

*Moving
Waters*



the Colorado River & the West

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The West Against Itself: The Colorado River-An Institutional History

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"River of Controversy" might have been the name if the Spanish explorers could have foreseen the many bitter conflicts over the Colorado. But their attention focused naturally on what first caught their eye, and they christened the river with a name reflecting the ruddy color produced by the enormous quantities of silt-more such sediment than carried by all but a handful of the world's streams. Like the Indians who knew the Colorado by other names and had relied on its waters since time immemorial, the Spaniards, a people from a water-shy country, recognized at once the river's critical importance to the area, although they could only guess at the size of the drainage basin-practically the entire lower left-hand corner of the present United States.

From its headwaters high in the Wind River Mountains of Wyoming, the Colorado meanders 1,400 miles and is the sole dependable water supply for 244,000 square miles, an area embracing parts of seven western states (Wyoming, Colorado, Utah, New Mexico, Nevada, Arizona, California) and Mexico. Though the watershed is vast, the Colorado is not a heavy flowing stream, ranking about sixth among the nation's rivers and having an average annual volume of less than fifteen million acre-feet. This is only a thirty-third that of the Mississippi and a twelfth that of the Columbia, but this modest flow became in the twentieth century the most disputed body of water in the country and probably in the world. The controversies extended far beyond the basin and involved great population centers that have built or are seeking to build aqueducts hundreds of miles long to develop the farms, cities, and industries of Denver and eastern Colorado, Salt Lake City and western Utah, Albuquerque and central New Mexico, and especially the vast megalopolis of Southern California stretching from north of Los Angeles to the Mexican border. Over the years the drive for water significantly altered the appearance and quality of the Colorado's flow, forced domestic and international agreements that sometimes harmonized and just as often exacerbated relations among water users, and created a legacy of laws, court decisions, and water-use patterns that continue to influence the lives of millions of people in the United States and Mexico.

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Genesis of an Idea: Arthur Powell Davis

For hundreds of thousands of years, the Colorado and its network of tributaries flowed without interruption to the sea. For a much shorter span, but one still measured in thousands of years, societies made their homes along the watercourses without appreciably changing either river or basin. The coming of the Spaniards in the sixteenth century, Mexico's short hegemony nearly three hundred years later, and the American conquest in the mid-nineteenth century scarcely altered the waterscape. The twentieth century, however, brought dramatic change as hundreds of thousands of newcomers poured into the Southwest and turned their energies toward developing the region's scarce water supplies.

Among the earliest advocates of large-scale development of the Colorado River was Arthur Powell Davis, nephew of the famous explorer and geologist John Wesley Powell. Davis was not the first to advance a sweeping plan, but as a prominent engineer in the U.S. Geological Survey and later in the Reclamation Service, he possessed the skills and connections to draw public attention to the proposal that he first unveiled in 1902. What he sought, he told his fellow engineers, was "the gradual comprehensive development of the Colorado River by a series of

large storage reservoirs." The keystone was to be a dam on the lower river built "as high as appears practicable from the local conditions."¹

Davis was driven by more than an engineer's natural desire to be associated with one of the world's great technological feats. He shared with Henry George and other reformers of the day a concern about the demoralizing effects of land monopoly, the end of the frontier, and urban crime, poverty, and unemployment. While many Americans pointed with pride to growing cities and industries, Davis worried about the seemingly precipitous decline in public morality and advocated a return to the values associated with the independent yeoman farmer so idealized by Thomas Jefferson.² To Davis, revitalization of the nation's moral fiber lay in getting more people to work the soil, and a major means to that end would be the reclamation of western lands mistakenly considered useless by many because of lack of water. The task, he recognized, would be enormous, so great and so expensive that only the federal government could overcome the obstacles and provide the necessary overall planning. And the place to begin, he believed, was the Colorado River. "I . . . considered problems in all of the Western States," he later recalled, "but there [was] . . . none which . . . excited my interest and imagination and ambition so much as the development of the Colorado River Basin. "³

Davis found a vehicle for his ideas in the newly created Reclamation Service, but lack of funds and mercurial public support prevented headway for nearly two decades. Then Californians, first in the Imperial Valley and later in Los Angeles and eventually throughout Southern California, endorsed his plans and set in motion a series of events that profoundly affected the Colorado River Basin.

Imperial Valley and the All-American Canal

Settlers in California's Imperial Valley, an arid but enormously fertile area of 600,000 acres just north of the Mexican border, only slowly became interested in Davis's ambitious scheme. Rather than dams, they wanted a canal—an "All-American Canal," as they called it—that would free them from their dependence on Mexico and assure them enough water to develop their lands. Because of a ridge of sandhills separating the valley from the Colorado, water had been brought in by diverting it south of the border through an old overflow channel of the river. The price exacted by Mexico for this privilege was stiff—the right to take up to half of the diverted water.⁴

At first the price seemed tolerable. Mexican development proceeded slowly while that in the Imperial Valley boomed following the introduction of water in 1901. By 1916 more than 300,000 acres were under cultivation, and valley leaders had plans to expand production even further.⁵ But by this time the entire river would occasionally be diverted, especially during the critical low-flow months of summer, and even taking the whole stream often produced insufficient water. While Mexico's water needs remained considerably less than those of US farmers, the reduced flow crossing the line still meant rationing of water in the valley. Alarmed by the threat to their crops and convinced that the situation would deteriorate as Mexico expanded its own agriculture, valley farmers began demanding a delivery system wholly in the US. Their clamor grew louder in response to unsettled conditions below the border created by the Mexican Revolution of 1910, refusal of Mexican landowners to share the cost of levees to

protect the delivery system, and the duties imposed on equipment used in protective work below the line. Especially galling to valley farmers was the disclosure that the largest single landholder on the Mexican side was a syndicate controlled by Los Angeles businessmen, the most prominent of whom was Harry Chandler, publisher of the Los Angeles Times. "These Mexican . . . lands," complained valley residents, "menace us like a great sponge, which threatens to absorb more and more water, until such time as they will take all of the natural flow of the river." 6

Unable to finance a new canal by themselves, valley farmers in 1917 turned to Washington for help. Operating through the Imperial Irrigation District, a powerful and well-organized public agency in charge of the valley's water system, they persuaded the Secretary of the Interior to investigate the feasibility of an All-American Canal and two years later got Congressman William Kettner to introduce a bill authorizing construction of the aqueduct. 7

The Kettner Bill immediately attracted the attention of Arthur Powell Davis, who saw it as an opportunity to lobby for his own river development plans. The canal, he told the bill's advocates, would be impractical by itself. It would be at the mercy of the floods that annually menaced settlements along the river and from 1905 to 1907 had actually broken into the Imperial Valley, destroying fields and homes and creating the Salton Sea. But "if we had complete storage," he observed, "the flood menace would be removed." To Davis the issue was clear-cut: "The Imperial Valley problem . . . is inseparably linked with the problem of water storage in the Colorado Basin as a whole." 8

Strong endorsements of Davis's position came from the engineering team sent by the Secretary of the Interior to investigate the canal's feasibility, from groups supporting the back-to-land movement, and from the League of the Southwest, a highly vocal booster organization representing scores of businesses and local governments. Imperial Valley leaders at first resisted tying the canal to a more grandiose and complicated project, but finally they surrendered to the force of logic and to the pressure from Davis and others. In 1920 they joined with Davis to promote passage of the Kincaid Act, which authorized the government to secure needed field data about the canal and storage sites. 9 These events did not go unnoticed elsewhere.

Enter Los Angeles

Among those following closely the maneuvering in Washington were Los Angeles officials, especially blunt-spoken William Mulholland, chief of the Bureau of Water Works and Supply, and E. F. Scattergood, head of the Bureau of Power and Light. They had spent their lives working to ensure that the city had all the water and electricity that it needed. For a community that had grown by nearly 600 percent during the two decades after 1900, this had been no small accomplishment. The city had fought successfully to gain control of the Los Angeles River, the major local supply, and in 1913 had completed a 233-mile-long aqueduct to the Owens River. 10 By 1920 as the Los Angeles population approached 600,000, Mulholland and Scattergood were turning their attention to the Colorado.

Of concern to city leaders at first was electricity rather than water. The aqueduct to the Owens Valley seemed to guarantee a plentiful water supply, but experts predicted a power shortage

within three to five years. Mulholland and Scattergood warned that local plant construction would only temporarily postpone, not prevent, a shortage. They advocated as a solution Arthur Powell Davis's proposal for a dam on the Colorado River. Told that a hydroelectric plant at the dam could provide the city with enough power for "all future needs," the city council required little persuasion. In August 1920, it endorsed Davis's plan and boldly proclaimed the city's intention to obtain power "direct from the Colorado River." ¹¹

The Los Angeles action delighted Davis and his new allies from the Imperial Valley, but another city decision a few years later pleased them even more. In 1923 a dry cycle prompted Los Angeles to look to the Colorado for water as well as electricity. Such a venture would require special diversion dams, an aqueduct even longer than the one to Owens Valley, and pumping stations to raise water over the mountains separating the city from the river. The undertaking was too costly for the city alone. In 1924 Los Angeles leaders negotiated with nearby communities for the creation of the Metropolitan Water District of Southern California (MWD). Three years later the state legislature approved the new agency and authorized it "to provide a supplemental water supply to the coastal plain of Southern California." ¹² These steps placed Los Angeles and the twenty-six other agencies that eventually joined MWD squarely alongside Davis and the Imperial Valley in their quest to develop the Colorado River.

Upper Basin Alarm and the Colorado River Compact

Long before Los Angeles entered into an alliance with MWD, leaders in the Colorado River Basin outside of California had become troubled. All recognized that the future development of their areas depended heavily on the Colorado, and they watched uneasily the advances being made by a state that contributed the least amount of runoff to the river.

Particularly disturbed were residents in the upper portion of the basin where the growing season was shorter and the lands less easily watered than in California or Arizona. The upper states wanted reclamation projects of their own, including some that would benefit areas outside the basin, especially in western Utah and eastern Colorado. Denver, for example, like Los Angeles, lay outside the basin and had grown rapidly if not as spectacularly as the southern California city. From a population of 134,000 in 1900, it had nearly doubled in size by 1920 and was threatening to precipitate a water war with its neighbors. "The most serious problem that confronts us at this time," warned a Denver official, "is the future water supply. Unless a construction program is formulated . . . that will bring to Denver and the agricultural communities surrounding it more water . . . , any great future growth in Denver's population must be made at the expense of the agricultural communities surrounding it." ¹³

Heightening such concern throughout the Upper Basin were a series of events in early 1922. The first occurred in February when the Interior Department issued the long-awaited study called for by the Kincaid Act. Known as the Fall-Davis Report-named for Secretary of the Interior Albert Fall and Arthur Powell Davis; who was now head of the Reclamation Bureau-it recommended construction of an All-American Canal, a storage reservoir "at or near Boulder Canyon," and the development of hydroelectric power to repay the cost of the dam. ¹⁴ The next development that disconcerted the upper states took place in April, when Congressman Phil Swing from the

Imperial Valley and Senator Hiram Johnson of California introduced a bill to implement the report's recommendations. This Boulder Canyon, or Swing-Johnson, bill met with immediate hostility from Upper Basin representative, who mounted a vigorous campaign against it. 15

Still another cause for alarm in the upper states occurred two months later. This involved western water law, specifically the doctrine of prior appropriation which gave legal entitlement to the first person using water- "first in time, first in right." This principle was recognized within each basin state, but uncertainty existed over whether it applied to users in two or more states on a common stream. In June 1922 the US Supreme Court, in *Wyoming v. Colorado*, eliminated all doubt by announcing that the rule of priority applied regardless of state lines. 16 Now even the law seemed to favor faster-growing states like California. Upper Basin leaders responded to the decision by reaffirming adamant opposition to all reclamation on the lower Colorado until their own interests were safeguarded.

The leader in defining those interests and in devising a protective strategy was Delph Carpenter of Colorado. A brilliant and prominent attorney with years of experience in water litigation, he had long advocated compacts or treaties to resolve interstate disputes. Although no states had demonstrated the practicality of his idea by apportioning water among themselves, Carpenter believed that the usual recourse to litigation was a mistake-it was too costly, too time-consuming, and invariably it created more issues than it resolved. His participation in Colorado's lengthy Supreme Court battle with Wyoming had reinforced these views as had the claims of federal attorneys that the US owned all the unappropriated waters in the West's streams. If the states did not put their houses in order, he feared that the federal government might do it for them, thus "weakening . . . state autonomy on all rivers." 17

In 1920, at a meeting of the League of the Southwest, Carpenter called for a compact covering the Colorado River. It was an idea whose time had come. The League enthusiastically endorsed his proposal, as did the legislatures of all the basin states. In August 1921 Congress consented to the negotiation of a compact. 18 Because the river was an international stream and considered navigable, the federal government sent to the negotiations its own representative, the highly respected Secretary of Commerce, Herbert Hoover. The delegates, now dubbed the Colorado River Commission, invited Hoover to chair the sessions which began in January 1922.

The commissioners spent most of 1922 in fruitless bargaining. They wrangled incessantly, each trying to ensure his state all the water it might need while refusing a similar concession to the others. Finally convinced that they would be unable to settle on a specific volume of water for each state, they decided to concentrate instead on apportioning the river between the upper and lower sections of the basin. 19 But even that decision was more easily reached than implemented. It rested on the assumption that the needs of groups of states could be pegged more easily than those of individual states, and it ignored the possibility of serious conflicts among the states within each basin. Nonetheless, it set the stage for the final round of talks scheduled for November 1922 in New Mexico.

Great pressure for a settlement permeated the negotiations which began on November 9 at Bishop's Lodge, a posh resort near Santa Fe. Californians were driven by their desire for the Swing-Johnson Bill, which had been bottled up in Congress by Upper Basin representatives in

control of key reclamation committees. Upper Basin leaders feared that if they did not negotiate a water supply for themselves, a disastrous flood on the lower river might stampede Congress into giving Californians the legislation that they wanted. "We simply must use every endeavor to bring about a compact . . .," pleaded Delph Carpenter, "otherwise . . . we may never again have a like opportunity." 20

Carpenter had taken the lead in seeking a settlement by circulating, prior to the Santa Fe meeting, a draft proposal allocating the Colorado's waters equally to the Upper and Lower basins. He established the demarcation point between the basins at Lee's Ferry, an old river-crossing station located in northern Arizona's canyon lands not far from the Utah border. While the boundary thus placed parts of several states in both basins, the Upper Basin consisted mainly of Wyoming, Colorado, Utah, and New Mexico and the Lower Basin of Arizona, California, and Nevada.

Discussion of Carpenter's proposal began on an ominous note. Most delegates considered it appealing, but W. S. Norviel of Arizona strongly objected and very nearly brought the proceedings to an end. He sharply criticized the plan for charging the Lower Basin for the water in its tributaries. Though estimates varied, most experts believed those tributaries produced a significant runoff-some two to three million acre-feet-with virtually all of it coming from Arizona streams. Norvie~ demanded for the Lower Basin all the water in the tributaries, in addition to half the river's flow as measured at Lee's Ferry. He would have preferred that Arizona's tributaries be given specifically to the state, but recognized that the decision to apportion water to basins instead of individual states precluded such an allocation. Besides, he felt Arizona had nothing to fear from the other Lower Basin state~ Nevada and California. Nevada's water requests had always been minimal, while California's "ultimate development," he believed, was "definitely well-known" and posed no threat to Arizona. 21

For days Norviel tenaciously defended his counterproposal, as first one delegate and then another advanced alternatives and sought to bring the conflicting parties together. His intransigence gradually gave way as he found himself standing alone against the pressure for a compromise settlement. The agreement to which he and the others finally gave their approval foresaw the delivery of 7.5 million acre-feet per year to each basin. Since the bulk of the water originated in the Upper Basin, however, the compact required the upper states to deliver seventy-five million acre-feet at Lee's Ferry every ten years. The ten-year provision allowed the Upper Basin to take advantage of the sometimes severe fluctuations in river flow. In addition to the basic allocation to each basin, the lower states could increase their apportionment by a million acre-feet. This provision reflected Norviel's insistence that the Lower Basin receive compensation for the water in its tributaries. The amount was considerably less than he had sought but high enough to win his grudging approval of the agreement. 22

The negotiators grounded their water-allocation formula on the Reclamation Bureau's assumption that the average annual flow of the Colorado River at Lee's Ferry was 16.4 million acre-feet. There was no gauging station at Lee's Ferry and this estimate derived from measurements made hundreds of miles downstream at Yuma. It also ignored years of unusually low flow prior to 1905. Nonetheless, the strong desire for a settlement caused no one to challenge the accuracy of the Bureau's estimate-an estimate that indicated 1.4 million acre-feet remained in the main stream as surplus for later allocation. 23

The few remaining issues were dealt with quickly. The delegates easily agreed to give highest priority to water use for "agricultural and domestic purposes." Hydroelectric power came in for a lesser priority and navigation was made "subservient" to all other uses.²⁴ As for a possible future treaty with Mexico, the delegates concluded that any such obligation should be met with surplus water, and if that proved insufficient, then the two basins should share equally the burden. This provision reflected a desire to cover an important contingency rather than sympathy for people in Mexico. "We do not believe they ever had any rights," observed Herbert Hoover. ²⁵ The Indians in the Colorado River Basin hardly fared better. Their rights were considered "negligible" and were dealt with perfunctorily in what Hoover called the "wild Indian article": "Nothing in this compact shall be construed as affecting the obligations of the United States of America to Indian tribes." ²⁶

On Friday, November 24, 1922, after fifteen days of bargaining, the delegates reached agreement on the compact. They adjourned to Santa Fe where formal signing took place in the Palace of the Governors amid much fanfare and self-congratulation. ²⁷

A Six-State Pact

The euphoria at Santa Fe was short lived. Within five months every state had ratified the compact except Arizona, but Arizona's refusal threatened to scuttle the enterprise since only unanimous approval would make the pact effective. Norviel had returned home to find a new governor in office whose views and those of his closest advisers were hostile to the agreement. "Arizona cannot afford to plunge blindly into a contract that may be unfair to her," Governor George W. P. Hunt cautioned the state legislature.²⁸ When studies completed a short time later suggested that Arizona might need the entire Lower Basin allotment to develop lands in the central part of the state, Hunt's position hardened. To him, opposition to the compact now became a test of state loyalty. He received strong support from private utility firms, which were alarmed that the pact would pave the way for the Boulder Canyon legislation and the construction of competing public power facilities. Powerful mining interests chorused their opposition because a public power plant would operate tax free. Since mining companies were shouldering nearly half the Arizona tax load, they would obtain no relief if the power plants to be built along the lower river and partially in Arizona were tax exempt.

But the major concern was water. Hunt believed the compact's "first fundamental error" was its failure to make allocations to individual states.²⁹ By suspending the law of prior appropriation between the basins, the compact would protect the Upper Basin from California; but it did nothing to safeguard Arizona from California. The principle of priority would still prevail among the Lower Basin states. This posed no problem for Nevada whose small needs were readily conceded by Arizona and California, but Arizonans became extremely cautious and then alarmed as they discovered potential uses for water and hydroelectricity not anticipated earlier. That alarm intensified when Californians, especially those associated with the Metropolitan Water District, made similar discoveries. Arizonans found additional reason for concern in the promise of Upper Basin leaders to withdraw their opposition to the Boulder Canyon Bill once the compact was in force. Enactment of the Boulder Canyon legislation would immeasurably aid California by authorizing the All-American Canal and especially the high dam that would

regulate the river and permit the MWD to build its own aqueduct and transmission lines. Arizonans, on the other hand, saw virtually nothing for themselves in the measure. A dam in Boulder Canyon would benefit few Arizona lands unless other expensive works were also constructed—works viewed by most experts at the time as economically unfeasible and for which there was no enthusiasm in Congress. Arizonans also worried about what they called the "Mexican threat." A regulated river would enable Mexico to expand its agriculture, and a future treaty might recognize the increased water uses. Put simply, Arizonans feared there would be little water remaining for them after the Upper Basin, California, and Mexico got what they wanted. Those fears, together with Arizona's own ambitious plans for the Colorado, translated soon into implacable opposition to both the compact and the Boulder Canyon legislation. 30

Arizona's refusal to ratify the compact prompted the other basin states to reassess their earlier insistence on approval by all seven basin states. Delph Carpenter took the lead in campaigning vigorously for a six-state agreement. Some Upper Basin leaders worried about endorsing a compact to which Arizona would not be a party, but Carpenter persuaded them that no practical alternative existed. Because California and Arizona were constantly reevaluating their earlier water needs as too small, it would be folly to attempt to renegotiate the pact and allocate water to each state, as Arizonans were insisting. As a nonsigner, Arizona might try to develop projects that would encroach on the Upper Basin allocation, but success in such a venture would require Washington's approval. The federal government had reserved all the possible dam sites along Arizona's canyons and was unlikely to release any of them without approval of the other basin states. "If the compact were agreed to as binding upon the United States and the six states which have already ratified," reasoned Carpenter, "it would in large measure serve the desired purpose. . . .³¹

Carpenter's logic proved persuasive. By March 1925 all the upper states and Nevada in the Lower Basin had approved the six-state arrangement. That left only California. Californians favored the reduced requirement for ratification, but only if through it they could absolutely assure themselves the Boulder Canyon Project. Earlier at Santa Fe, they had sought to have such an assurance written into the compact itself, but that had been considered inappropriate. Now, grown weary of waiting for congressional action, they sought that assurance through a different approach. Assemblyman A. C. Finney of the Imperial Valley introduced a resolution in the state legislature making California's approval of the six-state pact dependent upon construction of a high dam on the lower river. Passage of the resolution in April 1925 shifted the major battlefield over the Colorado River to Congress.³²

Arizona Overwhelmed: The Boulder Canyon Act

In late 1925, when Phil Swing and Hiram Johnson reintroduced in Congress their Boulder Canyon legislation, they included the compact among its provisions. In this way, congressional approval of the compact would mean authorization of lower-river development as well. Swing and Johnson subsequently added other inducements calculated to broaden support—royalties on power to be divided equally between Arizona and Nevada (in lieu of the taxes that those states would collect if the project were built by private capital) and funds authorizing the investigation of possible reclamation projects in every basin state except California. 33

Congress at first balked at the measure bowing not only to Arizona's protests but also to those of easterners and others unsympathetic to expensive reclamation and public power projects. In addition, many legislators felt that Arizona and California should be given more time to resolve their differences and to negotiate a Lower Basin apportionment of water. Such opposition lessened over the next two years as both states persisted in their refusal to reach agreement and as Californians launched a campaign dramatically highlighting the flood dangers and water and power needs along the lower river.

Upper Basin leaders were pleased that the Boulder Canyon Bill included the compact among its provisions, but their earlier anxieties returned as the prolonged debates on the measure rekindled their fears of both California and Arizona and reawakened their earlier preference for a seven-state compact. They finally agreed to support the bill, but only if California would promise to limit its use of Colorado River water. Without such a limitation, California could be expected to increase its uses until little remained for Arizona. That state, in turn, would obviously do everything possible to develop projects of its own-projects that would take water meant for the Upper Basin. Arizona would have to overcome serious economic and political obstacles to build such projects, but so long as the state possessed even a remote chance of doing so, the Upper Basin felt threatened. If, on the other hand, California would limit itself and leave a significant volume of Lower Basin water for Arizona, then the threat to the Upper Basin would be reduced considerably. "The States of the upper-basin much prefer a "seven-state compact," observed a Colorado congressman, "but they desire a compact of some kind, and with a provision under which one of the lower basin States-California- practically steps into the position of guarantor, so that the upper-basin [states] would be reasonably assured . . . that they could go ahead safely in developing their irrigation enterprises. "34

California agreed, but only reluctantly and after much haggling over the precise restriction on its uses. Congress finally settled on 4.4 million acre-feet plus no more than half of any surplus water unapportioned by the compact. Congress then went further in trying to harmonize basin rivalries by adding still another provision to the Boulder Canyon Bill giving prior approval to a Lower Basin pact. The suggested agreement would apportion 0.3 million acre-feet to Nevada, 4.4 million acre-feet and half the surplus to California, and 2.8 million acre-feet plus half the surplus to Arizona. In addition, all the waters of the Gila (Arizona's principal Colorado tributary) would go to Arizona and be exempted from any future Mexican treaty. Many objected to the proposal as an infringement on states' rights, but its author disagreed, insisting that it was merely a suggestion and "not the request of the Congress." "If California and Nevada and Arizona do not like this agreement," he explained, "they do not have to approve it. "35 With that assurance, the proposal won adoption and paved the way for a final vote on the bill.

Over Arizona's continued vigorous objections, Congress approved the Boulder Canyon Bill in December 1928. Two months later the California legislature agreed to the limitation imposed by Congress and on June 25, 1929, President Herbert Hoover declared the act effective.³⁶

Arizona V. California: Round One"

Enactment of the Boulder Canyon legislation meant approval of the Colorado River Compact and authorization of the All-American Canal and a high dam on the lower river. Under the terms of the new law, construction of the dam could not begin until the federal government had obtained contracts for the hydroelectric power needed to pay for the project. Since Nevada had no market for Boulder Canyon power and Arizona had neither a market nor a desire for one, Californians in 1930 obligated themselves to purchase all the electricity and thereby underwrite the cost of the dam and power plant. The contracts permitted the federal government to draw back 36 percent of the power for use in Arizona and Nevada any time during the fifty years required to pay for the project, but until the two states asked for power, California agencies had to take all of it.³⁷

The Great Depression of the 1930s slowed construction, but in 1935 Hoover Dam was completed (in more suitable Black Canyon, rather than in Boulder Canyon as originally planned) and a year later hydroelectric power reached southern California communities. In June 1941 the Metropolitan Water District of Southern California began delivering water to the coastal plain, and the next Imperial Valley residents received their first supplies through the All-American Canal. Californians delighted in these developments, which during the next three decades flowed Los Angeles to grow to three million inhabitants and the four coastal counties to attract a population in excess of ten million.³⁵

Arizonans looked angrily on California's rapid growth. Their state also grew during the same period, but the increases in people and economic development paled in comparison to those of California which they accused of taking water that rightly belonged to them. At first Arizonans returned to the negotiating table and tried to hammer out a Lower Basin compact with California, but the two states repeatedly failed to harmonize their differences and neither state was satisfied with the pact suggested by Congress in the Boulder Canyon Act.

When bargaining collapsed, Arizonans turned to the US Supreme Court for help. In 1930 in the first of a series of *Arizona v. California* cases, they asked the courts to declare unconstitutional the Boulder Canyon Act because it violated Arizona's "quasi-sovereign rights" by authorizing construction of a dam partially in Arizona without the state's permission. Congress's claim that it had acted to improve navigation was a "subterfuge and false pretense." The Court was unimpressed: authorization of the dam came clearly within the government's power to improve navigation and represented a "valid exercise of the Constitutional power."³⁹ Four years later Arizonans returned to the Court and asked it to certify for later use some oral testimony on the meaning of certain sections of the Colorado River Compact. They planned to use the testimony in a future suit against California. Again the Court disappointed them: "The meaning of the Compact . . . can never be material . . . since Arizona refused to ratify."⁴⁰ Still unwilling to admit defeat, Arizonans turned once more to the Court a year later. In 1935 they asked for a judicial apportionment of the lower Colorado in which Arizona would receive an "equitable share of the water." But, as before, the justices threw out the case. The technical reason was Arizona's failure to make the US government a party to the suit. Yet even if the US had been included, the Court left little doubt that the outcome would have been the same. Unless Arizona could show that it was actually being deprived of water to which it held title, there would be no "justifiable controversy."⁴¹ With hundreds of millions of gallons flowing unused in the river, Arizona stood little chance of demonstrating that harm had been done.

Convinced at last that the Court would not provide a satisfactory solution, Arizonans reopened bargaining with California. But here, too, the old patterns of intransigence reemerged. Arizonans had not endeared themselves to their rival when in 1933 they had sent their National Guard to prevent construction of MWD's diversion works on the Colorado. The shutdown proved temporary, but the incident had hardened differences that became further embittered as first one and then another of California's projects were completed.⁴² By the early 1940s the accumulated setbacks prompted some leading Arizonans to reassess the state's water policy—a policy grounded on opposition to the Colorado River Compact.

California's advances naturally played a role in Arizona thinking, but so, too, did developments at home. The state's population had more than doubled in the two decades following the drafting of the compact. By 1944 the number of people stood at 700,000 with most of them congregated in the central part of the state near the rapidly growing cities of Phoenix and Tucson. Local water supplies were inadequate for the growth envisaged by state leaders, and in some places wells had gone dry while in others pumping had led to land subsidence.

Electricity was in even shorter supply than water. In 1939 the Bureau of Reclamation responded to Arizona's plea for emergency power by establishing a line to Hoover Dam.⁴³

Arizona's decision to accept Hoover Dam electricity marked a major change in the state's policy. Leaders had delayed taking power as long as possible on the grounds that doing so would compromise their opposition to the compact. They had found support for such resistance from private power companies that were not anxious to compete with cheaper public power. But the need for electricity proved eventually too strong to resist. In time so did the desire for water. Many Arizonans began arguing that if the state was to win support in Congress for reclamation projects of its own, Arizona would have to ratify the compact. Taking this message directly to the people of the state was Governor Sidney Osborn. "With the passage by Congress of the Boulder Canyon Project Act in 1928," Osborn declared in 1943, "the era of theorizing about the Colorado's riches has ended. Whatever our previous opinion about the best place and the best plan for utilizing its water . . . we now can only recognize that the decisions have been made, and the dam has been constructed."⁴⁴ On February 24, 1944, the Arizona legislature unconditionally ratified the compact and reversed twenty-two years of opposition.⁴⁵ State leaders then began working closely with the Reclamation Bureau to devise a major reclamation project for Arizona. The struggle now entered a new phase.

The Mexican Water Treaty

Reinforcing Arizona's decision to ratify the compact was a treaty signed three weeks earlier by the United States and Mexico. On February 3, 1944, the two countries had ended nearly a half century of controversy by agreeing to divide the waters of the Colorado River. Some two thousand square miles of Mexican territory lay within the Colorado Basin, a modest amount of land when compared to the US drainage area, but it included the Mexicali Valley, one of the richest agricultural regions in Mexico.

The Mexicali Valley lies just across the border from California's Imperial Valley, and the

development of the two areas was closely intertwined from the outset. The need to divert water south of the line and to allow landholders in Mexico up to half the flow fostered farming in the Mexicali Valley while also stimulating demands in the US for the All-American Canal. Some leaders in both countries early advocated a treaty dividing the river's waters, but negotiations seldom got beyond the preliminary stage. Complicating the task were attempts to reach a similar agreement on the lower Rio Grande, the other major river shared by the US and Mexico. In 1906, the two countries had arrived at a settlement on the waters of the upper Rio Grande (the area north of Fort Quitman, a demarcation point just below El Paso and Juarez), but talks on the lower river stalled and became increasingly tangled with those on the Colorado. While virtually all the waters of the Colorado originated in the US, the situation was almost the reverse on the lower Rio Grande where more than 70 percent of the runoff came from Mexico. The situation contained the elements for a horse trade, but neither country would compromise enough to reach a settlement. Each nation tended to approach the rivers separately and to seek the superior settlement even when this meant adopting a legal position on one river at odds with the position advanced on the other stream. During extended talks in 1929 and 1930, the US offered Mexico 0.75 million acre-feet of Colorado River water, the maximum amount she had used in any one year up to that time, but Mexico insisted on more than four times as much. When the talks collapsed, Mexico expanded her agriculture below the border while Imperial Valley farmers looked forward to the completion of the All-American Canal with which they hoped to force a settlement on Mexico. 46

By the early 1940s both countries were anxious for an accord. The completion of the All-American Canal in 1942 and plans for a project on the lower Rio Grande that would neutralize Mexico's superior position there brought Mexican officials to the bargaining table. The US sought to put a limit on Mexico's Colorado River uses, which had doubled during the previous decade and could be expected to increase further as a result of Hoover Dam's regulation of the river. Only when Americans began using virtually the entire flow-and that might not be for decades-would the All-American Canal become an effective weapon. The US government, enmeshed in the crisis of World War II, also believed that a settlement of the water dispute would significantly advance the Good Neighbor Policy of President Franklin D. Roosevelt.

After months of bargaining during which the State Department consulted frequently with leaders in the Colorado Basin states, the two nations signed a treaty in February 1944. Mexico received 1.5 million acre-feet, an amount slightly less than the State Department believed that country was then using. 47

Californians greeted the news with anger. They claimed Mexico deserved only 0.75 million acre-feet, the maximum amount that it had used prior to the completion of Hoover Dam in 1935 and the amount offered in the unsuccessful negotiations of 1929 and 1930. Behind California's strong opposition was the belief that Mexico was being given water that would mostly come from California. The state had limited itself to 4.4 million acre-feet plus half the surplus, and California was currently using nearly a million acre-feet of surplus water. California's calculations indicated there would be little or no surplus remaining if Mexico received the amount promised in the treaty. 45

While Californians fought vigorously to prevent US Senate approval of the agreement, the other

basin states advocated ratification. They feared that Mexican uses would increase further and perhaps encroach on the basic compact allocations if a settlement were not obtained. Even Arizona, which also had designs on surplus water, endorsed the treaty. Arizonans, unlike Californians, had not built expensive aqueducts with capacities to carry surplus waters to the state. Moreover, Arizonans, who had now ratified the compact, shared the upper states' desire to safeguard the basic allocations in that agreement. Support also came from those worried about the harm that would be done to the Good Neighbor Policy by a rejection of the treaty. Repercussions would be more serious than in earlier years since Mexicans, not American capitalists, were now farming the Mexicali Valley. In 1938 the Mexican government had expropriated most of the land belonging to the Chandler syndicate and the remainder had been disposed of a few years later. Additional advocates of the treaty were Texans on the lower Rio Grande who were pleased with the provisions allocating water on that stream and providing for orderly international development.

The broad support, together with pressure from the White House, overwhelmed the California Opposition. On April 18, 1945, the Senate approved the treaty by a vote of seventy-six to ten. Five months later, on September 27, the Mexican Senate voted unanimous approval. 49

Upper Basin Compact: Harbinger of Development

The Mexican treaty, Arizona's ratification of the compact, and California's rapidly increasing uses of Colorado River water forcefully reminded the upper states of their own reclamation ambitions. Colorado had already taken the lead in 1937 by winning congressional approval of the Colorado Big Thompson Project, a plan for transporting water out of the basin to the cities and farms on the eastern slope of the Rockies. Other projects awaited a feasibility study authorized by the Boulder Canyon Act but delayed by the onset of World War II. Finally, in March 1946, the Reclamation Bureau issued the long-awaited study. The message proved disconcerting: many possible projects existed on the headwaters but there was not enough water for all of them. Until the upper states determined their individual rights the Bureau refused to approve any projects. 50

Within four months, the governors of the Upper Basin states had authorized negotiation of a compact to apportion their share of the river's waters. After two years of gathering data and holding public hearings, delegates gathered in Vernal, Utah, in July 1948 to draft an agreement. Three weeks of negotiations produced a pact apportioning the Upper Basin water on a percentage basis: 51.75 percent to Colorado, 23 percent to Utah, 14 percent to Wyoming, and 11.25 percent to New Mexico. The use of percentages reflected uncertainty over how much water would remain after the Upper Basin had fulfilled its obligation to the lower states and, if the surplus proved insufficient, to Mexico. Only Arizona, which had a small section of the state in the Upper Basin, received a specific volume—fifty thousand acre-feet. Unlike the compact of 1922, the Upper Basin agreement provided for the creation of an interstate agency, the Upper Colorado River Commission, charged with determining the water uses of each state and with reducing diversions if that should become necessary to meet the obligations to the Lower Basin. 51

The delegates circulated the draft agreement among their respective state governments, which gave the go-ahead for the formal signing in Santa Fe on October 11, 1948. By early 1949, the

pact had received the approval of all the upper-state legislatures and Congress. 52 Upper Basin leaders now joined with Reclamation Bureau officials to obtain major new reclamation projects for their region.

In early 1952 the first Colorado River Storage Project Bill reached Congress. It called for a billion-dollar dam-building program with major reservoirs at Echo Park on the Green River and at Glen Canyon on the main stream near the Arizona-Utah border. The bill immediately aroused opposition from southern Californians who viewed any significant developments on the upper river as threats to their own water uses. More recent measurements of flow had been calling into question the rosy forecasts on which the 1922 compact had been based. Major opposition also emerged nationwide and focused on the Echo Park reservoir, which would flood the unique and beautiful canyons of Dinosaur National Monument. The alarm escalated into the biggest battle over wilderness preservation since John Muir had tried to keep a dam out of Hetch Hetchy Valley at the turn of the century. The contest was essentially a civil war in which both sides labeled themselves "conservationists." While one side campaigned for conservation for use through dams and hydroelectric power, the other argued for conservation through preservation of unique wilderness areas. The struggle took on added intensity when opponents elevated Echo Park to the status of a test case that they believed would shape national policy for decades.⁵³

After several years of struggle, the bill's advocates finally conceded that Echo Park would have to go. Opposition in the House proved unmovable, and preservationists began threatening to campaign against other dam sites mentioned in the bill. The measure that finally cleared Congress in 1956 eliminated Echo Park and seemed to reflect an unequivocal preservationist victory: "It is the intention of Congress that no dam or reservoir constructed under the authorization of the Act shall be within any National Park or Monument."⁵⁴ Within a short time, however, it became clear that the victory was far from complete. Preservationists viewed their acquiescence to the other major dam in the bill at Glen Canyon as a serious mistake that cost the loss of a remarkable wilderness area. Their disappointment intensified several years later when they failed to prevent the water rising behind Glen Canyon Dam from flooding Rainbow Bridge National Monument in southern Utah.⁵⁵ The congressional proviso in the 1956 measure appeared to be a dead letter.

Under the resulting Colorado River Storage Project Act of 1956, Glen Canyon became the "cash register" generating most of the revenue through the sale of hydroelectric power to build a dozen so-called participating projects elsewhere in the Upper Basin. The largest was the Central Utah Project outside the basin, which was to receive water for nearly 144,000 acres of new land and a supplementary supply for almost 243,000 acres. By 1963 Glen Canyon Dam had been completed and Lake Powell had been brought into existence behind it. The act also authorized dams for three tributaries—Blue Mesa on the Gunnison, Flaming Gorge on the Green, and Navajo on the San Juan. Additional legislation in 1962 and 1964 further rounded out Upper Basin desires by authorizing the San Juan—Hama, Navajo, Fryingpan—Arkansas, Savery—Pot Hook, Bostwick Park, and Fruitland Mesa projects.⁵⁶

"Arizona V. California: Round Two"

The Upper Basin's success in obtaining reclamation projects aroused envy and concern in Arizona. That state had approved the compact in 1944 and three years later greeted enthusiastically the Reclamation Bureau's plan for a massive undertaking, the Central Arizona Project (CAP). The plan resurrected and now deemed economically feasible the old high-line canal scheme advocated by former Governor Hunt. The project called for a 241-mile-long aqueduct to transport some 1.2 million acre-feet to the rapidly growing Phoenix and Tucson areas. When Arizonans introduced a bill in Congress to authorize the CAP, they encountered stiff opposition from Californians who argued that "Arizona was attempting to use water that did not belong to the state. This time dissension centered on conflicting interpretations of the 1922 compact. The differing claims caused Congress to refuse approval of the CAP until the two states had resolved their differences. Congress did not want to invest in a project for which there might be no water,⁵⁷

The news bitterly disappointed Arizonans. While the Upper Basin, California, and Mexico were moving ahead with their projects, Arizonans had remained stymied. They believed their only recourse was to appeal once more to the US Supreme Court.

When Arizona filed suit in 1952, it asked the Court for a judicial apportionment of the Lower Basin's water. When it had made a similar plea in 1935 the Court had refused to act on the grounds that no actual harm was being done since the volume of water exceeded current uses. Seventeen years later the flow still exceeded uses, but this time Arizona succeeded in persuading the justices that the state would suffer serious harm if the dispute with California were not resolved.

The subsequent trial proved to be among the most complicated and hotly contested in Supreme Court history. It lasted eleven years, required the services of a special master, cost nearly five million dollars, and resulted in major shifts in position as the two states jockeyed for advantage. Some 340 witnesses testified and nearly 50 lawyers participated before the opinion was finally announced on June 3, 1963, followed by the decree on March 9, 1964.

The decision represented a tremendous victory for Arizona, although the nature of the victory took nearly everyone by surprise. The Court grounded its opinion not on the compact, but rather on the Boulder Canyon Act. In that measure, declared the Court in its five-to-three decision, Congress "intended to and did create its own comprehensive scheme for . . . apportionment." According to the justices, Congress in 1928 had not merely suggested a Lower Basin compact; it had actually authorized the Secretary of the Interior to use his contract power to implement a Lower Basin agreement—an agreement "leaving each State its tributaries" and an agreement in which "Congress decided that a fair division of the first 7,500,000 acre-feet of . . . mainstream waters would give 4,400,000 acre-feet to California, 2,800,000 acre-feet to Arizona, and 300,000 to Nevada."⁵⁸ By awarding Arizona all the water in its tributaries plus 2.8 million acre-feet, the Court gave the state virtually everything that it had unsuccessfully sought during the negotiations for the 1922 compact.

Californians reacted angrily to the decision, accusing the Court of misreading the intent of Congress and eroding the rights of the states. They correctly noted that the decision represented the first time that the Court had interpreted an act of Congress as apportioning rights to interstate

streams. Water rights had earlier been determined only by interstate compact or by the Supreme Court itself. Now a third way had won approval, even though it would have amazed the Congress of thirty-five years earlier to know what it was supposed to have done.⁵⁹

Another surprise was the Court's decision on how future surpluses and shortages would be allocated. Responsibility would rest with the Secretary of the Interior, who would not only apportion surpluses and shortages among the states but also among the users within each state. The latter marked an especially sharp break with tradition. Since states had always determined the water laws applicable to their citizens, they had naturally also determined the water rights of those citizens. But now the Court held that Congress had empowered the Secretary of the Interior to determine those rights when water had been secured by contract from federal reclamation projects.

In explaining Congress's authority over apportionment, the Court pointed to the navigation clause of the Constitution, but it also hinted that Congress could invoke the "general welfare" clause to divide the waters of non-navigable as well as navigable streams.⁶⁰ The decision thus increased dramatically Congress's authority over the nation's rivers. More importantly from the point of view of Arizonans, it seemed at long last to pave the way for the Central Arizona Project.

"Arizona V, California" and the American Indian

The decision in *Arizona v. California* proved almost as much a victory for American Indians as for Arizona. The Indians had long been overlooked in Colorado River matters, but following World War II they reemerged in the public consciousness as white Americans grappled uneasily with the social and economic inequities of the nation's ethnic minorities. When Arizona filed suit in 1952, the federal government intervened to protect its interests and also to defend the rights of the Indians living on the twenty-five reservations in the Lower Basin. Government lawyers asked for sufficient water to maintain not only Indian reservations, but, in addition, the national forests, parks, recreational areas; and other governmental holdings. Specifically for the Indians, the government demanded enough water to develop all the irrigable lands on the reservations.

The Court upheld the contentions of the federal attorneys, although in doing so it restricted its decision to the five reservations along or near the main stream-Chemehuevi, Cocopah, Yuma, Colorado River, and Fort Mohave-and left to the future the ultimate fate of the other reservations. Implicitly, however the opinion had far-reaching implications for Indians elsewhere. Invoking a principle laid down in the 1908 case of *Winters v. United States*, the justices held that the five lower-river reservations "were not limited to land but included waters as well. . . . It is impossible to believe that when Congress created the great Colorado River Indian Reservation and when the Executive Department of this Nation created the other reservations they were unaware that most of the lands were of the desert kind-hot, scorching sands-and that water from the river would be essential to the life of the Indian people and to the animals they hunted and the crops they raised. " In determining the volume of water set aside, the Court adopted the government's position. "How many Indians there will be and what their future needs will be can only be guessed. We have concluded . . . that the only feasible

and fair way by which reserved water for the reservations can be measured is irrigable acreage. "61 Although the measurement of the right was irrigable acreage, the Court held in a later supplemental decree that the Indians were not restricted in the uses to which they could put their water.62 Reason, rather than agriculture, seemed to emerge as the ultimate test.

The 1963 decision also stipulated that Indian uses were to be charged against the state in which a reservation was located. This especially disturbed Arizona where most of the Indian land was located, but it pleased none of the basin states. In addition, the Court held that the Indian rights dated from the establishment of a reservation and was superior to later non-Indian rights, including those rights based on uses initiated before the Indians had begun diverting water. Thus the Court held (and in so doing reaffirmed the earlier *Winters* decision) that the Indian rights existed whether or not the Indians were actually using water and continued unimpaired even if the Indians should cease their uses. Since some of the Indian lands along the lower river had been Set aside as early as 1865 and none later than 1917, the decision left the Indians in an almost impregnable legal position.

But the Indians soon learned that a legal right did not guarantee them water. A decade after the decision, the Indians were farming only about half their irrigable acreage. By the later 1970s the amount was closer to 60 percent, but the Indians themselves had developed less than 8 percent. The remainder was in the hands of non-Indian leaseholders. The major reasons for this situation were Indian poverty and non-Indian pressure on the federal government. The Indians were unable to finance expensive irrigation projects themselves, and Congress was reluctant to help because of pressure from non-Indians opposed to Indian projects that would divert water from their cities and farms. The Colorado River Indian Irrigation Project, for example, was initiated in 1865 but remains uncompleted primarily because of lack of funds. Not surprisingly, when Indian lands on the lower river have been developed, it has usually been because tribes have entered into long-term leasing arrangements with non-Indians. 63

Another disappointment to Indians on the lower Colorado was the 1983 Supreme Court decision on the extent of the irrigable acreage on the reservations. For two decades Indians and non-Indians debated sharply, with the Indians offering one set of figures and the non-Indians insisting on another and lower set. In 1979 the Supreme Court turned the dispute over to a special master who three years later recommended that the Court uphold Indian claims that would permit them to receive some 1.2 million acre-feet or about a third more water than had been awarded nearly twenty years earlier in *Arizona v. California*. In a five-to-three decision, the Court in 1983 rejected the recommendation, explaining that it violated the spirit of *res judicata*: "Recalculating the amount of practicably irrigable acreage runs directly counter to the strong interest in finality in this case." Besides, the Court observed, more water for the Indians "cannot help but exacerbate potential water shortage problems" for non-Indians. 64

Elsewhere in the Colorado River Basin, Indians have sometimes bargained away potential rights in order to obtain congressional support for projects. The Navajos, the nation's largest tribe, did so in 1957 when the tribal council, in exchange for congressional approval of the Navajo Indian Irrigation Project, agreed to waive its priority on the San Juan River 'and to share water shortages proportionately with non-Indians. A decade later the Navajos entered into still another agreement

which compromised their claims and became the subject of sharp controversy. In exchange for the construction of a power plant on the reservation and the jobs and revenue it would provide, the Navajos agreed to limit their demands to the water of the upper Colorado to fifty thousand acre-feet. The limitation was for the life of the power plant (now in operation) or for fifty years, whichever ended first. Many Navajos subsequently attacked the agreement, claiming that the federal government failed to fully inform the tribal council about valuable potential rights that it was surrendering.⁶⁵ In recent years, the Navajos have employed engineers and attorneys to prepare a water rights case against the basin states and the federal government. Some observers believe that the suit, if filed, will be for at least five million acre-feet. ⁶⁶ The outcome of such litigation, as well as of suits now being contemplated by other tribes, is impossible to determine. What is clear is that Indians can no longer be ignored in future planning for the Colorado River.

The CAP: Catalyst for Basinwide Development

Arizona v. California proved a boon—at least legally—for Indians, but Arizonans were the major beneficiaries. As victors in their decade-old struggle with California, they optimistically returned to Congress for authorization of the Central Arizona Project. Approval did not come easily, however. Californians had lost the Supreme Court battle in 1963, but their large delegation in the House of Representatives doggedly held up the Arizona project for five years. Behind the California resistance was the conviction of state leaders that earlier estimates of stream flow had been grossly overestimated. Instead of 16.4 million acre-feet at Lee's Ferry, the runoff, according to more recent estimates, was closer to fourteen million acre-feet. This meant that under conditions of full development, the Lower Basin would receive at Lee's Ferry only the seventy-five million acre-feet over a ten-year period as guaranteed in the 1922 compact. Adjustments for evaporation losses, Indian claims, and the Mexican treaty obligation could be expected to reduce the available supply even further.⁶⁷

But Californians were willing to bargain. As the price for dropping their opposition to CAP, they demanded a first priority for California's apportionment of 4.4 million acre-feet. In effect, Arizonans would have to promise to regulate CAP diversions so that Californians never received less than that amount. No one missed the point: California boldly sought to regain some of the ground lost in the 1963 Court decision.

Arizonans reluctantly acquiesced. Like Californians, they were uneasy about the adequacy of the water supply, but their desire for the CAP outweighed their uneasiness. The water diverted to the CAP, they promised Californians in a provision added to the bill, "shall be so limited as to assure the availability" of the 4.4 million acre-feet allocated to California.

Arizona had to mollify more than California. The concern about the water supply had spread to the Upper Basin. If the river flow at Lee's Ferry was only about fourteen million acre-feet, as many now suspected, then the upper states, after fulfilling their obligation to the Lower Basin, would receive 6.5 million acre-feet, a million acre-feet less than anticipated in the 1922 compact. Their share could drop even further after allowing for evaporation losses, the Mexican treaty, and Indian claims. Worried that such water-supply estimates might later prevent them from obtaining projects on their own, they tied their fortunes to the Arizona bill. They agreed to support it but

only in exchange for a provision authorizing five projects for the Upper Basin-Animas-LaPlata, Dolores, Dallas, West Divide, and San Miguel. This would bring to twenty-one the number of "participating projects" authorized by Congress for the Upper Basin since 1956.~

The maneuvering for concessions produced a bill authorizing projects for which the water supply was likely to be inadequate. This possibility prompted the basin states to close ranks behind another provision directing the Bureau of Reclamation to study ways of bringing water into the Colorado River Basin from other river systems. Strong opposition came from environmentalists and especially from leaders in the Pacific Northwest who knew that Bureau officials viewed the Columbia River as the probable source of a supplementary supply. Although the opponents failed to delete the provision, they succeeded in obtaining a ten-year ban on interbasin studies.

Satisfying the various water interests in the basin proved to be only one of the obstacles facing the CAP advocates. In the public's mind, the most controversial aspect of the legislation involved two proposed dams, one at Marble Canyon just east of the main gorge of the Grand Canyon, and the other at Bridge Canyon, a short distance west of Grand Canyon. The principal purpose of the dams would be

to generate hydroelectricity to provide revenue for building the CAP and power to pump the water into Central Arizona. Both dams would flood scenic areas, and the reservoir behind Bridge Canyon would inundate portions of Grand Canyon National Park and Grand Canyon National Monument. Environmentalists waged a vigorous, national campaign against the dams that was reminiscent of the struggle over Echo Park. The furor finally forced the deletion of the dams. In their place was substituted a coal-fired power plant to be built at Page in northern Arizona. 69

As finally amended, the CAP legislation emerged as the Colorado River Basin Project Bill. In September 1968, the billion-dollar-plus package of compromises received congressional approval. 70

Uncertainty over the adequacy of the water supply for the CAP as well as concern about the project's impact on the environment resulted in only small annual appropriations for actual construction. By the early 1980s the slowdown in the nation's economy had added to the delay, but by then the coal-fired plant had been built (emitting air pollutants over Grand Canyon, Zion, Cedar Breaks, and Bryce that caused environmentalists to regret having given their earlier approval) and completion of the CAP to the Phoenix area was scheduled for late 1985 and to the Tucson area for the early 1990s. In the Upper Basin, nine of the twenty-one participating projects had been completed by 1971 and work was continuing on most of the others in the early 1980s. Construction crews on the ambitious Central Utah Project had by early 1985 finished a tunnel through the Continental Divide and were under contract to complete the final segments of the 37-mile-long Strawberry Aqueduct.71

Salinity Controversy with Mexico

Even before construction had begun on the CAP or on most Upper Basin projects, the United States had become embroiled once more in a controversy with Mexico, this time over the quality of the runoff reaching that country. The 1944 treaty had guaranteed Mexico 1.5 million acre-feet,

but the agreement said nothing specific about water quality. The seriousness of the omission had become apparent even before ratification and while hearings were being held on the treaty in the US and Mexico. American negotiators claimed that the Mexican obligation could be met with water of any quality, while Mexico's diplomats told their senators that the treaty guaranteed water of "good quality." The issue had arisen because studies indicated that water reaching Mexico during certain future periods would consist almost entirely of heavily saline drainage from irrigated fields in the US. Such concern failed to dampen the enthusiasm of treaty advocates who feared that attempts to clarify the agreement through reservations or renegotiation would result in no treaty at all. 72 Sixteen years later water quality emerged as a bitter issue between Mexico and the US

In 1961 the Wellton-Mohawk Irrigation District, located along the lower Gila River in Arizona, completed a channel discharging drainage water into the Colorado just above Mexico's diversion canal. This water was exceptionally heavy in salt content since its source was an underground basin possessing no outlet and containing water that had been used and reused over the years until it had declined sharply in quality. The introduction into the Wellton-Mohawk Valley of a new supply from the Colorado River in the 1950s had raised the water table and damaged fields, causing farmers to take the Reclamation Bureau's advice and install wells to pump the polluted groundwater to the surface and channel it into the main stream. When this drainage water reached the Colorado in February 1961 it caused the average annual salinity of the flow crossing the border to nearly double. Resulting crop losses in Mexico produced a loud outcry. Mexican officials accused the US of violating the 1944 treaty, demanded compensation for damages, insisted on water as good as that going to the Imperial Valley, and threatened to take the issue to the International Court of Justice if the protests went unheeded. The US denied that the treaty imposed any obligation "with respect to the quality of the water," but nonetheless took steps to alleviate the problem. Fresher water was released from American dams and a channel was constructed in 1965 to divert the Wellton-Mohawk drainage around the Mexican intake. 73

The situation improved, but both countries recognized the improvement as temporary. It would be only a matter of time before evaporation from American reservoirs and completion of projects already authorized would seriously impair the quality of water crossing the border. The two nations sought a negotiated settlement, and on August 30, 1973, they signed an agreement known as Minute 242 of the International Boundary and Water Commission. 74

Both governments hailed the agreement as "the permanent and definitive solution of the salinity problem," an expression more of hope than of reality. Minute 242 promised Mexico that most of its water (1.36 million acre-feet) would have an average annual salinity of no more than 115 parts per million (plus or minus 33 ppm) over the salinity of the water going to the Imperial Valley. The balance of Mexico's water (0.14 million acre-feet), which had traditionally been delivered at San Luis on the Arizona-Sonora land boundary, would continue "with a salinity substantially the same as that of the waters customarily delivered there." The agreement obligated the US to assume all the costs necessary to maintain the agreed-upon salinity levels. In addition, the US pledged to finance the installation of tile drains in the Mexicali Valley and to fund any other "rehabilitation" measures necessary to eliminate the "salinity problem" there.

As far as Mexico was concerned, Minute 242 would represent a permanent and definitive solution" only so long as water quality remained substantially as it was at that time (approximately 1,000 ppm). The American negotiator of the agreement candidly acknowledged that unless the US immediately took steps to control salinity within its borders another dispute with Mexico was inevitable. 75

Congress took the hint. In June 1974 the Colorado River Basin Salinity Control Act received the overwhelming approval of both House and Senate. The measure authorized upstream salt-control projects in Nevada, Utah, and Colorado, as well as one of the world's largest desalination plants near Yuma. The plant is now under construction and scheduled for completion in 1989 or 1990. Only time will reveal the success or failure of the efforts. 76

Retrospect

"A river no more is one current assessment of the Colorado. 77 It is difficult to argue with such an observation. The dams and aqueducts already in place have permanently altered the river's appearance and, for more than two decades, have prevented virtually any water from flowing to the Gulf of California. 78 Completion of projects already authorized can only further control a river that long ago ceased to be wild. The wonder is that the Colorado has been so transformed in light of the monumental battles over its waters during the last three-quarters of a century. But those controversies reflect not only the preciousness of water in an arid land, but more importantly, the almost frenzied determination of the combatants to use water as quickly as possible and thereby strengthen their claim to it.

The determination to use rivers has shaped the major western institutions dealing with water in general and the Colorado in particular. The law of prior appropriation is an obvious reverberation, but so too are the Colorado River Compact, the Boulder Canyon Act, the Mexican treaty, the Upper Basin compact, the 1963 Arizona v. California decision, and the other actions, which, taken together, have made the Colorado what it is today. Each represents for its time what was perceived by its advocates as the best way of dealing with the river. The best way, of course, did not always mean the most efficient, the most environmentally sound, or the fairest way to proceed.

Some would now like to undo past decisions or at least to chart a future less constrained by those actions. In the Upper Basin are those who advocate rewriting the 1922 compact so as to reflect more recent estimates of stream flow and to assure themselves enough water to develop their oil-shale and other mineral reserves. Indians want a larger share of the river. Environmentalists wish to prevent additional development and to sidetrack some authorized but uncompleted projects. More significantly, they would like to change popular attitudes which view every drop of water reaching the ocean as a drop wasted and which tend to overlook aesthetic and recreational values associated with uncontrolled streams.

There are, in addition, those convinced that the only way to proceed is to augment the Colorado River with water from elsewhere. In 1978 the ten-year moratorium on studies to bring in water

from other basins was renewed for another ten years. When it was first imposed, most eyes were on the Columbia River, but the emergence of the environmental movement and the costly pumping requirements projected in studies of the Columbia have dampened enthusiasm for such a transfer—at least for the time being.

Ten years ago many experts predicted that desalination of ocean water would become a major source for meeting municipal and industrial needs. Since then, declining public support for nuclear plants and skyrocketing costs of oil for conventional facilities have seriously undermined this possibility for the foreseeable future. The energy cost in oil for desalting an acre-foot of ocean water in southern California is more than six times that for an equivalent volume of Colorado River water brought in by aqueduct. 79

A byproduct of the soaring cost of energy has been intensified competition for the relatively cheap power produced at Hoover Dam. The original power contracts were scheduled to come up for renewal in 1987. California by the mid-1980s was receiving nearly 65 percent of the electricity, while Arizona and Nevada were getting 17.6 percent apiece. At first, California insisted that the new contracts reaffirm the old arrangement, but Arizona and Nevada demanded an equal allocation among the three states, arguing that they needed the additional electricity, that the Boulder Canyon Act entitled them to it, and that the dam's location in the two states warranted a larger share. Californians disagreed, contending that their decision to take the power provided the revenue to build the dam and that "it's not right that Nevada and Arizona can come back 50 years later wanting to take two thirds of the power." 80 Others, especially in the East, objected to maintaining the current rate structure, arguing that the cost of Hoover electricity was significantly below that of power elsewhere in the nation and hence represented an unwarranted governmental subsidy. Anxious to forestall the growing demands for a rate increase and to avoid a protracted court battle among themselves, the three lower states in 1984 hammered out a compromise based upon increasing the capacity of Hoover Dam's generators, the surrendering by California of a small amount of energy, the obtaining of additional power from other sources, and the retention of the current basis for computing the cost of power. (Despite agreement on the last point, the actual cost of power to the public could be expected to rise significantly as a result of the changes to Hoover's generators and the obtaining of the additional power from elsewhere.) With the western states voting almost as a block, Congress approved the agreement and in late summer the President signed into law the Hoover Power Plant Act under which the new contracts would not again come up for renewal until the year 2017. 81

Although the dispute over power has captured recent headlines, concern over the water supply remains a fundamental issue. Representatives of basin states with incomplete water projects become nervous during public discussions about possible water shortages. Receiving much attention is weather modification through cloud-seeding as a way to augment river supplies. The results of the Bureau of Reclamation's pilot program in the San Juan mountains of Colorado suggest that cloud-seeding throughout the Upper Basin mountains would increase runoff by 1.3 million acre-feet a year. Although some find these claims encouraging, the overall feasibility of weather modification as a significant source of water must await the completion of current studies. 82 Also receiving emphasis are programs to control more effectively weeds along water courses and to encourage more widespread use of laser land-leveling technology, drip irrigation, and sprinkling rather than flooding.

Behind the scramble for water in years past was not only its obvious necessity for survival in a water-shy country but also an obsession with growth-an obsession that equated progress with obtaining enough water to develop the biggest farms and cities and industries. Many now question that fascination with growth, but even they tend to forget that water is a finite commodity. Ten years or a hundred years or a hundred thousand years from now, the world's supply will remain the same. Such an assertion cannot be made about the world's population or about mankind's capacity for devising technologies to use-and abuse-the limited water supply. Put another way, the fate of all natural bodies of water is inseparably tied to human values about the quality of life and the number of people any part of the world can properly support. Seen from this perspective, the Colorado River is a microcosm of the world's water supply. Lessons learned from its past and policies adopted for its future are of fundamental importance not only for those dependent on the river, but also for peoples everywhere.

Notes

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21. See, especially, Colorado River Commission, "Minutes of the Seventeenth Meeting" (15 November 1922), pp.8-12; "Minutes of the Nineteenth Meeting" (19 November 1922), pt. 1, pp.4, 8; W. S. Norviel, "Report of W. S. Norviel, Colorado River Commissioner, State of Arizona" 11923], p. 6, file 1-M13 15, Hoover Papers; Richard B. Sloan, "Pact Criticism Is Largely on What It Does Not Say," *Arizona Mining Journal* 6 (15 January 1923), p. 58. For a detailed discussion of the negotiations, see Norris Hundley, jr., *Water and the West: The Colorado River Compact and the Politics of Water in the American Way* (Berkeley and Los Angeles, 1975), pp.187-214.
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