dam, part of the Central Valley Project was authorized by Congress in 1960 and completed in 1968, but the Westlands project served almost exclusively corporate landowners, including the Southern Pacific Railroad and Standard Oil Company. According to Marc Reisner, district farmers paid only one tenth of the actual cost of the water they used, and 70 percent of the profit they received from crops came from federal water subsidies.³²

Federal subsidies to land served by the Bureau of Reclamation increased dramatically from 1902 to 1968, tipping the scale of benefits from national water projects away from the East and upper Midwest. Federal reclamation had been sold to Congress partly as compensation to the

West for river and harbor bills that mainly benefitted states around the Great Lakes and along the eastern seaboard. But the historian Tim Palmer estimates that from 1950 to 1976, the Northeast received only six percent of the money spent on water projects by the Corps of Engineers and Bureau of Reclamation while the South received 28 percent and the West about half. In effect, residents of the East and Midwest subsidized the growth of cities in the West at the expense of those in the northeast, as crops grown in California and Arizona received greater per acre subsidies than crops raised in other parts of the nation.³³

Yet the waste of bureau projects, the cost overruns, the environmental damage, the disproportionate benefits to the West and South, and the bureau's arrogance in responding to criticism do not alone explain why the era of dam-building came to an end in the 1970s. To some extent, of course, the Reclamation Bureau suffered from the deep public cynicism produced by the Vietnam War and Watergate. Few institutions of government escaped the crisis in moral authority. Still, the bureau's fall from grace was more significant because it had been built on such high ideals. The Corps of Engineers had never promised to transform society, but the Reclamation Bureau had inspired grand dreams—not just the dream of conquering forbidding deserts but of building a new society there. Often lost in the day-by-day operations of the bureau, these ideals remained the soul of federal reclamation.

Homemaking was the bureau's only mission that appealed to citizens outside the West. As long as the bureau paid homage to the family farm ideal, many of its blunders and failures were forgiven. In many parts of the West, farm size had increased dramatically during the agricultural depression that extended from 1920 to 1940. In Montana the average leaped from 480 acres to 821 acres, and in Wyoming from 749 to 1,866 acres. Tenancy also increased. In 1946,

Commissioner of Reclamation Michael Straus promised that within five years the bureau would have opened more than 45,000 family-sized farms on 4,000,000 acres.³⁴ The bureau's magazine, Reclamation Era, promised that the bureau would provide as many homes to returning veterans and their families as it had created on all its projects during the four decades prior to World War II. The first farms would be on the Klamath, Yakima, Minidoka, and Shoshone projects, but the single largest project would be in the Columbia River basin, where the bureau hoped to have at least 400,000 acres ready for settlement by 1950 or 1951. "The ultimate objective of the Bureau of Reclamation and its staff," Reclamation Era reported, "is to develop the West through the creation of permanent family farms on Federal Reclamation projects."³⁵

By the end of the 1950s, however, it was clear that the Columbia Basin Project would not resurrect the bureau's mission to create rural homes in the West. At the end of World War II, the Reclamation Bureau had hoped to create 10,000 to 20,000 new farms in the Columbia Basin, but only 2,300 had been opened by 1958. Nor was that land settled by young men looking for a fresh start; the median age of those who took up farms in the Columbia Basin Project was 40. Nor did it provide homes for those who had abandoned farms on the Great Plains; most settlers came from Washington or Utah. These were not rural poor. Over half had family assets of \$20,000 or more, and one-third did not live on their farms. In 1968, the Reclamation Bureau turned the project over to three irrigation districts. According to the historian Paul Pitzer, had the bureau finished the project, the results would have been even worse. "It would be a collection of family farms ranging from forty to eighty acres, none of them capable of supplying their owners with a satisfactory living. The area would be a rural slum. It is for the best that this aspect of the project failed."³⁶

It was not just that the bureau failed to create new family farms, it also failed to enforce older restrictions on farm size. By the 1970s, the hallowed 160-acre limitation on the cheap water each farmer could secure from the bureau became a mockery. From the beginning of its life, the Reclamation Bureau had little choice but to accommodate to large private landowners within the boundaries of its projects. Those landowners consistently opposed bureau efforts to control the sale of their surplus or “excess” land, and the bureau lacked both the staff and the inclination to monitor the sale or title transfers to private lands within projects. The Interior Department gave private landowners plenty of warning before it acted, and sometimes it did not act at all. A married couple could acquire water for 320 acres, and by signing a contract with the Secretary of the Interior to dispose of surplus land, any person who owned more than 160 acres was given cheap water to irrigate *all* the land for a decade or more before he was required to sell it. Moreover, if landowners paid all the construction charges imposed on the excess lands in advance, the Interior Department usually permitted them to sell that land at any price they wished.³⁷

The 160-acre limitation had never been enforced, but before the 1930s the vast majority of farms within the reclamation projects—well over 90 percent—were that size or smaller. Nevertheless, new projects undertaken by the bureau in the 1930s and after catered more and more to large landowners, particularly in California, and they were the projects that captured the public imagination. During the 1930s the bureau, with congressional approval, waived the 160-acre restriction on several large projects, including the Central Valley Project, Imperial Valley Project, and the Colorado--Big Thompson Project. The CVP was the biggest battleground, in part because the Corps of Engineers was ready to build some of the reservoirs within that project

as flood control structures that did not require repayment, and that was an attractive option to large farmers. In the south San Joaquin Valley, 700,000 acres were divided into 600 farms and 800,000 acres were divided into 12,300 small holdings. But that pattern of land distribution changed dramatically after World War II. By the time Congress raised the 160-acre limitation to 960 acres in 1982, and waived many other restrictions on large landowners, the family farm seemed more and more of an anachronism. Even more of an anachronism was the notion that federal reclamation should attempt to reform American society and distribute wealth as widely as possible. As Donald Worster has noted, the 1982 law tacitly acknowledged that the economic marketplace should decide the size of farms and the distribution of wealth, not government.³⁸

Although the Reclamation Bureau continued to serve many small farms, particularly outside California, the 1982 law convinced many critics of the bureau that it had abandoned its original mission and sold out to agribusiness. Even more serious, by the 1980s the Reclamation Bureau had lost its reputation as the exemplar of new technology. During the 1930s, Boulder Dam stood as a monument to human ingenuity, and the dams the bureau built were seen as thoroughly modern—the latest in the technology of managing nature. Boulder Dam was more than a piece of concrete. Among other things it symbolized a powerful idea that had been around since the Progressive Era, the concept of “multiple use.” The biggest dams built by the bureau, including Boulder, Shasta, and Grand Coulee all provided flood control and power, as well as irrigation and water for towns and cities. But those were exceptional, not typical dams. The West contained few places to build such dams, which is why small dams were so much more common than large ones. Not only were the sites for large dams limited, but most dams were constructed to serve a particular purpose. It was not easy to use a dam designed mainly to generate power for

flood control or irrigation as well.

During the 1930s, part of the appeal of high dams was that they would last as long as the pyramids. But after World War II, that very “permanence” became a liability. One of the strongest arguments against building dams had always been that it made more sense to move people to water than water to people. Far more water was lost in transit, through seepage and evaporation, than was delivered at the end of the pipeline or ditch. The Cold War raised new concerns. Dams contributed to the concentration of people in large cities, making those cities more attractive targets, and while high dams were very strong, they could not resist a direct hit from a thermonuclear bomb. Many of the West’s cities could be as easily paralyzed by disrupting their water and power systems, or by the floods that would result from bringing down one of these dams, as from the detonation of a thermonuclear bomb within the city itself. Even more important was the promise of nuclear power. As a writer in the Sierra Club Bulletin observed in 1948, “we may live to see the regulated use of atomic power a few years from now. If we learn to use it properly...we won’t need to harness all the rivers of the land....At least we might wait a little while and see what happens before we drown our greatest canyons and destroy forever so much natural beauty.”

David Brower suggested that atomic energy might make high dams obsolete long before they filled with silt. “Is it not time to reverse the trend of centralization—of concentrating tremendously remunerative strategic targets: of building larger projects to enable more people to live in less space[?]”³⁹ Silt was not just something that clogged dams, it was a symptom of bad land management. “[T]he real management of rivers begins in the headwaters and on the hilltops...through good land management,” a writer observed in 1950 in the Bulletin. Yet neither

the Corps of Engineers nor the Bureau of Reclamation cooperated with the Soil Conservation Service or the Forest Service in their attempts to fight soil erosion. In the middle of the 1960s, during debate over the proposed Rampart Dam in Alaska, a Corps of Engineers structure that would have created a reservoir larger than Lake Erie, a writer in Living Wilderness pointed out that any one of five atomic generators produced by the General Electric Company could produce as much power as the proposed hydroelectric plants at Rampart Dam at half the installation cost. And, she estimated, the price of the power to consumers would be no higher.⁴⁰

But most important was that hydroelectric power no longer seemed as attractive after World War II as it had during the 1920s or 1930s. California was a prime example. In 1910, falling water produced most of the electricity used in the state. Steam power was used mainly to meet peak demands. But the increasing efficiency of steam generators, the falling prices of petroleum and natural gas, and the fact that such plants could be located near large cities, made steam turbines increasingly attractive. In 1920, hydroelectric power constituted 37 percent of the power generated within the United States. That figure fell to 33 percent in 1940, and despite the large hydroelectric plants opened during World War II, only 36 percent of the nation's power came from falling water in 1945.⁴¹

New technology also reduced the need to expand the supply of water for irrigation. Insecticides, pesticides, and sophisticated farm machinery permitted farmers to raise much more food and fiber on the same land, irrigated or not. Levelling land with lasers, lining canals with concrete, delivering water directly to the roots of plants through underground pipes, utilizing computers to determine exactly the amount of water needed when it was needed in different soils, and raising plants that required less water were just a few of the changes that permitted

farmers to stretch their water supplies. Conservation promised to free up a large part of the West's water. And as the cost of irrigating land rose, it made little sense to build new dams and canals.⁴²

In retrospect, President Jimmy Carter's famous "hit list" of water projects seems far less significant than it did at the time. Dams had been under fire throughout the 1970s, and many critics of western water policy argued that there was no need to open any additional land to irrigation. On February 21, 1977, Carter released a revised version of the 1977-78 budget prepared by Gerald Ford's staff. At a time of growing budget deficits and inflation, Carter wanted to balance the budget, and eliminating wasteful spending would help. He deleted 19 water projects that he deemed improvident, unnecessary, or damaging to the environment. He also launched a review of 320 projects already authorized by Congress. Even such staunch environmentalists as representatives Moe Udall of Arizona and Gary Hart of Colorado came out against the cuts. Initially, environmental organizations strongly supported the president in the hope that Carter would abandon such projects as the Auburn Dam in California and the Garrison Diversion Project in North Dakota, but that support dissipated when—under strong pressure from Congress—Carter compromised so that only nine projects were eliminated. His support for raising the 160-acre limitation to 1,260 acres and for continuing the subsidies to the Westlands Irrigation District also dismayed environmental groups.⁴³

The cuts in spending on water projects were more apparent than real. In 1980, Carter approved four billion dollars for water projects, though relatively few of those projects were located within the West. On the advice of his chief economic adviser, David Stockman, and with the support of such disparate groups as the American Tax Reduction Movement, the National

Taxpayers Union, Common Cause, the Americans for Democratic Action, and the League of Women Voters, President Ronald Reagan went considerably beyond Carter. Reagan reduced spending on water projects and signed the first bill in American history to “deauthorize” water projects—eight projects that would have cost 2.5 billion dollars. Even more important, Reagan added the requirement that those who benefitted from new water projects share in paying for them. Since few water users were willing to use their own money to help pay for water projects, this—and the “stagflation” and deficits that characterized the Carter and Reagan years—did more to end the dam-building era than anything else. No new major Bureau of Reclamation projects were authorized during the 1980s or 1990s. In the 1970s and after, the greatest expansion of irrigation was on the Great Plains, where farmers mined underground water far faster than it could be returned by nature to the aquifers. Nebraska irrigated less than one million acres in 1959, but seven million acres in 1980.⁴⁴

By way of conclusion, what has the experiment in reclamation meant to the West and the nation? Most professional historians have regarded federal reclamation as a disaster, and there is plenty of evidence to support that conclusion. During its first few decades of life, the Reclamation Bureau did not succeed in placing “surplus” human beings on surplus land, it did not succeed in reforming rural institutions in the West, it did not succeed in curbing land speculation, and it did not succeed in producing a more virtuous society. By the 1930s only two or three million acres had been irrigated by the federal government, a far cry from the 30 to 100 million acres promised by various proponents of federal reclamation in 1902. The bureau became a much more popular institution within the West after World War II, but by the 1960s it would be blamed for encouraging rampant urban growth, for squandering tax dollars, for

deceiving the public, and for being the region's biggest polluter.

That said, the contribution of the bureau to the West depends on one's perspective. Until the last two decades, most appraisals of federal reclamation focused on economic benefits. In 1919, encouraged by the agricultural boom of World War I, Arthur Powell Davis, then director of the Reclamation Bureau, stated flatly that "national reclamation has amply justified all [that] its exponents declared for it [in 1902]." He estimated that the 122 million dollars spent on federal reclamation had generated 550 million in new wealth. Within the federal projects land that had sold for five or ten dollars an acre in 1902 fetched as much as \$200 an acre, and 600,000 westerners lived on or near a government project. In fiscal year 1920, the crops raised on the Salt River Project returned more than twice the cost of constructing that project. To be sure, the poorest states in the West, such as Nevada and Arizona, benefitted more than the wealthiest. For example, the population of Phoenix increased more than 400 percent from 1905 to 1917, and much of that growth derived from the Salt River Project. In 1920 as in 1980, the farms and cities of the West were much more closely related than most historians have recognized.⁴⁵

Historians have rarely considered what federal reclamation can teach us about government.⁴⁶ Yet there are powerful lessons in the bureau's story. First, the bureau suffered from a split personality from the beginning of its life. It could not reconcile the dream of the autonomous family farm with the goal of promoting regional economic development, as Boulder Dam demonstrates. Repeatedly, it was forced to choose between the two and in the end it did far more to shore up the status quo than to reform western society. Second, as a recent study by the political scientist Daniel Carpenter reminds us, the personalities and vision—or lack of vision—of bureau chiefs matters for as much or more than "bureaucratic culture."⁴⁷ The first head of the

Reclamation Service, Frederick Haynes Newell, may have been a fine engineer, but he was also blinded by a nineteenth century vision of agriculture that was anachronistic by 1902. Elwood Mead, Newell's chief rival to head the new program, had blind spots of his own, but there is little doubt that from 1902 to 1924 the bureau would have pushed a very different agenda in Congress had Mead been responsible for the program. Third, federal reclamation exemplifies federalism more than the expanding power of the central government. In the United States, power can flow two ways simultaneously. The power of state and local institutions often increase as federal agencies become more powerful in Washington. As one political scientist has put it, our system of government is more a marble cake than a layer cake. It has to be considered in its entirety. From the beginning of its life, the Reclamation Bureau was forced to accommodate itself to local interests and local institutions. We need to pay as much attention to how the bureau deferred and cooperated with state and local institutions of government, and attempted to fashion new institutions of government, as with how it tried to compete and dominate. Finally, federal reclamation demonstrates the power of sectionalism—within the West as well as the United States. The leaders of the Reclamation Bureau attempted to avoid the pitfalls of public works in the nineteenth century, but Americans have always expected the benefits of government to be spread as widely as possible. In 1902, that meant that 51 percent of the proceeds from the sale of public lands should remain within the state or territory where that land was located, and that decision had dire consequences for federal reclamation. And it is interesting to note that when Jimmy Carter issued his “hit list,” he received the strongest opposition from Utah, Wyoming, Colorado and Arizona, whose political representatives thought that California had received far more than its fair share of federal water appropriations. Whether the water projects they voted

for were wasteful or inefficient was beside the point. They wanted to catch up with California by capturing a share of the Colorado River for upstream interests.

It is important to note that the Bureau of Reclamation is still a very important federal agency. The masthead of its website announces that the bureau's mission is "Managing Water in the American West," not constructing water projects. The brief history tells us that the bureau has created "more than 600 dams and reservoirs including Hoover Dam on the Colorado River and Grand Coulee on the Columbia River." Today the bureau supervises or oversees the distribution of water to more than 31,000,000 urban and rural residents in the West, including one-fifth of the region's irrigation farmers, and, we are told, that land produces 60 percent of the nation's vegetables. It is the "Largest wholesaler of water in the country," and the second largest producer of hydroelectric power in the West, after the Corps of Engineers. How times have changed is reflected in the concluding paragraph in the "What We Do" section of the website: "Today, Reclamation is a contemporary water management agency with a Strategic Plan outlining numerous programs, initiatives and activities that will help the Western States, Native American Tribes and others meet new water needs and balance the multitude of competing uses of water in the West. Our mission is to assist in meeting the increasing water demands of the West while protecting the environment and the public's investment in these structures. We place great emphasis on fulfilling our water delivery obligations, water conservation, water recycling and reuse, and developing partnerships with our customers, states, and Indian Tribes, and in finding ways to bring together the variety of interests to address the competing needs for our limited water resources." The historian can only smile at those words, both because the mission of the bureau has changed so dramatically over the last few decades, and because the bureau has

come back from its deathbed before, particularly during the 1930s. If an agency that generated so much conflict over water in the past is now the region's negotiator and peacemaker, this surely is a brave new world.⁴⁸

Notes

1. The quotes are as reprinted in Donald J. Pisani, To Reclaim a Divided West: Water, Law, and Public Policy, 1848-1902 (Albuquerque: University of New Mexico Press, 1992): 319-20.
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5. The Roosevelt quote is as reprinted in The U.S. Reclamation Service: Its History, Activities, and Organization (New York: D. Appleton and Co., 1919), 19.
6. Theodore Roosevelt to Ethan Allan Hitchcock, July 2, 1902, Theodore Roosevelt Papers, Library of Congress, Washington, D.C. Also see Hitchcock to Charles D. Walcott, June 18, 1902, and Hitchcock to Roosevelt, July 9, 1902, Records Group 48, Records of the Department of the Interior, Entry 195, Hitchcock Letterbooks, National Archives, College Park, Maryland.
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11. E. B. Hoffman, "Cooperative Plan," dated May 5, 1915, Records Group 115, Records of the Bureau of Reclamation, General Files, 1902-1919, Box 85, "Legislation—Corres. Re Legislation and Laws Affecting the Reclamation Act thru 1915," Federal Records Center, Denver, Colorado. Also see B. E. Stoutmeyer to Elwood Mead, December 6, 1924, in RG 115, General Administrative Files, 1919-1929, Box 367, "(522): General Corres. Re Cooperation by States with the Bureau in Colonizing and Settling Lands thru 1929" and Reclamation Record 5 (December 1914), 455-56.
12. National Soldier Settlement Act, H. Rep. 216, 66 Cong., 1 sess., serial 7592 (Washington, D.C.: GPO, 1919), 15-17. Also see the extensive correspondence on the Lane bill in RG 115, General File, 1902-1919, Box 92, "(110-F): Corres. Re National Legislation [Soldier Settlement Act], Jan. and Feb. 1919) and Box 111, "(144): General Corres. Re Soldier Settlement Legislation (Federal) through 1929."
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19. Annual Report of the Secretary of the Interior for the Fiscal Year Ended June 30, 1944 (Washington: GPO, 1944), 5, IX-X.

20. Annual Report of the Secretary of the Interior, Fiscal Year Ended June 30, 1951 (Washington: GPO, 1951), VI.

21. Annual Report of the Secretary of the Interior for the Fiscal Year Ended June 30, 1944 (Washington: GPO, 1944), 5, 8; Annual Report of the Secretary of the Interior for the Fiscal Year Ended June 30, 1945 (Washington: GPO, 1945), 14; Annual Report of the Secretary of the Interior, Fiscal Year Ended June 30, 1951 (Washington: GPO, 1951), XV.

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37. Alfred Golze, Reclamation in the United States (New York: McGraw-Hill Book Co., 1952), 347-48.
38. "Irrigation Warfare Renewed," Business Week, Nov. 17, 1945, 19-20; Peter Barnes, "Water, Water for the Wealthy," New Republic, 164 (May 8, 1971), 9-13; Worster, Rivers of Empire,

292-94, 300-303; John Opie, The Law of the Land: Two Hundred Years of American Farmland Policy (Lincoln: University of Nebraska Press, 1987), 118.

39. "Dams," Sierra Club Bulletin, 33 (June 1948), 3-5; David Brower, "To Dam or Not to Dam," Sierra Club Bulletin, 33 (September-October 1948), 3-4.

40. Ginny Wood Hill, "Rampart-Foolish Dam," Living Wilderness, 29 (Spring 1965), 3-7. Also see "Rampart Project Study," Living Wilderness 29 (Winter 1965-66), 42, which noted that not only would the Rampart Dam take 30 years to reach its maximum power production, but it would not be as efficient as gas-fired generating plants, which could produce electricity at a lower cost.

41. Recent studies of electricity in the West include Jay Brigham, Empowering the West: Electrical Politics before FDR (Lawrence: University Press of Kansas, 1998) and James C. Williams, Energy and the Making of Modern California (Akron: University of Akron Press, 1997). Also see Louis C. Hunter and Lynwood Bryant, A History of Industrial Power in the United States, 1780-1930, v. 3 (Cambridge: MIT Press, 1991), 353, 360, 364, and Thomas H. Gammack, "Hydroelectric Myths," World's Work 58 (May 1929), 120.

42. See, for example, George Alexander, "Making Do With Less," National Wildlife, 22 (Feb.-March 1984), 11-13.

43. Reisner, Cadillac Desert, 317-43; Palmer, Endangered Rivers and the Conservation Movement, 100-102, 198-206; Brock Evans, "Washington, D.C.: Defending the Dam Back Home—Congress and the Politics of Waste," Sierra Club Bulletin, 62 (May 1977), 24.

44. On the expansion of irrigation on the High Plains see John Opie, Ogallala: Water For a Dry Land (Lincoln: University of Nebraska Press, 1993). Also see Donald E. Green, Land of the Underground Rain: Irrigation on the Texas High Plains, 1910-1970 (Austin: University of Texas Press, 1973).

45. Arthur P. Davis, "Results of National Irrigation," Reclamation Record 12 (December 1919): 546-47; Davis, "The Results of National Irrigation," Literary Digest 64 (January 17, 1920): 100-103; Congressional Record, 70 Cong., 2 sess., House, February 22, 1929, pp. 4077-84.

46. Notable exceptions include Worster, Rivers of Empire, 13, 51, 64, 131, and 279, and Richard White, "It's Your Misfortune and None of My Own": A New History of the American West (Norman: University of Oklahoma Press, 1991), 58-59, 182, 204. White characterizes the West as "the kindergarten of the American state. In governing and developing the American West, the state itself grew in power and influence." (p. 58)

47. Daniel P. Carpenter, The Forging of Bureaucratic Autonomy: Reputations, Networks, and Policy Innovation in Executive Agencies, 1862-1928 (Princeton: Princeton University Press, 2001).

48. The Bureau of Reclamation's website is www.usbr.gov. It was accessed on March 11, 2002.