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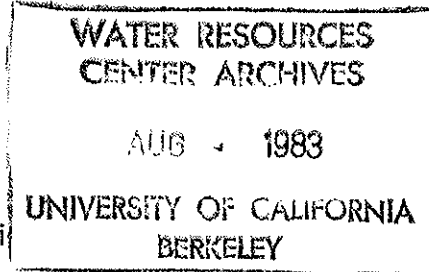
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THE EVOLUTION OF CALIFORNIA STATE WATER PLANNING 1850-1928

by

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TECHNICAL COMPLETION REPORT

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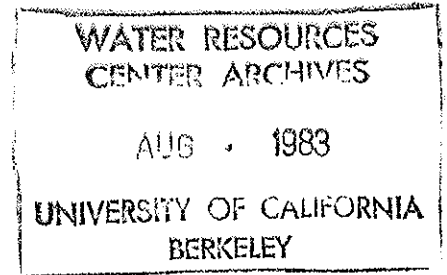


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ABSTRACT

California's water problems stretch back to the 1850's when argonauts began diverting water from rivers to get a placer deposits in stream-beds or to conduct hydraulic mining. Mining remained the most important economic use of water for two decades. In the meantime, farms, cities, and factories became important users of water, and these "interests" were joined by those committed to the maintenance of river navigation and the reclamation of "swamp" lands. By the 20th century, when mining no longer represented a significant use of water, hydroelectric power companies filed new claims to the State's limited water supply, and the problems of storing and controlling "flood water" began to receive serious attention from the State.

Though the State's participation in water planning increased enormously in the 20th century--particularly after World War I--the earlier period was significant for many reasons. State government played an active, if limited, role almost from the beginning. Not only did it publicize the State's water problems and gather water use information to aid private interests, it provided the legal framework necessary to use the resource. The well-known conflict between riparian and appropriative rights has overshadowed the Legislature's attempts to provide laws regulating water use by private interests. Even in the 19th century the State occasionally intervened directly to tackle a problem, as in 1880 by constructing restraining dams on the Yuba River to trap debris from hydraulic mining.

From 1850 to 1930, when a comprehensive State water plan was presented to the public, the State's role in planning changed dramatically. This study provides a chronological overview of State involvement with a focus on two themes: the evolution of legislative (as opposed to "court made") water law, and the development of the multiple-use concept of water planning.

I. A FRAGMENTED COMMONWEALTH: CALIFORNIA IN THE 19TH CENTURY

In the 19th century, California had a dual personality. If it was a "western" state, it was western with important differences. Clearly, it shared many of the characteristics of other "frontier" states. Its economy passed through several distinctive and fairly abrupt states. A mining and pastoral era gave way in the late 1860s to a wheat boom which, in turn, was eclipsed by horticulture in the late 1880s and 1890s. Sharp economic fluctuations resulted from such disparate factors as speculation in Nevada mining stocks, completion of the first transcontinental railroad, droughts, and real estate booms. Economic diversification--which helped mitigate these swings--was not achieved until well into the 20th century. Moreover, California, like other western states, was far removed from large markets for its crops, and suffered from inadequate transportation facilities, sectional rivalries, persistent labor shortages, and ethnic and racial conflicts. However, unlike its sister states and territories, California was highly urbanized, with 27 percent of its residents living in San Francisco in 1870. In the 1850s, San Francisco exhibited many of the violent and unstable elements of a frontier society. But by the 1870s and 1880s, law and order took second place to the same problems encountered by the rapidly growing cities of the eastern seaboard, including municipal corruption, the cost of government, poor relief, and the need for new water and sanitation systems. Residents of interior communities frequently grumbled that San Francisco paid scant attention to agriculture. By the 1880s, San Francisco sported a wide variety of financial institutions, and while investment capital was often short in California--forcing businessmen to rely on European or Eastern investors--the state depended far less on distant financial institutions than other western states. This, of course, did not mean that California was either independent or self-sufficient. Though it never became an economic "colony" of the East, its dependence on mining, and later wheat cultivation, made it the prey of unstable international markets. However, San Franciscans, if not all California "urbanites," could take pride in having passed through the frontier stage of development fairly rapidly.

Nevertheless, for all the advantages California enjoyed in comparison with other western states, its population growth lagged behind its enormous economic potential. California grew by 47 percent in the 1860s and 54 percent in the 1870s, while Kansas grew by 240 percent in the 1860s and 173 percent in the 1870s, Minnesota by 155 percent and 77 percent, and Nebraska

by 355 percent and 270 percent. In 1870, California's population averaged less than 1 person to the square mile while New England's ratio was 49 to 1, the Middle Atlantic states 69 to 1, and the south Coast states 15 to 1. Even sprawling Texas averaged two people per mile. During the 1880s, the state's population expanded at about the same rate as during the 1860s, despite a land boom in southern California. Then, in the 1890s, the growth rate dropped to 22.4 percent. Of all the arid West, only Nevada, which actually lost population during the 1890s, attracted fewer new residents. Though California's "remoteness" and the cost of transportation help explain these figures, the state's dry and unpredictable climate, contests over Mexican land grants--which blocked the sale of rich agricultural land along the coast for more than two decades after statehood--high unemployment, and land monopolies counted for more. California developed a reputation as the home of a rootless society of gamblers, speculators, and businessmen who had little attachment to the land and little allegiance to the values family farming promoted. Both within and without the state, California society was portrayed as disorderly and corrupt, the antithesis of basic American ideals.¹

California agriculture was in its infancy in the 1850s and early 1860s, placing third in the economy behind mining and the livestock industry. In 1846, more than 500 ranchos in upper California covered hundreds of thousands of acres in the Los Angeles basin and along the coast from San Francisco to Santa Barbara. The lanky Spanish cattle raised on these open ranges were valued for their hides and tallow, and only incidentally as a source of meat and milk. During the Mexican period, there was little attempt to improve the breeding stock, and the "industry" remained isolated. The only substantial overland drive occurred in 1837 when 700 cattle were sent north to the Willamette Valley. But the gold rush transformed the industry from a pastoral "life style" to a speculative business. Miners bought so much meat that for a time cattle drives from southern California to Sacramento and the mining camps rivalled the great Texas drives. Demand so outstripped supply that the price soared from \$4 a head in 1846 to over \$500 a head delivered in Sacramento in 1849. During the 1850s, cattle were imported from Mexico, Texas, and the Middle West, increasing both the supply and quality of meat. The total number of cattle increased from 448,796 in 1852 to 1,116,261 in 1859, and the number of milk cows tripled. In 1861, the nation's leading agricultural newspaper, The Country Gentleman, counted 55 ranchos in Los Angeles county alone. Abel Stearns' 12 ranches covered 230,815 acres on which grazed 18,000 cattle and 3,000 horses. The other ranches ranged in size from a modest 4,000 acres to 60,000 acres.²

Nature delivered a serious blow to the range cattle industry in the early 1860s. A massive flood in 1861-1862 was followed by drought in 1863-1864. Pastures dried up and cattle carcasses littered the barren countryside. In Monterey County--stronghold of the cattle industry in the Mexican period--the county assessor estimated that the herd had declined from 70,000 to less than 13,000 animals. But nature did not kill the open range. By irrigating pasture land, as Henry Miller would later do in the San Joaquin Valley, the ranchos might have survived. However, irrigation was expensive, and by the mid 1860s wheat farming on the rich coastal plains promised a much higher profit per acre than stock raising. Some ranchers moved their herds to the coastal valleys or Central Valley, and the open range survived into the 1870s. Yet by 1880 all accessible grazing land had been taken up and cattlemen faced increasing competition for the limited forage from sheepmen. Moreover, in 1872 the legislature passed the first major "no fence" law, tacitly acknowledging the primacy of farming by making stock owners responsible for damages to crops caused by free grazing animals. Many of southern California's huge estates were sub-divided during the 1870s, laying the foundation for that region's horticultural industry.

Sheep raising expanded during the 1850s along with the range cattle industry, and because sheep could graze on land unsuited for cattle, those herds suffered much less from the drought of 1863-1864. There were 80,867 sheep in California in 1852, but by 1860 this number had increased to 1,088,002. In that year California was the nation's fifth largest sheep raising state. By 1870 it led the nation as the herd swelled to 2,750,000. Both the quantity and quality of exported wool increased during the late 1860s and early 1870s. For example, the wool clip was 8,000,000 pounds in 1867 but nearly doubled to 15,000,000 pounds in the following year. However, the increasing value of land, and a second major drought in 1876-1877, permanently crippled the sheep business.³

As noted above, the explosive popularity of wheat culture in the middle and late 1860s contributed to the demise of the livestock industry. As early as 1854, a California booster informed The Country Gentleman that bountiful wheat fields stretched for eleven miles beyond the outskirts of Sacramento, yielding an average 60 to 80 bushels per acre. Midwesterners must have blinked hard at the figure because their farms usually produced only about 15 to 20 bushels per acre. Not surprisingly, the writer noted: "A man with a good 'ranch,' in the [Sacramento] valley, can make an independent fortune in a few years, not infrequently in one!"⁴ Fifteen years later, at the height of the wheat mania of the '60s, the San Francisco Evening Bulletin reported:

At the beginning of the last rainy season the excitement in favor of wheat growing had only been exceeded by some of the more memorable mining excitements of former days. There was a rush and a furor for wheat lands. Nearly every novice about to try his hand at agriculture, bought or rented lands for wheat culture. Two or three good harvests had turned the heads of thousands. Lands were rented in numerous instances, and a cash rental paid for a single year's occupation which was equal to the entire value of the lands.⁵

The boom grew out of several circumstances. First, during the Civil War the Confederate Navy reduced California's trade with the East Coast. This forced San Francisco merchants to step-up trade with England, particularly to acquire heavy machinery. Wheat, in effect, offered a medium of exchange--as well as a fleet of empty ships to carry European goods home. Moreover, wheat culture followed the railroad. The Southern Pacific line from San Francisco reached San Jose in 1864 and Salinas in 1872, opening the Santa Clara and Salinas valleys to grain farming. Finally, beginning with the winter of 1866-1867, a string of wet years contributed to the boom as crop yields ran far above normal, particularly where farmers had cultivated virgin soil. From 1866 to 1872, the acreage planted to wheat more than tripled.⁶

California newspapers condemned the speculative nature of wheat farming well into the 1890s. The similarities between mining gold and harvesting grain were not lost on the state's social and economic critics. However, wheat farmers had good reasons to choose that crop, and not all of their reasons stemmed from greed. In the 1860s, California was admirably suited to wheat and barely, but not many other crops. Wheat and barley were two of a handful of crops which could be raised in the Central Valley without irrigation, and wheat was the only major crop durable enough to export before refrigerated railroad cars became common in the late 1880s. The valley offered rich, flat land which required little preparation, and the would-be farmer needed little experience because wheat was easy to plant and virtually took care of itself. He could get by without a house, barn, or even quarters for hired hands. Farm laborers were seldom needed for more than three or four weeks a year, and the mild California climate permitted them to sleep under the stars.

Wheat's greatest attraction was economic. Setting up and operating a farm required little capital, and wheat usually returned a good profit from the first year. The farmer who planted vines or orchards had to wait five or ten years for returns on a much larger initial investment. In addition, his plants required much more care--which increased labor costs. Little wonder that wheat won the reputation as a "poor man's crop," even though the industry was dominated by huge farms after the 1860s.

Finally, there were other, less tangible, reasons for raising wheat. Because the crop required little attention, the wheat farmer did not have to endure a dreary rural existence

isolated from human society. Many wheat barons lived in Sacramento, Stockton, San Francisco, or Oakland, and left their comfortable urban surroundings only to supervise the planting or harvest. Others simply entrusted this job to lieutenants and rarely visited their farms. In addition, during the 1850s and 1860s, many wheat farmers along the coast could not secure clear land titles. Many Mexican land grants had been contested, and the average claim filed with the federal land commission in San Francisco took 17 years to confirm. Since wheat did not require the farmer to "improve" his land, he stood to lose less if the commission or courts ruled his title invalid. Then, too, some farmers had no intention of making California a permanent home. Often they had come to California looking for a fortune in gold, only to have their dreams of quick riches crushed by the hard life of the mining camps. They could hope that a few bumper wheat crops would give them wealth and respectability and allow them to return home in style.⁷

In short, wheat farmers adapted well to conditions in California, at least during the 1860s and 1870s. Instead of planting their crops in the spring, they left their land fallow through the summer, waiting for the rainy season in November. The first heavy rains softened up the sun-baked soil to permit plowing and seeding. Crops germinated well in the mild California winters, and the critical phase in the growth cycle did not arrive until mid-February. If several inches of rain fell after that time, the crops matured well. If not, they were stunted. In other words, farmers had to worry about the "evenness" of rainfall from November through April, not just the total amount--though in the San Joaquin Valley 15 inches of rain usually produced bumper crops while 10 inches yielded only a mediocre harvest. The crop matured very rapidly as temperatures warmed in late March and April. At this time, wind concerned farmers more than rain. Every few years, fierce north winds of 40 to 50 miles an hour swept down the Central Valley ushering in spring. Particularly in the San Joaquin Valley, where the soil was sandy, the winds literally blew crops away. But barring natural disasters, once crops matured they could be left in the fields for months as farmers negotiated transportation costs with shippers, and held back their harvest in the hope of getting the best possible price. They had little fear of rust or scale, and even after the harvest, sacks of wheat could be left in the field for weeks without danger from mildew.

Many observers of the California wheat industry also noted another major difference between farming on the Great Plains and in California. Almost from the beginning, wheat farming in California was highly mechanized. In 1860, on his 39,000 acre estate in the

Sacramento Valley, John Bidwell used 20 plows, four harrows, two mowers and reapers, and two threshers valued at \$7,500. And in 1862, farm machinery dealers in Sacramento and Stockton alone sold 500 mowers, 220 reapers, and 100 threshers.⁸ Technology quickly met the challenges of scale in California. Hyde's steam plow, invented in 1871, could plow a strip sixteen feet wide, sow, and harrow all in one operation. And by the late 1880s, the steam plow had been refined to the point that it could plow 160 acres in 24 hours.⁹ Harvesting was accomplished by twelve foot headers drawn by six horses or mules, and each machine could cut 15-25 acres a day. By 1880, another Sacramento Valley farmer, Hugh Glenn, raised more than 1,000,000 bushels of wheat on his 66,000 acre ranch in Colusa County. Glenn had more than \$100,000 invested in farm machinery, and his blacksmith shops manufactured a wide variety of new agricultural tools. One of his machinists constructed a separator with a threshing capacity six times greater than standard machines on the market. An historian of the California economy has observed: "California agriculture thus provided a model for commercialized farming throughout the United States."¹⁰ In the Mexican period, 12 men were required to raise an acre of wheat, but by the early 1890s, with the aid of advanced farm machinery, one worker could cultivate 130 acres.¹¹ Though most farmers lacked the resources of a Bidwell or Glenn, private companies harvested wheat at a flat charge per acre. The report of the California State Agricultural Society noted proudly in 1889:

It is a matter of some inquiry from many quarters, how it is that the farmers of California can afford to raise wheat at prevailing prices, located as we are, so far distant from the important grain markets of the world, and with the price of labor higher than with our great competitors. To this we answer that our generous soils give such prolific yield, and our peculiar climate admits of the use of the improved harvester and other agricultural machinery, whereby we are enabled to reduce the cost of harvesting to a comparatively light figure. This is the offset to the cheap labor of foreign lands, and enables us to meet all competitors in the production of this mighty staple.¹²

Cut off from eastern markets by the high cost of transporting bulky wheat crops by rail, California farmers then as now used technology to improve their competitive position in world markets.

Nothing reflects the effectiveness of mechanization better than crop production statistics. Though harvests varied dramatically from year to year, demand for California wheat remained high into the 1890s. In 1852, the state's farmers produced only 271,762 bushels of wheat, but by 1860 production reached 7,500,000 bushels, and California ranked ninth in the nation.¹³ By 1867, the state agricultural society's report indicated that 888,888 acres were planted to wheat, and they yielded 14,432,883 bushels.¹⁴ Already over 98 percent of the export crop went to Great Britain.¹⁵ Four years later 2,128,165 acres bore

28,784,571 bushels,¹⁶ but the richest harvests came in the early and middle 1880s. For example, in 1884, 3,587,864 acres provided 57,420,188 bushels.¹⁷ Though the census of 1890 showed California as the second largest wheat producing state, by 1900 it had fallen to sixth place. In 1916, the state produced only 4,000,000 bushels, and the wheat industry had long since lost its preeminent place in California agriculture.¹⁸

Many reasons help explain the wheat industry's sharp decline including competition from Canada and Russia for international markets, the introduction of new varieties of wheat superior to California strains, declining yields because of soil exhaustion, and the increasing value of farmland devoted to horticulture. But during its hey-day, the industry built a painful legacy. In 1877, the Sacramento Daily Record-Union bemoaned the fate of California agriculture:

We are all but too familiar with the picture: A level plain, stretching out to the horizon all around; for a few months a waving sea of grain, then unsightly stubble; in the center a wretched shieling [hut] of clapboards, weather-stained, parched, and gaping; no trees, no orchard, no garden, no signs of home...on everything alike the tokens of shiftlessness and barbarism. Such farmers buy their vegetables, their butter, their bacon, all they need, at the nearest town or settlement. They never think of raising anything beyond the one staple, wheat... Failing...a reformatory movement, we see nothing in prospect but a shiftless drifting backward further and further into barbarism, until, the fertility of the soil being exhausted, the reckless and half-civilized tillers of it shall be compelled to migrate, and shall, like other nomads, seek new camping-grounds in regions not yet destroyed for all purposes of production by methods similar to their own.¹⁹

Critics of wheat farming repeatedly raised a fundamental question: could wheat provide a stable agricultural foundation for the state's future economic growth? Beyond the damage to the soil, beyond the rootlessness of wheat farmers, beyond their get-rich-quick mentality, beyond even the dreary sameness of endless acres of grain, the most distressing aspect of wheat farming was the way it stifled the family farm. Such farms were anathema to the wheat baron. They could not compete on equal terms in the international wheat market, but, by diversifying crops, they threatened to drive up property values and taxes, cutting into profits. Hence, most grain farmers--especially in the Sacramento Valley--opposed small farming well into the 1890s. Consequently, where wheat flourished, community life seemed to shrivel and die. Moreover, the bonanza farm degraded labor and promoted class conflict. The Chinese and other minorities provided a capable work force. As one observer pointed out in 1869: "Labor is scarce and high priced; and were it not for the Chinamen in the state, one-half of our luxuriant harvest would annually rot in the fields for want of hands to gather it."²⁰ Yet California's agricultural wealth seemed to be built on the backs of a permanent class of dispossessed who, in turn, destroyed the opportunity of white laborers

by working for "starvation wages." As the 1860s gave way to the 1870s and 1880s, the "poor man's crop" helped create a closed agricultural system.

The greatest danger posed by wheat farming was its tendency to perpetuate, if not create, land monopoly. Most 19th century Americans believed that the nature of society derived from its agricultural base. Henry Nash Smith has argued that Americans revered the yeoman farmer as a reminder of a simpler, happier, more virtuous society. Though the "agrarian ideal" was threatened by urbanization and industrialization, the American West offered an opportunity to strengthen and restore this tarnished dream. The ideal was built on certain assumptions. Agriculture, not commerce or industry, was the only source of legitimate wealth, and the keystone of an egalitarian society. Every man had a "natural right" to own land, and land ownership promoted independence, pride, and dignity. The more who owned land the better, since a large "middle class" reduced the number of rich and poor, eliminating the basic source of class conflict. Hence, title to land should derive from use, not abstract property rights. Life close to the soil produced a moral society--luxury and artifice were characteristics of the city. Thus, the Homestead Act took on symbolic significance as an attempt to insure that the West would belong to the yeoman farmer, not the "slavocracy."²¹

California's social and economic critics carried the agrarian deal one step further. Not only was it the only sound foundation for a moral society, but history provided grim reminders of the fate which awaited those civilizations which abandoned the ideal. In 1871, Henry George published his famous Our Land and Land Policy in which he attributed the fall of Rome to land monopoly:

In the land policy of Rome may be traced the secret of her rise, the cause of her fall....The [Roman] Senate granted away the public domain in large tracts, just as our Senate is doing now; and the fusion of the little farms into large estates by purchase, by force and by fraud went on, until whole provinces were owned by two or three proprietors, and chained slaves had taken the place of the sturdy peasantry of Italy. The small farmers who had given her strength to Rome were driven to the cities, to swell the ranks of the proletarians, and become clients of the great families, or abroad to perish in the wars. There came to be but two classes--the enormously rich and their dependents and slaves; society thus constituted bred its destroying monsters; the old virtues vanished, population declined, art sank, the old conquering race actually died out, and Rome perished....Centuries ago this happened, but the laws of the universe are to-day what they were then.²²

Other critics found lessons closer to home. For example, the Sacramento Daily-Union noted that without its tradition of widespread land ownership, "...the United States would, in all probability, to-day contain less wealth and population, and not much more general intelligence than Mexico, where the land is all monopolized by the rich. Nothing has more retarded the prosperity of the South and Central American republics...."²³ And a special

committee of the California Legislature, one of several formed in the 1870s to study land problems in California, argued that land monopoly created a vast class of renters similar to conditions of land tenure in Europe: "This chief curse of civilization, upon which all minor monopolies are founded, is fast attaining such vast proportions in California, that it promises to soon become so powerful as to defy opposition, just as it defies all attempts to curb it in the Old World."²⁴

Critics of California and the nation's land policies often resorted to hyperbole. If San Francisco seemed overcrowded and steeped in corruption, the reason was land monopoly. If the rich and poor seemed particularly noticeable in California, the cause was land monopoly. If the economy was sluggish, if unemployment was high, if the workingmen threatened anarchy and revolution, and if the countryside was infested with "tramps" and "vagabonds," land monopolists provided a convenient scapegoat. Nevertheless, the phenomenon was real, even if yellow journalists, nostalgic reformers, and those who had failed in the race for wealth often saw vast conspiracies where none existed. Many careful historians, including Paul Wallace Gates, W.W. Robinson, and Gerald Nash have ably discussed land tenure in California. The federal land commission established in 1851 confirmed Spanish and Mexican land grants to nine percent of the total area of the state, or nearly 9,000,000 acres, and much of it was prime agricultural land. As late as 1944, nineteen of the original ranchos existed virtually intact, containing 728,139 acres. In addition, California received 8,852,140 acres in grants from the public domain, most of which had passed into private ownership by 1880. These grants included 2,193,965 acres in "swamp" lands, 500,000 acres granted for "public improvements," 6,400 acres to pay for public buildings, 46,080 acres for a state university, 150,000 acres under the Morrill grant, and the remainder in school lands. Dummy entrymen took up much of the land, and California allowed holders of land warrants to file on land before it had been segregated or surveyed.²⁵

In its report for 1873 and 1874, the State Board of Equalization noted that there were 122 farms on ranches in California larger than 20,000 acres; 158 ranging from 10,000 to 20,000 acres; 236 from 5,000 to 10,000 acres; 104 from 4,000 to 5,000 acres, 189 from 3,000 to 4,000 acres; 363 from 2,000 to 3,000 acres; and another 1,126 contained from 1,000 to 2,000 acres. In short, 2,298 individuals or companies owned parcels of 1,000 acres or more. In 1872, 28,000 farms contained 100 acres or more, but only 9,500 included less than that amount.²⁶ In its report for 1870 and 1871, the State Board of Agriculture used tax assessment figures to reveal that in eleven California counties, 100 individuals owned the staggering sum of 5,465,206 acres--an average of 54,652 acres per person. In San Joaquin

county--where land was used largely for grazing cattle in the early 1870s--the 13 largest landowners held title to 3,100,035 acres, an average of 238,464 acres per owner. No other county came close, but in Fresno county, seven individuals held title to an average 40,088 acres, and in Kern county, nine owned an average of 33,949 acres. Of these eleven counties, the smallest holdings were in Tehama county where five wheat farmers owned a "modest" average 9,742 acres each.²⁷ The largest individual landowner in the early 1870s was William S. Chapman of San Francisco, a land scrip speculator who held 350,000 acres. However, the San Joaquin county ranch of Henry Miller and Charles Lux contained 450,000 acres surrounded by 160 miles of fence, and two former state surveyors--general owned nearly as much.²⁸

Looked at in retrospect, the land monopoly of the 1870s appears particularly onerous. However, critics of California's land system often overlooked two important facts. First, without a dependable water supply only a small amount of California land would approach Mid-West land in value. And, second, land values varied enormously from one section of California to another, based not only on agricultural potential, but also on what use the land was put to. Irrigation agriculture was not advanced in the 1870s; as yet the state still lacked markets for irrigated crops. Hence, in 1870--particularly in the Central Valley--land that would one day command premium prices went begging at \$2.50 to \$5.00 an acre. Pasture land not only sold for low prices, but it also returned a low profit per acre. A 50 foot mining claim, or 200 foot town lot in Oakland, might well provide more income than a 2,000 acre rancho in the San Joaquin Valley. Similarly, vast estates by Mid-West standards might be less profitable than a family farm in Kansas or Iowa. Hence, the attitude of Californians toward land monopoly often derived from values "alien" to the state. Critics of monopoly could plead for limits on the size of estates, and equal taxation for cultivated and uncropped land; but given the different uses of rural land in California--mining, grazing, agriculture and lumbering--how could an equitable tax policy be constructed? Amidst the public outcry over monopoly in the early 1870s, the Board of Equalization noted: "When the vast territorial [area] of California is considered, with the fact that by far the greater part of the large tracts held in private ownership are unfit for any other agricultural purpose than that of grazing cattle and sheep, and are wholly incapable of adaptation to the plow, it would appear that the disadvantages which this state labors under from large holdings of valuable lands are not so great as we have generally supposed..."²⁹ During the Mexican period, most California land was worth little more than the value of its native grasses, and large holdings were consistent with the pastoral economy. In the 1860s, the wheat industry

often competed with stockmen for land, but it did not destroy the assumption that agriculture as practiced in the Mid-West could not flourish in California. After all, except on a very limited amount of land, wheat farming represented a year-to-year gamble with nature, and fortunes were lost as well as made. In short, the 1870s was a transitional decade during which the pastoral pattern had not yet been displaced by the new order of irrigation agriculture.

Beyond the question of whether California's arid climate suited the state to monopoly is the broader issue of whether monopoly retarded agricultural development. Did monopolists stifle immigration and discourage family farming, as so many contemporary critics charged? As noted above, many wheat farmers did oppose diversified agriculture, but they never controlled more than about 4,000,000 acres of land. The largest corporate landowner was the Central Pacific-Southern Pacific railroad. By 1882, it has been granted 9,500,000 acres, of which it had already sold nearly 1,000,000 acres.³⁰ Federal land surveys often lagged far behind railroad construction, so much of the land could not be sold during the 1870s. Moreover, most of it had little value without irrigation. During the 1880s, "middle management" officials promoted diversified agriculture and densely settled rural communities, a policy consistent with the railroad's economic self-interest. Such a policy also helped promote a positive "corporate image" at a time the railroad faced mounting criticism over rates and its "political influence." Richard Orsi has shown that the railroad's land agents from 1865 to 1907, B.B. Redding and W.H. Mills, actively promoted agricultural colonization through their speeches, writings, and support for private booster groups such as the California Immigrant Union, formed in 1869. The railroad sold its land on liberal terms, and provided special "excursion" rates and immigrant trains. It also encouraged the formation of local granges and farm cooperatives; gathered and disseminated information on soils, plants and precipitation; provided free transportation for the plants and other materials used in agricultural experiments conducted by the state university; subsidized publicists of the Golden State such as Charles Nordhoff; touted the state through the columns of railroad-owned or controlled newspapers; and, in 1898, began publishing Sunset magazine to glorify life in California. Orsi notes that the railroad became the state's chief proponent of planned, orderly agricultural settlement: "Increasingly, the Southern Pacific's own land development agencies and its subsidiary land corporations rejected haphazard land disposal in favor of founding organized agricultural settlements as stimulants to land sales and freight and passenger traffic."³¹

Nor did the railroad act alone. During the 1880s, many large land companies and individual speculators promoted colonization as an alternative to unplanned, uncoordinated settlement. As early as 1868, William S. Chapman--probably the largest land speculator in the late 1860s and 1870s--challenged the assumption that land speculation retarded agricultural development. He pointed out that the federal government had sold land in small parcels since 1859, but attracted few buyers. Only the speculator could acquire the vast tracts of land needed by wheat farmers, and the deceit and fraud used to acquire land was justified by unrealistic federal land laws:

I showed my faith by my works; I invested all the money I had in the purchase of these lands, and all I could borrow. I induced moneyed men to join me. What I bought I sold again at a small advance to actual settlers, whom I induced to farm the land according to my notions. Men who bought of me at \$2.50 an acre, payable in one year (with privilege of another year's time, if the crop should fail) have this year harvested a crop which will very nearly ten times over pay back their purchase money. I have entered some hundreds of thousands of [acres of] this land. I have sold it as fast as I could at reasonable prices to actual settlers, who have been induced by me to settle on it; others, seeing what I was doing, and having thus their attention directed to these lands, have pursued a similar course, the public mind has become excited on the subject, and settlement and cultivation have progressed in the San Joaquin Valley at a ten-fold greater rate than if there had been no 'speculation' in the matter.³²

Chapman argued that soil exhaustion, and the soaring value of land, would inevitably kill off wheat farming, but that it represented a necessary first step toward agricultural diversification. In 1868, he sold 80,000 acres to a colony of German farmers for \$1.80 an acre. In 1871, he helped establish the Fresno Canal and Irrigation Company, and shortly thereafter joined Isaac Friedlander, Charles Lux, William C. Ralston, and other land speculators in forming the San Joaquin and Kings River Canal and Irrigation Company. In 1875, he aided the first major colony in the San Joaquin Valley, the Central Colony, by donating 192 twenty-acre tracts, selling land on credit to small farmers, and sending an agent to Spain to select muskateel cuttings. He was also the first to promote alfalfa cultivation, and this crop subsequently became the foundation of dairy farming in California. Chapman lost most of his land when the San Joaquin and Kings River Irrigation Company failed in 1875, but he continued to believe that inadequate federal land laws unsuited to the arid West posed the greatest single obstacle to the expansion of agriculture.³³

Few of William S. Chapman's contemporaries considered him a public benefactor, but most shared his view that federal and state land laws were inadequate. For example, in his January, 1883, message to the California legislature, Governor George C. Perkins charged that "[t]he land system of our State, if, indeed, system it may be called, seems to have been adopted for the purpose of creating confusion and providing trouble."³⁴ Yet these critics

regarded monopoly as more than a "system" of land tenure and disposal. To them, monopoly was a social sickness, a reflection of the transcendence of individual property values over social welfare. Henry George argued that the effects of monopoly could be seen "...in the knotting up of business into the control of little rings, in the concentration of capital into a few hands, in the reduction of wages in the mechanical trades, in the gradual decadence of that independent personal habit both of thought and action which give to California life its greatest charm, in the palpable differentiation of our people into the classes of rich and poor."³⁵ In short, the tentacles of monopoly reached into every corner of the society and economy. Strong hostility towards land monopoly was evident at the constitutional convention of 1878-1879. Proposals were considered to prohibit ownership of more than 640 acres by any one individual, and to require forfeiture of all land over 640 acres unused for more than one year.³⁶ But these attempts failed, as did efforts to tax large tracts and small farms at the same rate.

Despite the near-obsession of 19th century Californians with land monopoly, there were other important reasons to account for the sluggish pace of agricultural development. The nature of California politics helps explain the state's inability to do more to encourage economic growth. Not only did most Californians mistrust politicians, and all proposals for state-sponsored public works such as irrigation canals, but sectional rivalries made the adoption of any unified "growth plan" impossible.

The transient nature of California's 19th century population had a profound influence on politics. As the Sacramento Record-Union commented in 1881:

The population of California is not only sparse, but migratory. The people are restless and given to change their residences. At the same time accessions of new blood are being constantly received. The general consequence is that the political character of towns and districts is liable to radical changes at brief intervals. In the long-settled Eastern States this is not the case. There communities retain about the same political relations from generation to generation. Men adopt the politics of their fathers often as a matter of course, and the same proportions are observed in the respective party votes during long periods. But in California there is a nomadic tendency which baffles and upsets all political calculations. The town or county which has been Democratic for several years may at any time become Republican through changes of population, or vice versa. And one of the consequences of this peculiar tendency to change is that it is impossible to arrange any plan of apportionment, from a partisan standpoint, which may not be found in a short time to operate in the contrary direction to that intended.³⁷

As in most mining districts in the American West, communities rose and fell so rapidly that apportioning political power in the legislature was guesswork at best. But political party affiliations were weak for many other reasons as well. Geographical alignments--such as northern versus southern California, and interior counties versus San Francisco--put

community interests above party. For example, Democrats in Sacramento often shared more common objectives with Republicans in their own city than they did with Democrats in San Francisco. Moreover, within each community, economic interest groups also transcended party affiliations. For example, wheat growers opposed changes in the state's land tax policies no matter which party championed reform. The major parties could duck hot political issues only at the risk of diluting their public appeal still further. The result was political fragmentation, with frequent splits in the two major parties, and the formation of ephemeral third parties such as the Workingmen's Party in the late 1870s and early 1880s, and the Populist Party in the 1890s.³⁸

The transient nature of the population also helps explain the absence of a group of "professional political leaders" in 19th century California. As the discussion of irrigation in the 1880s will reveal, there was little continuity in membership from one legislature to the next. Most lawmakers had little political experience, a fact that the voters did not hold against them. In the "pre-media," small-district age, political machines put forward affable, reasonably intelligent, reasonably honest men who could be controlled. Of course, in urban districts the machines also decided who would vote. Sometimes, especially in rural districts, state legislators were elected to champion specific legislation--for example, C.C. Wright went to the legislature in 1887 and pledged to sponsor irrigation district legislation. But most arrived in Sacramento without a legislative agenda, and with little political vision, and they must have returned "to the people" relieved to resume their permanent occupations. The high turnover, particularly in the assembly, did not reflect a "vote the rascals out" philosophy so much as a crude form of "rotation in office." Especially after 1879, when the new constitution limited the legislature to paid sessions of 60 days, this turnover insured that the state's politics could be orchestrated by a handful of short-sighted, sometimes venal, men--most of whom worked behind the scenes. For in the absence of a permanent legislative staff, continuity was provided not simply by those few politicians who had served in the legislature before, but by political bosses and well-organized interest groups like the railroad. This measure of "continuity" further undermined the reputation of politics as a profession, insuring that "the best men" rarely sought a career as public servants.

By the 1880s, complaints against political corruption in the legislature rivalled criticism of the railroad and land monopolies. For example, in April, 1886, San Francisco's Daily Evening Bulletin charged that there were actually two Republican parties in

San Francisco. "The one is an appanage of the Street Department--the other, in a lesser sense, of the License Collector's office....The conventions appointed the county committees and the county committees the conventions. A small group of Bosses divided between them the spoils of city and State."³⁹ Later in the year, the Bulletin described the San Francisco delegation as "the off-scourings of public offices." "All the great local bureaus had their representatives. The Federal offices also had their agents. The Democrats went to the City Hall for their Senators and Assemblymen, the Republicans to the Custom House or the Mint."⁴⁰ Stories of legislative sinecures make amusing reading today, but they were not taken lightly at the time. In 1889, Democratic Boss Christopher Buckley dominated the legislature. The Democrats created a multitude of petty jobs including a cuspidor inspector and clerks to aid the deputy-assistant sergeants-at-arms. The San Francisco Chronicle bitterly noted that although the clerks had not been needed to begin with, they were needed even less after the appointment of four "gate-keepers." Moreover, at the beginning of the session, an enrolling clerk and an assistant were appointed, even though the legislature already had a permanent staff of clerks to keep the journals. Nevertheless, when the journal clerks fell behind in their work, and the assistant enrolling clerk was asked to help, he had to refuse--he could not write! His offer to sacrifice half his salary so that another clerk could be hired did not impress the Chronicle. Though the California constitution specified the number and responsibilities of legislative employees, Buckley used the contingency fund to reward his friends.⁴¹

Sinecures were a relatively mild form of corruption compared to the "grand larceny" of special interest legislation. In 1862, the Sacramento Daily Union commented:

The great legislative evil of the State is the introduction and passage of local and special bills. At least three-fourths of the time of the legislature is consumed each session in the consideration of local bills, which refer either to individuals or counties. If the expenditures of the Legislature reach \$275,000 annually, about \$200,000 may be charged to the account of special legislation in which the state has no particular interest.

During the 1862 legislative session, the Senate adopted a resolution asking the Judiciary Committee to investigate "the best method of reducing to the smallest possible limit...the number of local and private bills." The resolution suggested that private bills might be submitted to a special legislative committee which would decide whether the purpose of the bill could be achieved by a general law, or by amending a general law. It also proposed that no bill be introduced unless first printed and distributed to each member of the legislature, and that no bill be brought up for debate before it had been published at least twice in a newspaper which served the region affected. The resolution noted

that because of the preoccupation with "pet" bills, legislation of state-wide interest rarely received adequate attention. The most important bills were frequently buried in a pile of legislation left over after the legislature adjourned.⁴²

Nothing came of the resolution, and the controversy continued. One of the most brazen pieces of special interest legislation came before the legislature in 1870 and 1872. A group of San Francisco businessmen, headed by the flamboyant engineer Alexis Von Schmidt, wanted to tap Lake Tahoe as a water supply for San Francisco and interior counties by building a huge aqueduct 163 miles across California at a cost of from \$6,000,000 to \$12,000,000. In 1870, even before construction plans had been published, the group by-passed the San Francisco Board of Supervisors and carried the scheme directly to Sacramento. There it joined a half dozen other private bills--all involving private franchises or construction jobs for San Francisco--which attracted heavy fire from the city's newspapers. The San Francisco Chronicle commented that these bills would bankrupt the city and asked: "...might it not be a good plan to confiscate the city altogether--sell her off at tax sale--give Sacramento and Oakland their just proportion of the proceeds, and hand the balance to the Tahoe Water Company? This would relieve many persons of anxiety upon the question, how to pay their taxes." Though many critics doubted the scheme's engineering feasibility, and others feared it would cost much more than estimated, the bill actually passed the assembly in 1872 by a vote of 49 to 27. Interior counties lined up behind the plan hoping it would provide Sacramento and hydraulic mines in the foothills with a cheap source of water. Though the San Francisco delegation managed to block the bill in the Senate by a 14 to 22 vote, the Tahoe project had come perilously close to success.⁴³ At the adjournment of the 1872 session, the Daily Stockton Independent commented: "When the Legislature convenes it is usually pronounced a superior body of men, and when it adjourns it is most generally denounced as excelling all of its predecessors in incompetency and corruption. It is to be presumed that the Legislature just adjourned will not be an exception..."⁴⁴

Despite criticism from the press, special interest legislation frequently found its way into law. The constitutions of 1849 and 1879 both required that bills cover only one subject, and that the subject be clearly identified in the title. But this requirement could be circumvented if the author simply described his bill as an amendment to a particular section of the civil code. Moreover, before the second constitution took effect, there was no legal requirement that bills be printed or read three times before coming up for a final vote. Though three readings were customary, one or more were often dispensed with in the rush of the

closing days of a session. Sometimes only the title of a bill was read, and the lawmakers trusted the sponsor's description of a bill's contents. And on some occasions, bills were read twice and passed without a final reading, only to have the law appear in print with startling changes from its second reading.⁴⁵

Framers of the second constitution did try to reform the lawmaking process. In submitting the document to the public, they explained: "The power of the Legislature has been restricted in every case where it would be safe to do so, in respect to the enacting of local or special laws." The new constitution required that all bills be printed and read in full three times on three different days. It also required a majority of all members of the legislature, to pass a bill--not just those present on any given day of a session--and prohibited the introduction of bills within 10 days of the close of a session without a two-thirds vote. Lobbying was made a felony, and the legislature could not "...appropriate money for any purpose besides the support of the State Government and institutions exclusively under the control of the State..." Nor could it lend its credit either to municipal or private corporations, or make gifts of land or money. The \$300,000 debt limit in the first constitution was maintained, and no debt could run for more than 20 years. Though lawmakers could meet as long as they wished, they could be paid for no more than 60 days.⁴⁶

Though the new constitution limited private legislation, it failed to reduce corruption in the legislature or raise the faith of Californians in their state legislators. The elimination of private bills did not end "special legislation," in part because such legislation grew as much out of sectional and geographic differences as the hold of interest groups on the legislature. Many sectional differences grew out of squabbles over legislative apportionment and San Francisco's political dominance over the state. But sectional rivalries also derived from discrimination in railroad rates, taxation, and the location of state institutions.

Sharp differences between northern and southern California emerged even at the first constitutional convention. Since virtually all the mines were confined to the public domain, and since the federal government refused to recognize the validity of those mining claims until 1866, taxes fell disproportionately hard on southern California where much of the land was in private ownership. In 1852, the six "cow" counties south of the Tehachapis paid over twice the property tax collected in northern California even though their population was only five percent of that in the 12 mining counties. Moreover, while mining counties insisted on

counting the transient mining population for purposes of legislative apportionment, northern California contributed less than half the revenue collected from the state poll tax. In 1959 the legislature actually approved a plan whereby the counties from San Luis Obispo south would have become the "Territory of Colorado." However, the Civil War intervened before Congress could consider the matter and assured that the "secession" of southern California would never again receive substantial support in the legislature.⁴⁷

After 1876, when the Southern Pacific completed its line into Los Angeles from northern California, southern Californians began to complain about rate discrimination. They hoped mining in Arizona would provide a foundation for Los Angeles' commercial empire, just as San Francisco's prosperity had been built largely on the mines of northern California and western Nevada. In particular, the fledgling citrus industry required new markets to realize its potential. However, in 1877 the Los Angeles Express charged that San Francisco had pre-empted trade with Arizona:

We have always had our doubts as to whether [the Southern Pacific] would permit us to compete commercially with San Francisco, but we thought that there was a sound policy underlying the encouragement by any railroad of agricultural activity in an agricultural district on the line of its route. If this policy [of discrimination] is persevered in, the railroad, instead of proving a benefit to Los Angeles, will actually prove an injury, for it will have raised hopes that are never to be realized....Give Los Angeles only half a fair show at the Arizona trade and she will ask no odds of San Francisco or any other place. But if the interests of every other part of the State are to be subordinated to the interests of that city, we shall have very discordant music in the provinces before the game is finally given up.⁴⁸

The S.P. charged 6½¢ per mile to carry certain goods from San Francisco to Yuma, on the California-Arizona border, while it charged 14½¢ per mile from Los Angeles to Yuma. Not surprisingly, the constitution of 1879--expected by many to curb the power of the railroad and other monopolies through more equitable taxation--won overwhelming support in southern California, where there were few large corporations or banks. Three of the four Los Angeles newspapers and both San Diego dailies supported the new compact while only one of San Francisco's journals favored it.⁴⁹

Southern California's attacks on the railroad were only partly justified. The cost of transporting goods over short runs often exceeded the cost of long hauls, depending on the total volume of goods carried, service to intermediate points, the number of empty cars, the frequency of scheduled runs, and other considerations. Moreover, in northern California the railroad competed with river transportation, which helped hold down rates. Nevertheless, after 1870 southern California's growth rate exceeded that in the north, and provided a burgeoning local market for the region's agricultural products. Though Los Angeles could

not rival San Francisco's population until the second or third decade of the 20th century, its businessmen started to open their own markets much earlier. For example, after the turn of the century, Los Angeles began to extend its financial influence over the San Joaquin Valley, formerly an economic province of San Francisco. The conversion of much of that valley from wheat farming to diversified, intensive horticulture stimulated investment from the East as well as Los Angeles, and the discovery of oil in 1895 near the Kern River helped fuel the boom. As Mansel Blackford has written: "The struggle for control of the valley, which had been developing since the 1880s, intensified after 1906. The merchants of Los Angeles took advantage of the confusion following the San Francisco earthquake and fire to penetrate north of Bakersfield into substantially the entire Valley."⁵⁰

Boosters in both parts of the state actively worked to lure immigration to their section, often by challenging the agricultural potential of the rival section. For example, on April 26, 1875, the Sacramento Daily Record-Union bitterly reported that southern California land companies had sent agents to Ogden, Utah, to lure migrants away from northern California. "The audacity with which this rascally business is carried on may be gathered from the fact that one of the touters was yesterday convicted [?] of telling immigrants who were bound for San Jose that no grain was or ever could be grown in that neighborhood; that the Santa Clara Valley (really the richest wheat section in the State) was a barren desert; and that all the wheat was grown in Southern counties." Yet northern California newspapers often went out of their way to attack southern California's irrigation colonies. These experiments in desert farming marked a radical departure from agriculture in the Mid-West, and offered great opportunities to unscrupulous land companies. Hence, northern California boosters frequently portrayed such ventures in the worst possible light. The Butte County Register, in the heart of the Sacramento Valley's wheat growing district, warned that those who bought land in agricultural communities would be "badly swindled." "In our opinion no bunko dealer in the 'fives' of San Francisco ever perpetrated a grosser fraud...than is sought to be perpetrated by the promoters of those colony schemes, in the poverty breeding counties of southern California, when trying to induce our farmers of small means to sell out and invest their little all in a twenty-acre interest in a wild-cat colony in Fresno, Los Angeles, San Diego, Santa Barbara, or other southern counties."⁵¹

The contest between northern and southern California first to attract immigrants and later to dominate trade masked deep sectional rivalries within the north itself. Both Oakland and San Francisco tried to capture as much of the oceanic trade as possible by

developing modern port facilities. Chico, Sacramento, and Stockton competed over trade within the Central Valley, as well as for the lucrative markets offered by mining communities in the Sierra Nevada foothills. Sacramento and San Francisco competed for the state capital, state fair, state prisons, and over which community should serve as the terminus for the first transcontinental railroad. Sacramento newspapers proudly claimed that their city held a competitive advantage over San Francisco. For example, the Sacramento Union noted in 1881:

Sacramento is abundantly able to supply northern California with everything. Her transportation facilities are in all respects as great as those of San Francisco. She can sell goods cheaper than the latter, because the business expenses of her merchants are much lighter. She can reach the mining counties and the whole northern section of the State from twelve to twenty-four hours quicker than San Francisco can. She can import goods, machinery, everything, from the East as speedily as San Francisco....There is therefore no necessity for the mining counties or the people of the upper valley to trade with San Francisco at all.⁵²

Yet the Union persistently complained that San Francisco had retarded the economic development of the interior counties first by monopolizing transportation, and favoring the mining industry--in which the city's businessmen had invested heavily--over agriculture; and, later, by refusing to sell off the large landed estates owned by speculators and non-resident farmers in the metropolis.⁵³

These sectional rivalries underscored two dominant themes in California's 19th century history. Not only was the state fragmented; it was both blessed and cursed with extremes. California contained arid and humid sections, mountains and plains, benign coastal valleys and torrid deserts, mining camps and large cities, wheat farms and orange orchards, Chinese and "Anglo-Saxons," railroad barons and "tramps." It was a state neither "Eastern" nor "Western," nor even a blend of the two. Rather it embraced many of the qualities of both--the lawlessness of the frontier no less than the urbanity of the metropolis. To use contemporary metaphors taken from another context, California was a "tossed green salad" rather than a "melting pot." Its extremes forced Californians to adapt to a "life-style" far different from that found in other parts of the nation.

This "polarization," added to the corrupt nature of California's political institutions and the power of its monopolies, undermined the ability of politicians to shape the state's economy. Though the constitutional convention of 1878-1879 devoted much of its attention to the baneful effects of land monopoly and the need for a fairer tax structure, the state legislature rarely tackled these issues. Nor did it devote much of its attention to public works schemes, with the exception of one or two atypical sessions. Admittedly, California's treasury could not support vast public works, and many politicians opposed state action on

principle, believing that water resource development was best left to individuals and private companies. But these reasons for opposing state aid took second place to the persistent fear that the broader the proposal for aid, the greater the opportunity for graft. When the legislature was forced to consider plans to construct state-financed irrigation systems in the 1870s and 1880s, the strongest criticism came not from doctrinaire proponents of laissez-faire, but from those who feared the creation of a rich new feeding ground for monopolies and special interests. The legislature would not attempt to regulate the appropriation or distribution of water until the turn of the 20th century, and did not consider a "comprehensive" plan for coordinated use and development of the state's water supply until the 1920s and 1930s.

NOTES

CHAPTER I - A FRAGMENTED COMMONWEALTH: CALIFORNIA IN THE 19TH CENTURY

1. For population statistics see the U.S. Bureau of Census, Abstract of the Twelfth Census of the United States, 1900 (Washington, D.C., 1904), 35, 227, 234, 291, and Twelfth Census of the United States, 1900, v. 1 (Washington, D.C., 1901), lxxxv, xc, 11. Also see Paul W. Gates, "Public Land Disposal in California," Agricultural History, 49 (January 1975), 177; J. Ross Browne, "Reclamation and Irrigation," in Transactions of the California State Agricultural Society during the Year 1872, in Appendix to the Journals of the California Senate and Assembly, 20th Sess., v. 3 (Sacramento, 1874), 391; Memorial and Report of the California Immigrant Union, to the Legislature of the State of California, in Appendix to the Journals of the 19th Session, v. 3 (Sacramento, 1872), 25; and "Wants and Advantages of California," Overland Monthly, VIII (April 1872), 339.
2. On the cattle and sheep industries, see L.T. Burcham, "Cattle and Range Forage in California: 1770-1880," Agricultural History, 35(July 1961), 140-149; Paul W. Gates, California Ranchos and Farms, 1846-1862 (Madison, 1967), 17-40; R.H. Allen, "The Spanish Land-Grant System as an Influence in the Agricultural Development of California," Agricultural History, 9(July 1935), 127-142; James M. Jensen, "Cattle Drives from the Ranchos to the Gold Fields of California," Arizona and the West, II(Winter 1960), 341-352; Robert Glass Cleland, The Cattle on a Thousand Hills: Southern California, 1850-1880 (San Marino, California, 1951); and Hubert Howe Bancroft, History of California, 1860-1890, v. 7 (San Francisco, 1890), 52-67. On the ranchos of Southern California see The Country Gentleman, 18(September 5, 1861), 161.
3. Gates, California Ranchos and Farms, 35; Frank Adams, "The Historical Background of California Agriculture," in C.B. Hutchinson, ed., California Agriculture (Berkeley, 1946), 34; The Country Gentleman, 29(February 7, 1867), 97 and 32(November 26, 1868), 360.
4. The Country Gentleman, 4(July 27, 1854), 56.
5. San Francisco Evening Bulletin, July 9, 1869. Also see the San Francisco Alta California, July 12, 1869, and The Country Gentleman, 34(September 2, 1869).
6. Allen, "The Spanish Land-Grant System as an Influence in the Agricultural Development of California," 133-134.
7. There is no comprehensive history of either agriculture or the wheat industry in California. However, on the wheat industry--in addition to the Frank Adams, Cleland and Gates works cited above--see Howard S. Reed, "Major Trends in California Agriculture," Agricultural History, XX (October 1946), 252-255; E.J. Wickson, Rural California (New York, 1923); Gilbert C. Fite, The Farmers' Frontier, 1865-1900 (New York, 1966); Osgood Hardy, "Agricultural Changes in California, 1860-1900," American Historical Association, Pacific Coast Branch, Proceedings, 1929 (Eugene, Oregon, 1930), 216-230; Gerald D. Nash, "Stages of California's Economic Growth, 1870-1970," California Historical Quarterly, LI (Winter 1972), 315-330; and Rodman Paul, "The Beginnings of Agriculture in California: Innovation vs. Continuity," California Historical Quarterly, LII(Spring 1973), 16-27; "The Great California Grain War: The Grangers Challenge the Wheat King," Pacific Historical Review, XXVII (November 1958), 331-349; and "The Wheat Trade between California and the United Kingdom," Mississippi Valley Historical Review, XLV (December 1958), 391-412.
8. Gates, California Ranchos and Farms, 44-45.
9. Joseph A. McGowan, History of the Sacramento Valley, v.1 (New York, 1961), 252.
10. Nash, "Stages of California's Economic Growth," 318-319.
11. Fifth Biennial Report of the Bureau of Labor Statistics of the State of California for the Years 1891-1892, Appendix to the Journals, 30th Sess., v. 2 (Sacramento, 1893), 16.

12. Transactions of the California State Agricultural Society During the Year 1889, Appendix to the Journals, 29th Sess., v. 8 (Sacramento, 1891), 22.
13. Gates, California Ranchos and Farms, 52. Agricultural statistics for this period are unreliable. For example, Gerald Nash, in State Government and Economic Development: A History of Administrative Policies in California, 1849-1933 (Berkeley, 1964), p. 63, estimates the 1860 wheat crop at only 6,000,000 bushels. On December 28, 1858, the Sacramento Daily Union noted that for the first time in the state's history, all the county assessors had complied with the law and submitted agricultural statistics to the state surveyor-general's office in Sacramento. But during the 19th century, such a year was rare. Moreover, even the statistics submitted are open to serious questions.
14. Transactions of the California State Agricultural Society for the Year 1868, Appendix to the Journals, 18th Sess., v. 3 (Sacramento, 1870), 132-133.
15. The Country Gentleman, 34(November 4, 1869), 352-353.
16. Biennial Report of the Surveyor General of the State of California from August 1, 1873, to August 1, 1875, Appendix to the Journals, 21st Sess., v.2 (Sacramento, 1875), 26-27.
17. Transactions of the California State Agricultural Society During the Year 1884, Appendix to the Journals, 26 Sess., v. 2 (Sacramento, 1885), 206-207.
18. Mansel G. Blackford, The Politics of Business in California, 1890-1920, (Columbus, Ohio, 1977). Particularly see Blackford's introductory chapter, pp. 3-12.
19. Sacramento Daily Record-Union, May 24, 1877. For similar statements see the Union of January 16, 1877; Charles Nordhoff, California: For Health, Pleasure, and Residence (New York, 1875), 228; "Wants and Advantages of California," Overland Monthly, VIII (April 1872), 338-347; and The Country Gentleman, 50(December 10, 1885), 992-993.
20. Bentham Fabian, The Agricultural Lands of California (San Francisco, 1869), 6. In California Ranchos and Farms, p. 62, Paul Gates notes that in 1860 the ratio of farm laborers was only two to one in California as opposed to three to one in Ohio and Illinois and four to one in Indiana.
21. Henry Nash Smith, Virgin Land: The American West as Symbol and Myth (Cambridge, Mass., 1950), 138-150. Also see Arthur A. Ekirch, Jr., Man and Nature in America (New York, 1963), 10-21.
22. Henry George, Our Land and Land Policy (New York, 1902), 129-130. Also see Charles A. Barker, "Henry George and the California Background of Progress and Poverty," California Historical Quarterly, XXIV (June 1945), 97-115.
23. Sacramento Daily Union, December 16, 1874. Also see the Union of November 4, 1873.
24. Report of the Special Committee on Land Monopoly, Appendix to the Journals, 20th Sess., v. 5 (Sacramento, 1874), 195.
25. Paul Wallace Gates, "Public Land Disposal in California," 160, 168. Gates' brilliant and exhaustive studies of land in California have set a high standard. See "Adjudication of Spanish-Mexican Land Claims in California," Huntington Library Quarterly, XXI (1958), 213-236; "California's Agricultural College Lands," Pacific Historical Review, 30 (May 1961), 103-122; "California's Embattled Settlers," California Historical Quarterly, XLI (1962), 99-130; "The California Land Act of 1851," California Historical Quarterly, L (1971), 395-430; "Pre-Henry George Land Warfare in California," California Historical Quarterly, 46 (June 1967), 121-148; and "The Suscol Principle, Preemption, and California Latifundia," Pacific Historical Review, XXXIX (November 1970), 453-472. Gerald Nash has also made a significant contribution. In addition to his State Government and Economic Development see "The California State Land Office, 1858-1898," Huntington Library Quarterly, XXVII (1964), 347-356; "Henry George Reexamined: William S. Chapman's Views on Land Speculation in Nineteenth Century California," Agricultural History, 33(July 1959), 133-137; and "Problems and Projects in the History of Nineteenth-Century California Land Policy," Arizona and the West, II (1960), 327-340. Gates and Nash's fine work have largely supplanted the only book-length history of land in California, W.W. Robinson's Land in California (Berkeley, 1948).

26. Report of the State Board of Equalization of the State of California for the Years 1872 and 1873, Appendix to the Journals, 20th Sess., v. 2 (Sacramento, 1874), 22-23.
27. Biennial Report of the State Board of Agriculture for the Years 1870 and 1871, Appendix to the Journals, 19th Sess., v. 3 (Sacramento, 1872), 15-16.
28. George, Our Land and Land Policy, 71-72.
29. Report of the State Board of Equalization of the State of California for the Years 1872 and 1873, in Appendix to the Journals, 20th Sess., v.2 (Sacramento, 1874), 24.
30. Annual Report of the Central Pacific Railroad Company to the Stockholders for the Year ending December 31, 1881 (San Francisco, 1882), 51-52.
31. Richard J. Orsi, "The Octopus Reconsidered: The Southern Pacific and Agricultural Modernization in California, 1865-1915," California Historical Quarterly, LIV (Fall 1975), 208. Also see Edna Monck Parker, "The Southern Pacific Railroad and Settlement in Southern California," Pacific Historical Review, VI (June 1937), 103-119.
32. William Chapman's letter, originally published in the San Francisco Evening Bulletin of August 27, 1868, is reprinted in Nash's "Henry George Reexamined: William S. Chapman's Views on Land Speculation in Nineteenth Century California."
33. Nash, "Henry George Reexamined," 134-135. For other "Pro-monopoly" statements see J. Ross Browne, "Agricultural Capacity of California--Overflows and Droughts," Overland Monthly, XX (April 1873), 313, and his "Reclamation and Irrigation," in Transactions of the California State Agricultural Society during the Year 1882, Appendix to the Journals, 20th Sess., v. 3 (Sacramento, 1874), 390-426; the statement of the former Deputy Registrar of the U.S. Land Office in San Francisco, W.W. Johnston, in Report of the Committee on Land Monopoly, Appendix to the Journals, 20th Sess., v. 5 (Sacramento, 1874), 278; and the address of the President of the California State Agricultural Society in Transactions of the California State Agricultural Society During the Year 1882, Appendix to the Journals, 25th Sess., v. 4 (Sacramento, 1883), 18.
34. Biennial Message of George C. Perkins, Appendix to Journals, 25th Sess., v. 1 (Sacramento, 1883), 8.
35. George, Our Land and Land Policy, 69.
36. Mary Montgomery and Marion Clawson, History of Legislation and Policy Formation of the the Central Valley Project (Berkeley, 1946), 11-13.
37. Sacramento Daily Record-Union, April 6, 1881.
38. There is no comprehensive history of California politics in the 19th century. However, important studies include Bancroft's History of California, v. 7; Theodore H. Hittell, History of California, v. 4 (San Francisco, 1898); Earl Pomeroy, "California, 1846-1860: Politics of a Representative Frontier State," California Historical Quarterly, 32 (1953), 391-402; William H. Ellison, A Self-Governing Dominion: California, 1849-1860 (Berkeley, 1950); Joseph Ellison, California and the Nation, 1850-1869: A Study of the Relations of a Frontier Community with the Federal Government (Berkeley, 1927); Carl B. Swisher, Motivation and Political Technique in the California Constitutional Convention, 1878-1879 (Claremont, California, 1930); Alexander Callow, Jr., "San Francisco's Blind Boss," Pacific Historical Review, XXV (August 1956), 261-280; R. Hal Williams, The Democratic Party and California Politics, 1880-1896 (Stanford, California, 1973); and Donald E. Walters, "Populism in California, 1889-1900," Ph.D. diss., history, U.C. Berkeley, 1952.
39. San Francisco Daily Evening Bulletin, April 6, 1886.
40. Bulletin, September 4, 1886. Also see the issue of September 18, 1886.
41. The San Francisco Chronicle, January 11, 12, 30, and February 10, 1889.
42. Sacramento Daily Union, March 11, 1862.

43. See Donald J. Pisani, "'Why Shouldn't California Have the Grandest Aqueduct in the World?': Alexis Von Schmidt's Lake Tahoe Scheme," California Historical Quarterly, LIII (Winter 1974), 347-360. The Chronicle quote is reprinted on p. 351.
44. Daily Stockton Independent, April 2, 1872.
45. Sacramento Daily Record-Union, December 25, 1877, and January 8, 9, and 15, 1880.
46. The quotes are from an "Address to the People of California" by the Constitutional Convention of 1878-1879 reprinted in the Pacific Rural Press, 17 (March 8, 1879), 156. The best description of the new constitution is in Swisher, Motivation and Political Technique in the California Constitutional Convention, 1878-1879.
47. Walton Bean, California: An Interpretive History (New York, 1973), 176-177; John W. Caughey, California: A Remarkable State's Life History, (Englewood Cliffs, New Jersey, 1970), 219-220; Ellison, A Self-Governing Dominion; Roberta M. McDow, "State Separation Schemes, 1907-1921." California Historical Quarterly, XLIX (March 1970), 39-46.
48. As reprinted in the Sacramento Daily Record-Union, August 4, 1877.
49. Swisher, Motivation and Political Technique in the California Constitutional Convention, 1878-1879, 47, 102. Swisher also notes that the Southern Pacific discriminated against Stockton. Goods cost little more to be shipped from San Francisco to the southern end of the San Joaquin Valley than they did from Stockton to the same point (p. 49).
50. Blackford, The Politics of Business in California, 1890-1920, 9. Also see the Pacific Rural Press, 75(April 4, 1908), 210.
51. The Register editorial is reprinted in the Sacramento Daily Record-Union, October 15, 1879. Also see the Union of October 20 and 30, 1879.
52. Sacramento Daily Record-Union, February 11, 1881.
53. For example, see the Sacramento Daily Record-Union of September 18, 1860; April 6 and 7, 1864; September 9, 1864; November 7, 1864; December 3, 1864; February 9 and 13, 1865; March 20, 1865; October 28, 1865; April 30, 1875; August 26, 1876; March 16, 1878; July 10, 1878; and March 26, 1879.

II. WATER LAW AND THE IDEA OF IRRIGATION IN 19TH CENTURY CALIFORNIA

Though irrigation was an important part of agriculture in southern California as early as the 1870s and 1880s, it was not common north of the Tehachapi Mountains until the 20th century. Land monopolies, uncertain titles to Mexican land grants, limited markets for perishable crops, high transportation rates, and the cost of irrigation canals retarded the development of this mode of farming. But there were also less obvious reasons for the lag. Irrigation was not a common feature of agriculture in humid parts of the nation, and many of California's new residents either openly resisted "artificial rain" or failed to appreciate its value. The development of irrigation suffered from a variety of charges including that it produced inferior crops, created disease, and contributed to the development of land monopoly. Yet even had the value of this agricultural innovation been widely recognized in 1850, irrigation would have floundered on California's uncertain and contradictory water laws.

Those laws were rooted in decisions made by the state legislature and supreme court in the 1850s. The constitution adopted in 1849 said nothing about water. But on April 13, 1850 the legislature declared that "[t]he Common Law of England, so far as it is not repugnant to or inconsistent with the Constitution of the United States, or the Constitution of laws of the State of California, shall be the rule of decision in all the Courts of this State."¹ The lawmakers did not appreciate the momentous consequences of this simple, one-sentence declaration. Traditionally, the English had used streams as sources of power or transportation. And since England usually received plenty of rain the year around, its rivers were also valuable as drainage systems. The right to use water derived entirely from the ownership of land adjoining a stream. Riparian, or "river bank" land owners could demand a flow of water undiminished in quantity or quality by those who owned riparian land upstream. In short, the rights of individual landowners were subordinate to "community interests."

Nevertheless, the law of April, 1850 was little more than an afterthought. As is well-known, California's miners had trespassed on the public domain, over which the state had no jurisdiction. In the absence of federal laws regulating the sale of mining lands, state officials moved to maintain order. On April 29, 1851 the legislature required that "[i]n actions respecting 'Mining claims,' proof shall be admitted of the customs, usages, or regulations established and in force at the bar, or diggings, embracing such claim; and such customs, usages, or regulations, when not in conflict with the Constitution and laws of this State, shall govern the decision of the action."² Beginning in 1848 and 1849, argonauts

diverted streams to get at placer deposits in river beds. Later they altered the course of rivers to wash away topsoil in search of ore-bearing quartz veins. In the mining camps, the first to claim water held the paramount right, and gold-seekers unwittingly adopted the principle upon which water law in the arid and semi-arid nations surrounding the Mediterranean was founded--"first in time, first in right." The "system" they established was not based on proximity to the water, where the water was used, how much water was used, or even how much wealth the water could produce. Time was the essence of a right and individual rights took precedence over common needs. However, in the 1850s the rights of the individual and community needs usually coincided.

California supreme court decisions in the 1850s did not fully support either the riparian doctrine or prior appropriation. Instead, they compounded the inconsistency between the 1850 and 1851 statutes. One critical problem facing the judges was how to meet the needs of hydraulic mining companies without violating federal water rights. The U.S. Constitution's "commerce clause" recognized federal jurisdiction over navigable rivers, but most streams flowing over mining lands had no value as avenues of trade. Still, if the nation's sovereignty over the public lands also implied control over the water supply serving those lands, then California had no more right to guarantee the ownership or use of water than it did to confer titles to the claims themselves. This raised a fundamental question: how could hydraulic mining companies raise the enormous sums of money needed to carry on their work if they could not secure clear legal title to a fixed quantity of water?

California's supreme court answered this question as best it could in 1855. Irwin v. Phillips dodged the issue of federal water rights by pleading that circumstances dictated recognition of the status quo:

Courts are bound to take notice of the political and social condition of the country which they judicially rule. In this State the larger part of the territory consists of mineral lands, nearly the whole of which are the property of the public...[A] system has been permitted to grow up by the voluntary occupation of the mineral region [which] has been tacitly assented to by the [federal] government, and heartily encouraged by the expressed legislative policy of the other [i.e. state government]. If there are, as must be admitted, many things connected with this system, which are crude and undigested, and subject to fluctuation and dispute, there are still some which a universal sense of necessity and propriety have so firmly fixed as that they have come to be looked upon as having the force and effect of res judicata. Among these the most important are the rights of miners to be protected in the possession of their selected localities, and the rights of those who, by prior appropriation, have taken the waters from their natural beds, and by costly artificial works have conducted them for miles over mountains and ravines, to supply the necessities of gold diggers, and without which the most important interests of the mineral region would remain without development. So fully recognized have become those rights, that, without any specific legislation conferring or

confirming them, they are alluded to and spoken of in various acts of the legislature in the same manner as if they were rights which had been vested by the most distinct expression of the will of the lawmakers.³

In the following year, the court acted again to protect and encourage mining and ditch companies by ruling that water rights should date from the beginning of work on diversion works rather than from the date of completion of those works or the actual diversion of water. This decision protected legitimate claims from the extortion of "interlopers" who might divert water simply to secure a "payoff" from a bona fide company.⁴

Nevertheless, the supreme court did not recognize appropriative rights as superior to riparian claims, nor did it try to resolve the inherent inconsistency between the two doctrines. In each individual case, the judges usually stuck to the immediate issues at hand. They did not reflect on the "system" of water rights evolving in California--or rather the lack of system--and sometimes they ignored their earlier decisions. For example, in 1853, two years before the landmark decision in Irwin v. Phillips, the court had called the doctrine of appropriation "impractical," arguing that "...the right of property in water is usufructuary, and consists not so much of the fluid itself as the advantage of its possession."⁵ This decision was the first to define the principle of "beneficial use," which became a qualification and limitation of appropriative rights throughout the arid West. The right to use water lapsed if the supply was not put to continuous use. However, the case failed to settle the theoretical issue of whether water, like other natural resources, could be "owned." In practice, the courts sanctioned the right of appropriators to sell or transfer their claims to others; only riparian rights were attached to the land. The question of "ultimate ownership," including the residual rights of the state, remained alive well into the 20th century.

The evolution of "court-made" water law has been discussed by both legal scholars and historians.⁶ However, they have largely ignored the laws enacted by the California legislature. During the 1850s and 1860s, California's courts were preoccupied with water law as it pertained to mining, but the legislature also addressed the needs of irrigation, private water companies, and municipalities.

California was not the first state or territory to adopt legislation regulating irrigation. In New Mexico, irrigation had been practiced on land adjoining the Rio Grande River at least since the 17th century. After New Mexico became a territory in 1851, its new legislature passed two acts--on July 20, 1851 and January 7, 1852--confirming and expanding the laws and customs which had prevailed prior to 1848. These laws put community needs first.

Existing public irrigation ditches were given special recognition and protection. For example, all those who owned arable land, irrigated or not, were required to maintain the common acequias. Irrigation was declared the primary use of water; water power or navigation had to give way if either interfered with farming. In addition, local justices of the peace were ordered to call special elections from time to time so that water users could elect watermasters. These salaried officials watched over the maintenance of old ditches, supervised the construction of new canals, and regulated the distribution of water. Their work was aided by country probate judges who appointed special commissions to appraise the value of land condemned for canal rights-of-way. The laws did not discuss the nature of water rights, but implied that the watermasters would determine the amount of water needed by each farmer from year-to-year.⁷

While individual property rights took precedence in the mining camps of California, as they would in Colorado, Utah followed a different course. There water laws were designed to fit the needs of irrigators, rather than miners, and community interests came first. Irrigation had been practiced in the Salt Lake Valley since the summer of 1847, but the Mormons rejected private ownership of natural resources. Instead, they believed that the church and its members should serve as stewards over the wealth God had created for man's use. Brigham Young warned: "There shall be no private ownership of the streams that come out of the canyons, nor the timber that grows on the hills. These belong to the people; all the people."⁸ Before 1852, when the first territorial legislature met, the bishop in charge of each Mormon congregation arranged canal surveys, and organized members of his ward into construction crews. Since irrigation works benefited the whole community, all able-bodied farmers were expected to contribute their labor. When the ditches were ready, the church appointed a member of the ward to serve as watermaster. That official, in consultation with the church, established rules of water use and supervised distribution. As in New Mexico, water claims were "attached" to particular parcels of irrigated land, and farmers were not promised permanent grants of specific quantities of water. The Mormon emphasis on group harmony and cooperation made water conflicts rare, but when they arose church-appointed arbitrators settled such disputes quickly and cheaply, without resort to the courts. After 1852, the principle of public ownership of water persisted, but administrative control was transferred from the church to county courts, which appointed the watermasters. The Salt Lake County court established a precedent when it required those who needed water to publish their requests at least twice in the Deseret News. If established water users protested, the court often investigated the water supply and held hearings before approving

or rejecting the applications.

In Utah, the church discouraged mining until after completion of the first "transcontinental" railroad in 1869. The Mormons feared "gold fever" not only because of its poisonous moral influences, but because mining failed to offer a stable foundation for future social and economic growth. Utah did not owe its existence to a mining boom, nor did its courts consider the needs of that industry in framing or interpreting water laws. Hence, until 1880, Utah challenged the common view in mining states that water was just another species of private property.⁹

Yet this distinction can be overdrawn. California's lawmakers may have lacked foresight, but they did try to provide for the needs of agriculture as well as mining. We do not know what inspired the first irrigation laws passed by the legislature. Perhaps the territorial laws of New Mexico and Utah served as models. Or, the legislature may have simply recognized and extended laws and customs carried over from the Mexican period. Certainly, the first irrigation law confirmed earlier customs and procedures. On April 13, 1854, the legislature acknowledged the pueblo rights of Los Angeles by granting "... the Mayor and Common Council of the said city the same power and control over the distribution of water for the purpose of irrigation or otherwise among the vineyards, planting grounds and lands within the limits claimed by the ancient Pueblo and Ayuntamiento De Los Angeles..."¹⁰ Much of the irrigated land had been under cultivation since mission days, and this was the first of several acts defining the rights of Los Angeles to the Los Angeles River. Pueblo water rights guaranteed the entire flow of water, including all underground supplies within the city limits, to the municipality, even though only part of the stream was used in 1854. Such rights even took precedence over those of riparian owners along the stream because they antedated statehood and the adoption of the Common Law. Appropriators and riparian owners could use water from the stream, but only after the city's needs had been met. In 1870, the legislature divided Los Angeles into three irrigation districts and provided for the election of a board of water commissioners to parcel out the water. As in New Mexico and Utah, irrigators within the city limits did not enjoy absolute rights; their water supply varied according to the quantity available from year to year. The commissioners could lay out new ditches on the request of a majority of farmers within a district, and they could also condemn land needed for rights-of-way. The cost of construction was met from a special "water fund" created by charging fees for the use of water. This fund was also designed to help pay for the maintenance of existing ditches and the salaries of commissioners and "overseers" (watermasters).¹¹ Apparently, this system proved unsatisfactory, for in 1872 these powers

were transferred back to the Mayor and City Council.¹²

Most of the statutes pertaining to irrigation in Los Angeles passed during the 1870s seem to have been inspired by a law adopted on May 15, 1854, one month after the legislature confirmed pueblo rights. The second law allowed a majority of voters in any township within the agricultural counties of San Diego, San Bernardino, Santa Barbara, Napa, Los Angeles, Solano, Contra Costa, Colusa and Tulare, to request an election to select three water commissioners and an overseer. In all incorporated cities within these counties, the mayor and city council could assume the commission's responsibilities. The act provided that "[t]he duties of the Commissioners shall be to examine and direct such water courses, and apportion the water thereof among the inhabitants of their district, determine the time of using the same, and upon petition of a majority of the persons liable to work upon ditches, lay out and construct ditches...." Overseers could demand up to twelve days work a year from irrigators served by community ditches, and the commissioners could levy taxes to pay for maintenance and construction in proportion to the amount of water used by each farmer. The commissioners could condemn land, at a fair price, and also had the power to prevent the damage or obstruction of ditches and canals, and pollution of the water supply. The law contained two important qualifications. It did not apply in counties where mining was the dominant industry, or to "mining interests" in general. Hence, the law suggested that mining took precedence over irrigation if the two uses of water ever came in conflict. Second, section 14 asserted the primacy of riparian rights: "No person or persons shall divert the water of any river, creek or stream from its natural channel to the detriment of any other person or persons located below them on any such stream."¹³

The law of 1854 expressed a clear preference for community-owned irrigation ditches and provided a foundation for public control and ownership of water used for irrigation. But it applied only where a majority of farmers wanted a "coordinated" public irrigation system and administrative control over distribution. Even where settlers backed such commissions--as in San Bernardino County where Mormons had watered land since the early 1850s--riparian owners could render the law inoperative by protesting diversions upstream from their land. The legislature tried to remove this obstacle in 1862 by giving the various water commissions power to condemn riparian rights which imperiled irrigation.¹⁴ However, apparently many lawmakers doubted the legislature's power to condemn private property, even for public purposes when a fair price was paid. Though the 1862 law remained on the books, the provision relating to riparian rights was never enforced. In 1864 and 1866--when the legislature enacted a series of new laws designed to define the powers and responsibilities

of each county's water commission more precisely--none of the statutes included the power to condemn riparian rights. In effect, these laws circumvented the 1862 statute.¹⁵

Some efforts to expand the 1854 law were more successful. By the end of the 1860s, Los Angeles, San Bernardino, Kern, Tulare, Fresno, and Siskiyou counties had mandatory water commissions, and some of the laws creating those commissions contained far-sighted, if impractical, provisions. For example, in San Bernardino County, which had the most "advanced" irrigation laws, settlers who took up land along a stream already fully utilized for irrigation were criminally liable, as were farmers who lied to the overseer about the number of acres under irrigation to secure more water.¹⁶ And while in one sense a Tulare County law of 1968 providing for private and corporate irrigation ditches represented a retreat from community control over water, the same law allowed the water commission to approve or reject all proposed private works. The commission, not private water companies, would decide where canals would be built and how much water could be used.¹⁷

Nevertheless, private water companies had already won substantial privileges in Sacramento. As early as 1858, the legislature set the pattern for corporate control over municipal water supplies when it passed an act providing for the incorporation of water companies. San Francisco's rapid growth prompted the need for more water, and the fledgling Spring Valley Company promised to supply it in exchange for an exclusive market. Since the company needed to secure rights-of-way and reservoir sites in San Mateo County, to the south of the city, the legislature modified a law passed on April 22, 1853 which permitted railroad companies to condemn land. The new law allowed municipal water companies to condemn water rights as well. It required these companies to provide water at "reasonable rates," the rates to be set by special administrative boards. The board consisted of four members, two appointed by the town, city, or county, and the other two by the company itself. The board or county sheriff could appoint a fifth member to break deadlocks, but endless bickering rendered these commissions ineffective. For a variety of reasons, many communities ignored this section of the law and let the companies set their own rates.¹⁸

In 1862, largely because farmers had begun to irrigate rich alluvial land adjoining Cache Creek, in Yolo County west of Sacramento, the legislature extended the condemnation privilege to companies formed "...for the transportation of passengers and freights, or for the purpose of irrigation or water power, or for the conveyance of water for mining or manufacturing purposes..." Such companies could claim all the water they needed, if it had not been previously appropriated. Since this restriction did not apply to "urban" water companies formed under the 1858 law, the legislature had implied that municipal needs

transcended all other uses, save perhaps mining. The water rates charged by ditch and canal companies were "subject to regulation" by county boards of supervisors, but in no case could the boards set rates at less than one and one half per cent per month of the capital actually invested in the enterprise. Not surprisingly, given the potential conflict between different groups of water users, the law did not apply to the mining counties of Nevada, Placer, Amador, Sierra, Klamath, Del Norte, Trinity, Butte, Calaveras, and Tuolumne.¹⁹ By 1865, the Cacheville and Woodland canal companies had constructed five main ditches out of Cache Creek with an aggregate length of 25 miles. The owners of the two companies hoped to secure a federal grant and reclaim over 100,000 acres of land.²⁰

Both the 1858 and 1862 laws failed to regulate water rates. The first law did not require municipal water companies to open their books, or even prepare regular financial statements. In 1881, the legislature ordered the boards of supervisors, town council, board of aldermen, or other appropriate community "legislative body" to set rates. The new law required all municipal water companies to compile complete lists of the names and addresses of their customers, including the amount charged for water during the previous year. The companies were also required to submit detailed sworn statements describing what they had spent on construction and maintenance since incorporation. However, most companies--including San Francisco's hated Spring Valley monopoly--either refused to comply or submitted inadequate or distorted reports.²¹ The law pertaining to rates set by canal and ditch companies was even weaker. Although it permitted boards of supervisors to set rates, they were not required to do so. Moreover, the law provided little guidance. Though the boards could not set water rates at less than one and one-half per cent per month of "capital actually expended," the law did not provide a maximum rate. Consequently, the boards of supervisors--whose decisions often reflected the power of large land and water companies in rural counties--either allowed the companies to set their own rates or established rates much higher than the minimum. In 1885 the legislature provided that on the appeal of at least 25 taxpayers, the boards would be required to set water rates, and those rates could not be less than six nor more than eighteen per cent of the value of the water company's property per year. But the legislature still did not require companies to provide adequate financial statements, and the law allowed the companies to pad their net worth with such questionable assets as water rights. This "watering" of assets invariably produced higher rates.²²

The regulation of water rights was only one question raised by the 1862 canal and ditch law. An even more significant issue--though its importance was not appreciated at the time--concerned the relationship of the 1862 law to the 1854 water commission statute. Put simply,

did passage of the 1862 law represent a retreat from the idea of public ownership implicit in the earlier legislation? The two laws defined water rights very differently. By emphasizing public ownership and distribution of water, the earlier law made all water rights relative rather than absolute. Neither that law nor any of its amendments authorized permanent grants of specific quantities of water. In dry years the overseer reduced the supply of all irrigators, apportioning the water on a pro-rata basis. Distribution was based on "equity" rather than on the chronological priority of claims. However, the 1862 law allowed private companies to claim specific quantities of water "not previously appropriated," and use the water without public supervision. That law seemed to run counter to the 1854 law by recognizing absolute water grants and acknowledging appropriative rights created before 1862. This was a serious legislative oversight. Several amendments to the 1854 law acknowledged and protected rights established under prior appropriation, as well as the right of individuals and private companies to build irrigation works. But each of those laws charged either a water commission or local board of supervisors with the responsibility of deciding how much water private ditch owners could use.²³

California's Surveyor-General in the early 1880s was a lawyer named James B. Shanklin. He denied that the legislature had ever granted any absolute rights to use water for irrigation, explaining:

The confusion and misunderstanding of the principles which, in my opinion, govern the distribution of water for irrigation purposes in those counties named in the Act of May 15, 1854, and kindred laws, arises from the supposition that any man could take water wherever he might find it, for any purpose, provided he did not interfere with his neighbor. This was the common rule in the mines, and when the miners left the mountains to make homes for themselves and families in the valleys, they naturally adopted the same rules they had learned in the mines, not knowing that different laws had been provided for regulating the use of water in the valleys, where irrigation was and will become more and more essential as our population increases. The two modes of regulating the use of water are necessarily different, and Mexico, from whom we secured this territory, has long been using both modes, one for the mines and one for agriculture, but never allowed the law for regulating water in the mines to operate where its use was necessary for farming. Hence, we notice that our legislators, as early as 1854, by adopting the Mexican rules for irrigation, prohibited the customs of the mines in using the watercourses, from gaining any foothold in the agricultural counties.

Shanklin argued that the 1862 canal and ditch company law did not modify or supersede the 1854 law in any way. It did not overturn the principle of public ownership and control of water, nor did any other legislation enacted before 1880. California codified its laws in 1872, and Section 19 of the Political Code denied that the process of acquiring rights by prior appropriation--described in Sections 1410 to 1422 of the Civil Code--affected any of the laws "creating or regulating Boards of Water Commissioners and Overseers in the several

townships or counties of the State." Then, on March 6, 1878, the legislature adopted a joint resolution asking Congress "to reserve from sale, or grant no exclusive ownership in" any stream large enough to serve more than one family. Water, the legislature declared, should be held "for the common use of all the inhabitants for the natural purposes of drinking and washing for man and domestic beasts, for irrigating the soil, and for mining purposes." This principle of "common use" was reaffirmed in the Constitution of 1879. Article 14, Section 1, declared that "the use of all water now appropriated, or that may hereafter be appropriated for sale, rental, or distribution, is hereby declared to be a public use, and subject to the regulation and control of the State in the manner to be prescribed by law."²⁴

Of course, Shanklin wrote from the perspective of 1882, when antimonopoly sentiment was near flood-tide. He wanted to demonstrate that no land or ditch company could "own" water, and that no company could use water without public supervision. He claimed that the 1862 law could not prevail in any agricultural county served by a board of water commissioners. Moreover, since the law had not specified any formal procedure for acquiring water, and since the legislature after 1854 recognized a difference between irrigation and mining water rights, then the principle of public control was implicit even in the 1862 law. Though the legislature had not chosen to regulate canal companies directly, neither had it given up the right to do so. In short, irrigation water rights were not permanent grants. Shanklin concluded: "The laws on this subject must be sufficiently elastic to meet the increasing wants of the people; and there would be no more sense in restricting the distribution of water to the present users than there would to pass a law that no one should be allowed to raise wheat in California except those at present engaged in that business."²⁵

Shanklin's arguments are important because historians have neglected the legislature's efforts before 1872. But his conclusions can be questioned on several grounds. Obviously, if the legislature was so committed to public ownership and administration, why were the laws it passed so ambiguous and "inconsistent"? Why was there no clear statement of principle? And if public officials wanted to establish a "system" of water use, at least for irrigation, why did most of the laws they enacted pertain to individual counties? Lawyers, like historians, often impose an order and consistency on the past which did not exist; Shanklin was no exception. There is scant evidence that the lawmakers had the knowledge of water law, foresight, or even understanding of irrigation agriculture, to provide a sound philosophical foundation for future laws. San Bernardino and Los Angeles counties had the most elaborate water laws in the state not because state officials acted to protect the "public interest" in water, or even the needs of irrigators as a class. Instead, the legislature responded to the

immediate needs of farmers in those counties. Historians have not studied the influence of Mexican water law on the evolution of water law in California after statehood. But, as mentioned earlier, southern Californians probably simply copied or modified familiar institutions. They were accustomed to public control and wanted it continued. Since 1854, California water laws have been piled layer on layer, not welded together like links in a chain. Those bewildering, complicated, inconsistent laws are the best evidence that the legislature paid little concern to consistency or principle.

That the legislature failed to do more can be easily explained. At least in theory, riparian rights doomed any system of public control to failure. There was little point in trying to establish a public water policy until the doctrine had been modified or abandoned. As mentioned earlier, the legislature recognized the primacy of riparian rights in the water commission law of 1854, granted the commissions the right to condemn such rights in 1862, then "recanted" in subsequent water laws. Even in the early 1860s, riparian rights were perceived by many legislators as being too firmly entrenched to be uprooted by statute. But if this is true, why had the legislature even attempted to provide a system of public control? The most likely reason is that during the 1850s and early 1860s, few legislators expected irrigation agriculture to expand rapidly in the future. They wanted to protect limited existing needs, and those needs did not conflict with riparian rights. Perhaps the legislature assumed that the two systems of water use could co-exist. Severe water shortages, and the resulting conflicts between riparian and appropriative water rights, did not erupt until the 1870s. At least in the short run, riparian rights did not seem an insurmountable obstacle to irrigation in the counties where it had been traditionally used.

The riparian doctrine sharply limited the legislature's initiative in water planning. But the uncertain nature of federal water rights was equally restrictive. State ownership of water suggested state regulation of its use. However, the national government never formally transferred sovereignty over water to the states. In 1866, 1870, and 1877, Congress recognized the right of Westerners to use streams flowing over the public lands for mining, agriculture, and other purposes. The appropriation of this water would be regulated by state, territorial, and local (e.g. mining district) laws.²⁶ None of these statutes defined federal water rights, and the nature of those rights would become a hot issue, especially in the 20th century.²⁷ Proponents of states' rights argued that Congress had tacitly acknowledged state sovereignty. For example, the Colorado Constitution of 1876 declared unappropriated water "the property of the public," and dedicated its use exclusively to "the people of the state." Many Coloradoans assumed that Congressional ratification of their constitution indirectly sanctioned state

sovereignty. Wyoming made the same claim in its constitution of 1889. Those who assumed that federal control over the public lands had not implied control over water could make a good case for states' rights. However, the case for "federal reserved rights" was equally persuasive. If Congress had simply recognized the status quo in 1866, 1870, and 1877--allowing the states to provide order in the filing and recording of water claims--then no transfer of sovereignty had occurred. The states could not expropriate a power of the federal government simply because Congress had not exercised that power. In any case, the basic issue was who owned the water. Whether individual or corporate claimants enjoyed a permanent right to use the water they claimed was unclear. But even if they did, title passed from the nation to the water user, not from nation to state to claimant. The states, according to this argument, only provided administrative systems to facilitate the acquisition of rights. This view had many critics, but it served as a warning beacon to partisans of state control in California's legislature.

The legislature could not establish state control over water, but in 1872 it did codify many legal principles originally expounded by the courts. The 1872 Civil Code, Sections 1410-1422, provided a formal administrative procedure by which appropriative rights could be established. Chronological priority--"first in time, first in right"--defined the relationship of all such rights to each other. Those who wanted to claim water had to post a notice at the point of diversion indicating the amount claimed, the ditch's size, where the water would be used, and the purpose. Within ten days a copy of the claim had to be filed with an appropriate county recorder; rights dated from the posting of the claim. Work had to begin within 60 days after posting a claim, and the claimant had to "...prosecute the work diligently and uninterruptedly to completion...." All those who had claimed water in the past, but had not begun constructing diversion works, had twenty days to start on pain of forfeiture. Finally, Section 1422 read: "The rights of riparian proprietors are not affected by the provisions of this title."²⁸

The new code did not impose greater state control over water users. In 1914, the California supreme court explained that the purpose of the law was "...to provide evidence whereby parties claiming under hostile diversions [e.g. contested claims] could establish their respective priorities and corresponding rights to the water and avoid the former difficulties in establishing the precise date of the inception of their respective enterprises."²⁹ The Act of 1872 attempted to reduce conflict among water users by precisely defining when the date rights became effective and the conditions under which they lapsed.



The 1872 Code was riddled with weaknesses and omissions. It did not create a comprehensive, centralized record of water rights, and potential water users had no quick way of learning how many claims to a stream existed. Appropriators were not required to announce their claims in a local newspaper, as they were in Utah. Consequently, large water projects could be launched in violation of established rights. To make matters worse, many water-courses passed through two or more counties, and those water users who had acquired water before 1872 were not required to "confirm" their rights under the new law. So the records of individual counties were fragmentary at best. Even water users who managed to discover how much water had been claimed could not be sure how much water remained because most claims were inflated and California lacked reliable records of the volume of water carried by the state's streams.

The 1872 law limited water rights to "beneficial use." However, the state did not provide administrative machinery to investigate whether appropriators used any or all of the water claimed. Beneficial use was not a "fail-safe" limitation on water rights in any case. Miners--for whom the 1872 law had been drafted--usually put their water claim to full use soon after the completion of diversion works. But farmers often opened their land to irrigation section by section. The courts subsequently ruled that if farmers had well-conceived plans to use the entire amount claimed, they did not have to use it all at once. Beneficial use could be defined by the amount of water originally turned onto the land, by the number of acres capable of irrigation, or by the capacity of irrigation ditches. The state's courts were not consistent on this point, and judgments in mining and irrigation cases often differed. Similarly, "diligence" in the construction of diversion works was also had to define. Work had to begin within 60 days, but the law placed no time limit on completion. Hence, some water rights survived for years because claimants performed inexpensive periodic "work" to sustain their claims. As in cases concerning beneficial use, the courts usually gave water users the benefit of the doubt.

The 1872 law was not simply ambiguous; it also contained many holes. For example, it said nothing about the transfer or sale of water rights. Hence it raised many questions: Could water be owned in the same sense land was owned? If water could be sold, did the second owner have to use it for the same purpose stated in the original claim? Did the water have to be obtained at the same diversion point? These questions were left to the courts, which invariably treated water rights as property, and no distinction was made between mining and irrigation. Moreover, the law did not set limits on the amount of water that could be claimed. Theoretically, a single appropriator could demand the right to a stream's entire volume, and

use far more water than his crops needed. The courts rarely considered "waste" in water rights suits. True, some uses of water--such as flooding gopher holes, or washing salts out of alkali-choked soils--were not considered beneficial uses. But the courts upheld most uses, including flooding land to raise pasture grass, and the main measure of water rights became continuous use rather than the "best" or most efficient use of water. Not surprisingly, given the laxness built into the 1872 law, it required claims to be expressed in anachronistic "miner's inches"--a notoriously imprecise and unreliable measure--rather than in cubic feet per second.

Perhaps the greatest weaknesses of the 1872 law related to riparian rights and rights created through "prescription." The courts ruled that water users could establish a claim outside the law by using water continuously for five years. These "prescriptive" rights were valid even if the water user had never filed a claim or complied with the provisions of the 1872 law. Apparently, the legislature had not anticipated that the courts would sanction this variety of claim. The main advantage in filing was that the water right dated from the posting of a claim rather than actual diversion. But posting a claim also had its dangers. For example, records kept by the county recorder "announced" claims which could come in conflict with riparian rights. Riparian owners could prevent diversions by appropriators, but only if they protested a claim within five years. After that period the "adverse use" enjoyed full protection under the law. Consequently, many appropriators tried to keep their diversions secret. By the 20th century, this category of rights became a great obstacle in the path of those who sought to find out how much water was being used or remained available for use.

The law reaffirmed the primacy of riparian rights, but did nothing to define them. During the 1870s and 1880s--when claims against the state's water supply dramatically increased--many fundamental legal questions concerning these rights remained unresolved. Many were not settled until the 20th century. Riparian rights could not exist on the public domain, but did they pertain to those Spanish and Mexican land grants confirmed by the federal land commission from 1852 to 1856? Could riparian owners use their rights to claim water for irrigation? Could they sell water to those who owned non-riparian land? If they bought non-riparian land adjoining their tract, did their riparian rights apply to the new parcel? If an owner subdivided a large riparian estate, which parcel or parcels inherited the riparian right? Could riparian owners claim the flood flow of a river--that heavy run-off occurring in May and June--or just the "normal" flow? Ostensibly, the most profound question was whether riparian rights could be condemned for "public purposes." Yet this

question actually aroused less controversy than many others because on long streams those who condemn riparian rights would have to settle with dozens of landowners and provide adequate compensation. The time and expense of determining fair prices for these rights made the legal question of riparian condemnation a moot point. Then, too, the legislature granted private water companies the right of condemnation--and many lawyers questioned the legislature's authority to pass such a law--what would prevent large riparian owners from forming canal companies to condemn, and thus protect, their own riparian rights?³⁰

The public controversy over riparian rights in the 19th and 20th centuries will be discussed at length in subsequent chapters. But the doctrine has been so often maligned as totally unsuited to the arid West that a few words of defense are warranted. Neither riparian rights nor the doctrine of prior appropriation represented an "ideal" system of rights. Neither reflected the needs of small farmers--that group most 19th century Californians considered most important to the state's future prosperity and stability--and both encouraged large landowners to monopolize water. But the one great advantage of riparian rights was their indefinite nature. Riparian owners could monopolize water as a class, but none actually owned water as property. The Common Law had assumed that water was too precious a resource, and subject to too many different uses, to be sold and traded like land or precious metals. So the riparian doctrine recognized no priorities at all. Rights did not depend on the size of one's estate, or even the use to which water was put. When conflicts arose, riparian owners usually settled their differences out of court through informal agreements. Theoretically, riparian owners could not reduce the volume of a stream, but in California the courts allowed them to do so unless neighbors downstream protested. So riparian owners could irrigate their land and pointed to the richness of alluvial soils and the ease with which riparian land could be watered as justifications for the superiority of their rights. In any case, where riparian owners did not choose to monopolize a water supply, or where they simply wanted to maintain peaceful relations with their non-riparian neighbors, appropriators could tap the unused supply.

In the 1870s and 1880s, many Californians considered prior appropriation better suited to the arid West than its rival doctrine, but that was partly because appropriation could help build up sparsely settled frontiers by attracting investors and developers. However, even when tempered by strong public control, it proved less suited to densely settled rural communities. There, justice demanded that the water supply provide the greatest good to the greatest number. Theoretically, prior appropriation allowed the first water user to claim the entire supply within a basin--though in California this was obviously limited by riparian

rights. Ironically, then, what was useful at one stage of development could limit later growth. To serve the largest number of water users, each doctrine required modification, and some modifications were enacted. For example, towns and cities could condemn both appropriative and riparian rights, and in 1887 the Wright Act conferred condemnation powers on irrigation districts. But the legislature never seriously considered modifying the riparian doctrine to fit conditions in California. California's courts had expanded the doctrine to permit irrigation. Yet the legislature might have stretched the definition of "riparian" to include all the land within a river basin. This would have been one way to eliminate the evils of both systems, even though such a change would doubtless have required a constitutional amendment. Yet if all water rights were "correlative," then some administrative body would have to define the public good and dole out the water. As conditions changed, water rights could come and go, expand and contract. Such speculation is, of course, "presentistic" in its sympathy for public control. Yet the legislature clearly underestimated the potential of the riparian doctrine to provide more equitable water rights.

Water law was only one element in the development of irrigation. Equally important were public attitudes toward that agricultural innovation. Though some Californians perceived the benefits of irrigation as early as the 1850s, many others remained skeptical for decades. The arguments of both proponents and critics of irrigation mirrored their deepest values as well as their conception of California's future.

California has always been perceived as a land of extremes, and the first characteristic of the state noticed by most visitors and new residents was the climate. A farmer in Sonora wrote to The Country Gentleman in December, 1858: "This is our winter as much as yours, and yet all my hogs, and all stock everywhere around, are living on grass. Farmers are plowing everywhere. The tilled farms have the appearance of yours next May...My whole farm, except where plowed, is one beautiful emerald green. No winter--no summer--no fall--but all one glorious spring!"³¹ But while many farmers applauded the mild, dry climate, other observers saw danger. In an editorial on how climate had affected the "personalities" of different European nations, the Alta California noted in 1867 that California's diverse climates helped explain the state's early history and boded ill for the future: "The thirst for excitement, the chase for material gratifications and the ruinous habits of wandering and change which characterize our population may all be ascribed, to a certain extent, to the influence of the some climate which endows it with so much vitality and vigor." The article blamed everything from the divisiveness of California politics to the frequency of class conflicts

on the climate.³²

Similarly, there were sharply different views of the state's agricultural potential. Boosters portrayed the state as remarkably fertile and productive. Many stories printed in the 1850s and 1860s by the nation's two leading agricultural periodicals, The Country Gentleman and American Agriculturalist, suggested that fruits and vegetables grew faster and larger in California than in older agricultural regions. Articles mentioned gigantic turnips which weighed 29 and 36 pounds, 100 pound sugar beets, 200 pound pumpkins, strawberries seven inches in circumference, pears 21 inches long, and apple trees that grew 12-15 feet in a single season.³³ Could any reader doubt that California was a farmer's "gold mine" as well as a source of enormous mineral wealth? Yet more than a few found that life in the new Eden was not as rosy as boosters made it out to be. In 1965, one disgruntled farmer wrote The Country Gentleman to warn that successful farming was the exception rather than the rule in California. The flood of 1862 and the drought of 1863-1864 had driven many settlers off their lands, and the farmer concluded: "...examined in its true light, it [California] is no nearer heaven than the good old homesteads of the east." "Old Hurricane," an easterner transplanted to southern California often wrote the same periodical complaining about drought, the absence of lumber for fences, the distance from markets, the high price of labor, uncertain land titles, and pasture grass which lasted best only a few months per year. Even the scenery disappointed him: "The scenery is grand, solitary and impressive. Its marked impression on me is desolation--and [it is] dry, sun-burned, dusty and waterless the greater portion of the year."³⁴

Not surprisingly, sharp differences also existed over the value of irrigation. Even in the 1850s, this agricultural novelty won some converts. In 1850, T. Butler King, President Zachary Taylor's special emissary to California in 1849, reported to the President that irrigation was not absolutely necessary to grow crops in the new mining commonwealth, and that draining the Central Valley should receive top priority. Still, he noted that irrigation's "...benefits should be secured, as far as possible, by suitable surveys and legal relations. Most of the valleys are watered by streams sufficiently large to be rendered very useful."³⁵ Later in the decade, the new California Culturist championed irrigation, despite protests from its readers. The journal lamented that almost nothing was known about irrigation in California, even though that "science" had been practiced in European nations with climates similar to California's for hundreds of years. One piece concluded: "Irrigation in California is to be one of the fixed principles of its agriculture, because in many localities it can no more be dispensed with than plowing."³⁶ In the late 1850s, the state

agricultural society began to award annual prizes for essays on farming and husbandry. In 1859, all three prizes went to papers on irrigation. The winner developed the theme that irrigation would render California independent of the seasons: "By adopting this system of irrigation we would be enabled to grow grass, grain, and roots, in endless succession, and in whatever order we might think most profitable or convenient, in many cases two or more crops in one year."³⁷

One of irrigation's most powerful attractions was the promise of increased production. Supporters argued that it would insure against irregular droughts, permit farmers to raise crops during the annual summer drought, and increase yields generally. In 1868, Titus Fey Cronise, an early California booster promised: "Wherever irrigation is provided it will insure thirty-five instead of twenty bushels of wheat per acre in an average of years."³⁸ Twenty years later, Nevada's powerful Senator William Morris Stewart claimed that where water was "artfully applied...there is secured at least twice the product that can be secured from the same area of land dependent for its moisture upon rainfall alone..."³⁹ Just why irrigation increased crop yields was not well understood. Some friends of irrigation maintained that water was a fertilizer which carried silt as well as decayed vegetable and animal material. An alternative explanation was that the nutrients were in the soil but required water to release them. As one farmer suggested: "There can be but little doubt that the chemical and mineral properties of the soils which enter into the substance or fruit of a plant, can be more readily taken from the soil when it is saturated with water, than when the soil contains but little moisture."⁴⁰

Irrigation also promoted crop diversification, another way to increase farm income. Farmers who raised wheat seldom grew anything else. Consequently, in the 1850s and 1860s, the state had to import much of its food at the same time the prosperity of California agriculture came to depend on the whims and caprice of the Liverpool wheat market half way around the globe. Tight credit, labor shortages, and shipping monopolies were only three of the reasons wheat farming became such a risky business. In the midst of the great drought of 1872, one newspaper editorialized: "Diversify the crops, then begins the date of a new development in the agricultural resources of California; new wealth will spring up; more varied interests will be directed here, and better prepared will be the State to compete with the States of the East. Corn, wheat, oats, barley, vegetables and fruits should be raised, so as to make every farmer independent of all markets; in fact, make his own farm a market place for such products."⁴¹

Most critics of wheat culture also expected irrigation to increase immigration into the state by encouraging the sub-division of large wheat farms as land prices increased. In this way, more land would become available for family farmers. In an address before the state agricultural society in September, 1874, Morris Estee explained: "Once irrigate the country, and the lands in large tracts under one ownership will, as a rule, be confined to remote or mountainous districts, while gardens and orchards will be found on every one hundred acres of land in all the valleys of the State, population will increase, wealth will become more evenly distributed, villages will appear every few miles, [and] a thousand pleasant homes will dot the State where now there are but scores."⁴² Everyone would benefit from irrigation. The land speculator could expect soaring land prices, the farmer more profit per acre, and the state itself both a larger tax base and hundreds of thousands, if not millions, of new residents.

Irrigation attracted support for many other reasons. It promised to beautify the state by transforming parched, dusty fields into lush gardens. It raised the prospect that forests could be grown artificially in the Central Valley to supplement the less accessible--and some thought rapidly disappearing--timber supply of the Sierra Nevada. It might even indirectly challenge the railroad's transportation monopoly by providing canals which could double as inland transportation lanes. Then there was the popular 19th century myth that "rain followed the plow." In 1880 the Chicago Tribune proposed that California follow the lead of Utah, where rainfall had doubled according to that newspaper since the introduction of irrigation: "A system of general irrigation in California would greatly increase the supplies of water by reason of the evaporation that would rise from the watered earth, which, borne by the winds against the lofty Sierra Mountain wall, would condense into rain and run down again in torrents to the rivers, and be spread by means of the canals...over the grateful land."⁴³

But these were trivial reasons compared to irrigation's "deeper purpose." Though most proponents of irrigation emphasized its practical benefits, a few saw God's plan unfolding in California. Perhaps the state's arid environment had been designed to test man's ingenuity and spur him to use resources more efficiently. Was it just coincidence that so many arid states needed irrigation, but so few had the water? Why did California contain so much fertile, flat, easy to cultivate land located so close to abundant Sierra water sources? Perhaps God had spared California the floods of summer and the rains of harvest time as part of a plan to perfect a new form of agriculture and make rural life more attractive. Irrigation suggested cooperation among men, not competition, and perhaps that imperative

would make for a better society. In any case, if Providence had chosen California as a laboratory for new social and economic institutions, then irrigation became almost a religious rite.⁴⁴

Of course, not many Californians regarded irrigation in such reverent terms, especially before the 1880s. Skepticism and sometimes outright scorn were more common. Understandably, many eastern or midwestern emigres to California adjusted to their new environment only reluctantly. Twenty-three years after statehood, the Pacific Rural Press lamented that so little of California agriculture suited the arid environment: "What California agriculture needs is not this or that man's opinion formed upon any former experience in the country from which he came; but we want the result of a California experience, with a California soil and climate. Then and not till then will we have entered upon anything like a system of true agricultural progress."⁴⁵

Early views of California's agricultural potential rarely considered the virtues of the environment. Lansford W. Hastings, in his Emigrant's Guide to Oregon and California published in 1845, reported that while "...the crops of dry seasons, are much less abundant than those of the ordinary seasons, yet...the crops even of a dry season, are much better here, than they are at any time in Oregon, or even in most of the [eastern] States."⁴⁶ Hastings suggested that the enormously fertile soil of the coastal valleys more than compensated for aridity. Lt. Charles Wilkes, who visited the Sacramento Valley in August and September of 1841 painted a darker picture: "A large part of this [valley] is undoubtedly barren and unproductive, and must for ever remain so. The part that is deemed good soil, is inundated annually, not for any great length of time, yet sufficiently long to make it unfit for advantageous settlement."⁴⁷ The Central Valley in particular seemed a forbidding place to farm, especially when mining promised quick wealth and, perhaps, a speedy return to the comfortable and congenial environment of home "back east." The Valley's limited potential seemed underscored by the fact that the Indians who lived there did not practice agriculture. Moreover, trees were sparse--a sure sign to easterners that the soil was infertile. Finally, the most likely farmland adjoining rivers and streams flooded each year. Not only did these floods pose dangers to crops, but the mud left behind when the water receded increased the difficulty of planting, harvesting, or transporting crops to market.⁴⁸

Outside the Central Valley, some land had been cultivated for decades. Land adjoining Alta California's missions had been irrigated since the 1770s and 1780s, and might have served as a "model" for settlers. Yet English and American observers alike scorned Mexican

agriculture. When British merchant Alexander Forbes published the first English history of upper and lower California in 1839, he described mission agriculture as "most rude and backward." California farmers used wooden plows, and did not employ fallowing, crop rotation, or any other techniques to maintain or restore soil fertility. Forbes treated irrigation with thinly veiled contempt, noting that "...I have never seen even by irrigation any thing which could promise a very superior return per acre to a heavy crop in England."⁴⁹ Subsequent observers reached similar conclusions. For example, in 1851 John J. Werth described irrigation as a "great bugbear" that had "very limited application." He claimed that winter crops of barley, wheat, and oats did not require irrigation anywhere in the state.⁵⁰

Contempt for Mexican institutions fitted well with the booster mentality of the first decades after statehood. Potential immigrants to California might find irrigation "foreign" or even "alien," but they also saw it as an added expense. Consequently, many of the state's promoters played down the need for canals and ditches. The first volume of the Overland Monthly contained a story entitled "Farming Facts for California Immigrants." Irrigation received only brief mention, and then to deny its need: "[A]rtificial irrigation is not practised but in very few and exceptional cases in this country." This was true, but not for the reasons suggested by the author. He claimed that even grapes could be raised without irrigation in California's matchless soil, and that in the foothill counties--where mining ditch companies offered farmers water at cheap rates--most still preferred to trust nature.⁵¹ In 1869, one of California's greatest boosters, Bentham Fabian, published his well-known Agricultural Lands of California. He did not discuss irrigation, and painted a picture of the San Joaquin Valley that bordered on fantasy. For example, in describing Tulare County--a desert where rainfall averaged only eight or nine inches a year--he noted: "Here are lands for all, a fertile soil, a delightful climate, and everything the heart of man can desire. Timber and water are abundant, and the woods provide for thousands of swine. Every description of grain, fruit and vegetables can be raised in profusion."⁵² And in the following year the Sacramento Union editorially chided the New York World for suggesting that agriculture in California required irrigation. The Union proudly noted that only two or three per cent of the 4,000,000 acres under cultivation were irrigated: "The New York World is, therefore, quite wrong in assuming that farming here must be attended with the expense of irrigation, and that this circumstance ought to turn that class of people from the Pacific coast...We have in this State not less than twenty million acres of good arable land that can be cropped every year in grain without irrigation...."⁵³

Similarly, the champions and critics of irrigation disagreed as to its effect on plant growth. Since the irrigation of field crops was limited in the early 1850s, many early opinions came from nurserymen. Some conceded that the controlled application of water promoted growth, but pointed out that irrigated trees were not as uniform and contained more wood in proportion to fruit or foliage. In addition, they claimed the wood was more "pulpy." This theory argued that the roots of irrigated trees sprouted closer to the surface and never became as efficient in transmitting nutrients. Hence trees raised without irrigation were considered hardier, and more resistant to frosts and disease. Moreover, the fruit from irrigated trees was commonly considered inferior in taste, if not in quantity or size.⁵⁴ The attitudes of nurserymen toward irrigation did not differ markedly from those of farmers. Agoston Haraszthy, generally regarded as the father of the modern California wine industry, wrote in 1861 that "...the experience of France and all wine growing countries in Europe proves that irrigated vines produce weak wines, void of acidity or astringency, possessing an aqueous or watery taste, and without any flavor." He also claimed that wine produced from irrigated vineyards did not keep well.⁵⁵ Nor were such views restricted to viticulturalists. A grain farmer in Anaheim wrote the Anaheim Gazette in 1871: "My objection to irrigation is that it creates a hard pan; the soil becomes dense and sodden, and if allowed to dry, bakes as hard as a brick; produces an excessive growth of stalk, and small product of grain; once begun it must be continued, as the plants irrigated only have surface roots, as the subsoil becomes too dense to be penetrated."⁵⁶ Many farmers argued that deep plowing and a good mulch cover could achieve better results than irrigation with less expense. In addition, by the 1880s the state university's fledgling agriculture department noticed that some of the San Joaquin Valley's soil was alkaline, and that alkalinity problems often increased following several years of irrigation.⁵⁷

The views of farmers and nurserymen probably attracted little attention among the public at large. But the argument that irrigation contributed to or even caused disease won wider recognition. From the 1840s, the Central Valley had been perceived as a dangerous place to live. The valley flooded annually, and the floods often created a vast inland lake. The receding water left behind marshes, bogs, and swamps, perfect breeding places for mosquitoes. Malaria was second only to tuberculosis among California's serious diseases during the late 19th century, and it struck soldiers stationed at posts in the Sacramento Valley particularly hard. Until the turn of the century, when the germ theory of disease began to win acceptance, most doctors and scientists believed that disease resulted from the decomposition of plant and organic matter. Standing water promoted decay, but high temperatures, the number of

hours of sunshine, and the prevalence of winds were also believed to contribute to the spread of dangerous "miasmata." Appropriately, the literal definition of malaria was "bad air." Many observers also believed that trees helped purify the atmosphere, and that the virtual absence of trees in the Central Valley helped explain the persistence of disease in that part of the state.⁵⁸ Irrigation, of course, seemed to contribute to the problem, and not just in the Central Valley. The Pacific Rural Press noted that "[t]here is no doubt but that the irrigation of lands late in the season in this State is almost sure to be followed by a general prevalence of chills and fever and other bilious diseases in the vicinity of such lands. The prevalence of diseases of this character in the portions of the foothills of the Sierras [sic] is now generally attributed, and no doubt truly, to the presence of water in the mining ditches, reservoirs, hydraulic tailings, etc." The Press suggested that farmers confine irrigation to the winter months.⁵⁹

The presumed relationship between irrigation and disease worried the state board of health during the 1880s, as irrigation expanded in southern California. The board first recognized the danger in its report for 1873, and in the late 1870s or early 1880s formed an "Irrigation and Tree Planting" committee to study the problem. The group devoted most of its attention to the Los Angeles basin. Dr. J.P. Widney concluded that land near the coast developed "...with irrigation, a very active form of malaria..." Inland communities near the mountains, such as San Gabriel, Pomona, and Riverside, seemed to have little problem. According to Dr. Widney, the heat, porous soil, and heavier native vegetation in these areas all protected against malaria. Like Widney, Dr. H.S. Orme emphasized the value of drainage, and also argued that many diseases similar to malaria were caused by poor sanitation rather than irrigation. However, irrigation was extremely dangerous because hot weather spurred "...into activity many forms of organic germs, including minute algae confervoids, diatoms, bacteria etc. The germ spores of these organisms require both heat and moisture for their full development. Until then, they remain in a passive condition for weeks, months, and even years; but in the presence of heat and moisture, they develop and become prolific with the most wonderful rapidity." In short, the "germs" were in the soil waiting for the proper conditions to develop. Alluvial lands rich in humus were particularly good breeding ground. When the summer temperature exceeded 60 degrees, water touched off a process of "poisonous fermentation." Dr. Orme maintained that planting Eucalyptus trees in irrigated areas subject to malaria offered the best protection.⁶⁰

Besides the danger of disease, irrigation's supporters faced a wide range of additional arguments. Some critics charged that irrigation would discourage or destroy the small farm. Not many small farmers could afford the cost of irrigation works or water rights suits; yet such suits were inevitable in the absence of strict state control over water. Then, too, irrigation might promote monopoly by encouraging land and water companies to snatch up these resources in anticipation of future profits. As the Stockton Daily Independent commented in 1873: "All at once there is a wonderful mania prevailing in relation to the necessity of watering every poor man's land, and it is worthy of observation that it is not poor men or small farmers who are manifesting any great anxiety upon the subject." Or, as a correspondent of the Colusa Sun charged even more bluntly in 1875: "Most of the discussion [about irrigation] is gotten up by speculators--by designing men, or, perhaps, from those who have large amounts of poor land in the valley and wish to get up some excitement in order to sell their land..." Even the prospect that a private irrigation project would be launched in a particular section drove up land prices.⁶¹ Others charged that tree-planting would increase rainfall, render the climate similar to the humid East, and make irrigation unnecessary. The first conference on irrigation held in the trans-Mississippi West met in Denver in 1873. The delegates concluded that tree-planting was of the "utmost importance," and should be given a fair test before the construction of artesian wells or expensive canals.⁶² The Sacramento Daily Union confidently predicted in 1871: "Once cover any considerable portion of our plains with forest trees, and marked effects will be seen in the climate and productive power of contiguous lands."⁶³ Such thinking reflected the hope that the arid Western environment might one day prove more congenial to patterns of cultivation long practiced in the East.

Nineteenth century irrigators rarely applied water to the land scientifically, and the quality of their crops suffered from their ignorance. "Flood irrigation" grew out of the notion more was better, and also the desire to maintain legal title to the greatest quantity of water possible. California's water laws encouraged waste by basing claims on the amount of water used rather than the amount needed. Not until the 20th century would soil scientists and hydraulic engineers conduct systematic studies of the "duty" of water--the optimum quantity of water needed to raise a particular crop in different soils under different climatic conditions.

As one of California's most perceptive students of agriculture observed in 1923, early misconceptions about irrigation "...influenced settlement for some time and delayed development of those vast areas of interior plains and mesas from which the greatest volumes of distinctively Californiana products are now secured."⁶⁴ However, by 1910 or 1920, many

myths had been exploded. Farmers recognized that some plants with shallow roots, including virtually all summer vegetables, required irrigation to mature well even where rain fell in abundance. And even where rainfall was sufficient to produce regular harvests, irrigation improved both the quantity and quality of most crops, particularly fruits. Admittedly, too much water produced poor plants. This was true in the East as well as the arid West, and irrigation itself was not to blame. Heavy summer rains damaged the quality of fruit as much as excessive irrigation. Fortunately, the California farmer did not have to worry much about summer rains. From May through September he could precisely regulate the amount of water received by his crops.

Compared to other arid states, irrigation developed rapidly in California during the 19th century. Inadequate water laws and public prejudices toward irrigation posed formidable obstacles, but California contained millions of acres of fertile soil, a warm climate, and a relatively abundant water supply. It also contained a small but active group of investors willing to bankroll irrigation projects. Nevertheless, to those Californians who hoped irrigation would transform the state's economy and society, development seemed painfully slow. During the year from 1850 to 1887, Californians considered many schemes to promote irrigation including federal aid to private companies, state irrigation systems, and local irrigation districts. In the 1870s and 1880s, a wide variety of interest groups lined up behind one or another plan, but they checkmated each other. As more and more land was opened to cultivation, the cost of irrigation works increased. This doomed the public ditches favored in the law of 1854. Local communities could not afford the added expense of building ever-longer canals, nor could they resist the increasing political power exercised by land and water companies in Sacramento. At the same time, public antagonism toward corporate monopolies stalled private irrigation development, and sectional rivalries coupled with a pervasive public fear of corruption in the legislature blocked state irrigation plans. Ultimately, the irrigation district emerged as the best institutional tool to raise large sums of money without losing local control.

NOTES

CHAPTER II - WATER LAW AND THE IDEA OF IRRIGATION IN 19TH CENTURY CALIFORNIA

1. Cal. Stats., 1850, 219.
2. Cal. Stats., 1851, 149.
3. Irwin v. Phillips, 5 Cal. 140 (1855).
4. Conger v. Weaver, 6 Cal. 548 (1856).
5. Eddy v. Simpson, 3 Cal. 252 (1853). The court made a similar ruling in Boggs v. Merced Mining Co., 14 Cal. 279 (1859).
6. There is no comprehensive historical survey of the evolution of court-made water law in California. The best study is Gordon R. Miller, "Shaping California Water Law, 1781-1928," Southern California Quarterly, LV (Spring 1973), 9-42. Unfortunately, Miller largely ignores the irrigation laws passed by the California Legislature. Also see the citation listed below in note #30.
7. New Mexico's earliest laws are reprinted in the Report of the Surveyor General of California, August 1, 1880 to August 1, 1882, Appendix to the Journals of the California Senate and Assembly, 25th Sess., v. 1 (Sacramento, 1883), 15-17.
8. As quoted in Leonard Arrington, Great Basin Kingdom: An Economic History of the Latter-Day Saints, 1830-1900 (Cambridge, Mass., 1958), 52.
9. Arrington, Great Basin Kingdom, 52-54 and 241-244; Elwood Mead, Irrigation Institutions (New York, 1903), 220-223. Also see Charles H. Brough, Irrigation in Utah (Baltimore, 1898), and George Thomas, Early Irrigation in the Western States (Salt Lake City, 1948).
10. Cal. Stats., 1854, 205.
11. Cal. Stats., 1870, 702.
12. Cal. Stats., 1872, 30 and 128. Also see Cal. Stats., 1874, 633, and Cal. Stats., 1876, 692.
13. Cal. Stats., 1854, 76. In 1857 (Cal. Stats., 1857, 29) the law was amended to include Santa Cruz and San Luis Obispo counties as well as those mentioned in the text.
14. Cal. Stats., 1862, 235.
15. Cal. Stats., 1864, 87 and 375; Cal. Stats., 1866, 609 and 777.
16. Cal. Stats., 1859, 217; Cal. Stats., 1864, 87.
17. Cal. Stats., 1868, 112.
18. Cal. Stats., 1858, 218.
19. Cal. Stats., 1862, 541. Also see Cal. Stats., 1870, 660 and Cal. Stats., 1872, 732.
20. Report of the California State Board of Agriculture for the Years 1864-1865, in Appendix to the Journals, 16th Sess., v. 2 (Sacramento, 1866), 19-20. Also see Paul Wallace Gates, California Ranchos and Farms, 1846-1862 (Madison, 1967), 81 and Gerald D. Nash, State Government and Economic Development: A History of Administrative Policies in California, 1849-1933 (Berkeley, 1964), 78.
21. Cal. Stats., 1881, 54.
22. Cal. Stats., 1885, 95.
23. Cal. Stats., 1866, 313; Cal. Stats., 1868, 112; Cal. Stats., 1876, 547.

24. Report of the Surveyor General of California, August 1, 1880 to August 1, 1882, 30-37. The quote is from p. 31.
25. Ibid.
26. For the July 26, 1866 and July 9, 1870 laws see U.S. Revised Statutes, Sections 2339 and 2340. For the March 3, 1877 law see U.S. Statutes at Large, XIX, 377.
27. For a full discussion of the conflict between the states and federal government over western water see Donald J. Pisani, "State v. Nation: The Battle over Water Rights in the American West, 1902-1922." Pacific Historical Review.
28. California Civil Code, 1872, Title VIII, Sections 1410-1422 (March 21, 1872), 268-270.
29. Palmer v. Railway Commission, 167 Cal. 163 (1914).
30. On the 1872 code and the state of California water law in the last decades of the 19th century see Wells Hutchins, California Law of Water Rights (Sacramento, 1956); John D. Works, "Irrigation Laws and Decisions of California," in Oscar T. Shuck, History of the Bench and Bar of California (Los Angeles, 1901), 101-172; Mead, Irrigation Institutions, 180-219; A.E. Chandler, "Appropriation of Water in California," California Law Review, IV (March 1916), 206-215; Lucien Shaw, "The Development of Water Law in California," California Bar Association, Proceedings of the Thirteenth Annual Convention, XIII (1913), 154-173. Also see the appropriate sections of C.S. Kinney's four volume legal masterpiece, Treatise of the Law of Irrigation and Water Rights and the Arid Region Doctrine of the Appropriation of Water (San Francisco, 1912); S.C. Wiel, Water Rights in the Western States (San Francisco, 1908); and A.E. Chandler, Elements in Western Water Law (San Francisco, 1918). Two recent legal surveys, prepared by the staff of a special commission appointed by Governor Edmund G. Brown, Jr., during the California drought of 1976-1977, also merit attention. See David Anderson, Riparian Water Rights in California (Sacramento, 1977) and Marybelle D. Archibald, Appropriative Rights in California (Sacramento, 1977).
31. The Country Gentleman, 13 (February 24, 1859), 122-123.
32. Alta California (San Francisco), June 25, 1867.
33. The Country Gentleman, 3(April 6, 1854), 216; 9(June 18, 1857), 399; 14(December 1, 1859), 350; 17(June 13, 1861), 387. American Agriculturalist, 19(September 1860), 273.
34. The Country Gentleman, 25(February 23, 1865), 130-131; 27(May 3, 1866), 290.
35. T. Butler King, Report of Hon. T. Butler King on California (Washington, D.C., 1850), 41-42.
36. California Culturist, I(December 1858), 312-313. Also see I(June 1858), 16, and II (September 1859), 129-131. This periodical lived only a few years and the most prominent state farm journal in the 1850s and 1860s, the California Farmer, devoted virtually no attention to irrigation.
37. Transactions of the Agricultural Society of the State of California for 1859, in Appendix to the Journals, 11th Sess., v. 1 (Sacramento, 1860), 308. The three essays are on pp. 308-323. By this time national farm journals also occasionally noted the value of irrigation, even in the East. They argued that it was valuable for flooding pastures to raise grass, during dry summers, and as a carrier of fertilizing silt. See The Country Gentleman, 12(August 26, 1858), 121; and the American Agriculturalist, 19(April 1860), 103, and 23(August 1864), 236-237.
38. Titus Fey Cronise, The Natural Wealth of California (San Francisco, 1868), 381.
39. Sacramento Daily Record-Union, August 20, 1889. For early statements on the effects of irrigation on crop production in California see the Report of the California State Board of Agriculture for the Years 1864-1865, in the Appendix to the Journals, 16th Sess., v. 2 (Sacramento, 1866), 21-25 and the Sacramento Daily Union, January 30, 1866.
39. Sacramento Daily Union, November 11, 1861. The interest in increasing production also helped lay a foundation for "scientific farming" in California. One reason many critics

attacked wheat farming was that it represented a crude form of agriculture which impoverished the land by steadily draining away its fertility. Irrigation, on the other hand, might restore fertility as it increased yields.

41. The Daily Stockton Independent, February 9, 1872.
42. Transactions of the California State Agricultural Society for the Year 1874 in Appendix to the Journals, 21st Sess., v.1 (Sacramento 1876), 201.
43. As reprinted in The Argonaut (San Francisco), March 13, 1880.
44. For examples of the religious impulse in irrigation propoganda see the Daily Evening Bulletin (San Fransico), May 14, 1864; Transactions of the California State Agricultural Society, 1864, in Appendix to the Journals, 16th Sess., v. 3 (Sacramento, 1866), 72; Transactions...1874, in Appendix to the Journals, 21st Sess., v. 1 (Sacramento 1874), 190; and the Sacramento Daily Record-Union, December 29, 1877.
45. Pacific Rural Press, V(June 21, 1873), 392.
46. Lansford W. Hastings, The Emigrant's Guide to Oregon and California (Cincinnati, 1845), 84.
47. Lt. Charles Wilkes, Narrative of the United States Exploring Expedition During the Years 1838, 1839, 1840, 1841, 1842, (Philadephia, 1850), v. 5, 193.
48. Kenneth Thompson and Richard A. Eigenheer, "The Agricultural Promise of the Sacramento Valley: Some early Views," Journal of the West, XVIII (October 1979), 33-41.
49. Alexander Forbes, A History of Upper and Lower California (London, 1839), 257 and 246-247.
50. John J. Werth, A Dissertation on the Resources and Policy of California (Benecia, California, 1851), 77-78. Also see Edwin Bryant, What I Saw in California (New York, 1848), 307 and 449; T. Butler King, Report of Hon. T. Butler King on California, 32, 34; and Walter M. Fisher. The Californians, (San Francisco, 1876), 47-48.
51. "Farming Facts for California Immigrants," Overland Monthly, I(August 1868), 176-183.
52. Bentham Fabian, The Agricultural Lands of California (San Francisco, 1869), 23. Fabian's view of Kern County was just as fanciful. For example, he suggested that wheat harvests of 60 bushels per acre were common there when 30 bushels would have been much closer to the norm. (p. 10)
53. Sacramento Daily Union, May 28, 1870.
54. California Culturist, I(December 1858), 312-313, and II(October 1860), 181-182; Transactions of the California State Agricultural Society for the Year 1859, 322; and "Western Agricultural Improvements," Overland Monthly, IV(February 1870), 150.
55. Sacramento Daily Union, November 11, 1861.
56. As reprinted in the Alta California (San Francisco), February 11, 1871.
57. Daily Evening Bulletin (San Francisco), January 26, 1880.
58. Kenneth Thompson, "Insalubrious California: Perception and Reality," in Annals of the Association of American Geographers, LIX(March 1969), 50-64; and "Irrigation as a Menace to Health in California: A Nineteenth Century View." in The Geographical Review, LIX (April 1969), 195-214.
59. Pacific Rural Press, I(June 24, 1871), 388.
60. Seventh Report of the State Board of Health of California for July 1, 1880 to December 1, 1881 (Sacramento 1882), 104-106; Eighth Biennial Report...for the Years 1882 and 1883 (Sacramento, 1884), 51-59; Ninth Biennial Report...from June 30, 1884 to June 30, 1886 (Sacramento, 1886), 132-133; Tenth Biennial Report...from June 30, 1886 to June 30, 1888 (Sacramento, 1888), 224-227.

61. Stockton Daily Independent, July 11, 1873; Weekly Colusa Sun, July 3, 1875.
62. Forest and Stream, I(October 23, 1873), 168.
63. Sacramento Daily Union, October 4, 1871. For expressions of the belief that California's climate was gradually changing to resemble climates in the humid half of the nation see the Alta California (San Francisco) of July 25, 1854 and October 9, 1869.
64. E. J. Wickson, Rural California (New York, 1923), 312.

III. THE SEARCH FOR AN INSTITUTIONAL BASE: THE IRRIGATION MOVEMENT, 1850-1877

During the first three decades after statehood, proponents of arid land reclamation in California suggested four institutional mechanisms to expand irrigation. Private land and canal companies--and the two often went hand-in-glove--took the lead in reclamation. Most of these companies were highly speculative, befitting the state's frontier economy. California offered a broad spectrum of get-rich-quick schemes, and many investors chose the chance of substantial immediate profits--as in mining--over the expectation of "steady," but unspectacular, long-term returns. Canal construction projects faced formidable obstacles ranging from California's uncertain water laws to the state's sparse agricultural population, and few companies were willing to launch such ventures solely on the anticipated revenue from water sales. Most ditch companies sold land they, or allied land companies, owned adjoining canals for a handsome profit. In theory, the smaller the tracts, the greater the potential for gain--which helps explain the increasing popularity of irrigation colonies in the 1870s and after. The largest of these companies sought land grants from the state or nation, not just to provide "security" to wary investors, but also because block grants offered opportunities for larger projects.

Private irrigation companies enjoyed only limited success during this period, and the largest projects inevitably failed. Those companies which succeeded in delivering water to farmers frequently did so at the price of creating unpopular land and water monopolies. Once the private systems were in operation, farmers often complained about high rates and poor service. Consequently, in southern California and parts of the San Joaquin Valley, some farmers--occasionally with the encouragement of private canal companies--experimented with a second institutional device, the "mutual" water company. These companies were owned and operated by the farmers themselves, and the amount of water each farmer received as well as his influence over irrigation policies, depended on the number of shares of company "stock" owned. This arrangement provided a high degree of community control, but failed to provide a mechanism to raise large sums of money. Mutual water companies were usually found in regions where most of the irrigated land adjoined reliable water sources.

The economic turmoil of the 1870s helped popularize two other institutional alternatives. Some crusaders for irrigation came to favor a centralized canal system built and operated by the state. They argued that only the state could create a unified, coordinated irrigation

network which would serve the greatest number of farmers at the lowest cost. However, as noted, in the 1870s California's government did not inspire public confidence or trust, and by 1877 the irrigation district seemed to have won out over the other three contenders. Districts promised to combine local control with an effective tool to raise money for massive irrigation works.

The development of irrigation owed much to the mining industry. The principle upon which irrigation was based--moving water from water rich to water deficient areas--was perfected by miners. During the 1850s, newspapers often complained about water shortages and the need for a steady year-round supply. The Sacramento Daily Union noted in 1854 that "[t]he day is not far distant that will see nearly the entire body of water running from the Sierra Nevada diverted from its natural channels, and carried in canals and ditches over hills and through valleys to points where it is needed to assist the miner in extracting the gold from auriferous soil in which it is now so safely embedded."¹ The same ingenuity which drove men to move mountains in their quest for precious metals had, by 1867, helped construct over 300 ditch systems covering nearly 6,000 miles in mountainous counties from Siskiyou to Tulare. By the 1880s, U.S. Army engineers estimated that over \$100,000,000 had been invested in these artificial channels.²

The mining industry's positive contributions to California agriculture are easy to overlook. Nineteenth century critics of mining claimed that it choked rich valley farmland with silt and debris washed down from the foothills; contributed to the speculative spirit which fueled the wheat "mania"; and promoted inadequate, short-sighted water laws. Yet mining also spurred technological development. Many of California's pioneer engineers learned their trade in the mining camps. The skills they acquired from that experience--for example, techniques to construct flumes, pipelines, and pumps--often could be applied to other engineering jobs, including the design and construction of irrigation works or municipal water supply systems. Similarly, foundries and shops originally devised to construct mining tools were easily adapted to the construction of agricultural and industrial machinery.

Ironically, the two most tangible legacies of the mining industry--its reservoirs and canals--proved of less value. By the 1870s, miners stored over 150,000 acre feet of water. In Nevada County, the center of hydraulic mining, North Bloomfield's system alone impounded over 23,000 acre-feet of water, most of it in Bowman Lake. However, by the mid-1880s, the industry was moribund, and the crusade to "store the floods" did not blossom until the late

1890s and early years of the 20th century. By that time, brush, log, and earth fill dams popular in the 1870s, had given way to much larger and more substantial concrete structures. So while the state's first dams were often used by irrigation districts and hydroelectric power companies, the methods and materials used to build them were largely outmoded by the 20th century. The canals were somewhat more useful. In 1880, the state engineer reported that about 9,000 acres of land in the foothills was irrigated from mining ditches, most near Auburn and Placerville. Yet this constituted no more than one or two percent of the total acreage irrigated in California in that year. Even after the courts outlawed hydraulic mining in 1884, irrigation in the foothills lagged behind the rate of growth in southern California and the Central Valley.³

Most of the large corporate irrigation schemes launched during the 1850s and 1860s failed, but some individuals and groups enjoyed limited success. In southern California, Mormons bought up part of the vast Lugo ranch within the Mormon Corridor in 1851, and by 1855 irrigated over 4,000 acres in present-day San Bernardino County. Two years later, German settlers founded the state's first "irrigation colony" at Anaheim. Fifty settlers purchased twenty acre tracts at \$2 an acre and laid out vineyards. Later citrus colonies at Riverside, Redlands, Pasadena, and Pomona learned much from this early lesson in intensive agriculture.⁴ In the San Joaquin Valley, irrigation began in the driest section at the south end of the valley and gradually spread north. In 1851, E.F. Beale built a canal to serve his El Tejon ranch and by 1853 irrigated 1,900 acres of wheat. The first Kern River ditches were opened in 1858, and by 1873 six major canals served 5,000 acres. Apparently, the Kings River was not utilized for irrigation until 1866. In the Sacramento Valley, James Moore tapped into Yolo County's Cache Creek in 1856, and by 1872, 15,000 acres were under irrigation in that county.⁵

Nevertheless, these limited accomplishments paled into insignificance compared with the ambitious dreams of a handful of promoters and speculators. Unable to secure clear title to large blocks of prime agricultural land in southern California and the coastal valleys, these men turned their attention to the Central Valley and Colorado Desert. The earliest scheme, approved by the California Legislature on April 11, 1857, pertained to the southern San Joaquin Valley. The law allowed the Tulare Land and Canal Company to build a 34 mile canal linking Tulare Lake with the San Joaquin River via the Kings River Slough. In exchange for its promised work, the company received the odd-numbered sections of state swamp and overflow land adjoining the canal, along with swamp land bordering Tulare, Buena Vista, and

Kern lakes. Construction had to begin within a year and finish within five years, on pain of forfeiting the franchise. In addition, the company received the right to charge tolls from boats passing through the canal, though control over the canal would pass to the state after twenty years.⁶

The proposed canal was expected to accomplish three purposes. The company claimed that Tulare Lake was at least 35 feet higher than the San Joaquin River, and promised that the canal would drain a large part of that lake as well as Buena Vista and Kern lakes, which fed into the larger lake from the south end of the valley. Project boosters predicted that as much as 500,000 to 700,000 acres of reclaimed alluvial soil would become available to new settlers. In addition, the canal would serve as a transportation artery linking the southern San Joaquin with Stockton and the San Francisco Bay region. Crops, cattle, and hogs would find easy access to the markets of northern California, and the cost of transporting goods into the southern valley would be dramatically reduced. No longer would most of the San Joaquin Valley be an isolated desert. Finally, though the canal's main purposes were drainage and transportation, it would also provide water to irrigate thousands of parched acres of land along its route. Early in the fall of 1857, one of the scheme's most ardent supporters, the Stockton Argus, confidently predicted: "The opening of this canal will direct the trade of that whole valley to Stockton."⁷

The Tulare Land and Canal Company took advantage of a swamp land bill passed by the California Legislature in April, 1855. In September, 1850, the federal government had promised to deed all the swamp and overflowed land within each state's borders to the state on condition that the money received from their sale be used to build levees and drainage systems to aid in reclaiming the land. The act was passed to assist states along the lower Mississippi River where flooding was a year-around problem. In the arid West, most "swamp" land was under water no more than a few weeks a year. The law provided that only those lands designated as "swamp and unfit for cultivation" on federal land office maps would be turned over to the states.⁸ However, in the new state of California government surveyors of the public domain moved painfully slow, at least from the perspective of land speculators--who fully appreciated the value of land adjoining the state's major rivers. California's officials repeatedly appealed to Washington to speed up the surveys, but to no avail; the state did not receive patents for the land until the 1860s by which time most of the land was already in private ownership. Consequently, in 1855 the legislature took the law into

its own hands. It asked the county surveyors-general to informally designate the flood land within their counties, and allowed individuals to buy these lands at \$1 an acre if they could secure two affidavits swearing that the land was flooded. To prevent speculation, especially in "urban" real estate, the legislature prohibited the sale of swamp lands within ten miles of San Francisco, five miles of Sacramento, Stockton and Oakland, and one mile of the Sacramento River. Still, the law was an open invitation to fraud, and the Tulare Land and Canal Company milked the inviting opportunity for all it was worth.⁹

The company quickly began to sell its swamp land to settlers for \$1 an acre. In December, 1857, company spokesman wrote to the Stockton Argus recounting a recent trip to Tulare Lake during which he claimed to have been lost in the tules for a week. He also claimed that work had begun on the aqueduct, promising that its width and depth would rival the Erie Canal. Settlers, he noted, had begun to stream into the valley:

Already is this work drawing into that valley a large immigration, principally from the Coast Range, driven from their former homes by Spanish grants, and drawn there by the fertile soil and prospects of the speedy completion of the canal for irrigating and commercial purposes. The lands thus opened to market are sold by our State for unreclaimed lands under the law of 1855. Large locations are being made there. The Company making the canal receives pay for its labor in lands upon its border, and, of course, their price of lands is governed by that of the State.

The company agent reported that many newcomers were working on the canal in exchange for land. By spring he expected that over 200,000 acres would be reclaimed.¹⁰

Nevertheless, intense public criticism of the project surfaced in the opening months of 1858. The San Jose Tribune labelled the scheme a "barefaced land stealing operation" and "an intense humbug and swindle." It charged that the company had done no work on the canal and even owed a blacksmith \$150 for the plow designed to "dig" the ditch. The newspaper also questioned the company's plan to dig a furrow then use the flow of water itself to carve out most of the ditch. Such a canal could not float boats of 80 ton burden, as the act of 1857 required. Finally, the editorial charged that the company had claimed vast tracts of land which were not flooded, and did not require reclamation. The Tribune called for a legislative inquiry. The Stockton Weekly Democrat described the project's promoters, W.F. Montgomery and Associates of San Francisco, as "a party of seedy, hungry, broken down schemers." It pointed out that since the swamp land grant had not been fully surveyed by the state, the company, in effect, exercised a virtual monopoly over settlement in most of the southern San Joaquin Valley. Both newspapers, along with the powerful Sacramento Daily Union, asked the state to rescind the grant.¹¹

The California Senate's Swamp and Overflowed Land Committee investigated the scheme in January, 1858, and issued a report on February 2, 1858. Though the company claimed to have invested \$40,000 to \$50,000 in the project, its only work consisted of a furrow several miles long. Theoretically, by beginning work on the canal within one year, the company had lived up to its part of the bargain. But the legislature, convinced that the company would never finish the canal, annuled the grant in the middle of April. Even so, the company continued to sell swamp land and sued the state for breach of contract. A year later the Union editorialized: "The fact appears to be that the Company [has] disposed of large tracts of its land to speculators in San Francisco and elsewhere, and these parties are in nowise disposed to abandon the field without a struggle."¹²

In 1860, the California Supreme Court upheld the company, and the legislature reenacted its franchise in 1862. Meanwhile, a new group had taken over the rights of W.F. Montgomery and Associates. The question of what constituted "swamp and overflowed" land remained a hot state-federal issue until 1866, when the national government confirmed titles to swamp land already sold or granted by the State. Many of the patents covered land which flooded only under very unusual circumstances, such as during the great flood of 1862. Despite the federal requirement that revenue from the sale of such lands be used exclusively for reclamation, the state used the money for many other purposes. It paid for the survey and segregation of flood land, as well as the salaries of a state board of swamp land commissioners created by the legislature on May 13, 1861. Many members of the legislature also wanted to "borrow" money from the swamp land fund to pay general state expenses. Hence, the state had a strong incentive to restore the Tulare Land and Canal Company's franchise. The more federal land it could sell, the greater the return to the state.¹³

However, in 1863 Tulare Lake was discovered to be lower than the San Joaquin River, and the canal scheme was dropped. Without an adequate lock system, the canal might have flooded more land than it reclaimed. But the land grant was continued even after the lawmakers absolved the company of the responsibility of building a canal. Apparently, some individual landowners had purchased actual flood land from the company or state and had made an honest effort to reclaim their tracts. When state officials inspected the region in 1865 or 1866--at the end of the drought of the middle-1860s--they overestimated the amount of work which had been done. In any case, in 1867 the governor approved titles to 89,120 acres of land in the southern San Joaquin Valley. The courts annuled the company's original grant in 1878, but by that time much of the land had already changed hands and the

legislature subsequently reconfirmed the titles of all landowners who could show that they had spent \$1 an acre or more to reclaim their land. In the end, the Tulare Land and Canal Company did little either to reclaim actual flood land or promote irrigation.¹⁴

The legislature considered a second major irrigation scheme in 1859. Oliver Wozencroft had first crossed the Colorado Desert--now known by the far more pleasant name "Imperial Valley"--on his way to the gold fields in 1849. A Louisiana-born doctor, Wozencroft helped draft the first state constitution in 1850, and later in that year was appointed to a commission to negotiate reservation treaties with California Indian tribes. The U.S. Senate rejected the treaties, but by the middle 1850s Wozencroft had become an important civic leader in San Francisco. He lobbied for a wagon road to California from Fort Kearny via South Pass, and became chairman of the California Emigrant Road Committee. The group clamored for better transportation and mail service.¹⁵

Wozencroft's support for a stage route linking northern California with the East went unrewarded. However, in September, 1858, the Butterfield Overland Mail Company began carrying passengers and mail semi-weekly from St. Louis to San Francisco over the "ox-bow route" through Arkansas, Oklahoma, Texas, New Mexico, and Arizona. The most dangerous and uncomfortable part of the trip was from Yuma on the California-Arizona border to Los Angeles. In order to stay close to water and avoid the intense heat of the Colorado Desert, the stages travelled a circuitous 180 miles through northern Mexico before swinging north along the Laguna, Vallecito, and Santa Rosa mountains, thence through San Geronimo Pass into the Los Angeles Basin.

Wozencroft knew that a trail straight through the desert would save time and eliminate the encroachment on Mexican soil. But there was no water for 80 miles west of Fort Yuma. He also recognized--with help from an associate, the San Diego County surveyor--that the Colorado Desert could be easily reclaimed. Desert land along the Colorado River produced exceptional crops, and the future "Imperial Valley" was much lower than the level of the Colorado River, which had once emptied into the valley. Hence, water could be diverted or "drained" into the desert through one of the river's overflow channels which entered the valley through Mexico; vast and shifting sand dunes separated the valley from the river north of the international border.¹⁶

On April 12, 1859, the California legislature asked Congress to deed the entire Colorado Desert to the state, explaining that the "...country herein described is known to be a desert waste, devoid of water, and vegetation, owing to which it presents a great barrier

to travel, and transportation, on the most approved route of land communication between the Atlantic and Pacific." The lawmakers proposed that a series of canals would provide water for travellers, and "...cause the desert to yield to the wants of man her latent, reserved, and hidden stores." Since the desert had flooded in the past, the legislature suggested that a land grant would be in keeping with the federal swamp land law of 1850.¹⁷ On April 15, 1859, the legislature declared that once the state had received title to the land, it would be ready to transfer ownership to Oliver Wozencroft and his associates. However, ownership could not change hands until a special commission, to consist of state and county officials, had inspected the finished canals and ditches.¹⁸

Perhaps because of the Civil War, Congress did not consider the state's request until May 1862. By that time the Commissioner of Public Lands had raised many objections to the project, which was embodied in House Bill #417. The land office complained that no detailed construction plans, or even estimates of construction costs, had been submitted to Congress; nor had the federal government investigated the project's feasibility. The Commissioner described the desert land as "third rate," and warned that the grant might include mountains containing valuable mineral deposits. For this reason, the House Committee on Public Lands had reduced the size of the grant from the 6,500,000 acres requested by California to 3,000,000 acres. However, the committee rejected the Commissioner's suggestion that a grant of alternate sections would be adequate on grounds that such a grant might prevent Wozencroft and his associates from securing clear rights-of-way for their canals. Two Congressional reports had been prepared containing eye-witness descriptions of the desert and transportation problems in southern California. These reports emphasized that the land would remain totally worthless without reclamation. Nevertheless, the bill was tabled and the scheme never again received serious attention from Congress.¹⁹

Nor was Congress's lack of interest surprising. Many Northern Congressmen had opposed the ox-bow route, and the outbreak of war offered a perfect excuse to shift the Butterfield Overland from the southwest to the old Oregon Trail--which was done in 1861. Moreover, many northern Californians had opposed the southern route because they feared Los Angeles would be built up at the expense of San Francisco and Sacramento. When President Lincoln signed the Pacific Railroad Act on July, 1862, guaranteeing that the first "transcontinental" would also follow the central route, the dream of a wagon road through the Colorado Desert became anachronistic. The shift to the central route eliminated the need for "way stations" in the desert, and cut-off a steady stream of overland stage passengers into southern California, some of whom might well have helped settle the reclaimed desert.²⁰

In the 1870s, new promoters, including California's premier land speculator, William S. Chapman, suggested reclaiming the Colorado Desert by permanently altering its climate. Instead of relying exclusively on irrigation canals, these men hoped that flooding the valley would stimulate rainfall. However, their fanciful scheme attracted little interest from state officials or potential settlers. The desert would not be spanned until the Southern Pacific completed its line to Yuma in 1877, and the Imperial Valley was not opened to large-scale farming until the early 20th century.²¹ Nevertheless, Wozencroft's project underscored an important truth about early irrigation in California. Ambitious projects could only be undertaken where land could be acquired in huge blocks. But, as the experience of the Tulare Land and Canal Company in the San Joaquin Valley also demonstrated, most substantial tracts of public land were far removed from major markets and centers of settlement. These regions would be developed only after the railroad provided a reliable means of transportation and a pool of potential settlers. Unfortunately, by that time California's inadequate water laws would do as much to impede the development of irrigation as inadequate transportation had in the 1850s and 1860s.

In the middle and late 1860s, the spectre of drought haunted the dreams of California boosters. The great drought of 1864 has long been recognized as having killed off the range cattle industry in southern California, paving the way for the subdivision of large ranchos and the eventual appearance of citrus farming. In March, 1864, the Sacramento Daily Union recounted the visit of an officer in the First Cavalry, California Volunteers, to Los Angeles:

He says that being one of a hunting party a fortnight ago, in a walk of five or six miles from the city of Los Angeles, he counted, on the bottoms of creeks and small streams, as many as eight hundred dead cattle which had perished from starvation. The entire grazing country is as clear of vegetation as a desert, and as dusty as a traveled throughfare in midsummer. One rancher who was a year ago the owner of a great many cattle, has had for six weeks past, all the men he could find willing to hire, employed in skinning his dead cattle, and still he finds himself unable to keep up with the rapid mortality in his herd.²²

When Governor Frederick F. Low addressed the California Legislature in December 1865, he noted that the drought had demonstrated "...the necessity of providing a general system of irrigation for our noble expanse of valley land. We should foster by every means in our power the growing disposition on the part of our farmers to cultivate a less number of acres with a greater variety of crops..."²³

California's early governors paid scant attention to the state's water problems, and Low was probably the first to express an active interest in irrigation. But a few state officials recognized the need for planning even during the 1850s. An 1850 statute charged

the new state surveyor-general with many important responsibilities. He was required to provide the legislature with "plans and suggestions" for improving river navigation as well as for "...the draining of marshes, prevention of overflows and the irrigation of arable lands by means of reservoirs, canals, artesian wells or otherwise...." The surveyors-general frequently lacked the skills and interest, and always lacked the money, to carry out their mission. However, in his 1856 report, John A. Brewster recommended a state water system. Brewster was one of the first Californians to recognize that irrigation, flood control, and "swamp" land reclamation were closely related. Reservoirs could be used to store the annual spring floods for irrigation and mining; California abounded with suitable reservoir sites. Similarly, dykes and by-pass channels could be used both to prevent flooding in the Central Valley and reclaim overflowed land. He concluded: "A system of reclamation similar to the one proposed, or in fact any other should not be left to individuals or counties, but be general for the whole State where required and under the care of a state officer. Now is the proper time for a determination of the State policy in regard to this matter, and when a proper system is once adopted, all direct legislation thereupon should be in accordance with it." Brewster offered to prepare a comprehensive water plan for the governor or legislature, but received no encouragement in Sacramento. The state geologist also acknowledged the need for irrigation in his reports for 1854 and 1855.²⁴

The first objection usually raised against state action was economic--California's limited government revenue did not permit an active role in water resource development. In 1854, two successful artesian wells drilled near San Jose suggested that underground sources might provide an abundant water supply for farmers as well as miners. Test wells were sunk in the Los Angeles basin as well as the Santa Clara Valley. In 1856, the legislature considered "An Act to Encourage Agricultural and Mining Interests of the State" which would have created a special state commission to investigate the potential of artesian wells. The bill promised \$20,000 to pay for drilling test holes, and the assembly referred the legislation to a special committee for evaluation. The committee concluded that "[w]ith water for the purposes of irrigation, the plains referred to [the Central Valley and the coastal plains of southern California] are capable of sustaining a vast number of inhabitants ...This done by the State at large, opens the field for private enterprise, and there can be no doubt that monied power thereafter will seek the wants of the people." Nevertheless, both the committee and the legislature as a whole considered the \$20,000 appropriation excessive and no action was taken.²⁵

The state could, and did, seek federal aid. Following the 1864 drought, the California State Board of Agriculture commented:

This work is of sufficient magnitude and will be of sufficient benefit, in our opinion to justify the General Government in donating her entire interest in this land to the State for the purposes of its accomplishment. Why should not these vast plains, lying back from our great rivers, almost valueless without such improvements, be as justly and properly the subject of redemption by Government land aid, as the lesser extent of tule or swamp lands bordering immediately on their banks? If the policy is good, and it certainly is, in the one case, than why not in the other?²⁶

In the fall of 1865, John Bidwell, the Congressman from northern California, promised to introduce a bill in Congress granting California's arid public lands to the state. His justification was not just economic. True, the state needed a source of revenue to promote irrigation, and the arid land would never be worth anything to the nation without reclamation anyway. But Bidwell also believed that all "...canals for irrigation should be made upon a system, so as to harmonize with the reclamation of swamp and tule lands, and equalize the distribution of water for the benefit of all." Such a system implied coordinated state supervision, if not direct state construction and operation, of new waterworks.²⁷

Apparently, Bidwell never introduced the bill, and if he did it made no headway. But the drought did spawn a third major irrigation scheme, this one designed to reclaim land in the Sacramento Valley. Will S. Green, who sponsored the project, was destined to become a prominent leader in the irrigation crusade during the 1880s and 1890s. Born in Kentucky, Green emigrated to California in 1849 at the age of 16. For a few months he piloted the first steam ferry across the Carquinez Straits at the north end of San Francisco Bay, and he was also awarded an early government contract to deliver mail in Sonoma and Napa counties. He moved to Colusa County in July, 1850, and helped establish the city of Colusa on the Sacramento River. There he improved his skills as a self-taught engineer, and in 1863 established the Colusa Sun, a weekly newspaper which he owned and edited until his death in 1905. He served as Colusa County's surveyor from 1857 to 1867, and also spent one term in the California legislature during the middle 1860s. Though Green owned thousands of acres of land between the Sacramento River and Butte Creek, his attempts at farming were unsuccessful because of frequent droughts and heavy flooding.²⁸

Not surprisingly, Green's newspaper ran frequent editorials on the need for irrigation. In April, 1864, he commented: "Farming must be made a certainty, or else we had as well quit it. We cannot compete with other States and other countries if we must lose an entire crop every few years." And in December he noted: "We of the Sacramento Valley have been particularly unfortunate... having had as many as four [crop] failures in thirteen years,

and four short crops." Green drummed home an important truth. Though the Sacramento Valley usually received more rainfall than southern California, it has no less susceptible to the ravages of drought. The amount of rainfall mattered less than when it fell, and farmers in the Sacramento Valley--as elsewhere in the state--could only hope that the rain fell relatively evenly during the winter growing season.²⁹

In the fall of 1864, County-Surveyor Green and a business associate, C.D. Semple, called several public meetings in Colusa to discuss a scheme to irrigate 20,000 acres in the Sacramento Valley. They planned to dig two canals tapping into the Sacramento River near the mouth of Stony Creek, roughly 40 miles up-river from Colusa. The first canal would follow the high west bank of the river for an undisclosed distance; the other would skirt the Coast Range until it emptied into Putah Creek, about 100 miles south in Yolo County. Green suggested that the state could afford to spend \$100,000 on the project, and the counties of Yolo, Colusa and Solano could also help subsidize the work by buying stock in the canal company. Each county could expect a rapid increase in tax revenue once irrigation became available. But the most novel feature of Green's plan involved the obligation of the farmers served by the canal. He proposed that each landowner mortgage his land to the Colusa, Yolo and Solano Canal Company in exchange for shares of stock. The greater the amount of land mortgaged, the greater the investment--and, in turn, control over company policies. The company would issue interest bearing bonds to pay for construction, holding the land as collateral. Water sales would provide a sinking fund to pay off the bonds. Green repeatedly emphasized that the drought of 1864 had cost much more in crop losses than the anticipated \$800,000 cost of the main canal. But his primary inducement was in keeping with the speculative nature of wheat farming during the 1860s. Noting that land along the river usually sold for no more than \$6 an acre, and land away from the river about \$3 an acre, Green promised: "These lands, after the canal is completed, will be worth twenty dollars per acre, so that the money lended would have an immense margin in addition to the canal itself, which will probably be the most profitable as well as the most secure stock in the State of California."³⁰

The Colusa, Yolo and Solano Canal Company won little public support. Many farmers favored irrigation, but few were willing to pay for it. Moreover, heavy rains fell in the Sacramento Valley in November, 1864, ending the drought. The promise of a bumper harvest in 1865 effaced the bitter memory of stunted crops. Throughout the arid West during the last third of the 19th century, support for irrigation usually grew out of immediate water

shortages, not a desire for comprehensive water resource planning or scientific farming. Particularly during the 1860s, California farming was nearly as speculative as mining. Few farmers were willing to commit themselves to agriculture as a long-term investment. Consequently, when Green appealed for public subscriptions of \$5 to \$10 per landowner to pay the cost of surveying a canal, his request fell on deaf ears. He paid the cost out of his own pocket. The lack of public support persuaded Green to scale-down his project. The canal surveyed was only 7.5 miles long. Nevertheless, the company's promoters promised it would irrigate 80,000 acres of Colusa County's best farmland.³²

When the California legislature met in 1866, Green had a bill ready. He now proposed a 120 mile canal from the Colusa-Tehama County line to Cache Creek Slough in Solano County. Such a canal would not interfere with irrigation from Putah Creek to the south of Cache Creek. The canal would be 100 feet wide and five to six feet deep, capable of carrying barges laden with wheat, barley and other bulky crops, and able to irrigate "at least" 600,000 acres of land. Most of this land could not be farmed without irrigation. Green promised that the canal would increase the annual tax revenue of Colusa, Yolo, and Solano counties by \$5,000,000 to \$6,000,000. It would also serve as an "overflow channel" when the Sacramento River reached flood stage, aiding in swamp land reclamation and helping protect the vulnerable communities scattered along the river. The bill asked for \$8,000 to survey the canal, but the Senate's Committee on Agriculture assured the governor and legislature that foreign investors stood ready to pay the cost of construction. Moreover, the appropriation would not have to be paid until state officials, including the surveyor-general, had approved the plans. With these assurances, the bill passed. It represented the first direct monetary support the State of California provided to encourage irrigation.³³

The survey was conducted by William H. Bryan, an engineer appointed by the governor. Generally, Bryan's report was favorable: "I can speak with confidence of the adequacy of the plans proposed for the object in view, provided the execution of them is placed in the hands of persons experienced in the building and management of canals, and are properly supervised during their construction." He predicted that the canal would cost \$11,381,068, and irrigate 750,000 acres. Since the irrigated land would support an average of one person per acre, the Sacramento Valley's population would increase many fold. The engineer opposed beginning the canal at the Colusa-Tehama line because most arable land in that part of the valley was too far above the river level. But he claimed \$8,000 was insufficient to survey another route. The report's most pessimistic conclusion concerned the canal's potential

for shipping. Bryan considered irrigation and transportation incompatible because transportation interests required a channel with little current while farmers needed a fairly strong flow.³⁴

Ironically, the attempt to combine irrigation and transportation helped kill the scheme. Dual purpose canals cost much more to build, and critics balked at the potential transportation monopoly which the Colusa, Yolo, and Solano Canal Company would enjoy--the Southern Pacific would not complete its line through the Sacramento Valley until the mid 1880s. The biggest problem facing the company was finding a reliable source of income. The valley's population was thin and scattered, and in wet years farmers could not be expected to use the canal for irrigation. Hence, tolls and land sales offered the most reliable revenue. Moreover, the federal government was more likely to grant land for a multiple-purpose project than for one devoted entirely to irrigation. In the 1860s, Green served on a state commission appointed to draft a flood control plan for the Sacramento Valley. The group endorsed the Green canal scheme's value as an "overflow channel," but nothing came of the recommendation. By the beginning of the 1870s, much of the valley's public land had been taken up by wheat farmers. As noted in Chapter I, from 1866 to 1872 the acreage planted to wheat in California more than tripled. Theoretically, this increased the need for irrigation, but it also broke up the virgin tracts of government land coveted by the canal company. Moreover, the company faced increasing competition from rival groups. For example, by the early 1870s the Clear Lake Water Works Company had begun to irrigate land adjoining Cache Creek in the Capay Valley. The company hoped to win control over Clear Lake, at the head of the stream, and anticipated that this reservoir could irrigate as many as 400,000 acres in the Sacramento Valley.³⁵

Nevertheless, at the dawn of the 1870s, a variety of circumstances promoted new interest in irrigation. Much of the virgin land first cultivated by wheat farmers in the late 1860s and early 1870s was more susceptible to drought, as on the west side of the San Joaquin Valley. Moreover, soil exhaustion had reduced crop yields on many of the wheat ranches farmed since the 1850s and early 1860s. Since irrigation was frequently touted as a "fertilizer," some farmers hoped it could restore the vitality of their land. Then, too, as the number of farmers entering the San Joaquin Valley increased during the 1870s, the power of stock-growers--who opposed irrigation and agriculture for many reasons--began to ebb. For example, the successful battle to force the livestock interests to accept responsibility for damage to crops served as a barometer of the increasing political power of farmers in Sacramento. Sacramento's Daily Bee commented in 1873: "Settlers in the Tulare Valley region

have multiplied to such an extent as to wage determined war upon the stock-growing interest. They are declaring in favor of a no-fence law for that county, and will make this question an issue in the coming election. The prospects are that the stocklords will be driven to the wall."³⁶

Even more important, a severe drought hit California again in the late 1860s. In October, 1871, the San Francisco Bulletin noted that two-thirds of California's grazing land was barren and that many cattle and sheep had been driven into Nevada to find forage. In the following month the newspaper ominously reported:

We have clear evidence that over an area of country on the west side of the San Joaquin Valley, 60 miles long and 10 broad, the crops have been an entire failure for two years. Great destitution prevails in this district. The calamity did not happen in an hour, but has been coming on slowly for two years. The pinch is now very great. Most of these settlers have been unable to pay for their land, and while they cannot mortgage land to which they have no clear title, as a basis of credit...We judge from the data at hand, that not less than 2,500 people in this valley are so destitute that they cannot procure seed for sowing their fields."³⁷

The Alta California noted that irrigation offered an unfailing alternative to drought. It estimated that twice the water needed to irrigate the entire Central Valley flowed untapped into San Francisco Bay from the Sacramento and San Joaquin rivers. Until a system of reservoirs and canals put that water to use, drought would discourage agriculture as it slowed migration into the state. "Such canals would cost much money, but not one-tenth as much as the years of drought cost us, directly and indirectly."³⁸

The newspaper's advice did not go unheeded. In June, 1870, the Sacramento Union described canal projects as the "coming California epidemic," noting that "...there are no less than ten bills before Congress now, asking aid in Government lands to build canals in this State. Ten sections to the mile of canal is the figure named in most of them." In the following year, the Calaveras and San Joaquin Water Company proposed building a 40 foot wide canal from the Mokulumne River near Camanche to Bear Creek in San Joaquin County and from that point on to the Calaveras River and Stockton. The company hoped to irrigate 350,000 acres of land. Merced County was particularly favored by new projects. Work on the Merced Irrigation Canal began in February, 1871, and promoters planned a 50 foot wide canal connecting the mouth of the Merced River to Bear Creek, from which point water would be carried, through canals and creeks, to the Merced River. The Merced and San Joaquin Irrigating Company planned to use water from those two rivers and carry it through the west side of the San Joaquin Valley to Antioch. And Moses J. Church, often called the "father" of irrigation in the valley, appropriated a large share of the Kings River in 1870, established

the Fresno Canal and Irrigation Company, and began to serve land near that town in 1872. These were but a few of the projects under consideration during the early 1870s. Most were speculative and ephemeral, but by 1880 private irrigation companies had spent \$400,000 on irrigation south of the Kings River alone.³⁹ Virtually all of these schemes built on the prospect of huge profits from land sales, not on revenue anticipated from water sales.⁴⁰

The most ambitious and controversial project was launched in 1866 by San Francisco capitalist John Bensley. During his career, Bensley promoted a variety of business ventures ranging from lead, iron and coal mines to the California Steam Navigation Company. But he became particularly interested in water resource development. He organized San Francisco's first water company in 1857, and that company provided most of the city's water until 1865. On a trip to Chile, Bensley witnessed irrigated fields of grain and alfalfa, which prompted him to claim a large part of the San Joaquin River and organize the San Joaquin and Kings River Canal Company on March 7, 1866.⁴¹

At the time, rail transportation into the San Joaquin Valley was six or seven years in the future, and the valley mainly served grazing herds of cattle, sheep and horses as well as native herds of elk and antelope. The region's backwardness can be seen in a traveller's droll description of Fresno in 1866: "This city (God save the mark!) is situated on a slough of the San Joaquin, and some wags will gravely tell you it is the head of navigation, and destined at not distant period to become a 'great place.' The 'city' comprises two houses--one a hotel, where there is also a store, and the other I think [is] now uninhabited. Fresno County's population in 1866 numbered only 3,000 people and Millerton, the county seat, had less than 200 residents. The county's taxable property was worth only \$1,000,000, and only 4,500 acres were under cultivation. Kern County to the south, carved out of parts of Los Angeles and Tulare counties in 1866, contained only, 3,500 residents; and while it covered nearly 1,500,000 acres, only 15,000 had been opened to agriculture. Tulare County contained only 6,000 inhabitants in 1866, one thousand of whom lived in Visalia, the county seat."⁴²

Not surprisingly, Bensley's scheme to build a huge irrigation canal through the San Joaquin Valley was considered visionary by potential investors. After failing to win financial help in San Francisco, he travelled to New York in 1867-1868 but found no greater success in the financial marts of the East. Though his company began a canal in 1868, only the drought and the expanding Southern Pacific line into the valley kindled interest in the scheme. Early in 1871, Bensley won the financial help of William Ralston. Ralston, a

founder and soon to be president of the Bank of California, cut a wide swath in California's financial and political circles. He had worked closely with Bensley in the California Steam Navigation Company and various San Francisco water projects.⁴³

The San Joaquin and Kings River Canal Company was reorganized in May, 1871. The crew of prominent investors included Ralston and Bensley, William S. Chapman, Isaac Friedlander (the "wheat king"), Nicholas Luning and A.J. Pope (two directors of the Bank of California), and Lloyd Tevis (president of Wells Fargo Company). Because the canal would cross part of the vast estate owned by Henry Miller and Charles Lux, the two cattlemen received stock in the company in exchange for their support. The proposed canal would skirt the Coast Range 230 miles stretching from Buena Vista Lake at the bottom of the valley to Antioch on the upper arm of San Francisco Bay. A series of eight major lateral canals would criss-cross the valley linking the main canal with the San Joaquin River and other Sierra Nevada streams. The canals would provide transportation for grain and lumber-carrying barges, as well as irrigation.⁴⁴ The San Joaquin Republican commented that the project was so vast as to appear impractical, "...but when we read further and learn the names of the incorporators...we are reassured, and we lay down the paper with the idea dawning upon us that those men are capable of performing anything they undertake."⁴⁵

The promoters needed more than money to make their venture successful. The vast project overshadowed even the Erie Canal, and demanded an engineer of national or international reputation. The San Joaquin and Kings River Canal Company found such a figure in Robert Maitland Brereton. Brereton was born in England, but spent the early years of his career in India. In the late 1850s, he began work on the Indian Peninsula Railway connecting Bombay with Calcutta and Madras. His talents as a construction engineer won him almost immediate recognition in England. During more than a decade's stay in India, Brereton became well-acquainted with the massive British irrigation system then under construction. After the Bombay-Calcutta-Madras line was completed in March, 1870, the Indian government asked Brereton to visit the United States and report on American techniques of railroad construction. By this time, the engineer enjoyed such fame and social position that he won introductions to such American notables as Cornelius Vanderbilt, William B. Astor, Cyrus Field, James B. Eads, Jay Cooke--and William C. Ralston. In July, 1871, at a stopover in Victoria, British Columbia, Brereton received an urgent telegram from Ralston asking him to come to California and prepare comprehensive engineering plans for the canal project. Since several months remained before his scheduled return to India, Brereton agreed. Once in California, Ralston

used a high salary and gifts of company stock to persuade Brereton to assume the permanent position of chief engineer. Many years later, the Englishman would regret having abandoned a career which paid a \$12,000 yearly salary, and promised a \$5,000 annual retirement and a knighthood, for such a speculative scheme. He also turned down an offer to become Chief Engineer of Railroads in Japan in 1872.⁴⁶

Brereton quickly took charge of construction. He realized that a comprehensive, coordinated irrigation system for the San Joaquin Valley would take 50 years or more to complete, and that the works ought to be constructed in sections as increases in the population warranted. He noted that damage from the violent, dry north winds of May and June could be avoided if farmers planted a variety of wheat used in Sonora, Mexico, rather than types native to Chile or Australia. The Sonoran wheat matured a month earlier than the other varieties, but would not grow well without irrigation. The main canal ought to be built immediately because cheap transportation was the valley's greatest need, and public opposition to the railroad's transportation monopoly had reached fever pitch. Moreover, canal tolls would provide the company with a steady source of income until the anticipated population boom had increased demand for irrigation water.⁴⁷

Soon after returning to California in July, 1871, Brereton inspected the San Joaquin Valley and filed two engineering reports with the company. He had been asked to devise a plan to irrigate all the land from the Tejon Pass to Antioch. Brereton quickly realized that the valley's aridity, hot winds, and dusty soil corresponded to conditions in India, where irrigation had been enormously successful. Moreover, California, like India, contained an abundant water supply and plenty of potential storage sites. For example, three feet of water from the surface of Tulare Lake would irrigate 1,500,000 acres, and Brereton also proposed damming Kern and Buena Vista lakes as well as the Tulare and Kaweah rivers. Ultimately, virtually the entire water supply of the San Joaquin Valley would be harnessed, and nearly 1,000,000 acres of overflowed land would be reclaimed using an extensive levee system. Brereton recommended that the main canal should begin at Tulare Lake, rather than Buena Vista Lake. This would reduce the canal's length to 160 miles. The shorter ditch would cost \$2,600,000, and would carry sufficient water to irrigate a block of land six miles on either side of the route. The cost of construction per acre would average \$4.33. But if farmers paid \$1.25 per crop per acre, then once the land adjoining the canal had been settled, the company could expect a yearly return of \$800,000 from sales of irrigation water alone. Brereton estimated the project's total cost at \$14,350,000, but the expense would be spread

over many years. Irrigation works would cost \$7,660,000, and swamp land reclamation \$6,690,000. Ultimately, nearly 4,000,000 acres would be served by the company's irrigation works.

For all his optimism, Brereton recognized several potential dangers. The first 50 miles of canal would pass through the Miller-Lux estate, which contained 300,000 acres adjoining the proposed route. One day the two stockmen might use their riparian rights to claim all the water. Moreover, he warned that unless the company received free rights-of-way from the speculators who owned most of the valley, the appreciation of land values along the route would make the canal's cost prohibitive. The landowners would also have to offer small farmers inducements to lure them into the valley; the project depended much on their cooperation. Nevertheless, Brereton concluded his second report on a hopeful note: "With water, rich soils and heat combined, the productiveness of this country will be so great that the present wandering and never-settled population, who are in the San Joaquin Valley this year and next year in Oregon...will give place to settlers who will delight in making California their permanent abode. By carrying out gradually a sensible and practical system of irrigation and land reclamations, you insure California the possibility of its becoming most populous and richest state in the Union..."⁴⁶

Meanwhile, in July, 1871, work began in earnest on a stretch of canal between Firebaugh's Ferry on the Fresno Slough--near the great bend of the San Joaquin River--and Los Banos to the northwest near the foot of the Coast Range. This section was selected for several reasons. Since the west side of the valley had been particularly susceptible to drought, it was a fitting place to demonstrate the value of irrigation. Then, too, the Southern Pacific had already begun to build its line south from Antioch toward Fresno. The railway would run near the canal, carrying supplies as well as potential farmers. Los Banos was already strategically situated at the end of a 75 mile wagon road linking it to Gilroy on the other side of the Coast Range, and another S.P. line had just connected Gilroy with the San Francisco Bay region. Thus, until the Central Valley line reached Los Banos, men and equipment could be brought over the mountains. Finally, Miller and Lux had signed a contract with the canal company giving it the right of way to build through their land in exchange for the promise of sufficient water to irrigate 16,667 acres of pasture land in 1872, 33,334 in 1873, and 50,000 in 1874--at a price of \$1.25 per acre per crop. The company also leased 5,000 acres from the two men to serve as a demonstration farm, and promised to plant at least 25% of the land to alfalfa to demonstrate the value of that

crop as livestock feed. Miller promised to pay \$20,000 towards the cost of constructing the canal over a three year period, and allow the company to use his men and equipment on the excavation. By mid-August, 300 teams of horses and 400 men were employed digging an average two-thirds of a mile of canal per day. The ditch was 32 feet wide at the bottom, 42 feet wide at the top, and two feet deep. However, on either side, levees were piled four feet above ground level to achieve an overall depth of six feet. By the end of the year about 40 miles of ditch had been dug, and overnight the value of land near the canal increased from an average \$2.50 an acre to \$20-\$30. After finishing the canal to Antioch, the company planned to extend it south into the Kings River Basin.⁴⁹

Initially, the project won considerable newspaper support. In August, 1871, the Stockton Daily Independent claimed that "[p]robably no other enterprise now being prosecuted in this State provides more advantages than this work." In November, the Sacramento Daily Union applauded the venture as an opportunity to prevent the Southern Pacific from developing a transportation monopoly in the San Joaquin Valley. And in December, the California Mail Bag argued that California would never develop without irrigation and urged the state to loan its money or credit to aid the company.⁵⁰ But opinion began to shift in January, 1872. In that month William Ralston asked Governor Newton Booth to endorse the project publicly, but received a stiff refusal. Booth had ridden to power in 1871 on a wave of anti-monopoly sentiment, and maintained that farmers ought to build irrigation works on their own; he strongly opposed any subsidy to the company. But on January 23, 1872, California's Congressman Tompkins introduced a "memorial" asking Congress to grant the company the even numbered sections of government land extending out five miles on either side of the canal, along with an indemnity strip where land had already been taken up. The memorial noted that irrigation could not be profitable in a thinly settled region, and that a land grant would help win financial aid from European investors. The Union now bitterly assailed the company a collection of land and water "sharks." Speculators already controlled much of the state's best farmland, and the Union opposed any new land grants. "It is the will of nine-tenths of the voters of California that every acre of land left in the hands of the Federal Government here shall be religiously kept for the use and benefit of the actual settler and cultivator, and that the millions of acres already monopolized by one or two hundred land-grabbers shall be taxed out of their hands as soon as possible."⁵¹

Yet this effort was not just an exercise in greed; it reflected many of the San Joaquin and Kings River Canal and Irrigation Company's deep financial problems. The contract with

Miller and Lux refused to share the profits they reaped from the appreciation of land in the vicinity of the new canal. If speculators refused to share their new wealth with the company, how could it acquire its own land? Ralston and associates never issued detailed construction plans to the public, presumably partly to reduce speculation. However, the project promised to blanket the valley with an elaborate network of canals, and potential farmland anywhere in the valley became a better investment once the company began its work. Why should speculators sell to the company--especially if they owned land along the main canal, whose route had already been surveyed? For these reasons, a government land grant was perceived as a vital source of revenue. Since Congress seemed unreceptive, only one alternative was left. In the spring of 1872, Ralston asked Brereton to travel to England and use his social and financial connections, along with those of the Bank of California, to win the help of English investors.

When Brereton arrived in London, he found English investors reluctant to pour money into any western scheme. Many had lost heavily in mining ventures, and they spurned Brereton's offer to serve as their trustee and agent in California. C.J.F. Stuart, head of the Oriental Bank of London, had worked closely with William Ralston and the Bank of California in promoting earlier western enterprises. In August, 1872, he advised the California financier:

I think if you had a Committee of men in London, of known respectability & prudence who would take charge of such Companies as you desired to place here, and if the enterprizes were of a solid moderate character which would comment [sic] themselves to our investors; if above all the stock were partly taken in California and held on terms identical with that offered to English shareholders; I believe a vary large amount of such investments would be taken in London. As to the adventure which W. Brereton brought over, I have not yet gone closely into it, but the scheme has I believe the faults I have mentioned, so far at least that there are two classes of share-holders provided for. In this case it did not matter, as Mr. Brereton came at a bad time, when John Bull was suffering from a too credulous belief in Pyramids of Silver and the like, not to mention the Erie Railway and would not look at anything American--so that the San Joaquin Valley has not had a fair chance. This was not the fault of your Agent, and you must not blame him for a result which no man in England could alter.

Brereton tried to peddle company stock for \$7-\$8 a share when the same securities sold for only half that amount in San Francisco. Stuart warned that English investors were particularly wary of "watered" stock. However, Brereton did succeed in getting about a dozen potential investors to promise to visit California the following spring.⁵²

After Brereton returned to the United States, the canal company launched its first concerted effort to win federal support for the project. The engineer served ably as a Lobbyist in Washington during the 1872-1873 session, carrying the scheme to President Grant, Speaker of the House James G. Blaine, Generals W.T. Sherman, George G. McClellan and

W.S. Hancock, the California Congressional delegation, and Nevada's powerful Senator William Morris Stewart. On January 17, 1873, Senator Cornelius Cole of California introduced the company's bill in the Senate, and Representative Houghton launched the same bill in the House on February 10th. It promised canal rights-of-way through Kern, Tulare, Fresno, Merced, Stanislaus, San Joaquin, Contra Costa, and Alameda counties, along with two even numbered sections of public land per mile of main canal and an additional 100 acres per mile to pay for building reservoirs. The land was made subject to state taxation, and charges for irrigation, as well as transportation tolls, would be subject to state regulation. On Cole's request, the bill was sent to the Senate Committee on Public Lands. Since Senators Eugene Casserly of California and Stewart of Nevada sat on the committee, the legislation had powerful support. However, the committee refused to act without additional information. As Casserly reported at the end of February: "Much care has been taken by the committee to mature the bill and to provide the proper guards for the general interests. We desire, however, all the aids possible toward the best possible measure...before the next session of Congress."⁵³

On February 28, 1873--the day following Casserly's statement in the Senate--Stewart introduced a bill to provide for a federal irrigation survey in California. The legislation provided for a five-member commission including two representatives from the Corps of Engineers, one from the Coast Geodetic Survey, the Chief of the California Geologic Survey, and a "disinterested" engineer to "...make a full report to the President on the best system of irrigation for said [Sacramento and San Joaquin] valleys, with all necessary plans, details, engineering, statistical, and otherwise, which report the President shall transmit to Congress at its next session, with such recommendations as he shall think proper."⁵⁴ The bill prompted Senator Lyman Trumbull of Illinois to warn the Senate that "...if this survey is allowed...the time will come when you will be called upon for a very large appropriation to complete the work, if it should be recommended." Nevertheless, the bill passed, and President Grant signed it into law on March 3, 1873. Though many California newspapers failed to perceive the connection between the survey and Ralston's canal project, the link was obvious. For example, the first version of Stewart's bill limited the survey to the San Joaquin Valley; only at the suggestion of Senator Casserly did the Nevada Senator add the Sacramento Valley. Moreover, when the commission was formed, the head of the group, Army engineer B.S. Alexander, quickly offered the "consultant" post to Brereton, as if by prearrangement.⁵⁵

The "Alexander Commission," as it came to be called, was organized in May, 1873, and did most of its work in June, July and August, spending a scant six weeks in the field.⁵⁶ Because the survey's cost was limited to \$5,000, and because the commission members all held full-time jobs, the reconnaissance was hurried and superficial. Robert Brereton refused to sit on the commission, in part to maintain its impartiality, and in part because his salary as a commissioner would cut deeply into the already inadequate budget. However, he accompanied the group on its trips and provided its members with valuable information, including data acquired by the San Joaquin and Kings River Canal and Irrigation Company and information on irrigation in India and other nations surrounding the Mediterranean. As early as June, the Coast Geodetic Survey's representative, George Davidson, warned that "...the surveys & engineering works will require comprehensiveness, time, skill & larger amounts of money..." The Commission could not afford to test the soil or water, or prepare topographical maps.⁵⁷ While the survey was underway, the Stockton Daily Independent chided the commission: "A survey in a carriage or a railroad car would seem more like trifling with the matter instead of attaching the requisite importance to a great enterprise...We are under the impression that a survey sufficiently thorough to enable the commissioners to make an intelligent and comprehensive report to Congress, cannot be accomplished in less than two years."⁵⁸

Nevertheless, the commission's report published in 1874, contained much of value. It noted that "...all the irrigation that has been effected so far has, with one or two notable exceptions, been done with little or no system, and with a lavish waste of water that could never be permitted in any well-arranged system..." Canals had been constructed at Bakersfield and Visalia with too great a slope. Swift water currents washed away banks and "scoured out" the channel, making efforts to raise water over the banks into distribution ditches progressively more difficult. Moreover, no attention had been paid to drainage, which meant that water collected in stagnant pools on low ground, and rendered the "... vicinity of these two towns unhealthful in the summer-season." The commission predicted that 8,500,000 acres could be irrigated in the Central Valley, including swamp lands--12,000,000 acres if the low foothills were included. The cost of a complete irrigation system would average \$19 an acre, which was far more than the existing population could pay. So a comprehensive system would take 50 years or more to complete. Still, the commission emphasized that "...the works should be properly planned and located in the beginning, so

that whatever is done to meet the present requirements of a sparse population may form a part of those that will be necessary to meet the demands of a population of millions by simply enlarging them."⁵⁹

The commission proposed an elaborate network of canals. On the west side of the Central Valley, a north-south canal would leave the Sacramento River near Red Bluff and follow the foot of the Coast Range to Fairfield, across Suisun Bay from Antioch. Several east-west canals would serve farmland in Yolo County, but no canals were recommended north of that county. From Antioch, the canal would run to Tulare Lake, then on to Buena Vista and Kern lakes, without any east-west feeder channels. These two canals were essentially those favored by Will Green and associates and the San Joaquin and Kings River Canal and Irrigation Company. The commissioners warned that a continuous canal down the east side of the Central Valley would be impractical because it would intersect too many streams flowing out of the Sierra Nevada Range. The cost of siphons or aqueducts to bridge these streams would be prohibitive. Nevertheless, a broken canal could extend from Red Bluff to Bakersfield along the Sierra foothills. The report devoted little attention to storage reservoirs. It did propose damming many Sierra streams, but only so that the water could be raised above the river banks into distribution ditches. On the east side, many east-west canals would connect the main canal with the Sacramento and San Joaquin rivers. Aqueducts on the east side of the San Joaquin Valley would be expensive because a hardpan two or three feet under the topsoil would require blasting to excavate, but most of the canals elsewhere would be relatively cheap because the valley was essentially flat and contained deep topsoil.⁶⁰

The commission concluded that irrigation would be vital to California's development, especially in the San Joaquin and Tulare valleys. But given the state's limited population, investment in irrigation projects would remain risky for the foreseeable future. Ideally, farmers should pay for their own dams and canals, and the increasing value of their land under irrigation would permit them to do so. However, "...the experience of other countries appears to prove that no extensive system of irrigation can ever be devised or executed by the farmers themselves in consequence of the impossibility of forming proper combinations or associations for that purpose." Because the state and counties could anticipate a rapid increase in tax revenue where irrigation was practiced, they would also have the means to pay for irrigation works. But if the state or counties refused to undertake construction--because of the great expense or opportunity for fraud--they could still encourage private companies to do the job. First, both the state and nation should devise plans for

comprehensive irrigation systems, "...and the first step in that direction ought to be to make a thorough instrumental reconnaissance of the country to be irrigated, embracing the sources from whence the irrigation-canals ought to commence, gauging the flow of rivers and streams, and defining the boundaries of the natural districts of irrigation into which the country is divided." Private companies should only be permitted to undertake projects consistent with an overall plan laid out by the government, and state officials should inspect the works at each stage of construction. The commission also recommended other limitations on private enterprise. After a certain period, all irrigation works should become property of the state or of the irrigators themselves; the state should hold the right to purchase the works sooner, if necessary. In addition, both the price and the "duty" of water--the amount actually needed to raise different crops in different soils--should be set by the state, though supervision over distribution could be granted to state-chartered "associations" of irrigators. All water rights should be permanently wedded to the land so that the two commodities could not be sold separately. In most parts of California, the federal government should play a limited role in water resource development. But its vast landholdings between Visalia and Bakersfield suggested that it might "...encourage the irrigation of these lands." The report did not explain the form such aid should take, and nowhere did the commissioners recommend that the national government construct canals or offer loans or land grants to private companies. The report concluded on a somber and prophetic note, warning that if the state failed to supervise the acquisition of water rights and the distribution of water, California could look forward to a "fruitful crop of contentions in the future."⁶¹

Surprisingly, historians have neglected the Alexander Commission. Most studies of arid land reclamation begin with the Desert Land Act of 1877 and John Wesley Powell's deservedly famous "Report on the Arid Region of the United States," published in 1878.⁶² Admittedly, the Alexander Commission was severely hampered by its limited budget, by the fact that none of the commissioner's could devote full-time to the survey, and by the requirement that their report be ready in time to present to the following session of Congress. Nevertheless, in many ways the report was perceptive and far-sighted. Even though the commission strongly emphasized the necessity for irrigation in California, it did little to advance the fortunes of the San Joaquin and Kings River Canal and Irrigation Company. For all of Brereton's considerable influence, the group refused to rubber-stamp the company's request for a massive federal land grant. Instead, the report was written so that many of its conclusions applied

not just to California, but to the arid West as a whole. The commissioners recommended that land and water rights be joined together permanently; that water conflicts should be anticipated and avoided before the construction of any comprehensive water system; that the state should regulate the acquisition and distribution of water; that farmers should be limited to a reasonable quantity of water per acre to reduce waste; that the construction of drainage works should accompany the construction of irrigation canals; and that a thorough topographic and hydrographic survey of the Central Valley should precede any reclamation program. The report also was the first federal survey to draw on the experience of other nations, and it clearly anticipated future water planning in California. Not only did it recognize the need to transfer water from the water-rich Sacramento Valley to the water-deficient San Joaquin Valley--the basic principle behind the Central Valley Project launched in the 1930s--but it also devoted passing attention to what came to be known in the 20th century as the "multiple-use" concept of water development. The commissioners appreciated that reservoirs in the Sierra foothills could be used for flood control and swamp land reclamation as well as irrigation.

Still, their efforts bore little fruit. In December, 1873, Nevada's Congressman C.W. Kendall, perhaps acting in concert with Senator Stewart, forwarded a bill (H.R. 759) to General A.A. Humphreys, the Army's Chief of Engineers. The legislation proposed a similar irrigation commission to investigate Nevada's water supply, and included a \$20,000 appropriation to pay for drilling test wells. The bill was designed to aid mining as well as agriculture, but never got out of committee.⁶³ Clearly, irrigation was still in its infancy. Public opposition to federal aid to private water companies reinforced the skepticism of those who questioned the practicality or desirability of irrigation. In the same year the Alexander Commission published its report, George Perkins Marsh--who served as U.S. Minister to the Kingdom of Italy from 1861 until his death in 1882--issued his "Irrigation: Its Evils, the Remedies, and the Compensations." A decade earlier he had published Man and Nature, a pathbreaking study in human ecology. The essay on irrigation, which he wrote in Rome in July, 1873, was also based on his extensive travels through Europe and the Middle East. Marsh observed that "...the tendency of irrigation, as a regular agricultural method, is to promote the accumulation of large tracts of land in the hands of single proprietors, and consequently to dispossess the smaller land holders."⁶⁴ The cost of building and maintaining irrigation works, as well as defending water rights in the courts, contributed to land as well as water monopolies. The minister suggested that irrigation in Europe

helped explain the absence of a broad, land-based middle class: "...the middle class, which ought to constitute the true moral as well as physical power of the land, ceases to exist and enjoy a social status as a rural order, and is found only among the trading and industrial population of the cities." Marsh also recognized other dangers. In the absence of proper drainage, malaria flourished on irrigated lands, and the increased humidity led to respiratory illnesses. The unhealthiness of Rome and New York were "...due in part to the increased extent of market-gardens, and consequently of irrigated lands..." Irrigation also promoted the growth of weeds, probably produced inferior vegetables, and--where it relied on storage reservoirs--subjected the surrounding population to the danger of dam failures. Finally, Marsh warned that by increasing agricultural production, irrigation would exacerbate the problem of farm surpluses already experienced by American farmers.⁶⁵

Marsh admitted that "irrigation may be immensely extended among us with great economical advantage," but only where state governments exercised absolute control over water. He recommended that private irrigation works be prohibited except distribution ditches. All reservoirs and canals should be constructed, maintained, and operated by the states; water should be distributed by the states; water users should hold their rights for limited periods rather than as perpetual rights; farmers should pay for the water they used; all reservoir sites and canal lines should be reserved by the states or federal government; and the states should encourage the division of large estates into small farms. The greatest benefit from state-sponsored irrigation would be a larger population and tax base, but Marsh also suggested that irrigation might become a source of revenue: "The truly stupendous net-work of canals lately constructed in India by the British Government, taken as a whole, yields a fair rate of interest, and some of the more important branches return annually more than twenty per cent on their entire cost. The government irrigation-works in Italy and France, too, have been found highly remunerative as a direct investment."⁶⁶ The influence of Marsh's report in California would be hard to determine, but it must have served as a caution sign to lawmakers in Washington. Friends of irrigation could not take much comfort in the document. Even discounting the dangers of irrigation, the hope of achieving such a degree of public control over water in the arid West was remote.

Publication of the Alexander Commission's report caused little more reaction in California than Marsh's essay. Both were essentially academic exercises because the Alexander Commission had not provided a step-by-step plan for arid land reclamation in the state. In any case, while the commissioners were conducting their survey, criticism of

the San Joaquin and Kings River Canal and Irrigation Company mounted. Such influential newspapers as the Stockton Independent and Sacramento Union led the assault. The Independent charged that the forty mile stretch of canal constructed in 1872-1873 had been poorly engineered. The canal's grade was about one foot per mile, resulting in a swift current. The banks washed out frequently, so the channel had been lined with willow branches. However, while the company had promised to irrigate several hundred thousand acres from the first unit of the project, the swift current restricted irrigation to little more than 30,000 acres--and virtually all that land belonged to Miller and Lux. The Independent also feared that the completed canal would divert so much water from the San Joaquin River that the value of that stream for irrigation and navigation would be destroyed. It favored improving the channel of the San Joaquin River, where transportation was free, but the company claimed the right to divert water into its canal year-round, not just during the growing season. Of course, the Independent's strident criticism reflected a strong sectional rivalry within the San Joaquin Valley. If the canal reached Antioch, and destroyed the navigability of the San Joaquin River, Antioch might well replace Stockton as the queen city at the head of the valley.⁶⁷

The Independent's editorials also reflected the increasing power of the new California State Grange. The years 1869 to 1879 witnessed the state's first protracted economic depression. Drought, the completion of the "transcontinental" railroad, the declining production of California's mines, and rampant speculation in stocks traded on the San Francisco exchange, helped produce high unemployment, farm mortgage foreclosures, business bankruptcies, and a host of additional economic woes. These were intensified by the nationwide economic slump which began in 1873. The drought reduced demand for farm labor at the same time the Central Pacific Railroad laid off thousands of construction workers. The unemployed flooded into northern California cities, where they were joined by destitute migrants who had hoped to follow the railroad to fortune. In the three years from 1873 through 1875, over 150,000 immigrants entered California, more than emigrated to the state in the entire decade before 1867. Ironically, as Ira Cross has suggested, the new railroad initially hurt business more than it helped. Now Chicago and other eastern cities could tap markets previously reserved for San Francisco merchants. The high cost of labor and most materials in California, and warehouses filled with goods purchased at higher prices which had reached the state by sea, placed California businessmen at a temporary competitive disadvantage. To make matters worse, the depression helped focus public attention on many

festering problems which antedated the 1870s including land speculation and land monopolies, corruption in government, the increasing power of the railroad in state politics, and the role of the Chinese in California society. Cooperative action held out the hope that some of these issues might be resolved, and the "terrible seventies" spawned many new political parties, labor organizations and other associations, including the Grange.⁶⁸

The Grange had its birth in informal farmers clubs which sprang up in 1871. These soon gave way to local Granges, and on July 15, 1873, delegates from 28 local Granges met in Napa to form a state organization. The new group engaged in a variety of associational activities including trade and marketing cooperatives, farmer-owned banks and insurance companies, and Grange stores. It also tried to use the power of numbers to lower transportation rates charged by the railroads and the shippers who carried the annual wheat crop to Liverpool. By October, 1873, when the first annual convention met, 104 subordinate Granges counted 3,168 members, and at the peak of the Grange's membership in 1874, the 231 Granges--located mainly in the wheat-growing counties of Napa, Sonoma, Santa Clara, Sacramento, San Joaquin, Santa Cruz, Sutter, El Dorado, and Los Angeles--claimed 14,910 members. One historian has noted that many of the economic obstacles faced by California farmers after the Civil War, also plagued farmers across the nation. Nevertheless, "...the farmers of the Golden State had additional burdens to bear--manipulation of grain prices by a local monopoly of commission merchants, uncertain land titles, confused water rights, periodic droughts, extreme conditions of monopoly in the ownership of land and water rights, and a completely corrupt state government operating under an inadequate and faulty constitution."⁶⁹

Historians have disagreed about the nature of the Grange's membership and leadership in California. Rodman Paul and Gerald Nash, among others, have argued that the Grange consisted of large, speculative wheat farmers, distinguished mainly by being latecomers to the business. They note that most Grangers purchased their land after the Civil War, for high prices and at high interest rates. However, a recent article by Gerald Prescott suggests that the Grangers may well have constituted a different breed of bonanza farmer. Prescott contrasts Grange leaders with the leadership of California's State Agricultural Society during the 1870s and 1880s, and finds that only four of the agricultural society's 45 leaders also belonged to the Grange. In addition, Grange leaders owned smaller parcels of land, and 93% lived on their farms--in sharp contrast to the high percentage of non-resident farmers who led the agricultural society. Perhaps the leaders of the older agricultural society--many of whom were also wheat farmers--had closer ties to San Francisco's

business elite. In any case, during the 1870s the Grange provided some of the state's most strident critics of monopoly, and placed many of its members in the state assembly. It did much more to promote irrigation than had the agricultural society. Just as the Grange stood for cooperation in marketing and purchasing, it favored irrigation as a cooperative endeavor to increase productivity and land values, as well as to guard against the caprices of nature.⁷⁰

The Granges eagerly joined the newspaper assault on monopoly, and the San Joaquin and Kings River Canal and Irrigation Company became the group's favorite target during the last half of 1873 and 1874. For months critics of the scheme had protested against giving the company large blocks of land or unlimited water rights. As the Sacramento Bee warned in May, 1873, the perpetual grants requested by the company would give it absolute control over development in the San Joaquin Valley: "This is the worst kind of a subsidy--worse a thousand times than any railroad subsidy ever given, for it enables a company to monopolize not business, but the main elements of all life."⁷¹

The 1873 Congress had refused to consider a land grant until the Alexander Commission had completed its survey, so the company returned to Congress in June with a new proposition designed to help finance its project. Ralston and his associates had seen the rapid increase in land values adjoining the completed section of canal, and also along the proposed route from the San Joaquin River to Antioch. So they decided to try to force those who owned land through which the canal would pass to help pay its cost. The bill required all landowners to pay the company a flat assessment of \$1.50 an acre, payable in two annual installments. Those who refused would be required to pay interest of 10% per year on their debt to the company, and that debt would constitute a lien or mortgage on the land. For five years following the adoption of the bill, farmers would also be required to pay the company one-sixteenth of the value of their crops, whether they irrigated their land or not. After the canal had been completed, they would be obligated to pay an additional levy of \$1 an acre, as well as the "usual," or prevailing, rate for the water they used. The bill did not set any limit on rates. One San Joaquin Valley farmer bitterly assailed the company's new request:

Why, sirs, you would own us, we would be but your serfs, beholden to your mercy for the bread we would put in our children's mouths. You would, with a high hand, backed by legal authority, rob a large community of their homesteads and their birthright, and with the combined wealth of these spoils would make yourselves millionaires. What do you take use for? Fools outright? Slaves from some foreign lands, used to despotism, and ready and willing to bow our necks for the burden you would place upon us?"⁷²

Local Grange chapters and farmers clubs throughout the San Joaquin Valley adopted memorials urging Congress to reject the company's appeals for land and water grants, and forwarded them to Washington. The Pacific Rural Press, in commenting on a resolution adopted by the Stockton Grange, concluded that "...the settlers are unanimous in the opinion that the water should belong to the State or [federal] Government, and if they must pay for it, they do not want to enrich monopolies by doing so."⁷³

By the end of 1873, the San Joaquin and Kings River Canal and Irrigation Company had exhausted virtually every potential source of financial support. On December 9th, the company's trustees--claiming that over \$300,000 had already been spent on the project--wrote Governor Newton Booth offering to sell out to the state. Booth, a companion of the anti-monopoly crusade and a bitter critic of the company, ignored the proposal.⁷⁴ Nevertheless, the company's prospects brightened in the spring. On May 18, 1874, Robert Brereton persuaded thirty of California's most prominent capitalists and landowners--including the largest speculators in San Joaquin Valley land--to accompany him on a tour of a 6,000 acre model irrigated wheat farm the company had created on land leased from Miller & Lux adjoining the completed section of the canal. This drought-resistant farm demonstrated that wheat profited as much from irrigation as vegetables or fruit. It had yielded an average of 50 bushels an acre as opposed to nearby dry farmed land which produced only 10 bushels an acre.⁷⁵ Apparently, this farm, and perhaps the example set by several irrigation colonies Brereton had laid out for Ralston in 1873-1874 near Fresno, finally won the support of land speculators in the valley. W.S. Chapman, Isaac Friedlander, and Miller & Lux, agreed to give the company stock bearing a par value of \$25 per share. Brereton then returned to London in 1874-1875. Using the land as collateral and bait, he won the promise of an English syndicate to build the canal. But Chapman and Friedlander went bankrupt in 1875, as did the Bank of California, and William C. Ralston died in August. Much of Chapman and Friedlander's best land, and the canal, ended up in the hands of Miller & Lux. Brereton, who had invested \$40,000 in the company, was forced to sell his stock to the cattle barons for \$1,000.⁷⁶

One of the 19th century's boldest dreams died with Ralston. By 1880, Miller & Lux had extended the canal an additional 27 miles, and provided water to more than 150,000 acres.⁷⁷ But Ralston's plan to reclaim the entire Central Valley through private enterprise would never be revived.⁷⁸ The project failed for many reasons including the enormous cost, the valley's scattered population, the anti-monopoly sentiment of the 1870s, poor engineering, an absence of scientific evidence concerning the benefits of irrigation, the overwhelming

commitment of most farmers to wheat, the lack of adequate transportation, and the separation of land and water rights. By the end of the 1870s, the conflict over water rights would loom as the largest obstacle to the expansion of irrigation. But during the period from 1850 to about 1877 or 1878--by which time most of the state's easily used water had been claimed--finding a way to finance irrigation posed the greatest hurdle.

That was the problem faced by the state legislature in each biennial session from 1872 through 1878. Most Californians believed that the state should play some part in promoting irrigation, but they differed as to the precise role. Between the two poles of unregulated private enterprise, and a complete state irrigation system, existed a wide range of options. A variety of "interest groups" favored irrigation. True, many established wheat growers feared that irrigation would drive up taxes along with land values, rendering their business unprofitable. They also worried about losing political power to the new farmers who might settle in their counties. These sentiments prevailed particularly in the Sacramento Valley. But in the much drier San Joaquin Valley, the Grange solidly supported irrigation, as did its spokesmen in the legislature. The irrigation legislation considered in the 1880s usually reflected the objectives of large land or mining companies, while most of the laws proposed in the 1870s bear the Granger imprint. Of course, land speculators and businessmen also favored irrigation--when they stood to profit. By the early 1880s, the railroad, in order to promote freight and passenger traffic and sell its land in the Central Valley, actively supported both immigration and irrigation. But urban businessmen also recognized how their future prosperity depended on rural growth. For example, in January, 1872, the San Francisco Chamber of Commerce's Committee on Swamp and Overflowed Lands noted that California's unusual climate discouraged immigration because "...notwithstanding the advantages of soil and climate, the immigrant fears to settle in a country where large districts are subject to uniform droughts, continuing for two or three years in succession; while in other places floods covering millions of acres at a time are likely to destroy the improvements of whole neighborhoods."⁷⁹

The legislature of 1871-1872 convened in the shadow drought, amidst the flurry of public excitement and optimism generated by the schemes of ambitious private ditch companies like the San Joaquin and Kings River Canal and Irrigation Company. As the legislature gathered in Sacramento, the Colusa Sun predicted that private companies might spend as much as \$25,000,000 to \$30,000,000 before the next legislature met at the end of 1873. Will Green warned that "...this can hardly be expected if some encouragement is not given by the state," but many Californians still believed that private enterprise could reclaim the arid lands

without the aid of government. Moreover, the drought broke in January and February, 1872, and the promise of good wheat crops reduced the pressure to adopt bold legislation. The only significant irrigation bills pertained to Stanislaus County, through which the San Joaquin and Kings River Canal and Irrigation Company's great ditch would pass on its way to Antioch.⁸⁰

The first bill would have permitted Stanislaus County to loan the Tuolumne Water Company \$150,000 to build canals from the company's dam two miles above LaGrange on the Tuolumne River to land between the Merced and Stanislaus rivers. Ten-year, ten-percent bonds would have been issued to raise the money, and, in turn, the company would have granted the county a lien on its dam, water rights, and the canals themselves. Moreover, the Board of Supervisors could regulate the price of water, though the company was guaranteed at least \$1.25 per acre per crop. In years of scarcity, the company promised to distribute water on a pro-rata basis. The bill also gave the company a right to condemn all land needed for canals, using railroad condemnation procedures as a model.⁸¹ Eventually the fear of monopoly turned the Stanislaus legislative delegation against the bill. Nevertheless, the company succeeded in ramming its scheme through the legislature. Only Governor Newton Booth's pocket veto saved the county.⁸²

Far more significant was the irrigation district bill introduced by a Stanislaus County state senator. Utah was the first state or territory to adopt irrigation district legislation in the arid West. In 1865, the Utah territorial legislature provided that farmers could organize districts and levy taxes to pay for irrigation works. The farmers themselves decided whether to tax all the land within a district, or only the land irrigated. However, the law did not permit a district to issue bonds or borrow money, so it provided few financial advantages over using private ditch companies to construct canals. The law did insure that irrigation would require community consent because two-thirds of all district residents had to approve formation of the district as well as any tax levies. Though many districts were formed, Elwood Mead concluded that by the beginning of the 20th century the law had had "no appreciable results."⁸³

The irrigation district found its greatest success in California, but there, too, not until the 20th century. The Wright Act of 1887, as repeatedly amended, was widely copied in the arid states. But California's experimentation with irrigation district legislation began in 1872, and built on swamp land legislation enacted during the 1860s. In 1861, the legislature provided for the organization of reclamation districts on the petition of one-third of the landowners within a proposed district. That law also created a state board

of swamp land commissioners responsible for planning and coordinating comprehensive levee and drainage works. The board could spend up to \$1 an acre from state funds, the money to be derived from sales of the swamp land granted to the state by the federal government in 1850. Any additional expenditures had to come from the landowners themselves. In the following year, the lawmakers authorized the districts--if one-third of their residents approved--to levy taxes to pay for reclamation. By the end of 1862, the state contained 38 swamp land districts covering 485,000 acres. In 1868, the legislature permitted the owners of a majority of district land to elect boards of trustees who, in turn, could hire engineers to draft reclamation schemes. Following the completion of these plans and cost estimates, the county boards of supervisors could appoint three commissioners to inspect the land and impose taxes according to the benefits provided to different parcels of land. Yet the attempt to reclaim flood lands failed. In 1866, the legislature--under strong pressure from land speculators and large wheat farmers--abolished the state board and transferred its functions to the counties. This ended the prospect of an integrated reclamation plan. Two years later, the legislature dropped a 640 acre restriction on the amount of swamp land an individual could acquire, touching off a mad scramble to acquire the remaining "flood" land. Most of this land passed into private ownership by 1872. Nevertheless, the swamp land legislation of the 1860s established the principle of using special districts to solve problems not easily addressed by city or county governments. These new administrative units enjoyed the power to tax and condemn land, though they lacked the authority to issue bonds or float loans.⁸⁴.

The Stockton Independent clearly recognized the 1872 irrigation bill's lineage when it announced that the legislation permitted the formation of districts "...on the same basis, and in the same manner as reclamation districts are formed in the Tule Land Districts."⁸⁵ The law allowed landowners to form irrigation on drainage districts on appeal to their local board of supervisors, and the board was required to approve the petition if "no land is improperly included or excepted from the district." The landowners were granted the right to elect a board of trustees to conduct irrigation surveys. The board, in turn, would appoint three commissioners to "...assess upon the lands situated within the district a charge proportionate to the whole expense and to the benefits which will result from such works...." The local district attorney was given the responsibility to collect delinquent taxes, and all revenue would be paid into the county treasury. Though the district could condemn the right of way for irrigation works, it had no power to condemn established water

rights. The act was probably passed in part to benefit private irrigation companies. One clause permitted groups of landowners to build and manage irrigation projects on their own, without using an elected board of trustees or district by-laws. However, the increasing power of land and water companies in Sacramento was also reflected in a clause prohibiting application of the law to Fresno, Kern, Tulare, or Yolo counties. Although the 1872 legislation marked a beginning, no districts were formed under its provisions.⁸⁶

As noted earlier, in 1873 anti-monopoly sentiment reached a new peak. Newspapers bristled with stories blaming large, impersonal institutions--ranging from the railroad to the city of San Francisco--for California's social and economic ills. Opposition to bigness per se was symptomatic of the painful passage from the frontier economy of the 1850s and 1860s to the modern industrial-agricultural economy whose outlines began to appear in the closing decades of the 19th century. Irrigation became much more than a means to reclaim California's arid lands. In the 1870s and 1880s, it took on the trappings of a crusade--which sought to lay the foundation for a more stable economy at the same time it reaffirmed the values of a simpler rural past. Most Californians still believed that the state's agricultural future should belong to the small family farmer. And they also assumed that irrigation agriculture would help mitigate the rapid, unpredictable fluctuations in climate, land and grain prices, stock quotations, and freight rates characteristic of the 1870s.

Though the legislature would not meet again until December, 1873, public interest in irrigation continued unabated. Irrigation districts won much popular support. For example, the Stockton Independent urged the state to conduct a thorough hydrographic survey of California's arable lands, then turn plans for a coordinated irrigation system over to individual districts. It urged that the districts be permitted to issue bonds to pay for the works, and that all water rights be attached to the land served by new canals.⁸⁷ But the Sacramento Bee took the lead in recommending stronger central control. It noted that the districts favored by the Independent would include only the land whose owners wanted irrigation, and this restriction would prevent construction of the more efficient water supply system. Moreover, those who moved into these districts later might encounter a water monopoly no less onerous than that exercised by private land and ditch companies. So the Bee suggested that any irrigation system should provide sufficient water to serve all potentially irrigable land. This could be done if the federal government chartered and organized a "National Bank of Irrigation" in Sacramento and gave it the power to issue \$8,500,000 in legal tender notes to pay for reclaiming 1,400,000 acres in the Sacramento and

San Joaquin valleys. The paper estimated that this land would cost an average of \$6 an acre to irrigate. Sales of water would pay off the debt in 50 years; meanwhile, the government would hold a mortgage on the lands served. Water would be sold at a fixed price unaffected by the number of acres a farmer owned or the distance of his farm from main canals.⁸⁸ The Bee's scheme depended on the federal irrigation commission's eagerly awaited recommendations. But when the paper found that the Alexander Commission would not provide a complete blueprint for future irrigation development, it urged the state to appoint a board of engineers to draft a plan, then pay for it by issuing 30 year bonds redeemed from revenue collected from water sales.⁸⁹

Amidst the flurry of editorial excitement over irrigation, the Grange held its first convention in Napa in July and ordered its committee on irrigation to prepare a bill for introduction at the next session of the legislature "...having for its objects the utilizing of all the inland waters of the State, and their uniform and equitable division and distribution, under the authority and control of the State, among the actual land owners of the State..." The delegates concluded that such a bill should provide for a thorough hydrographic survey by the state, state designation of irrigation districts, and state supervision over the distribution of water. The districts themselves should pay for their irrigation works by issuing bonds. In order to secure reliable water supplies for these districts, the Grange urged that the legislature "...provide a way for condemning every and all actual, asserted or pretended prior right[s], privilege[s], or franchise[s] to...any of the inland waters of this State, whether held or claimed by individuals or corporations..." The state organization urged the subordinate Granges to apply as much pressure as possible on the legislature to insure "immediate action."⁹⁰

Northern Californians dominated the Napa convention, but southern California farmers had also begun to organize. At the request of the Farmers' Union of Los Angeles County, champions of irrigation from throughout the Los Angeles basin gathered at Los Angeles on October 25, 1873. The group heard ex-governor John G. Downey extoll the virtues of irrigation:

First of all, the paucity of rainfall renders irrigation a necessity for the greater part of our lands. Secondly, as a fertilizer, it perpetually renovates our fields, as the waters carry in solution nearly all the elements required for the organic composition of vegetable life. Thirdly, it enables the farmer to select his time of planting and harvesting; and, fourthly, it enables him to destroy the numerous pests that infest his soil, in the shape of squirrels, gophers, rats, etc.⁹¹

The group approved a set of resolutions which echoed the Grange's call for state administrative control over California's water supply. In particular, the southern Californians worried about the danger riparian rights posed to the future of irrigation in their section of the state. They urged the state to survey all potential reservoir sites and establish a department of irrigation to administer water distribution in each new irrigation district. The convention closed after delegates elected a special committee to draft an irrigation bill.⁹²

The Grange's proposal to condemn all existing water rights and eliminate the private ownership of water did not win universal support. The Colusa Sun warned: "But don't let us mix up mining and agricultural matters too much.... The State could, for less money than it would require to condemn and pay for all the old dilapidated mining ditches in the State, build canals that would supply all the people of both these great valleys with water." The Sun predicted that such a massive condemnation proceeding would cost the state \$50,000,000 to \$100,000,000--far more than it could afford. Nevertheless, the Grange's support for irrigation districts won wide approval, especially from Governor Newton Booth. Booth had strong reservations concerning the state's part in the development of irrigation:

If a general system of irrigation should be projected, the work to be constructed and managed by the State, it is possible that a great deal of work would be done which would prove unnecessary and unprofitable; some portions of the State would be taxed for improvements in which they have no interest, and the mining districts, to which water is as essential as to farming, would have a right to demand that the system should be extended to them. Is it not possible to divide the State into irrigation districts, allowing each to determine the question for itself, and giving to each acre a vested right to its pro rata [share] of the water supply, and conferring upon each district the power to condemn the water rights which are necessary for its own irrigation?

The irrigation district rested on the principle of local control and attracted support from many Californians who--for financial, moral, or constitutional reasons--objected to expanding the size of state government.⁹³

As the legislature convened in December, 1873, the prospects for passage of Grange-inspired irrigation legislation appeared good. But during the first two weeks of December, heavy rains fell throughout the Sacramento and San Joaquin valleys raising the prospect of a bumper wheat harvest. The winter of 1873-1874 was the wettest in years, and by mid-April the Stockton Independent confidently predicted that the wheat crop would be 33% larger than any previous harvest.⁹⁴ Supporters of irrigation legislation warned that drought would return, but their message had lost much of its sting. Most of the rewards promised by

irrigation were not immediate, and many wheat farmers--infected as they were with a "cut and run" mentality--refused to look beyond the next harvest.

Nevertheless, on January 21, 1874, Assemblyman Venable of Los Angeles introduced a bold irrigation bill backed by a petition from 1,700 "practical farmers" in southern California. The legislation provided that the governor would appoint a board of water commissioners to divide the state into irrigation districts. The board, in turn, would hire engineers to assist in its work. In delineating district boundaries, the commissioners would determine how much land was suited to irrigation, the supply of water available, and the best means of using it. Once they had prepared a detailed irrigation scheme, their printed report would be circulated within the proposed district. If one-third or more of the landowners favored the proposal, the board could call a special bond election--though the bonds could be issued only if a majority of tax-paying landowners approved. After the election, residents of the district would exercise little direct influence over irrigation policies. The state would construct the irrigation works, supervise the distribution of water, and determine the price irrigators would pay for that water. All proceeds would be paid into the state treasury, for use in retiring the bonds, but the salaries of the commissioners and engineers would be paid by the state from the general fund. Most important, the board could "...acquire by purchase all property necessary to carry out and maintain the system of irrigation provided for in this Act." This represented a step back from the Grange's earlier demand for the condemnation of all private water rights in the state, but the bill did give the state the right to exclusive control over all water used within the districts.⁹⁵

The Venable bill passed the assembly--the stronghold of Granger political power--on February 27th and was reported favorable by the Senate Irrigation Committee. However, the full senate rejected the legislation near the close of the session by a vote of 13 to 26.⁹⁶ The bill failed for several reasons. The Sacramento Union commented that "[t]he system proposed by this bill is admirably suited to a paternal Government, like France under Napoleon, but is entirely contrary to the spirit of both our people and our Government. It is centralism gone to seed." Many of the bill's critics opposed the expansion of state control, arguing that the irrigation districts ought to be given more power to manage their own affairs. But the Stockton Independent, which supported the legislation, also recognized the persistent power of "localism" in the legislature; some lawmakers opposed any measure that did not directly benefit their own district, especially if it cost money. "Some of

the spigot economists who disgrace the seats to which they have been elected...complained of the expense, and because it was to cost the people of the whole State \$40,000 per annum to make the preliminary surveys and do the necessary work of inaugurating this great system of irrigation, they must vote against the appropriation." The Independent also hinted that land and water companies had worked to defeat the bill because its condemnation process would have sharply restricted their power to monopolize water. Nevertheless, defeat of the bill probably owed as much to the effects of the Depression of 1873 on the California state budget as to any other cause. Such an ambitious scheme did not stand much change during a period of retrenchment. Nevertheless, the lost cause was deeply mourned. For example, upon hearing of the senate's decision, Grangers who lived at Ellis Station on the west side of the San Joaquin River flew their flags at half mast.⁹⁷

Another, less ambitious, water bill fared better. It may also have been Grange inspired, perhaps designed as a backup to the Venable bill. In any case, the second bill--introduced by Senator Bush on January 16 and signed into law on March 10, 1874--also provided for the formation of irrigation districts. But it applied exclusively to Los Angeles County, and provided no role for the state. The law created a Superintendent of Irrigation for Los Angeles County. On the appeal from a majority of residents within a proposed district, the superintendent could order an election to choose three water commissioners to govern the district. The same election would decide whether the voters were willing to tax themselves to raise the money needed to build irrigation works. Special "overseers" would serve as district tax assessors, but the district commissioners would draft irrigation plans, fix the price of water, and condemn all land, water, and ditches necessary to insure the success of their projects. No land already irrigated could be deprived of an adequate water supply, but all unused water was declared to be public property, "to be held for their use." The law also set penalties for those who wasted water.⁹⁸ Like the 1872 irrigation district law, the legislation passed in 1874 proved ineffective. Los Angeles' pueblo rights forced the lawmakers to exclude all land served by the Los Angeles River, and, even more important, the law did not restrict riparian rights.

By the early months of 1875, the fate of the Venable bill forced the Grangers to adopt a new strategy. On April 20, 1875, eight subordinate Granges on the West Side of the San Joaquin River met at Graysonville to form the Land Owner's Canal and Ditch Company. The failure of the San Joaquin and Kings River Canal and Irrigation Company left the way

open for drought-ridden West Side farmers to construct the Tulare Lake-Antioch canal on their own. The proposed plan required the Grange-dominated company's board of directors to survey the canal route and estimate the amount of water available, the land susceptible of irrigation, and the total cost of the project. This information would provide the foundation for a bill to be presented to the following session of the legislature. The bill would reserve all unappropriated water to the district and authorize the issuance of district bonds to pay for constructing the canal. Taxes would be levied against all potentially irrigable land in the district to retire the bonds. The canal would belong to the landowners--in the fashion of a mutual water company--and all profits from water sales and shipping tolls would be distributed among the landowners in proportion to the size of their estates. By May 20th a bill was ready.⁹⁹

An official of the State Grange, J.W.A. Wright, outlined the organization's broader legislative program in a Fourth of July address at Placerville. Wright argued that the state should immediately assert control over the state's water supply

in order to have irrigation and navigable canals, which shall not interfere with mining rights, constructed by competent and reliable companies, in such manner as to secure the greatest good to the greatest number. Such laws should empower the State to have general surveys made; to divide its territory into irrigation districts; to have a sufficient number of Irrigation Commissioners elected by the people of each district to authorize the election by the people in all these districts of one or more State Commissioners, who shall supervise the irrigation interests of the State at large, and see that its laws are enforced; to provide that the taxes needed to thus establish and regulate irrigation be levied an equitable basis on the lands in the districts where such funds are to be expended. These laws should also provide for the just and regular distribution of water, and fair charges for the same. They should make these systems of irrigation, and the water furnished by them, a part of the realty of the several districts, and thus render the land and its water privileges hereafter forever inseparable.¹⁰⁰

Though the Grange now supported greater local control, its program still left a large role to the state government. The trick was to steer a careful course between centralism and localism, comprehensive planning and laissez-faire.

By October, 1875, both the Democratic and Republican party platforms promised aid to irrigation, and the state's newspapers bombarded readers with a bewildering variety of irrigation district schemes. But voices of caution occasionally broke through the growing clamor for irrigation districts. Skeptics included Robert M. Brereton, former chief engineer of the San Joaquin and Kings River Canal and Irrigation Company. Brereton pointed out that the cost of reclaiming the West Side of the San Joaquin Valley would be at least \$12,500,000, a sum which exceeded the value of the land to be reclaimed. A tax of \$2.50 per acre per year--the average per acre annual revenue from grazing in the valley--would

be required simply to pay the interest on a \$12,500,000 bond issue. In effect, Brereton argued that bonds secured by a mortgage on San Joaquin Valley land simply would not sell. He also predicted many of the problems later encountered by organizers of irrigation districts. Many proponents of districts wanted to reserve the vote in district elections to irrigators, excluding land speculators, stockmen, and villagers. This might facilitate the creation and operation of districts, but it would also allow irrigators to "tyrannize" their neighbors. For example, the district directors would certainly try to include as much land as possible in the district to increase the tax base. On the other hand, if all landowners or taxpayers enjoyed the vote--particularly if votes were apportioned according to acreage owned--the chances of forming irrigation districts in the Central Valley were slim because many farmers as well as stockmen opposed irrigation. Brereton suggested that condemnation offered an answer to this problem. The irrigators might condemn the lands of those who did not want to be included in a district, paying only the going price which prevailed prior to the construction of irrigation works.¹⁰¹

The legislature of 1875-1876 considered five irrigation bills, only one of which became law. Two provided for state-supervised irrigation district systems, and the other three pertained to particular districts proposed for the San Joaquin Valley and Los Angeles County. The most controversial piece of legislation was introduced by Senator Creed Haymond of Sacramento County. Apparently, Haymond originally intended to present a bill providing for the construction of massive dams on such streams as the Feather and Yuba rivers to store water for irrigation and capture the debris being washed into the Sacramento Valley by hydraulic mining companies. When the dams had filled with tailings, the debris would be piped or flumed onto tule and low lands in the valley, aiding in their reclamation. However, the miners balked at the expense, so Haymond dropped the scheme and focused his attention entirely on irrigation.¹⁰² His bill bore striking similarities to the Venable bill considered in 1874. Both proposed highly centralized state systems which allowed local irrigation districts little autonomy. The Haymond bill would have created a state irrigation board to survey potential districts and prepare construction plans. Once a district had been formed, and bonds had been issued, every act from the assessment of taxes to the distribution of water would be performed by state officials. The major differences between the Venable and Haymond bills were that the latter required the consent of two-thirds of the landowners to establish a district--rather than one-third--and the Haymond legislation limited the cost of irrigation works to 30 percent of the assessed value of district

property.¹⁰³ As in 1874, critics complained that the bill gave the state too much power, and that it would touch off a bitter power struggle among proponents and opponents of irrigation within many districts.¹⁰⁴

The other general act--which pertained to the entire state except Los Angeles County--promised greater local control. It provided for a state board of irrigation to designate districts, formulate irrigation plans, and supervise construction. However, an elected board of district irrigation commissioners would take charge of the completed irrigation works, issue bonds, set water and navigation rates, and distribute water to individual users. Moreover, elected district officials would assess the value of land and collect taxes; the taxes would constitute a lien on district property. As in the Haymond bill, the value of bonds could not exceed 30% of the assessed value of district property. In addition, the bonds could not be sold at less than par value, and payments would be graduated. During the first ten years after issuance of the bonds, taxes and water sales would be used exclusively to pay interest. Then, during the following decade, taxes would be increased gradually to pay off the principal. Presumably, the value of irrigated crops would more than offset the higher tax burden. Though the bill met many of the objections raised by critics of the Venable and Haymond acts, it also authorized a \$25,000 appropriation to pay for preliminary surveys and set up the new state office. This, combined with the persistent opposition of most land speculators and stockmen to higher taxes, killed the bill.¹⁰⁵

In addition to these general bills, special legislation was considered for Los Angeles, Fresno, Tulare and Kern counties. The Los Angeles bill was designed to replace the law enacted in 1874. It provided much more specific guidelines for forming irrigation districts within the county. The Board of Supervisors was required to divide the county's arable land into districts defined by government subdivisions or natural boundaries, such as river basins. Each district would be supervised by an elected board of water commissioners which could condemn existing water systems--though it had to provide established users with sufficient water from the new system to irrigate all their land. The boards could issue bonds not exceeding 10 percent of the assessed value of property in a district. A tax on all taxable property within a district, not just on irrigated farmland, would retire the bonds and pay the board's expenses and salaries. District overseers appointed by the board would supervise the distribution of water and maintain the ditches. Like the earlier legislation, the bill set penalties for wasting water, and excluded Los Angeles and the Los Angeles River. Unlike

the earlier bill, it also carried a \$5,000 state appropriation to pay for the initial surveys. This helps explain why the bill won little support in either house of the legislature.¹⁰⁶

The act pertaining to Fresno, Tulare and Kern counties would have made each county's board of supervisors an ex-officio irrigation commission with power to take control of all unappropriated water and create irrigation districts on the petition of 50% or more of the landowners within a particular river basin. The board would prepare construction plans, but irrigation works could not cost more than 20% of the assessed value of all land within a district. If the election carried, the board could issue bonds not exceeding 30% of the value of all land susceptible of irrigation. A superintendent, appointed by the board, would manage the district and distribute the water, but the board itself would set water rates. The measure was a conservative piece of legislation, but it stood little chance in a region dominated by cattle barons and large land companies. Moreover, the bill conflicted with the West Side Irrigation District legislation.¹⁰⁷

The Grange had devoted most of its legislative efforts to the West Side bill, which passed the legislature in March, and won the governor's approval on April 3. However, the law's most important provisions could not take effect until ratified by district voters. The legislation created an immense district containing several million acres of land. The law did not designate precise boundaries, but the district would include all the land between the west shore of Tulare Lake to the south, the foothills of the Diablo Range to the west, the shore of Suisun Bay to the north, and the state survey line designating the boundary between "high" lands and "swamp and overflow" lands to the east. Within ten days after signing the act, the governor was required to appoint a board of five commissioners to represent the district until the first general election was held within sixty days. Each commissioner had to live in a different one of the five counties in the district. The appointive board's main responsibility was to survey the canal route, establish precise district boundaries, and prepare construction plans. At the first election, all "legally qualified electors"--not just landowners or irrigators--would choose a new board, assessor, tax collector and treasurer. Even more important, they would approve or reject a \$4,000,000 bond issue and a district tax on all property, personal as well as real. If the voters rejected the tax, the district would be defunct. The legislature granted the district the right to use all unappropriated water, and it could also condemn all land and existing canals needed to construct a comprehensive irrigation system.

However, on the same day the West Side bill was approved, a "supplemental" act--inspired by Miller & Lux and other large landowners in the valley--also took effect. This law was designed to buy time for opponents of the district. It postponed the first election until May, 1877, but required the governor to appoint three commissioners to conduct the surveys. These officials had to report to the governor by March 1, 1877, and publish their findings in one newspaper in each county within the district for 30 days preceding the May election. This supplemental act represented the first in a series of legal maneuvers designed to checkmate the Grange's plans.¹⁰⁸

The district's opponents must also have hoped that since neither piece of legislation appropriated money to pay for the surveys--which would have been financed by tax revenue had the election been held within 60 days--the project would never be launched. But the commissioners paid part of the cost out of their own pockets, and the governor promised to ask the next legislature to reimburse all farmers who helped pay for the surveys if the voters rejected the canal scheme at the May, 1877, election.¹⁰⁹ Raising the money proved a difficult task, but nature provided a convenient reminder of the need for irrigation when the worst drought in twenty-five years visited California in the fall of 1876. The drought left grim reminders of nature's caprice throughout the state, but its worst effects were felt in southern California and the San Joaquin Valley which received less than 50 percent of average annual precipitation. In the valley, the Kern River ran dry by late spring and cowboys used ropes to pull weakened cattle out of the mud. Grass disappeared quickly in the spring, and in some parts of the valley stockmen chopped down oak trees to permit cattle to feed on the leaves and tender shoots. Desperate herdsmen slaughtered bands of sheep to salvage their pelts, which fetched only 12½ cents apiece; normally sheep sold for two or three dollars a head. Many animals were simply left to starve, and the valley was littered with carcasses much as southern California had been during the drought of 1864.¹¹⁰

The three commissioners--J.R. McDonald, F. Williams, and H. D'Veuve--ultimately raised \$25,000 to pay for the surveys. The work itself was entrusted to William Hammond Hall, who became the district's chief engineer, and General B.S. Alexander of the Corps of Engineers, who served as consulting engineer. Alexander, of course, had been the ranking member of the federal irrigation commission of 1873-1874. The two engineers concluded that the canal scheme was entirely feasible, though Hall recommended against combining navigation and irrigation because a dual-purpose canal would cost much more to build, an estimated \$4,305,786. This sum did not include the cost of distribution ditches, which were expected to add \$1 to \$30

an acre to the cost of reclamation, depending on the proximity of irrigated land to the main canal. In all, the 185.5 mile aqueduct would serve 340,000 acres. The two engineers maintained that there was more than enough unappropriated water in the district to reclaim this land.¹¹¹

After the commission filed its report with the governor in March, criticism of the project began to mount. On April 14th, a convention called to nominate candidates for district offices adjourned on a sour note as Democrats charged that too many Republicans had been selected. Moreover, Contra Costa County, at the canal's outlet into San Francisco Bay, even refused to send a delegate to the convention. Residents of that county grumbled that the canal would serve little of the county's prime farmland, and that they would be saddled with a much larger tax burden than other district residents. Contra Costa County contained a much larger population and much more taxable property than the counties to the south. Moreover, even many supporters of the scheme admitted that a dual-purpose canal would be too costly. The Grangers hoped to use the canal to break the railroad's transportation monopoly in the valley, but could the canal attract sufficient freight traffic away from the railroad to pay for its added expense and maintenance costs? The money saved by building a canal exclusively for irrigation, some critics predicted, would more than pay for distribution ditches.

Rarely did critics challenge the engineering feasibility of the project, or discuss the multitude of legal questions it posed. Instead, they focussed on two points: the canal's cost and its uneven benefits. Theoretically, taxes could continue to be levied even if the district failed to complete the canal, or if breaks in the channel rendered it unuseable for extended periods. And while all district residents would have to begin paying irrigation taxes soon after the bonds had been issued, those living at the north end of the valley would wait months or, perhaps, years to enjoy any benefits. Moreover, how could residents of the district be sure that new bond issues would not be required in the future: To attract investors, the West Side law specified that \$500,000 in bonds could be sold at 75 percent of par and the remainder at 90 percent. Thus, even if all the bonds sold, they might return as little as \$3,525,000, far less than the cost of the project reported by Hall and Alexander. Could anyone predict how high taxes might rise? On the eve of the election, San Francisco's Alta California, a bitter foe of the district, warned: "Much of the land in the district is under mortgage, and one of the first results of an affirmative

vote will be that the mortgagees will sell out under foreclosure, probably at a loss, to avoid further risk. Of many wild schemes offered to the public in California as great improvements, this is the worst...."¹¹²

However, within the San Joaquin Valley, drought-plagued farmers ignored most of the reasonable objections to the law, and bitterly assailed the stockmen and speculators whom they considered responsible for the criticism. The Stockton Independent, which usually spoke for the Grangers, editorialized:

The stock-raisers would like very well to have the farming land abandoned as unproductive that they might have the privilege of grazing their herds upon it during the Winter months when some feed exists. That class of stock-raisers, who usually own no land and make no attempt to produce the fodder that their stock consumes, but depend upon what nature gives them, have been the curse of California, and the stock-breeding interests will never be what they should....It is irrigation that is required to raise alfalfa and other grasses for feeding stock.

Several days later, a correspondent from the Granger stronghold of Grayson charged that Henry Miller--hardly a landless stockman--was using his money to defeat the canal project. The Independent reported that most valley farmers opposed a dual-purpose canal, and that Hall had prepared a supplemental report describing alternate canal routes which would exclude Contra Costa County from the district. Supporters of the district warned against further delay, but promised that defects in the law would be repaired prior to the next session of the legislature.¹¹³

The election resulted in an overwhelming victory for the district and the Grange. The scant population of the San Joaquin Valley was reflected in the total vote: 476 for, 224 against. Only Contra Costa County, where the vote ran 3 in favor to 134 opposed, offered formidable opposition. Outside that county, the canal project lost in only one precinct. In Firebaugh's Ferry, where Henry Miller owned most of the land, the district lost--by one vote. In Los Banos, a farm community also dominated by the Miller estate, the canal carried by a comfortable two to one margin. On June 5th, an irrigation celebration ball was held at Grayson, where the vote had been 73 to 8 in favor of the project. The governor, Will Irwin, and lieutenant governor both joined the Grangers in celebrating the dawn of a new age in the history of California. Many who voted for the scheme expected the next legislature to modify the project by eliminating Contra Costa County and the requirement that the canal provide navigation as well as irrigation. But the future looked very bright in the fall of 1877. The Pacific Rural Press suggested that the Grange had elected so many members to the legislature that the group held the balance of power, and would use its power to defend the irrigation cause in Sacramento.¹¹⁴

At the end of the 1870s, irrigation was still in its infancy in California. The surveyor-general reported that in 1878 the state contained 616 irrigation ditches which served only 204,455 acres of land. The leading irrigation counties were Los Angeles and Merced, each of which contained roughly 37,000 acres under ditch. San Bernardino residents irrigated 20,000 acres, and Tulare County's ditches served about 18,000 acres. However, San Joaquin County contained only 2,000 acres fed by canals, and the Sacramento Valley's most heavily irrigated county, Yolo, contained only 12,250 irrigated acres. Moreover, though the population of the San Joaquin Valley had grown enormously since the middle 1860s, by the end of the 1870s, the combined populations of Fresno, Kern, and Merced counties numbered little more than 20,000 people, about two percent of the state's total. No more than one in twenty of the state's residents lived in the San Joaquin Valley, and only about ten percent of the population lived south of the Tehachapis. Still, in relative terms, irrigation had made substantial gains. From 1875 to 1879 alone, irrigation increased by 45 percent.¹¹⁵

Looking back over the first three decades of California history, several conclusions emerge concerning the irrigation crusade. First, support for government action increased dramatically during this period. As much as they would have welcomed federal land grants, few Californians wanted or expected the national government to build canals. But state aid was a different matter. As Gerald D. Nash has demonstrated, before the Civil War state governments provided substantial aid to private businesses, particularly transportation companies. In California, Nash concludes, the state's direct role in aiding business remained small more for economic than philosophical reasons: "Only the constitutional limitations on the state's debt and the poor conditions of its finances during this period prevented a more active program."¹¹⁶ In short, while Californians feared the growth of state government, they were not hide-bound by the doctrine of laissez-faire. For example, by the 1870s, state irrigation surveys won substantial public support. Many arguments were offered to encourage the state to undertake this work. The "impartial" data compiled by state officials could be used to attract new settlers and investors--both hungered for reliable sources of information on the amount and quality of the state's arable lands, the supply of available water, the cost of reclaiming the land, and a host of related matters. Even more important, by the end of the decade, a large number of Californians recognized that piece-meal irrigation development would ultimately produce a totally uncoordinated network of canals and dams. The state needed an overall blue-print to guide the future development of irrigation. The state's vast size and range of climates, the failure of swamp land reclamation districts to coordinate their efforts, and the number of economic

groups which laid claim to the state's water--including farmers, miners, and shippers--demanded a comprehensive plan. Only the state could provide the necessary leadership.¹¹⁷

Of course, as the Venable bill illustrated, some supporters of irrigation--including many members of the Grange--wanted the state to play a more active role. They realized that providing a state water plan and ensuring that private companies complied with that plan were two different things. California presented challenges that private enterprise simply could not meet. It contained two major rivers--the Sacramento and San Joaquin--whose navigability had to be protected; swamp land to be reclaimed; and communities which demanded security from the massive, periodic floods that afflicted the Central Valley. All this in addition to the water needs of farmers, miners, and city dwellers. Even given a state water plan, how could private companies coordinate these efforts? For example, what incentive did companies which claimed the San Joaquin River for irrigation have to protect the rights of shippers, or lumbermen who used the stream to transport logs down from the Sierra to mills on the valley floor?

Even more important, unless the state took control of the water supply, what would protect farmers and other water users from the dangers of monopoly? As early as 1871, the Sacramento Union warned that "[t]he Legislature...should exercise great caution in passing upon...water franchises, in order that the rivers of the State may not, as its railways have done, fall into the ruthless and selfish hands of monopolies----It will not do, in view of a tolerably hopeful future, to allow irrigating corporations to get their claws upon our rivers so as to exercise a monopoly of their waters, or exclude other important uses."¹¹⁸ The fear of monopoly which haunted Californians during the last three decades of the 19th century, prompted many to turn to the state. As James H. Budd--who would serve as California's governor from 1895 to 1899--put it in an address to the San Joaquin Valley agricultural society in 1873: "It may be stated as a safe rule, that when works of internal improvements are vital to the prosperity of the State, and such works cannot be constructed by private corporations without danger of monopoly and oppression, such works should be constructed by the state."¹¹⁹ A state administered irrigation system was attractive in the 1870s partly because much of the state's water had not yet been claimed by private interests, and few observers recognized the entrenched power of riparian rights. By the middle 1880s, much of the state's water had been appropriated, and the public became painfully aware of the obstacle riparian rights posed to the expansion of irrigation. Moreover, so many private water systems had been built that a coordinated canal system became impractical, if not

impossible. In short, while a state system seemed "feasible" in 1874, a decade later it no longer appeared as a realistic alternative.

But assuming the feasibility of a state system, why did it fail to win wider support? The depression of the 1870s, and the legislature's reluctance to vote any substantial new appropriations, explain why the Venable bill failed, but not the intensity of criticism directed against such legislation. That criticism reflected the low opinion most Californians had of the state government itself. As the San Francisco Alta commented in 1871, the legislature simply could not be trusted with massive public works projects:

Sad experience...teaches us that we would...rue the day that we consented to the State taking upon itself the construction of a work such as we have indicated [a state irrigation system]....We shall say nothing in this connection of the favoritism that would be exhibited; of the rich streams which the active party manager would enjoy without money and without price; of the embezzlements that would occur; of the number of water collectors who would be invalidated, and forced to proceed to the Hot Springs, in the hope of getting their bank accounts straightened out by swallowing medicinal waters. We have got to such a curious pass, that it is not safe to entrust this thing that we call Government with any enterprise involving the expenditure of money calculated to promote the common weal."¹²⁰

Irrigation was not required throughout the state, but the officials charged with building a state system would try to make the canal network as large as possible--not for the sake of efficiency, but to milk the treasury. A state system would provide a grab-bag to reward the party faithful, and set a bad precedent. Though the friends of a state system argued that the whole state would benefit economically, farmers and land speculators would benefit most. And once the state had issued bonds to build irrigation works, could the legislature long resist the temptation to issue bonds to improve navigation and harbours, reclaim swamp lands, or build impoundment reservoirs for miners? Once "special interest" legislation rewarded one group of water users, the genie would be out of the bottle.

There were, of course, many other criticisms directed against a state system, including questions about the competence of California engineers to undertake such a vast, unprecedented project. By the end of the 1870s, almost as if by a process of elimination, the irrigation district emerged as the institutional alternative most likely to avoid the twin evils of corporate monopoly and legislative corruption.

NOTES

CHAPTER III - THE SEARCH FOR AN INSTITUTIONAL BASE: THE IRRIGATION MOVEMENT, 1850-1877

1. Sacramento Daily Union, December 25, 1854.
2. The California Water Atlas (Sacramento, 1978), 16.
3. S.T. Harding, Water in California (Palo Alto, California, 1960), 65-66.
4. Paul Wallace Gates, California Ranchos and Farms, 1846-1862 (Madison, 1967), 78; Henry S. Anderson, "The Little Landers Land Colonies: A Unique Agricultural Experiment in California," Agricultural History, V (October 1931), 139-150; Robert G. Cleland, The Cattle on a Thousand Hills: Southern California 1850-1880 (San Marino, California, 1951); Gilbert C. Fite, The Farmer's Frontier, 1865-1900 (New York, 1966), 156-174; O.O. Winther, "The Colony System of Southern California," Agricultural History, 27 (July 1953), 94-102.
5. Wallace Smith, Garden of the Sun (Fresno, California, 1956), 448-449; Harding, Water in California, 89-91, 94; I. Teilman and W.H. Shafer, The Historical Story of Irrigation in Central California (Fresno, California, 1943), 9; Joseph A. McGowan, History of the Sacramento Valley, v. 1 (New York, 1961), 389-392.
6. Cal Stats., 1857 _____ [add page reference]
7. As reprinted in the Daily Evening Bulletin (San Francisco), October 6, 1857.
8. Roy Robbins, Our Landed Heritage: The Public Domain, 1776-1970 (Lincoln, Nebraska, 1976), 154-156.
9. The swamp land bill of 1855 is reprinted in full in the Sacramento Daily Union, April 18, 1855. Also see Governor John Bigler's address to the California Legislature reprinted in the Union of January 10, 1856; Report of the Surveyor General for 1858, in Appendix to the Journals of the California Legislature, 9th sess (Sacramento, 1859), and Report of the Surveyor General for 1860 in Appendix to the Journals, 11th sess. (Sacramento, 1860), 12-13.
10. As reprinted in the Daily Alta California (San Francisco), December 20, 1857, and in the Daily Evening News (San Francisco), December 14, 1857.
11. The San Jose Tribune editorial was reprinted in the Sacramento Daily Union, January 13, 1858; the Stockton Weekly Democrat's statement is from the Union of January 28, 1858.
12. Sacramento Daily Union, February 3, February 9, and April 15, 1858. The quote is from the Union of April 7, 1859.
13. Sacramento Daily Union, December 15, 1860; April 3, 1862; November 28, 1870. Also see the reports for the state surveyor-general and board of swamp land commissioners for the early 1860s in the appendices to the journals of the legislature and Robert Kelley, "Taming the Sacramento: Hamiltonianism in Action," Pacific Historical Review, XXXIV (February 1965), 21-49; Kenneth Thompson, "Historic Flooding in the Sacramento Valley," Pacific Historical Review, XXIX (November 1960), 349-360; and Richard H. Peterson, "The Failure to Reclaim: California State Swamp Land Policy and the Sacramento Valley, 1850-1866," Southern California Quarterly, 56(Spring 1974).
14. Harding, Water in California, 145; Sacramento Daily Union, March 28, 1863.
15. W. Turrentine Jackson, Wagon Roads West: A Study of Federal Road Surveys and Construction in the Trans-Mississippi West, 1846-1869 (New Haven, 1952), 175-176, 201, 205; Norris Hundley, Water and the West: The Colorado River Compact and the Politics of Water in the American West (Berkeley, 1975), 19-20.
16. Barbara Ann Metcalf, "Oliver M. Wozencroft in California, 1849-1887," M.A. thesis, University of Southern California, 1963.

17. Cal. Stats., 1859, 392.
18. Cal. Stats., 1859, 238. Local groups had already tried to build roads across the desert. The Daily Alta California reported on June 28, 1858 that enterprising San Bernardino citizens were planning to dig wells at twenty mile intervals across the Colorado Desert. But shifting sands made building a road to Yuma nearly impossible.
19. Congressional Globe, 37 Cong., 2 sess. (1861-1862), Part III, 2379-2381; S. Rep. 276, 36 Cong., 1 sess. (serial 1040); H. Rep. 87, 37 Cong., 2 sess. (serial 1145).
20. The standard history of the Butterfield Overland is Roscoe P. Conkling and Margaret B. Conkling, The Butterfield Overland Mail, 1857-1869 (Glendale, California, 1947). Wozencroft's scheme did surface at least twice more in the California legislature. See A.B. 385 (Rockwell), introduced February 14, 1870 in Assembly Bills, 1869-1870, and S.B. 481 (Satterwhite), introduced March 2, 1876 in Senate Bills, 1875-1876, California State Law Library, Sacramento. Both bills failed to win much support, probably because state officials recognized the federal government's increasing reluctance to grant land to the states.
21. S. Misc. Doc. 84, 43 Cong., 1 sess. (serial 1584); Alta California (San Francisco), August 13, 1873; San Francisco Chronicle, January 13, 1887; John Wesley Powell, "The New Lake in the Desert," Scribner's Magazine, X (October 1891), 463-468.
22. Sacramento Daily Union, March 30, 1864. On the effects of the drought also see The Country Gentleman, 23(April 14, 1864), 244 and 23(May 19, 1864), 321; and The California Farmer, 21(March 11, 1864), 41.
23. Governor Frederick Low's annual address to the legislature was reported in the Sacramento Daily Union, December 9, 1865.
24. Annual Report of the State Surveyor General, 1856, in Appendix to the Journals, 8th sess., (Sacramento, 1857), 24-26. The quote is from p. 26. Also see the Third Biennial Report of the Department of Engineering of the State of California, December 1, 1910 to November 30, 1912, in Appendix to the Journals, 40th sess., v. 4 (Sacramento, 1913).
25. Gates, California Ranchos and Farms, 79-80; Sacramento Daily Union, April 5, 1856; A.B. 84 (Leihy), introduced February 12, 1856. The California State Law Library's collection of bills begins with the 1868 session. Bills introduced in earlier sessions may be found in the California State Archives, Sacramento. Also see Majority Report of Special Committee to whom was Referred Assembly Bill No. 84, in Appendix to the Journals, 7th Sess., (Sacramento, 1856).
26. Report of the California State Board of Agriculture for the Years 1864-1865, in Appendix to the Journals, 16th sess., v. 2 (Sacramento, 1866), 22.
27. The quote is from the Sacramento Daily Union, September 1, 1865. Also see the Daily Alta California, October 19, 1865.
28. The best survey of Will S. Green's life is John P. Ryan's "Notes on Will S. Green, Father of the Glenn-Colusa Irrigation District," a typescript manuscript on the Bancroft Library, University of California, Berkeley. Also see Julian Dana, The Sacramento: River of Gold (New York, 1939), 192-193, and McGowan, History of the Sacramento Valley, I, 236.
29. The Weekly Colusa Sun, April 16, 1864 and December 10, 1864.
30. The Weekly Colusa Sun, October 22, 1864 and November 12, 1864. The quote is from the latter issue.
31. The Weekly Colusa Sun, November 26, 1864; April 1 and April 15, 1865. Transactions of the California State Agricultural Society, 1864, in Appendix to the Journals, 16th sess., v. 3 (Sacramento, 1866), 37; Report of the Surveyor General for 1865, in Appendix to the Journals, 16th sess., (Sacramento, 1866), 108.
32. The Weekly Colusa Sun, September 9 and 23, 1865.

33. Report of the Senate Committee on Assembly Bill No. 321, in Appendix to the Journals, 16th sess., v. 3 (Sacramento, 1866). Also see Report of Committee on Internal Improvements of the Assembly on Assembly Bill No. 321 in the same volume.
34. Report of the Engineer of the Sacramento Valley Irrigation and Navigation Canal, Appendix to the Journals, 17th sess., v. 2 (Sacramento, 1868). The quote is from p. 31. Also see William Bryan's letter to I.N. Hoag, Secretary of the California State Board of Agricultural in the Biennial Report of the Board of Agriculture of the State Agricultural Society for the Years 1866 and 1867, in Appendix to the Journals, 17th sess., v. 3 (Sacramento, 1868), 47. Bryan had apparently travelled in Europe and the Middle East and observed irrigation as practiced there. Perhaps this was one reason he won the appointment to survey the canal. In any case, in April, 1866, he published a series of articles on irrigation in Italy and India, the first systematic attention paid by a California engineer to irrigation outside the United States. See the Sacramento Daily Union, April 5, 13, 20 and 27, 1866.
35. Report of the Commissioners Appointed to Examine into the Practicability of Making a New Outlet for the Flood Waters of the Sacramento Valley, in Appendix to the Journals, 18th sess., v. 3 (Sacramento, 1870); H. Exec. Doc. 290, 43 Cong., 1 sess. (serial 1615), 29. A modified scheme to build a dual-purpose canal from Red Bluff to Benicia was proposed in 1873 by John K. Luttrell, a candidate for the state legislature. He suggested that the state issue bonds at 7% interest and loan the money to Tehama, Colusa, Yolo, and Solano counties to finance construction. The counties would repay the state using revenue from water sales. However, the scheme was doomed to failure because the state constitution forbade the state from loaning its credit to any person, corporation, or county, and the state debt ceiling--also set by the constitution was well below the cost of the project. See The Weekly Colusa Sun, December 6, 1873.
36. The Daily Bee (Sacramento), June 23, 1873. Also see the Alta California (San Francisco), March 6, 1869.
37. The Evening Bulletin (San Francisco), October 6 and November 3, 1871. On the drought, also see The Weekly Colusa Sun, July 8, 1871 and the California Mail Bag, I (December, 1871), 3. The federal irrigation commission of 1873-1874, discussed later in this chapter, reported: "The rain-fall of the years 1868-'69, 1869-'70, [and] 1870-'71, was marked as not only below the average over the whole extent of the country but throughout the southern section south of Monterey, and in the southern part of the Great Valley the rain-fall was so limited that neither grain nor grass grew. Hundreds of farms were abandoned, and stockmen were compelled to drive their cattle, horses, and sheep to the gulches of the mountains not only for food but for water. In February, 1870, not a blade of grass was to be seen over the extensive valley of the Santa Clara; and the broad plains of Los Angeles...were nearly desolate even to the borders of the streams. From Tulare Lake to San Diego, the country was nearly desolate; and in March, 1871, the usual season when the crops should be luxuriant, not a blade of grass was to be seen over the great plains and through the valleys, which are richly covered after favorable rains." H. Exec. Doc. 290, 43 Cong., 1 sess. (serial 1615), 15-16. California newspapers did not begin to recognize the drought's effects until 1870 and 1871, perhaps because its cumulative results--painfully reflected in abandoned farms and bankruptcy proceedings--were not immediately evident.
38. Alta California (San Francisco), March 31, 1871.
39. Sacramento Daily Union, June 9, 1870; Pacific Rural Press, I(April 15, 1871), 232 and II (November 18, 1871), 309; The Weekly Colusa Sun, December 2, 1871; Smith, Garden of the Sun, 449.
40. Harding, Water in California, 92.
41. George H. Morrisson, typescript biography of John Bensley, in the Hubert Howe Bancroft Collection, Bancroft Library.
42. Alta California (San Francisco), January 9, 1866.
43. David Lavender, Nothing Seemed Impossible: William C. Ralston and Early San Francisco (Palo Alto, California, 1975), 353-355.

44. Pacific Rural Press, I (May 20, 1871). Also see the issues of May 13 and May 27, 1871.
45. As reprinted in The Daily Bee (Sacramento), May 23, 1871. Although Bensley gave up his primary interest in the canal company in May, the company was not formally reorganized until the new company's first Board of Trustees meeting was held on September 9, 1871. At that time the San Joaquin and King's River Canal Company was re-christened the San Joaquin and Kings River Canal and Irrigation Company.
46. Robert M. Brereton, Reminiscences of an Old English Civil Engineer (Portland, Oregon, 1908), 23-24; Brereton to George Davidson, September 3, 1910 and April 14, 1911 in the George Davidson Collection, Bancroft Library.
47. See Brereton's statement in Ezra S. Carr, The Patrons of Husbandry on the Pacific Coast (San Francisco, 1875), 310-313.
48. Brereton's general report dated August 19, 1871, is reprinted in his Reminiscences of Irrigation-Enterprise in California (Portland, 1903), 54-59. His more detailed second report, dated October 6, 1871, is reprinted on pp. 59-73 of the same volume. All quotes are from the two reports.
49. The Stockton Daily Independent, August 15 and October 18, 1871, and January 20, 1872; Pacific Rural Press, II (October 7, 1871), 216; William D. Lawrence, "Henry Miller and the San Joaquin Valley," M.A. thesis, U.C. Berkeley, 1933, 101; E.F. Treadwell, The Cattle King, (Boston, 1950), 67. The first stretch of canal was not completed until January, 1873. The first irrigated crops were harvested in 1874.
50. The Stockton Daily Independent, August 15, 1871; Sacramento Daily Union, November 3, 1871; California Mail Bag, I (December 1871), 3.
51. William C. Ralston to Newton Booth, January 18, 1872, as reprinted in Brereton, Reminiscences of an Old English Civil Engineer, 1858-1908, 74-75; Memorial Asking Aid from Congress for Irrigating Purposes, in Appendix to the Journals, 19th sess., v. 3 (Sacramento, 1872), 4. Sacramento Daily Union, January 29, 1872; The Stockton Daily Independent, January 30, 1872.
52. C.J.F. Stuart to William Ralston in the Oriental Bank Corporation files in the William Ralston Collection, Bancroft Library. Also see Stuart to Ralston, July 27, 1872, and Brereton to Ralston, July 17, 1872.
53. For the bill itself see the Sacramento Daily Union, March 1, 1873. Also see The Stockton Daily Independent, February 14, 1873, and Cornelius Cole to William Ralston, February 2, 1873 in the Ralston Collection. The quote is from the Congressional Globe, 42 Cong., 3 sess., February 27, 1873, 1846.
54. The bill (S. 1584) is reprinted in the Congressional Globe, 42 Cong., 3 sess., vol. 46:3, 305.
55. Congressional Globe, 42 Cong., 3 sess., vol. 46:3, 1930. The Daily Bee (Sacramento), Feb 25 and March 27, 1873; The Stockton Daily Independent, February 25, March 3 and 8, 1873; The San Francisco Chronicle, March 17, 1873; The Weekly Colusa Sun, March 1, 1873.
56. RG 77 (Office, Chief of Engineers, U.S. Army), "Letters Received, 1871-1876 (1873:927)". National Archives, Washington, D.C. This file contains monthly reports outlining the commission's activities and itinerary.
57. George Davidson to Superintendent, U.S. Coast Geodetic Survey, June 23, 1873, Letterbook, v. 26 (1873), Davidson Collection, Bancroft Library. Also see Davidson's letters to the Superintendent dated July 19, August 6, and November 24, 1873, and his "Annual Report for 1873" in George Davidson Letterbook for October 1873-February 1874, microfilm from originals at the California Academy of Sciences, Bancroft Library; The Weekly Colusa Sun, May 17, 1873; The Stockton Daily Independent, May 16, 1873.
58. The Stockton Daily Independent, June 23, 1873.
59. H. Exec. Doc. 290, 43 Cong., 1 sess. (serial 1615), 16, 23-24, 34, 38.

60. Ibid., 27. See the map appended to the report. Though the commission paid little attention to storage reservoirs, it did note the value of such structures in reclaiming valley swamp land and providing water to miners in the foothills. While the report estimated that reservoirs could help irrigate as much as 1,000,000 acres of additional land in the Central Valley, the construction of canals to tap normal stream-flow took precedence (pp. 39-40). Not until the late 1880s and 1890s would westerners pay much attention to capturing "flood" waters. By that time, most of the surface flow had already been appropriated.
61. The commission's conclusions were reprinted on pp. 77-80 of the report.
62. For example, John Gance, in his classic "The Beginnings of Irrigation in the United States," Mississippi Valley Historical Review, XXV (June 1938), 59-78, devotes only two hasty paragraphs (pp. 72-73) to the Alexander Commission without discussing its conclusions. His earlier "The Origin of a National Reclamation Policy," Mississippi Valley Historical Review, XVIII (June 1931), 34-52, fails to mention the commission. More recent historians have also neglected the commission. See, for example, Paul Wallace Gates "Reclamation of Arid Lands" in his monumental History of Public Land Law Development (Washington, D.C., 1968), 635-698, and William Lilley III and Lewis L. Gould, "The Western Irrigation Movement, 1878-1902: A Reappraisal," in Gene Gressley, ed., The American West: A Reorientation (Laramie, Wyoming, 1966). Neither mentions the Alexander Commission. Stanley Roland Davison, in his excellent The Leadership of the Reclamation Movement, 1875-1902 (New York, 1979), concludes that for 1873 the Alexander Commission's findings were "fairly advanced" (p. 74), but Davison does not fully discuss the significance of its conclusions.
63. RG 77 (Office, Chief of Engineers, U.S. Army), "Letters Received, 1871-1886 (1873: 2414)".
64. George Perkins Marsh, "Irrigation: Its Evils, the Remedies, and the Compensations," S. Mis. Doc. 55, 43 Cong., 1 sess. (serial 1584), 4. Marsh's report was also published on pp. 362-381 of the Commissioner of Agriculture's Report for 1874. On Marsh's career see David Lowenthal, George Perkins Marsh: Versatile Vermonter (New York, 1958), and Arthur A. Ekirch, Jr., Man and Nature in America (New York, 1963), 70-80.
65. Marsh, "Irrigation...", 6, 7, 9, 11-12.
66. Marsh, "Irrigation...", 14-19. The long quote is from p. 17.
67. The Stockton Daily Independent, Feb 1, 15, and 22, 1873. The judgment of the Independent concerning the inadequacy of the canal was later echoed by John S. Hittell in Commerce and Industries of the Pacific Coast (San Francisco, 1882), 404-405.
68. Ira B. Cross, in his A History of the Labor Movement in California (Berkeley, 1935), presents an excellent discussion of the economic problems of the 1870s on pp. 60-72. Also see Ralph Kauer, "The Workingman's Party of California," Pacific Historical Review, XIII (September 1944), 279-280. Cross notes that the economic slump of the 1870s was not uniform in its effects. The worst years were 1869-1872 and 1875-1877.
69. Clarke A. Chambers, California Farm Organizations (Berkeley, 1952), 9. Also see Solon J. Buck, The Granger Movement: A Study of Agricultural Organization and its Political Economic and Social Manifestations, 1870-1880 (Cambridge, Mass., 1913); Carr, The Patrons of Husbandry on the Pacific Coast; Gerald L. Prescott, "Farm Gentry vs. the Grangers: Conflict in Rural America," California Historical Quarterly, 56 (Fall 1977), 328-345; and Rodman Paul, "The Great California Grain War: The Grangers Challenge the Wheat King," Pacific Historical Review, 27 (November 1958), 331-350.
70. Gerald Nash, State Government and Economic Development (Berkeley, 1964), 161; Paul "The Great California Grain War," 333-334, 344; Prescott, "Farm Gentry vs. the Grangers," 345 (fn. 46).
71. The Daily Bee (Sacramento), May 23, 1873.
72. Sacramento Daily Union, July 19, 1873. The terms of the bill were discussed in a separate column in the same issue.

73. Pacific Rural Press, 6(October 18, 1873), 248. Also see the Sacramento Daily Union, July 2, 1873; The Stockton Daily Independent, July 2, 4 and 10, 1873; and The Weekly Colusa Sun, July 5, 1873.
74. The Stockton Daily Independent, December 20, 1873; The Weekly Colusa Sun, December 20, 1873; Pacific Rural Press, 7(April 4, 1874), 210.
75. Robert M. Brereton to George Davidson, September 29, 1911, in the Davidson Collection, Bancroft Library. Also see Brereton's Reminiscences of Irrigation-Enterprise in California, 7-8; The Evening Bulletin (San Francisco), May 18, 1874; and the San Francisco Post, May 18, 1874.
76. Brereton, Reminiscences of an Old English Civil Engineer, 25, 30; Brereton to George Davidson, September 3, 1910, in the Davidson Collection, Bancroft Library; Henry Miller dictation in the Hubert Howe Bancroft Collection, Bancroft Library; Treadwell, The Cattle King, 73. Apparently, Miller & Lux did not own a majority of the canal company's stock until 1877, when John Bensley went bankrupt.
77. Harding, Water in California, 100; Treadwell, The Cattle King, 77.
78. For Ralston's "Central Valley Project" see his letter to "My Dear Lawton," May 5, 1873 in the Ralston Collection, Bancroft Library, and J. Ross Browne, "Agricultural Capacity of California--Overflows and Droughts," Overland Monthly, XX (April 1873), 313.
79. Annual Reports to the Chamber of Commerce of San Francisco, 1872 (San Francisco, 1872), 15.
80. The Weekly Colusa Sun, December 2, 1871; The Daily Stockton Independent, February 28, 1872.
81. A.B. 553 (Sensabaugh), introduced March 7, 1872 in Assembly Bills, 1871-1872, California State Law Library.
82. Thomas E. Malone, "The California Irrigation Crisis of 1886: Origins of the Wright Act," Ph.D. diss., Stanford, 1965, 44-46. Private bills were extremely popular during the 1870s, and the fact that they frequently found their way through the legislature despite strong local opposition helps explain why the Constitution of 1879 prohibited such legislation.
83. Elwood Mead, Irrigation Institutions (New York, 1910), 234.
84. Harding, Water in California, 142; W.W. Robinson, Land in California, (Berkeley, 1948), 191-192; Sacramento Daily Union, March 5, 1861, February 25, 1862, November 27, 1869, November 28, 1870. Also see the references cited in note 13.
85. The Daily Stockton Independent, March 1, 1872.
86. Cal. Stats., 1872, 945.
87. The Stockton Daily Independent, February 1, 1873; May 12, 16, 26, and 28, 1873; April 28, 1873.
88. The Daily Bee (Sacramento), May 13, 22, June 5, 1873. The quote is from the May 22 issue. Also see The Weekly Colusa Sun, May 31, 1873.
89. The Daily Bee (Sacramento), July 2, 1873.
90. Carr, The Patrons of Husbandry on the Pacific Coast, 147-148. The July convention was held the following November, at which time conferees simply ratified the statement of principles adopted in July. See the Pacific Rural Press, 6(November 15, 1873), 308.
91. Transactions of the California State Agricultural Society During the Year 1873, in Appendix to the Journals, 20th sess., v. 6 (Sacramento, 1874), 475.

92. Carr, The Patrons of Husbandry on the Pacific Coast, 305-308; Daily Express (Los Angeles), October 25, 1873; Sacramento Daily Union, October 27, 1873. At about the same time the Los Angeles convention met, proponents of irrigation met in Denver and urged Congress to grant half of the arid public domain to the states--excluding mineral lands--to aid in reclamation. The drought of the early 1870s was felt throughout the West, not just in California. For the proposals of the Denver convention see Carr, p. 309.
93. The Weekly Colusa Sun, November 22, 1873; Pacific Rural Press, 6(November 1, 1873), 278; The Stockton Daily Independent, December 13, 1873.
94. The Stockton Daily Independent, December 18, 1873, and April 14, 1873.
95. A.B. 172 (Venable), introduced January 21, 1874, in Assembly Bills, 1873-1874, v. 1. California State Law Library. Also see the Pacific Rural Press, 7(January 31, 1874), 73, and The Stockton Daily Independent, February 3, 1874.
96. The Stockton Daily Independent, February 27 and March 20, 1874; the Pacific Rural Press, 7(March 28, 1874).
97. Sacramento Daily Union, March 7, 1874; The Stockton Daily Independent, March 27, 1874; The Weekly Colusa Sun, February 28, and March 8, 1874.
98. Cal. Stats., 1874, 312.
99. Pacific Rural Press, 9(April 17, 1875), 250; May 1, 1875, 283; May 29, 1875, 360; The Weekly Colusa Sun, May 1 and May 29, October 16, 1875; Sacramento Daily Record-Union, May 22 and 25, 1875; Smith, Garden of the Sun, 450-451. The Colusa Sun of May 29, 1875, also revealed that a public meeting had been held on May 22, 1875, to promote irrigation in the Sacramento Valley. However, irrigation districts did not enjoy much popularity in that part of the Central Valley. Will Green reported that "[t]he advantages of irrigation was admitted by all, but most of them were opposed to the State lending its credit for the purpose of carrying out a system, and also against allowing [district] Trustees or Commissioners to tax land for the purpose." Green outlined his modest district scheme, based on the formation of joint-stock companies rather than special tax districts, in the Sun of September 25, 1875. His bill was also discussed in the Rural Press, 10(October 2, 1875), 216.
100. The Stockton Daily Independent, July 20, 1875.
101. The Weekly Colusa Sun, October 30, 1875; San Francisco Chronicle, November 21, 1875.
102. Oscar T. Shuck, Bench and Bar in California (San Francisco, 1889), 340-341. Creed Hammond was a prominent California attorney who represented the railroad in many of its rate cases. He also pleaded at least one case on behalf of the hydraulic mining companies which had been sued by farmers for flooding the low-lands with debris. The hydraulic mining controversy's relationship to the irrigation crusade is discussed in the next chapter.
103. S.B. 80 (Haymond), introduced December 20, 1875, in Senate Bills, 1875-1876, California State Law Library.
104. For editorials opposing the Haymond bill see the Sacramento Daily Record-Union, December 22, 1875; The Weekly Colusa Sun, January 8, 1876; and The Stockton Daily Independent, January 14, 1876.
105. S.B. 233 (O'Connor), introduced January 20, 1876 in Senate Bills, 1875-1876, California State Law Library. Also see The Stockton Daily Independent, January 28, 1876.
106. A.B. 89(McConnell), introduced January 4, 1876, in Assembly Bills, 1875-1876, California State Law Library.
107. S.B. 9(Lindsey), introduced December 9, 1875, in Senate Bills, 1875-1876, California State Law Library.

108. Cal. Stats., 1876, 731 and 885. Also see the Daily Evening Bulletin (San Francisco), April 7, 1876; the Pacific Rural Press, 11(April 1, 1876), 209 and April 8, 1876, 233; The Stockton Daily Independent, April 22, 1876.
109. Pacific Rural Press, 11(June 10, 1876), 369 and 12(July 8, 1876), 36; Daily Alta California (San Francisco), November 26, 1876.
110. Cross, History of the Labor Movement in California, 70; Lawrence, "Henry Miller and the San Joaquin Valley," 116; The Stockton Daily Independent, January 3, 1877; The Country Gentleman, 43(February 14, 1878), 105.
111. Sacramento Daily Record-Union, March 7, 1877; Pacific Rural Press, 13(March 17, 1877), 168; Daily Alta California (San Francisco), March 29, 1877.
112. Pacific Rural Press, 13(March 31, 1877), 193; April 21, 1877, 249; April 28, 1877, 257; The Stockton Daily Independent, April 21, 1877; The Sacramento Daily Record-Union, April 24 and 30, 1877; the Daily Alta California (San Francisco), April 27 and 30, 1877. The quote is from the Alta of April 30.
113. The Daily Stockton Independent, April 24 and 28, 1877. The quote is from the issue of April 24.
114. Sacramento Daily Record-Union, May 4 and 11, 1877; The Stockton Daily Independent, May 7 and June 9, 1877; Pacific Rural Press, 13(May 12, 1877), 296. The Union of January 12, 1878, reported that there were 50 Grangers who held seats in the legislature, nearly 42 percent of the total delegation.
115. Transactions of the California State Agricultural Society During the Year 1876, in Appendix to the Journals, 22 sess., v. 3 (Sacramento, 1877), 110-111; Biennial Report of the Surveyor General of the State of California from August 1, 1873 to August 1, 1875, in Appendix to the Journals, 21 sess., v. 2 (Sacramento, 1875), 44-45; Biennial Report of the Surveyor General of the State of California from August 1, 1877-1879, in Appendix to the Journals, 23 sess., v. 4 (Sacramento, 1879), 26-29, 48-49. Statistics culled from these reports must be used with caution. Many counties failed to report regularly and estimates prepared by the surveyor general and state agricultural society often differed markedly.
116. Gerald D. Nash, State Government and Economic Development: A History of Administrative Policies in California 1849-1933 (Berkeley, 1964), 10-26, 79. The quote is from p. 79.
117. For examples of support for state irrigation surveys see the Annual Reports to the Chamber of Commerce of San Francisco, 1872 (San Francisco, 1872), 18; The Stockton Daily Independent, January 30, 1872 and February 20, 1873; J. Ross Browne, "Agricultural Capacity of California--Overflows and Droughts," Overland Monthly, XX(April 1873), 303; Sacramento Daily Record-Union, May 5, October 8, October 15, October 22, November 6, and December 9, 1875; February 25, 1878; Pacific Rural Press, 12 (December 2, 1876), 372.
118. Sacramento Daily Union, November 28, 1871.
119. Transactions of the California State Agricultural Society During the Year 1873, Appendix to the Journals, 20 sess., v. 6 (Sacramento, 1874), 609. For other examples of the link between anti-monopoly sentiment and support for a state irrigation system see the Biennial Report of the State Board of Agriculture for the Years 1870 and 1871, Appendix to the Journals, 19 sess., v. 3 (Sacramento, 1872), 25-26; California Mail Bag, I(December 1871), 33; Pacific Rural Press, 6(October 11, 1873), 232; The Daily Bee (Sacramento), October 1, 1875; and the Fresno Expositor as reprinted in the Sacramento Daily Record-Union, January 12, 1878.
120. Alta California (San Francisco), May 28, 1871.

IV. STALEMATE: IRRIGATION IN THE CALIFORNIA LEGISLATURE, 1878-1889

The irrigation crusade began in the 1870s, touched off by drought and depression, and reached flood tide in the middle 1880s. During the 1870s, irrigation and private water companies were in their infancy. But irrigation expanded at a much more rapid rate during the following decade. The end of the persistent depression freed money for investment in irrigation projects; the railroad had opened vast tracts of virgin land to farmers; and a real estate boom in southern California lured thousands of new settlers into that part of the state. However, the growth of irrigation promoted an intense, and often sordid, struggle for the state's unappropriated water. The state legislature grappled unsuccessfully with a series of inter-related water problems. For example, how could California's water laws be revised to protect and encourage investors, yet adequately guard against monopoly? How could the needs and interests of different groups of water users be reconciled? And how could a "centralized" state water plan succeed given California's rigid sectional differences? The legislative struggle culminated in the special session of 1886--devoted entirely to irrigation--and the adoption of the Wright Irrigation District Law in 1887.

When the new legislature met in December, 1877, the West Side Irrigation District stood high on its agenda. As mentioned in the last chapter, Contra Costa County residents bitterly opposed inclusion in the district, and most district boosters hoped to reduce the canal's cost by eliminating the navigation features. But the need to revise the law became imperative shortly after the first West Side election when Henry Miller won an injunction suit "...based on the unconstitutionality of the act and all proceedings under it were enjoined."¹ Not surprisingly, the 1878 West Side law excluded Miller's land and the San Joaquin and Kings River Canal and Irrigation Company's aqueduct. The Assembly Committee on Irrigation and Water Rights argued that Miller already sold water to farmers, providing a useful "public service." Hence, the courts might rule against the district's "higher good" argument in a condemnation suit. In any case, such a suit would be lengthy and expensive, and construction on the canal could not begin until the courts had arranged a financial settlement. The committee estimated the canal's value at \$1,300,000--more than half the \$2,000,000 bond issue authorized by the 1878 law. Thus, condemnation would virtually exhaust the district treasury. In order to survive, the district would be forced to appeal to the state for more bonds, or a direct subsidy. Yet the district faced a cruel dilemma--one which must have comforted

Henry Miller and the stockmen. Since the 1878 law excluded Contra Costa and Alameda counties, as well as Miller's land and the canal, the district's tax base, now restricted exclusively to sparsely settled agricultural land, had virtually disappeared. When the \$2,000,000 bond issue went on sale in December, 1878, the bonds contained a lien on 325,000 acres within the district valued optimistically at \$6 an acre. In effect, the total value of the collateral was about equal to the face value of the bonds, and much less than the total interest debt. Thomas Malone has offered several explanations for the West Side District's failure including an inadequate water supply; the discovery that water from Tulare Lake was too alkaline for irrigation; the beginning of a wet cycle in 1878; the apparent defection of an important district leader to the cattlemen; and the state's refusal to back the district bonds. But the over-riding reason was simple--the bonds did not sell. Depression-weary investors looking for a secure return did not find irrigation district bonds attractive. As the Daily Alta California accurately predicted on December 16, 1878: "The trouble will probably be that the best legal and engineering talent of the State will not recommend the investment."²

The same legislature also approved a second irrigation district law in 1878, one which pertained exclusively to the lands between the Stanislaus and Tuolumne rivers in Stanislaus County. As noted in the last chapter, the county first tried to promote irrigation in 1872, but the fear of monopoly turned most of its residents against private ditch and canal companies. Consequently, in 1878 the legislature approved a novel institutional alternative--the joint-stock company--in an attempt to encourage canal building. The scheme grew out of the assumption that irrigation invariably drove up tax revenue as it increased land values. The law provided that any five or more people could incorporate to irrigate land within the "Modesto Irrigation District"--roughly that land presently included in the Turlock and Modesto irrigation districts. The incorporators would issue stock, but only landowners could purchase shares, and then no more than one share for each acre of land owned. This was essentially the principle employed by mutual water companies. Once Stanislaus County farmers had purchased 50,000 shares of stock, the County Board of Supervisors could issue \$25,000 in six to eight percent bonds. Upon the completion of each five mile stretch of canal, the board could issue an additional \$25,000 in bonds, up to a total of \$500,000. The law pledged any increase and principle on the loan, but neither the county or state assumed financial responsibility for repayment. It also forbade raising taxes to pay off the debt, and limited assessments against stock necessary to maintain the canals to a maximum of \$1.50 per acre.³ Nothing came of the "Modesto Irrigation District," perhaps because the need for

irrigation was not keenly felt in Stanislaus County during the rainy years of 1878-1881. Nevertheless, the law illustrated the range of measures considered during the late 1870s and 1880s to raise money for irrigation works.

The West Side and Modesto Irrigation acts were only two of the bills considered by the 1878 legislature. Three others resembled legislation enacted or considered at earlier sessions. Two special irrigation district bills were introduced, one pertaining to Fresno and Tulare counties, and the other to Los Nietos township in Los Angeles County.⁴ The most familiar piece of "old business" came from state Senator Creed Haymond, who again introduced his bill to create a state irrigation commission responsible for defining irrigation districts and constructing canals. The legislation fared no better than it had two years earlier, though Haymond now served as chairman of the Senate Committee on Irrigation.⁵ Finally, the legislature, under the ominous shadow of the Desert Land Act approved in 1877 (discussed later in this chapter), moved to protect against corporate greed and clarify jurisdiction over unappropriated water on the public domain. It appealed to Congress to grant all surplus water to the states and territories.⁶

The legislature's reluctance to consider broad irrigation schemes was understandable. The rainy winter of 1877-1878 produced extensive flooding in the Central Valley, which resembled an inland sea after the rains of late February. The flood waters swept away homes, inundated towns, drowned livestock, and choked prime farmland with silt and debris. The drought of 1876-1877 soon became only a bitter memory. Moreover, General B.S. Alexander, who had headed the federal irrigation commission of 1873-1874, told the state senate's irrigation committee that two years of comprehensive engineering surveys would be required to prepare a state water "plan."⁷

The legislature took Alexander's advice by authorizing the first survey of water resources undertaken by any of the United States. By a two to one vote, the lawmakers created the office of state engineer, and appropriated \$100,000 "...to provide a system of irrigation, promote rapid drainage and improve the navigation of the Sacramento and San Joaquin Rivers." The salary of the state engineer reflected the new office's importance; his \$6,000 annual compensation matched the governor's. Three hydrographic forces had converged to produce the new law: the drought of 1877, the flood of 1878, and hydraulic mining debris. Not surprisingly, the state engineer was expected to address each of these problems. However, the irrigation surveys promised to be his most demanding job. Flood and debris damage were limited to specific parts of California, particularly in the Sacramento

Valley, but irrigation could be practiced almost anywhere in the state. The new law ordered the state engineer go locate and map all land capable of irrigation; divide these lands into natural drainage districts; designate the best water sources in each district; determine the average annual water supply; prepare plans for irrigation works; and give his "... opinion and advice to such parties as may be engaged in irrigating a district, or who may be about to undertake the irrigation of a district."⁸

The governor, perhaps as a sop to the Grange, appointed William Hammond Hall as the first state engineer. Hall was born in Maryland in 1846, began his engineering career as a draftsman for the U.S. Corps of Engineers, then worked as a surveyor and field engineer for the U.S. Board of Engineers for the Pacific Coast. In 1870, he conducted a topographic survey of San Francisco's Golden Gate Park--then little more than a series of sand dunes--and served as the city's Engineer and Superintendent of Parks from 1871-1876. From 1876-1878, he worked as the West Side Irrigation District's chief engineer. Hall enjoyed the reputation of a brilliant young engineer, but he was also a cold, aloof, and abrasive individual who did not adapt well to the give and take of political life. Much like John Wesley Powell, he approached his work as a "scientist" dedicated to the principle of long-range water planning. But unfortunately he lacked the bureaucratic skills and public support to achieve his objectives.⁹

As the legislature of 1878 disbanded at the beginning of April, the Stockton Independent bitterly commented that "...it may be unhesitatingly asserted that no former legislature has been so generally condemned and there has been none that has so completely lost the confidence of the people."¹⁰ The Independent's biennial lashing contained more than its usual sting in part because the legislature seemed to have "dodged" irrigation and water rights. True, it had authorized irrigation surveys, but whether the state engineer would do any more to stimulate irrigation than the federal commission of 1873-1874 remained to be seen. Still, the Independent and other critics overlooked one basic reason for the legislature's caution. In September, 1877, the state's voters finally, after rejecting the legislature's call for a constitutional convention in 1873-74 and 1875-76, approved the meeting. California's lawmakers were often reluctant to tackle controversial issues anyway, and they used the impending convention as a justification and excuse to defer action on thorny issues.

The convention had ostensibly been called because the Constitution of 1849 contained only a few lines on taxation, an omission which became particularly galling during the protracted depression of the 1870s. But Hubert Howe Bancroft, whose monumental history of

California still bears close reading, attributed the convention to the blighted dreams of treasure-seekers:

Many of those who had esteemed themselves favorites of fortune when the tide was at flood, now found themselves stranded on barren sands. They had lost the ability to return to the monotonous groove of their pre-California lives; and having also lost their place in the ranks of progress here, were falling out by the wayside. Their youth was fled, their shoulders bent, their locks thin and gray; they could no longer dig, had gold been as plenty as in '49; but they still had the restless aspiring, projective spirit, and were unwilling to go down to oblivion. These men believed, or affected to believe, in the efficacy of a new constitution to cure the ills from which they suffered.¹¹

The new Workingmen's Party joined the Grangers in attacking the unequal distribution of wealth and political power in California. These shrill critics hoped that a new constitution would mitigate or eliminate inequities in taxation, corruption and inefficiency in government, the railroad's stranglehold over transportation, the poisonous effects of land and water monopolies, speculation in stocks and bonds, the servile labor class represented by the Chinese, and an inadequate money system based on a metallic currency. As one historian of the constitutional convention has noted, farmers took the lead because "...most of these grievances were of particular importance to the agricultural interests of the state..."¹²

The Constitution of 1849 had been drafted to suit a frontier economy based on mining and stock-raising. It resulted in a tax-assessment system which bore heavily on land used for agriculture because growing crops were taxed along with the land itself, in effect encouraging land speculators and cattle barons who used the grass nature provided to feed their roving herds of livestock. As the Sacramento Union remarked in 1875,

...as the case stands the men who own the largest tracts of land in the San Joaquin Valley are actually opposed to irrigation, for the simple reason that they can make more out of the land by feeding stock on its natural pasturage than by breaking it up into small holdings and preparing it for artificial irrigation... So long as the owner of ten or twenty thousand acres can get the County Assessor and Board of Equalization to assess his land so low that it pays him to feed stock on it, so long will he shirk the trouble and expense attending the division of the land into small farms, and the distribution on water upon it.

Similarly, California law continued to treat water rights as a variety of private property long after the mining industry began its long economic decline in the early 1870s. Iron-clad water rights were unsuited to an economy rooted in intensive agriculture; irrigation demanded that community needs take precedence over private profit. However, neither the courts nor legislature provided effective control over the acquisition of water rights, or the rates charged by irrigation or municipal water companies. In 1975, the Union also cited a classic example of the effects of monopoly. Grangers in Kingsburg, on the Kings

River, had begun to irrigate land directly from that stream only to encounter a court injunction pressed by a water company which claimed sole ownership of the river. The company forced the farmers to go twenty miles upstream from their lands to acquire water, and charged them \$6,000 for the privilege of constructing the canal. In addition, it levied an annual charge for the water itself. The newspaper commented: "The wrong, the crime against the country, lies above and beyond them [the monopolists and speculators]. It lies in the existence of laws by which speculators acquire such rights."¹³ The basic problem was that however ill-founded California's water laws, many rights had already become vested.

The constitutional convention began its deliberations in September, and formed a "Committee on Water and Water Rights" to draft that section of the document concerned with water. Many vexing legal questions confronted the group, including: What were the precise water rights of the federal government vis-a-vis the states? Could the state assert control over non-navigable streams, even if they originated on or flowed through the public domain? What constituted a "navigable" stream, and could the state permit diversions from such streams if no damage to shipping resulted? Could the state constitution be amended to give private water companies or irrigation districts the right to condemn established water rights, or would this violate the equal protection of property rights promised by the U.S. Constitution? Should the new constitution assert absolute public control over all water, or only that quantity of water claimed by private companies, or only the volume claimed by private companies to serve a "public use"? Finally, should the architects of the new constitution provide for a state system of irrigation--if only to protect the unappropriated water supply?

The Committee on Water and Water Rights had plenty to talk about. Well over a dozen legal proposals came from the floor of the convention alone. At one extreme were provisions to dramatically strengthen state control. These included James O'Sullivan of San Francisco's unified state irrigation system, Presley Dunlap of Sacramento County's prohibition on any further appropriations of water by individuals or corporations, and Volney E. Howard of Los Angeles County's amendment to permit state condemnation of existing water rights.¹⁴ At the other extreme were a handful of delegates who wanted to protect and expand corporate water rights, as sanctioned by the doctrine of appropriation. These included delegate W.J. Tinnin of northern California's Third Congressional District's proviso that the right to claim water "...for mining, manufacturing, agricultural, or domestic purposes, from any stream or lake in this State, shall never be denied," to John R.W. Hitchcock of San Joaquin

County's amendment to give individuals and corporations constitutional authority to condemn land for the construction of canals and ditches.¹⁵ In the middle were a series of proposals to declare all water public property, but allow appropriation subject to state supervision over the acquisition of water rights and distribution of water.¹⁶

The entire convention considered the committee's report in January and February, 1879. For a variety of reasons, most delegates did not want the constitution to be too explicit or detailed, and this undermined the possibility of using the document to sanction a state irrigation system. Since the Grangers were split between proponents of irrigation districts and partisans of a unified state system, such a scheme had little chance anyway; it won little support in committee. Delegate W.J. Tinnin condemned state irrigation works as wholly impractical. The federal government had shown no inclination to help redeem the arid lands, so any comprehensive project would be far beyond the state's limited resources. Tinnin predicted that a comprehensive system would cost at least \$300,000,000 to \$400,000,000. The state could not construct canals by taxing the land itself, because most irrigable land was undeveloped. Equally important, any general tax would be inequitable. The cost of irrigating land in the San Joaquin Valley would be much greater than reclamation in southern California, and Tinnin asked: "Would the farmers of San Diego, Los Angeles, Santa Barbara, Ventura, Santa Clara, Humboldt, Mendocino, and the miners of the State of California, submit to such a tax? Certainly not." Nor was Tinnin persuaded by the argument--raised by George Davidson and others--that the British success in reclaiming the arid lands of Egypt and India had any relevance for California. Absolute governments ruled both nations, and wages in the two countries were much lower than in California.¹⁷

The bitterest debate came over the issue of whether water could, or should, be considered private property. This was a particularly controversial question because private companies claimed water for "future" use as well as present, immediate needs. Delegate Joseph C. Brown of Tulare County doubtless represented the philosophy of large land and canal companies in his county when he addressed the convention on February 14th:

This idea that there can be no property right in water is wrong. It is contrary to what has been established as the correct doctrine by the Courts of the land. These wild notions are all wrong. They are contrary to justice and law, and right. We had better be guided by the decisions of the Courts of the land, and by experience, and by a sense of justice than to launch out upon an unknown sea.

Dennis Herrington of Santa Clara County responded that the English Common Law had always wisely prevented even the sovereign from owing water, and described the doctrine of

appropriation as "all nonsense." Critics of the Committee on Water and Water Rights charged that the new constitution's innocuous provisions concerning water would encourage rather than deter water monopolists.¹⁸

Looked at in retrospect, the committee's caution seems perfectly understandable. First, though the Grange represented an important political force at the convention, few of its members were schooled in the law. Reluctantly or not, the Grangers as well as the Workingmen were forced to defer to "experts" on many points, and many of those experts represented the same special interests the convention had been called to defeat. Common sense might brand California's water laws a disgrace, just as simple justice dictated that water was too precious to be treated as an ordinary commodity. But the law was something more--and something less--than simple logic and equity. For example, what good would it do for the convention to declare absolute state control over California's water supply, only to have the U.S. Supreme Court reject the constitutional provision relating to water on grounds it violated the federal constitution? Then too, given the reputation of the California legislature, who could be sure that a bold declaration of public control would not play into the hands of "the interests"? If established water rights could be overturned, even in the name of the "public good," the entire state water supply would be "up for grabs."

Despite their zeal for reform, the legal and political inexperience of most delegates played directly into the hands of private water companies. Speaking to the convention on January 19, 1879, Dennis Herrington suggested one reason the delegates had spent so little time discussing the "water question": "I am thoroughly convinced that if this question had been managed and manipulated through this Convention by the Spring Valley Waterworks [Company], it could not have been managed more to suit their taste...." Herrington noted that the infamous San Francisco water company wanted to use the powers of eminent domain granted by the new constitution to confiscate Lake Tahoe and other large bodies of water. Since the Spring Valley Company included the value of water rights in its capital, citizens of San Francisco and other communities could expect to pay for water which would cost the company nothing, or next to nothing.¹⁹ The Sacramento Union went even further:

Perhaps the people of the interior would not need to make the schemes of the Spring Valley Water Company a matter of great concernment, on the theory that San Francisco ought to be able to take care of her own interests, but it happens that the plot is not limited to the municipal bounds of the metropolis in its effects. Spring Valley represents capital; San Francisco capital controls the chief hydraulic mining and water companies of the common. The lobby, therefore, has not only taken care of Spring Valley, but to be consistent had also to protect all other water and capitalistic interests of a like nature. Hence it is notable that the Convention is silent as the grave in its

Constitution regarding the debris question, the denudation of the mountains of their forest mantle, the monopoly of water rights, the diversion of some and the filling up of other streams, and the obliteration of a vast acreage of agricultural land. So, while Spring Valley has been the main artery, there are tributary to it a score of interests which have been protected, to the injury of the greater ones, left to merciless exposure. Thus, the Convention has failed even to make the declaration that agriculture is the paramount interest, and that the Legislature shall, by adequate laws, provide for its protection against the deposit of mining debris; it has failed even to memorialize Congress on the subject....It has failed to declare against and provide checks for the evil which eats up all water privileges, and makes the people of the State tribute payers to the water monopolists.

In short, the Union saw a cleverly laid conspiracy: San Francisco "capital" had invested heavily in both the Spring Valley Company and hydraulic mining ventures. The owners of the mining companies, which flooded the valley with debris, feared that farmers would retaliate by using the new constitution to destroy the mining industry's power by confiscating its water. In addition, the newspaper had complained that the water monopoly enjoyed by the mining companies in the Sierra foothills blocked the settlement of millions of acres of land well-suited to fruit-growing. It might have added that San Francisco capitalists also owned many of the San Joaquin Valley's largest land and water companies. However, by suggesting the existence of a monolithic "business community," the newspaper overstated its case.²⁰

The new constitution did little to check the power of water companies. Article XIV provided that "[t]he use of all water now appropriated, or that may hereafter be appropriated, for sale, rental, or distribution, is hereby declared to be a public use, and subject to the regulation and control of the State, in the manner to be prescribed by law...." This section gave the appearance of strengthening public control, and in 1913 became a prime justification for enacting the statute which finally extended state administrative control over the acquisition of all new water rights. However, such was not the purpose in 1879. Section XIV drew a clear distinction between water claimed by private companies, and that diverted directly from a stream by individual farmers, mill-owners, miners, and others. In effect, the new constitution permitted the state to exercise administrative control over water only under certain circumstances; it did not lay the foundation for "blanket" control. Moreover, Article XIV seems to have been written with municipal water companies in mind. It required boards of supervisors, town councils, or other local governing bodies to set rates each year. Thus the phrase "regulation and control of the state" pertained not to the acquisition or forfeiture of water rights, but predominately, if not solely, to water prices. As

mentioned in Chapter II, the legislature had already authorized boards of supervisors to set water rates. So the new constitution's basic innovation was its requirement that public officials set rates.

But if the Spring Valley Water Company played such a large part in shaping the new constitution's section on water, why did it tolerate public control over the rates it could charge? Why would a private water company voluntarily submit to the judgment of elected officials? The answer was, of course, that Spring Valley directors hoped the new constitution would reduce public criticism of their company, but still permit corporate control over the rate-making process. Section XIV did not require water companies to open their books to public officials, nor did it prevent them from padding their net worth with intangible assets such as water rights, rights-of-way, and options on reservoir sites. In effect, company officials knew that they could control rates by providing distorted or misleading or incomplete information. In "difficult cases," they might also provide bribes or other "favours." However, if utility rates were set by a state board or commission in Sacramento, the company could not exercise as much influence. The Constitution of 1879, by fixing rate-making at the local level, did more to limit than increase state administrative control.²¹

Yet, in assessing the accomplishments and significance of the constitutional convention, two points should be remembered. First, the Spring Valley Company's success derived as much from the nature of the Granger-Workingmen coalition as from the artful designs of San Francisco businessmen. One of the most persistent criticisms levelled against the convention during its five-month session was that it largely ignored agricultural problems. Some newspapers even suggested a conspiracy--that land and water monopolists used the railroad as a scapegoat to distract the public from their own evil deeds. However, the success of the Granger-Workingmen alliance depended on finding issues of common concern which transcended definition as exclusively "rural" or "urban" problems. Tax policies, opposition to the Chinese, and hostility towards the railroad proved to be useful "rallying points." Even assuming that the Grangers could agree on a program of irrigation and water law reform which they had not been able to do in the past, how could they win the support of the San Francisco based urban "proletariat"? Second, while the constitutional provision on water did not represent a substantial reform, another provision in the document was destined to have a profound effect on the legislative battles over irrigation that raged throughout the following decade. The new constitution banned all bills that pertained to particular

counties or towns in an attempt to eliminate special interest legislation. In doing so, it also prohibited irrigation legislation, such as the West Side, Modesto, and Los Angeles irrigation district laws, tailored to meet the needs of farmers in different parts of the state. Oddly enough, while the new charter had been drafted in part to make the legislature more efficient, and reduce corruption, it had the opposite effect. Now each interest group had to use all the political power at its command to force the legislature to enact laws that affected the entire state. Hence, while the different objectives of, say, farmers and miners had been implicit in many of the legislative debates of the middle and late 1870s, they would become much more obvious and intractable during the 1880s.

Hydraulic mining touched off the first round in the legislative water "war" of the 1880s.²² This variety of mining began as an attempt to tap gold deposits in the gravel beds exposed when streams and rivers changed their course and carved new channels. Initially, during the 1850s and early 1860s, tailings were allowed to wash into adjoining streams. But advances in technology permitted miners to use a greater volume of water under greater pressure, and by the middle 1860s miners began to dump the increasing mass of debris into the deep river canyons. From 1867 to 1870, a new series of innovations--ranging from Hoskins "Little Giant" hose to steam-driven, diamond-tipped drills designed to excavate tunnels--exacerbated the problem. Fortunately, the drought that plagued farmers in most parts of the state from 1868 to 1874 was a blessing in disguise to communities scattered along the Feather, Bear, Yuba, and American rivers. Though they began to build ever-higher levees during the early 1870s, severe flooding did not occur until the middle of the decade. For example, in January and November, 1875, Marysville, located at the confluence of the Feather and Yuba rivers, experienced a devastating flood. Twice its residents dug out from under tons of mud that filled streets, basements, homes, and shops. The damage occurred even though Marysville was virtually a walled city surrounded by levees as high as chimney tops.

The miners claimed that floods were an act of nature, but the industry's effects on the environment could be measured in other ways. By the middle 1870s, mining debris had virtually eliminated navigation on the Feather River and sharply curtailed transportation on the Sacramento River. Increasingly, wheat farmers were forced to depend on the railroad to carry their crops to San Francisco. Moreover, as much as 30,000 acres of prime farmland adjoining the Yuba, Bear, and Feather rivers had been choked with layer upon layer of silt. Some critics blamed shoaling in northern sections of San Francisco Bay on the miners, and predicted that if allowed to continue, navigation would be destroyed in the bay, crippling

the economy of northern California. The Sacramento Union led the editorial attack on hydraulic mining. In January, 1876, it commented:

Hydraulic mining may be said to be in its infancy to-day, and it is growing with wonderful strides....The mass of sediment carried into the rivers is increasing almost in a geometrical ratio, and the action of the silting process upon the upper waters...becomes more marked every month. We believe that if no measures are taken to abate this evil, five years from the present time will see a large proportion of the valley lands desolate, the navigation of the Sacramento and other rivers completely destroyed, and annual destruction of property exceeding the net value of the products of California mines. That the agricultural interest should stand by supinely and witness the ruin of its prospects is not to be expected.²³

Beginning in 1876, farmers turned to the courts and legislature seeking relief.²⁴

The hydraulic mining controversy reflected California's difficult transition from a mining to an agricultural economy, as gold gave way to grain. A correspondent to the Pacific Rural Press wrote in 1877: "You have often been reminded of the forlorn and dilapidated condition of the Sierra foothills...When the flush times of mining prosperity began to wane, the interest and industry was transferred to the great San Joaquin Valley."²⁵ However, despite plunging stock values, abandoned mines, and a shrinking population, the mining counties retained a disproportionately large delegation in the state legislature, while the blossoming agricultural counties lagged in representation. Moreover, the mining industry counted many allies among the San Francisco delegation, which represented the state's "business community." For example, while the agricultural counties voted overwhelmingly to accept the Constitution of 1879, the two strongholds of opposition were the mining counties and those surrounding San Francisco Bay. The agricultural counties looked to Sacramento and Stockton for leadership as the hydraulic mining controversy gave new meaning to the persistent sectional struggle between the "neglected" interior and the "greedy" metropolis. As the Sutter Weekly Banner remarked:

The farmers of the interior have fought this giant evil alone, and their efforts to prevent the ruin of their land and the destruction of our great national highways, have met with little recognition or encouragement. San Francisco has furnished the capital to wash down mountains upon their most fertile lands with charming indifference to the injuries inflicted so long as a steady stream of gold flowed into her coffers. It is to be hoped that as the destruction has now reached her own domains [e.g. silting in Suisun and San Pablo bays], she will hesitate in the further prosecution of an industry that brings nothing but ruin to the State.²⁶

Thus, at the dawn of the 1880s, the long-standing symbiotic political and economic relationship between the mines and urban capital became even more conspicuous.

The mining controversy also contributed to an emerging agricultural rivalry between northern and southern California. Completion of the Southern Pacific's line into Los Angeles in 1876, touched off an agricultural colony boom in southern California which lasted

into the late 1880s. The sub-division of large estates in southern California had begun following the drought of 1863-1864, at roughly the same time wheat barons and land speculators in northern California rushed to piece together their vast domains. By the middle 1870s, would-be farmers could find little cheap, accessible land in the Central Valley. Many northern California newspapers appealed to the landowners to sell small parcels to immigrants at reasonable prices, but with little result. Consequently, the papers began to advertise foothill land as a new agricultural eden. The Sacramento Union noted that the advantages of foothill farms outweighed the "volumes of word painting of scenery and climate generated by southern California journals to lure farmers into that part of the state. Plenty of fertile government land remained in the mountain valleys, and the nearby mining camps provided ready markets for farm commodities. The foothills were cooler, secure from floods, and enjoyed heavier rainfall than land in either the Central Valley or southern California. Moreover, they contained an abundant supply of timber, and farmers there could avoid the miasmatic diseases commonly associated with irrigation in the state's flatlands. Best of all, these lands were already served by an extensive network of flumes and canals. Unfortunately, the mining industry also claimed most of the water supply, and often refused to share it with farmers for fear that a flood of new settlers would erode its political power. Moreover, since the ownership of land seldom included mineral rights, foothill agriculturalists faced the grim prospect of having their farms ravished by hydraulic miners. The Union noted that the foothills would not be settled until the primacy of mining had ended: "The people of California are continually crying out for more and quicker settlement. The press devotes its space to elaborate demonstrations of the fertility of the foothill lands...We know now that the dependence of California henceforth must be upon agriculture, and that mining can only play a subordinate part in State development."²⁷

As the legislature of 1880 convened, the hydraulic mining controversy held center stage. William Hammond Hall, the new state engineer, submitted his first formal report to the legislature in January, urging that plans for river improvements be integrated into "one harmonious whole and thus contribute towards the final accomplishment of the ultimate object--the prevention of widespread inundations and the improvement of the navigation of the rivers." He noted, for example, that while mining debris seriously threatened navigation in Sacramento Valley rivers, the levee "system" built in bits and pieces since the 1850s also harmed shipping. The embankments differed in height, thickness, and composition, so breaks occurred at the weakest point. Once an opening had occurred, that particular section of levee bore the full fury of the flood. Sometimes the new outlet permanently changed the

stream's course, or divided it among two or more new channels. So Hall recognized the link between debris damage, flood control, and the protection of navigation. He dusted off a plan originally devised by the miners to trap the largest debris behind impoundment dams--which might also store water for farmers--then confine the streams within uniform levees. The higher rate of flow would "scour out" the channel and permit more silt to be carried in solution, protecting the stream bed as well as riparian land. The silt which remained could be flumed into selected Tule basins, thus aiding the reclamation of swamp land. Hall's plan offered something for everyone.²⁸

The state engineer's plan was embodied in a bill rushed through the legislature by the mining companies and their allies in April. The law created a special commission, whose members included the state engineer and surveyor general, to divide the state into drainage districts and consider flood control schemes prepared by the state engineers. Such plans required the approval of local boards of drainage commissioners, appointed by the governor from among the residents of each district. Several taxes paid for the work. Each local board imposed a tax of 1/20 of 1% of the assessed value of land within its district; swamp land owners paid a sum equal to the value of reclamation (but no more than \$3 an acre); and hydraulic mining companies paid a tax of 1/2¢ per miner's inch of water used in their operations. In addition, a tax of 1/20 of 1% assessed value would be levied against all land in the state. Theoretically, this mixture of taxes would evenly distribute the cost of drainage and debris works. For example, the bill's sponsors justified a state-wide tax partly on the grounds that improvements in transportation would benefit the whole economy.²⁹

The new law met intense criticism throughout the state. Chico's Butte Record charged that the legislation had been passed in exchange for the mining county delegation's support for a bill championed by insurance companies. San Francisco's Chronicle claimed that the mining lobby had paid up to \$1,000 a vote to pass the measure. Many northern California farmers had hoped that the legislature would shut down the hydraulic mining industry permanently; others had argued that the miners should pay the full cost of protecting the Sacramento Valley from debris damage. Opposition was particularly strident in Los Angeles County. Los Angeles residents felt slighted because virtually all the state prisons, hospitals, and normal schools were located in northern California. During the 1880 legislative session, a bill to establish a teacher's college in Los Angeles passed the senate, but stalled in the assembly. Similar bills had been rejected many times during the 1870s. Then, too, while most of northern California stood to gain directly or indirectly

from the drainage bill, flood problems were not serious south of the Tehachapis. The Los Angeles Herald declared that "no more iniquitous measure ever passed a California Legislature," charging that the new law represented precisely that class of special interest legislation banned by the new constitution. "It would be just as logical to tax the whole State to pay for a failure of the crops and fleece which have been ruined by drought in the southern counties as to levy a tax to repair the ravages of the debris of mines." Only one southern California senator voted for the bill--ironically his vote was the price of winning senate approval for the normal school--and after the governor signed the bill into law, Los Angeles newspapers bristled with angry threats that southern California should secede from the rest of the state. The Los Angeles Express bitterly complained: "This Debris bill is offensive to us in every respect. It not only takes our money from us without any fair return, but it emphasizes the utter disregard the populous portion of the State has for a section which is weaker politically than the other."³⁰

Oddly enough, the Sacramento Union became one of the new law's strongest defenders. Earlier, in November, 1877, the paper had criticized an editorial in the Dutch Flat Forum which called for state construction of reservoirs to capture the tailings, and a network of iron pipes to carry the silt to settling basins. The Union commented that "...a proposition like that cited looks like an attempt to saddle upon the whole State an outlay which justly falls upon the mining class, and which cannot with any equity be thrust upon others." Perhaps the promise of swamp land reclamation, flood control, or the mining industry's future support for a state irrigation system, won the Sacramento journal over to Hall's plan. In any case, it chided critics of the bill, noting that hydraulic mining benefitted the whole state, and that the economic health of the entire Pacific Coast depended on keeping San Francisco Bay free of debris. Moreover, the drainage law, by increasing the amount of land under cultivation, might well lower state taxes by expanding the tax base. In any case, the principle of using general tax revenue to benefit particular sections was well established. For example, state taxes to support public education were distributed not according to each county's tax burden, but according to its educational needs.³¹

In April, 1880, the legislature asked Hall to design the debris dams. In August, he submitted his plans to James B. Eads and Colonel George H. Mendell for review, and the two men quickly gave their approval. Mendell represented the Army Corps of Engineers, and had worked closely with state officials on flood problems since the middle 1870s. Since the legislature hoped to persuade the federal government to pay at least part of the cost of

drainage work, Mendell's support was essential. Eads had won national recognition by designing a fleet of armored gunboats during the Civil War. Later, he bridged the Mississippi River at St. Louis and devised a jetty system to prevent shoaling at the mouth of that river. His engineering reputation persuaded the governor to appoint him a consultant. Construction began in the fall of 1880 as 800 men went to work building two dams on the Yuba and Bear rivers. Other workers built new levees along the Yuba, American, and Feather rivers. Apparently, Eads had persuaded Hall to build brush dams rather than earthfill or masonry structures. Such dams were cheaper to construct, and their height could be raised easily to provide additional storage as the debris accumulated. Moreover, since the woven brush mattresses were little more than dense screens, they would not seriously impede stream flow. In fact, they would capture the heaviest debris, such as rocks and timber, even when most of the stream flowed over the dam's crest. Maintaining swift currents in Sacramento River tributaries was vital to "scour out" debris which had already washed into the valley. Hall, Eads, and Mendell all assumed that the stronger the current, the greater a stream's capacity to carry material in solution. For this reason, upstream from the Yuba River dam, nearly two miles of brush and sapling embankments had been constructed to maintain the channel behind the dam and prevent erosion of the stream banks. After inspecting the completed Yuba River dam in November, the Marysville Appeal's editor remarked: "In all its parts the dam is a splendid piece of engineering. The work has been done thoroughly, and is highly creditable in every way to both contractors and engineers." Visitors flocked to see the flood control works. In January, 1881, virtually the entire state assembly inspected the Bear River debris works.³²

The legislature of 1881 convened during one of the rainiest winters California had experienced since the 1850s. Many legislators grumbled that the dams had cost too much and would not last through the severe winter. Despite Governor George Perkins' warning that debris damage might exceed \$160,000,000 unless the state forged ahead with its drainage work, several bills were introduced in the legislature to rescind the 1880 law. Outside the Sacramento Valley, the law had almost no public support. However, the mining block, aided by members of the San Francisco and Sacramento delegations, prevented consideration of the leading repeal bill at the beginning of March by a vote of 39 to 36. But the drainage work continued only into the fall. On September 26, 1881, the California Supreme Court ruled the law unconstitutional, mainly on a technicality. Article IV, Section 24, of the state constitution required that each bill concern only one subject, and that subject be clearly

revealed in the title. The court ruled that, strictly speaking, channel improvement and debris impoundment were not drainage works. Moreover, the court ruled that the taxes authorized by the law were unconstitutional because the legislature could not delegate the responsibility of collecting taxes to boards which represented special districts, and also because the law had provided a triplicate system of raising revenue which violated the principle of equal taxation. As if this was not bad enough, a month later fire ravaged the Yuba River dam which, along with the Bear River structure, had already been seriously damaged by floods.³³

In 1884, a United States circuit court banned hydraulic mining in California, and the industry's prominent part in the state's economy quickly faded though the debris it had produced continued to wash down into the Sacramento Valley for over 30 years thereafter. Robert Kelley has credited the legislature of 1880 with launching "the state's first large-scale effort at controlling the Sacramento River."³⁴ Yet the Drainage Act of 1880 had much broader significance as well. It provided for the first substantial state expenditure for water resource development in the arid West, if not the nation as a whole, and it reflected a dawning awareness of the need for centralized resource planning. William Hammond Hall recognized, even if most of the state's residents did not, that irrigation, drainage, flood control, navigation, and reclamation were closely related and required comprehensive, unified treatment. On the other hand, passage of the Act, and its failure to accomplish the results promised by its sponsors, reinforced the common, complementary assumptions that the legislature was hopelessly corrupt and the state government could not be trusted to build efficient public works. Critics of the law charged that the state had paid several times more than private individuals would have paid for the same work, and that the dams had broken up after they quickly became clogged with debris. In short, their failure was not simply an act of nature, and it cast doubts on the judgment of Hall, James Eads, G.H. Mendell, and engineers in general, as well on the wisdom of the legislature. Hydraulic mining was still in its infancy, and dam-builders had few precedents to follow. But if three such prominent engineers had been unable to solve the debris problem, could any engineers draft, let alone build, a comprehensive irrigation project for the state? Hall and the office of state engineer suffered most of all, because the debris scheme undermined confidence in his other work, including the irrigation surveys. Finally, the Drainage Act revived and intensified powerful rivalries between different groups of water users in different parts of the state. Farmers in southern California and the San Joaquin Valley were now even more

likely to place section above the needs of farmers as a class, and the mining "block" in the legislature became even less likely to support the objectives of farmers anywhere in the state. The new constitution and drainage law served to polarize, rather than unify, water users.

Although the legislatures of 1880 and 1881 had been preoccupied with the debris problem, they also devoted considerable attention to the controversy over water rights. In his 1880 report, William Hammond Hall noted that "[t]he establishment of a proper water right system will do more to bring about a solution of the...problems of irrigation...than all else which can be accomplished at this time." He gave several telling examples of inadequate state control over the acquisition of water rights. Eighty-three claims had been filed on the Kings River, but only 42 listed specific quantities of water and those exceeded the maximum flow of the stream by 250 percent. On the Kern River, conditions were even worse. Seventy-six quantifiable claims had been filed, amounting to more than twenty times the river's peak flow. Not surprisingly, the result had been increasing litigation, and a reluctance of private capital to invest in irrigation projects. Like most proponents of irrigation, Hall assumed that California's future should be built on intensive agriculture and the family farm. But before potential immigrants would consider California as a permanent home, huge estates would have to be divided up and conflicts over water rights reduced or eliminated. Hall concluded that the state should not build irrigation works, but "...should foster irrigation interests by establishing a business basis for enterprise in irrigation projects." This could be done by giving state officials control over the acquisition of water rights; by establishing irrigation districts; by attaching water rights to the land; by classifying the state's irrigable land according to the qualities of different soils and the amounts of water needed to raise different crops; by subjecting all water rights, except municipal, to condemnation by the state; and by declaring agriculture as the highest use of water. Hall argued that the land itself should bear the cost of irrigation, and that the farmers themselves should distribute the water following state "schedules and regulations." In particular, all diversions from navigable streams should be monitored closely by the state to protect navigation. The state should also be responsible for inspecting all irrigation systems to reduce waste, though Hall urged that existing water rights "should not be interfered with" otherwise. He requested, and was subsequently granted, permission to prepare water laws for submission to the 1881 session of the legislature.³⁵

Hall did not comment directly on riparian rights except to note that they "...should be recognized as preferred rights to water for stock and domestic purposes."³⁶ Whether this meant that such rights should be limited to those purposes was not clear. In any case, in the opening months of 1880, several newspapers expressed alarm that recent California Supreme Court decisions seemed to strengthen the rights of riparian owners at the expense of appropriators.³⁷ Most legislators did not yet realize how effectively time had sanctioned the riparian doctrine, and two bills were introduced to restrict this category of rights. The most controversial bill, sponsored by Senator Satterwhite, would have limited riparian rights to condemnation for irrigation. The bill made little headway. The San Francisco Bulletin expressed a common reservation when it noted that while riparian rights ought to be reduced to quantifiable proportions, "...it by no means follows that any three or more wealthy persons should be allowed, for their own benefit, to divert water away from everybody else below them."³⁸ The second bill was introduced too late in the session to receive serious consideration. It would have abolished the riparian doctrine outright, subject to the stipulation that those who owned riparian lands could claim all the water they put to use at the time the law took effect.³⁹

The Satterwhite bill prompted an immediate response from riparian owners, led by Henry Miller. They framed a bill, introduced by Senator Langford of San Joaquin County, to limit appropriative rights and reduce conflicts among riparian claimants. The bill provided that when an upstream diversion reduced the water available to a riparian owner, he could ask the superior court to measure the stream above and below the diversion point and if the inspection supported the charge, the sheriff would close down the ditch. Moreover, the legislation promised each riparian owner "...the same proportion of water that his or their proportion of frontage on the stream bears to the whole frontage of the stream within the county..." At the request of a "respectable minority" of riparian users, the court could also appoint a watermaster to dole out the supply. Langford's bill won even less support than Satterwhite's. It would have destroyed appropriative rights because any riparian owner would have been able to challenge any appropriate right on the same stream, no matter how long the appropriator had used the water or for what purpose, even if the diversion had never prompted opposition in the past.⁴⁰

Neither the Langford nor the Satterwhite bills attracted the attention they would have commanded at earlier sessions of the legislature. The wet winter, all-consuming debris controversy, and the state engineer's anticipated water laws stifled discussion. However,

Hall presented his suggestions to the governor in October, 1880. He had prepared two bills, and the outline of a third. The first was designed to provide a full record of all existing claims to California's water supply; the second provided for the filing of future claims and the allocation and distribution of that supply; and the third offered proposals concerning the formation and operation of irrigation districts.⁴¹

Hall recognized the need for a complete record of water rights to reduce litigation, determine the state's surplus supply, and pave the way for state administrative supervision over allocation and distribution. Since the state surveyor-general maintained a full record of land titles, he suggested that this official also be designated "State Register of Water Rights." The process of compiling an accurate record of claims would begin with the county recorder. Each water user, except riparian owners and those served by municipal water companies, would be given a year to record his claim with the county. The claim would include a variety of information including when the notice of intent to divert had been posted, if applicable, when actual diversion began, how much water was currently being used, and the location and a description of ditches and diversion works. The recorder would then relay this information to the surveyor-general who would compare it with information gathered by the state engineer. The surveyor-general would then forward copies of all the information he had acquired to the state attorney general who, in turn, would order each district attorney to file suit in the name of the state against all claimants to a particular stream in the appropriate superior court. The court would require each to demonstrate the validity of his water right, on penalty of forfeiture for noncompliance. The final court decree would be recorded in both Sacramento and the appropriate county. The would-be appropriator would be able to tell easily how much water remained available for future use. Hall emphasized that this bill posed no threat to established rights. But since the courts limited water rights to "beneficial use"--though they often defined the phrase very broadly--most claims that existed only on paper would be quickly eliminated, and other claims might well be reduced. Any such legal action posed a direct threat to water users; the burden of proof was on them, not the state.

The second bill built directly on the first, and Hall urged that the legislature consider them as a "package." It would have created a state board of water commissioners--consisting of the governor, surveyor-general, and state engineer--to supervise the issuance of new water rights and regulate distribution. Among its responsibilities, the state board would establish uniform standards for measuring water quality and the volume of diversions.

Though the board would have broad review and veto powers, most day-to-day administrative tasks would be performed by local administrative units comprising three to five counties. These districts would be designated by the state board according to drainage basins, and they would be administered by boards of local appointees selected by the governor. The state engineer would serve as an engineering consultant to each district, and the state surveyor-general would provide local water officials with copies of all water rights, court decrees and other data collected by state agencies. The local boards could grant surplus water to individuals or companies, though any application approved at the local level could be rejected in Sacramento. In particularly wet years, the local board might also grant temporary rights to use water, but these "rights" would not enjoy any priority or other legal recognition. Local officials would continually monitor stream flow and diversions, and they could prevent waste by banning faulty water works or uncapped artesian wells. In dry years, they could also prohibit diversions that interfered with riparian rights or threatened shipping on navigable streams. However, all riparian rights would be limited to stock and household uses, and they could not be used on any land more than 1/4 of a mile beyond the river bank. Appropriate rights not used for two consecutive years, or put to "good use," could be revoked. In October of each year, the local board would publish a schedule of water rights for each stream under its jurisdiction in an appropriate newspaper. The board's expenses would be paid from a tax levied against all land within the district. In Hall's first annual report, filed in January, 1880, the state engineer had recommended that the state assert the power to condemn all water rights, though he realized that the expense involved would make wholesale condemnation actions impractical. Consequently, neither of the bills proposed in October, 1880, contained such a provision. Hall doubtless expected that his system would weed out weak, extravagant, or speculative claims, anyway.

Had the legislature accepted Hall's proposals, California would have enjoyed the most advanced code of water laws in the arid West. As noted in Chapter II, Utah had been the first state or territory to assert public control over water, but in 1880 it largely abandoned this principle, and allowed individuals to acquire water rights without formal administrative review. However, in 1879 and 1881, persistent water conflicts on the Cache la Poudre and South Platte rivers prompted Colorado to create a state engineer's office and divide the state into water districts that conformed to the boundaries of natural drainage basins. These were the most elaborate water laws adopted by any state to that time. Any resident of a water district would appeal to a district court to adjudicate all water rights

on a particular stream, and each water user had to participate in the proceedings. Unfortunately, the law did not permit the state to participate in the process. It was not considered a party to the suits, nor was it allowed to collect information to guide the courts. In fact, the courts were not required to notify the state engineer that an adjudication suit had been instituted. Since court officials did not have the training, time, or resources to measure stream flow or inspect diversion works, they usually accepted the statements of claimants at face value. Hence, most of the early adjudication cases produced decrees which granted far more water than the particular stream carried. Decrees usually granted either the amount of water claimed, or the capacity of a claimant's ditches, not the amount of water actually used or needed. So while a state water commissioner with substantial theoretical powers administered the distribution of water in each district, his efforts were severely limited by the nature of the decrees themselves. Similarly, the laws did not provide complete state supervision over the acquisition of new water rights. After 1881, each potential water user was required to file a claim with the state engineer within 60 days of beginning irrigation surveys or the actual construction of ditches. But the state engineer had no power to reject or scale-down applications which claimed excessive quantities of water. Moreover, Colorado did not provide for a centralized record of claims actually put to use until 1887. In almost every respect, Hall's proposals went far beyond the pathbreaking laws of Colorado.⁴²

In fact, they posed so many challenges to established water users that they stood no chance of becoming law. The state engineer failed to realize that ideals like planning and efficiency had a very small constituency. His measures were as "impractical" as they were far-sighted. Riparian owners would oppose them not only because Hall wanted to severely limit their rights, but because his proposed laws would not prevent appropriators from monopolizing water. On the other hand, appropriators could worry that state supervision over water distribution might result in curtailing established rights in the name of preventing waste or state sovereignty. Proponents of local control could argue that Hall wanted to concentrate too much power in Sacramento, while supporters of a state irrigation system saw Hall pandering to powerful local land and water companies. Then, too, the system might prove very costly. The residents of each district would have no say in the boundaries of the district, or in the selection of those who ran it, or in the policies the water commissioners followed; but they would pay the cost of administration. Moreover, all land within the district would be taxed, not just the irrigated or irrigable lands. Finally, Hall had committed the same error

he made in conducting his irrigation surveys. The engineer saw his job essentially as one of scientific investigation while many Californians expected a more immediate "pay-off." They were less interested in the quantity of water in the Kings River, or in a topographic map of the state, than they were in building dams and canals. Yet after two years of work, the state engineer still had not drafted any specific construction plans. Consequently, he disappointed those who wanted to use such plans as the basis for a state irrigation system as much as he disillusioned the sponsors of private irrigation projects and irrigation districts. Not surprisingly, Hall's two bills were never introduced in the legislature. Nor did they receive much public attention. They were 30 years before their time.⁴³

Given Hall's support for the debris bill of 1880, his opposition to a state irrigation system seemed inconsistent to many proponents of state control. The failure of the West Side District, the new constitution's limitation on legislation restricted to particular interests, counties or regions, the monopolization of land and water in the Tulare Valley by James B. Haggin and others following passage of the Desert Land Act in 1877 (discussed later), increasing conflicts over water rights in the courts, and the precedent set by the debris bill, all combined to rekindle interest in a centralized, public system. As in its defense of the debris bill, the Sacramento Union urged Californians to rise above sections and interest groups; it defended a state system on grounds that the new residents it would lure into the state and the expanded tax base would more than justify the state expenditure. The Pacific Rural Press observed that San Joaquin Valley and southern California counties would not support the debris bill unless it was extended to provide irrigation: "There is also a feeling among the dwellers in those counties, that they will not be fairly dealt with, unless the State, which orders them to pay taxes for the impounding of mining debris, shall also spend public money to aid them in the development of their interests. There seems to be pure justice in the claim." The Daily Alta California took the court battle between Lux and Haggin as an object lesson: "Whatever the merits of this case, as the law now stands, it seems plain that this and similar contests bear testimony to the growing need of a comprehensive State system for the control of all the waters within her boundaries. This necessity will grow more pressing as each year passes." The Riverside Fruit Growers' Association was one of many farmers groups to call for a state system. It demanded state ownership of all large rivers and lakes, state construction of storage reservoirs, and state measurement and distribution of water. However, it is not clear whether this group wanted the state, or the farmers themselves, to pay for the work.⁴⁴

On the other hand, the failure of the debris dams, and the sectionalism engendered by the fight to repeal this legislation, made passage of a comprehensive irrigation bill unlikely. The Pacific Rural Press noted: "The issue of the debris bill has been so hotly contested that in the event of its failure there will be full head made by disappointed parties against any irrigation work. In fact, there seems a chance that the whole department of State Engineering may be swept away." Aside from the obvious reluctance of many legislators to saddle the state with yet another expense, some northern Californians resented the stand taken by the "cow counties." As the Daily Alta California, nominally a friend of state irrigation, commented: "Now, if southern California were to remain in this State, we should recognize the irrigation claim as the most just she has yet put forth. As, however, she does not desire or intend to remain, we fail to see the justice of overburdening our already heavily taxed people for the purpose of outfitting the new "State." Apparently, the Alta wanted to limit any state system to land north of the Tehachapis."⁴⁵

Of the irrigation bills considered by the 1881 legislature, only one made any headway. The proposed legislation included bills to abolish the state engineer's office, subject all water to public control, and require private ditch companies to distribute water on a pro-rata basis during droughts.⁴⁶ There were also several irrigation district bills. Senator West of Los Angeles introduced legislation, in his words, "...having in view the control and retention in reservoirs of such quantity of the waters now carried by the river channels from the mountains to the bays or sea, during the rainy season, or when the snows are melting, as may be needed in the several irrigation districts to be formed under provisions of this Act..." This required two separate measures. The first would have repealed the entire civil code pertaining to the acquisition of water rights, so that the state could guard the supply of stored flood water from monopolists and speculators. The second, loosely inspired by some of Hall's recommendations, would have created a state water board consisting of the governor, surveyor-general, attorney-general, and state engineer to divide the state into hydrographic districts. It required the state engineer to prepare maps showing all the arable land and potential reservoir sites within a district. Irrigation works would be built by the state, following the state engineer's plans, but local taxpayers would have paid the cost of construction. Initially, a tax of 1% of assessed value would be levied against all property in the district, and when the works had been finished, an additional assessment of \$3 per acre on all irrigable land would be imposed. District water boards, appointed by the governor, could approve, reject, or amend construction plans, but the state board would have full

administrative control over all water rights and diversion ditches. Since most of southern California's surface water supply had already been claimed, and since many friends of irrigation doubted the practicality of condemning established rights, West offered a way to by-pass corporate control over water. His bill was the first presented to the legislature which acknowledged the importance of storage reservoirs. A bill introduced by Senator Bost closely resembled West's bill except that it did not mention storage works, and, instead gave the local district board power to condemn all appropriative rights and limit riparian rights. Though the Bost bill would have given the state board power to review all applications for water rights, it also provided for greater local control over the day-to-day operation of districts.⁴⁷

Finally, Senator Grove Johnson of Sacramento County, Hiram Johnson's father, introduced a bill to divide the state into drainage and irrigation districts. The act declared that because of "...physical and climatic causes the material interests of the State are so widely extended and diversified in character that no general law in relation to the ownership, use, and distribution of water for irrigable purposes can be made applicable to the whole State." Therefore, Johnson suggested that all of southern California, as well as Merced, San Benito, Monterey, Fresno, Inyo, Tulare, Kern, San Luis Obispo, and Ventura counties, should be designated as an irrigation district, while the remainder of the state would be classified as a drainage district. The most important part of the bill was a declaration that "...the law of riparian rights and ownership, as to land and water, shall not prevail in said irrigable district." This act appears to have been drafted in the interest of irrigation, to pacify southern Californians angered by passage of the debris bill. It also reflected the absence of strong support for irrigation in the Sacramento Valley. Most of all, it mirrored the fear of many northern Californians that the abolition of riparian rights would play into the hands of the hydraulic mining companies. The riparian doctrine promised riparian owners a flow of water undiminished in quality as well as quantity. Theoretically, it could be used to protect a stream from "pollution," as it prevented water monopolies. And while many would-be appropriators in northern California opposed the doctrine, cities adjoining streams, as well as riparian farmers whose land had been damaged by mining debris, saw riparian rights as a valuable legal tool. In May, 1881, the Sacramento Union candidly commented: "We cannot afford to adopt a system of riparian rights which, in order to secure freedom to cultivators by irrigation, requires the farmers of the northern part of the State to submit to ruin by the precipitation of mining detritus upon their lands." Johnson had

close ties with the railroad, whose leaders doubtless saw the mining industry as an impediment to northern California's economic development. On February 14, 1881, his bill easily passed the senate by a vote of 23 to 10. However, perhaps because of the power large water companies enjoyed in the assembly, the bill died in the lower house.⁴⁸

Even though the legislature of 1881 was no more successful than previous sessions in securing irrigation or water rights legislation, soon after the legislature adjourned an event occurred which shifted the conflict over water rights from the Sacramento back to the San Joaquin Valley. On April 15, 1881, in Judge Benjamin Brundage's Kern County Superior court, the most famous water case in California history opened. Lux v. Haggin pitted two powerful forces: Henry Miller and Charles Lux, who used their extensive riparian rights to flood pasture land and raise forage for stock: and James Ben-Ali Haggin, Lloyd Tevis, and W.B. Carr, whose appropriative claims to the Kern River were used to irrigate land near Bakersfield in the Tulare Valley. The legal conflict which formally began in 1881, became an important, and sometimes all-consuming, issue in each session of the legislature from 1882-1887.⁴⁹

The conflict between these arch-rivals actually began in the 1870s. Henry Miller was the largest stockman, and one of the largest landowners, on the Pacific Coast. The German immigrant prided himself on being a self-made man, though he could not have built his empire without the enormous tracts of cheap "swamp" land he purchased from the state. His vast estate dated from the drought of 1864. In 1890, Miller recalled that he had lost two-thirds of his cattle in the drought. "From that time on, the people settled in around the country and utterly wiped out the free range and then the question arose what should we do--should we keep less cattle or buy more land? So we commenced to buy a little land and a little more..." Using the Swamp Land Act of 1850 and land scrip, Miller and his partner Charles Lux acquired a 100 mile long block of land adjoining the San Joaquin river, beginning northwest of Fresno at the great bend of the river, and extending north to the stream's confluence with the Merced River, east of Modesto. And along the Kern River, he pieced together a 50 mile long block of land stretching from Bakersfield to Tulare Lake. By his own admission, in 1890 Miller & Lux owned 750,000 acres in California, Nevada, and Oregon.⁵⁰

Miller's cattle business, like the mining industry, demonstrated how patterns of water use well-suited to the 1850s and 1860s had become outmoded by the end of the 1870s. As the San Joaquin and Kern rivers swelled over their banks in the spring, and subsequently receded, they left behind mile after mile of lush pasture. Miller used an elaborate system of dams

and levees to take full advantage of the annual flood. As William D. Lawrence, Miller's most reliable biographer, has pointed out, the cattle baron favored "artificial" irrigation when it furthered his own interests. Miller was one of the first Californians to raise alfalfa, rice and cotton, and all three crops required irrigation. By 1881, he had nearly doubled the length of the San Joaquin and Kings River Canal and Irrigation Company's aqueduct. In 1880, the canal irrigated 29,000 acres, including 12,000 in grain and 5,000 in alfalfa, though it was capable of serving about 120,000 acres. Miller also constructed other canals. As earlier noted, in the 1870 he joined with the king of San Joaquin Valley land speculators, W.S. Chapman, to build a 30 mile canal from the San Joaquin River to Chowchilla Slough, south of Merced. By the second decade of the 20th century, Miller's irrigation network was capable of watering 340,000 acres. Of course, even though Miller sold and rented thousands of acres to farmers, he was not a land promoter, and he did not relish the prospect of irrigation transforming the San Joaquin Valley into a haven for small farmers.⁵¹

The landed empire of Haggin, Tevis, and Carr, was no less impressive. James Ben-Ali Haggin's character was in stark contrast to Miller's. While Miller rose from humble beginnings, led an austere life, and shunned the public eye, Haggin was descended from a prominent Kentucky family and moved freely in California's "high society." He was seen frequently travelling in a posh personal railroad coach with an attached dining car or on his private steam yacht. In California, he won recognition as a horse-breeder, and assembled the best-known racing stable on the Pacific Coast. He inherited his exotic middle name from his maternal grandfather, a Turkish physician. After practicing law for four years in New Orleans, Haggin emigrated to California in 1850, and in the following year formed a long-lived partnership with his brother-in-law, Lloyd Tevis, as "brokers and capitalists." Tevis had much in common with Haggin. Both were from Kentucky, both were lawyers, and both shared a genteel upbringing. The two men engaged in a variety of business ventures together, most notably as leading investors of Wells, Fargo & Company.⁵²

Miller, Haggin and Tevis are well-known to students of California history, but William B. Carr has been all but forgotten. "Billy" Carr was a fascinating character, a dominant figure in California politics during the late 1870s and 1880s. His crude, brash, flamboyant nature was forged on the frontier, and perfectly complemented the more refined personalities of Haggin and Tevis. Born in Indiana in 1830, Carr came to California as an argonaut, but soon turned to the lucrative business of digging mining ditches in El Dorado and Sacramento counties. Subsequently, California's rapid growth fueled his career in

construction. In the mid-1850s, he built most of the levee-system surrounding Sacramento, and during the 1860s, after he moved to San Francisco, his factory supplied most of the brick used by the city in its public buildings. Gradually, Carr established the political connections that would make him San Francisco's most powerful political boss by the late '70s. His association with Haggin and Tevis in Kern County land schemes began in 1874.⁵³

In 19th century California politics, no city had more corrupt political institutions than San Francisco, and no political figure was more vilified than the shadowy Boss Carr. As in the rest of the nation, political parties in California served many purposes, but none was more important than distributing the booty of office and San Francisco's rapid growth offered plenty of opportunities. Modern historians have argued that political bosses filled an "institutional gap" as the nation's towns gave way to sprawling metropolises. In particular, the absence of a class of "professional" politicians and experts trained in solving the new range of urban problems worked against the development of responsible party leadership. Men like Carr, who skillfully turned San Francisco's Republican Party into his own private preserve, provided some measure of continuity. However, their "talents" were rarely appreciated by the public. As early as 1873, San Francisco's Bulletin declared that "...no man who has a particle of self-respect cares to be found in [Carr's] company." Four years later, in a scathing indictment of the Republican Party, San Francisco's Argonaut charged that Carr and his associates were "...a ring of mercenary bandits who steal to get office, and who get office to steal....Through this man Carr alone the honors of the party, its offices, its patronage and its emoluments must be dispensed...." The San Francisco Chronicle, one of Billy Carr's most persistent critics revealed the extent of the boss's political power:

...The most 'influential' politician among us is a man who has no idea of politics apart from the money he can obtain by the business. Coarse and ignorant, he cannot appreciate the higher aspirations of gentlemen, but measures man and principles by dollars and cents. He is a power in the primaries; he designates our public officials; he makes and unmakes laws at the State Capital; he essays to elect Congressmen and United States Senators; he orders them to vote as he chooses upon public measures, and they must allow him to name the men who are to fill the Federal offices in this State. No matter how high a character or how good the qualifications candidates may have there is no chance for them except to 'see Billy Carr' and pass the ordeal of his approval....From the highest to the lowest and all along the line the commanding influence of this mighty potentate is felt and feared. If a man shows any independence, he is put down at once.

Later in the same month, the Chronicle charged that United States Senator Aaron A. Sargent "...belonged body, mind and soul, to Billy Carr...."⁵⁴

The author of the best early history of Kern County, Wallace Morgan, has left a suggestive portrait of Carr and his considerable political skills:

Fat, aggressive, determined, absolutely unabashed, with bull-dog courage and endurance, he was a typical political boss of the larger and more perfect type. Frequently and fervently cursed and hated, he could walk into a saloon in a hostile ward and in ten minutes have enough sworn allies to insure the victory of his candidates. If a delegation of angry farmers in the days of the bitter water troubles came after Carr with the intention of puncturing him with bullets or stringing him up to a high-branching cottonwood, he met them with outstretched hand and slaps on their backs and sent them away wreathed in smiles of hope and assurance....Carr was a finished performer...and later actors on the Kern county stage sat at his feet and learned to do politics in the scientific, metropolitan style.

Morgan described Carr as the "generalissimo of the Haggin forces."⁵⁵

The "generalissimo" had high hopes for Kern County. Land was cheap there, and much of it remained part of the public domain. Moreover, the soil was unusually fertile, and the railroad had reached Bakersfield in August, 1874. At that time, small ditches, owned by the farmers themselves, provided limited irrigation, and Carr's first step was to acquire control of this water supply. He urged the farmers to incorporate and issue stock. This done, the Haggin & Carr forces bought up most of the stock, securing control of the Buena Vista, Pioneer, Stine and other canals. The farmers, lacking the resources to build weirs and headgates on their own, initially looked upon the land promoters as benefactors. A larger irrigation system promised to drive up the value of their land, and Haggin and Carr hired local men to construct the irrigation works. Then, on May 4, 1875, the San Franciscans claimed 3,000 cubic feet per second from the Kern River, about three times more water than the stream had ever carried, an amount roughly equivalent to the entire amount of water used for irrigation in Los Angeles County. In the same year, Haggin and Carr dammed the Kern north of Bakersfield, then built a 13 mile canal to divert water onto 13,000 acres desert soil. Subsequently, the Calloway Canal became part of the Kern River Land & Canal Company, and precipitated the Miller-Haggin legal contest. Downstream, in Buena Vista Slough, Henry Miller owned 200,000 acres of low land which flooded even in relatively dry years, insuring adequate pasture. Within a few years, this upstream diversion began to threaten Henry Miller's cattle business, as well as his economic hold on the Kern Valley.⁵⁶

The Haggin-Tevis-Carr team also moved quickly to acquire a land monopoly along the Kern River near Bakersfield, as Miller had downstream. The first large block of land, 59,000 acres comprising odd-numbered sections in six townships adjoining the stream, was obtained from the Southern Pacific soon after Billy Carr took up residence in the county. However, in 1875 and 1876, many farmers followed the railroad into the valley and purchased small

tracts from the federal government for \$2.50 an acre. Consequently, the would-be land and water barons looked for, and perhaps "devised," a tool to stop this process. On March 3, 1877, Congress passed the Desert Land Act, which allowed settlers to purchase a section (640 acres) of land for \$1.25 an acre if the claimant irrigated all his land within three years after filing. Only one entry could be made per person. The act was the first federal law passed to promote irrigation, but most members of Congress failed to recognize that much of the West's water supply was already controlled by private companies. Moreover, the cost of irrigating 640 acres was well beyond the means of small farmers, even those who could secure a reliable water supply.

Some California periodicals, notably San Francisco's Argonaut and Chronicle, charged that the bill had been drafted and introduced by Aaron Sargent at the insistence of Haggin & Carr. True or not, in the early weeks of April, 1877, the new land syndicate filed on over 100,000 acres of desert land. The entries were made hastily, before federal officials announced that the land was available. The Chronicle bitterly noted:

...the President's signature was not dry on the cunningly devised enactment before Boss Carr and his confederates were advised from Washington that the breach was open. It was on Saturday, the 31st of March. The applications were in readiness, sworn and subscribed to by proxies, for taking up the intervening sections of the railroad grants through the Kern Valley. All that Saturday night and the following Sunday the clerks in the Visalia Land Office were busy recording and filing the bundles of applications dumped in upon them by Boss Carr, although it was not until several days after that the office was formally notified of the approval of the Desert Land Act....

Most of the dummy entrymen were residents of San Francisco, and employees of the United States Mint, the U.S. Custom's House, or Wells, Fargo & Company. They were paid \$1 to \$5 apiece for their signatures. Haggin, Tevis, and Carr did not pay filing fees, or the 25¢ an acre required as down-payment under the Desert Land Act. Moreover, their vast land-grab superseded the claims of many bona-fide settlers who had preempted 160 acres and planned to pay the government \$2.50 an acre.⁵⁷

The Haggin-Tevis-Carr syndicate was far from finished. In 1878, it acquired the 17,600 acre Mexican land grant of San Emigdio, and in the following year thousands of additional acres from the Livermore-Redington tracts. Meanwhile, many small farmers, hit hard by drought and monopoly, sold out to the group and fled the valley. In 1882, John Hitte^l reported that Haggin and his associates owned 300,000 acres in Kern County, only 40,000 of which were under irrigation. This represented about 75% of the county's irrigated land.⁵⁸

The Kern River Land and Canal Company used a variety of tactics to intimidate uncooperative farmers. It reduced or cut-off water supplies, an act which ultimately

forced many settlers to sell-out to the company. It filed over 100 separate suits against Kern County farmers who did not buy water from the company, in an attempt to eliminate those diversions. And, because Boss Carr dominated Kern County politics, it occasionally used local officials--ranging from judges to tax assessors--to "harass" recalcitrant settlers. Of course, other forms of control were more subtle. For example, farmers whose families depended on their off-season job constructing irrigation ditches for Haggin, Tevis, and Carr were not likely to rock the boat. Even so, the Kern County Grange and Workingmen's Party bitterly assailed the land and water monopoly and repeatedly called for repeal of the Desert Land Act. And in January, 1878, the Bakersfield Grange appealed to the State Senate Committee on Irrigation to introduce a law permitting irrigators to elect their own boards of water commissioners to parcel out the water. They charged that the land syndicate had wasted water and short-changed many irrigators.⁵⁹

Throughout the 1880s, large land and water companies, and their allies, maintained that the doctrine of appropriation served the needs of farmers well, and that riparian rights posed the major obstacle to expanding irrigation. Many historians have echoed this view. For example, Carey McWilliams, certainly no friend of California's land barons, noted in 1935: "The doctrine of appropriation was obviously the fairest and most economical and the fullest use of an inadequate water supply. It was based upon an equitable idea and a practical consideration." Yet this conclusion ignores the fact that the doctrine of appropriation offered little protection to the small farmer because water rights were not attached to the land and restricted to "reasonable"--not just, "beneficial"--use. Moreover, the battle over water rights derived as much from the inadequate system of resolving disputes among appropriators, as from the inherent conflict between riparianism and appropriation. Haggin & Carr used the courts and their vast financial resources to crush rival appropriators, and so did large appropriators throughout the San Joaquin Valley. For example, in the two decades following the drought of 1877, Moses J. Church, often regarded as the "father" of irrigation on the Kings River, engaged in over 200 court battles to defend his appropriative rights. His legal expenses exceeded the cost of all the irrigation works he constructed. Most of the suits involved cattlemen who sought to use their riparian rights to block the expansion of irrigation. But a substantial number involved disputes among appropriators: new irrigators against old, irrigation colonies (and later districts) against private water companies, and ditch against ditch. Riparian rights were only one source of conflict. The geographical diversity of the state, the variety of uses to which water was put, the economic

power of land and water companies, the speculative nature of business, and an inadequate legal system, all insured that California would raise an abundant crop of suits with or without the riparian doctrine.⁶⁰

Nevertheless, many Californians believed that the future of irrigation in California hinged on the outcome of Lux v. Haggin. The case grew out of the drought of 1877, as did many of the Kings River suits. In that year, diversions through the Kern County Land and Canal Company's Calloway Canal dried up Buena Vista Slough, contributing the death of 16,000 cattle. Miller & Lux offered to permit the farmers upstream to divert up to 75% of the stream's volume in a given year, if the irrigation company promised to allow the remaining water to reach the pasture-land. Haggin & Carr refused, confident that no local court would rule against them. But drought gave way to flood, and the conflict temporarily faded. Finally, on April 15, 1881, Miller & Lux filed suit in the Kern County Superior Court.⁶¹

The case attracted considerable public attention. Many farmers believed that the riparian doctrine severely limited the expansion of irrigation. Yet, as Arthur Maass has shown, this was not as much of a danger as it appeared. Irrigators had long circumvented the riparian doctrine by establishing "prescriptive" rights through continuous diversion for at least five years or by purchasing water or forbearance from riparian owners. Moreover, most riparian owners did not relish the prospect of costly litigation, and settled their conflicts with appropriators out of court. Perhaps the greatest danger posed by riparian rights was that if the courts recognized such rights as supreme, then a comprehensive state irrigation system would be impossible. State officials would not be able to determine how much surplus water the state could use. In any case, after 49 days of testimony and lawyer's arguments, Judge Benjamin Brundage ruled on November 3, 1881, that the English Common Law was obsolete in California. E.F. Treadwell has commented that "public opinion" swayed the decision. "Individually they [the farmers served by Haggin & Carr's company] presented pathetic figures, but in the aggregate they were a power. They represented the voting strength of the country. Long before the trial was over, it was clear that the judge was strongly in their favor, and the trial became only the making of a record of his errors."⁶²

Henry Miller immediately filed an appeal, but the Supreme Court did not consider it until October, 1884. Meanwhile, Judge Brundage's decision gave little comfort to the champions of appropriation, at least outside Tulare County. Soon after the legislature of 1883 convened, the Assembly Committee on Irrigation and Water Rights visited Fresno and Tulare

counties. It paid homage to the small farmer, lauding the efforts of those Fresno County irrigators who made a comfortable living from 20 acres of land. Yet, the committee reflected the growing power, selfishness, and limited vision of California's land and water companies. Once again, riparian rights were condemned as the major obstacle to the expansion of irrigation. However, the committee paid no attention to the need for a complete record of active water rights, state control over the acquisition of new water rights and control over distribution, or improving the process of adjudicating conflicts. The campaign to reform California's water laws launched by the Grangers and other anti-monopolists in the 1870s, had been taken over by the very interests that movement had been designed to control.⁶³

Nothing reflected this better than the reception William Hammond Hall's suggestions met. By 1883, Hall had given up on the model water bills he had proposed to the 1881 legislature. He noted that he was not a lawyer and had offered the legislation solely as a "starting point for discussion." But Hall still maintained that the legislature should provide an orderly process for the acquisition, recording, and updating of water rights, as well as a distribution system which would reduce waste. The engineer wrote in his 1883 report:

The establishment of a system of control and direction, which will relieve the Courts of many vexatious suits, and which will inspire confidence in and add stability to irrigation property, need not constitute an attack on existing claims of right, and need not bear heavily upon or embarrass the users of public waters. The effect, under a wise system, would be felt gradually; all parties concerned would as gradually become used to it, and recognize in State control the only means of protecting the interests of each, as it has proven in every old irrigation country in the world. In this connection I have no measure to urge or advocate, believing it to be the best interests of the cause of irrigation, to have the subject thoroughly understood by the people, and to have measures emanate from them or their representatives in the legislature.

Hall's "conservatism" angered the state surveyor general, who had accused the engineer of being more interested in quieting titles to water than in dividing the supply equitably. Hall had never openly supported a declaration of public control over water, nor did he favor wholesale condemnation of existing rights by the state, or a state irrigation system. Consequently, he was sometimes portrayed as a pawn of the monopolists. Perhaps Hall did stand to profit personally from his recommendations, though we have no evidence to prove as much. In any case, as in 1881, no legislator stepped forward to champion Hall's proposals; nor did they capture the attention of the public.⁶⁴

The most controversial water legislation introduced at the 1883 session was proposed by Assemblyman Wharton of Fresno County. Wharton introduced five irrigation bills, two of which attracted particular notice. One would have permitted the formation of irrigation districts

at the request of local farmers following the completion of surveys of the irrigable land and water sources by county surveyors. Each district would be governed by an elected board of water commissioners, and, if two-thirds of the voters within a proposed district agreed, bonds could be issued to pay for the works. The bonds would be retired through a tax on the irrigated land. The most novel feature of this bill was that it would have given local commissioners the power to condemn all water rights within the district. A second bill, A.B. 365, would have "invalidated" the riparian doctrine. Though the Assembly Irrigation Committee reported this bill favorably, a strong minority report was filed by committee members from Tulare-Kern, Nevada, and San Bernardino counties. These lawmakers cited court cases upholding riparian rights, and denied that the legislature had the constitutional power to abrogate the doctrine. Further, they charged that Californians "...taken as a whole, have made no demand for such legislation, but large land owners in particular counties, who have acquired lands under the Desert Land Act, and who have conveyed portions of them to settlers, with a guarantee [sic] that water shall be furnished in ample quantities, seek legislative aid in this instance in order to carry out their contracts, and to defeat the decisions of the Courts."⁶⁵

Several other water bills were introduced in the 1883 legislature. The most far-reaching proposed by Senator Whitney, challenged the doctrine of appropriation. The bill may have been inspired by the 1854 law discussed in Chapter II. Whitney wanted to give the county boards of supervisors the responsibility of allocating and distributing the water within their jurisdiction. His bill declared the state's unappropriated water public property, and prohibited the future acquisition of appropriative water rights for irrigation; mining would not be affected. Each year, the board would divide up the water supply, giving public ditches preference over the claims of individual diverters as well as water companies. However, it could not deprive any established irrigator of his water supply. If any particular water user disputed the board's judgment, the board in an adjoining county could arbitrate the dispute. This bill, like Wharton's package of legislation, failed to win the approval of either house of the legislature.⁶⁶

The year 1884 was a busy one for irrigation promoters. During the 1870s, sentiment for water law reform had been confined largely to the San Joaquin Valley. But the debris controversy kindled interest in reform among northern Californians who wanted to limit the power of hydraulic mining, just as the rapid growth of southern California following completion of the railroad into Los Angeles in 1876 stimulated reform in that section.

Moreover, the irrigation crusade even won some converts among San Francisco businessmen, many of whom suffered from a business slump in the middle 1880s. Hydraulic mining had all but disappeared after a federal court injunction prohibited it in 1884. Moreover, in 1882 the completion of the Southern Pacific's line to New Orleans reduced San Francisco's economic hold over the "cow counties," just as completion of the Northern Pacific's transcontinental in 1883 cut into San Francisco's control over the markets of Oregon and Washington. In short, while strong sectional differences prevailed, and even intensified, during the 1880s, water law reform enjoyed much broader appeal than it had at the end of the previous decade.

For example, in the middle of May, a convention met in Riverside to discuss California's inadequate water laws. Originally, the convention had been scheduled to coincide with the Sixth Annual Exhibition of Citrus Fruits held in Riverside in March, but torrential rains forced a postponement. The keynote address set the mood of the meeting. It declared the riparian doctrine "repulsive, dangerous and ruinous to California....Let our courts in an evil hour give preference and sanction to this principle and the spectacle of decadence in Los Angeles and San Bernardino counties inside of five years would be mournful, aye hideous, to contemplate." Though some members of the convention doubted that either the courts or legislature could overturn riparian rights, the delegates agreed to meet again in Fresno in December to draft legislation for the 1885 legislature.⁶⁷

A new sense of urgency confronted the delegates who met at Fresno at the close of the year. On October 27, 1884, the California Supreme Court had overturned Judge Brundage's decision. Though it also agreed to hear new arguments in the future, its decision clearly gave riparian rights primacy over those acquired by appropriation. The Fresno convention's executive committee issued an "Address to the Legislature" which argued that since the Eastern states had frequently modified the Common Law to suit local conditions, California could do the same:

The conclusion must be that, by the Act of 1850, we adopted only such portion of the common law of England as was applicable to our condition, and whatever we did take of the common law included a power and duty existing in Judges and Courts exercising common law jurisdiction to modify the common law when demanded by common necessity, and reconcile conflicting decisions arising either from such modifications or from the misapprehension as to the applicability of any portion of the common law, and this without any usurpation of the powers of the Legislature.

The men who wrote these words were not disinterested idealists. Their economic interests and home counties spoke volumes. The group consisted of Will Green of Colusa County, D.K. Quinwalt and E.D. Ruggles of Tulare, J. De Barth Shorb of Los Angeles, Richard Hudnut

of Kern, and J.T. Wharton and H.S. Dixon of Fresno. There was no representation from such important irrigation counties as Napa, Yolo, or Monterey, nor did any of the members represent business or other economic groups. Shorb, who was chairman of the group and would serve as an active lobbyist before the legislature, owned 10,000 acres of land suited for development as citrus orchards and grape vineyards, and Green owned thousands of acres near the Sacramento River. When the legislature was considering the bills drafted by this group, Green candidly admitted: "...if the bills pass, the present year will see the Sacramento Valley." Presumably, Green was referring to the Stony Creek Canal Company which he had formed earlier in the year.⁶⁸

The "Fresno Bills" constituted a comprehensive package of water legislation. Senator Reddy of Los Angeles County introduced three bills in the Senate, and Assemblyman Weaver introduced companion measures in the Assembly, S.B. 210 and A.B. 410 limited riparian owners to the amount of water they actually used, and granted appropriators the right to condemn any riparian claims which limited their diversions. They also confirmed all existing appropriative claims.⁶⁹ S.B. 37 and A.B. 170 borrowed from William Hammond Hall's proposals of 1880, but without challenging any established appropriative rights. They required each appropriator to file a formal claim on forms prepared by the state engineer. Once a complete list had been compiled, the state attorney general would file suit to quiet titles on each stream, though the individual superior courts would simply confirm existing diversions and establish chronological priorities. The resulting decree would be conclusive, though disgruntled claimants could appeal. Each year, water users would be required to update claims by providing the county recorder with information concerning the location and extent of diversions. Anyone who wanted to claim water in the future would also have to file and make the same annual statement, but the state was not given the power to evaluate new claims or distribute the water.⁷⁰ S.B. 38 and A.B. 171 provided for the formation of irrigation districts administered by local boards of water commissioners, upon petition from the owners of half the land within the proposed district whose boundaries would be designated by the state engineer. The commissioners would issue bonds and purchase or condemn established water rights, and a district board of trustees would determine the assessed value of all district lands and apportion taxes to retire the debt according to the value of the land and anticipated benefits from irrigation.⁷¹ Finally, a proposed constitutional amendment would have allowed district officials, as well as county boards of supervisors, to set the rates charged by private water companies. However, the amendment promised the

companies a minimum return of 7% per year on capital invested. The amendment was designed, in part, to meet the needs of irrigation districts which chose to allow private water companies to build their irrigation works.⁷²

Many California newspapers, including the San Francisco Alta and Chronicle, the Fresno Expositor and Republican, the Los Angeles Herald and Express, and the Colusa Sun, supported the legislation.⁷³ However, considerable opposition surfaced in Sacramento and San Francisco, as well as in the mining counties. Sacramento's Bee and Union both opposed the Fresno bills. The Bee argued that any increase in diversions from northern California streams would reduce their volume, limiting both navigation and their capacity to scour out mining debris. It also argued that riparian proprietors had rights that could not be ignored; the legislature should not "...rob one set of men for the benefit of another." The Union wondered if the limitation on riparian rights embodied in S.B. 210 had been engineered by the mining interests. Any limitation on riparian rights might also limit the liability of hydraulic mining companies: "Better that the deserts remain unreclaimed and the parched lands go unwatered, than that the law be floated out, which is to-day the safeguard of the people against the unnatural descent of mining debris and slickens, and which, if unchecked, would render the fertile regions along the Sacramento river uninhabitable and utterly destroy the navigability of the chief free highway of the State." San Francisco's Bulletin noted that the proposed constitutional amendment guaranteeing a 7% return to water companies was unrealistic because it did not require water companies to open their books. Nor could any city or county dependent on a water monopoly afford to penalize a company that failed to comply with the law. It also charged that this proposal had been inspired by the Spring Valley Company. A prominent correspondent of the Pacific Rural Press noted that public control over water rates was of limited value in any case:

Under those [Fresno] bills a man that secures possession of water can do just what he pleases with it. He is not bound by law to divide with any one, pay or no pay. What does [sic] Haggin & Carr care that the Board of Supervisors shall fix a water rate? They are under no obligation to furnish water to others, even if they get all [the] Kern River. Under these bills then a water owner can dry out his neighbors, and buy for a song all the land his water will cover. He even is not bound in his yearly statement to show whose land was irrigated (Sec. 15). These bills should be entitled: Acts to monopolize the land and water of the arid portions of the State in the quickest and most effectual manner.

The state's former surveyor general, James W. Shanklin commented: "The vice of nearly all the bills on irrigation, is the taking of the patrimony of the people from them and

giving it over to private and corporate ownership." Shanklin maintained that public ownership offered the only safe alternative to monopoly.⁷⁴

The Fresno bills passed the assembly by over a four to one margin on February 24, 1885. However, despite the tenacious lobbying efforts of J. DeVarth Shorb, in the senate they encountered a strong coalition of senators who represented the hydraulic mining and riparian interests. The mining block, led by Nevada County's Senator Cross, pushed two "pet" bills. One would have authorized the payment of \$260,000 for the debris dams and levees constructed in 1880 and 1881. This was the amount left unpaid after the supreme court overturned the Debris Act of 1880. The second bill would have permitted mining companies to condemn land and build debris impoundment dams on their own; in exchange, they would have been absolved of all responsibility for future damages to towns or farms in the valleys. Three men led the senate debate over the irrigation bills: Reddy, who had introduced the Fresno legislation; Cox, a lawyer and riparian owner with strong ties to Miller & Lux; and Cross. Debate over the legislation often focussed on technical legal questions--for example, whether riparian rights originated in federal or state laws. But the delegation headed by Cross opposed the water bills because the agricultural interests had strongly opposed the Debris Bill, and still refused to back any legislation favorable to mining. When the irrigation bills reached the senate, many miners hoped that a trade-off could be arranged. For example, the Downieville Mountain Messenger commented on February 28th: "...we expect it [the bill limiting riparian rights] to give our fellows a chance to trade votes, and trade them often, to the end that the dam bill of Senator Cross, or one of kindred import, may become a law, and remove from our backs the old man of the valley, who is riding us to death." However, when Cross's bill came up for a senate vote late in February or early in March, it won only one vote from outside San Francisco or the mining counties.⁷⁵

Apparently, poor floor management also accounted for the failure of the irrigation bills. Senator Reddy had served two previous terms in the legislature, but he could not match the parliamentary skills of Cross. He waited nearly a month to introduce the bills, and, consequently, they were buried under a mound of proposed legislation. Moreover, the bill limiting riparian rights ended up in the general file, rather than the much shorter special file. Reddy also took on too many jobs. He spent a week championing a bill to create a home for the blind, and squandered both energy and political support pushing several unpopular measures including one to abolish voting requirements for jurors. Since senate rules prohibited spending more than an hour and a half per day on any particular bill or set of bills, the time lost was critical. A majority of the senate supported the

...legislation. But the floor leaders, first Reddy, then Del Valley could not muster the two-thirds vote required to consider the Fresno bills out of order. The Sacramento Union noted that many opportunities to bring the bills forward in the senate had been ignored. It suggested that Reddy and Del Valley had dragged their feet in the hopes of exploiting the irrigation controversy in their next election campaigns.⁷⁶

In the end, the legislature of 1885 accomplished little more than its predecessors. Several other water bills were introduced, but they offered little new, and floundered the wake left by Fresno bills.⁷⁷ Near the end of the session, an angry J. DeBarth Shorb issued a pathetic, melodramatic appeal to the lawmakers:

...turn not a deaf ear to the supplications of the thousands and tens of thousands whose now happy homes may be made desolate by non-action on your part...You know that thousands of people went upon the arid deserts of California because they had not the means to purchase land elsewhere, and under what they thought the laws of the State, diverted the waters of the streams upon them; that they lived in flimsy huts, affording insufficient shelter from the burning sun of summer, and the cold blasts of winter; that they went poorly clad, and lived on the coarsest food--not enough, in many cases, to properly support life--while they were digging ditches and waiting for the vine and fruit trees to grow, and that thus beautiful homes have been made, and large and prosperous communities built up...But now comes an interpretation of law that these diversions of water are wrong and illegal; that three of four cattle kings, who happen to have the swamps at the ends of some of the streams, have the right to have the swamps remain swamps; that the desert shall no longer bloom, but that it shall be a desert... We have spoken thus far in behalf of our present population; but we add to this prayer for the future of California. We beg that you will not, by non-action, destroy for years the bright future of our State.

Apparently, some members of the legislature were moved by the appeal. The Los Angeles Times reported that a "large number" of Republicans in the legislature favored a special legislative session devoted to irrigation.⁷⁸

In the months that followed, the water controversy continued to burn at white heat. Even such a staid literary journal as the Overland Monthly joined the debate.⁷⁹ The State Grange, whose political influence had faded considerably since the middle and late 1870s, remained the most vocal pressure group to call for greater public control over water. For example, its Committee on Irrigation reported to the 13th annual meeting of the Grange in October, 1885:

Your committee know of no safer or better plan to accomplish this desirable object [of promoting irrigation] than through a general system of irrigation which shall be under complete state control. Of course, in order to carry out this aforesaid system the State will have to exercise its power of eminent domain as well on riparian owners, so called, as upon the owners of existing water ditches, who may have acquired vested rights; in either case we deem that ample compensation should be made for any losses sustained.

However, many Grange members apparently perceived a threat to their own water rights in such a scheme, and the memory of the debris debacle of 1880-1881, as well as the sordid power play of the mining delegation at the 1885 session of the legislature, convinced them that a state water project posed untold dangers. Consequently, the Grange rejected the recommendation. However, it adopted a resolution supporting a constitutional amendment

declaring that all water courses and lakes, except those barely sufficient to water half a section of land, and except such water as is claimed by the United States for navigation purposes, are the inalienable property of the State, and that no diversion of water from the basin of a lake or a channel of a stream is lawful without the permission of the public authorities, and that no lease of water obtained from the State authorities should extend beyond a term of ten years.⁸⁰

The Irrigation Association of California also joined the call for water law reform, noting that northern California was lagging far behind the growth rate of southern California. The group, dominated by northern California boosters and businessmen, pointed out that irrigation had contributed to a doubling of taxable property in Los Angeles from 1881 to 1885.⁸¹

Whatever, the opinions of literary journals, farm organizations, or state boosters, the state supreme court still had the last word on California water law. On April 26, 1886, it handed down its final judgment in Lux v. Haggin. The majority opinion ran 150 pages, and essentially upheld the 1884 decision. It warned that without the check of riparian rights, appropriation would produce a monopoly "...by comparatively few individuals, or combinations of individuals controlling aggregated capital, who would either apply the water to purposes useful [only] to themselves, or sell it to those from who they had taken it away, as well as to others. Whether the fact that the power of fixing rates would be in the Supervisors, etc., would be a sufficient guarantee against overcharges would remain to be tested by experience." The court could not deprive citizens of vested rights without good cause, and certainly not because another group of citizens considered their needs a higher good. Unlike appropriative rights, riparian rights were inseparable from the land itself, and those rights could not be confiscated without destroying the value of the land itself. However, for the first time the court formally acknowledged that irrigation was a "public use" of water. In doing so, the justices confirmed the right of irrigation companies and other organizations of farmers, such as irrigation districts, to condemn riparian rights on condition of proper compensation. The case also clarified several other characteristics of these rights which had been widely accepted but not confirmed by the highest court: disuse did not destroy riparian rights; riparian farmers could use a reasonable quantity of water to irrigate their land, or sell water to non-riparian landowners, even if these diversions reduced a stream's volume (assuming the forbearance of others who owned land adjoining the stream): and water rights

... acquired through adverse use and prescription were not subject to challenge by riparian owners. Thus, condemnation, purchase, and adverse use, offered hope to irrigators. Moreover, the court also confirmed the primacy of appropriation on the public domain, as recognized the federal statutes of 1866, 1870 and 1877.⁶²

The four to three vote to uphold the riparian doctrine suggested the depth of disagreement among the judges. The dissenters offered several cogent arguments. First, the English Common Law had often been adapted or restricted to serve local conditions. The English had abandoned riparian rights when they moved into India, just as the doctrine had been radically amended in California. Had not the formal adoption of appropriation by the courts served as a de facto limitation on riparian rights, an indication that the doctrine, as observed in England and the humid Eastern states, could not prevail in arid climates? Then, too, Spain and Mexico did not recognize riparian rights. So it was possible to argue--especially given the terms of the Treaty of Guadalupe Hidalgo--that the system had been continued, rather than created anew, when California entered the nation. Such an interpretation, of course, gave chronological priority to appropriation. Finally, Justice Myrick argued that the riparian doctrine tacitly violated the Swamp Land Act of 1850. The swamp lands had been deeded to the states on condition of reclamation. However, many swamp land owners used their riparian rights to flood the land, violating the spirit of the law. Ironically, the doctrine of appropriation, which was more suited to irrigation, had contributed to the reclamation of overflowed land by reducing the volume of the state's major streams.⁶³

Of course, San Joaquin Valley water users were less interested in points of law than in the impact of Lux v. Haggin on their own water rights. They reacted to the suit in two ways. On July 28, 1888, 31 corporations and 58 individuals claiming water from the Kern River agreed to divide up the stream. The contract promised Henry Miller and his allies exclusive use of the Kern River from September to February, and also from March through August when the river carried less than 300 cubic feet per second. The remaining water was divided in the ratio of two-thirds to the Haggin interests and one-third to the Miller group. To increase the existing supply, the two sides also agreed to share the cost of damming Buena Vista Lake and building new canals and levees. Arthur Maass has noted that similar agreements were worked out between appropriators and riparian owners on the Kings River. However, the suit had an even more immediate result. Before the Haggin forces opened negotiations with Henry Miller, they turned to the legislature for one last try at amending California's water laws.⁶⁴

In April, 1886, the proponents of the Fresno Bills, now organized as the "State Irrigation Convention," urged farmers to form anti-riparian clubs: "Organized, you have a potent force in the selection of judges and legislators. It is within your power to crush the threatening evils of riparianism. Fire the hearts of the people with the justice of your cause. Show political parties that you have the strength and will to enforce what you demand." The "convention" reported that only 284,000 people lived in the Central Valley, a population density of five to the square mile. This compared, according to the group's figures, with 92.6 per mile in the Merrimac Valley; 56.5 per mile in the Connecticut Valley; 173 per mile in the Hudson Valley; and 109.7 per mile in the Miami Valley. It estimated that the valley could support 11,000,000 people, "...a population which would make San Francisco the most desirable business city in the world, and the mart of an immense commerce, as varied in the products of which create it as the globe gleaned trade of London."⁸⁵

The interest of the appropriators in winning support from San Francisco financial interests was evident in the choice of that city for the anti-riparian convention held on May 20th at the Grand Opera House. One member of the executive committee claimed that the anti-riparian clubs organized throughout the state in the spring counted 20,000 members. However, aside from the notable presence of the President and Cashier of the Bank of California, the San Francisco delegation gave little evidence that the water companies had won over the city's business community. Moreover, virtually all the delegates were from southern California or the San Joaquin Valley. Most were canal company lawyers, and 14 were employees of Haggin's Kern County Land and Water Company. W.B. Carr was elected vice-president and given a seat on the executive committee. Although Colusa County, in the Sacramento Valley, contained three anti-riparian clubs, Will Green, who was listed as a member of all three, doubtless fathered and nurtured the groups. Green drafted a "Declaration of Principles" clearly inspired by the water companies. And when some delegates refused to sign the "creed," they were prohibited from participating in the convention.⁸⁶

The most prominent delegate to the San Francisco conference was Governor George Stoneman who owned a large citrus orchard in San Gabriel, helped organize California's first formal irrigation convention in 1873, and preached the need for water law reform in his message to the 1885 legislature. After the supreme court issued its decision, Haggin asked Carr to hunt down members of the 1885 legislature and enlist their support for a special session to reconsider the Fresno bills, as well as a new scheme to reorganize the supreme court. As noted earlier, a majority in the 1885 legislature had favored the bills, and Haggin and Carr

...feared that their support might evaporate during the six months prior to the next regular session. In any case, Carr garnered the signatures of 21 of the 38 senators and 64 of the 78 assemblymen on a petition warning that before the next regular session "...thousands of citizens and their families may be ruined, and millions of property may be destroyed." The document pledged the signators to support the proposed legislation. Wallace Morgan has claimed that Carr, "reinforced by a stalwart bunch of his friends from Kern county and elsewhere," presented the petition to the governor in a San Francisco hotel room, apparently on July 15, 1886. That night, the governor "...distinguished and endeared himself...by consuming without a quiver more mint julips than any other man in the crowd from below the Mason and Dixon line could carry off." Despite the governor's well-earned reputation as a hard drinker, the feat was all the more prodigious given his service in the Union Army. We do not know whether the governor's advanced state of intoxication had been "planned" by Carr or not, but towards the end of the evening the jolly executive signed the executive order calling for the extra session to meet on July 20th.⁸⁷

In his call for a special session, Governor Stoneman suggested that a state of emergency existed in California which could lead to the armed conflict between appropriators and riparian owners:

The majority of the judges of the Supreme Court have announced that any riparian proprietor may obtain an injunction against any person not a riparian proprietor, to prohibit him from appropriating, diverting or using water from the stream above his land. Under this ruling the ditches and canals, which are the arteries of the agricultural life of the State, may be closed by writs from the courts, and, too, upon ex parte application, without notice or warning or opportunity of being heard until after irretrievable damage has been done. Many such suits are now pending. Writs of injunction have been asked for and in some cases obtained, but have not been obeyed. Should an attempt to be made to enforce them and others which are likely to issue, as is apprehended, serious trouble may ensue, because the people may resist to prevent the desolation of their homes, farms, vineyards and orchards.⁸⁸

The governor exaggerated the emergency, just as he incorrectly assumed broad popular support for the proposed legislation. The demand for a special session arose for a number of reasons, not all of which were directly related to Lux v. Haggin. Sacramento's Bee mentioned that the federal government had recently cancelled fraudulent timber entries in California, and that Haggin & Carr's dummy entries in Kern County continued to provoke public criticism. Consequently, the two men may have taken these cancellations as a warning that the Interior Department might soon revoke their titles to Desert Land Act claims. They could strengthen their title by irrigating as much land as possible. "But if they can secure the water," the Bee's editor wrote, "the recovery of the land would be a mere matter of time. This

consideration may be one reason of their great outlay for the extra session." Moreover, Stoneman himself doubtless hoped to strengthen his chances for reelection in November. The irrigation crisis offered a ready-made political opportunity both for him and the Democratic Party.⁸⁹

But it was a risky opportunity. In 1884, Stoneman had called an unsuccessful special session to consider railroad rate legislation, and many newspapers made him a scapegoat for their blighted hopes. He faced a similar danger in 1886. While the legislature seemed committed to reform, most of the members "cultivated" by Carr did not represent counties where irrigation was common. And since they faced little direct pressure from constituents, their support depended as much on vote-trading and bribes as on the fiction that riparian rights would destroy irrigation and imperil the state's economic future. Thomas E. Malone, in his excellent study of the 1886 session, noted that within the Central Valley only 19% of all farmers practiced irrigation, and only 2% of the farmland was under ditch. South of the Tehachapis, 55% of all farmers used irrigation, but, still, only 12% of the farmland was watered. Moreover, the counties of Los Angeles, San Bernardino, San Diego, Fresno, Tulare and Kern elected only eleven of the legislature's 120 senators and assemblymen.⁹⁰ Reform was made doubly difficult because of the three-way split between champions of appropriation, riparian rights, and "state control." The state control party included interest groups ranging from mining companies to the Grangers. Finally, any constitutional amendment to abolish riparian rights would require a 2/3 vote of the legislature.⁹¹

Most of the state's newspapers supported the Fresno bills in 1885, but that support all but disappeared by the beginning of August, 1886. The Stockton Independent commented: "Private ownership and control of the waters of the state is far more to be dreaded than the objectionable law of riparian rights, which is altogether inapplicable to California....The idea of recklessly giving away public property and then paying individuals for the use of that property cannot be entertained...." After an exhaustive survey of county records, San Francisco's Chronicle prepared a stream-by-stream list of the state's leading appropriators. Not surprisingly, the names of the champions of the pending legislation appeared frequently. The newspaper concluded that only remote Inyo County, on the eastern side of the Sierra, contained any unclaimed water, and that most streams had been claimed many times over. Hence, any law which simply confirmed existing appropriative claims would subject all future water users to a corporate monopoly, a monopoly which would enjoy a perpetual profit of at least 7% a year.⁹²

Nevertheless, as the legislators poured into Sacramento, Carr expressed confidence that they would pass the Fresno bills and adjourn within a week. He was joined in Sacramento by several able lobbyists including Haggin's personal secretary and J. DeBarth Shorb. The trio was frequently seen buttonholing lawmakers in the lobby of the Golden Eagle Hotel. The San Francisco Chronicle noted that they were no less active in the "arena" itself:

That it is a Haggin and Carr fight, pure and simple, for the waters of Kern River is to an unprejudiced observer indisputable. An hour in either chamber would be sufficient to convince any one. At any hour in the day J. DeBarth Shorb can be found in the Assembly chamber, while the Senate chamber is perpetually alarmed by the presence of W.B. Carr. Henry C. Dibble, or Judge Dibble as he is popularly called, and who has been here since the opening day of the session, divides his time between the two chambers, consulting and advising with Carr and Shorb and communicating their instructions to their followers.

Charles Lux, and a host of prominent San Francisco politicians, including the city's Democratic boss, Chris Buckley, ably represented the other side. Though the appropriators dominated the assembly, Miller & Lux controlled a substantial minority in the senate. The San Francisco Post published a list of "senatorial cattle" which it claimed "will be seen to bear the brand of Miller & Lux when the final rodeo is made." The statement, indiscreet but fully warranted, resulted in the correspondent's expulsion from the senate floor. Charges of vote-buying appeared frequently in the press. For example, the Stockton Independent claimed that Carr's forces had paid \$300 to each assemblyman who voted for the constitutional amendment abolishing riparian rights, and promised an additional \$600 pay-off if the amendment cleared the senate.⁹³

Many other bills and constitutional amendments won some attention from the 1886 legislature besides those in the Carr-Shorb package. Partisans of state control offered several measures declaring California's unappropriated water public property, and two more providing for a state irrigation system. Senator Days' plan would have retired state bonds through assessments against the land benefitted; Senator Cross's bill would have put the issuance of bonds up to a state-wide vote, then used general tax revenue to pay them off. Cross, one of Carr's strongest critics in the senate, called for the erection of dams "for irrigation and other beneficial purposes." Clearly, he hoped that such dams would capture debris and permit a revival of the hydraulic mining industry. Moreover, he probably hoped to form a new alliance with northern California farmers. His bills were reintroduced by Anthony Caminetti of Amador County in 1889, but the mining counties could no longer count on strong political support from the San Francisco delegation, so they could not dictate state policy as they had in 1880. With the additional exception of Senator Whitney's irrigation

district bill, most of the remaining legislation pertained to water rights--specifically how to limit the riparian doctrine. This legislation, dwarfed as it was by the Fresno bills, had little chance of winning broad support.⁹⁴

Despite almost daily editorial blasts against the Fresno bills, Haggin & Carr, and corruption in the legislature, Carr's substantial payroll and lobbying skills might have saved the day had the cause of irrigation not been closely linked to the supreme court reorganization plan. Publicly, Governor Stoneman justified the scheme by claiming that two of the justices had been incapacitated by physical illness, or perhaps even "mental incompetence," for months, and that the court was underpaid. However, these reasons were a transparent "cover." Carr and Shorb wanted a new court so that they could be sure the legislation passed by the special session would be upheld. A new court also represented a "fall back position." Even if the appropriators failed to reform the state's water laws, they could hope that a reorganized court would overturn the verdict in Lux v. Haggin.

The governor, aided by Carr, Shorb, and company, pushed a bill to reduce the court's size from seven to five members, and increase salaries from \$6,000 to \$12,000 a year. This would have permitted Stoneman to "retire" justices Robert F. Morrison and John R. Sharpstein, both of whom had been part of the majority in Lux v. Haggin. Senator Grove Johnson of Sacramento County claimed that the two judges were totally incapacitated, and had not written an opinion for months. He reported widespread support for reorganization among the legal profession. The campaign received welcome help from former Chief Justice David S. Terry, famed for his duel with Senator David C. Broderick in 1859. Terry had served as Sarah Althea Hill Sharon's attorney in a divorce suit against William Sharon, the silver baron and U.S. Senator from Nevada, and later married her. The Supreme Court, including Morrison and Sharpstein, had rejected Terry's claims in the property settlement. In response, the attorney urged the legislature to investigate the fitness of the two judges.⁹⁵

Meanwhile, public reaction to the court plan was overwhelmingly negative. On July 26, 1886, Senator Cox of Sacramento County presented the legislature with a petition bearing the signatures of 20,000 to 25,000 residents of San Francisco and Alameda counties. Many of the petitioners were lawyers and businessmen who originally supported the Fresno bills. Now they urged state control over all irrigation, and appealed to the legislature to reject the reorganization plan. The San Francisco Bar Association warned that the scheme would render the court subordinate to the legislature, and make conformity to public opinion the essential test in evaluating the soundness of decisions. Many Grange chapters also joined the

battle. The Pomona chapter echoed many critics who considered reorganization essentially a plot by which one group of citizens sought legal permission to steal the property of another group of citizens. It protested any "...policy that would assassinate the independence of our judges and strike a fatal blow at the stability and integrity of property--a policy essentially lawless, revolutionary and communistic; a policy that seems to be an open declaration of war against the basic and fundamental principles upon which our Government is grounded." Less than a week after the special session convened, the assembly judiciary committee unanimously rejected Stoneman's reorganization proposal, and two weeks later a special assembly committee concluded that the charges of incompetence directed against Morrison and Sharpstein were "groundless." Apparently, both judges had recovered their health by the time of the hearing.⁹⁶

Many who had supported the Fresno bills in 1885 recognized that the supreme court reorganization plan was an impudent power play, and they quickly soured on the remaining legislation. By early August, Carr and Shorb faced almost unanimous opposition from the state's press, and while they still dominated the assembly, they stood no chance of winning sufficient support in the senate. On August 20th, the governor prorogued the legislature until September 7th, claiming that the lawmakers needed time to campaign and nominate candidates for the fall elections. The Republicans had scheduled their state convention for August 27th and the Democrats for August 31st. Stoneman's refusal to dismiss the legislature contributed to the atmosphere of suspicion surrounding the Fresno bills. Senator Lynch of San Francisco, as well as many skeptical newspaper editors, charged that Carr had engineered the break so that he could use his substantial power at the convention to cajole recalcitrant Republicans. In Lynch's words, the boss hoped that "...some of the doubtful ones might see the vision of a golden light and...return converted, consoled and--compensated."⁹⁷

Perhaps the most damning public revelation concerning the special session occurred soon after the legislature reconvened on September 7th. The Sacramento Bee got hold of a confidential letter dated August 17, 1886, from Paul Oeker, an agent of the California Immigration Association which represented San Francisco's largest merchants, to Bernard Marks, an employee of a San Francisco real estate company who had served as a lobbyist for the Carr team. Both the Bee and Stockton Independent published the letter. Oeker noted that the cause was lost, that San Francisco businessmen who had originally signed petitions supporting the Fresno bills had turned against the legislation, and that the "...money spent already

[in the legislature] would have built reservoirs in the mountains." He urged that the discredited state irrigation convention disband:

Instead of this unfortunate combination which was weighed down by the firm of Haggin & Carr, local organizations should be formed... Only a few ditch owners came to Sacramento to plead their cause, but no small irrigators were heard even by letter. What good has been all those 60,000 signatures obtained here from merchants and bankers? If you ask them to-day, ninety-nine out of every 100 will tell you they gave their signatures under a misapprehension. If these people had attached any other meaning to their name, they would have come in large delegations to Sacramento before the [senate irrigation?] committee. The bankers and members of big firms, the Board of Trade and Chamber of Commerce of San Francisco, Los Angeles, San Diego, Stockton, Sacramento, etc. would have called special meetings to indorse your...cause, and in the face of that the Senate would not have dared to go back on their pledge... Unfortunately, Messrs. Shorb & Carr and the committee [?] stand alone in the fight with the majority of the press of the State against them and general distrust in their noblest motives. Unless you people can, in the eleventh hour of this ill-spent session patch up some possible compromise with their opponents and carry through some half-measure to make a beginning, nothing else will be left for Haggin & Carr but to either buy out Miller & Lux in Kern county, even at a sacrifice, which will come back to them, or make another sort of compromise with them for the water, so as to keep part of the same sure in any case...Any Constitutional amendment ever indorsed by Haggin & Carr will be defeated at the polls. Any candidate for Judge indorsed by them will not be elected. Miller & Lux have again triumphed...

Oeker warned that pro-appropriation votes would fetch a very high price in the next legislature, and suggested that the money would be better spent in buying a settlement with Miller & Lux.⁹⁸

The legislature formally adjourned on September 12th. Shortly before the legislators left Sacramento, they rescinded Section 1422 of the Civil Code which had acknowledged the primacy of riparian rights. This was purely a symbolic act, and the actors in the drama knew it. Riparian rights could not be limited by statute, and, in any case, the code amendment adopted in 1886 excluded all existing riparian rights.

Nevertheless, the sordid special session did make an important contribution to the evolution of irrigation and water law in California. Both the riparian and appropriative doctrines had been discredited as the pliant tools of monopolists, leaving state control as the only sensible alternative. Senator John M. Days, in pleading for his bill to create a comprehensive state irrigation system argued that

...where the public controls, through its constituted authorities, all the waters and great canals in the interest of the people, the rights of future generations are reserved, the cost of water to the consumer is infinitely less than when it passes through the hands of the feudal lord appropriators; the revenue goes to defray governmental expenses instead of into the pockets of said appropriators; there is less waste of water, more system, health is attended to and malaria prevented.⁹⁹

Many Grange chapters supported such a system in the hope the state could prevent monopolies and use general tax revenue to build dams and canals, thus reducing the cost of water to farmers.¹⁰⁰ Unfortunately, the vexing questions which had haunted partisans of a comprehensive state system in the past remained: How could such a system be paid for when irrigation was restricted to limited areas of the state, most of which were sparsely populated? How could a statewide system preserve some measure of local control over irrigation? And how could the irrigation works be built without providing a new arena for fraud and corruption?¹⁰¹

The irrigation district, which, of course, had been the subject of substantial legislative experimentation since 1872, provided the answer. The state Democratic platform, adopted on September 2, 1886, reflected a growing public sentiment when it recommended:

Appropriation of water, whether heretofore or hereafter made, should give no right to more water than is absolutely used in an economical manner for a beneficial purpose. To guard against a monopoly of water for irrigation, irrigation districts should have the right to acquire by purchase or condemnation the means necessary in conducting the water to do the lands comprising such irrigation districts. The English law of riparian rights is inapplicable to the circumstances and conditions of California. The State may at any time assume control of the division, use and distribution of water under general laws enacted for that purpose; provided, the State shall in no event be called upon by taxation, or otherwise, to construct irrigation works.

Newspapers ranging from Will Green's Colusa Sun to the Tulare County Times joined the call for new irrigation district legislation.¹⁰²

Ironically, in the legislature of 1887, irrigation and water rights attracted far less attention than they had in 1885 or 1886. The Stockton Independent suggested that "[t]he pending negotiations between Haggin & Carr and Miller & Lux...may or may not have anything to do with the [irrigation] question apparently dropping into obscurity, but it is reasonably supposable that these differences cut an important figure..." Equally important, the attempts by hydraulic mining companies to secure legislation that would eliminate their responsibility for debris damage by allowing them to build restraining dams, once again overshadowed irrigation.¹⁰³

Nevertheless, eight or nine irrigation bills were introduced. Most involved either irrigation districts or special study groups. Assemblyman Brierly of Los Angeles County offered a bill to establish a five-member committee to draft water rights legislation for consideration by the 1889 legislature. The bill required the committee to sift through all the data collected by the state engineer, examine the water laws of other states and nations, hold hearings throughout the state, and file a formal report with the governor by October, 1888. Fifty thousand dollars was promised to pay for the work. This bill was interpreted

by some newspapers as a vote of "no confidence" in the state engineer, and some of its support doubtless came from those who wanted to delay the adoption of irrigation district legislation. Riparian owners and many appropriators feared that irrigation districts would be given too much power over existing water rights, and, then as now, the formation of a special commission offered one method to buy time. In any case, the "go slow" approach won the support of several northern California newspapers, including the San Francisco Chronicle and Sacramento Bee.¹⁰⁴

The Brierly bill passed the assembly early in the session, but stalled in the senate. Many legislators balked at the unnecessary expense, especially since the state engineer had been gathering irrigation data for nearly a decade. The fruitless debate had gone on long enough. Stockton's Independent reported that "...unless something is done of an immediate and practical character bankruptcy will follow in hundreds of instances in sections [of the San Joaquin Valley] where irrigation is needed and demanded. Capital will not seek investment unless some law is passed to protect it in building canals and ditches so long as the Supreme Court decision stands as it now does." Four hundred and twenty landowners in Stanislaus County urged the legislature to approve an irrigation district law introduced by Assemblyman C.C. Wright of their county. Their petition argued that "[t]he local character of this bill, its recognition of existing rights, and its provision for the equal distribution of the waters, where equal burdens are borne and equal benefits conferred, renders the system particularly adapted to our wants, and as we believe equally adapted to other localities subject to irrigation." The San Francisco Chronicle, which originally supported the commission scheme, came out in favor of the Wright bill when it discovered that Haggin & Carr, as well as Miller & Lux, opposed the legislation: "Whatever may be the defects of the Wright bill, it will have the effect of shutting off all schemes for the wholesale seizure of the running water of the State under any claim of law whatever. If it will accomplish this, as it will do, it will preserve the water for the use of those who need it, and the next Legislature, having had two years experience under the system of this bill, can remove any crudities that may be found in it.... The Wright bill is all that stands between the rich water monopolist and the poor farmer." The measure passed the assembly by a vote of 65 to 0 on February 18, 1887, and though it was amended by the senate's riparian block, easily won approval in the upper house on February 28th. On March 7th, after word reached the assembly chamber confirming that the governor had signed the legislation, enthusiastic applause swept over the floor. Subsequently, the legislature approved a companion bill giving superior court judges

the power to deny or suspend injunction suits against diverters if the defendant posted an indemnity bond. The Wright Act promised compensation to all riparian owners. Nevertheless, these claimants might have used injunction suits to prevent indefinitely the construction of district irrigation works.¹⁰⁵

The Wright Act was conservative in tone, carefully drafted, and detailed. Unlike earlier bills, it did not limit participation in district elections to irrigators, or even "rural" landholders. The Senate Irrigation Committee had decided that irrigation districts were "political divisions," and both the state constitution and civil code prohibited property qualifications for voting.¹⁰⁶ Consequently, while the new law required at least 50 freeholders to petition their county board of supervisors before an election to form a district could be scheduled, all eligible voters could participate in that election, as well as in subsequent elections to select district officials or issue bonds. A two-thirds majority was required to form a district, but the initial bond issue required the approval of only a simple majority.

The law also gave irrigation districts authority to tax all real property within their boundaries, including town lots and buildings. Presumably, this was done for two reasons. Since all eligible voters could participate in the elections, they could also be expected to share the expense of building irrigation works. Then, too, the town and village would prosper with the countryside as irrigation drove up the value of land and crops. Consequently, the Wright Act required taxes to be levied solely according to the value of property, not according to the specific benefits derived by individual residents. The taxes would be used to pay district expenses--such as purchasing land or riparian rights--and to retire bonds, which could not be sold at less than 90% of face value.

Each district would be governed by a board of five directors, whose responsibilities included purchasing or condemning water rights and rights of way, supervising construction of dams and canals, and distributing the water supply. All water would be apportioned according to the ratio of individual tax levies as compared to the total district debt. However, no water rights were "absolute." In theory, the water supply belonged to the district, and not individual water users. Hence, a farmer who began irrigating his land as soon as district irrigation works had been completed would have no priority over residents whose land could not be served until years later. The board's authority was not as strong as some proponents of district legislation wanted. For example, the established courts, rather than the board or some other administrative-judicial tribunal, would determine compensation in condemnation suits. Moreover, the board could not condemn any water rights, dams, canals, or other works

owned by individual miners or mining companies. Nor could any district's diversions impair shipping in a navigable stream.¹⁰⁷

The Wright Act was far from revolutionary. Except for the provision opening district elections to all eligible voters, the new law simply borrowed the most unobjectionable features of earlier district bills. Nor did it expand the state's power over water. State administrative officials had no role in the designation of districts, the certification or issuance of bonds, the distribution of water, the process of condemning established water rights, or the acquisition of new rights. The law was a monument to sectionalism and the power of special interest groups; it exalted the principle of local control. Consequently, it promoted piece-meal, uncoordinated development of the state's water supply. The Wright Act was not a bold reform; it acknowledged that no bold program of water resource development could be adopted in a state cursed with such a wide range of factions.

In fact, adoption of the Wright Act went hand-in-hand with reducing the state's responsibility to promote irrigation and provide efficient, equitable water laws. The legislature of 1889 might have expanded the responsibilities of the state engineer to permit his office to collect information useful to the new irrigation districts. For example, Hall might have measured streamflows, proposed district boundaries, and tested soils. Instead, most lawmakers had already decided that the adoption of district legislation ended the need for a state engineer. In 1887, they had approved a "final appropriation" providing for the "...completion of all work now in the hands of the said Engineer." Prompted by weariness over the irrigation issue, a desire to avoid controversial issues, a yen to economize, and hostility towards William Hammond Hall, the legislature summarily abolished the office in 1889. In doing so, the state lost the services of the strongest "disinterested" champion of water law reform in the state.

Hall, like J.D. Whitney in the 1860s, contributed to his own downfall. Both men gathered a wealth of information not immediately useful to their "constituents," both were slow to publish their reports, and both paid the price. After more than a decade of work, Hall still had not told the state's farmers where to build dams or dig canals. He had been saddled with a wide range of responsibilities which forced him to neglect the irrigation surveys, the last of which had been conducted in 1884 or 1885. These included preparing a plan on how to use and develop Yosemite state park, and designing sewage and fire control systems for public buildings and asylums.¹⁰⁸ These chores were assigned even while the legislature steadily whittled down his appropriations in the years following the debris fiasco.

Then, too, Hall had systematically alienated much of his potential support, particularly among the Grangers. As mentioned earlier, Hall refused to support a state irrigation system. This so irritated the San Francisco Chronicle that on July 24, 1886, it commented: "The people of the State...think better of Colonel Hall's administrative ability than he does himself. They think he could build a system of irrigation works that would give satisfaction, and that he could furnish the farmers with water at very much less cost than the 8 per cent on the investment which his friends Haggin and Carr declare is the least they will do the job for." If Haggin and Carr were Hall's "friends," they did little to help him in the legislature. Nevertheless, his refusal to ally with the Grangers made him particularly susceptible to such charges. Similarly, Hall alienated many southern California farmers when he suggested that storing flood water in California was impractical because the state did not contain enough storage sites, and the cost of storage would exceed the resources of individual irrigation companies. Finally, in 1887 he made yet another political blunder by supporting the "code commission" to draft new water laws, and urging that this work be completed before the adoption of district legislation. The Stockton Independent noted: "This recommendation, if followed, would postpone practical action for at least four years."¹⁰⁹

Yet, for all his political ineptness, Hall's scientific judgment was sound. Many of his critics had considered his job temporary from the beginning. But the state engineer recognized that the expansion of irrigation agriculture would take place over decades, not in one burst of activity. Consequently, a "final report" could not be made. In his last report, William Hammond Hall penned a swan song filled with notes of bitterness and disillusionment:

This department was set up as sort of a compromise medium between two powerful couplets of unreasonable and selfish contending interests: The Hydraulic Mining and Anti-debris couple, and the Appropriation and Riparian couple. It is but natural that under such circumstances it [the state engineer's office] should suffer in efficiency and popularity, and that those should come to the surface willing and ready to accomplish their private ends, or vent their personal animosities, by making use of whatever popular prejudice or misunderstanding there might be on the subject...Now there is a reason for this, outside of any personalty or the outcome of the respective works. It is this: To be acceptable and popular before the public every procession must be headed by a band. A mere individual worker, no matter how efficient or how much multiplied in the public parade, cuts no figure unless there be popular music to which the appearance is made...No technical or scientific man can study his subject, attend to the duties of such a department, and at the same time make the appearance and music necessary to popularize his efforts... The State Engineering Department needs a Board--a Board of Directors, or Trustees, or Consulting Engineers, call them what you will--to do the popular things, and secure appropriations, while the State Engineer... does the work.

Hall also issued a prophetic warning: "When, as is sure to come, the State is forced to take control of her streams for irrigation, arterial drainage, and reclamation regulation, it will be found that the time has passed in which alone the data might have been acquired necessary for intelligent action, both in an engineering and political way." California would wait for a decade before new champions of water law reform picked up the flag.¹¹⁰

The elimination of the office of state engineer was yet another reflection of the stalemate in the legislature. Most of the causes of that deadlock--sectionalism, rival economic groups, inconsistent water laws, and political corruption or ineptitude--have already been discussed. But two causes are easy to overlook: the complexity and far-reaching legal implications of many water bills, and the high turnover in the legislature. Thomas Malone has estimated that from 1850 to 1890, 238 water bills were introduced. Many such as those which limited riparian rights or asserted state control over unappropriated water raised prickly legal questions which could not be answered. For example, even the most artful scholars of water law could not define precisely the line of demarcation between state and federal water rights. Could the legislature be expected to do any better? Since the constitution of 1879 limited paid legislative sessions to sixty days, lawmakers did not have much time to study the water bills. Consequently, they usually tackled more manageable issues. Only when pressure from special interest groups became intense, and lobbyists dipped into their purses to dispense their most powerful "arguments," did the "irrigation question" receive careful consideration. The high legislative turnover made the lawmakers much easier to corrupt. Only two assemblymen in the 1881 legislature returned two years later; only one member of the 1885 session had served longer than one term; and only one assemblyman and five senators elected to the 1887 legislature had served before. Politics was far from a profession, and most Californians doubtless voted as much out of disgust as hope. For a variety of reasons, most lawmakers, particularly in the assembly, did not stand for reelection. So in the absence of a permanent legislative committee staff and state administrative bureaucracy, little progress could be made from one session to the next. In effect, the lessons of the past had to be relearned every two years, and every session involved an enormous amount of wasted effort.¹¹¹

Yet the historian who looked solely at the legislature would get a distorted view of the development of irrigation in California. Even before the state supreme court handed down its final ruling in Lux v. Haggin, land and water company boosters predicted that the riparian doctrine would kill off irrigation, or at least sharply restrict its growth. This did not

happen. Water companies proved to be unprofitable long-term investments, but they grew more rapidly during the 1880s than in any previous or subsequent decade. For example, the number of southern California water companies increased from nine in 1880 to twenty a decade later; and the acreage irrigated by these ventures increased from 17,000 to 130,700 acres. In 1890, the largest block of farmland irrigated in southern California--some 18,000 acres--received its water from the Bear Valley Water Company's new reservoir in San Bernardino County. And by the end of the 1880s, a second "large" reservoir had been constructed, this one in San Diego County on the Sweetwater River.¹¹²

In 1878, California's surveyor-general estimated that about 200,000 acres of the state's farmland were irrigated. Yet by 1890, this number had swelled to 1,004,233 acres, an increase of 500 per cent. In that year, California contained the largest number of irrigated acres of any state in the arid West, over 100,000 acres more than its nearest rival, Colorado. The greatest growth had occurred in the San Joaquin Valley and southern California. Tulare County led the state with 168,455 irrigated acres, Kern followed with 154,665 acres, and Fresno ran third with 105,665 acres. The two leading irrigation counties south of the Techachipis, Los Angeles and San Bernardino, counted 70,164 and 37,907 irrigated acres, respectively. Reliable statistics comparing the growth of irrigation county by county during the 1880s are not available, but the impact of irrigation was reflected in growth of population and property values. In 1870, the combined population of the seven counties where irrigation was practiced on the largest scale--Los Angeles, San Diego, San Bernardino, Kern, Tulare, Fresno, and Merced--was 40,849; by 1890, their population had increased to 296,719. Thus, while the population of the state as a whole roughly doubled from 1870 to 1890, it increased by more than 700% in southern California. In the same twenty year span, the value of property in the above counties increased from \$22,513,820 to \$198,356,127. By 1890, land which sold for \$5-\$25 an acre in Los Angeles and San Bernardino counties in 1870 sold for \$100 to \$1,100 an acre; land around Fresno, which had sold for \$3-\$20 an acre twenty years earlier, fetched \$75 to \$750 an acre. Of course, irrigation was not the only reason for soaring property values. New rail lines, floods of health seekers, and artful land speculators all contributed to the rapid increase in prices. Still, with the notable exception of baronial Kern County, population growth went hand-in-hand with the expansion of irrigation.¹¹³

The above statistics mirrored the beginning of a profound revolution in California agriculture. Wheat had begun to give way to fruit, which process symbolized the transition from speculative to "scientific" farming. In 1880, California's fruit growers held their

first annual convention, and three years later the state created a board of horticulture, mainly to gather information on the host of voracious insects that plagued citrus growers. By 1883, even some northern Californians recognized that diversified agriculture offered a solution to many of California's economic and social problems. For example, in November, 1883, Horace Davis, President of San Francisco's Chamber of Commerce addressed the third convention of fruit growers, praising the future of horticulture:

...In the first place, your crop is surer than the crop of grain; in the next place, you can produce a great deal more to the acre; in the third place, you increase the value of the land, where the grain raiser only exhausts it; and in the fourth place, because you require so much more of care, of industry, of patience, and of prudence in your business,...you must inevitably raise a better class of citizens; and, moreover, the fact that your industry requires so much individual attention, lessens the quantity of land you are capable of holding and cultivating, and so tends to the cutting up of that portion of the State which is fit for your purposes into smaller holdings, which is the salvation, the prosperity, and the safety of the State.

Davis believed that agriculture passed through distinct phases which reflected the progress of civilization as a whole. While grain-growing suited the individualistic, acquisitive economy of the frontier, diversified farming fostered education and community life.¹¹⁴

The horticultural revolution depended on technological and institutional innovations ranging from new techniques to dry and can fruit, to refrigerated cars and special fruit trains, to cooperative marketing associations. Many Californians also believed that the irrigation district would stimulate the expansion of fruit culture. However, the optimism of 1887 soon gave way to the cynicism and despair of the early '90s. After a decade of prosperity and rapid growth, a devastating nationwide depression hobbled California's economy. Migration into the state slowed to a trickle, private investment in irrigation dried up, most irrigation districts went bankrupt, and many Californians looked to the future with apprehension or dread. Not until the 20th century would the state's inhabitants secure some measure of control over their economic destiny.

NOTES

CHAPTER IV. STALEMATE: IRRIGATION IN THE CALIFORNIA LEGISLATURE, 1878-1889

1. E.F. Treadwell, The Cattle King (Boston, 1950), 345.
2. Cal. Stats., 1878, 468. The legislature also repealed both the 1876 West Side laws; see p. 887 of the statutes. Also see Thomas E. Malone, "The California Irrigation Crisis of 1886: Origins of the Wright Act," Ph.D. diss., Stanford University, 1965, 97-111; The Stockton Daily Independent, January 5, March 15, and March 18, 1878; Pacific Rural Press, 15(January 19, 1878), 33; March 23, 1878, 185; 16(December 14, 1878), 376; 19(January 31, 1880), 65; "Report of Committee in Irrigation and Water Rights," in Journal of the California Senate, 1877-1878 (Sacramento, 1878), 391-392; and the Daily Alta California (San Francisco), December 16, 1878.
3. Cal. Stats., 1878, 820
4. S.B. 245 (Fowler), introduced January 23, 1878 in Senate Bills, 1877-1878, v. 1; and A.B. 373 (Holloway), introduced February 4, 1878 in Assembly Bills 1877-1878, v. 1. The Holloway bill pertaining to Los Nietos township in Los Angeles County was enacted. See Cal. Stats., 1878, 374.
5. S.B. 13 (Haymond), introduced February 21, 1878 in Senate Bills 1877-1878, v. 1. Also see The Stockton Daily Independent, January 9, 1878.
6. "Assembly Joint Resolution Number 10," adopted March 6, 1878 in Cal. Stats., 1878, 1070. Creed Haymond also introduced a resolution requesting the federal government to permit California to use the proceeds from the sale of all public lands within the state borders to pay for irrigation works. The resolution, "Senate Joint Resolution Number 23," introduced on January 11, 1878, failed to win approval from either house. It can be found in Senate and Assembly Concurrent Resolutions, 1877-1878, at the California State Law Library, Sacramento.
7. Sacramento Daily Record-Union, January 12 and 14, 1878; March 4 and 15, 1878; Pacific Rural Press, 15(March 2, 1878), 136.
8. Cal. Stats., 1878, 634; Third Progress Report of the State Engineer to 1883 Session of the Legislature, in Appendix to the Journals of the California Legislature, 25th sess., v. 1 (Sacramento, 1883), 3-4. Also see William Hammond Hall's later testimony before the Stewart Irrigation Committee in Report of the Special Committee of the United States Senate on the Irrigation and Reclamation of Arid Lands, S. Rep. 928, 51 Cong., 1 sess., v. 2 (Washington, D.C., 1890), 208-218. In his Gold vs. Grain: The Hydraulic Mining Controversy in California's Sacramento Valley, a Chapter in the Decline of the Concept of Laissez-Faire (Glendale, California, 1959), pp. 104-106, Robert Kelley suggests that the hydraulic mining controversy was the main reason for creation of the office of State Engineer. However, in testimony before the Stewart Committee, William Hammond Hall suggested that the 1878 law was a compromise between cattlemen and the Grangers. The stockmen did not want irrigation, while an increasing number of Grangers--stung deeply by the cattle barons' attempts to kill the West Side District--clamored for a centralized state irrigation system. Moreover, while Hall had no experience dealing with flood control, his service as Chief Engineer for the West Side District gave him some familiarity with irrigation, and made him an acceptable appointee to the Grange. Then, too, since the state's farmers were split over who should build irrigation works, state-conducted hydrographic surveys offered a logical compromise among the irrigators themselves.
9. William Hammond Hall deserves a biography. Unfortunately, the records from his eleven years as state engineer have been lost or destroyed--with the exception of his field surveys and note-books, which are held by the California Water Resources Department. The small collection at the California Historical Society in San Francisco is of little value. For a brief, but superficial, account of Hall's career as state engineer see Charles P. Korr, "William Hammond Hall: The Failure of Attempts at State Water Planning in California, 1878-1888," Southern California Quarterly, 45 (December 1963), 305-318. Hall's most important reports have been collected in two volumes at the California State

Library under the title Miscellaneous Reports of the State Engineer, 1880-1888. He also published Irrigation in Southern California (Sacramento, 1880). For thumb-nail sketches of his life see Who's Who on the Pacific Coast, 1913 (Los Angeles, 1913), 243-244, and The California Water Atlas (Sacramento, 1978), 23.

10. The Stockton Daily Independent, April 1, 1878.
11. Hubert Howe Bancroft, History of California, 1860-1890 (San Francisco, 1890), 372.
12. Dudley T. Moorhead, "Sectionalism and the California Constitution of 1879," Pacific Historical Review, XII (September 1943), 291. The best history of the convention is Carl B. Swisher's Motivation and Political Technique in the California Constitutional Convention, 1878-1879 (Claremont, California, 1930). Also see Winfield J. Davis, History of Political Conventions in California, 1849-1892 (_____, 1893), and Ralph Kauer, "The Workingmen's Party of California," Pacific Historical Review, XIII (September 1944), 278-291.
13. The first quote is from the Sacramento Daily Record-Union of April 20, 1875; the second is from the issue of October 7, 1875.
14. Debates and Proceedings of the Constitutional Convention of the State of California Convened at the City of Sacramento, Saturday, September 28, 1878 (Sacramento, 1880), v. 1, 95, 220, 272.
15. Debates and Proceedings, v. 1, 86, 165.
16. Debates and Proceedings, v. 1, 81, 101, 143-144, 225.
17. Debates and Proceedings, v. 2, 1020. The convention as a whole discussed water and water rights questions on January 14-15 and February 14-15, 1879. See pp. 1019-1022; 1024-1031; 1371-1376; and 1472-1473. The section of the new constitution pertaining to water was formally adopted on February 26, 1879.
18. Debates and Proceedings, v. 3, 1373.
19. Debates and Proceedings, v. 2, 1027. Delegate Henry W. Smith of San Francisco raised the argument (see p. 1021).
20. The quote is from the Sacramento Daily Record-Union, February 12, 1879. Also see the Union of November 20, 21, and 23, 1878. The Union was owned or controlled by the Central Pacific Railroad. Not surprisingly, it charged that the Workingmen's Party obsession with making the railroad a scapegoat for all of California's economic problems, resulted in a neglect of agriculture at the convention.
21. The new constitution's section on water is reprinted in Debates and Proceedings, v. 3, 1472-1473. After it had completed its work, the constitutional convention appointed a committee to explain the new document to the voters. As for water, the committee noted: "We provide that when water is offered for sale or hire to the public it should become a public use, and be regulated by law." For the committee report see the Pacific Rural Press, 17(March 8, 1879), 156.
22. The standard work on California's hydraulic mining controversy is Kelley's Gold vs. Grain. The opening chapter sketches the historical development of hydraulic mining. Also see Joseph A. McGowan, History of the Sacramento Valley (New York, 1961), 293-301; John Walton Caughey, The California Gold Rush (Berkeley, 1948), 249-268; and Rodman W. Paul, California Gold: The Beginning of Mining in the Far West (Lincoln, Nebraska, 1947), 147-170.
23. Sacramento Daily Record-Union, January 3, 1876.
24. For broad overviews of the environmental impact of hydraulic mining see the Reports of the Joint Committees of the Assembly on Mines and Mining Interests, and Agriculture, Relative to the Injury now being done to Lands and Streams in this State by the Deposit of Detritus from the Gravel Mines, in Appendix to the Journals, 21 sess., v. 4 (Sacramento, 1876), and Majority Report of the [Assembly] Committee on Mining Debris, Appendix to the Journals, 22 sess., v. 4 (Sacramento, 1878). The first report included one engineer's prediction

- that even if the flow of debris did no increase--as valley residents expected--Suisun Bay would fill in 15.5 years and San Pablo Bay in 31.25 years (p. 11). The second report concluded that the beds of the Sacramento River and its tributaries were four to twenty-five feet higher as a result of hydraulic mining, and some of the river canyons contained debris 100 feet thick (pp. 4-5). For newspaper coverage of the controversy in the critical year of 1876, see the Sacramento Daily Record-Union, December 24 and 28, 1875; January 17 and 29, 1876; March 4, 1876, and April 1, 1876; Pacific Rural Press, 11(January 8, 1876), 28; January 15, 1876, 40; March 18, 1876, 177; June 3, 1876, 356.
25. Pacific Rural Press, 13 (May 19, 1877), 306.
 26. As reprinted in the Sacramento Daily Record-Union, June 7, 1877.
 27. The quote is from the Sacramento Daily Record-Union, June 2, 1880. Also see the Union for April 12, 14 and 25, 1875; May 1, June 23, August 4, October 6, and November 15, 1875; August 16, 1877; January 12 and 26, May 29, September 7, 1878; and June 12, 1880.
 28. Report of the State Engineer to the Legislature of the State of California, Session of 1880, in Appendix to the Journals, 23 sess., v. 5 (Sacramento, 1880). The quote is from Part I, pp. 9-10. Hall's recommendations for solving the debris problem are summarized in Part II, pp. 13-14. San Francisco's Daily Evening Bulletin reprinted excerpts from the the state engineer's report on January 22, 1880. Hall's plan was first proposed to the legislature in February, 1878, by William Parks who represented Nevada County in the state senate. See Kelley, Gold vs. Grain, 99-100.
 29. Kelley, Gold vs. Grain, 150-152.
 30. Los Angeles Daily Herald, March 21, April 8, April 11, April 15, 1880; The Weekly Express (Los Angeles), April 17 & 24, 1880; The Weekly Butte Record (Chico), March 13, 20, and April 17, 1880; The San Francisco Chronicle, April 8, 1880; The Humboldt Times (Eureka), April 10, 1880.
 31. Sacramento Daily Record-Union, November 17, 1877; April 9, April 28, and November 13, 1880.
 32. Kelley, Gold vs. Grain, 154, 239; Annual Message of George C. Perkins to the Legislature (January, 1881), in Appendix to the Journals, 24 sess., v. 1 (Sacramento, 1881), 18; Report of the State Engineer to the Legislature of the State of California, Appendix to the Journals, 24 sess., v. 3 (Sacramento, 1881), 31-65; Report of the Board of Directors of Drainage District No. 1, Showing Progress of Work to January 1, 1881 in the same volume as Hall's report; Sacramento Daily Record-Union, September 4, November 11, 15, 17, and December 14, 1880; January 22, 1881; Pacific Rural Press, 20(July 31, 1880), 72, 116; November 20, 1880, 330; and November 27, 1880, 346; and The Stockton Daily Independent, January 28, 1881. The Marysville Appeal quote was reprinted in the November 27 issue of the Rural Press.
 33. The Stockton Daily Independent, January 31, 1881; Pacific Rural Press, 21(January 15, 1881), 41; Sacramento Daily Record-Union, January 8 and 14, 1881; February 9, 16, 21, 23, 25, and 26, 1881; March 2, 1881; July 12, 13, and 29, 1881; September 28, 1881; and October 24, 1881. In all the state spent over \$500,000 on debris work, including \$105,000 for the Yuba River dam and \$74,000 for the structure on the Bear River. For a break-down of how the money was spent, see Report of the Assembly Committee on Claims, Twenty-Fifth Session, on Assembly Bill No. 207, in Appendix to the Journals, 25 sess., v. 6 (Sacramento, 1885), 4, 11.
 34. Kelley, Gold vs. Grain, 132.
 35. Report of the State Engineer to the Legislature of the State of California, Session of 1880. The first quote is from Part IV, 125. The material on water rights controversies is from page 4 of the same section. Hall's suggestions regarding water law reform are from his conclusions, pp. 4-5.
 36. Report of the State Engineer...1880, Part IV, 5.
 37. See, for example, the Daily Alta California (San Francisco), January 26, 1880, and The Weekly Express (Los Angeles), February 7, 1880.

38. S.B. 211 (Satterwhite), introduced January 28, 1880 in Senate Bills, 1880, v. 3. Also see the Daily Evening Bulletin (San Francisco), February 17, 1880; the Daily Alta California (San Francisco), February 11, 1880; Sacramento Daily Record-Union, February 10, 17, and April 14, 1880; and The Stockton Daily Independent, July 8, 1880.
39. A.B. 525 (Sayle), introduced March 15, 1880 in Assembly Bills, 1880, v. 4.
40. S.B. 257 (Langford), introduced February 4, 1880, in Senate Bills, 1880, v. 3. Also see the Daily Evening Bulletin (San Francisco), February 6, 1880; the Daily Alta California (San Francisco), February 11, 1880; and The Weekly Express (Los Angeles), February 14, 1880.
41. The bills, and Hall's explanation of their terms, were reprinted in Part IV of the Report of the State Engineer to the Legislature of the State of California--Session of 1881, Appendix to the Journals, 24 sess., v. 3 (Sacramento, 1881), 11-44. For a concise summary of the proposed legislation see Hall's The Irrigation Question in California: Appendix to the Report of the State Engineer to His Excellency George C. Perkins, Governor of California in the same volume.
42. Elwood Mead, Irrigation Institutions (New York, 1910), 222-223, 143-179; A.E. Chandler, Elements of Western Water Law (San Francisco, 1913), 57-61. Also see Robert Dunbar, "The Origins of the Colorado System of Water Right Control," Colorado Magazine, 27 (October 1950), 241-262 and "The Significance of the Colorado Agricultural Frontier," Agricultural History, 34 (July 1960), 119-126.
43. In his address to the legislature in January, 1881, Governor George C. Perkins urged that the legislature consider Hall's proposals. He noted: "Our present laws [not] only do not provide for the issuance of definite water rights, but they make no provision for the prevention of waste, and no provision for the adequate organization to construct irrigation works." Annual Message of George C. Perkins to the Legislature [1881], in Appendix to the Journals, 24 sess., v. 1 (Sacramento, 1881), 17. The debris controversy helps explain why Hall's bills received little public attention. The Pacific Rural Press was one of the few journals to mention them. See the issue of January 1, 1881, p. 1 and that of January 15, 1881, p. 34. The appropriation bill to pay the cost of continuing Hall's irrigation survey attracted more attention. See the Sacramento Daily Record-Union, April 16, 1881; The Stockton Daily Independent, April 21, 1881; and the Pacific Rural Press, 21 (April 9, 1881), 262.
44. Sacramento Daily Record-Union, December 13 and 28, 1880; January 3, and 6, 1881; Pacific Rural Press, 21 (January 1, 1881), 1; The Weekly Butte Record (Chico), January 22, 1881; Daily Alta California (San Francisco), April 21, 1881.
45. Pacific Rural Press, 21 (February 12, 1881), 104; Daily Alta California, April 21, 1881.
46. A.B. 451 (Cunningham), introduced February 5, 1881 in Assembly Bills, 1881, v. 6; S.B. 279 (Rowell), introduced January 26, 1881, in Senate Bills, 1881, v. 2; A.B. 197 (Griffith), introduced January 14, 1881 in Assembly Bills, 1881, v. 3.
47. S.B. 311 (West), introduced January 31, 1881 in Senate Bills, 1881, v. 3; S.B. 309 (West), introduced January 31, 1881 in the same volume; A.B. 464 (Bost), introduced February 7, 1881 in Assembly Bills, 1881, v. 6; Pacific Rural Press, 21 (February 5, 1881), 89. The quote is from S.B. 309.
48. S.B. 287 (Johnson), introduced January 28, 1881 in Senate Bills, 1881, v. 3. Also see Journal of the Senate During the Twenty-Fourth Session of the Legislature (Sacramento, 1881), 146, and the Sacramento Daily Record-Union, February 14 and May 23, 1881. The reluctance of many northern Californians to abandon the riparian doctrine persisted long the industry shut down. See, for example, the editorial in The Daily Bee (Sacramento), August 3, 1886.
49. Lux v. Haggin, 69 Cal. 255, 10 Pac. 674.
50. Henry Miller dictation (c. 1890), pp. 18-19, in Hubert Howe Bancroft Collection, Bancroft Library; E.F. Treadwell, The Cattle King (Boston, 1950), 85; W.W. Robinson, Land in California (Berkeley, 1948), 193.

51. See the unpublished typescript biography of Charles Lux, prepared by W.H. White from an interview with Lux, in the Bancroft Collection, Bancroft Library. Also see Treadwell, The Cattle King, 187; William D. Lawrence, "Henry Miller and the San Joaquin Valley," M.A. thesis, U.C. Berkeley, 1933, 109-110. Treadwell's biography must be read with caution. He served as Miller's attorney, and became one of California's leading experts in water law. As a persistent defender of the riparian doctrine and the rights of private property, he pictures Miller as a beleaguered businessman threatened by the "mob rule" of the 1870s. Consequently, his book gives a distorted view of the water conflicts of the 1870s and 1880s.
52. Alonzo Phelps, Contemporary Biography of California's Representative Men (San Francisco, 1881), 325-329; James Burnley, Millionaires and Kings of Enterprise (Philadelphia, 1901), 265-270.
53. Phelps, Contemporary Biography of California's Representative Men, 309-310.
54. The Bulletin's description of Carr was reprinted in The Stockton Daily Independent of December 4, 1873. The other quotes are from The Agronaut (San Francisco), I (June 30, 1877), 4; and the San Francisco Chronicle, May 10 and 22, 1877. Apparently, Carr also had close ties to the railroad, which stood to profit from expanded irrigation in the southern San Joaquin Valley both from freight traffic and land sales. The Kern County Weekly Courier of January 17, 1874 described Carr as the former "political Napoleon of the Railroad Company." But on May 9th, it reported that Carr and Leland Stanford had visited Bakersfield together and that Carr served as "the right hand man of the railroad company, entrusted with nearly every matter of delicacy and difficulty, requiring skill, finesse, shrewdness, and untiring perseverance that is to be managed on this coast. He is the Napoleon of lobbyists and intriguers, and is never known to fail in any point he attempts to carry." Carr's connection to the railroad may have been through Lloyd Tevis, who had been a vice-president of the Central Pacific.
55. Wallace M. Morgan, History of Kern County California (Los Angeles, 1914), 100.
56. Margaret Aseman Cooper Zonlight, Land, Water and Settlement in Kern County, California (New York, 1979), 300; Wallace Smith, Garden of the Sun, (Fresno, California, 1956), 447-449. Zonlight's perceptive study, reprinted from her 1954 U.C. Berkeley M.A. thesis, provides the best overview of the development of the Haggin-Carr empire, subsequent water conflicts, and their baneful effect on small farming and community life in the county.
57. San Francisco Chronicle, September 28, 1877 and January 21, 1878; Zonlight, Land, Water, and Settlement in Kern County, California, 75, 143, 157. On the Desert Land Act see Paul W. Gates, History of Public Land Law Development (Washington, D.C., 1968) 638-643; John T. Ganoe, "The Desert Land Act in Operation, 1877-1891," Agricultural History, II (April 1937), 142-157; Stanley Roland Davison, The Leadership of the Reclamation Movement, 1875-1902 (New York, 1979), 75-78; Roy Robbins, Our Landed Heritage (Lincoln, Nebraska, 1976), 219-220. Gates notes (p. 639), that by June 30, 1877, 467 entries had been filed in California covering 166,665 acres.
58. Zonlight, Land, Water, and Settlement in Kern County, California, 75; John S. Hittell, Commerce and Industries of the Pacific Coast (San Francisco, 1882), 406. Nineteenth century land speculators often argued that land monopoly was necessary to promote the growth of irrigation in California. Zonlight challenges this assumption. She notes that while the population of Kern County doubled from 1870 to 1877, following passage of the Desert Land Act migration into the county dried up. The population of Kern County did not increase from 1880 to 1886, during which period Fresno County's population grew by 89 per cent and Tulare County's by 66 percent. Moreover, she claims that monopoly destroyed community life. Average school attendance in the county dropped from 649 children in 1879 to 246 in 1886 (pp. 259, 316) because so many families fled the valley. The population remained stable only because many single, male renters or tenants replaced the family farmers. According to Zonlight, the Desert Land Act destroyed any chance that the state or federal governments, or private irrigation districts, would undertake irrigation projects in Kern County. And the Haggin-Carr/Miller-Lux monopolies set a pattern for the future: "The trends observed in land use, the development of a seasonal labor force, the slowing and retardation of population growth, the poverty of the social, educational, recreational and other community facilities were determined to a large extent when Haggin's enormous desert land acquisition was given the Governmental seal of

approval." (pp. 174-175) Perhaps Zonlight was right. Unfortunately, she never fully explained what Haggin and Carr wanted to achieve in Kern County. Were all their motives self-serving? Were they any more greedy than the speculative "small" farmers they replaced? In any case, Zonlight does not pay adequate attention to the effects of the Lux v. Haggin suit on migrations in and out of the county.

59. San Francisco Chronicle, October 19, 1877, and January 29, 1878.
60. Carey McWilliams, Factories in the Field: The Story of Migratory Farm Labor in California (revised edition, Santa Barbara, California, 1971), 33; Virginia E. Thickers, "Pioneer Agricultural Colonies of Fresno County," California Historical Quarterly, XXV (March and June, 1946), 17-38 and 169-177; Arthur Maass and Raymond L. Anderson, ...and the Desert Shall Rejoice: Conflict, Growth, and Justice in Arid Environments (Cambridge, Mass., 1978), 232-237. There were, of course, several important differences between the Kings and Kern River, to the south. First, the agricultural colonies established around Fresno in the 1870s prevented any private company from monopolizing the Kings River. Then, too, Fresno County's cattlemen did not enjoy the same political power in their county that Miller exercised in Kern County. Finally, the Kings River carried much more water, which reduced the basic source of water conflicts and made a corporate monopoly infeasible.
61. The Daily Bee (Sacramento), July 28 and August 20, 1886.
62. Lawrence, "Henry Miller and the San Joaquin Valley," 132; Daily Alta California (San Francisco), April 21, 27 and 29, and November 5, 1881; The Stockton Daily Independent, April 18, 1881; Pacific Rural Press, 22(November 19, 1881); Maass, ...and the Desert Shall Rejoice, 226-231; Treadwell, The Cattle King, 85.
63. Journal of the [California] Assembly, 1883 (Sacramento, 1883), 275; Pacific Rural Press, 25(February 17, 1883), 136, 137.
64. The quote is from the Third Progress Report of the State Engineer to the 1883 Session of Legislature, in Appendix to the Journals, 25 sess., v. 1 (Sacramento, 1883), 10. Also see the Report of the Surveyor General, August 1, 1880 to August 1, 1882 in the same volume. That report included, on pages 37-38, Hall's rejoinder to the charges of the Surveyor General. On this dispute also see the Sacramento Daily Record-Union, August 2, 1882.
65. A.B. 16, introduced January 10, 1883 in Assembly Bills, 1883, v. 1; A.B. 155, introduced January 13, 1883 in v. 2; A.B. 320 introduced January 26, 1883; A.B. 323 introduced January 26, 1883; and A.B. 365, introduced February 1, 1883. All are in volume 2. For the minority report on A.B. 365 see the Journal of the [California] Assembly, 1883 (Sacramento, 1883), 283-285. Also see the Pacific Rural Press, 25(January 20, 1883), 45 and February 24, 1883, 158; and the Daily Evening Bulletin (San Francisco), February 14 and March 2, 1883.
66. S.B. 87(Whitney), introduced January 16, 1883 in Senate Bills, 1883, v. 1. The other bills pertaining to irrigation districts were S.B. 257(Reddy), introduced in January, 1883, Senate Bills, 1883, v. 2, and A.B. 423 (Keeler), introduced February 8, 1883 in Assembly Bills, 1883, v. 3.
67. Pacific Rural Press, 27(February 16, 1884), 145, 178; March 8, 1884, 221; March 29, 1884, 293; May 24, 1884, 512, 514, 516; June 14, 1884, 588 and 590; and 28(July 19, 1884), 50. The quote is from the May 24 issue.
68. "Address to the Legislature of the State of California by the Legislative Irrigation Committee of the State Irrigation Convention held at Fresno in December, 1884," in Pamphlets on California, v. 17, Bancroft Library; Thomas E. Malone, "The California Irrigation Crisis of 1886: Origins of the Wright Act," Ph.D. diss., Stanford, 1965; Pacific Rural Press, 28(December 27, 1884), 556 and 29(February 7, 1885), 125; Sacramento Daily Record-Union, February 20, 1884. The Sacramento Bee of July 22, 1886 reported that Will Green's company--he was president--claimed virtually the entire flow of the Sacramento River during the agricultural season, 500,000 miner's inches of water.

69. S.B. 210(Reddy), introduced February 2, 1885 in Senate Bills, 1885, v. 3; A.B. 410 (Weaver), introduced February 2, 1885 in Assembly Bills, 1885, v. 5. The four "Fresno Bills" were discussed in the Pacific Rural Press, 29(January 24, 1885), 69, and February 7, 1885, 125.
70. S.B. 37 (Reddy), introduced January 19, 1885, in Senate Bills, 1885, v. 1; A.B. 170 (Weaver), introduced January 19, 1885 in Assembly Bills, 1885, v. 2.
71. S.B. 38 (Reddy), introduced January 19, 1885 in Senate Bills, 1885, v. 1; A.B. 171 (Weaver), introduced January 19, 1885 in Assembly Bills, 1885, v. 2.
72. Pacific Rural Press, 29(February 7, 1885) 125.
73. Appended to the "Address to the Legislature" cited in note #68 above were eighty pages of newspaper editorials supporting the Fresno bills. The editors blamed a wide variety of interest groups--including cattlemen, miners, and even the railroad--for blocking the legislation. Many of the editorials assumed that the Fresno bills addressed the needs of small farmers. For example, the San Francisco Chronicle of February 21, 1885 claimed that a group of senators were prepared to kill the bills through a filibuster. Such an act was "...doubtless in the interest of the capitalists, who foresee that legislation will defeat their hopes of securing a monopoly of water."
74. The Daily Bee (Sacramento), February 25 and 28, March 3 and 12, 1885; Sacramento Daily Record-Union, February 24, 26, and 28, 1885; Daily Evening Bulletin (San Francisco), January 30 and March 11, 1885; Pacific Rural Press, 29(February 14, 1885), 142, May 23 1885, 492. The Union quote is from the issue of February 27th; the excerpt from the letter to the Pacific Rural Press is from the issue of February 14, 1885; and James W. Shanklin's statement is from the Union of February 28, 1885.
75. Pacific Rural Press, 29(February 28, 1885), 187, March 7, 1885; The Daily Bee (Sacramento), February 17 and March 5, 1885; Daily Evening Bulletin (San Francisco), February 20, March 2, March 11, and March 12, 1885; The Mountain Messenger (Downieville, February 28, March 14, and March 28, 1885; San Francisco Chronicle, February 25, 28, and March 5, 1885. The Chronicle suggested in its March 5th issue that the railroad had ordered its "representatives" in the senate to oppose the irrigation bills unless the appropriators supported the "Heath Amendment," which, apparently, would have reduced railroad taxes. The Sacramento Daily Record-Union published a supplement on March 11, 1885 which printed critical parts of the debate in the legislature.
76. Sacramento Daily Record-Union, March 14, 1885; Pacific Rural Press, 31(April 10, 1886), 349 and 360; Los Angeles Daily Times, February 22 and March 4, 1885; Daily Evening Bulletin (San Francisco), February 17 and March 7, 1885.
77. The most important bill aside from the Fresno legislation was S.B. 50, introduced by Senator Whitney of Alameda County on January 19, 1885. Whitney had aided Senator Cross in blocking the irrigation bills in the senate. Whitney's bill declared California's water supply "the common property of the people of the State" and "forever inalienable." See Senate Bills, 1885, v. 1. Though the constitutional amendment to guarantee water companies at least a 7% return failed, a law was enacted (Cal. Stats., 1885, p. 95) which promised the companies at least 6 percent, but not more than 18 percent, annually on their investment.
78. Los Angeles Daily Times, March 3, 1885. The Shorb statement is from the Times of March 8, 1885. The Daily Evening Bulletin (San Francisco), March 12, 1885, reported that Shorb and Will Green saw little chance for a special session.
79. George W. Haight, "Riparian Rights," Overland Monthly, second series, V(June 1885), 561-569; John H. Durst, "Riparian Rights from Another Standpoint," VI (July 1885), 10-14; and A.A. Sargent, "Irrigation and Drainage," VIII (July 1886), 19-32.
80. The first quote is from the Pacific Rural Press, 29(October 31, 1885), 356; the second from the Press of October 24, 1885, 336.
81. Fifth Annual Report of the Immigration Association of California, 1886 (San Francisco, 1887), 4-6.

82. Lux et. al. vs. Haggin et. al., Majority and Minority Opinions of the California Supreme Court, October 27, 1884 and April 26, 1886 (Sacramento, 1886). The quote is from pp. 66-67. On the Lux v. Haggin suit see S.C. Wiel, Water Rights in Western States (San Francisco, 1905), 34-37; Treadwell, The Cattle King, 78-94; Morgan, History of Kern County, 98-109; Wells Hutchins, The California Law of Water Rights (Sacramento, 1956), 52-53; Harding, Water in California, 38-39. Had the challenge to riparian rights involved the orchards of Los Angeles or San Bernardino rather than the wheat fields of Kern County, the court might have ruled differently. Citrus fruit required irrigation to develop, while wheat could be raised in many years--even in the southern San Joaquin Valley--without artificial moisture. July 20, 1886; and The Stockton Daily Independent, July 20, 21, 23, 28, and August 13, 1886. The Times of March 17, 1887, reported that W.B. Carr had been sued by one of his agents. Apparently, the agent, at Carr's request, had bribed several legislators using his own money, only to have the boss refuse to pay him back when the irrigation bills floundered in the senate.
94. For surveys of the legislation considered in 1886 see the Pacific Rural Press, 32 (July 31, 1886), 101-102; August 14, 1886, 139-140; and August 21, 1886, 161. S.B. 11 (Days), introduced July 26, 1886, and S.B. 7, 8, and 9 (Cross), introduced July 22, 1886. Cross also introduced S.B. 13 on July 26th, one of several bills introduced to provide for the condemnation of riparian rights. But the Cross bill was unusual in that it also provided a process for quieting title to all water through comprehensive state suits against all water users, county by county. Among the many other noteworthy bills were S.B. 1 (Del Valle), introduced July 21, 1886; S.B. 3 (Reddy), introduced July 21, 1886; S.B. 4 (Lowe), introduced July 21, 1886; S.B. 6 (Whitney), introduced July 21, 1886; S.B. 10 (Whitney), introduced July 22, 1886; S.B. 12 (Saxe), introduced July 26, 1886; S.B. 15 (Reddy), introduced July 28, 1886; S.B. 18 (Kellog), introduced August 6, 1886; A.B. 2, introduced August 5, 1886; A.B. 3 (DeWitt), introduced July 21, 1886; A.B. 6 (McJunking), introduced July 26, 1886; A.B. 7 (Walrath), introduced July 29, 1886; and A.B. 8 (Goucher), introduced July 30, 1886. All of these bills were bound in a special volume, Bills, Resolutions, Constitutional Amendments of the Special Session of 1886, housed with the other bills in the California State Law Library, Sacramento.
95. Malone, "California Irrigation Crisis of 1886," 167; Los Angeles Daily Times, July 20, 1886; Sacramento Daily Record-Union, July 22, 1886; Theodore H. Hittell, History of California, v. 4 (San Francisco, 1897), 696-697.
96. The declaration of the Pomona Grange was reprinted in the Pacific Rural Press, 32 (August 14, 1886), 132. Also see The Daily Bee (Sacramento), July 22, 23, and 27, 1886; Sacramento Daily Record-Union, July 28, 1886; The Stockton Daily Independent, August 3 and 11, 1886; and the San Francisco Chronicle, August 7, 10, and 11, 1886.
97. Senator Lynch's statement is from the San Francisco Chronicle of August 14, 1886. Also see The Stockton Daily Independent, August 21, 1886; the Daily Evening Bulletin (San Francisco), August 20, 1886; the San Francisco Chronicle, August 21, 1886; and the Los Angeles Daily Times, August 21, 1886.
98. As reprinted in The Stockton Daily Independent, September 10, 1886.
99. Daily Evening Bulletin (San Francisco), August 19, 1886.
100. The Grange chapters were virtually unanimous in calling for greater state control over the allocation and distribution of water. However, only a few chapters favored state construction of irrigation works. For samples of the many resolutions sent to Sacramento by local Granges during the special session, see The Stockton Daily Independent, July 28, 1886; The Daily Bee (Sacramento), August 2, 1886; The Morning Call (San Francisco), August 4, 1886; and the Pacific Rural Press, 32 (August 7, 1886), 116, and August 21, 1886, 152.
101. For typical editorial reservations concerning a state irrigation system see the San Francisco Chronicle, July 27, 1886, and the Sacramento Daily Record-Union, July 28, 1886.

- B. Marks, in "The Riparian Decision in Interior California," Overland Monthly, IX (February 1887), 145-162 warned would-be appropriators that the condemnation privilege confirmed by the court offered little consolation. For example, since there were 64 riparian owners along the Kings River, each would have the right to a separate trial in condemnation proceedings; hence, the potential for litigation was almost endless. Moreover, since each riparian owner theoretically controlled the entire flow of the stream, each might require restitution for that volume of water. Moreover, if a stream changed its course--as often occurred especially in southern California--a whole new batch of riparian owners would be created along with a new crop of suits. For a defense of the decision see Warren Olney, "The Present Status of the Irrigation Problem," Overland Monthly, IX (January 1887), 40-50.
83. Lux et. al. v. Haggin et. al., passim. The argument that the doctrine of appropriation took precedence by inheritance had many weaknesses. For example, the argument could be easily turned on its head. If federal water law was based on the English Common Law, then riparian rights would have applied on all the public domain as a condition of federal sovereignty. In the 20th century, federal officials often claimed that the nation enjoyed "prior and paramount" water rights based on its original ownership of the public domain. This argument held that even though the nation had deeded away parcels of land to the states, land companies, and individuals, the nation retained ultimate sovereignty over water as the original riparian owner.
 84. "Contract and Agreement between Henry Miller and others of the first part of James B. Haggin and others of the second part, July 28, 1888," in Bancroft Library: G.H. Baldwin, "Water Rights on Kern River," Report for the California State Water Commission (1918), appended to J.B. Lippincott's Report on the Miller and Lux Ranch, Southern Division on Kern River, California, in file #36-1, J.B. Lippincott Collection, California Water Resources Archives, University of California, Berkeley; Treadwell, The Cattle King, 94; Harding, Water in California, 39; Maas, ...and the Desert Shall Rejoice, 372-374. The Miller-Haggin agreement was embodied in a court decree issued in August, 1900. The decree was still in effect in 1918.
 85. Pacific Rural Press, 31 (April 10, 1886), 349. Also see the Press for April 3, 1886, 32, and April 10, 1886, 352.
 86. Malone, "The California Irrigation Crisis of 1886," 137-138; Pacific Rural Press, 31(May 29, 1886) 528-529; June 5, 1886, 555, 556, 558; June 12, 1886, 578-582; June 19, 1886, 602-609; June 26, 1886, 626-636; Daily Evening Bulletin (San Francisco), May 20, 1886; The Morning Call (San Francisco), May 20, 21, and 28, 1886.
 87. Morgan, History of Kern County, 108. Haggin and Carr probably also feared that since the next session of the legislature would select a U.S. Senator, the lawmakers would have less time to devote to irrigation and water rights issues. The Sacramento Daily Record-Union reprinted the petition for a special session in its issue of August 20, 1886. The number of signatures suggested about the same level of support for the Fresno bills as prevailed in the 1885 legislature. The thin majority in the senate boded particularly ill for the appropriation party.
 88. Pacific Rural Press, 32(July 24, 1886), 82-83.
 89. The Daily Bee (Sacramento), July 26, 1886; also see the Los Angeles Daily Times, July 18, 1886.
 90. Malone, "The California Irrigation Crisis of 1886," 16, 18.
 91. On the composition of the legislature see The Daily Bee (Sacramento), July 26, 1886; The Stockton Daily Independent, July 23, August 5, and August 13, 1886; and the Sacramento Daily Record-Union, July 21, 1886.
 92. The Stockton Daily Independent, July 28, 1886 and San Francisco Chronicle, August 15, 1886. Also see the Chronicle of July 18, 1886 and the Pacific Rural Press, 32(July 24, 1886), 82, 83, and July 31, 1886, 97; and Tulare County Times, July 22, 1886.
 93. The San Francisco Chronicle editorial is from the issue of August 12, 1886. The Post comments were reprinted in The Daily Bee (Sacramento), July 27, 1886. Also see the Daily Evening Bulletin (San Francisco), August 19, 1886; Los Angeles Daily Times,

102. The Democratic Party platform was reprinted in The Weekly Colusa Sun, September 11, 1886, along with an editorial favoring irrigation districts. At the other end of the Central Valley, the Tulare County Times published similar editorials on June 3, 10, and 17, 1886. By the fall of 1886, one of the strongest proponents of districts was U.S. Senator Leland Stanford, who may well have reflected the railroad's stand on the irrigation issue. For his views see the Sacramento Daily Record-Union of July 30 and August 17, 1886, and The Stockton Daily Independent of July 30, 1886. By the legislative session of 1887, the state Grange also favored the creation of autonomous independent districts. See the Pacific Rural Press, 33(February 12, 1887), 124.
103. The quote is from The Stockton Daily Independent of January 2, 1887. On the debris controversy and legislation considered by the 1887 session to "correct" the evil, see the San Francisco Chronicle, January 28, February 4, February 6, and March 5, 1887. The senate killed the debris bill on March 4. On March 19, 1887, the Mountain Messenger of Downieville claimed that large landowners in the Sacramento Valley--almost none of whom irrigated their land--had paid \$1,500 a vote to defeat the mining legislation.
104. The Stockton Daily Independent, January 26 and 29, and February 15, 1887; San Francisco Chronicle, January 3 and 26, February 8 and 27, 1887; The Daily Bee, February 11, 1887; Pacific Rural Press, 33(January 29, 1887), 81, and February 19, 1887, 148; The Weekly Colusa Sun, January 29, 1887. For the bills, see A.B. 247 (Brierly), introduced January 24, 1887, in Assembly Bills, 1887, v. 3, and A.B. 226 (Mathews), introduced January 21, 1887, in the same volume. The later bill had been introduced in 1885 as A.B. 544 and S.B. 301.
105. The first quote is from The Stockton Daily Independent of February 15, 1887; the second from "Petitions of Citizens of Stanislaus County urging the Passage of Assembly Bill No. 12 Relating to Irrigation," in Appendix to the Journals, 27th sess., v. 8 (Sacramento, 1887); the third is from the San Francisco Chronicle of January 17, 1887. Also see the Chronicle of January 15, and March 14, 1887; the Independent of March 1 and 8, 1887; and The Los Angeles Times of February 23, 1887. For the anti-injunction law see Cal. Stats., 1887, 240.
106. The Stockton Daily Independent, January 23, 1887.
107. Cal. Stats., 1888, 29. Four other irrigation district bills were proposed to the 1887 legislature. A.B. 287 (Vincent), introduced January 26, 1887, Assembly Bills, 1887, v. 3, resembled the Wright Act. However, it restricted taxes to irrigable land and required the approval of two-thirds of all landowners to carry a bond election. A.B. 83 (Butler), introduced January 11, 1887, Assembly Bills, 1887, v. 1, was identical to A.B. 71 and S.B. 38 considered in 1885. It provided for the state engineer to set district boundaries, but required the approval of the owners of half the assessed property within the district before bonds could be issued. Perhaps the most "democratic" district bill was S.B. 73 (Langford), Senate Bills, 1887, v. 1. It required a petition from the owners of more than half the acreage within a proposed district to form a district, and restricted the vote in all district elections to landowners--in proportion to the ratio of the size of their landholdings to the total land area of the district. Each of the above bills proposed locally controlled districts. The only state plan was A.B. 64 (Bost), introduced January 11, 1887, Assembly Bills, 1887, v. 1. This bill was virtually identical to Bost's A.B. 464 proposed in 1881. It required the state engineer to set district boundaries, and provided for a state board to supervise the construction of irrigation works, following the approval of plans by a local review board. After the works had been completed, the state would regulate water distribution. Works would be paid for from the proceeds of a uniform tax on all district property.
108. See, for example, the First Biennial Message of Governor George Stoneman, January 5, 1885, in Appendix to the Journals, 26 sess., v. 1 (Sacramento, 1885), 16.
109. Pacific Rural Press, 32(July 31, 1886), 103; The Stockton Daily Independent, January 22, 1887. For other samples of anti-Hall sentiment see the Sacramento Daily Record-Union, February 21, 1885, and the San Francisco Chronicle, January 9, 1889.

110. Report of the State Engineer to His Excellency R.W. Waterman, Governor of California, for the Year and a Half ending December 31, 1888, Appendix to the Journals, 28 sess., v. 1 (Sacramento, 1889), 9-10, 8.
111. Malone, "California Irrigation Crisis of 1886," 149, 184.
112. Pacific Rural Press, 43 (January 16, 1892), 54, and S.T. Harding, Water in California, 110. Some of these companies were mutual water companies. The first was established at Pomona in 1875, and from 1881 through 1884 many mutual water companies were established at communities including Redlands, Ontario, and Riverside. As mentioned earlier, many of these ventures originated as private water companies. One great advantage of a mutual company was that the price charged for water was not regulated by local boards of supervisors.
113. Report on the Statistics of Agriculture in the United States at the Eleventh Census, 1890 (Washington, 1895), vii, 41, 116, 117; Report of the Special [Stewart] Committee of the United States Senate on the Irrigation and Reclamation of Arid Lands, S. Rep. 928, 51 Cong., 1 sess. (Washington, 1890), v. 1, 54; Report of Irrigation Investigations in California, U.S.D.A. Office of Experiment Stations Bulletin #100, S. Doc. 356, 57 Cong., 1 sess. (Washington, 1902), 217; San Francisco Chronicle, January 1, 1887; Pacific Rural Press, 38 (August 10, 1889) 115-116. Of course, statistics can be deceptive. For example, most irrigation in Tulare and Kern counties produced forage. So while these counties contained far more irrigated land than Fresno County, in 1889 property in the latter county was worth about three times the assessed value of Kern County's property, and \$10,000,000 more than property in Tulare County.
114. Horace Davis's speech was reprinted in the Annual Report of the State Board of Horticulture of California, 1884, Appendix to the Journals, 26 sess., v. 5 (Sacramento, 1885); the quote is from p. 31. For a similar statement by another northern Californian, see the speech of Morris M. Estee reprinted in the Transactions of the California State Agricultural Society During the Year 1884 in volume 2. Southern California's extraordinary growth prompted northern California businessmen to form several new organizations to encourage the development of their section. The most notable new booster group was the State Board of Trade formed in July, 1887, but few businessmen in northern California paid much attention to agriculture and irrigation until the end of the 1890s. On the State Board of Trade see the Pacific Rural Press, 34 (August 27, 1887), 163.

V. THE TERRIBLE '90s: FROM THE WRIGHT ACT TO THE SECOND IRRIGATION CRUSADE

Supporters of the Wright Act hoped it would transform agriculture in California. But their new districts quickly encountered crippling obstacles including defects in the law itself, opposition from land barons, and the economic depression of the 1890s. By 1898-1899, when a severe drought again visited the state, most champions of irrigation had soured on the district concept. The drought revived support for state and federal irrigation works. However, the "second" irrigation crusade was not simply a throwback to the 1870s and 1880s. In part because the Grange's political influence had ebbed, in part because of the increasing importance of water "experts," and in part because of the growing "interdependence" of the state's economy, farmers themselves played little part in the new movement. It was led by northern Californians--including a particularly strong contingent of San Francisco Bay Area civic leaders--who finally recognized that the "queen" city's economic health depended directly on the agricultural prosperity of the Central Valley. Since virtually the entire natural stream-flow in California had long since been claimed, the movement was dedicated to "storing the floods," the heavy run-off which went to waste in the late spring as the Sierra snow-pack melted. The revival of support for state and federal action did not reflect the anti-monopoly sentiment common to the 1870s. Instead, it derived from the assumption that comprehensive storage works were beyond the resources of private companies, and could be operated more efficiently by public officials.

Initially, the Wright Act had enjoyed broad appeal. Partisans of state control hoped that the district law was a harbinger of more direct state involvement in the future; private ditch companies welcomed the opportunity to build irrigation works on contract; and many others expected to profit from rapidly increasing land prices. The district form of organization held out great promise. It gave farmers virtually complete control over their irrigation systems, allowing them to organize according to watersheds rather than in counties or other political units with arbitrary boundaries. In this way, irrigators served by a common water supply in two or more counties could be joined in one district, and all diversions from that source--old as well as new--could be coordinated. Obviously, this consolidation process was expected to promote efficiency and reduce waste. In any case, farmers would pay far less for their water because the district would provide it at cost. The district also provided a marvelous economic tool: It was a mechanism to make money as well as painlessly raise it. The appreciation in land values would pay for irrigation works, and make the bonds attractive

to investors. On paper, who could lose? Moreover, the new political units would "encourage" large landholders to sell off their excess holdings to small farmers. Both the positive economic incentive of selling land at great profit to new settlers, and the "negative" incentive of rapidly increasing district taxes on land held solely for speculation, would encourage the subdivision of large estates. Wheat would give way to fruit, and baronial rancho to family farm, not through the pressure of visionary laws to break up land monopolies, but through a natural--perhaps even "inevitable"--economic process. Finally, these democratic institutions offered a way to bridle riparian rights, and patch the numerous holes in California water laws. In its emphasis on cooperation and collective action, the Wright Act challenged the individualistic pattern of farming which had dominated in California's "frontier economy." The needs of each community would take precedence over the interests of the largest landowners.¹

By the early 1890s, the Wright Act had won converts throughout the arid and semi-arid West. As early as 1890, Nevada's Senator William Morris Stewart drafted a bill to grant irrigation districts the federal pasture and timber land within their boundaries. And by the end of the following year, Richard J. Hinton of the Department of Agriculture's Office of Irrigation Investigations and a prominent figure in the "national" irrigation movement called for cession of the public domain to the arid states on condition that the states enact laws modelled on the Wright Act. For many years, Western boosters had called for wholesale federal land grants to the state. However, the Desert Land Act, along with most other federal grants, demonstrated that most land given to the states ended up in the possession of large land and water companies. If the states could distribute federal land solely to public districts, rather than individuals or companies, monopoly could be avoided. Hinton succeeded in getting the 1893 Irrigation Congress to accept his plan, but another leader in the irrigation crusade, William Ellsworth Smythe, opposed the idea. He favored the Wright Act in California, but doubted that it would work in thinly settled parts of the West like Arizona and Wyoming where land had little value and the cost of dams and canals would exceed the benefits provided to residents.²

Most Western states did not copy the Wright Act until the 20th century, but California's irrigation promoters wasted no time in putting the new law to the test. In the eight years following 1887, forty-nine districts were organized covering about 2,000,000 acres of land, 2% of the state's total land area. However, only 24 actually issued bonds, for a total debt of \$18,000,000. Four districts were organized in 1887; seven in 1888; six in 1889; eleven in 1890; thirteen in 1891; three in 1892; four in 1893; and the last--fittingly called the

Amargosa--in 1895. Southern California spawned 30 of the districts, including 13 in Los Angeles County; 13 in San Diego County; and 4 in San Bernardino. North of the Tehachapis, Tulare and Colusa counties each produced 5 districts; Fresno 4; Stanislaus 2; and Yuba, Shasta and Kern counties one each. The preponderance of districts in southern California reflected more than that sections' greater need for irrigation. Southern California had enjoyed a real estate boom since the late 1870s, and when it faded in the late 1880s, a handful of unscrupulous real estate speculators used the irrigation district as a new tool to inflate land values. These promoters hoped to "take the money and run." Some never intended to build the works they promised to settlers; others promised far more water than they actually delivered. About 20% of the districts were essentially speculative ventures launched by real estate sharks.³

Nevertheless, initially many Californians considered the irrigation district law a great success. For example, in September, 1890, the Pacific Rural Press reported that many of the district bonds were selling for 90 to 96 percent of par, and at the end of the year San Francisco's Chronicle commented that "...the bonds of a number of districts have been issued and disposed of on favorable terms, and work has been commenced in the construction of canals. These bonds are so well thought of as securities that they were taken up by capitalists without the heavy discount too frequent in similar affairs." The Chronicle added that while the average cost of irrigation would not exceed \$2.50 an acre, irrigation would drive up land values by from \$50 to \$200 an acre. In his address to the legislature of 1891, Governor H.H. Markham called the results of the Wright Act "favorable and encouraging."⁴

But even as the governor spoke, many of the early districts floundered. Colusa County's Central District provides a useful case study. The largest of seven districts organized in the Sacramento Valley, it was the child of Will S. Green, the newspaperman and speculator who had been promoting irrigation in the valley since the drought of 1864.

Immediately after the governor signed the Wright Act on March 7, 1887, Green began to drum up support for a district adjoining the Sacramento River. In 1884, as Colusa County Surveyor and the Stony Creek Canal Company's leading promoter, Green had surveyed a 40 mile canal between Stony Creek and Cache Creek--essentially the same aqueduct he first proposed in 1864. The newspaperman-booster estimated the cost of the main canal and feeder lines at \$600,000, and promised that this network could supply 265,200 acres with water. Even adding \$260,000 as a contingency fund, the cost of irrigation would average only \$3.24 an acre. At a public meeting held in Maxwell on March 26th, a three-man committee was appointed to determine precise district boundaries and collect the signatures of 50 landowners necessary

to put the organization of a district before the voters. The Sacramento Valley was so thinly populated that most of the 64 signatures collected belonged to owners of town lots in the villages of Maxwell and Williams.⁵

In 1887, the average farm within Green's proposed district contained 870 acres, and the largest landowners in the district owned estates which averaged 2,225 acres apiece.⁶ Many of these wheat barons did not live on the land, and they used every conceivable argument to scuttle the district. They complained that irrigation would produce poor fruit and disease, and saturate valley soils with alkali. They complained that the cost of irrigation would kill wheat and barley industries. They complained that the district had been improperly organized for many reasons, but especially because not all land in the district could be irrigated from a single water source, as required by the Wright Act. And, most of all, they complained that landless voters and town-dwellers could carry any district election. On October 19, 1887, "Pioneer" wrote the Colusa Sun expressing the frustration shared by most of the valley's large farmers:

That the irrigation law is a blow aimed directly at large land holders is as apparent as a nose on the face. In Colusa county there could not be formed an irrigation district of any considerable dimensions without including one or more small burghs or towns. Now what we want to know is this. Is it right for the many men of small holdings who generally hang around those little villages and the men with no holdings at all except a cigarette holder, to waltz up to the polls on election day, and cast their vote, and thereby become the dictator to the man with his thousands of acres of land? There is only one way to construe the matter. It places the whole army of men with small holdings, the laborer, the tramps and the paupers on the one side and the landlords with their thousands of acres on the other. And the former say to the latter, 'we will build an irrigation ditch here or there as we please and we'll make you foot the bills.'⁷

A tense atmosphere prevailed in Colusa County as the November district election drew near.

Green conceded that the Wright Act should have restricted participation in district affairs to landholders. However, the construction of his canal depended on winning the "spite vote" of landless tenants and farm workers, as well as the "pocketbook vote" of small town merchants who hoped to profit from the appreciation of land values, but they also feared that a wave of new settlers would erode their political power and drive up taxes. Then, too, wheat ranches were not solely an economic investment. In 19th century California, they were "badges" worn by the state's landed gentry. Although wheat was a highly speculative crop, the wheat ranch was part of a "life-style" as well as a source of wealth.⁸

On November 22, 1887, Colusa County residents approved the formation of the Central Irrigation District by a vote of 271 to 52. The district included 160,000 acres, only 60 percent of the land area initially proposed by Green. The new boundaries probably excluded the

lands of some disgruntled large wheat farmers. All five of the original directors were residents of Willows, Maxwell, or Colusa; whether they had any practical experience as farmers, let alone irrigators, is uncertain. In any case, they named C.E. Grunsky, a hydraulic engineer with extensive experience acquired designing canal systems for Miller and Lux as well as Haggin, Tevis, and Carr, as chief engineer. Following the election, the Sacramento Union predicted: "Soon Colusa county will come to the front as the home of thousands of small farmers." Green himself urged the district's opponents to fall into line: "With a five-to-one sentiment against you, you must know that the thing will come, and if you delay it on legal quibbles it is only giving trouble to yourselves and to others....If it is a success you will reap the reward."⁹

The Central District, along with virtually every other district, faced many court challenges. Some suits questioned the constitutionality of the Wright Act; others charged district promoters and officials with violating or ignoring provisions of the new law. Nevertheless, by March, 1888, Grunsky completed his engineering surveys. He estimated the average cost of watering district lands at \$4.81 an acre--which sum included a liberal allowance for acquiring rights-of-way and fighting legal battles. On April 2, 1888, a \$750,000 bond issue carried by a vote of 189 to 36, and the first \$100,000 in bonds went on sale in July. Legal obstacles delayed the beginning of construction until November 9, 1889, when Will Green, in a modest ceremony, broke ground for the aqueduct. On November 16th the newspaperman exuberantly predicted that the project would be completed quickly, again assuming that the greed of large landowners would ultimately overcome their objections: "[The work] will go on because everybody can see that the land of Central District has advanced more in value since the letting of the [construction] contract than the entire cost of the work."¹⁰

By February, 1890, Green was less optimistic. The drought of 1889 drove many small farmers out of the Sacramento Valley, and most of the abandoned farms were snatched up by the wheat barons. Green warned that the concentration of wealth in the hands of an elite had helped destroy the Roman Empire, and drew a parallel:

Where, o where are we drifting in America? Look close around you and see what is going on! 180 square miles with but a single school census child! Shall we open [the] Central canal or will the great landlords find means to shut it up? The canal may be stopped up, our rich plains given up to the few, and finally fall into decay and ruin, and those who have promoted it fill unknown graves, but some future Napoleon will read a lesson from it.¹¹

Yet the criticism continued and intensified. By the early months of 1890, Joseph A. Sutton, a former chairman of the Central Irrigation District's Board of Directors, complained that the district had been badly managed. In particular, he charged that construction costs had

been padded. Green and the former district officer engaged in a running battle during 1890 and 1891. At one point, Sutton described the newspaperman and his "lieutenants" as men "...who by their blundering have rendered the business a failure and disastrous." Green responded in kind: "Since Satan sought to rule in Heaven and became the king of hell he has not had a more complete parallel [than Sutton]."¹²

The charges were partly warranted. The Wright Act prohibited the sale of district bonds at less than 90¢ on the dollar. This discouraged potential investors, bankers, and bond houses, especially given the cloud of litigation which hung over the districts during the late 1880s and early 1890s. Put simply, the bonds were too risky at the price. After failing to sell their bonds on the open market, many districts used them almost like depreciated currency to pay-off contractors willing to speculate. Accordingly, construction companies fattened up their bids to include a suitable "discount." Such an arrangement could not last indefinitely in any district, and by 1891 the San Francisco Bridge Company wisely refused to take any more of the Central District bonds. The company suspended its work on the canal after completing 40 of 61 miles. Unfortunately, the 40 miles were not continuous and no headgates had been constructed.¹³

Nevertheless, many of the added costs were beyond the control of district officials. Of the three major gaps in the completed canal, two were within estates whose owners bitterly opposed the aqueduct; one stretch of 6.5 miles crossed the Glenn ranch, and the other, a 2.5 mile section, ran through the Glide ranch. Since the Glenn estate had asked an exorbitant price--\$50,000--for the right-of-way, district officials sued to condemn the land. But a sympathetic jury awarded the Glenn trustees \$33,000 for the parcel which Green claimed was four times the prevailing price for comparable land in Colusa County. In the summer of 1891, an association formed by the irrigation districts, and perhaps San Francisco bankers, to help make irrigation district bonds a more attractive investment, hired William Hammond Hall to survey the plans of each district and issue an "impartial" report on its chances of success. Hall reported that the Central District had fine soil, sufficient water, and well-designed irrigation works. And while he predicted that the cost of the Central District's water system would ultimately reach \$940,364.25, of which nearly \$400,000 had already been spent, he maintained that the \$190,000 beyond the original bond issue had been due to litigation and condemnation settlements rather than fraud or inept management.¹⁴

Will Green acknowledged the district's failure as early as March, 1892. But the final blow came in October, 1893, when the California Supreme Court ruled that since some of the original 64 petitioners who had appealed to the board of supervisors to form a district owned

town lots, the district had not been legally organized. Although the court did not dissolve the district, it did enjoin the sale of any more bonds. Of the \$574,000 in securities already in circulation, 80 percent had been taken by the San Francisco construction company and the remainder by farmers and land speculators within the district. The bonds had attracted virtually no "outside" investors.¹⁵

The failure of the Central Irrigation District, and the tumbling price of wheat during the 1890s, turned Colusa County into a waste-land; the county's already scanty population declined by 50% during the 1890s. The San Francisco Call commented in 1903:

Litigation commenced early in the history of the district and has continued until the present time. Owing to the litigation and to the bonded indebtedness incurred for the work already performed on the ditch, sales of lands in the region have been impossible and parties owning large tracts, containing thousands of acres, have found it impossible to divide them into smaller parcels and make sales thereof, so the population has not increased.

Similar conditions prevailed within defunct irrigation districts throughout the state. Of the seven irrigation districts formed within the Sacramento Valley, only one--the Browns Valley District which irrigated land near Marysville from a 26 mile canal completed in February, 1893--succeeded. Even that district had not enjoyed complete success. It had been organized to provide water to 53,000 acres, but only 7,000 acres were irrigated from the canal in 1915.¹⁶

In the same Month the Call published the editorial quoted above, Willard M. Sheldon of the San Francisco Savings Union organized the Central Canal and Irrigation Company and the Colusa-Glenn-Yolo Land Company. The ditch company attracted investors from San Francisco, Fresno, and Los Angeles as well as Colusa and Williams. As a first step, the land company bought 4,600 acres from the Glenn estate for \$180,000, expecting to sell the land to settlers once the ditch company completed the canal. Sheldon promised to extend the aqueduct from the northern boundary of Glenn County to Woodland, a distance of about 85 miles, reclaiming 300,000 acres. The Central Irrigation District's directors leased the canal and other irrigation works to the water company for 50 years at \$25 a year in exchange for Sheldon's promise to finish the canal, install headgates, and provide water to residents of the district at rates subject to review by district officials. The investor also bought up the district's extant bonds at 35¢ a dollar, relieving residents of their original tax burden as well as the continuing expenses of litigation. The Colusa County section of the canal was completed in 1904, but the anticipated flood of small farmers failed to appear. Like most private irrigation companies formed in the 19th century, the venture failed to make money. Ironically, the enlarged canal finally fell under the control of the successful Glenn-Colusa

Irrigation District. However, old patterns of land use die hard, and irrigation failed to create an agricultural eden in the Sacramento Valley. As late as 1957, a prominent irrigation district bond trader, J. Rupert Mason, commented in his oral history: "There are 200,000 acres in the Glenn-Colusa District and no small holdings, none. Not even today. It looks like Spain."¹⁷

Many other irrigation districts outside the Sacramento River Valley shared the fate of Will Green's venture. Only a few well-managed projects, such as the Modesto and Turlock districts weathered the financial storms of the 1890s; the remainder died within a few years of birth.¹⁸ And as the speculative balloons burst, even the soundest districts suffered from the aftershocks. Most potential investors turned against all irrigation bonds, and apprehensive farmers refused to settle within any district. Examples of "wild-cat" schemes abound, but two deserve special mention. A group of land speculators organized the Manzanita District in Los Angeles County on December 5, 1891, even though they knew that the district had no chance of finding a reliable water supply. When the district was formed, less than a dozen permanent residents lived within its borders. The promoters had "imported" sufficient residents, by giving them land, to secure the 50 signatures necessary to call a district election. Once a bond issue had been approved, bona-fide settlers began to enter the district. Meanwhile, the land company had exchanged its land--worth at most \$5 an acre--for \$200 an acre in bonds. Apparently, its directors hoped that as real settlers took up the land they might be able to sell the bonds at a price approaching face value. Even more outrageous the company had not secured title to all the land it sold; part actually belonged to the Southern Pacific. Many gullible "settlers," some of whom were doubtless speculating on their own, were left holding the bag.

The Manzanita District was land speculation pure and simple. But speculation in water rights also offered great opportunities. The Jamacha District, located only a few miles from San Diego's business district, was organized on November 2, 1891 by the San Miguel Water Company, which hoped to exchange its water rights for a fortune in bonds. On the \$111,000 in bonds issued by the district, the company received \$105,000 for its rights. The remainder paid for a reservoir site and the construction of a small dam. Histories of the Linda Vista District in San Diego County, the Big Rock District in Los Angeles County, and the Rialto District in San Bernardino County, offer similar examples. However, not all district promoters sold land and water. Many organized districts to sell existing irrigation works, or build new ones, at an enormous profit.¹⁹

Even without the machinations of artful speculators, and the opposition of large land-owners, the Wright Act faced formidable obstacles. Most district promoters assumed--and their assumption was shared by leaders in the national reclamation movement--that any crop could be raised in any desert soil given a sufficient water supply. They believed that even silt-free water contained nearly miraculous properties as a fertilizer. Unfortunately, the flow of California's streams had not been measured systematically, and the unusually wet period from 1880 to 1887 convinced many Californians that the average yearly water supply was larger than it actually was. A few even believed the dictum "rain follows the plow," that the rapid expansion of irrigation during the 1880s had permanently altered the state's climate. To make matters worse, irrigation planners routinely underestimated the volume of water needed to irrigate different crops. Most assume a "duty" of one or two acre feet of water per acre--about one-third to one-half the amount actually required. Because almost every district overestimated its water supply, and underestimated its needs, projects were launched which might not have been undertaken if promoters had had reliable stream-flow data.

The temptation to choose relatively isolated, sparsely settled areas proved irresistible to many speculators. Not only did they offer greater opportunities to profit from land sales, they were also easier to administer as districts. However, most districts did not start from scratch, and few could be formed in California that did not include some land already under cultivation. Consequently, few irrigation districts provided the efficient irrigation network promised by the law. Often, districts coordinated and expanded canal networks laid out by private companies. But they had a harder time producing unity among the water users themselves. District directors and assessors grappled with many prickly questions. For example, how should land already irrigated be taxed in relation to virgin land? Should established farmers who irrigated land adjoining a stream pay the same district tax as new settlers whose land was located five or ten miles from the water source? And should the water rights of established farmers enjoy chronological priority over all new settlers, or should all rights date from the formation of the district? In short, how could the residents of such "mottled" districts be placed on an "equal" footing?

These vexing questions were compounded by the Depression of 1893, the drought of 1898-1900, and other conditions beyond the control of individual districts. Moreover, they highlighted gaps and defects in the Wright Act itself. The law did not require district officials to have any practical experience in irrigation agriculture, let alone in designing or administering water supply systems. Inevitably, the lack of experience contributed to serious errors of judgment--as when the Central Irrigation District's directors approved a

canal whose bed was six feet above the Sacramento River's typical summer flow. In addition, since the law did not provide for state review of construction plans or bond issues, much more money was spent than necessary. Similarly, the law did not provide an effective method to condemn existing rights. The burden of condemning the multitude of riparian rights both within and without district boundaries in the courts proved overwhelming, as did arriving at a definition of fair compensation for such confiscated property. The district form did not abolish, or even weaken, riparian rights, as so many of its proponents had promised. Nor did it give appropriators within an irrigation district any advantage over those outside district boundaries; the courts observed chronological priorities after 1887 as they had before. Ironically, if anything the Wright Act increased litigation over water rights.

Probably the greatest single defect in the law related to the sale of district bonds. The Wright Act restricted the interest on irrigation bonds to five percent, even though many other types of bonds offered a higher return. Thus, many investors asked why they should take a chance with the new variety of bond when traditional securities could be found at six percent or better. District farmland and irrigation works backed up the bonds, but the total debt ran much higher in irrigation districts than in other bond-issuing jurisdictions. For example, state law limited school and county bonds to five percent of the assessed value of property within the district, and city bonds to fifteen percent. However, Wright Act districts faced no limit, and districts frequently bonded themselves up to 100 percent of assessed value in anticipation of sharp increases in land prices.²⁰

In the end, no law, no matter how carefully drawn, could have avoided the web of litigation spun around most of the irrigation districts. The Wright Act proved as much of a boon to lawyers as it had to land speculators. A mass of suits filed in 1887 and 1888 attempted to undermine individual districts by challenging the procedures followed in their creation, the establishment of boundaries, the issuance of bonds, and the assessment of taxes. Consequently, the 1889 legislature enacted a law to speed-up and consolidate the process of judicial review. Had such a law not been adopted, interminable litigation might have prevented any district from issuing bonds. The new law required the states' superior courts, on petition from an irrigation district's board of directors, "...to examine and determine the legality and validity of, and approve and confirm, each and all of the proceedings for the organization of said district...from and including the petition for the organization of the district, and all other proceedings which may affect the legality or validity of said bonds...." The law expedited the review process by requiring the courts to disregard any "...error, irregularity, or omission which does not affect the substantial rights of the

parties to said proceeding...." Moreover, those who chose to appeal a decision had to do so within 10 days.²¹

This amendment to the Wright Act reduced litigation and made district bonds more secure. But the U.S. Supreme Court did not rule on the constitutionality of the law until November, 1896. The first constitutional challenge came in Turlock Irrigation District vs. Williams, decided on May 31, 1888.²² The plaintiff claimed that irrigation districts were private rather than public corporations, and questioned the right of districts to condemn property for a private purpose. The suit also charged that the law allowed condemnation without due process; apportioned taxes unequally; permitted unlimited taxation even when taxes exceeded benefits; and constituted a usurpation of judicial power both by the legislature and by local boards of supervisors. The California Supreme Court disagreed and upheld the Wright Act on grounds that irrigation districts were "quasi public" corporations with full powers to condemn property and levy taxes. It concluded: "This is not a law passed to accomplish exclusive and selfish private gain; it is an extensive and far-reaching plan by which the general public may be vastly benefited. And the Legislature acted with good judgment in enacting it...The Act under discussion in all respects complies with the various provisions of the State Constitution." The state supreme court unanimously upheld the Wright Act in this and five subsequent cases.²³

This made the Fallbrook case, decided on July 22, 1895, all the more ironic. In 1894, an absentee landowner named Maria King Bradley sued the Fallbrook Irrigation District in the U.S. Circuit Court for Lower California, located in Los Angeles, challenging the constitutionality of district assessments. The circumstances surrounding the case are obscure. Why did Mrs. Bradley choose a federal court? Was she acting on her own or on behalf of an organized opposition group? And, had Judge Ross been bribed? Whatever the answers to these questions, the judge ignored the millions of dollars in bonds already in circulation, the irrigation works already in use, and the overwhelming sympathy for the Wright Act demonstrated by the state courts. Instead, he ruled:

No man's property can be constitutionally taken from him without his consent and transferred to certain other men for their use, however numerous they may be. And that is just what the legislation in question authorizes to be done. Private property is thereby authorized to be assessed and sold to provide water to supply the landowners in a certain district more or less limited in extent, for irrigation purposes. Every person within such district is not entitled to the use of water so provided upon the same terms and conditions as every other person, but only those persons who happen to own land in the district.

In short, all district taxes and bonds violated the property clause of the 14th Amendment.²⁴

The Fallbrook District's directors appealed the decision to the U.S. Supreme Court, which overturned the Circuit Court ruling on November 16, 1896.²⁵ But much damage had already been done. One champion of the district idea noted:

There were those who had faith in the law and the districts; some had only hopes of both, but when the decision of Judge Ross was announced the heart of everyone failed; confidence was lost; the bonds were valueless upon the market; all activities upon the water systems were shut down; several districts were disorganized; there was heard wailing over lost property on one side and about incompleting work on the other; it was as though some giant hand had come from out of the mist and closed upon them, and thousands were squeezed in the vise.

The circuit court decision compounded the effects of the depression of the 1890s on the districts. Even though the Supreme Court had finally upheld the Wright Act, irreparable damage had been done by the lower court ruling.²⁶

The U.S. Supreme Court verdict electrified opponents of the Wright Act, but they found a new champion in George Hebard Maxwell. Maxwell was a young attorney who had specialized in irrigation district litigation during the 1890s and headed the legal staff of Maria Bradley and company in the Fallbrook case. In October, 1896, even before the supreme court had spoken, Maxwell founded the California Advocate to publicize injustice, incompetence, and fraud in the administration of the state's irrigation districts, and to lobby for state and federal reclamation in the Golden State. Subsequently, he formed the California State League to organize the opposition and further his objectives in the political arena. The motives of Maxwell and his followers are not entirely clear. Some of his backers, including Miller & Lux, hoped that Maxwell's muckraking would discredit the Wright Act once and for all. However, some district bondholders probably took refuge in the camp of the enemy, hoping that the state or federal government would take over the districts and pay off the badly depreciated bonds at par. By 1897, many district bonds were trading at less than 50¢ on the dollar.

Maxwell filled early issues of the California Advocate with the hyperbole which characterized his uncompromising personality. In the November, 1896, issue, he denounced "the underlying communistic principle of the Wright Act," warning that it would soon spawn a legion of "improvement districts" with the "power to vote unlimited debt." In December, he described the Wright Act as "a menace to every one contemplating settlement in California," warning that "any newcomer to the State may, at any time, against his will, have his property embraced in an irrigation district and taxed even to confiscation to provide irrigation to others." In the same issue he characterized district bonds as "rotten with fraud and all manner of illegality." He noted that payment of the bonds would require taxes far beyond the

the means of most landholders, taxes that "involve the confiscation of half or more than half of the lands of every district in California." Maxwell emphasized that most opponents of the district concept favored greater state control over water: "They believe that the state should appoint a competent commission to supervise the construction of works and to distribute the water at the actual cost of such construction and distribution."²⁷

The crusade against the Wright Act culminated in the Bridgeford Act, adopted in 1897. The agricultural depression of the 1890s, particularly the low price of wheat, crippled the districts, but after November 16, 1896, district dissidents could no longer hope that the courts would cancel their debt. Moreover, that debt would soon become even more onerous. The Wright Act wisely specified that for the first ten years after the issuance of bonds, only the six percent annual interest need be paid. District supporters had hoped that by the time farmers began to pay off the bulk of their debt, the appreciation in crop and property values would render the increased tax burden easier to bear. Consequently, while the Central District's tax burden was only 1\$ per \$100 of assessed valuation in 1897, it threatened to soar in 1898 and 1899 because the law required the retirement of at least 5% of the bonds in the eleventh year, 6% in the twelfth year, 7% in the thirteenth year, and so on until the entire debt had been paid by the twentieth year. The legislature could not erase existing debts, but it could limit the issuance of new bonds and the formation of new districts.

Irrigation was not a hot issue in the 1897 legislature; a bill to provide state bounties for coyote scalps won more attention on the floor of the two houses. No new districts had been created since 1895, and none was likely to be established while the devastating depression continued. However, spokesmen for the irrigation districts and their critics squared-off at a joint meeting of the senate and assembly committees on irrigation and water rights held on January 21, 1897. The meeting had been called to discuss amendments to the Wright Act, and George Maxwell and a legal associate, J. Percy Wright, played a prominent part in the heated debate. The meeting ended after the joint committee appointed a nine-man subcommittee to draft new legislation. The subcommittee included strong defenders of the district form, including Assemblyman James A. Waymire, as well as critics.²⁸

The group selected E.A. Bridgeford to draft the legislation, and he produced a bill markedly different from the Wright Act. As signed by the governor on March 31, 1897, the new law virtually abandoned the district concept. It required a majority of all landowners, representing a majority of the property values of land susceptible of irrigation, to petition the board of supervisors before an election to form a district could be held. The Wright Act simply required a petition from 50 freeholders within the proposed district, and they

could be town residents as well as farmers. The new law also required a two-thirds vote to create a district, rather than the simple majority demanded by the 1887 legislation. Moreover, while the Wright Act allowed district directors to call bond elections on their own initiative anytime after the first election had been held, the Bridgeford Act required the same petition to schedule a bond election that it required to schedule the election to create the district. The directors could dispense with the petition only when the proposed bond issue was for \$10,000 or less. Other changes pertaining to bonds provided that the securities be issued for 30 rather than 20 years, with the principle paid in the 21st through 30th years; that the bonds carry five rather than six percent interest; that they be exempt from state, county, or municipal taxes; that they could not be sold at less than par; and that they could not be used directly to pay for land or water rights. The new act did not tamper with the obligation of recalcitrant landowners to pay off bonds already issued and in circulation. But it did establish a procedure by which any landowners could petition to "withdraw" from the district. If the directors approved the petition, the property owner could not be taxed to pay off future bond issues. The law also required the directors of new districts to exclude all land not irrigated, such as pasture, on the demand of the owner or owners. Finally, it provided that special elections could be held to reduce the bonded debt if more bonds had been approved than were necessary to build the irrigation works and those bonds had not yet been sold.²⁹

The Bridgeford Act achieved its basic objective; no new irrigation district was formed until 1909. Meanwhile, conditions did not markedly improve within the established districts until the 20th century. In January, 1898, George Maxwell scornfully wrote:

No bank in California will loan on an acre of land in any irrigation district. No man who is informed as to existing conditions will purchase property or make investments in an irrigation district unless it be as speculation--gambling on the chances of knocking it out. Home seekers shun the irrigation districts as though they were cursed with the plague. The system hasn't a friend left except those who are bondholders, or a few who are getting cheap water at their neighbor's expense....³⁰

In the closing months of the 19th century, few Californians could even imagine the remarkable success this maligned institution would enjoy during and after World War I.

Proponents of the Wright Act had hoped that the district would transform California agriculture. They assumed that the cost of irrigation would force landowners who used their estates "inefficiently," such as for grazing or wheat cultivation, to sell out to small fruit and vegetable farmers. Yet the spread of irrigation during the 1880s did not seriously affect the wheat industry. Since the 1870s, California had been one of the nation's top wheat-producing states, and mechanization allowed for a dramatic increase in production. In 1890, the state produced 40,000,000 bushels of wheat, second only to Illinois. International

competition and a glutted grain market did far more to destroy wheat farming in California than irrigation. By the 1890s, competition from the Midwest, Canada, and Russia began to depress prices, and the bottom dropped out of the market in 1893. California growers could not compete with these new regions because they raised an inferior variety of wheat and faced higher production and transportation costs. "Club wheat" stayed in the shell well when left in the field after harvest, so it was particularly resistant to mold and rotting. But the low gluten content of its flour made it far less attractive than wheat from Kansas. The California wheat industry's decline was so precipitous that by 1905 or 1910, wheat was only a minor crop. As early as 1900, many of the large wheat farms were on the market at prices ranging from \$10 to \$40 an acre.³¹

The depressed economy and aborted irrigation districts limited the expansion of irrigation during the 1890s, but the demise of the wheat industry laid a foundation for its future growth. Since the late 1860s, California's sprawling wheat ranches symbolized the persistence of land monopoly, and they were blamed, fairly or not, for many of the state's social and economic problems. Yet, if anything the vise of monopoly tightened during the 1880s. Declining crop yields due to soil exhaustion, and the high price of farm machinery, encouraged the largest growers to expand the size of their estates, and drove many "small" farmers out of business. By 1890, the champions of wheat no longer touted it as the "poor man's crop," as they had in 1870. In 1880, Yolo, Colusa, Butte, and Tehama counties included 71 estates of more than 5,000 acres; in all these princely domains totalled 797,761 acres. Yet by 1890, the number of landowners holding more than 5,000 acres had swelled to 106, and they held a total of 1,479,104 acres. Not surprisingly, the population of these four counties increased only four percent during the 1880s. And while the Sacramento Valley was the stronghold of the wheat industry, huge estates remained commonplace in the San Joaquin Valley as well. For example, in Fresno County, the center of irrigation in the San Joaquin Valley, 44 landowners held estates of 5,000 acres or more in 1875 for an aggregate of 847,379 acres. In 1890, the county still contained 41 holdings of 5,000 acres or more, and the total acreage had increased to 943,557 acres. Miller & Lux's Fresno County pastures increased from 169,464 acres in 1875 to 239,486 in 1890.³²

The persistence of monopoly, coupled with the crushing economic depression, offered new opportunities to the "philosophers" of irrigation. Since the 1870s, irrigation had been sold as a panacea capable of providing stability to the state's economy by purging it of those lingering speculative characteristics inherited from the 1850s and 1860s. It would break-up land monopolies, stimulate immigration into the state, increase the value of crops and land,

and promote country life. Occasionally, one of the institution's champions took a swipe at San Francisco by noting that irrigation would decentralize the state's population and promote the hinterland at the expense of the metropolis. But irrigation's value as a tool to preserve Republican institutions and civic virtue was not appreciated until the late 1880s and 1890s. By that time the flow of immigrants into east coast cities had reached flood tide. Whether the "new immigration could be assimilated remained a moot question, but the crowded and dreary tenements of Boston, New York and other eastern cities contained a potentially explosive landless proletariat. As E.W. Maslin noted in his address to the Seventeenth District Agricultural Association of Nevada and Placer counties in August, 1886:

What pursuit than agriculture offers more security that family ties will not be sundered, that the family name will be honored for generations? If you would have men to rule this land, after you shall have gone, who will transmit to their posterity the blessings of constitutional and religious liberty possessed by you, who shall resist sedition, anarchy, socialism, nihilism, and the thousand devilish foreign-born schemes of idle, vicious scum, consecrate this land to agriculture. Every tree, every vine is a teacher of the love of the beautiful and order. Every cottage is a hostage against misrule....Let us recognize the fact that property is unequally distributed and provide the remedy....I know of no better remedy than to deflect the current of young men, now tending to cities, to the rural districts.

Maslin suggested that Nevada and Placer counties had plenty of water for irrigation, and that residents of those counties could profit from an appreciation in land values just as residents of southern California had. Proponents of irrigation noted growing similarities between Europe and the United States. But irrigation offered an alternative to the crowded cities, unemployment, lawlessness, vice, corruption, and class conflicts endemic to industrial America. The arid West contained millions of potential homes for the landless masses, and promised a revival of rural values. Only water was needed for the region to realize its great destiny. In the late 1880s and 1890s, an increasing number of California's irrigation boosters linked the nation's social stability and economic health to Western agricultural development.³³

Of course, California was in no economic condition to launch a program to reclaim her arid lands as an inducement to potential immigrants. Erik Peterson has shown that four issues dominated the 1894 gubernatorial election: the depression, government spending, the "currency question," and railroad rate regulation. All three political parties--the Populists no less than the Democrats and Republicans--called for sharp reductions in state spending, even though all three candidates for the governorship favored a government-owned transcontinental railroad.³⁴ Retrenchment dominated the administration of Governor James Budd. He abolished state aid to aged indigents, cut 15 companies from the state militia, slashed the budgets of

state insane asylums, abolished the state viticultural commission, and eliminated the state bounty for coyote scalps. The governor, who in the 1870s had favored a state irrigation system, did not oppose all state public works. For example, he asked the legislature to draft a plan to improve the state's rivers and protect against floods. While he wanted the federal government to pay for the work, he argued that the state should do it if the national government refused. But Budd paid no attention to the financial plight of the state's irrigation districts, nor did he mention irrigation in any of his speeches.³⁵

During the period from 1893-1897, the irrigation crusade all but evaporated. But it revived rapidly during the drought of 1898-1900. The drought's effects were not uniform. In 1898-1899, San Francisco and Sacramento enjoyed 77 percent of their normal rainfall while Los Angeles received only 35 percent; in 1899-1900, Sacramento received 105 percent of normal precipitation, San Francisco 84 percent, and Los Angeles only 48 percent. Nevertheless, the 1898 statistics are misleading because most of northern California's rain fell during a two week period in late March and early April; this limited the value of the precipitation to farmers. Overall, 1898 was California's driest year in two decades.³⁶

During the drought, George Maxwell's career blossomed. In the early months of 1898, Maxwell continued to ponder the "irrigation district problem." In March, he recommended that the state issue its own irrigation district bonds to raise the money needed to complete and own all the district water systems. The plan called for the state to reimburse bondholders for the amount they actually "paid" for the securities in money or services--75 percent of par in the Modesto, Turlock, and Escondido districts; 50 percent of par in the Central and Tulare districts, etc. The new bonds would be issued for a longer period, to reduce district taxes, and no land would be included in districts without the approval of the landowner, and a competent, impartial state engineer would determine whether the local water supply was adequate to irrigate all the land within the district. Moreover, no towns would be included in the districts, and each landowner would be able to avoid district taxes by paying for his water right in full upon completion of the irrigation works. Maxwell noted: "There can be no doubt that a State irrigation system could be devised which would do away with all the defects of the present district system, and under which the disasters in the districts could be relieved."³⁷

However, in 1898 Maxwell drifted further and further away from any variety of state reclamation. Apparently, the young attorney first recognized the national significance of irrigation in 1896, when he attended the Irrigation Congress meeting at Phoenix. In the following year, after a meeting of the Trans-Mississippi Industrial Congress in Wichita,

Kansas, Maxwell formed the National Irrigation Association. Western railroads heavily subsidized the new booster organization in anticipation that a national reclamation program would drive up the value of their lands and increase their freight and passenger traffic. So would state reclamation, but most of the arid West was sparsely populated, which increased the cost of irrigation, and the western states enjoyed only limited financial resources. By 1898, Maxwell's lobbying efforts won endorsements from the National Board of Trade, National Business Men's League, and National Association of Manufacturers.³⁸ Meanwhile, the crusade for federal reclamation won new respectability from the efforts of Captain Hiram Martin Chittenden of the U.S. Army Corps of Engineers. In his famous report, "Preliminary Examination of Reservoir Sites in Wyoming and Colorado," Chittenden recommended that the national government build and operate reservoirs in the arid West, providing free water to farmers and distributing it under state laws.³⁹ This report inspired Maxwell, and the drought of 1898 may well have driven home the point that reservoir construction was too big a job for the states.

In 1899, Maxwell emerged as the chief publicist for federal reclamation. For example, in February he testified before the Senate Committee on Commerce in favor of a bill to use \$5,000,000 from the River and Harbor appropriation to build reservoirs in the arid West. Maxwell maintained that irrigation was a national, rather than sectional, issue. Arid land reclamation was as important as navigation and flood control, and simple justice dictated that money set aside for "internal improvements," such as that contained in the Rivers and Harbors fund, be dispersed impartially, in the West as well as East and South. In his testimony before the commerce committee, Maxwell also promised that eastern businessmen would profit mightily from western development: "Every new home in the West would make an increased market for the Eastern manufacturers and the farmers would feed the workers in the Eastern factories." But the fear of domestic turmoil also figured prominently in Maxwell's thinking. In a piece published in Irrigation Age in September, 1899, the lobbyist wrote:

We are passing through a period of prosperity when there is work for all who want it. But hard times are sure to come again when men will be thrown out of employment. Labor-saving machinery is constantly lessening the need of human labor. Our wage-earning population is increasing at an enormous rate. Year by year occupation must be found for the new workers who are growing to youth and manhood. Labor organizations have worked wonders in dignifying labor and maintaining fair wages. But they can not create work where there is none. They should use all their influence to open a channel through which all surplus labor can constantly return to the land, and Arid America beckons to them with open arms....

The "labor problem" preoccupied Maxwell long after Congress adopted the Newlands Act in June, 1902.⁴⁰

The drought was not confined to California, and the California legislature of 1899 reflected the growth of support for federal reclamation throughout the arid West. In a Senate Joint Resolution sent to Congress, the lawmakers bemoaned the state's agricultural stagnation, and declared that "the building of storage reservoirs is far beyond the means of the state." As a first step, the resolution called for federal reservoir and canal surveys. An Assembly Joint Resolution specifically asked for a survey of reservoirs to "confine and husband" the waters of the Stanislaus, Tuolumne, Merced, Fresno, San Joaquin, Kings, and Kern rivers, as well as a plan for such canals and ditches "as will provide for sufficient irrigation of the whole valley of the San Joaquin." Both resolutions urged federal construction and operation of the proposed irrigation works. Since Maxwell was in Washington for at least part of the California legislative session, his part in the adoption of these resolutions is unclear.⁴¹

Yet, not all Californians were willing to jump on the bandwagon for federal reclamation. In the late spring of 1899, a group of San Francisco bankers and businessmen issued a statement which questioned the wisdom of relying on federal aid:

The drouth of 1898 cost the State of California over \$40,000,000. For twenty-five years we have applied to the National Legislature without relief. It refuses to regard the question as a national one. No inter-state questions are involved in the sources of water supply of our State, as such sources are almost all within our geographical boundaries...Of late years the attention of the National Legislature has been turned toward the irrigation by storage reservoirs of lands still owned by the United States. We have no such lands of any appreciable amount in this State, therefore our chances of relief from this quarter are less, in our opinion, than they were years ago...Private capital will not invest in storage reservoirs, as the return must be small or the public oppressed. The Wright Irrigation Act has been a practical failure. Moreover, the control exercised by the Boards of Supervisors over such investments frightens private capital.⁴²

This left the alternative of direct action by the state. The "State party" was organized in April, 1899, when it became clear that 1899 would be as dry as 1898. The group's leaders included George Davidson, a Professor of Astronomy at the University of California who had served on the Alexander Commission in 1873; William Thomas, a prominent San Francisco attorney; W.H. Mills, Land Agent for the Southern Pacific; I.W. Hellmann, President of the Nevada Bank; E.B. Pond, President of the San Francisco Savings Union; Philip N. Lilienthal, Manager of the Anglo-Californian Bank Limited; Hugh Craig, President of the San Francisco Chamber of Commerce; and F.W. Dohrmann, President of the Merchant's Association. They unanimously agreed that the federal government would not pay for reclamation in California, but that the state finally had the means to pay for irrigation works. It could issue bonds, then retire them using proceeds from the sale of irrigation water and electrical power generated at the reservoirs--a source of revenue not available to proponents of state

irrigation works in the 1870s and 1880s. The "state party" also agreed that San Francisco businessmen should take the lead in raising money to pay for surveys of California reservoir sites because the city's "very existence depends upon the success of the country." Finally, the group called for a convention to discuss the state's water problems and coordinate the efforts of those dedicated to "storing the floods" with those interested in preserving the state's forests.⁴³

The call for a convention also won the support of the California State Association for the Storage of Flood Waters, another group spawned by the drought. This association--whose membership included Davidson, Thomas, and Mills--pitched its appeal to a wide constituency. It promised that cheap hydroelectric power would revive mining, stimulate industrial growth by providing an alternative to imported coal, and provide a means to tap hitherto inaccessible underground water for irrigation. In addition, storage reservoirs would facilitate the drainage of swamp lands and aid navigation by increasing stream-flow during summer months, contributing to the normal "scouring" effect.⁴⁴

As the convention, scheduled for November, drew near, George Maxwell and his growing legion of supporters opened fire on the state party. In a form letter dated October 20, 1899, bearing the letterhead of the National Irrigation Association, Maxwell charged: "The vast possibilities of mismanagement and corruption in the future which lurk in the movement started by Mr. William Thomas, of San Francisco, attorney for the Irrigation District Bondholders looking to the issuance of millions upon millions of state bonds to store and distribute the flood waters of California, should arouse the active interest of every citizen and property owner in California." In October, Maxwell spoke throughout southern California against state reclamation. Several newspapers echoed his suspicions concerning the motivations of the state party. For example, San Jose's Herald editorialized:

It is probable that a proposition will be sprung to bond the State to construct reservoirs and other works for irrigation...Who are behind it? It is hard to say, but we may guess. The Wright law irrigation bondholders might find a way to repair the value of their securities in connection with an issue of State irrigation bonds. The money lenders of San Francisco will see in it a chance for driving a thriving business in buying and speculating in bonds. What other interest may be in the background remains to be seen.

The Los Angeles Express claimed that the scheme would primarily benefit the private contractors selected to build the dams.⁴⁵

Four hundred and eighty-one delegates attended the convention, held at San Francisco's Palace Hotel on November 14, 1899. The California State Association for the Storage of Flood Waters had issued formal invitations to the Governor, Lieutenant Governor, Chief Justice of the Supreme Court, two members of each county board of supervisors, three delegates from each

assembly district, the mayors of the state's major towns and cities, and assorted representatives from boards of trade, chambers of commerce, and other civic and business associations.⁴⁶

One intriguing question is why San Francisco bankers and businessmen launched the new crusade to store the floods when the drought hit so much harder south of the Tehachapis. As noted above, Maxwell and his followers charged that the movement was inspired and led by irrigation district bondholders who hoped to recoup on a poor investment. But the motives of San Francisco's business community were considerably more complicated. The collapse of the wheat industry had had little effect in southern California, but--combined with the failure of many irrigation districts--it helped drive many farmers out of the Central Valley. San Francisco financial institutions ended up holding hundreds of mortgages on large tracts of land rapidly declining in value. Moreover, while southern California's population had not expanded as rapidly during the 1890s as it did during the previous decade, its growth still far outpaced northern California. The seven counties of southern California absorbed 90 percent of the rural population growth during the 1890s, and most of the overall state increase of 22.4 percent as well. Many San Francisco businessmen read the population statistics as a warning that Los Angeles would soon replace "the city" as the state's financial center. Then, too, as Mansel Blackford, Gerald Nash, and others have suggested, by the turn of the century, the state's businessmen wanted a more rational, orderly economy. San Francisco's leaders prodded by drought, the collapse of the wheat industry, statistics on rural depopulation, and other disquieting features of the "terrible nineties," finally acknowledged that the future of their city depended on the health of agriculture in the Central Valley. They hoped that when businessmen joined together to plan for future growth, the "boom and bust" cycles so characteristic of California's economy in the 19th century would disappear. Irrigation offered the foundation for that growth.⁴⁷

San Francisco Mayor James Phelan, a charter member of the California State Association for the Storage of Flood Waters, delivered the convention's opening address, and remarked: "I am informed that already there are two parties--one contending that it is the duty of the State to provide for the storage of flood waters, and the other that it is the duty of the Federal Government." The "nationalists," with their glowing promise of free storage works, won out. Maxwell's appointment to the critical legislative committee of the new California Water and Forest Association, formed as a result of the meeting, symbolized their victory. The convention adopted a platform which endorsed federal reservoirs paid for from proceeds derived from federal grazing leases though it also endorsed joint federal-state river improvement projects, hydrographic surveys, and the construction of reservoirs designed to

generate electrical power. In most respects, the platform echoed the National Irrigation Congress's program. For example, it recommended that all irrigation water rights be attached permanently to individual parcels of land; that beneficial use should be the first test of any water right; and that a national commission should resolve conflicts over interstate streams. The convention charged the state with the responsibility to collect stream-flow data, reform its outdated water laws, and create an "irrigation tribunal" to prepare a comprehensive record of valid water claims and resolve conflicts over water rights out of court. The Pacific Rural Press noted that the platform planks did not elicit serious debate:

A glance at them will show why the meeting was quiet. As Mayor Phelan premised, everyone was in favor of Government work, and the allusions to Uncle Sam even by those who trusted rather to State initiative were respectful in the extreme. The sentiment of the assembly, as signified by the applause, were clearly along national lines, and the proposition of bonding and taxation [as in irrigation districts] to promote reservoir building was hardly heard of. Those who have faith in such a measure as most expeditious and practicable were content to hold their views in abeyance. For this reason no issue was joined during the first day of the convention, and approval of the plans of the National Irrigation Congress grew more and more emphatic.

The friends of state reclamation had conceded the first round, but the battle had just begun.²³

As the 19th century wound to a close, the future remained uncertain. The drought had lasted two years already, and the immediate prospect for federal reservoirs was dim. On the other hand, the irrigation crusade had finally become a state-wide movement, with San Francisco's business leaders in the vanguard. Agriculture would no longer take second place to mining and wildcat land speculation schemes. Moreover, sectional differences had softened considerably since the early 1880s, and the state's economy was slowly recovering from its long period of economic listlessness. For better or worse, the decade of the 1890s belonged to the irrigation district, just as private water companies dominated the 1880s. Only a few irrigation districts, and almost no private water companies, survived the 1890s in good health. By a process of elimination, state and federal action seemed to offer the only hope that California agriculture would realize its full potential.

NOTES

CHAPTER V - THE TERRIBLE '90s: FROM THE WRIGHT ACT TO THE SECOND IRRIGATION CRUSADE

1. For a discussion of the Wright Act's terms see Frank Adams, Irrigation Districts in California, 1887-1915, State of California, Department of Engineering Bulletin # 2, second edition (Sacramento, 1917), 8-9. C.C. Wright himself explained the district law in The Irrigation Age, II (February 1, 1892), 446-448. Richard J. Hinton presented the testimony of many supporters of the law in his Report on Irrigation, 1891, Sen. Ex. Doc. 41, Part 1, 52 Cong., 1 sess., serial 2899 (Washington, D.C., 1892).
2. San Francisco Chronicle, February 20, 1890; The Irrigation Age, II (November 1, 1891), 264; February 1, 1892; 442; March 15, 1892, 522.
3. For surveys of early Wright Act projects see Adams, Irrigation Districts in California, 1887-1915; Ray M. Gidney, "The Wright Irrigation Act in California," M.A. thesis, U.C. Berkeley, 1912; Annual Report of the State Board of Horticulture of the State of California for 1892, in Appendix to the Journals of the Senate and Assembly of California, 30th sess., v. 3 (Sacramento, 1893); Eleventh Report of the State Mineralogist, Two Years Ending September 15, 1892, v. 9; and Fifth Biennial Report of the Department of Engineering of the State of California, December 1, 1914, to November 30, 1916, Appendix to the Journals, 42 sess., v. 5 (Sacramento, 1917), 129-130. The best brief histories of the districts individually are contained in the Gidney thesis.
4. San Francisco Chronicle, December 29, 1889; Pacific Rural Press, 40 (September 20, 1890), 257; Inaugural Address of Governor H.H. Markham, Delivered January 8, 1891, Appendix to the Journals, 29th sess., v. 1 (Sacramento, 1891).
5. The Weekly Colusa Sun, March 26 and April 2, 1887; Sacramento Daily Record-Union, March 28, 1887. The best overall surveys of the Central Irrigation District are in Adams, Irrigation Districts in California, 1887-1915, 11-14; Joseph A. McGowan, History of the Sacramento Valley, v. 1 (New York, 1961), 389-401; and John P. Ryan, "Notes on Will S. Green, Father of the Glenn-Colusa Irrigation District," unpublished manuscript in the Bancroft Library, University of California Berkeley.
6. Adams, Irrigation Districts in California, 1887-1915. 11.
7. The Weekly Colusa Sun, October 29, 1887. Also see the editorial reprinted from the Willows Democrat in the Sun of September 8, 1888.
8. The wheat industry in California deserves a book-length study, or at least a chapter or two in a comprehensive history of agriculture in the Golden State. While many aspects of the wheat industry have been studied, historians particularly need to examine the non-economic motives behind wheat farming. For example, did wheat farmers see themselves as a landed aristocracy in the same sense as large farmers in Europe? Were they implicitly challenging the small family farm which served as the agricultural ideal in the region from which they emigrated? What did the wheat rancher think of the family farm in California? These, and many other questions concerning the wheat industry, need to be answered.
9. Sacramento Daily Record-Union, November 23, 1887; The Weekly Colusa Sun, November 26, 1887. The Union reported the results of the election as 310 for and 52 against.
10. The Weekly Colusa Sun, February 18, March 10, April 7 and June 9, 1888; November 16, 1889; San Francisco Alta, November 12, 1889.
11. The Weekly Colusa Sun, February 8, 1890.
12. The Weekly Colusa Sun, March 8, 1890; September 26, 1891. The quotes are from the later issue.
13. Adams, Irrigation Districts in California, 1887-1915, 13; The Weekly Colusa Sun, September 21, 1891; Sacramento Daily Record-Union, August 17, 1891. Central District voters approved an additional \$250,000 bond issue in 1891, but the securities did not sell.

14. The Weekly Colusa Sun, December 6, 1890; August 8, 1891; The Irrigation Age, I (October 15, 1891), 234. In the Sun of October 24, 1891, Green admitted that the Wright Act should have created a state board to certify each issue of irrigation district bonds before they went on sale.
15. The Weekly Colusa Sun, March 28, 1892; In re Central Irrigation District, 117 Cal. 382; California Advocate, I (December 1896), 89.
16. The San Francisco Call, January 11, 1903; McGowan, History of the Sacramento Valley, v. 1, 396-397. On the continuing litigation over the Central Irrigation District see the Call, January 24, 1901; May 24, 1902; and June 26, 1902.
17. The San Francisco Call, January 11 and 12, 1903; San Francisco Chronicle, April 8 and 19, 1903; July 9, 1904; and November 26, 1904; "Marketing Irrigation District Bonds," in Transactions of the Commonwealth Club of California, 6 (December 1911), 531; S.T. Harding, Water in California (Palo Alto, California, 1960), 89-90; and J. Rupert Mason, Oral history transcript, Bancroft Library, at p. 32. To add to the irony surrounding the fate of the Central District, irrigation promoter Charles F. Lambert suggested that the district would have failed for a more prosaic reason. Chief Engineer C.E. Grunsky's experience had been restricted to the San Joaquin Valley, where the flow of water in July was much greater than in the Sacramento Valley because of the heavier snow-pack in the southern Sierra. Apparently, Grunsky fixed the main canal's grade six feet above the Sacramento's low water mark in July. In the 20th century, electric pumps lifted irrigation water from the river into the canal, but this technology was not available in the late 1880s and early 1890s. See the Charles Lambert oral history transcript at the Bancroft Library, pp. 49-50.
18. Even in the darkest days of the 1890s, the Turlock District remained in relatively good health. For example, the San Francisco Chronicle of March 4, 1897, reported that on March 2nd the district sold \$472,500 in bonds at 90¢ on the dollar. However, the bonds may have been "sold" to a contractor at much more of a discount than reported to the newspaper.
19. The material on the Manzana and Jamacha districts is taken from the unpaginated Appendix B of Gidney's M.A. thesis, "The Wright Irrigation Act in California." Many other districts shared similar experiences. See, for example, Adams, Irrigation Districts in California, 1887-1915, 28-29, 36-37, 39-41.
20. For explanations of the Wright Act's failure see Hinton, Report on Irrigation, 1891, 29-34; "Marketing Irrigation District Bonds," 515-583; Harding, Water in California, 83-84; William E. Smythe, "Irrigation Principles," Irrigation Age, 8 (January 1895), 10-12, and Out West, 18 (May 1903), 656; Edward F. Adams, "California Irrigation District Bonds," Sunset, 27 (September 1911), 324-327; Sacramento Daily Record-Union, July 11, 1891; San Francisco Chronicle, January 3, 1897; Pacific Rural Press, 57 (March 4, 1899), 130.
21. Cal. Stats., 1889, 212.
22. Turlock Irrigation District vs. Williams, 76 Cal. 366.
23. Pacific Rural Press, 35 (June 9, 1888), 502; John E. Bennett, "The District Irrigation Movement in California," Overland Monthly, XIX (March 1897), 252-253. The other critical state court cases including the Wright Act's constitutionality included Central Irrigation District vs. De Lappe, 79 Cal. 351 decided on May 31, 1889; Crall vs. Poso Irrigation District, 87 Cal. 140, decided on December 15, 1890; and In re Bonds of Madera Irrigation District, 92 Cal. 296, decided on December 14, 1891. See Adams, Irrigation Districts in California, 1887-1915, 105-112, for a complete list of court cases.
24. Maria King Bradley et. al. vs. the Fallbrook Irrigation District et. al., 68 Fed. 948; The Record-Union (Sacramento), July 23, 1895; The San Francisco Call, July 23 and August 10, 1895.
25. Maria King Bradley et. al. vs. the Fallbrook Irrigation District et. al., 164 U.S. 112.

26. The quote is from Bennett, "The Irrigation District Movement in California," 256. On the appeal to the federal circuit court decision in the Fallbrook case see The San Francisco Call, September 24, 1895. For the Supreme Court's verdict see Irrigation Age, 10 (November 1896), 139-143.
27. California Advocate, I (November 1896), 44, and December, 1896, 80, 88, 89, and 98. Copies of the Advocate for 1896-1898 are at the California State Library, California Room, Sacramento. Also see Frank Adams oral history transcript at the Bancroft, pp. 80-81. The San Francisco Chronicle of January 3, 1897, noted that proponents of a state system of irrigation favored a system whereby local landowners who did not want to employ irrigation would not be taxed for the benefit of those who did. The Chronicle issue contained a number of pieces outlining the conditions in California's irrigation districts.
28. The Record-Union (Sacramento), January 19, 22, 28; March 4, 6, 13, 14, 1897; The Evening Bee, January 22, 1897.
29. Cal. Stats., 1897, 254; Adams, Irrigation Districts in California, 1887-1915, 47. Also see Adams' Irrigation Districts in California, California Department of Public Works Bulletin # 21 (Sacramento, 1930), 40.
30. California Advocate, 3 (January 22, 1898), 4.
31. Department of Agriculture and Census Bureau crop statistics for the period from 1880 to 1900 are not entirely reliable. Nevertheless, they do clearly illustrate trends in the California wheat industry. In 1880--a peak year for wheat growers in California--2,117,350 acres planted to wheat produced 33,877,600 bushels worth \$32,522,496 or 96¢ per bushel. By 1887, the acreage had increased to 2,766,235 acres which produced 30,429,000 worth \$22,517,460, or 74¢ a bushel. Acreage planted to wheat remained fairly stable through the 1890s. In 1893, the acreage still totalled 2,620,490 acres, and yielded 34,852,517 bushels, but the price had dropped to \$18,471,834, an average of 52¢ per bushel. The price remained essentially unchanged for the rest of the decade. In 1900, the census estimated 2,683,405 acres of wheat in California, a total yield of 36,534,407 bushels, and a price of 55¢ per bushel. By 1910, only 478,217 acres were planted to wheat and they produced only 6,203,206 bushels. Ironically, however, the value of the wheat crop in 1910 exceeded that of 1900 even though acreage planted had declined by 82 percent and bushels produced by 83 percent. Many other statistics illustrate the abject state of the wheat industry during the 1890s. For example, the yield per acre dropped from 15.9 to 13.3 bushels from 1890 to 1893, and by 1900, California farmers received the lowest monetary return per acre of wheat farmers within any arid or semi-arid state. See Report of the Commissioner of Agriculture, 1880 (Washington, D.C., 1881), 192-193; Report of the Commissioner of Agriculture, 1887 (Washington, D.C., 1888), 538, 540; Report of the Secretary of Agriculture, 1890 (Washington, D.C., 1890), 299; Report of the Secretary of Agriculture, 1893 (Washington, D.C., 1894), 480, 482; Twelfth Census of the United States, 1900: Agriculture, Part II, Crops and Irrigation (Washington, D.C., 1902), 28, 29, 92-93; Thirteenth Census of the United States, 1910, v. 6 (Washington, D.C., 1913), 143, 160.
32. The statistics are from W.H. Mills, "California Land-Holdings," a speech delivered to the Chit-Chat Club of San Francisco in December, 1891. A copy is contained in Pamphlets on California Lands, v. 2, at the Bancroft Library, University of California, Berkeley. For other statements by Mills on the effects of land monopoly see The San Francisco Call, January 13, 1896, and December 19, 1897. For an excellent brief survey of Mills' role in promoting irrigation in California, see Richard J. Orsi, "The Octopus reconsidered: The Southern Pacific and Agricultural Modernization in California, 1865-1915," California Historical Quarterly, LIV (Fall 1975), 197-200. For a sampling of editorial statements on land monopoly in California see the San Francisco Chronicle, January 1, 1887, and January 3, 1897; The Weekly Colusa Sun, March 26, 1887, and December 15, 1891; Pacific Rural Press, 48 (July 14, 1894), 18; and The Country Gentlemen, 64 (June 29, 1899), 505.
33. Transactions of the California State Agricultural Society, 1886, in Appendix to the Journals of the Legislature, 27th sess., v. 3 (Sacramento, 1887), 695. Also see the speech of P.D. Wigginton in the same report, as well as the report of the California State Board of Trade to the Stewart Irrigation Committee in Report of the Special Committee of the United States Senate on the Irrigation and Reclamation of Arid Lands.

- 51 Cong., 1 sess., S. Rep. 928, v. 2 (Washington, D.C., 1890), 190-207, especially pp. 205-207, and Mills, "California Land Holdings," 10.
34. Erik Falk Peterson, "The End of an Era: California's Gubernatorial Election of 1894," Pacific Historical Review, 38 (May 1969), 141-156.
 35. First Biennial Message of Governor James H. Budd to the Legislature of the State of California, 1897, Appendix to the Journals, 32 sess., v. 1 (Sacramento, 1897), and Second Biennial Message..., in Appendix to the Journals, 33 sess., v. 1 (Sacramento, 1899).
 36. "Drought in California," Transactions of the Commonwealth Club of California, 21 (December 28, 1926), 473-526. For specific reports on the drought see the Pacific Rural Press, 56 (December 31, 1898), 426; 57 (February 11, 1899), 82; February 18, 1899, 98; April 29, 1899; 258; 60 (September 22, 1900), 178; October 13, 1900, 226.
 37. The San Francisco Call, March 15, 1898, and the Pacific Rural Press, 56 (August 6, 1898), 84-85. Later issues of the California Advocate--see, for example, 3 (July 9, 1898), p. 1--proposed a nine-point program to aid agriculture in California. The program included creation of a State Board of Irrigation and Public Works to supervise construction of state reclamation projects, and a "just, equitable, and comprehensive" set of irrigation laws for California. However, the program also called for federal storage reservoirs. In 1898, Maxwell considered state and federal reclamation compatible, though he did not clearly define the responsibilities of each.
 38. William Ellsworth Smythe, The Conquest of Arid America, (2d ed., New York, 1905), 272-273. Samuel P. Hays, in his Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1890-1920 (Atheneum paperback edition, Cambridge, Mass., 1974), 9-11, claims that Maxwell did not form the National Irrigation Association until 1899. But the irrigation publicist had begun to publish the National Advocate, a journal probably subsidized by the same group which bankrolled the Association, in 1897. This tends to corroborate Smythe.
- Maxwell soon lost interest in the California Advocate--though not in the politics of California water--and the journal ceased publication in late 1898 or early 1899. The very small circulation of the California Advocate, National Advocate, Homemaker, and Talisman--each of which Maxwell edited--suggests that they may have been intended primarily for circulation among businessmen, politicians, and other "decision-makers" rather than designed to win broad public support for the federal reclamation program.
39. Hiram Martin Chittenden, "Preliminary Report on Examination of Reservoir Sites in Wyoming and Colorado," H. Exec. Doc. 141, 55 Cong., 2 sess (Washington, D.C., 1897).
 40. Pacific Rural Press, 57 (March 4, 1899), 133; George H. Maxwell, "Reclamation of Arid America," Irrigation Age, 13 (September 1899), 407-409.
 41. Senate Joint Resolution No. 8, adopted February 9, 1899, in Cal. Stats., 1899, 444; Assembly Joint Resolution No. 7, adopted March 6, 1899, in Cal. Stats., 1899, 497.
 42. As reprinted from the Redlands Citrograph in the Irrigation Age, 13 (July 1899), 356-357.
 43. William Thomas to J.M. Gleaves (President of the California Water and Forest Society), April 24, 1899; and George Davidson to F.H. Newell (Chief Hydrographer, U.S. Geological Society), May 1, 1899, in the George Davidson Collection, Bancroft Library.
 44. See leaflet entitled "The California State Association for the Storage of Flood Waters," in folder entitled "California Water and Forest Association, Carton 16, George Davidson Collection. Also see the Pacific Rural Press, 56 (December 31, 1898), 431.
 45. A copy of the October 20, 1899 letter is in the Water Supply of California collection of pamphlets, v. 3, at the Bancroft. The San Jose Herald editorial was reprinted in The Citrograph (Redlands), October 28, 1899, an issue which contained many articles on irrigation and the storage question. The Los Angeles Express attacked state reclamation in its issues of October 16 and 21, 1899. The National Irrigation Association probably never contained more than a handful of active members. It had been formed largely to lend respectability to Maxwell's lobbying efforts.

46. George Davidson to Henry T. Gage (Governor of California), September 15, 1899, Davidson Collection; The Citrograph (Redlands), October 28, 1899.
47. The keen interest of San Francisco businessmen in reclamation can be seen in the annual reports of the city's Chamber of Commerce. See Forty-Ninth Annual Report of the Chamber of Commerce of San Francisco, 1899 (San Francisco, 1899), 9, 10; Fiftieth Annual Report... (San Francisco, 1900), 42 and 53; Fifty-First Annual Report... (San Francisco, 1901), 40, 44, 51, 54, 58, and 70-71; and Fifty-Second Annual Report... (San Francisco, 1902), 34 and 66. For an excellent analysis of the changing nature of business in California built on the "organizational synthesis," see Mansel Blackford, The Politics of Business in California, 1890-1920 (Columbus, Ohio, 1977). Gerald D. Nash's State Government and Economic Development, A History of Administrative Policies in California, 1849-1933 (Berkeley, 1964), also deserves close reading.
48. The two quotes are from the Pacific Rural Press, 58 (November 18, 1899), 322. Also see the Press of November 25, 1899, 338 and 341-342; December 9, 1899, 370; and December 23, 1899, 406; San Francisco Chronicle, November 12, 15, 16, 17, 1899. The first issue of Water and Forest, the publication of the new Water and Forest Association, noted that the convention had "indorsed [sic] the platform of the National Irrigation Association, syllable for syllable, as presented and urged by its representative, George H. Maxwell." See I (September 1900), 7. Though the state and federal factions disagreed over most issues, both argued that the state's forests should be protected from fires, over-grazing and overcutting. Timber conservation was a laudable goal in itself, but the irrigationists looked to the state's forests mainly as a "reservoir" to stabilize and even augment the water supply available to farmers. In short, they looked at forests as watersheds as well as collections of trees.

VI. THE STATE, THE NATION AND THE IRRIGATION CRUSADE, 1900-1917

Many historians have viewed the conservation movement which flowered during the 1890s and first decade of the 20th century as a purely "eastern" growth, a plant which could flourish only in the congenial political and scientific "soil" of Washington, D.C. The same interpretation argues that the states of the arid West opposed "conservation" in favor of the free-wheeling exploitation and development of their natural resources by individuals and private companies.¹ Admittedly, the conservation movement built on the ideals of science, efficiency, and central planning promoted by a coterie of bureaucrats in Washington, led by F.H. Newell, A.P. Davis, Gifford Pinchot, W.J. McGee, Marshall O. Leighton and others. But, unlike the other arid and semi-arid states, California's economy had largely passed through its "frontier phase" by 1900, and the California Water and Forest Association, Commonwealth Club of San Francisco, Sierra Club, and other conservation and civic groups, served as powerful indigenous voices for the conservation ethic and reform. For example, the Commonwealth Club, with the substantial assistance of Governor Hiram Johnson and other California Progressives, helped push a new water code through the legislature in 1913. The state also established control over the formation and financing of irrigation districts, which helped revive that dormant institution. Ironically, the national government played little part in the development of California's water supply before the 1930s. It joined the state in gathering much useful information, but the Golden State did not offer many feasible federal irrigation projects.

Members of the California Water and Forest Association recognized that since the 1870s their state had lagged consistently behind most other states and territories in the Far West in population growth and many aspects of agricultural development. During the 1870s and 1880s, eight of the eleven states and territories increased in population faster than California, and during the 1890s nine did. From 1890 to 1900, the value of California's farm property increased by only 3 percent, the smallest increase in the West. In the same period, Utah's farm property appreciated by 90 percent and Colorado's by 37 percent. In 1900, California farms averaged 397.4 acres. Only the states and territories where grazing predominated exceeded that figure. Similarly, the Golden State contained the highest percentage of both tenant farmers and urban residents in the West. Census officials classified 40 percent of its inhabitants as "urban," about the same percentage as Pennsylvania and Maryland.²

William Thomas, the California Water and Forest Association's first president, knew that conditions in California were even worse than the statistics indicated. Southern California's growth partly obscured the economic stagnation north of the Tehachapis. Thomas suggested that California could double its population in the first decade of the 20th century if it promoted immigration: "If we do nothing our rural population will drift toward the cities, which cannot support them if agriculture proves unsuccessful. Develop the country, and the cities will develop themselves. The Orient has just been opened to us as a new market for our products, and now is the time for us to do something, and the first thing to do is develop our water resources." According to Thomas, the water supply could be increased by building reservoirs, planting trees, and tapping underground sources.³

As early as July, 1889, a committee of prominent San Franciscans wrote A.C. True, Director of the Department of Agriculture's Office of Experiment Stations, asking him to appoint Elwood Mead--head of the Office of Irrigation Investigations under True--to study irrigation and water rights in California. Those who signed the letter included William Thomas; the manager of the State Board of Trade; the presidents of Stanford University, the German Savings and Loan Society, and the French Savings Bank of California; and the vice-president of the Crocker-Woolworth National Bank. They noted that nowhere in the United States were irrigation problems "more important, more intricate, or more pressing" than in California. "We can offer... examples of every form of evil which can be found in Anglo-Saxon dealings with water in arid and semi-arid districts. Great sums have been lost in irrigation enterprises. Still greater sums are endangered. Water titles are uncertain. The litigation is appalling."⁴ Subsequently, the Water and Forest Association, which held its first meeting in November, raised \$10,000 to help pay for Mead's study and a survey of reservoir sites on the Kings, Salinas, Yuba and other rivers by the U.S. Geological Survey's Hydrographic Branch. Frederick Haynes Newell headed the Hydrographic Branch. Like Mead, he recognized that the survey work in California could enhance the reputation of his office as well as his chances to direct a federal reclamation program in the future. The Water and Forest Association's officers expected Mead and Newell's agencies to match or exceed the amount collected by the association.⁵

By the summer of 1900, Mead had assigned a half dozen assistants the job of surveying irrigation and water rights controversies on an equal number of streams. His best-known Lieutenant was William Ellsworth Smythe, whose skills as a journalist and publicist had helped win the job of vice-president of the Water and Forest Association. In his annual report for 1900, the Secretary of Agriculture proudly noted: "This is the largest and most comprehensive

inquiry regarding irrigation laws, customs, and conditions which has been undertaken in this country."⁶

Mead offered many reasons to explain the "retarded" growth of irrigation in California. The Wright Act's failure had turned many farmers against irrigation, and farmers had long feared becoming the "serfs" of private ditch companies. Moreover, the state contained more organized groups of water users than any other western state, and those groups represented a wider range of interests. California also presented many unique hydrographic conditions. What other western state contained two streams like the Sacramento and San Joaquin, used extensively for both shipping and irrigation? These conflicts threatened to get worse as fledgling hydroelectric power companies placed new demands on the water supply. Mead reported that strong prejudices against the idea of irrigation persisted, particularly in the Sacramento Valley. There he interviewed farmers who still believed that bumper fruit and wheat crops could be produced without irrigation, and that irrigation would touch off malaria epidemics and destroy the health of valley residents.⁷

But Mead concluded that conflicts over water rights had been the main reason for the languishing state of California agriculture:

There are few places in the world where rural life has the attractions or possibilities which go with the irrigated home in California, yet immigration is almost at a standstill and population in some of the farmed districts has decreased in the past ten years. It is certain that some potent but not natural cause is responsible for this, and this cause seems to be a lack of certainty or stability in water rights which has given an added hazard to ditch building and been a prolific source of litigation and neighborhood ill feeling. Farmers who desire to avoid the courts and live on terms of peace and concord with their neighbors avoid districts where these conditions prevail.

Mead noted that "floating" water rights had been one major source of conflict. California's water companies had been allowed to claim huge quantities of water apart from the land. Since the 1870s, farmers had complained frequently and bitterly about the price they paid for water, the quantities they received, and poor, often discriminatory, service. The state had passed laws allowing, and later requiring, boards of supervisors to set rates and distribute water fairly; but these statutes had proven ineffective. Floating rights, often for indefinite quantities of water, contributed to monopoly in the 1870s and 1880s. And, in the long run, they discouraged investment in private irrigation projects. Following the principle of "beneficial use," the courts rarely reduced the water claims of individual irrigators, even when those farmers wasted water. But the courts often reduced the supply available to private companies. Since water rights were not attached to the land, most companies could not be sure of their water supply, and investors shied away from such risky ventures. Many other water

rights problems Mead discovered have been discussed in earlier chapters. These included the indefinite nature of riparian rights, the multitude of purely speculative claims, the slow process of quieting contested claims, and the enormous expense of litigation. Litigation had killed many irrigation projects and crippled even more.⁸

Mead's individual investigators provided an abundance of illustrations to reinforce his general arguments. William Ellsworth Smythe surveyed agricultural conditions in California's Honey Lake Valley, 100 miles north of Lake Tahoe. He found an incredible array of water claims had been filed against the region's streams and lakes. For example, in 1873 one W. B. Sargeant had claimed all the surplus water in the Susan River--the largest stream in the valley--"over and above the 2,000 inches claimed by A. A. Smith." Ten years later, J. H. Slater claimed "the waters in Caribou and Silver lakes and tributaries" without estimating either the total water in the lakes, or the amount he actually needed. And in 1887, D. W. Ridenour and Charles Lawson demanded "all water here flowing in Gold Run Creek" despite thirteen older claims to the same stream. Smythe estimated that the Honey Lake Basin's water supply would irrigate about 100,000 acres of land. However, under the law of 1872 claims had been filed to a water supply sufficient to irrigate nearly 230,000,000 acres--over twice the total land area of California and many times the irrigable acreage in the entire arid West!

The basin's first water suit was settled in 1864, and by 1900 fifty-three cases had been thrashed out in the courts. Most of these cases fell into three categories: conflicts between rival appropriators as to how much water each was entitled to; conflicts produced by uncertain or ambiguous court decisions; and conflicts between irrigation companies and consumers. Smythe charged that the courts had done as much to promote conflict as to settle it. They frequently granted water to the extent "heretofore used," or granted a specific quantity of water without considering the number of acres a farmer cultivated, or the crops he raised. Moreover, since the courts usually overestimated stream-flow in adjudicating water cases, their judgments did not provide much help in dry years. Smythe bitterly concluded:

The fault lies not with the people, not even with the lawyers, though the latter inevitably fatten upon the misfortunes of the community. The fault lies with the irrigation laws of California, which are notable alike for what they contain and what they omit. If deliberately devised to plague the people, no system which man's evil genius could invent would effect the result more surely than the system which invites them to make such reckless claims as we have seen in the case of Honey Lake Valley, and then leaves them to fight it out to the bitter end.

Put simply, irrigation could not expand in the Honey Lake Valley until the state's water laws had been revised.⁹

Conditions in the Honey Lake Basin were hardly unique. In 1856, James Moore filed the first appropriation on Cache Creek, in Yolo County. Theoretically, appropriative rights were limited to beneficial use. However, the state's courts had neither the experience, revenue, or inclination to gather hydrographic data in the field. Consequently, water cases often hinged on the eloquence or deceit of high-priced attorneys, or the relative political power and social standing of contestants in their local communities. In any case, ultimately the state supreme court confirmed Moore's right to 432 cubic feet of water per second, more than twice the volume of water his ditch could carry. Many residents of Capay Valley according to Mead's investigator, had been forced to raise wheat because the Moore and Capay ditches monopolized the valley's water supply. In Monterey County, 70 claims had been filed against the Salinas River. Only 10 of the claimants actually diverted water, but many of the remainder filed and re-filed to keep their paper claims alive. Finally, of the 316 claims filed against the San Joaquin River and its tributaries, six were for the entire stream, and the remainder constituted eight times its greatest flood flow and 172 times its average volume.¹⁰

Each of Mead's five investigators ended his report with suggestions for reforming California's archaic water laws.¹¹ However, once their work had been completed, they joined Mead in Berkeley to draft a comprehensive list of reform proposals. They agreed that the state should declare all unappropriated water public property and create a "Board of Control" to determine and record existing rights and regulate future appropriations. The board would consist of an attorney, businessman, and civil engineer selected by the state supreme court. The board would complete and maintain the record of water rights, determine the volume of unused water in the state, and fix the water rates charged by private ditch companies. A state hydraulic engineer would serve as the board's executive officer and, through his lieutenants, supervise the distribution of water among irrigators. To facilitate this task, the state would be divided into water districts whose boundaries conformed to natural watersheds. All future water rights would be attached to the land and limited to the amount of water actually needed, as determined by the state engineer. Moreover, beneficial use would limit riparian, as well as appropriative, rights. The group suggested that the federal government build storage reservoirs in California, but only to serve public lands. The report did not define the part the state government should play in promoting reclamation, though it did recommend the establishment of state administrative control over the creation of irrigation districts and the construction of their dams and canals. Mead and his aides concluded by suggesting that California's governor appoint a special commission to frame new water

laws for the state. The panel's recommendations closely resembled the "Wyoming Idea," the legal and administrative system Mead had drafted in 1889-1890 while he served as Wyoming state engineer.³²

Mead believed that the adoption of a modern code of water laws would have a profound effect on the state:

The creation of a code of irrigation laws which, by their justice and effectiveness, will be worthy of the people of California, will do more than all other influences combined to multiply the number and increase the value of rural homes, and will mark the beginning of a new era of emigration to this attractive and lovable State. It is an opportunity for the exercise of constructive statesmanship which rarely appears in the life of any Commonwealth...The possibilities which wait on success ought to enlist the wisest minds of the State. If they can do for California what Napoleon and Cavour did for Italy, what Deakin has done in part for Australia, and Dennis more effectively for Canada, they will inaugurate an economic revolution whose influence will be felt throughout the West.

Mead knew that without a dramatic increase in state control over water, litigation would continue to stifle private irrigation projects. Even more important, he saw that state or federal storage reservoirs would be worthless unless the state found ways to "protect" the captured water supply from appropriators and riparian owners.³³

Bulletin Number 100 contributed to Elwood Mead's reputation as the West's pre-eminent expert on water law and arid land reclamation. It prompted the University of California's President, Benjamin Ide Wheeler, to ask Mead to organize a Department of Irrigation in the university, and insured that the Office of Irrigation Investigations would participate in future state-federal hydrographic studies. Moreover, Mead hoped that the publicity his report received would help persuade Congress to establish a separate Bureau of Irrigation under his control in the Department of Agriculture. Bureau status promised larger appropriations. And in addition, the leadership of such a bureau would make Mead the likely choice to head any federal reclamation program approved by Congress. Ironically, however, Bulletin Number 100 put Mead squarely in the "state party" camp. He thought the states, rather than federal government, enjoyed sovereignty over the West's water, and--at least in California--he wanted to restrict federal reclamation to public lands. Since California contained little arable land within the public domain, Mead foresaw a limited federal role. These views won the enmity of George Maxwell, as well as Mead's chief rival, Frederick Haynes Newell.³⁴

Mead's conclusions simply reinforced the dissatisfaction with California's water laws which prevailed among many members of the Water and Forest Association. His report ably sketched the extent and effects of litigation in California, but paid little attention to the process of litigation. As noted above, despite the enormous costs of litigation, an expense which bankrupted many small farmers, the legal system had little success in resolving water

conflicts. The courts could not enter a battle except on the appeal of one or more participants, and by the time a suit had been filed, the contestants often feared and hated each other. Suits were not so much evidence of a desire to resolve conflicts as they were symptoms of deadlock. Nor was the leisurely pace of court proceedings likely to cool overheated tempers. Interminable stays, injunctions, and appeals increased the possibility that once a decision had been reached, the conditions which prompted the suit in the first place might no longer exist. In any case, suits rarely included all interested parties, so decisions were inevitably incomplete. Moreover, enforcing a decree was no easy matter; contempt proceedings were also expensive, and subject to the same delays as water rights suits themselves. Since the courts did not study conditions in the field--even though those conditions frequently were more important than points of law--judges depended almost entirely on biased witnesses for information. Cases often hinged on which side could afford the most persuasive "expert" witnesses. Finally, the courts simply defined the rights of private property. They rarely considered the "public interest."

Bulletin Number 100 encouraged reformers in the California Water and Forest Association. William Ellsworth Smythe, the association's first vice-president, had stumped the state in favor of water law reform since the summer of 1900. In August, 1901, he promised Mead to work for the election of a governor and legislature pledged to reform. If he failed, he vowed to lead an independent movement "...which, at least, may give [us] the balance of power in the Legislature and enable us to demand the reform at the end of a club." In the following month, Smythe wrote Mead acknowledging receipt of a copy of the report and endorsed it as "...a thirteen inch gun directed against Fort Water Monopoly...I shall make every effort in my power, from now until the election of the next legislature, to see that the views expressed in the report, together with the overwhelming evidence on which they are based, are brought to the attention of the people."¹⁵

Smythe was a valuable publicist. He had almost single-handedly launched the national reclamation crusade in April, 1891, when he published the first issue of Irrigation Age, which he edited until 1895. Throughout the 1890s, Smythe championed irrigation and planned agricultural colonies as tools to populate the arid West and make farming more attractive and efficient. He also claimed that dry land reclamation would help solve most of the nation's chronic social and economic problems. In the late 1890s, new defenders of the faith, including Maxwell, Mead, and Newell, overshadowed the journalist. However, in 1900 he "restored" his reputation by publishing The Conquest of Arid America, a celebration of the

development of irrigation and its future potential which became a Bible to crusaders for reclamation. In the same year, he joined Elwood Mead and began his survey of the Honey Lake Basin for the Office of Irrigation Investigations.¹⁵

In 1901, Smythe became a regular staff writer for Charles F. Lummis's Land of Sunshine, which became Out West in the following year. During the first decade of the 20th century, Out West was California's second most popular magazine after the Overland Monthly. Smythe used his regular column, "The 20th Century West," to sell the ideas of Mead and the California Water and Forest Association. He supported the construction of dams by the federal government, but only to serve public land and only if the state retained administrative control over the stored water. He proposed that the state reclaim private land using taxes levied against the land directly benefited. As an alternative, he suggested that California follow the lead of New Zealand by purchasing or condemning the state's largest farms, subdividing them into family plots with planned villages at strategic locations, and leasing the new homesteads to small farmers for an annual fee of five percent of the state's cost of buying and improving the land. The state would build roads, bridges, and other public works, in addition to canals, to make the rural communities attractive places to live. A lease system, Smythe hoped, would dramatically increase immigration into California by providing protection against the twin evils of land monopoly and speculation. The journalist also warned that federal officials might overlook California if the state had not revised its water laws prior to the inauguration of a national reclamation program.¹⁷

The Water and Forest Association's meeting of December 20, 1901, was sparsely attended. J. M. Wilson, Mead's chief lieutenant in California, reported: "Our report [Bulletin #100] seemed to please everybody very much and will I think be very satisfactory to all those who would like to see the reformation of the laws, but there are others who will probably not find it so satisfactory." The group agreed to appoint a special commission to draft a new water code and submit it to the legislature which would convene in January, 1903. The blue ribbon panel subsequently appointed included Mead; Frederick Haynes Newell of the Geological Survey's Hydrographic Branch; Judge John D. Works of Los Angeles, a lawyer experienced in water rights litigation and a former justice of the California Supreme Court; Presidents David Starr Jordan of Stanford and Benjamin Ide Wheeler of the University of California; Professors C. D. Marx of Stanford and Frank Soule of U.C., both prominent engineers; and Chief Justice of the California Supreme Court William H. Beatty. Beatty, who had little sympathy for reform, served as an ex-officio member; but Works, Jordan, Wheeler, Marx, and Soule had all been active members of the Water and Forest Association (whose membership numbered around 5,000 at the end of 1902). In March, 1902, the San Francisco Chronicle

editorialized: "All the members of the Commission, it is believed, wish that at the beginning of our irrigation development California had enacted such laws as are now in force in Wyoming. The problem which they have to deal with is what approach to that system we can now make with due regard to vested rights..."¹⁸

By October, 1902, the model water law was ready. Judge John Works drafted the legislation, which echoed the recommendations contained in Bulletin Number 100. The proposed law was not as "radical" as it might have been. Some members of the Water and Forest Association favored state ownership of all water and irrigation works. To appease them, Works included a provision allowing the state to buy up or condemn all private water rights even though no member of the code commission favored wholesale condemnation or purchase. The bill created a four member Board of Engineers whose members had to be hydraulic or civil engineers from different parts of the state. The board was responsible for granting future water rights, determining the amount of water needed to raise different crops under different conditions, scaling down inflated water claims, distributing the water supply to prevent waste and conflict, and adjudicating disputed claims. Moreover, on the appeal of 25 percent of those served by a private water company, the board could also set water rates. This provision reflected the common assumption that the county boards of supervisors did not have the expert knowledge needed to set rates and were too susceptible to political pressure from local water companies to make fair judgments. To facilitate the board's work, the law required all water companies to provide the state board with a detailed financial statement each year. The act specified that no new water rights would be granted until the board had completed a thorough inventory of the state's water supply and had compiled a full record of existing claims. Riparian owners and appropriators alike would receive only the water they needed, not the amount they claimed or even the amount they actually used. Limiting riparian rights to beneficial use was vital; otherwise, the state's surplus water supply could not be determined. Finally, the bill promised the federal government full use of the state's flood waters, and granted it the right to purchase or condemn any water rights needed to insure the success of an irrigation project. Thus, the "Works Bill" regulated virtually every step in the process of recording old claims, issuing new rights, doling out the state's water, and settling legal conflicts among irrigators. The bill did have two serious omissions. It failed to provide state control over municipal water supplies, and it completely ignored underground water.¹⁹

Intense criticism of the Works bill appeared almost immediately in southern California.

Critics, led by spokesmen for the region's water companies, irrigation districts, and chambers of commerce, charged that the bill violated the concept of "home rule" by giving the proposed Board of Engineers "unlimited" and "dictatorial" judicial as well as administrative powers. For example, though the law allowed water users to appeal board decisions in the courts, it did not require the board to provide claimants any hearing at all; the process of determining rights would be arbitrary. Moreover, some critics feared that the board's power to tamper with existing rights in the name of preventing waste would reopen water conflicts already settled by the courts. They also feared that losing control over the distribution of water to an expensive and "unresponsive" new bureaucracy based in Sacramento. How much would the army of water agents needed to administer the law cost? And if, as many suspected, the Works bill was designed to serve as the foundation for a comprehensive, state-controlled reservoir and canal system, the financial burden might increase dramatically in the future. The Riverside Daily Press recognized the most immediate threats to southern California irrigators when it warned against renewed litigation and editorialized: "We prefer to be are [sic] own judges of the amount of water our land needs. If Riverside, by her enterprise and her wealth, has acquired a good supply, as she has, that is no reason whi we should be called upon to 'divy' with some of our less fortunate neighbors. That is socialism gone to seed."²⁰

Canal companies, riparian owners, and other opponents of water law reform found strong allies in George Maxwell and, surprisingly, William Ellsworth Smythe. Maxwell argued that water law reform was "...nothing more than a proposition to defeat the whole national irrigation movement by interminable delays." In the late 1890s, Maxwell did everything possible to destroy California's irrigation districts. But in 1902 he became a champion of home rule:

In all matters relating to the adjudication of rights on streams and the division of the flow between irrigators, it has always seemed to me that it would be far from beneficial in many parts of California to create a State political machine at Sacramento, with power to appoint local officers throughout the State to distribute the water...Could not the desired result be reached in a much simpler way by some plan of local control and self-government on the part of the irrigators themselves? In other words, could not each stream or hydrographic basin, where it was desired by the irrigators, be organized into a local district for administrative purposes only, leaving it to the irrigators themselves to determine by vote as to whether such a system should be inaugurated?

In January, 1903, Maxwell wrote to Governor George Pardee explaining that "[a]s the laws of California now stand, the national government can come right in and build irrigation works to utilize any of the unused or unappropriated waters of the State...without in any way interfering with vested rights, or being involved in any complications with state officials or rights claimed by the State. Such complications would inevitably follow the inauguration

of such a system as that proposed by the Works Bill or any similar code of irrigation laws..." Congress had enacted the Newlands Act in June, 1902, but did not decide the extent to which federal reclamation would benefit private lands. As already noted, Mead and many members of the California Water and Forest Association's "state party" wanted to restrict federal reclamation to public lands. However, the West's largest railroads had subsidized Maxwell's National Irrigation Association, and they favored a more flexible policy to drive up the value of their own lands and insure that the largest possible area was reclaimed. Moreover, since California offered some of the best opportunities for reclamation--if private land could be included in the irrigation projects--Maxwell doubtless believed that the entire federal program's success depended on the Reclamation Service's efforts in California.²¹

Smythe's motivation is harder to understand because his thinking changed so abruptly. Lawrence B. Lee has suggested that the irrigation crusader's unsuccessful bid for a Congressional seat in the fall of 1903 left him deeply in debt and forced him to turn to the state's water companies for financial assistance. Certainly, he served as their unofficial spokesman during the debate over the Works bill.²² In any case, Smythe claimed that the proposed law was unsympathetic to federal reclamation; failed to establish public ownership of water; did not safeguard the principle of local control; and contained no provision for adjudicating disputes between holders of established rights. He claimed that the act ought to be called "an act for the protection and encouragement of private speculation in the Water supply of California."²³

Judge Works responded to Maxwell and Smythe's criticisms by noting that although he had drafted the bill, every member of the code commission had approved it. According to the judge, members of that group disagreed on only one major issue: whether the legislature had the constitutional power to determine the total acreage of riparian land in California and limit riparian owners to beneficial use. He traced all opposition to the bill back to private companies intent on preserving hard-won monopolies.²⁴

The death of the Works bill did not satisfy George Maxwell. He also wanted to kill the state appropriation earmarked for the Department of Agriculture to continue the Office of Irrigation Investigations's hydrographic work in California. Nevertheless, even though Maxwell enlisted the vast political power of the railroad in his struggle with Mead, Governor Pardee refused to approve any appropriation for joint study unless \$10,000 went to Mead's Office.²⁵

The defeat of the Works bill served as a reminder that the sectionalism which helped

block a state irrigation system and water law reform in the 1870s and 1880s still prevailed. Recognizing that opposition to the bill had been centered in southern California, several leaders in the Water and Forest Association proposed that the Works bill be redrawn to apply exclusively to that part of California north of the Tehachapis. However, a deep rift had appeared in the association.²⁶ Early in 1903, the organization's vice-president and former president, William Thomas, resigned in protest over the tactics used by Smythe, Maxwell and other members of the association to defeat the water bill. Thomas, and many other charter members of the association, believed that their conservation society had been taken over by the enemies of reform. Consequently, they banded together in May, 1903, and formed the Commonwealth Club of California. The group included many champions of water law reform including Thomas, Benjamin Ide Wheeler, James D. Phelan, and Governor George Pardee. It also included future governor Hiram Johnson. The club's organizer, Edward F. Adams, edited the San Francisco Chronicle and had fought hard for the Works bill in his columns. Adams hoped that the Commonwealth Club would represent the whole state; the Water and Forest Association's members had been drawn largely from northern California. Like most Progressives, he had deep faith in the rationality of man and assumed that people usually disagreed over issues out of ignorance rather than economic self-interest, personal rivalries, or other sordid motives. So the club's basic job was to gather "the facts." Individual sections collected information, compiled reports, and drafted bills for consideration by the entire club. Adams believed that the club's "impartial" data allowed it to propose much sounder legislation than could issue from the committees of the railroad-dominated legislature. During the first few years of its life, the Commonwealth Club tackled such hot Progressive issues as civil service reform, the California Penal system, the referendum, tax reform, and government regulation of railroads. Its meeting of November 9, 1904, considered the state's water laws.²⁷

William Thomas presented the keynote address at the November gathering. By this time, he realized that the legislature would reject any attempt to turn the determination and adjudication of water rights over to an administrative commission. Yet the Chief Justice of the California Supreme Court had complained specifically about "...the large and increasing class of cases arising from disputed water rights." So Thomas suggested that the state, as owner of unappropriated water, appoint a deputy attorney general to gather information on claims and file suit in the state's name to quiet titles stream by stream. Within watersheds already covered by court decrees, the state's action would be a formality. The Section on

Public Laws formally approved the plan, noting: "North of Fresno, in spite of innumerable law-suits, litigation has hardly begun. If nothing is done there will be far more litigation in the North than there ever was in the South."²⁸

Thomas's proposal failed to win the approval of the whole club because many southern California members feared reopening litigation under any circumstances and also because of the anticipated cost. Late in 1903, the club's members asked the Section on Public Laws to draft a comprehensive water bill. But soon after the committee began its work, the earthquake and fire of 1906 destroyed most of the club's records and diverted attention to the job of rebuilding San Francisco. For the next few years, the Commonwealth Club looked at municipal issues, including San Francisco's need for a larger water supply. Although the club added a conservation section in 1909, and actively discussed the future of the state's irrigation districts in 1911, it did not return to water law reform until 1912.

Meanwhile, federal reclamation had come to California. On June 17, 1902, Theodore Roosevelt signed the Newlands Act, and the new Reclamation Service quickly began to look for potential irrigation projects in the Golden State. California offered many attractions including a long growing season, rich soil, abundance of potential reservoir sites, well-developed transportation network, and plenty of engineers skilled at building water works. Moreover, a pattern of cooperation had already been established in the federal-state cooperative surveys undertaken by the Interior Department's Geological Survey Office and Agriculture's Forestry Service and Office of Irrigation Investigations in 1900 and after. Then, too, the Reclamation Service desperately wanted to maintain the political support of California's Congressional delegation, the largest in the West. This support depended on the amount of aid California received from the federal government.²⁹

Reclamation Bureau files at the National Archives contain thousands of appeals for projects from business and civic groups, as well as water user associations, scattered throughout the state.³⁰ However, the Reclamation Service had a hard time finding feasible projects. For example, though the vast Los Angeles Basin offered a marvellous climate, the San Gabriel and San Bernardino Mountains provided few canyons suitable for reservoir sites, and there was a completely inadequate surface water supply. At least two-thirds of the basin's orchards depended on underground water for irrigation in 1902. The Reclamation Service and U.S. Geological Survey carefully examined underground water sources within the region, but could do little to augment the supply.³¹ On the other hand, the Sacramento Valley offered an abundant water supply and plenty of good reservoir sites, but most streams emptied into the Sacramento River, a navigable stream under the jurisdiction of the Army

Corps of Engineers. Reservoirs in the Sacramento Valley might affect navigation and touch off a battle with the politically powerful, well-entrenched Army agency.³² The Owens Valley, in the eastern Sierra, offered 60,000 acres of irrigable public land and an excellent reservoir site. However, the valley was 4,000 feet above sea level, the cold climate restricted the growing season, and the soil was heavily alkaline. Owens Valley farmers could be expected to raise only low value forage crops, as they had in the past. In addition, many landowners refused to cooperate with the Reclamation Service because they did not stand to benefit directly from a federal irrigation project.³³

In October, 1903, a Reclamation Service board of engineers recommended that the most practical irrigation projects from an engineering standpoint were at Clear Lake, in the Coast Range 100 miles north of San Francisco; on the Kings River near Fresno; and on the Colorado River at Yuma, just north of the U.S.-Mexico border. However, it warned: "As measured by the ease with which agreement could be entered into with irrigators in dealing with the land and water question, the order is just reversed."³⁴ About half of California remained part of the public domain, but most of that land was in the Mojave or Colorado deserts, or in the virtually inaccessible northeastern corner of the state. In 1902, the Reclamation Service's first director, Frederick Haynes Newell, recognized that federal projects in California "...will primarily benefit lands in private ownership."³⁵

The fate of the Clear Lake and Kings River schemes illustrated many of the obstacles faced by the Reclamation Service in California and the entire arid West. After Lake Tahoe-- which the Service expected to acquire for its Truckee-Carson Project in western Nevada-- Clear Lake was the largest natural storage reservoir in the state. It covered 40,000 acres, and J.B. Lippincott, the Reclamation Service's chief officer in California, predicted that a dam at the lake's outlet to Cache Creek could raise the water level six feet, providing a supply adequate to irrigate 250,000 acres. The Geological Survey had already discussed such a project in its Water Supply and Irrigation Paper Number 45. Because the project would utilize a natural storage reservoir, the cost would be much lower than most reclamation projects in California, about \$500,000. Then, too, the Service needed at least a few projects in the West which provided quick returns to farmers. Its political support could disappear overnight if construction took too long.

Most of all, the Reclamation Service hoped to win a monopoly over the lake's water, and no other site in California offered such an opportunity. In March, 1878, the California legislature designated Clear Lake as a navigable body of water. Morris Bien, the Reclamation

Service's chief legal officer suggested "...the legislature regarded this body of water as subject to its own control, and not open to use or occupation by private parties, as in the case of non-navigable bodies of water." In 1904, California Attorney General U.S. Webb concurred with this interpretation. He reasoned that since the lake was navigable, and its navigability might be affected by diversions from the lake or Cache Creek, water users could claim water only with the express approval of the legislature. In effect, state laws regulating the acquisition of water rights did not apply. Hence, in theory the state could give the nation all the water in the lake, or at least that which had not been claimed and put to beneficial use prior to 1878.

The superb soil and 17 inches of average annual rainfall enjoyed in the Clear Lake region, added to the attractions already mentioned, put it at the top of the list. However, in the opening years of the century, a group of investors had spent \$100,000 to acquire water rights on Cache Creek and another \$14,000 to buy land at the outlet of the lake. Moreover, they had built 25 miles of canal in the expectation of selling 16,000 acres or more to farmers. In October, 1903, Lippincott noted: "It was suggested that they submit a proposition to us, based on the guaranteeing to them of a water supply for their lands as a recognition of their existing rights, leaving the project to us for complete development. They decline to deal with us on any basis." Later, the irrigation promoters offered to sell out to the government for \$1,500,000, and even under intense pressure from California Governor George Pardee, they refused to drop their price below \$750,000. The payment of such an exorbitant price would have encouraged other land speculators who were busy buying up land at the lake in the hope they could sell to the government at a fat profit. In addition, the Reclamation Service had only \$2,000,000 to spend on its projects in California in 1904. Had it paid the price, little money would have been left for other work in the Golden State.³⁶

The Reclamation Service might have tried to force the issue by having the water rights of these developers invalidated in the courts. But the courts moved slowly, and the contest might have seriously injured the Reclamation Service's image. Already, critics of federal reclamation grumbled that the initial projects contained mainly private land--which they thought violated the spirit of the Newlands Act. A decision to force federal reclamation on private landowners would have compounded the problem. Moreover, given the "state party" influence in the legislature, the lawmakers might well have approved a water grant to the developers. In any case, the federal government stood both to gain and lose from supporting state control over Clear Lake.³⁷

The Reclamation Service also encountered recalcitrant water users on the Kings River. As a Clear Lake, the Geological Survey had already surveyed storage sites along the river and published its findings in Water Supply and Irrigation Paper Number 58. J. B. Lippincott had conducted the survey and estimated that a reservoir in Clarks Valley could store 217,196 acre feet of water, at an average cost of \$10.15 per acre foot, and a reservoir at Pine Flat could store an additional 78,197 acre feet. Lippincott found the appeal of integrating the half dozen major canal companies, and dozens of smaller ditches, overpowering. Here was an opportunity to promote efficiency and eliminate conflicts among water users. Even though all the land around Fresno had long since passed into private ownership, the town served as the "raisin capital" of the San Joaquin Valley, and irrigated crops from that region returned much more per acre than land in the Cache Creek Valley, where wheat remained the dominant crop. Moreover, in 1900 a majority of water users on the Kings River had organized the Kings River Storage Association. They had several motives. First, they wanted a federally-financed dam. Farmers along the Kings River usually had an adequate supply of water for irrigation in May and June, but not during the summer or fall. Moreover, after years of litigation, most of the major private water companies had buried the hatchet. In 1897 the Fresno Canal and Irrigation Company, People Ditch Company, Last Chance Water Ditch Company, and Lemoore Canal and Irrigation Company signed a voluntary agreement allocating water between the four companies. Subsequently, several mutual water companies also joined the agreement. At least in theory, many water users agreed that the \$40,000 average annual expenditure for litigation spent fighting over the normal flow of the river could be spent building dams to store flood water to augment the supply. A new supply of water would reduce conflict, at least if the recipients could agree how to apportion it.

Apparently, J. B. Lippincott won the support of L. A. Nares of Liverpool, who managed the Fresno Canal Company and Consolidated Canal Company for the English capitalists who owned the ditches; Frank Short who owned or managed the 60,000 acre Laguna de Tache ranch, which included extensive riparian rights; and the Alta Irrigation District, whose water supply had been cut off by the courts every year on July 1. However, while these interests wanted reservoirs and a coordinated irrigation system, they balked at repaying the government or turning their water rights over to the Reclamation Service. To make matters worse, Newell heard a rumor that Lippincott was speculating in land near the river. The Reclamation Service's chief discounted the charge. Nevertheless, he wrote to Lippincott on November 27, 1903:

...the more I consider the matter the less desirable it seems to me it is for us to go into the King [sic] River country at present, or until we have reclaimed public land somewhere in California. We are the subject of scrutiny and attack from various sources [nationally] and the most serious charge which can or may be made against us is that we are diverting the work from the reclamation of public land to assist speculators in disposing of their holdings. For the present at least we must be extremely cautious not to take up enterprises which give any foundation for this charge. In all of the other States public land reclamation is under consideration although the area of public land may not be very large. Even in Arizona [the Salt River Project] we have reserved large areas of public land around Phoenix and are in a position to reclaim this if water is not taken by owners of small tracts. In the case of King River, there is no public land to reclaim... There has been no popular movement to induce us to take up work and if we begin operations here it will be charged that we have been induced to do so by the speculative element. In short, the men who are clamoring for examination and construction of works in the part of California where there are public lands, will make it extremely uncomfortable for us and perhaps destructive if we voluntarily neglect them and take up the work on King River. In fact I do not think we could recommend this to the Secretary of the Interior in the face of the strong opposition and statement that we are interfering with private enterprise.

Ten days later Newell reminded Lippincott that 1904 was an election year and that the enemies of federal reclamation would exploit any opportunity to discredit the Roosevelt Administration's policies. The Reclamation Service's director reported an "active, persistent and definite" popular, as opposed to corporate, demand for federal reclamation in the Honey Lake Basin. However, Lippincott quickly responded that the public land left in the valley was of poor quality, located too far from existing or potential canal lines.³⁸

The Reclamation Service refused to give up on the San Joaquin Valley, even in the absence of attractive projects. An engineering board investigated 7,880 square miles of land from Bakersfield to Madera County, north of Fresno, in the fall of 1905. This tract still contained scattered blocks of government land, though they were far removed from surface water sources. The board which included Newell's second-in-command, Arthur P. Davis, reported: "Within this area it is found that the amount of underground water, which lies near the surface, and is available for irrigation purposes is enormous and that its value is but little recognized." Cheap power was needed to raise the water to the surface, so the board recommended putting the entire Tuolumne River watershed permanently off-limits to private developers. But the plan ran into two snags. By the end of 1905, most of the reclamation money earmarked for California had been spent or committed; there was no money to build hydroelectric plants. In addition, Newell hesitated to reserve such a large watershed. Throughout the West, private developers claimed that the Reclamation Service had blocked legitimate projects by reserving land and reservoir sites it could not put to

immediate use. Newell treated many of his western critics with thinly veiled contempt, but he was more cautious in California. Other states, such as Nevada, had a much greater need for federal reclamation and a small delegation to Congress; the howls of critics there were not likely to undermine the federal program. The board's recommendations went unheeded.²⁹

Elimination of the Clear Lake and Kings River projects in 1903 and early 1904 left the Reclamation Service with only one major irrigation project. Vast tracts of rich, alluvial soil bordered the Colorado River in California and Arizona, and most of it still belonged to the nation. Because frosts and freezes rarely hampered agriculture in the warm, dry desert climate, farmers could raise abundant crops year round; pioneer irrigators around Blythe and Needles boasted of five or six alfalfa crops a year and wheat harvests of 60 bushels an acre. The Colorado contained an abundant water supply and also offered many potential reservoir sites upstream. Residents along the river seemed eager to cooperate with the Reclamation Service, whose officials hoped that a mining boom in Arizona would create ready markets for farm products raised on any federal project. J. B. Lippincott crowed: "...here is an opportunity to 'Build the State.' Here is a sleeping empire at our doors awaiting the touch of some Siegfried to awaken it."³⁰

The most important attraction, at least to Lippincott, was the 500,000 acres of land in the Imperial Valley. The Colorado River Basin offered plenty of good public land, but most of it was too far above the level of the stream to irrigate using gravity-fed canals even with the help of diversion dams to raise the water. The expense of pumping water onto the "bench lands," given the primitive pump systems available in the early years of the 20th century, would have sharply increased the cost of reclamation borne by individual farmers. Reclamation Service officials knew that they could lure potential settlers onto government land only by promising relatively inexpensive reclamation works. Since the Imperial Valley was below the level of the river and contained many thousands of acres of government land, it offered a way of expanding the project and, conceivably, reducing its per acre cost. The valley had been opened to irrigation in June, 1901, by the California Development Company. By 1904, the company provided water to 70,000 acres. However, its canal followed an old flood channel through Mexico before it reentered the United States and began to fill with silt. Farmers began to grumble that they were receiving less water than promised. Lippincott reported to Governor George Pardee:

The farmers at that locality [in the Imperial Valley] informed me that their losses, due to insufficient water supply, this spring will aggregate \$600,000. This is because the canals are not adequate to carry the water. Water rights have been sold for 271,000 acres of land in California, and

the capacity of the canal is not sufficient in my judgment for the irrigation of more than say 60,000 or 70,000 acres. In addition to this I understand the Company has numerous contracts in Mexico [to provide water to private lands]. We are keeping our hands off the situation, but I think something will break down there pretty soon and when the break comes we hope to be in a position to stand in the breach.

Lippincott acknowledged that an "All-American Canal" directly from the Colorado River into the valley would reduce the flow of water into Mexico and might precipitate international conflict. Nevertheless, he urged that "...we certainly should not give up a very large amount to them."¹

Despite Lippincott's enthusiasm for building the Colorado River Project around the Imperial Valley, other Reclamation Service officials, including A.P. Davis and George Wisner, opposed his recommendation. Norris Hundley has suggested that the Service backed off from buying out the California Development Company because the United States could not own property in Mexico. He also implies that the company, by opening a new stretch of canal through Mexico in May, 1904, increased the water flow into the Imperial Valley and reduced the dissatisfaction of the farmers themselves.² Even more important, Lippincott's critics thought that adding the Imperial Valley was "financially infeasible." The \$20 an acre cost of the All-American Canal, added to the debt incurred by purchasing the company's property, would have increased the cost of water to farmers. George Wisner commented:

It seems to me that the present is not the proper time for the Government to purchase the rights of the California Development Co. The Company claims that it has valuable assets in the way of lands and water rights and that if left alone they can successfully reclaim the lands of the Imperial Valley. They have expended a large amount of money to inaugurate this project, and should be given a fair opportunity to demonstrate what they can do. If they are successful they should be given the right to use such amount of water of the Colorado River as they actually put to beneficial use, and if they are not successful their property rights will assume their true value, and the Government may then be able to take up the project on such a financial basis as to render it a feasible project to undertake.

The massive flood of 1905-1907 destroyed the California Development Company's Imperial Valley empire, and led to renewed calls for an All-American Canal. However, the Reclamation Service was unable to raise the money to build the expensive aqueduct until 1928.³

Davis' opposition to Lippincott's All-American Canal may have been exacerbated by the earlier differences of judgment of the two engineers over reclamation along the Colorado River itself. Lippincott had pushed for building diversion canals as quickly as possible, even before a complete topographic map of the river basin had been completed. In March, 1903, he warned Newell that the Reclamation Service would face mounting public criticism unless it began work as soon as possible. He opposed the construction of large dams on the Colorado,

both because of the expense, and because the construction of dams would slow down other work. However, Davis took a more comprehensive view, arguing that the tremendous load of silt carried by the river could be turned to advantage. He proposed four dams along the lower Colorado, the first at the mouth of the Williams River above Parker, Arizona. This "high dam" would capture enough water to irrigate 400,000 acres and generate electricity besides. And as it filled with silt, thousands of acres behind the dam, particularly flood plains, alkali flats, and other low-lying areas, would gradually be reclaimed or "produced." After the silt destroyed the reservoir's storage capacity, water could be released from the dam's lower outlets exposing the new farmland. Meanwhile, the Reclamation Service would have constructed another dam further upstream. Eventually, Davis hoped that 1,200,000 acres could be reclaimed or created along the river at a cost of \$22,000,000.⁴⁴

Pending thorough surveys, the Reclamation Service initially withdrew from entry all the public land along the Colorado River from the Grand Canyon to the Mexican line. However, the Service's limited budget did not permit launching Davis' open-ended project and government engineers had great difficulty finding any suitable reservoir sites on the lower Colorado. There, the river's gradient was so small that the accumulated silt from 225,049 square miles of land upstream settled out. Engineers found the closest bedrock at Bulls-Head, thirty miles upstream from Needles, at a depth of 130 feet.

The Reclamation Service decided to build the first unit in the Colorado River Project at Yuma, on the California-Arizona border. Yuma was chosen for several reasons. The Southern Pacific Railroad ran through the town, providing the transportation needed to build the project and later carry crops to market. Moreover, a large majority of local farmers supported federal reclamation. Agricultural settlement around Yuma began in 1897, but the Colorado often flooded alluvial farmland and private ditch companies built poorly constructed, uncoordinated canals. Consequently, the irrigators formed the Yuma County Water Users Association in November, 1903, and appealed to the federal government for assistance. Equally important, the Yuma Indian Reservation offered thousands of acres of easily irrigable land in California adjoining the river.⁴⁵

In 1904, the Reclamation Service persuaded Congress to split up the Indian Reservation into five to ten acre irrigated plots. Apparently, Congress bought the allotment scheme as a way to undermine tribal landownership and promote "scientific" family farming, a policy consistent with the earlier Dawes Act. After allotment, the remaining land--about 16,000 acres in California--was thrown open to settlement under the Newlands Act. The Reclamation Service's motive was clear. The former Indian land constituted the largest block of public

land within the Yuma Project. The project contained 97,000 acres in 1906, only 27 percent of which belonged to the nation. Once Congress approved allotment, a board of engineers approved the project on April 8, 1904, and the Secretary of Interior promised \$3,000,000 to pay for construction on May 10th.⁴⁶

The project contained four major features: a settling dam, irrigation canals for both California and Arizona, flood control levees, and drainage ditches to prevent the build-up of alkali and remove seepage water which collected behind the levees. The Laguna Dam, constructed twelve miles upstream from Yuma, served as the capstone of the project. It was erected at a site where low granite hills came nearly to the edge of the river, offering substantial abutments. But these, in themselves, were not sufficient to anchor the dam. Its design repeated many of the features of the British "floating dams" on the Ganges and Nile rivers; the 600,000 ton weight of the structure helped keep it in place even though it could not be anchored to bed-rock. The 226 foot wide, nineteen foot high dam was not designed primarily to store water; instead, it provided a ten mile long settling basin. The headgates could be raised to "skim off" the upper foot of water from the river into canals, leaving the silt behind. At the base of the dam, sluice-gates provided a way to flush the dam of debris as it accumulated. Initially, the Reclamation Service predicted that the cost of reclaiming land within the Yuma Project would average about \$35 an acre.⁴⁷

Unfortunately, like most other federal reclamation schemes, the Yuma Project failed to live up to expectations. The Reclamation Service suffered from a "love-hate," or perhaps "dependence-avoidance," relationship with private landowners and ditch companies. It faced a staggering dilemma: federal reclamation had been sold to Congress largely as a plan to provide homes for landless urban workers, tenant farmers, and other disgruntled residents of the humid East; but these people lacked the experience to build successful desert irrigation projects. Even though Newell and his lieutenants stubbornly, and foolishly, refused to exploit the skills and experience of the Department of Agriculture, they did appreciate the need for experienced, seasoned, well-established farmers to insure the stability of projects and help teach and "acclimate" new settlers. Nevertheless, established farmers, whose water rights frequently antedated the Newlands Act by many years, often perceived national reclamation as a threat rather than opportunity. They expected some "compensation" for forfeiting the advantage time had given them to enter a repayment contract with the federal government. Invariably, Reclamation Service officials promised established water users a water supply equal to that which they had enjoyed in the past. In some cases they promised even more

water, and invariably they promised more reliable canals that were cheaper to maintain. But many established farmers joined up for an even more immediate reason: to make money selling land to new settlers.

Ironically, the Newlands Act's famous 160 acre limitation encouraged land speculation. Of course, the law did not require farmers to divest themselves of all land over 160 acres immediately, nor at all if they were satisfied to leave the excess holdings unirrigated. Sadly enough, the law did not provide any procedure to regulate the disposal of "surplus" land. Since 1903, the process has varied from time to time and place to place; but everywhere large farmers have played important roles in determining policy. To compound the problem, speculation was not confined to "large" landowners. In most projects, the 160 acre limitation was a moot restriction, because the Secretary of the Interior could restrict the size of farms within project boundaries to as little as forty acres; on the Yuma Project, farms varied in size from 50 to 100 acres, depending on the location and quality of land. This limitation was designed to promote intensive farming and community life, as well as reduce the cost of construction by reducing the length of canals. However this sop to scientific farming, encouraged even more speculation, and Reclamation Service officials often winked at outrageously inflated land prices within projects, especially during the boom of World War I. Such was the price of acquiescence. By 1907, the Reclamation Service had signed up 91 percent of the private landowners within the Yuma Project.⁴⁸

By the end of the same year, the Reclamation Service had also bought out four or five major canal companies within project boundaries. And here again, its need to pacify local vested interests left a legacy of suspicion among new settlers. The Service paid considerably more than canal systems were worth to avoid an ugly condemnation suit. As mentioned earlier in many parts of the arid West, private companies persistently assaulted the Reclamation Service as arbitrary and capricious in its treatment of vested rights. The nation had the power to condemn all property necessary to build irrigation projects, but the Newlands Act failed to provide a legal process to speed up the resolution of such frequently ugly, interminable suits. Moreover, the cost of litigation swelled the debt of farmers as did the cost of "accommodation" out of court. Usually the Service favored the latter alternative to protect its reputation and speed up construction. But such arrangements angered many farmers. Not surprisingly, by 1909--when the Laguna Dam was finished--the per acre cost of reclamation within the Yuma Project had ballooned from \$35 to \$55 an acre. Two years later, it reached \$65 an acre.⁴⁹

Such problems simply scratched the surface. For example, the Colorado River had not been systematically measured during the 1890s, a wet decade save for its closing years. In its enthusiasm and inexperience, the Reclamation Service overestimated the water supply for irrigation and underestimated the thirstiness of desert soils. This error was particularly dangerous, however understandable, on the lower Colorado where many farmers practiced irrigation year round. In 1912, the Service reported that from 1902 to 1911, the stream's flow varied from a maximum of 25,900,000 acre-feet to a minimum of 7,960,000 a.f. with a mean of 16,500,000 a.f. This was much less water than anticipated, and the erratic flow underscored the need for storage which A. P. Davis had perceived from the beginning. Without upstream storage, which the Reclamation Service began to search for once again in 1914, no new Colorado River units were possible.⁵³

As of June 30, 1912, the Yuma Project was listed as being 73.7 percent complete, but only 10,500 acres were under cultivation. Much of this land had been irrigated in 1902, and instead of high-value citrus crops, farmers raised mainly alfalfa, and occasionally barley or corn. Canals silted up much faster than expected, and drainage ditches did not effectively solve the problem of alkali build-up in the ground water and topsoil. Both problems added to the expenses faced by settlers. The Reclamation Service continued to dazzle the nation with its technological ingenuity. On the Yuma Project a 930 foot long inverted siphon carried water under the Gila River into the Yuma Valley. But this work could not hide the rate at which settlers were abandoning their land. As mentioned earlier, virtually all the land in California had belonged to the Yuma Indian Reservation, where 173 farms had been opened to settlers beginning in March, 1910. Of these, 68 had been forfeited in 1910; 17 in 1911; 10 in 1912; and 4 in 1913. When Franklin K. Lane became Secretary of the Interior in 1913, he appointed a special committee to survey conditions on the project. One member of the panel concluded:

The local water users on the Reservation Unit in the Yuma Project, some one hundred and seventy-five in number, have been deceived, mistreated and burdened to such an extent that unless relief is afforded they must abandon their farms and seek homes elsewhere. Large sums of money have been expended in the construction of an irrigation system, the Leguna [sic] Dam, the carrying and lateral systems, drainage system, which is a failure and the general physical condition of the works and the installation of the structures is evidence at the present time of the incapacity, wastefulness and improper administration of the affairs.

Since the purpose of such complaints was to reduce the debt of project farmers, many of these pleas exaggerated conditions on the Yuma Project. Moreover, many conditions, including the string of dry years from 1909 to 1911, were beyond the government's control. Still, the sheer number of complaints in Reclamation Bureau files help explain Lane's decision to

fire Frederick Haynes Newell in 1915. Fair or not, on the nation's irrigation projects, Newell and his lieutenants were portrayed frequently as heartless, bungling, petty tyrants, immune to the criticism of settlers.⁵¹

That southern California had been chosen as the home of the state's first federal reclamation project angered many northern Californians. The population of southern California was growing at a much faster rate than that of the northern section, and the Yuma Project offered one more inducement for immigrants to settle south of the Tehachapis. Politics dictated that the second project would belong to the north, and after considerable searching, the Reclamation Service found a potential project on the California-Oregon border. In its quest to find irrigable public land, the Service discovered that by draining Tule and Lower Klamath lakes, over 100,000 acres of prime farmland would be exposed. Nevertheless, the federal government faced a thorny legal problem. Though the lakes were navigable interstate bodies of water, and hence under federal jurisdiction, once drained the lake beds would belong to the states. Federal officials used gentle pressure to persuade Oregon and California to deed the land to the nation. For example, J. B. Lippincott advised California Governor George Pardee in September, 1904: "We feel very much inclined to vigorously push a large project for Northern California, and the adjustment of this matter with reference to these lake beds we consider a vital matter in the case."⁵³

The Klamath Project, as it came to be called, held many attractions besides a large block of public land. The Klamath River offered an abundant water supply, and many of the natural lakes in the region promised cheap storage facilities. Moreover, such an interstate project, where water stored in one state was used in another, raised legal issues private ditch companies could not solve; the nation could not be considered an "interloper." Finally, the scheme appealed to Reclamation Service engineers because it involved swamp land reclamation, and a measure of flood control, as well as irrigation.

As usual, before the nation could begin work, peace had to be made with established interests. As soon as word of the project leaked to the public, land speculators tried to file on the land under the Tule and Lower Klamath lakes in state land offices, but the Reclamation Service enlisted the aid of Governor Pardee to block these entries.⁵⁴ Most of the region's private ditch companies welcomed the opportunity to sell-out to the federal government, but the Klamath Canal Company proved more stubborn. This company had been formed in January, 1904, to construct a canal from Upper Klamath Lake to Tule Lake. It hoped to reclaim 60,000 acres and offered irrigators and potential irrigators water at \$10 an acre--a price which persuaded the owners of 20,000 acres to enter contracts with the

firm. As a matter of routine policy, the Reclamation Service had withdrawn all the public land, reservoir sites, and hydroelectric power sites in the region, but Lippincott urged Newell to use the Service's withdrawal power--and power to deny rights of way--to checkmate the company. Although the promoters of the venture promised to begin construction as soon as possible, Lippincott smelled speculation: "Personally I believe it is the same old proposition over again of a Civil Engineer seeing some natural opportunities, endeavoring to seize them, work them up into shape [,] and dispose of the proposition to some other outfit he may find who will build." The War and Justice departments supported the Reclamation Service's cause on grounds that the company's diversion from a navigable interstate body of water was illegal without federal approval. Neither Klamath nor Tule Lake was used extensively for transportation, but early in 1905 the Justice Department secured a temporary injunction blocking the use of Upper Klamath Lake for irrigation.⁵⁵

Originally, the Klamath Canal Company offered to sell its property and water rights to the federal government for \$250,000, but once the Justice Department filed suit to prevent diversions from Klamath Lake, the company cut its price, ultimately settling for \$150,000.⁵⁶ In the following year, the Reclamation Service spent another \$170,000 to purchase the property of the Jesse D. Carr Land & Livestock Company, which included an important reservoir site at the Clear Lake in Modoc County, just south of the California-Oregon border.⁵⁷

As approved in 1905, the Klamath Project contained 236,000 acres, and government engineers estimated the project's cost at \$4,500,000, or about \$18 an acre. Because the Reclamation Service had decided to use natural reservoirs at Clear Lake in California and Horsefly Lake in Oregon, the project promised the lowest per acre reclamation cost of any federal scheme. However, the Service decided that only about 50,000 acres under Lower Klamath and Tule lakes could be easily reclaimed, so the percentage of public land within the project shrank to about 23 percent by 1906. Not surprisingly, given cattle ranching's dominance in the region's economy, 40,000 acres within the proposed project were held in tracts larger than 160 acres.⁵⁸

As on the Yuma Project, the rate of settlement lagged behind expectations. Both projects were far removed from major urban markets; the Klamath Project was 451 miles from San Francisco and 443 miles from Portland. Moreover, while the Southern Pacific's rail line ran directly through Yuma, farmers on the Klamath Project were 36 miles or more from the Klamath Lake Railroad's closest station. The two projects also shared many other similarities including the need for extensive drainage ditches--which slowed the work of draining Lower

Klamath and Tule lakes. In 1916, when the Klamath Project was 62 percent complete, 30,123 acres of public land were open to settlement on the project, but only about 27,000 acres were under irrigation. Moreover, the number of project farms declined from 405 in 1912 to 352 in 1915, and the number of tenant farmers increased from 50 to 105 during the same period. As on the other federal projects, prosperity came only with World War I.⁵⁹

Forced to confine their efforts to remote sections of California, Reclamation Service officials hoped one day to begin a larger reclamation project which would win greater public recognition and political support. As mentioned earlier, in 1902 and 1903 the Sacramento Valley--especially Clear Lake--seemed a happy choice. The valley's rich soil largely eliminated the alkali and drainage problems suffered by farmers on the Yuma and Klamath projects. Moreover, the Sacramento River carried an enormous volume of water, and the rim of the valley contained many suitable reservoir sites. The U. S. Geological Survey had measured the stream's volume since 1896 at a station in Iron Canyon, above Red Bluff. Finally, the wheat industry's rapid decline made the valley a perfect laboratory to promote diversified agriculture. Irrigation would encourage crop rotation and help restore soil fertility. It would also boost the per acre economic return and help lure new settlers into the valley.

However, federal reclamation encountered a mixed reception in the Sacramento Valley. Many large landowners, such as Will S. Green, opposed federal efforts because of the 160 acre limitation and federal "limitations" on established water rights. (The Reclamation Service tried to put all project water rights on an equal footing; those who had irrigated their land for 20 years had no stronger claim than new settlers).⁶⁰ On the other hand, the valley also had its share of boosters eager to attract a federal project. The Sacramento Valley Development Association, formed in 1900 to arrest the flood of people out of the valley, pushed for a comprehensive \$40,000,000 Sacramento Valley Project as early as 1905. At the time, the entire Reclamation Fund contained only \$28,000,000, so the proposal had no chance of winning approval in Washington. Thereafter, the group cut back its expectations and pinned its hopes on the construction of a major reservoir at Iron Canyon.⁶¹

During the years from 1903 to 1906, the Reclamation Service contented itself with survey work in the Sacramento Valley. In cooperation with the U. S. Geological Survey, it set up stream measurement stations on the Sacramento River's major tributaries; prepared extensive topographic maps of the valley's west side; and inspected 24 potential reservoir sites, including Iron Canyon.⁶²

Apparently, the overall Sacramento Valley Project remained as Newell had outlined it in the Service's first annual report:

The general idea for the extension of irrigation in [the] Sacramento Valley is to ultimately construct a large diversion canal from the head of the valley down its western side. During high stages of [the] Sacramento River this canal would be supplied with water from the river itself, and during the low stages from numerous reservoirs in the Coast Range. The system would be operated in such a way that navigation of [the] Sacramento River would not be interfered with by irrigation diversions.

Of course, entrenched interests prevented the Reclamation Service from beginning the Sacramento Valley Project at Clear Lake, as originally intended.⁶³

In addition to the recalcitrance of entrenched interests, the Reclamation Service also faced formidable opposition from another federal agency, the much older Army Corps of Engineers. The Corps had participated informally in flood control planning in the Sacramento Valley since the 1870s, when the controversy over hydraulic mining debris emerged. Of course, the Corps also maintained the navigability of the Sacramento River. Soon after passage of the Newlands Act, the Corps' ranking officers in California warned the Reclamation Service that a flow of at least 10,000 second-feet of water would be needed to maintain shipping. The stream carried this amount only a few weeks a year, and the Reclamation Service bitterly complained that irrigation should take precedence over navigation during the summer months. Had the restriction been applied to private irrigation companies, the Reclamation Service might have swallowed it more easily. But the War Department made no protest against "illegal" diversions made through the canal originally constructed by Will Green's Central Irrigation District. The Corps had taken heavy fire from the California Miners Association and other groups which questioned the design of the debris restraining dams constructed by the Army on the Yuba River. J. B. Lippincott hoped that such protests might result in Congress transferring the responsibilities of the Corps to the Reclamation Service. On the other hand, the Corps doubtless wanted to embellish, or perhaps refurbish, its reputation in California by constructing reservoirs for irrigation in the Sacramento Valley. This would have dramatically expanded the Corps' responsibilities.⁶⁴

Both the Corps and the Reclamation Service acknowledged the value of reservoirs to impound water for irrigation, but they disagreed as to the effectiveness of reservoirs in flood control, which may explain why the Army did not lobby actively to expand its duties in California. Frederick H. Newell, who would serve the famous Inland Waterways Commission in 1907, recognized that watershed protection, flood control and irrigation were interrelated:

The two problems [of flood control and irrigation] are in fact one and inseparable. It is believed that it will be difficult to reclaim the Lower Sacramento Valley except by building storage reservoirs, to be operated in connection with levees, and in such way as to offer the greatest protection to the latter. The safety of the reclaimed areas can be further insured by protecting and extending the forested area near the headwaters of the streams. The investigations previously made on the Lower Sacramento Valley [by the Army Corps of Engineers and State of California], having for their purpose the reclaiming of the flood basins, have been confined to the problems of channel enlargement and levee protection, the great object being to pass the flood flow to tide water without utilization.⁶⁵

Newell and Lippincott both believed that construction of the major reservoirs surveyed by the Reclamation Service would eliminate flooding in the valley. For example, Lippincott remarked that a dam at Iron Canyon would reduce the Sacramento River's "flood wave" by 50 percent.⁶⁶ The Corps denied that reservoirs could provide significant protection against floods.⁶⁷

Even though the Yuma and Klamath projects took economic precedence, Lippincott urged that construction begin as soon as possible on a small Sacramento Valley irrigation project. In April, 1906, he wrote Newell: "The Sacramento Valley offers the greatest opportunity for irrigation development at the least cost, and with the least complications of anything that I am familiar with in the State..."⁶⁸ By the summer of 1906, Newell approved construction of a very small project at Orland, twenty-five miles west of Chico, if the cost could be kept under \$1,000,000. He noted: "By [building a small unit] it may be practicable to secure an allotment for work wholly within the State of California and to keep with us the sentiment of the people in the Sacramento Valley."⁶⁹ Just as the Reclamation Service considered the Yuma Project as the first step toward comprehensive development of the Colorado River, the Orland Project was expected to herald full development of the Sacramento.

The Orland Project included 14,000 acres of land, less than one percent of the Sacramento Valley's irrigable land. All was held in private ownership and impoverished from years of ruthless wheat and barley farming. The Irrigation Age clearly perceived the Reclamation Service's objectives: "When... these ten thousand acres now producing a small amount of wheat shall become highly productive, when oranges and lemons and walnuts and almonds are being shipped from this small area by the hundreds of car loads, when the land shall have increased in value from less than \$10 to many hundreds of dollars per acre, then it is hoped that the large landowners will consider it to their benefit to encourage similar work elsewhere."⁷⁰

The Orland Project did not divert water directly from the Sacramento River. Instead, it drew its supply from a large, relatively untapped tributary, Stony Creek, and constructed

cheap storage at the East Park Reservoir, 40 miles southwest of Orland. Orland was also attractive because its water users association eagerly assisted the Reclamation Service in persuading landowners to sell off their excess holdings and sign repayment contracts; project farms were restricted to 40 acres. The association also helped arrange amicable negotiations by which several small ditch and power companies sold their property to the nation.⁷¹

The Reclamation Service completed the East Park Reservoir in June, 1911, and one year later the Orland Project was 84 percent complete. The Reclamation Service enjoyed some success on the project. For example, in 1915 the average irrigated project farm contained only 25 acres and the average farm 44 acres--some landowners persistently refused to break up their estates or utilize irrigation. Clearly, diversified agriculture had not yet arrived in the Sacramento Valley. Well over three-fourths of the project land produced alfalfa, and dairying quickly became the project's basic industry. In 1915, only ninety acres were planted to almonds, eighty-eight to deciduous fruit, and eighty-seven to citrus fruit. The value of crops per acre was very low, only \$26.99. This sum soared to \$71.90 during World War I, but the value of crops still remained considerably less than on most federal projects. Moreover, land speculation posed a problem as it had on the Yuma and Klamath projects. One "professional" speculator later estimated that 75 percent of the project's early residents joined the game. He purchased project land for \$10 an acre, sold it for \$40, bought it back at \$75 an acre, and resold it for \$125 an acre. "Everyone was happy along the line. Everybody made money." Nevertheless, high land prices slowed down the rate of settlement on the Orland Project.⁷²

Federal reclamation in California quickly fell under a cloud of disappointment and disillusionment. By World War I, less than 100,000 acres in the state had been opened to irrigation by the federal program, and much of that land had been farmed before 1902. Not until 1935, when the Reclamation Bureau assumed responsibility for building the massive Central Valley Project, did that agency play a significant role in California's agricultural development. Federal reclamation in California failed for many reasons already noted including the absence of public land; the isolation of projects from prime markets; soaring prices of farms due to land speculation; drainage problems which dramatically increased farmers debt to the nation; and the Reclamation Service's preoccupation with constructing dams, tunnels, and canals, to the detriment of the needs of the farmers and communities the irrigation works sustained. Yet the result of the failure was more significant than the failure itself. By 1910, virtually none of California's legion of irrigation boosters expected the federal government to pay for dams and canals. And since private ditch companies had proven to be

disastrous investments, state reclamation--and the irrigation district--won new life.

As mentioned in the last chapter, only a handful of California's irrigation districts survived the 1890s. William Ellsworth Smythe suggested that the district form could be revived and made workable if a competent state engineer or board passed judgement on district bonds:

{The state} could sell its own bonds readily a 3 per cent interest, depositing in its treasury the 5 per cent bonds of the district and making the difference in interest pay all the expenses of administration. It would then be no longer necessary for the district financial agents to hawk their securities in the money markets of the world, selling them at all sorts of prices or exchanging them with contractors for doubtful consideration....The State would risk nothing in the operation; the districts would gain everything. The burden of taxation would rest where it belongs--on those who are to receive the benefits. There would be no weary waiting of years for State or Federal schemes to materialize and to reach those remote neighborhoods which have fewer citizens and fewer outside friends. There would be no more heart-breaking private enterprises dealing with undertakings beyond their grasp.

Of course, many critics of the district form of organization bitterly opposed the state underwriting bonds because they feared that district residents would be heavily taxed to pay off badly depreciated bonds at par and that such a policy would stimulate the growth of new speculative irrigation schemes. Moreover, Article IV, Section 31 of the state constitution specifically prohibited any state financial aid to "local government," and most state officials thought that the irrigation district constituted an institution of government.⁷³

At the urging of Governor George Pardee, Smythe proposed a second way to revive the irrigation district in November, 1904, at the irrigation congress meeting in El Paso. He suggested that the Reclamation Service investigate and certify proposed new irrigation districts and build the works. District bond issues would pay for construction, but the Secretary of the Interior would supervise the issuance and sale of bonds. When the irrigation system had been completed, control would pass to local landowners. The proposal won considerable support from officials in the Reclamation Service because the Reclamation Fund had already been committed and little money remained available to pay for completely new projects. However, A. P. Davis noted that the Reclamation Service could not enter cooperative agreements with the residents of proposed irrigation districts without specific authorization from Congress. That authorization never came, and Smythe's idea won little support in California.⁷⁴

Effective legal reform finally came in 1911 and 1913. In 1909, the South San Joaquin and Oakdale irrigation districts were formed in San Joaquin County, the first new districts organized since 1895. District boosters recognized that something had to be done to win the confidence and support of investors, and they hired L. L. Dennett, a prominent Modesto

attorney, to propose bills to the 1911 legislature. Dennitt's major contribution was a law requiring the "certification" of district bonds by the State Controller. Before the bonds won the stamp of state approval, the entire project had to be investigated and approved by a bond commission consisting of the State Superintendent of Banks, the Attorney General, and the State Engineer. The commission was responsible for considering the district's water supply, soil, drainage conditions, the quality of proposed irrigation works, cost of condemned property and water rights, and many other elements which influenced the success of individual districts.⁷⁵

By 1911, increasing crop prices, the decline of the wheat industry, and an upswing in immigration into the state, prompted a flurry of new interest in irrigation districts. For example, in 1911 the Imperial Irrigation District was organized in the Imperial Valley; it contained 523,000 acres and constituted the largest district ever formed in the state. In November of the same year, Governor Hiram Johnson sponsored a convention at Stockton to discuss new district legislation, and in the same month the Commonwealth Club offered its suggestions for reform.⁷⁶

The suggestions offered by these two groups and others bore fruit when the 1913 legislature met. One new law spelled out in greater detail the points the bond commission should consider in its surveys of district financial affairs, and required the commission to survey new districts before any local bond election could be held. The same law limited the bond issues of new districts to 60 percent of the value of district lands. The commission did not have the power to block the issuance of bonds, but a negative report guaranteed the defeat of any bond issue election because district voters recognized that investors would not purchase securities deemed a bad risk by the state.⁷⁷ The 1913 legislature also enacted a law requiring the state engineer to investigate all potential districts prior to formal organization. If for any reason he filed an adverse report, then the district could be formed only with the approval of 75 percent of the district's voters. However, only one district in the Mojave Desert was organized against the state engineer's advice.⁷⁸

The expansion of state control over irrigation districts coincided with a successful attempt to reform California's water laws.⁷⁹ Franklin Hichborn, a close student of the California legislature during the Progressive years, claimed that the California Water and Forest Association's model code of 1902-1903 (the "Works Bill") was reintroduced in 1905 and 1909.⁸⁰ If it was, the bill failed to reach the floor of the legislature and attracted no public attention. Nevertheless, few Californians versed in the law denied the need for reform.

even though they differed as to the shape it should take. State laws failed to define riparian rights, failed to protect bona fide water users against the extortion of speculators, failed to provide or settle water disputes quickly and cheaply, and failed to provide clear title to water stored in reservoirs.⁶¹

By 1911, several circumstances contributed to a renewed interest in water law reform. A new water code would spur the revival of irrigation districts. It might also prevent fledgling hydroelectric power companies from claiming the state's remaining water supply to the exclusion of future irrigators. Perhaps most important, an increasing number of Progressive conservationists deeply feared the monopolization of natural resources by "the special interests" and hoped to promote the efficient use of those resources under the supervision of disinterested experts and special commissions. They looked to the state as guardian of the people's patrimony, and they found a willing champion in Governor Hiram Johnson, who assumed office in January, 1911. In his inaugural address, Johnson noted:

The great natural wealth of water in this State has been permitted, under our existing laws and lack of system to be misappropriated and to be held to the great disadvantage of its economical development. The present laws in this respect should be amended. If it can be demonstrated that claims are wrongfully or illegally held, those claims should revert to the State. A rational and equitable code and method of procedure for water conservation and development should be adopted.

The threat to bring monopolists to bay squared with the Progressive desire to chastise the wicked and turn politics over to the "right men."⁶²

When the 1911 legislature convened, most of its Progressive members had had no more time to study water resource problems than the new governor. Hence, a comprehensive water bill was not proposed. However, the lawmakers did enact three important statutes drafted by a committee appointed by the Republican State Committee. The group included such notable Progressives as Francis J. Heney, William Kent, Chester Rowell, and George Pardee, who served as chairman. One law declared all water public property, and limited appropriations to generate electricity to 25 years. Only publicly owned utility companies, or irrigation districts which generated electricity for use wholly within their boundaries, were exempt. This law helped lay the foundation for state administrative control over water, though it built on the questionable assumption that the state could exercise control over water already appropriated as well as future claims.⁶²

In 1911, Progressives throughout the nation believed that monopolies exercised by electric companies posed a great danger to the economic health and future prosperity of the United States. Electricity offered a cheap, clean, abundant energy source, if private power

companies could be regulated effectively. The second California law required hydroelectric companies to file extensive formal applications to appropriate water with a five-member "board of control," which included both the governor and state engineer. Power companies were also required to file annual financial statements and full descriptions of all work conducted by the company during the previous year. The statute allowed the state to charge for the water used to generate electricity, and the board could reject or scale-down applications deemed monopolistic or extravagant. It also required power companies to obtain permits to build dams, and power "combinations" which restrained trade--as determined either by the board of control or state attorney general--could be divested of their water rights in the courts. Finally, the act attempted to assert public control over all water previously claimed, but not put to beneficial use, by declaring that water "unappropriated." This represented the first statute to give the state explicit control over the acquisition of new water rights. However, the law did not provide for a full-time board of control, which limited the measure's effectiveness.⁸³

The most publicized of the three laws created a three-member state conservation commission and charged it with "...investigating and gathering data and information concerning the subjects of forestry, water, the use of water, water power, electricity, electrical or other power, mines and mining, mineral and other lands, dredging, reclamation and irrigation, and for the purpose of revising, systematizing and reforming the laws of this state... concerning...these said subjects." Johnson appointed ex-governor Pardee to head the commission. The other two members were Francis P. Cuttle, President of the Riverside Water Company and the California Orange Company, and Ralph Bull of Humboldt County. Bull resigned several weeks after his appointment, and J. P. Baumgartner, editor and manager of the Santa Ana Daily Register, Orange County's largest paper, took his place. Johnson wisely gave southern California heavy representation on the commission. Doubtless, he remembered the southern California's overwhelming opposition to the Works bill.⁸⁴

Much of the conservation commission's field work was done by Elwood Mead's old agency in the Department of Agriculture.⁸⁵ But the commission's staff also gathered data, including a comprehensive record of all claims to water used for power generation, stream by stream.⁸⁶ The commission devoted most of its attention to water law reform. And despite repeated warnings from Francis Cuttle, Pardee decided to try to push a bill through the legislature during a special session which met from September through December, 1911. Louis Glavis, the commission's notorious secretary, drafted the water bill in close consultation with Pardee,

and the legislation was introduced without a hearing before irrigators, power companies, conservation groups or other interested parties.⁸⁷

The bill was introduced on November 29th in the Assembly by William C. Clark of Alameda County. In a December 11th letter to Johnson, Pardee explained that the legislation had been designed to "recover" one-half to two-thirds of the state's water supply and:

...clear up and remove all fictitious and speculative filings on and appropriations of water and the use of water--of which there are, we know by actual investigation, something like 20,000 in this State--and give them back to the State, so that they may be reappropriated, under State control and supervision, only by those who will put them to a beneficial use, and not make and hold them in coldstorage for monopolistic and speculative purposes.

The bill created a state water commission to investigate and quiet water rights on the state's streams. The commission's decisions could be appealed in the superior courts. In many ways, the bill reinforced and expanded the laws enacted during the regular session at the beginning of the year. For example, the Clark bill repeated the 25 year limitation on power permits, though an amended version expanded the permit life to 50 years. The bill also authorized specific filing fees for water rights applicants, ranging from \$50 for irrigators to \$250 for power companies. But the Clark measure faced opposition even from reformers. Critics complained that such a bill should be introduced only after the conservation commission filed its formal report with the legislature in 1913. They also charged that no bill should be enacted which had not been exposed to public criticism; for this reason even the Commonwealth Club rejected the bill. Pardee and Glavis had made a bad decision. They wanted to move fast to restore water to public control and determine the state's supply of surplus water. In so doing, they made the conservation commission and state board of control-- Glavis held seats on both panels--seem arbitrary, capricious, and above public opinion.⁸⁸

Pardee felt betrayed by the legislature, and perhaps by Hiram Johnson, who had refused to support the Clark bill. Ironically, the governor had not been told about the bill until it had been introduced. Still, Pardee blamed "the interests" for its defeat:

Say what you will, this seems to be the situation to me: The power people are very willing to have any sort of legislation on the books that will not give anybody the machinery to take away from them the water appropriations they are not using. But when it comes to any legislation that will really enable the State to do any real conservation work, then the power people (not unaided and unabetted by some of the irrigation people this time) are not in favor of having anything done.

The ex-governor correctly perceived that a new interest group had entered the political arena since the defeat of the Works Bill, but he failed to own up to his own responsibility for the Clark Bill's failure.⁸⁹

had no alternative but to seek such a restriction.⁹¹

Hiram Johnson worked hard to pass the conservation commission's water bill; the governor made it the first of his "10 Commandments" to the 1913 legislature. Many of the state's leading newspapers, including the Sacramento Union, San Francisco Chronicle, and Los Angeles Times, opposed the legislation and on May 12, 1913, the Union described the battle over the proposed law "one of the bitterest fights of the session." The bill was amended four times in the lower house, defeated, then passed by one vote on reconsideration. The arm-twisting continued in the Senate as Johnson lined up support vote by vote among recalcitrant senators. In most sessions, such technical bills attracted little public attention. But on May 8th the Senate Judiciary Committee's chambers were jammed with spectators and reporters as that committee opened hearings on the bill. Later, the governor confided to Gifford Pinchot: "In the last Legislature the biggest fight I had was to pass this water bill, and I did it by the narrowest margin." Without Johnson's active assistance, the water bill would have suffered the same fate as earlier reform proposals.⁹²

As finally approved, the 1913 water code was much more modest than the Works or Clark bills. The most ambitious western water laws, such as those in Wyoming, gave state commissions, or a state engineer, the power to adjudicate water rights and distribute the water as well as regulate the acquisition of new rights. The conservation commission's law created a centralized record of claims, established clear administrative procedures for filing new claims, and sharply reduced the number of "paper rights." Moreover, it forcefully asserted state sovereignty over water, laying the foundation for a future expansion of state administrative control. After 10 years, all riparian rights would be limited to beneficial use, just as appropriative rights were. And after 20 years, any rights filed under the new law could be revoked by the state water commission if the state paid for property damages and the cost of distribution works. This step could be taken as an administrative action, without resort to the courts. The expansion of state authority could also be seen in the filing fees and annual charges demanded from new water users. Symbolically these fees reflected state sovereignty over water, though they also had the practical value of providing a measure of financial independence to the new water commission. It did not have to depend exclusively on legislative appropriations. The fees were also expected to help conserve water by reducing waste. Irrigators and power companies which paid for their water were more likely to use it efficiently.⁹³

Nevertheless, even the bill's supporters wondered if the new law would work. John M. Eshleman, Chairman of the State Railroad Commission, had worried that the charges for using

In the early months of 1912, the conservation commission revised the Clark Bill and held public hearings on the legislation. And by the time the 1913 legislature met, the commission had issued a 502-page survey of California's natural resources. Over half the report concerned water problems. The commission reiterated its call for a wholesale determination of water rights, and recommended that the state condemn and purchase all riparian rights. The proliferation of water rights filed by power companies made a full determination of rights doubly important. The commission estimated that California's streams could generate over 5,000,000 horsepower of electricity, more than 14 times the amount produced in 1912. The companies usually included the value of water rights in their capital value, and water rates reflected these bloated values even when the rights were not being used at the time. The report paid close attention to corporate attempts to "cold-storage" water to deprive other companies of its use, protect a supply for future expansion, or simply reap speculative profits. For example, the commission found that 90 percent of the water which had been claimed for power purposes in Plumas, Butte, Tehama, Stockton, Yuba, Sacramento, Yolo, Tuolumne, and Inyo counties had not been put to use within a reasonable period of time, as the law required. Instead, many companies kept their rights alive by doing a small amount of work, or by simply refileing claims from time to time. The 1911 law establishing the board of control had allowed the new commission to pass judgment on all new applications to use water for power. Unfortunately, it had not permitted the board to investigate and weed-out claims filed prior to 1911.⁹⁰

The water law which took shape in the spring of 1912 lacked some of its earliest trappings. For example, the conservation commission initially favored regulating underground water when it was diverted onto land not immediately adjoining the well. Those who irrigated land "riparian" to the well were exempt, and no permit would be granted if it interfered with these water users. In effect, such a provision would have extended the riparian doctrine to underground water. The commission quickly abandoned this provision because many southern Californians--whose section strongly depended on subterranean water--feared that specific grants of water by the state would promote litigation. Then, too, the commission worried that if the state legislature accepted the riparian doctrine as a tool to regulate underground water use as the courts had already done, it might be reluctant to restrict riparian rights on surface streams. Similarly, while originally the conservation commission favored the condemnation and purchase of riparian rights, by the summer of 1912 it considered such a policy infeasible. The cost would be staggering, and contested cases might take years to settle. Even though the commission doubted the legislature's power to limit such rights, it

water were too high and might induce power companies to burn coal to generate electricity. In addition, while Section 20 of the new law prohibited private power companies from counting their water rights as capital assets, he warned that the imposition of more than token water fees might reinforce the traditional view of water as private property held by the courts. Along with most friends of the measure, he doubted the constitutionality of the section limiting riparian rights.⁹⁴ Frank Adams, the federal Office of Irrigation Investigations chief representative in California and a prominent member of the Commonwealth Club argued that the conservation commission had paid too much attention to fighting monopoly and not enough to settling water conflicts. Adams began his career as one of Elwood Mead's assistants, and he never lost his sympathy for the "Wyoming System." On June 6, 1913, Adams wrote his boss in Washington, Samuel Fortier: "...those behind the measure have not cared to give very serious consideration to the means of accomplishing the things they seek. The detailed procedure which makes up the bulk of the water laws of other States is almost entirely omitted and the desire has been merely to establish the authority of the State and trust any Commission that might be appointed to act wisely." Adams recognized that the water commission lacked police powers. It could investigate water conflicts, hold hearings, and provide superior courts with "expert" information and testimony. But the courts were not bound to consult the commission or honor its findings; the water commission lacked the power to enforce court decrees, let alone its own decisions. Adams won a small victory when he persuaded Governor Pardee to add Section 37 to the law, which gave the state the power to supervise the distribution of water "...when such supervision does not contravene the authority vested in the judiciary of the state...." But the state could distribute water only when local water users requested its help. Adams also thought the law had been weakened by allowing municipalities to claim water without filing claims. No other state allowed such an exemption which had been included to win the approval of the legislative delegations from San Francisco and Los Angeles. Many lawmakers from the two cities railed against water power monopolies, but zealously defended municipal monopolies in the Tuolumne and Owens River watersheds.⁹⁵

On June 9, 1913, perhaps with the new water law still fresh in his mind, Hiram Johnson wrote to fellow-Progressive Meyer Lissner:

Communities will stand just so much reform legislation at one time, and wise is the man who intuitively has some conception of just how far he can go.... Indeed, our legislation has brought us to the very verge of disaster, and all over the state the attacks on us have had their effect.

In short, a weak water law was better than no law at all. Johnson, Adams, and Pardee alike

recognized that the success of the new statute depended on future amendments, and on the people appointed to the new water commission. The legislature had slashed the commission's appropriation from \$75,000 a year to \$25,000, so little money remained for investigation in the field. Pardee hoped the governor could stretch the meager fund by appointing competent commissioners willing to serve without salary.⁹⁶

The law was much too broad in scope, the problems it addressed too complex, and the interests it threatened too powerful for the measure to win unqualified success. But it posed enough of a challenge to the status quo that immediately following its adoption large power and irrigation companies launched a referendum campaign to block it.⁹⁷ The law weathered the storm and finally took effect at the end of 1914. Subsequently, the legislature both strengthened and weakened the law. For example, in 1917, it sharply reduced filing fees and virtually eliminated annual water user fees.⁹⁸ This did not destroy the principle of state sovereignty over water, but it made the water commission more financially dependent on the legislature. On the other hand, in the same year the lawmakers expanded the water commission's part in the process of adjudicating water rights.⁹⁹

The 1913 law failed to speed up litigation or reduce its cost, and it also failed to limit riparian rights. Nevertheless, it represented a substantial administrative reform which California historians have neglected. For example, George Mowry's classic, The California Progressives, devotes only a paragraph to water law reform, and Spencer Olin's study of Progressivism, California's Prodigal Sons, neglects the reform entirely, arguing that "[t]he high tide of reform in the areas of economics, politics and social welfare was not matched by similar advances in conservation and agriculture."¹⁰⁰ Both the irrigation district legislation and water laws enacted in 1911 and 1913 belie this interpretation. The expansion of state power over natural resources, the Progressive challenge to "the interests," the Progressive faith in experts and special commissions, and the Progressive belief in order and planning, all found expression in the quest to manage the state's water supply more effectively.

Ironically, as in earlier decades the fears of reformers were usually exaggerated; battles in the legislature did not fairly represent the state of California agriculture. Boosters of irrigation often suggested that the institution had reached its limit without new water laws to help stimulate investment and protect farmers from litigation. But the crusade to reform California's water laws had been prompted by many motives including the anti-monopoly sentiment of Progressive politicians; the engineer's quest for efficient use and administration of natural resources; the desire of northern California bankers and

boosters to see their section of the state outpace the rapid population growth of southern California; and the "greed" of investors who hoped new water laws could help revive dormant irrigation districts.

Despite its outmoded water laws, California grew and prospered during the first decade of the 20th century. The number of acres cropped in California increased little from the 1880s to the 1920s. But north of the Tehachapis, the number of farms dramatically increased with the break-up of wheat farms, and from 1900 to 1910, the greatest population gains occurred in heavily irrigated counties. For example, Stanislaus County had the biggest gain, 136.7 percent, largely because of the expansion of irrigation agriculture around Turlock and Modesto. Fresno County's population increased by 99.5 percent, Orange County's by 74.8 percent, Riverside County's by 93.9 percent, San Bernardino's by 103 percent, and Tulare's by 93.4 percent. On the other hand, the population of the Sacramento Valley increased by only 34 percent.¹⁰¹ Between 1900 and 1910, virtually every agricultural statistic spelled prosperity. The average per acre value of the state's farm land increased from \$21.87 to \$47.16. The number of irrigated farms increased from 25,675 to 39,352. Irrigated acreage increased from 1,446,114 acres to 2,664,104 acres, an 84 percent increase. The percentage of irrigated farms grew from 35.4 to 44.6 percent. The length of main ditches expanded from 5,106 to 12,599 miles, a 146.7 percent increase. And the total value of irrigation works increased from \$19,181,610 to \$72,445,669, and increase of 277.7 percent. Of the irrigated land, over 75 percent was in the San Joaquin Valley and southern California; the rich Sacramento Valley contained only eight percent of the state's irrigated acreage.

In 1900, 20 states ranked ahead of California in population, but by 1910, the state ranked twelfth. Southern California's growth continued to eclipse the northern part of the state. From 1900 to 1910, the San Francisco Bay counties increased by 40.6 percent while the counties south of the Tehachapis grew by 146.9 percent. Not only had the total population of the "cow counties" surpassed that of the Bay Area, but southern California's population exceeded that of the entire northern section if the population in the San Joaquin Valley was added to that of the six southernmost counties.¹⁰²

In the second decade of the 20th century, irrigation continued to expand at a rapid rate, particularly during World War I. Irrigated land increased from 2,664,104 acres to 4,219,040 acres. The second and third decades of the century belonged to the refurbished irrigation districts. From 1910 to 1920, the amount of land in irrigation districts increased by more than 400 percent, from 642,510 to 2,575,198 acres. At the same time, the capital invested in irrigation works swelled from \$72,445,669 to \$194,886,388. Nevertheless, the

precipitous fall of crop prices after the war posed an ominous warning that irrigation may have grown too fast. The total value of California's farm products nearly tripled from 1909 to 1919, increasing from \$224,981,000 to \$729,661,000. But by 1921, this figure had fallen back to \$471,748,000.¹⁰³

During the 1920s, irrigation came of age in California. Despite the often raised question of whether California needed to increase its agricultural production, the "irrigation lobby" continued to push for expansion. And since virtually all the smaller potential irrigation projects had already been developed by private enterprise, mutual water companies, and irrigation districts, most boosters looked to the state. Dreamers such as Robert Marshall joined practical hydraulic engineers such as Frank Adams in calling for a state water plan. By 1931, the principle of state-sponsored irrigation works championed by the Grangers nearly 60 years earlier had become reality.

NOTES

CHAPTER VI - THE STATE, THE NATION AND THE IRRIGATION CRUSADE, 1900-1917

1. One of the most recent examples of this point of view is G. Michael McCarthy, Hour of Trial: The Conservation Conflict in Colorado and the West, 1891-1907 (Norman, Oklahoma, 1977), p. 6 and passim. Some parts of this chapter were published in different form in Donald J. Pisani, "Water Law Reform in California, 1900-1913," Agricultural History, 54 (April 1980), 295-317.
2. Abstract of the Twelfth Census of the United States, 1900 (Washington, D. C., 1904), 35, 227, 234, 291; Twelfth Census of the United States, 1900, v. 1, (Washington, D.C., 1901), lxxxv.
3. William Thomas, "Necessity of Irrigation," in Transactions of the State Agricultural Society, 1900, Appendix to the Journals of the Senate and Assembly of the California Legislature, 35 sess., v. 3 (Sacramento, 1903), 85; Water and Forest commented on the 1900 census statistics in I (September 1900) 7. In 1900, California contained only two large irrigation reservoirs, the Sweetwater Dam in San Diego County and the Bear Valley Dam in San Bernardino County. Since most private water companies and irrigation districts were bankrupt, or on the verge of bankruptcy, the future of reclamation looked bleak. For a brief survey of the Water and Forest Association's early history see Forestry and Irrigation, 11 (August 1905), 364-367.
4. Report on Irrigation Investigations in California, U. S. Department of Agriculture Office of Experiment Stations Bulletin #100, S. Doc. 356, 57 Cong., 1 sess. (Washington, 1902), 22. Elwood Mead, a civil engineer by profession, became a leading expert on western water law by 1900. His office published many surveys of water rights conflicts including Water Rights on the Missouri River and its Tributaries, U.S.D.A. Office of Experiment Stations Bulletin #58 (Washington, 1899); Abstract of Laws for Acquiring Titles to Water from the Missouri River and its Tributaries with the Legal Forms in Use, Bulletin #60 (Washington, 1899); Water-Right Problems of the Bear River, Bulletin #70 (Washington, 1899); and Irrigation Laws of the Northwest Territories of Canada and Wyoming, Bulletin #96 (Washington, 1901). The best survey of Mead's career is J. R. Kluger's "Elwood Mead: Irrigation Engineer and Social Planner," Ph.D. diss., University of Arizona, 1970. Also see Paul K. Conkin, "The Vision of Elwood Mead," Agricultural History, 34 (April 1960), 88-97.
5. In 1893, the California legislature appropriated \$250,000 for river improvements on the condition that the federal government match that sum--which was done in 1896. This set the precedent for extensive cooperation in various water surveys conducted during the Progressive Era and after. See the Pacific Rural Press, 64 (August 30, 1902), 129. Also see Water and Forest, I (September 1900), 7 and November, 1900, pp. 4-5; George Davidson to F. H. Newell, April 10, 1900 in the George Davidson Collection, Bancroft Library, U. C. Berkeley; and Elwood Mead to A. C. True, November 18 and 23, 1899 in RG 8, Records of the Bureau of Agricultural Engineering; Irrigation Investigations Division, General Correspondence, 1898-1902. National Archives, Suitland, Maryland.
6. Annual Reports of the Department of Agriculture for the Fiscal Year Ended June 30, 1900 (Washington, D.C., 1900), 202.
7. Report of Irrigation Investigations in California, Bulletin #100, 18, 31-32, 34.
8. Report of Irrigation Investigations in California, 19, 35, 36, 41, 43. The quote is from p. 19.
9. Report of Irrigation Investigations in California, 84, 85, 88, 91, 94-95. The quote is from p. 91.
10. Report of Irrigation Investigations in California, 170, 190, 195, 232.
11. Report of Irrigation Investigations in California, 112-113; 255-258; 322-325; 346-351; and 392-395.
12. Report of Irrigation Investigations in California, 397-400. Elwood Mead described the Wyoming code of irrigation laws in his Irrigation Institutions (New York, 1903) p. 247-274.

13. The quote is from Elwood Mead's little-known preliminary report published one year before Bulletin #100. See Irrigation Investigations in California, S. Doc. 108, 56 Cong., 2d sess., serial 4033 (Washington, D.C., 1901), 28-29. Also see Report of the Secretary of Agriculture, 1901 (Washington, D. C. 1901), LXXXV-LXXXVI. Mead recognized the link between water law reform and other Progressive objectives. He hoped that Progressives who feared monopolies in oil, copper, coal and iron, might also worry about water monopoly. Expanding state control over water was particularly appealing when many Progressives urged public ownership of basic utilities. See Report of Irrigation Investigations in California, Bulletin #100, 64.
14. Pacific Rural Press, February 23 and June 22, 1901, and January 11, 1902; Francis E. Warren to Elwood Mead, June 1, 1901, J. M. Wilson to Mead, August 22, 1901, William E. Smythe to Mead, October 28, 1901 and California Water and Forest Association to James Wilson, Secretary of Agriculture, November 22, 1901, in RG 8, Records of the Bureau of Agricultural Engineering; Irrigation Investigations Division, General Correspondence, 1898-1902, National Archives, Suitland, Maryland. For reports of other work done by the Office of Irrigation Investigations in California see Report of Irrigation Investigations 1900, Office of Experiment Stations Bulletin #104 (Washington, D.C., 1902), 137-146 for a discussion of measurements of the Gage Canal in Riverside; Report of Irrigation Investigations, 1901, Office of Experiment Stations Bulletin #119 (Washington, D.C., 1902) 103-189 for a study of the duty of water under the Gage Canal and Tule River Basin, as well as a study of the San Bernardino Valley's underground water supply; and Report of Irrigation Investigations, 1902, Office of Experiment Stations Bulletin #133 (Washington, D.C., 1903), 151-165 for a survey of irrigation systems on Stony Creek, a tributary of the Sacramento River. For the rivalry between Mead and Newell over the federal reclamation program see Professor Lawrence B. Lee of San Jose State University's typescript manuscript, "Elwood Mead and the Beginnings of National Reclamation."
15. William E. Smythe to Elwood Mead, Aug. 29 and Sept. 14, 1901, RG 8, Irrigation Investigations Division, General Correspondence, 1898-1902. On Smythe's lobbying efforts on behalf of water reform see Pacific Rural Press 60 (Aug. 18, 1900) 98, and Nov. 17, 1900, 306.
16. There is no full-length biography of William E. Smythe. However, see Lawrence B. Lee's introduction to a reprint of Smythe's Conquest of Arid America (Seattle 1969) and his "William Ellsworth Smythe and the Irrigation Movement: A Reconsideration," Pacific Historical Review, 41 (August 1972), 289-311, and "William E. Smythe and San Diego, 1901-1908," Journal of San Diego History, 19 (Winter 1973) 10-24; Martin E. Carlson "William E. Smythe: Irrigation Crusader," Journal of the West 7 (January 1968) 41-47; and Stanley R. Davison, "The Leadership of the Reclamation Movement, 1875-1902," Ph.D. diss., U. C. Berkeley, 1951.
17. For Smythe's views on the state and federal roles in reclamation see Land of Sunshine, 15 (July 1901), 65-72; November, 1901, 382; December, 1901, 491; Out West, 16 (January 1902, 79; April, 1902, 437. Smythe discussed the New Zealand experience at length in the February, 1902 issue of Out West, pp. 202-209. The assumption that the federal government would refuse to build irrigation works in any state which had not compiled a full record of water claims, established control over future grants, provided for adjudication of water conflicts and for state distribution of water was very common in 1901 and 1902. For example, William Thomas, President of the Water and Forest Association wrote Mead on December 31, 1901, noting that at its annual meeting, members of the association had recognized that "...unless we could have a code of laws which would secure to the public any flood waters which the National Government might choose to store and permit to flow down the natural channel of the stream, we could expect no assistance from the Federal Government." RG 8, Irrigation Investigations Division, "General Correspondence, 1898-1902."
18. J. M. Wilson to Elwood Mead, December 24, 1901, RG 8, Irrigation Investigations Division, "General Correspondence, 1898-1902," San Francisco Chronicle, March 1, 1902. For a concise summary of the Water and Forest Association's water law reform objectives see Water and Forest, I (October 1901), 4.
19. The Works Bill was reprinted in full in a supplement to Water and Forest, II (October 1902). It was amended in December 1902, after the Water and Forest Association's annual meeting. The provisions mentioned are from the revised version. For discussions of the bill see The San Francisco Call, October 14, 1902; San Francisco Chronicle, November 23 and December 6, 1902; and The Record Union (Sacramento), December 7, 1902.

20. The quote is from the Riverside Daily Press, December 30, 1902. Also see the Press of December 29, 1902; The Times (Los Angeles), December 30, 1902; The San Diego Union, December 27, 29 and 30, 1902. Most of these issues reported on a convention staged at Riverside on December 29 to protest the Works Bill.
21. See George Maxwell's statements in Out West, 16 (May 1902), 546-555 and Forestry and Irrigation, 8 (November 1902), 444-447. The block quote is from p. 553 of the Out West article. Maxwell's letter to George Pardee of January 16, 1903 is in the Pardee Collection, Bancroft Library. Also see William Thomas to Pardee, March 14 and September 5 and 11, 1903, in the same collection; J.M. Wilson to Elwood Mead, December 19, 1902 and Frank Adams to Mead, December 20, 1902, in RG 8, Irrigation Investigations Division, "General Correspondence, 1898-1902." Wilson reported opposition to the Works Bill had surfaced at the December meeting of the Water and Forest Association. Adams reported on a meeting of the irrigation code commission held on December 19th. He revealed that "Judge Works doubts very much if this one [bill] will pass."
22. See Lawrence B. Lee's brief biography of Smythe in Howard Lamar, ed., The Reader's Encyclopedia of the American West (New York, 1977), 1125-1126, and his typescript "Elwood Mead and the Beginnings of National Reclamation." The Los Angeles Times of February 24, 1903, identified Smythe as "...the authorized representative of a number of irrigation companies throughout the southern part of the State..." This was particularly revealing because the Times opposed the Works Bill.
23. William E. Smythe, "The Failure of the Water and Forest Commission." Out West, 17 (December 1902), 751-757 and 18 (March 1903), 381-389; Smythe to State Irrigation Convention, October 7, 1904, in Smythe Correspondence folder, George Pardee Collection, Bancroft Library.
24. John D. Works, "Answers to Objections Made to the Irrigation Bill Proposed by the Water and Forest Association," and "Should the Irrigation Bill Pass?", undated pamphlets in a volume entitled Irrigation in California at the Bancroft Library. Also see Works to Pardee, January 9 and 14, in the Pardee Collection at the Bancroft and his letter reprinted in The San Francisco Call, January 28, 1903. The San Francisco Chronicle's editor agreed with Works. See, for example, the issue of February 27, 1903. However, the Pacific Rural Press noted: "Opposition [to the Works Bill] proceeded from two sources, one which desired to be let alone in present possessions secured through the courts or otherwise, and the other which desired a nationalization of the whole question of property in water. Each side freely used the help of the other in condemning the proposed enactment, and both opponents used weapons they should not have liked to slay the measure." See the Press, 65 (February 28, 1903), 130.
25. See J.B. Lippincott to Frederick Haynes Newell, March 31, 1903, and the attached correspondence pertaining to A.B. 75 and cooperative investigations in California in "Correspondence--J.B. Lippincott, 1905," in the Frederick Haynes Newell Collection, Box 6, Library of Congress, Washington, D.C. In particular see Maxwell to Lippincott, February 8, 1903. This collection of correspondence shows Maxwell's enormous influence on the California Legislature. Also see Elwood Mead to Benjamin Ide Wheeler, February 14, 1903, at the University of California Archives, Bancroft Library; George Pardee to William Thomas, January 23, February 1, and February 13, 1903; Water and Forest, III (April 1903), 2; and The Country Gentleman, 69 (June 16, 1904), 559-560. In the next four years, Mead's office studied different methods of irrigation in California, assessed the value of different pump systems, and surveyed problems relating to seepage, drainage and reclamation of alkali-choked land. See Elwood Mead, "The Irrigation Investigations in California of the Office of Experiment Stations," Forestry and Irrigation, II (August 1905), 367-369.
26. The Record-Union (Sacramento), January 26, 1903. On the rift within the Water and Forest Association see John D. Works to T.C. Friedlander, March 14, 1904 and Works to Elwood Mead, March 17, 1904, in RG 8, Records of the Office of Irrigation Investigations, "Field Office Correspondence, 1904-1906." In the first letter Works complained that Smythe and Maxwell were circulating letters urging opponents of the Works Bill to join the Water and Forest Association as one way to undermine reform. In the early months of 1904, the association's president often spoke out against reform. See "California Water and Forest Association" in Forestry and Irrigation, 10 (May 1904), 195, and Water and Forest, IV (May 1904), 1.

27. See Edward F. Adams's keynote speech to the Commonwealth Club in the club's Transactions, I (1903-1905), 3-6. The best history of the club's early years is in Frank Adams's biography of his father, Edward F. Adams: 1839-1929 (Berkeley, 1966), especially Chapter 10, pp. 115-122.
28. William Thomas's speech was reprinted in the Commonwealth Club's Transactions, I (1903-1905), 1-10. For the Chief Justice's statement see p. 12. The comment of the Public Laws Section is on p. 19. Irrigation had developed much more rapidly south of the Tehachapis and the water supply there was much more limited. Consequently, water conflicts in that section erupted earlier than further north and most of its streams had been adjudicated by 1900. This, of course, helps explain opposition to the Works Bill.
29. The best survey of federal reclamation is Paul Wallace Gates History of Public Land Law Development (Washington, D.C., 1968), 635-698. Also see the introductory chapter in Donald C. Swain's Federal Conservation Policy, 1921-1933 (Berkeley, 1963); William E. Warne, The Bureau of Reclamation (New York, 1973); and Michael C. Robinson, Water for the West: The Bureau of Reclamation, 1902-1977 (Chicago, 1979).
30. For example, see Records Group 115, Records of the Bureau of Reclamation, National Archives, "930: California; Surveys & Investigations thru 1910" as well as the files for 1911-1914; 1915-1918; and January-June 1919. Each of these files contains separate folders for different parts of California such as the Honey Lake Valley, Victor Valley, Kings River Basin, Santa Barbara, San Diego, Palo Verde, and Chuckawalla Valleys.
31. J.B. Lippincott to Hydrographer, U.S. Geological Survey, August 6, 1903, RG 115, "930: California; Surveys & Investigations thru 1910"; Walter C. Mendenhall, "The Underground Waters of Southern California," Forestry and Irrigation, 10 (October 1904), 448-455 and "Studies of California Ground Waters," Forestry and Irrigation, 11 (August 1905), 382-384; and Mendenhall's address to the Twelfth National Irrigation Congress (1904) in the Proceedings of the International Irrigation Congress (Galveston, Texas, 1905), 150-157.
32. J.B. Lippincott to F.H. Newell, November 28, 1903, in RG 115 "(930-8) California: Surveys & Investigations, Kings River Storage."
33. Forestry and Irrigation, 9 (November 1903), 558-559; Second Annual Report of the Reclamation Service, 1902-1903 (Washington, D.C., 1904), 54-55, 93-96; F.H. Newell, "The Reclamation Service and the Owens Valley," Out West, 23 (October 1905), 454-461; and A.P. Davis to the Secretary of the Interior, September 1, 1905, in RG 115, "(527) Owens Valley: Preliminary Reports on General Plans."
34. J.B. Lippincott and W.H. Sanders to F.H. Newell, October 15, 1903, RG 115, "(153-11) Yuma Project: Reports of the Engineers, Estimates of Construction Etc. thru 1906." The four-man board of engineers included Lippincott, the Reclamation Service's chief engineer in California and the southwest and Morris Bien, head of the Service's Legal and Lands Division in Washington.
35. First Annual Report of the Reclamation Service from June 17 to December 1, 1902 (Washington, D.C., 1903), 105.
36. J.B. Lippincott and W.H. Sanders to F.H. Newell, October 15, 1903. RG 115, "(153-11) Yuma Project: Reports of Engineers, Estimates of Construction, Etc. thru 1906"; Lippincott to Governor George Pardee, May 14 and June 4, 1904; Morris Bien to Pardee, May 27 and July 26, 1904; Bien to A.B. Nye (Pardee's private secretary), May 27, 1904, all in the Pardee Collection, Bancroft Library; U.S. Webb (California Attorney General) to Arthur C. Huston, October 7, 1913, in the Hiram Johnson Collection Bancroft; Pacific Rural Press, 66 (October 17, 1903), 246; and J.B. Lippincott, "The Reclamation Service in California," Forestry and Irrigation, 10 (April 1904), 162-169.
37. On the issue of state versus federal sovereignty over the West's water see Donald J. Pisani, "State vs. Nation: The Battle Over Water Rights in the American West, 1902-1922," Forthcoming in the Pacific Historical Review.
38. For an excellent discussion of Kings' River water conflicts see Arthur Maass and Raymond L. Anderson, ...and the Desert Shall Rejoice: Conflict, Growth, and Justice in Arid Environments (Cambridge, Mass., 1978), Chapter 6, especially pp. 232-237. Also see Second Annual Report of the Reclamation Service, 1902-1903 (Washington, D.C., 1904), 53-54;

- J.B. Lippincott and W.H. Sanders to F.H. Newell, October 15, 1903, in RG 115, "(153-11) Yuma Project: Reports of the Engineers, Estimates of Construction, Etc. thru 1906"; J.B. Lippincott to Hydrographer, U.S.G.S., July 26, 1904 in "(930-8) California: Surveys & Investigations, Kings River Project" and Newell to Lippincott, November 27 and December 7, 1903 in the same file. That file also contains accounts of meetings of the Kings River Storage Association held on November 28 and December 10, 1903. Finally, see Lippincott to George Pardee, December 1, 1903 and April 20, 1904 in the Pardee Collection, Bancroft Library.
39. J.B. Lippincott, A.P. Davis, W.C. Mendenhall, and O.H. Ensign to F.H. Newell, November 22, 1905, and Newell to Davis, December 2, 1905, RG 115, "(989) Sacramento Valley; General Reports thru 1908"; Fifth Annual Report of the Reclamation Service, 1906 (Washington, D.C., 1907), 99.
 40. J.B. Lippincott to Hydrographer, U.S.G.S., August 6, 1903, RG 115, "(930) California: Surveys & Investigations thru 1910"; Lippincott and W.H. Sanders to F.H. Newell, October 15, 1903, "(153-11) Yuma Project: Reports of the Engineers, Estimates of Construction Etc. thru 1906"; First Annual Report of the Reclamation Service from June 17 to December 1, 1902 (Washington, D.C., 1903), 121; "Possible Irrigation Projects [in California]," Forestry and Irrigation, 9 (March 1903), 142-145; Sharlot M. Hall, "The Problem of the Colorado River," Out West, 25 (October 1906), 305-322.
 41. The long quote is from J.B. Lippincott to George Pardee, April 20, 1904, the shorter quote from Lippincott to Pardee, December 1, 1903, both in the Pardee Collection, Bancroft Library; Lippincott to Newell, September 23, 1904, RG 115, "(187-8) Colorado River Project, Board and Engineering Reports and General Correspondence, Imperial Valley thru 1909"; Irrigation Age, 20 (February 1905), 103. For an excellent background to the history and water conflicts of the Colorado River see Norris Hundley, Dividing the Waters: A Century of Controversy Between the United States and Mexico (Berkeley, 1966), and Water and the West: The Colorado River Compact and the Politics of Water in the American West (Berkeley, 1975).
 42. Norris Hundley, Water and the West, 26. Many farmers in the Imperial Valley also opposed federal reclamation because they opposed the 160 acre limitation. See J.B. Lippincott to F.H. Newell, January 14, 1908, RG 115, "(187-B) Colorado River Project; Board and Engineering Reports and General Correspondence, Imperial Valley thru 1909."
 43. George J. Wisner to F.H. Newell, November 29, 1904, RG 115 "(187-B) Colorado River Project; Board and Engineering Reports and General Correspondence, Imperial Valley thru 1909." For similar sentiments see A.P. Davis to Wisner, December 5, 1904, in the same file. Congress finally authorized the All-American Canal when it accepted the Boulder Canyon Act in 1928, though the ditch was not completed until the early 1940s.
 44. A.P. Davis to J.B. Lippincott, October 10, 1902, RG 115 "(187) Colorado River Project, thru 1905." Also see Lippincott to Davis, October 18, 1902, and Davis, George Wisner, and W.H. Sanders to Newell, September 26, 1904 in the same file; Lippincott to Newell, March 23, 1903 "(930-8) California: Surveys & Investigations, Kings River Storage"; Irrigation Age, 18 (December 1902), 53-54; and Second Annual Report of the Reclamation Service (Washington, D.C., 1904), 123-161.
 45. J.B. Lippincott, "The Reclamation Service in California," Forestry and Irrigation, 10 (April 1904), 162-169; Sharlot M. Hall, "The Problem of the Colorado River," Out West, 25 (October 1906), 312; U.S. Reclamation Service (Portland, Oregon, Office) to George Pardee, August 25, 1905, Pardee Collection, Bancroft Library.
 46. Ethan Allen Hitchcock, Secretary of the Interior, to Director of the U.S.G.S., May 10, 1904, RG 115 "(153-11) Yuma Project: Reports of the Engineers, Estimates of Construction Etc. thru 1906"; Los Angeles Times, May 10, 1904; Ninth Annual Report of the Reclamation Service, 1909-1910 (Washington, D.C., 1911), 74. The Reclamation Service exhibited little interest in the welfare of American Indians, but plenty of interest in their land. It persuaded Congress, perhaps as a logical extension of the Dawes Act, to allot land in very small parcels, a step made possible by irrigation. Of course, this opened new land to white farmers. The relationship between federal reclamation and the allotment policy has not been studied by historians.

47. Official Proceedings of the Thirteenth International Irrigation Congress, 1905 (Portland, Oregon, 1905), 209-210; "National Irrigation: Work and Progress under the Reclamation Act," Maxwell's Talisman, 6 (March 1906), 27; "The Yuma Reclamation Project," Forestry and Irrigation, 12 (March 1906), 143-144; Hall, "The Problem of the Colorado River," 324-325.
48. For early examples of Reclamation Service concern with land speculation, the 160 acre limitation, and winning the support of established farmers, see J. B. Lippincott to George Maxwell, Executive Chairman of the National Irrigation Association, May 2, 1903, RG 115, "(153-11) Yuma Project: Reports of the Engineers, Estimates of Construction Etc. thru 1906," And A. P. Davis, et. al., to F. H. Newell, April 8, 1904, in the same file. Also see the Fifth Annual Report of the Reclamation Service, 1906 (Washington, D.C., 1907), 100.
49. Ninth Annual Report of the Reclamation Service, 1909-1910 (Washington, D.C., 1911), 78 For a case study of the problems faced by the Reclamation Service on a particular irrigation project, the Truckee-Carson Project in western Nevada, see Donald J. Pisani, "Conflict over Conservation: The Reclamation Service and the Tahoe Contract," Western Historical Quarterly, X (April 1979), 167-190, and "Western Nevada's Water Crisis, 1915-1935," Nevada Historical Society Quarterly, XXII (Spring 1979), 3-20.
50. Tenth Annual Report of the Reclamation Service, 1910-1911 (Washington, D.C., 1912), 72; Eleventh Annual Report of the Reclamation Service, 1911-1912 (Washington, D.C., 1913); Fourteenth Annual Report of the Reclamation Service, 1914-15 (Washington, D.C., 1915), 323-324; "Report of J.B. Lippincott to Arizona and California River Regulation Committee," dated October 1, 1913, RG 115, "(187) Colorado River Project thru 1913."
51. Charles Johnson to John D. Works, U.S. Senator from California, August 14, 1915, in the John Works Collection, Bancroft Library. Also see Everett Teasdale to Works, August 3, 1915, in the same collection. The "Yuma Irrigation Project" files in RG 115 for 1913-1915 contain many similar complaints. Partly as a result of this discontent, the Reclamation Service allowed for graduated repayment of individual debts to the government. This had been authorized by Congress on February 13, 1911, but applied only to those irrigation projects designated by the Reclamation Service for special consideration. See Eleventh Annual Report of the Reclamation Service, 1911-1912 (Washington, D.C., 1913), 204-205.
52. Fourteenth Annual Report of the Reclamation Service, 1914-1915 (Washington, D.C., 1915), 59-63; Fifteenth Annual Report of the Reclamation Service, 1915-16, (Washington, D.C., 1916), 5-6, 13, 68-83. The Reclamation Service frequently changed the size of projects. On the Yuma Project, the project's size was listed from 86,000 acres to over twice that area, largely depending on whether "future additions" were included. Usually, the project was listed between 90,000 and 110,000 acres.
53. J.B. Lippincott to George Pardee, September 29, 1904, Pardee Collection, Bancroft Library. Also see Lippincott to Pardee, March 9, 1905. The Reclamation Service drafted the state act transferring ownership of the lake beds to the nation. See Morris Bien to Pardee, December 23, 1904, and January 27, 1905, in the Pardee Collection. Copies of the California law, and a similar Oregon statute, are included in RG 115 "(281) Klamath: Engineering Reports thru 1905." The federal law was approved on February 9, 1905 (33 Stat. L. 714). It was reprinted in the Fifth Annual Report of the Reclamation Service, 1906 (Washington, D.C., 1907), 20.
54. J.B. Lippincott to George Pardee, January 29, 1905, Pardee Collection, Bancroft Library.
55. The quote is from J.B. Lippincott to Chief Engineer (F.H. Newell), July 29, 1904, RG 115, "(281) Klamath: Engineering Reports thru 1905." Also see Lippincott, et. al., to Chief Engineer, April 14, 1905 in the same file and Lippincott's speech, "The Klamath Project-- Status of Investigations, 1904," reprinted in Proceedings of the Twelfth International Irrigation Congress of 1904 (Galveston, Texas, 1905), 190-198.
56. "Memorandum of Proposed Recommendations to be made by the Board of Engineers of the United States Reclamation Service to the Secretary of the Interior Relative to the Purchase of the Property of the Klamath Canal Co.," dated May 3, 1905, RG 115, "(281) Klamath: Engineering Reports thru 1905"; Fifth Annual Report of the Reclamation Service, 1906 (Washington, D.C., 1907), 29.

57. Forestry and Irrigation, 12 (November 1906), 518; Irrigation Age, 22 (December 1906), 53.
58. Forestry and Irrigation, 11 (June 1905), 276-278, and 12 (March 1906), 115-118; The Irrigation Age, 22 (November 1906), 8-12; Fifth Annual Report of the Reclamation Service, 1906 (Washington, D.C., 1907). Because of the sale of excess holdings, the average size farm within the Klamath Project dropped from 104 acres in 1907 to 69 acres in 1910 (Tenth Annual Report of the Reclamation Service, 1910-1911 [Washington, D.C., 1912], 202-207).
59. Fourteenth Annual Report of the Reclamation Service, 1914-1915 (Washington, D.C., 1915), 249-250; Fifteenth Annual Report of the Reclamation Service, 1915-1916 (Washington, D.C., 1916), 373; Nineteenth Annual Report of the Reclamation Service, 1919-1920 (Washington, D.C., 1920), 320-330. Even during the boom days of World War I, the Klamath Project remained too isolated to raise high value cash crops. Alfalfa and timothy remained the project's staples.
60. F.H. Newell reported that at the annual convention of the California Water and Forest Association held in 1903, he had met many Sacramento Valley residents who opposed federal reclamation. See Newell to George Maxwell, December 13, 1903, RG 115 "(848) Orland Project: Preliminary Reports and General Plans, etc. to December 31, 1909."
61. For the Sacramento Valley Development Association's activities see the San Francisco Chronicle, March 6, 8, 11, 12, 13, 15, 17, and 29, 1902; Forestry and Irrigation, 11 (June 1905), 283-284; Pacific Rural Press, 70 (November 11, 1905), 308; Mary Montgomery and Marion Clawson, History of Legislation and Policy Formation of the Central Valley Project (Berkeley, 1946), 14-16.
62. Second Annual Report of the Reclamation Service, 1902-1903 (Washington, D.C., 1904), 43; Forestry and Irrigation, 10 (May 1904), 202; Fifth Annual Report of the Reclamation Service, 1906 (Washington, D.C., 1907), 5, 94-98; H.E. Green, U.S.G.S. Engineer, to George Pardee, April 20, 1904; Morris Bien to Pardee, March 31, 1904; and F.H. Newell to Pardee, December 30, 1904, January 18, 1905, and February 8, 1905 in the Pardee Collection, Bancroft Library.
63. Second Annual Report of the Reclamation Service, 1902-1903 (Washington, D.C., 1904), 53.
64. J.B. Lippincott to F.H. Newell, July 18, 1905, RG 115, "(930-8) California: Surveys & Investigations, Kings River Project"; Newell to E.G. Hopson, October 12, 1909 and Hopson to Newell, October 22, 1909, in RG 115, "(989) Sacramento Valley: General Reports thru 1908"; J.B. Lippincott to George Pardee, February 14 and 15, 1905, in the Pardee Collection, Bancroft Library.
65. Fifth Annual Report of the Reclamation Service, 1906 (Washington, D.C., 1907), 98.
66. J.B. Lippincott, "General Outlook for Reclamation Work on California," Forestry and Irrigation, 11 (August 1905), 353; also see Lippincott's "The Sacramento Valley Irrigation Project" in the volume of pamphlets entitled Sacramento County at the Bancroft Library.
67. On the Army Corps of Engineers opposition to reservoirs for flood control see Samuel P. Hays, Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1890-1920 (Cambridge, Mass., 1959), 200-218, and Arthur E. Morgan, Dams and Other Disasters (Boston, 1971), 252-309.
68. J.B. Lippincott to F.H. Newell, April 17, 1906, RG 115 "(930) California: Surveys & Investigations thru 1910." Also see Lippincott to Newell, May 3 and November 14, 1905 in "(989) Sacramento Valley: General Reports thru 1908."
69. F.H. Newell to D.C. Henny, July 26, 1906, RG 115, "(989) Sacramento Valley: General Reports thru 1908."
70. Irrigation Age, 22 (May 1907), 213. Also see 23 (June 1908), 235. In its May, 1908, issue (p. 203), the Age commented: "...[the Orland Project's] chief value will...be as a positive demonstration to the landowners of the Valley of the unparalleled advantages of the Government system, and with that end in view it is planned to make the Orland Project the model irrigation system, or rather the Orland Unit was selected because it has all the essential elements of such a model system."

71. On early planning for the Orland Project see A.P. Davis to D.C. Henny, January 2, 1907; Davis, et. al., to F.H. Newell, August 5, 1907; Henny to Newell, February 20, 1907; and Newell to Henny, February 28, 1907, in RG 115, "(848) Orland Project: Preliminary Reports and General Plans, etc. to December 31, 1909." Also see Sixth Annual Report of the Reclamation Service, 1906-1907 (Washington, D.C., 1907), 70-72; Seventh Annual Report of the Reclamation Service, 1907-1908 (Washington, D.C., 1908), 63-65. A board of engineers formally recommended construction of the Orland Project on November 12, 1906, and the Secretary of Interior approved preliminary project plans in December.
72. For a fascinating account of land speculation within the Orland Project see Charles F. Lambert's oral history transcript at the Bancroft Library. The quote is from p. 26. Also see the Pacific Rural Press, 79 (June 24, 1911), 489 and 498; Eleventh Annual Report of the Reclamation Service, 1911-1912 (Washington, D.C., 1913), 59-62; Thirteenth Annual Report of the Reclamation Service, 1913-1914 (Washington, D.C., 1915), 83-88; Fourteenth Annual Report of the Reclamation Service, 1914-1915 (Washington, D.C., 1915), 67-72; and Nineteenth Annual Report of the Reclamation Service, 1919-1920 (Washington, D.C., 1920), 101.
73. William E. Smythe in Report of Irrigation Investigations in California, U.S.D.A. Office of Experiment Stations Bulletin #100, 110-111. The state legislature did not entertain Smythe's proposal, but it did draft a constitutional amendment, ratified by the voters in 1902, which exempted irrigation district bonds from state taxation.
74. W. E. Smythe, "A Success of Two Centuries," Out West, 22 (January 1905), 75; "The Reclamation Service," Forestry and Irrigation, 11 (June 1905), 280. Francis G. Newlands described and endorsed Smythe's plan in his letter to the Secretary of the Interior, January 26, 1905, in RG 48, "(1420-1904) Miscellaneous Projects: State Irrigation Under National Control, Francis G. Newlands," National Archives, Washington, D.C. In the same file, see Charles Walcott's letter to the Secretary of the Interior, June 3, 1905 drafted by A.P. Davis.
75. Sixth Biennial Report of the Department of Engineering of the State of California, December 1, 1916 to November 30, 1918 (Sacramento, 1919), 74; Frank Adams oral history transcript, Bancroft Library, p. 232; J. Rupert Mason oral history transcript, Bancroft Library, p. 106. In 1911, Dennett also drafted a law by which taxes in new irrigation districts--and old ones if a majority of residents approved--were levied solely on the value of farmland, excluding improvements. Large district landowners had paid proportionately lower taxes than smaller farmers, who were taxed for houses, trees, barns, and other property. This law forced many large landowners to sell their estates--often wheat farms--opening up land for smaller farmers. For a contemporary assessment of the law's effects see the Modesto Morning Herald, February 12, 1914.
76. See "Marketing Irrigation District Bonds," in Transactions of the Commonwealth Club, 6 (December 1911), 515-583. Many of the Commonwealth Club's suggestions were later written into law by Frank Adams, a prominent member of the club and California's foremost expert on irrigation districts.
77. Cal. Stats., 1913, 778. J. Rupert Mason oral history transcript, Bancroft Library, 109-110; Frank Adams oral history transcript, Bancroft Library, 235; Adams, Irrigation Districts in California (Sacramento, 1930), 40-41. The bond commission act was revised frequently in the succeeding years. For example, see Cal. Stats., 1915, 692; Cal. Stats., 1917, 582; Cal Stats., 1919, 1207; Cal. Stats., 1921, 1198.
78. Cal. Stats., 1913, 993. The 1913 law required the state engineer to report any conditions he thought might limit the chances of a district to succeed. In 1915, the legislature amended the law and required the state engineer to report on the overall feasibility of a project, not just its obvious weaknesses or limitations. For a full discussion of the amendments to the Bridgeford Act adopted in 1911, 1913, and 1915, see Frank Adams, Irrigation Districts in California, 1887-1915 (Sacramento, 1917), 48-57.
79. One element in the expansion of state control over irrigation districts was giving the state the power to protect the water supply of potential districts from speculators and developers. In 1917, the legislature passed a law which permitted the state engineer to withdraw from appropriation any water that he considered necessary to the success of that district as part of his preliminary investigation into the district's feasibility. See Frank Adams oral history transcript, Bancroft Library, p. 241. This was just part of the overall expansion of state regulatory power during the Progressive Era.

80. Franklin Hichborn, Story of the California Legislature of 1913 (San Francisco, 1913), 158. The bill Hichborn mentions probably bore little resemblance to the legislation drafted by John Works. Hichborn claims that in 1909 "special interests" pushed the bill as a way of "securing the water wealth of the State" by involving the state "in active opposition to the Federal Government's conservation policies." Perhaps electrical power companies saw advantages to the Works Bill because it did not regulate water claimed to generate power. However, the bill certainly did not favor any other "special interest" group of water users.
81. Of course, not all specialists in water law believed in reform. Frank Short, a leading California attorney who represented many large power and ditch companies, commented in 1906 before the irrigation congress meeting in Sacramento: "We [in California] simply dispense with the Engineer and Governing Board and let the people settle their rights in the good old-fashioned Anglo-Saxon way in the courts, and they are settling them, I think, well and satisfactorily and along just lines." Proceedings of the Fifteenth National Irrigation Congress, 1906 (Sacramento, 1907), 249. In a letter to Milton T. U'Ren, a member of the California Conservation Commission, dated December 8, 1910 in the George Pardee Collection, Bancroft Library, Short commented that "our irrigation laws are almost ideal."
82. Cal. Stats., 1911, 821.
83. Cal. Stats., 1911, 813. On the water laws passed at the 1911 session see George Pardee to Thomas R. Shipp, April 11, 1911; Pardee to Franklin Hichborn, April 12, 1911; and Pardee to Hiram Johnson, April 16, 1911 in the George Pardee Collection, Bancroft Library. In its first 1 and one-half years of life, the board of control received 66 applications to use water and granted 14, though many applications were still pending.
84. Cal. Stats., 1911, 822; Pacific Rural Press, 79 (March 18, 1911), 210-211; The San Francisco Call, April 25, 1911.
85. On the work of the Office of Irrigation Investigations see Frank Adams to George Pardee, May 2, 1911; Pardee to Samuel Fortier, May 19, 1911; Fortier to Pardee, May 26, 1911; and Adams to Louis Glavis, Secretary of the California Conservation Commission, October 18, 1911 in RG 8, Records of the Bureau of Agricultural Engineering, "Irrigation and Drainage Investigations Division, General Correspondence, 1909-1912."
86. Louis R. Glavis to George Pardee, September 11, 1911 and October 9, 1911; Glavis to the California Conservation Commission, October 9, 1911; Glavis to the Secretary of the Interior, October 9, 1911, in the Pardee Collection, Bancroft Library.
87. Apparently, Louis Glavis had been hired by several large timber companies and helped them acquire valuable timber land. Subsequently, he was fired, or forced to resign, as Secretary of the California Conservation Commission. Glavis, of course, had helped undermine the reputation of Secretary of the Interior Richard A. Ballinger by charging that Ballinger was in league with the "interests." On Glavis's problems in California see Hiram Johnson to editors of the Outlook, January 20, 1913 and Johnson to Meyer Lissner, January 25, 1913 in the Hiram Johnson Collection, Bancroft Library.
88. On the Clark bill see Louis Glavis to George Pardee, December 1, 1911; Hiram Johnson to Curtis Lindley, December 9, 1911; Lindley to Johnson, December 11, 1911; Lindley to Board of Control and Conservation Commission, December 11, 1911; Pardee to Johnson, December 11, 1911, in the Hiram Johnson Collection, Bancroft Library; Pardee to L. L. Dennett, December 19, 1911; Pardee to Milton T. U'Ren, December 19, 1911; Pardee to Gifford Pinchot, December 27, 1911; Pardee to J.P. Baumgartner, January 4, 1912; Pardee to S.C. Graham, January 4, 1912; and Pardee to R. L. Hargrove, January 16, 1912, in the Pardee Collection, Bancroft Library. Also see the San Francisco Chronicle, November 30, December 5, December 15, December 15, and December 16, 1911; Los Angeles Times, December 16, 1911; The San Francisco Call, December 9, 1911; The Sacramento Bee, November 30, 1911; The Sacramento Union, November 30, 1911, December 15 and 16, 1911.
89. George Pardee to C.D. Marx, December 19, 1911, Pardee Collection, Bancroft Library.

90. Report of the Conservation Commission of the State of California, January 1, 1913 (Sacramento, 1913), 22-23, 30-31, 38-39. The report neglected many resources. California's forests merited only 29 pages and fish and game, petroleum, coal and other natural resources received only passing mention, or no attention at all. The fear of water monopolies had clearly made water the most controversial resource.
91. C.E. Tait to Samuel Fortier, May 21, 1912, RG 8, "Records of Irrigation Investigations/ Staff Correspondence 1906, 1912-1915"; Francis Cuttle to Hiram Johnson, August 18, 1915 Hiram Johnson Collection, Bancroft Library; San Francisco Chronicle, May 16, 1912. Tait noted in his letter to Fortier: "Hundreds of new wells are bored every year and these furnish new evidence [in court proceedings]. It is a question if provision can be made under a new system for the frequent reopening of cases after the first adjudication as will be demanded to give justice to all."
92. Cal. Stats., 1913, 586. For discussions of the bill's provisions see the Frank Adams oral history transcript at the Bancroft Library, pp. 192-222; George Pardee's "Address on the Water Commission Law," speech delivered on November 7, 1913, in the California Room, California State Library, Sacramento; and Alfred E. Chandler's "The Water Bill Proposed by the Conservation Commission of California," California Law Review, 1 (January 1913), 148-168. One provision of the law, little noticed at the time, became increasingly important as the twentieth century wore on. For the first time, municipal water use was given clear priority over water used for agriculture, navigation, mining, and other uses. This gave the state specific authority to condemn water rights to ensure the future growth and prosperity of California communities.
93. Cal. Stats., 1913, 586. For discussions of the bill's provisions see the Frank Adams oral history transcript at the Bancroft Library, pp. 192-222; George Pardee's "Address on the Water Commission Law," speech delivered on November 7, 1913, in the California Room, California State Library, Sacramento; and Alfred E. Chandler's "The Water Bill Proposed by the Conservation Commission of California," California Law Review, 1 (January 1913), 148-168. One provision of the law, little noticed at the time, became increasingly important as the twentieth century wore on. For the first time, municipal water use was given clear priority over water used for agriculture, navigation, mining, and other uses. This gave the state specific authority to condemn water rights to ensure the future growth and prosperity of California communities.
94. John M. Eshleman to Hiram Johnson, January 13, 1913, in the Hiram Johnson Collection, Bancroft Library. For the most thorough analysis of the bill by its critics see the Transactions of the Commonwealth Club, VIII (February 1913).
95. For Frank Adams' criticisms of the water bill see his oral history transcript at the Bancroft Library, 192-222; his letters to Samuel Fortier of February 13, March 22, March 31, April 26, and June 6, 1913, and to W.F. McClure, California State Engineer, February 11 and 19, 1913, and to James F. Farragher, May 5, 1913, in RG 8, Office of Irrigation Investigations, "Staff Correspondence 1906, 1912-1915." As an engineer, Adams resented the tendency of Progressive reformers to by-pass existing institutions and turn water problems over to special commissions and entirely new agencies. He thought that the California State Engineer's office should have been given the responsibility to enforce the new water law. He also strenuously opposed the charges for water levied by the new statute.
96. Hiram Johnson to Meyer Lissner, June 9, 1913 in the Hiram Johnson Collection, Bancroft Library. Also see Johnson to Gifford Pinchot, July 7, 1913 in the same collection. For Pardee's view of the significance of the new law, see his May 25 and December 7, 1913 letters to Gifford Pinchot, in the Gifford Pinchot Collection, Library of Congress.
97. On the referendum campaign see Transactions of the Commonwealth Club, 9 (October 1914), 581-595.
98. Cal. Stats., 1917, 195.
99. Cal. Stats., 1917, 231. For subsequent amendments to the 1913 law see Cal. Stats., 1919 511 and 1193; Cal. Stats., 1921, 442, 443, 482, and 543; Cal. Stats., 1923, 51, 124, 161, and 162; Cal. Stats., 1925, 586; Cal. Stats., 1927, 1024 and 1668.

100. George Mowry, The California Progressives (Berkeley, 1951), 152; Spencer Olin, California's Prodigal Sons (Berkeley, 1968), 176.
101. Frank Adams, "Irrigation the Basis and Measure of the Present Agricultural Growth of California," in Report of the California State Agricultural Society for the Year 1909, in Appendix to the Journals of the 39th sess. of the California Legislature, v.2 (Sacramento, 1912), 46.
102. "Statistical Summary of the Production and Resources of California [1911]." in Appendix to the Journals, 40th sess., v.2 (Sacramento, 1913), 222-223. This was the first complete statistical survey of California agriculture compiled by state officials. After 1911, such surveys were published frequently. The above report should be supplemented with the section on irrigation in the "Statistical Summary of the Production and Resources of California" prepared by the State Statistician and included in the Report of the State Board of Agriculture, 1913, in the Appendix to the Journals, 41 sess., v. 3 (Sacramento, 1915), 166-183. Also see Samuel Fortier, "Irrigated Agriculture Dominant in California," Pacific Rural Press, 76 (July 25, 1908), 49, 53; San Francisco Chronicle, December 14, 1911; Annual Report, California Development Board, 1913 (San Francisco, 1913), 6; Annual Reports of the California Development Board, 1918 and 1919 (San Francisco, 1920), 7.
103. California Development Association, Report on Problems of Agricultural Development in California (San Francisco, 1924), 5, 7; Statistical Report of the State Board of Agriculture for the Year 1921, in Appendix to the Journals, 45 sess., V. 3 (Sacramento, 1923).

VII. TOWARD A STATE WATER PLAN: IRRIGATION IN THE 1920s

Irrigation came of age in California during the 1920s. As the boom years of World War I gave way to the '20s, the state's farmers suffered from declining prices, as did farmers nationwide. Yet even though the state already contained an irrigation network capable of serving more land than had been watered in 1920, and even though declining prices resulted in part from overproduction, demands for a state water "plan" proved irresistible. The plan did not reflect the triumph of science, efficiency, or coordinated central planning. Nor did it represent an attenuation of those sectional rivalries which had blocked state irrigation projects in the past. The quest for a water plan reflected the state's increasing wealth; by 1925 California officials could consider building water projects which would have been far beyond the state's means in 1900. State officials also assumed that sales of hydroelectric power would help subsidize the cost of irrigation, and they promised that construction of a state project would mitigate the depression's effects by providing jobs for thousands of unemployed workers. The state water plan succeeded because it promised something to everyone. As such, it was more the product of political logrolling than of scientific planning.

From 1900 to 1917, most parts of California enjoyed above average, if not abundant, rainfall. But drought returned in 1917-1919, 1924, and 1929- 1935.¹ In its report for 1919-1920, the Department of Engineering warned:

The succession of dry years experienced by the State, beginning with 1917, attended by unprecedentedly small flow of water in the streams, has demonstrated most forcibly that irrigation development has reached its limit unless conservation of the water resources can be established. This can be brought about partly by learning and applying more economical use[s] of water...But the greater conservation is in controlling the wild destructive flood waters by storing them for summer use."²

Though California led the West in miles of ditches and canals, reservoir construction lagged far behind Colorado during the first two decades of the twentieth century.

Everywhere in California the dry years culminated in painful water shortages, touching off new conflicts and exacerbating old ones. On the Sacramento River, subnormal rainfall, the cultivation of rice, and reclamation of swamp land intensified rivalries among upstream and downstream water users. In 1910, California farmers planted only 100 acres to rice. This figure increased to 15,000 acres in 1914, soared to 83,000 acres by 1917, and peaked at 164,700 acres in 1920. In 1919, rice sold for a record \$5.93 per hundredweight, and

while the price fell off sharply by 1921--to \$2.56--rice remained a popular crop. The Sacramento Valley produced over 95 percent of California's annual harvest, in part because the Sacramento River provided plenty of water. Since rice required "flood irrigation," it demanded far more water than wheat or alfalfa; in the Sacramento Valley, the average seven acre feet of water per acre per year needed to cultivate rice was over twice the amount required for most other crops. Unfortunately, as diversions increased, the flow water into San Francisco Bay decreased. Moreover, the "return flow" was often heavily contaminated with alkalis and salts, which prompted the state engineer to observe in 1925: "The quality of any return irrigation water is poor, and the return water from rice irrigation on the heavy lands of the upper valley is especially so, since the water has stood on the rice fields for many weeks practically stagnant and when released contains not only rotted vegetation but the accumulation of salts leached out from the lands, making it an undesirable domestic supply even when filtered." Pollution became particularly acute in dry years when most of the river consisted of return flow.³

In the early months of 1920, the drought and increasing demands of irrigators also contributed to salt water "intrusion" from San Francisco Bay. Torredos, or marine borers, attacked piers and moorings ever further upstream, and the city of Antioch stopped using the salty water as a domestic supply. In February, the state water commission warned rice farmers to restrict their planting because the winter's rainfall had been unusually light; for example, stream flow at Red Bluff measured only one-third of normal. Subsequently, water users along the river held several meetings, and some farmers did limit their sowing. But since no court decree covered the stream, no easy way could be found to decide who should plant less.⁴

On July 1, 1920, the city of Antioch and 97 delta landowners pressed suit against a multitude of reclamation districts, irrigation districts, irrigation and land companies, and individuals demanding that 3,500 cubic feet per second of water flow past the city; the flow had dropped to as little as 500 cubic feet per second at Sacramento during the fall of 1920. The defendants represented 452,584 acres of land, including 136, 581 acres planted to rice and 72,618 acres of other irrigated crops. Even though the Sacramento-San Joaquin delta included 400,000 acres of land, only the owners of 40,000 acres entered the suit. Antioch based its claim on several points of law. As a riparian owner, it claimed the right to a full flow of the river, undiminished in quality. However, the city's legal staff also declared that an appropriation of water for domestic purposes implied sufficient water to deliver a pure supply--not just the actual quantity taken from the river. The defendants

countered that Antioch owned only a 60 foot riparian lot and diverted no water there. They also claimed that appropriative rights could not exceed the amount of water actually diverted. As for the charge of polluting the stream, the upstream interests responded that they could not be charged with contaminating the river unless they consciously added harmful ingredients. Nature herself contributed many unpalatable and destructive chemicals to the water, including contaminants which leached into the stream from levees and riverbanks. Moreover, the suit was not a simple contest between upstream and downstream farmers, or even domestic water users and irrigators. The city of Sacramento had been named as a defendant, and what court would limit that city's water supply to protect the rights of delta farmers and residents of Antioch? The Alameda County Superior Court refused to pass judgment, even though the first 40 days of testimony cost the participants in the case about \$200,000. However, as a result of the suit the State Department of Engineering began to discuss the feasibility of a salt water barrier to block the intrusion of salt water and store fresh water for irrigation and to serve those towns surrounding Suisun Bay.⁵

The next dry year, 1924, spawned additional lawsuits, including conflicts between upstream irrigators. Consequently, the California Water Rights Division called a "River Problems Conference" at the end of January which was well-attended by different water users along the stream. It resulted in the formation of a "Permanent River Problems Conference" sponsored by the Water Rights Division and Sacramento Chamber of Commerce. In April, the "conference" appointed a watermaster to measure and monitor all diversions from the river. By reducing waste, the watermaster won a temporary truce.⁶

The Corps of Engineers' attempt to keep the Sacramento River open to shipping added another element to the controversy. The Army had tried to maintain a depth of seven feet from the river's mouth to Sacramento; a four foot depth from Sacramento to Colusa; and a three foot depth from Colusa to Chico Landing--in all 202 miles of waterway. Before 1915, the Corps confined its work to clearing the river of snags and drifts and building jetties. In 1915, the cost of channel dredging was less than \$2,000. However, this sum increased to an average \$70,000 in 1918 and 1919, when even Sacramento was inaccessible to river traffic without dredging. Army officials noted that during the war the value of freight carried on the river more than tripled.⁷

The Corps of Engineers recognized the economic value of irrigation, and promised that if the Permanent River Problems Committee established in 1924 appointed a water-master to prevent waste and restrict planting in dry years, the Corps would not insist on maintaining the river as it was before the war:

If the foregoing steps were taken, the diverters of water from the upper Sacramento and its tributaries might reasonably expect the War Department to consider the adoption of an administrative policy by which the recognized requirements of navigation would be limited so as to conform to the general good of the community and the Department would assume the additional cost of maintaining a navigable channel. However, as long as the competition for water is on a basis of each man for himself without the recognition of anyone else's rights, as long as waste is known to exist, it can hardly be expected that the War Department will continue to permit infringement upon the rights, with the protection of which it is charged.

Yet despite the War Department's warning, by the end of the 1920s the Sacramento River conflict remained unresolved. In dry years, lawyers dusted off their suits and prepared for battle. But, inevitably, a rainy winter or two effaced the bitter memories of earlier droughts and such suits dragged through the courts for years.⁸

On California's second most important stream, the San Joaquin, conflict over water rights occurred less frequently during the 1920s. Early state laws declared the river navigable to Tulare Lake, but these had never been enforced and since the 1870s irrigation eclipsed navigation. Moreover, because irrigation developed much earlier than in the Sacramento Valley, conflicts between farmers and power companies occurred less frequently; the companies were forced to buy their rights from farmers and irrigation companies. Moreover, since litigation over rights began relatively early in the San Joaquin Valley, by the 1920s water users there had learned to settle their differences out of court. The popularity of irrigation districts in the San Joaquin, as opposed to the Sacramento Valley, testified in part to the greater spirit of cooperation among litigation-weary residents of the southern valley. Moreover, the Corps of Engineers recognized that the smaller San Joaquin was less valuable for navigation; ships rarely carried freight past Stockton, roughly 45 miles above the river's mouth. In 1917, the Corps' ranking officer in California noted: "The paramount interest in this valley is irrigation rather than navigation. There is insufficient water even if economically used to supply the area that may ultimately become available for irrigation." On the San Joaquin, as on the Sacramento, the War Department favored "canalization," by which ships could travel through special channels containing elaborate systems of locks such as the Corps was constructing on the Ohio River.⁹

In the San Joaquin Valley, the declining water table posed a much greater danger than the conflict between irrigation and navigation. From 1909 to 1919, land irrigated with underground water in California increased from 32,539 to 299,841 acres, and most of the increase occurred in the San Joaquin Valley. But by the end of the 1920s, drought had forced

farmers to abandon 20,000 acres in the south valley, and irrigation on many more acres had been cut back. In Tulare County, where farmers pumped an average 800,000 acre feet of water each year while nature returned only 300,000 acre feet to the aquifer, the assessed value of property fell by \$1,000,000 in one year alone. Four hundred wells had been abandoned in the county in the middle and late '20s, and the cost of pumping water increased dramatically as the water table fell.¹⁰

By the mid-1920s, water shortages in the Sacramento and San Joaquin Valley spawned a half-dozen major reservoir projects, and California entered a new epoch of irrigation development. At Pine Flat on the Kings River, 20 different canal companies and associations of water users agreed to build a 600,000 acre foot capacity structure capable of providing water to 1,000,000 acres. On the Tuolumne River, the Modesto and Turlock Irrigation districts voted \$5,000,000 in bonds to pay for a 270,000 acre foot reservoir designed to serve 200,000 acres. The Madera Irrigation District acquired San Joaquin River water rights from the Miller & Lux estate and planned a 575,000 acre foot reservoir at Friant, expected to water 300,000 acres. In Tulare County, a 292,000 acre water storage district had been created to build a 300,000 acre foot reservoir on the Kern River at Isabella. The Merced Irrigation District voted to construct the Exchequer Dam with a 280,000 acre foot capacity. Outside the San Joaquin Valley, storage projects were planned for the Sacramento River at Iron Canyon, for the Mojave River to serve land near Victorville, and for the Colorado River. The cost of irrigation had soared since 1900, when the cost of ditches and canals averaged between \$5 and \$10 an acre, excluding distribution works. By 1909, this figure reached about \$20 an acre, and by the 1920s, largely due to the cost of storage works, the cost increased to \$50 to \$100 an acre. However, most of these projects did not become feasible until the 1920s because they depended on revenue from the incidental sale of hydroelectric power to subsidize the cost of construction. For example, proponents of the Pine Flat Dam expected that power sales would pay half the dam's cost, as well as provide cheap power to those who depended on underground water.¹¹

Ironically, these schemes took form at a time when some students of California agriculture fretted about overproduction. From 1909 to 1919, an average of 28,000 acres of trees and vines were added to California's agricultural capacity each year. However, from 1919 to 1925 the acreage increased to an average 112,000 acres annually. At the same time, the value of most fruits dropped sharply. From 1919 to 1923 the price of oranges fell by 35 percent, almonds and apples by 50 percent, raisins and peaches by about 70 percent, and

apricots by nearly 80 percent. The value of land planted to fruit declined by half during the same years, and these figures were adjusted for post-war inflation. Frank T. Swett, President of California's Pear Growers' Association, commented in 1925: "The fruit industry, ultimately, will get over its present troubles, if the Bullifornia unscrupulous land peddlers, boomers, and poets and painters of rainbows will let it alone for a while." Such observers became prime critics of the expansion of irrigation.¹²

In 1925, one of California's closest students of irrigation, Frank Adams, acknowledged that more than 400,000 acres under ditch within irrigation districts remained to be settled and probably 1,000,000 acres in the state as a whole. Adams argued that the \$5,000 or more needed to buy and develop a 40 acre irrigated farm exceeded the resources of most prospective settlers. "California is perhaps not so bad off...as are some of the other states," Adams noted, "but taking the West generally, obtaining settlers is the most urgent need and not bringing more land under irrigation projects."¹³ Nevertheless, he believed that California's agricultural problems stemmed as much from underconsumption, or lack of adequate transportation, as from overproduction. He did not worry about the expansion of irrigation, because the projects planned for the San Joaquin Valley would take years to complete, and the nation's rapid increase in population promised new markets in the future. Moreover, even during the early 1920s, demand for vegetables increased--demonstrating that not all crops suffered uniformly--and irrigated land sold briskly in some parts of the state. The Commonwealth Club's Section on Irrigation observed that only about 75 percent of California's readily irrigable land was under irrigation as opposed to 87 percent in Colorado and more than 80 percent in Utah and Idaho.¹⁴

During the 1920s, the irrigation district flourished while most federal reclamation projects languished. In 1927, California's irrigation districts contained over twice the acreage of all the West's federal projects combined, and by most measures the districts were far more successful. For example, despite the 160 acre limitation in the Newlands Act, on the average California's districts contained smaller farms than the federal projects. The Bureau of Reclamation recognized the district's success as a cooperative institution during the 1920s when it encouraged farmers to form districts to replace the less formal water user's associations.¹⁵

By the end of 1926, California contained 90 active and 20 inactive districts, although 19 of the "active" had not issued bonds. This represented a ten-fold increase over the number of districts which had survived the 1890s. Four districts were formed in 1915, three

in 1916, five in 1917, seven in 1918, seven more in 1919, thirteen in 1920, seven in 1921, six in 1922, six in 1923, seven in 1924, and eight in 1925. By November, 1926, California's irrigation districts included 3,583,284 acres and had issued \$136,053,841 in bonds.¹⁶

Despite the popularity of irrigation districts during the 1920s, large landowners continued to chafe at the restrictions imposed by this institutional form. They found an alternative way to raise money in the water storage district, which incorporated basic features of the state's reclamation district laws. The legislature adopted the first water storage act in June, 1915--apparently at the urging of the Iron Canyon Association--but the state supreme court invalidated critical parts of the statute. The lawmakers were more careful when they drafted a second law in 1921. This permitted the owners of a majority of land within any proposed district, or 500 landowners representing title to at least 10 percent of the land, to petition the state engineer to organize a district. The new law gave the state substantially greater power over storage districts than the state engineer exercised in evaluation irrigation districts. Petitions to organize irrigation districts went directly to county boards of supervisors, not Sacramento, and the act of 1921 required the state engineer to approve all petitions to include or exclude land from the district as well as pass judgment on the feasibility of dams. Nevertheless, large landowners would clearly dominate the new districts. Voting in all storage districts was proportional to land ownership--landowners received one vote for each \$100 in the assessed value of their property. This contrasted sharply with the "one man, one vote" philosophy of the irrigation district. So did the requirement that tax assessments to pay off bonds vary according to benefits received rather than apply uniformly to all land within a district. In addition, the landowner within a storage district did not have to live within the district to vote in district elections; the land of ditch company, or any corporation for that matter, could exercise control from afar. While the irrigation district had revolutionary implications for the size of landholdings, pattern of farming, and political leadership within a particular region, the water storage district built on the status quo. It permitted the construction of reservoirs without tampering with existing water distribution systems.¹⁷

By November, 1922, the state engineer had received three petitions to form storage districts, all in the San Joaquin Valley, and all engineered by large landowners, ditch companies, or other corporate interests. For example, the famous Kern County Land Company--which dated back to the 1870s--still owned much land adjoining the Kern River. It petitioned for the formation of a 250,000 acre storage district in May, 1922. The election

to create a district was held on November 10, 1923, and carried by the overwhelming vote of 68,465 to 21,929. However, since the land company held nearly half of the votes, the election did not represent a fair test of public opinion in the Kern Valley. Without the company's votes, the election would have lost by 10,222 to 21,929.¹⁸

In 1923, the legislature enacted another important law, though it received much less than the water storage act of 1921. This act permitted the formation of "water conservation districts" to unite storage, reclamation, irrigation, or drainage districts into broader governmental units. Water users along the Kings River sponsored the legislation in the hope it would facilitate the construction of the reservoir at Pine Flat. They could have used the 1921 law, but then district assessors would have imposed taxes according to benefits; the 1923 law left that job to the assessors in each constituent district. Like water storage districts, conservation districts were formed on appeal to the state. The state engineer and two lieutenants assumed the title of "state irrigation board," and enjoyed even greater power than the state engineer did in supervising water storage districts. The board was charged to survey proposed irrigation works, estimate the cost of construction, schedule bond elections and apportion the costs among the different districts. It also decided how those districts would share the stored water and revenue from hydroelectric power. In effect, this law appointed the state as an arbitrator to settle anticipated future water conflicts among the multitude of water users on the Kings River.¹⁹

The State Engineer's office and Division of Water Rights constituted a fledgling "water bureaucracy." The legislature had abolished the first state engineer's office in 1889. Then, in 1907, it created a new Department of Engineering, mainly to assist in rebuilding San Francisco following the earthquake and fire of 1906. In 1921, the lawmakers consolidated the Department of Engineering, Highway Commission, Water Commission, State Land Settlement Board and Carey Act Commission into a Department of Public Works. The new department included five divisions: Architecture, Land Settlement, Highways, Water Rights, and Engineering and Irrigation. The latter division investigated the feasibility of plans for irrigation and storage districts, vouched for the security of their bonds, and supervised the construction of all district works. It also reviewed plans for bridges over navigable streams and for reservoirs and dams not built by municipalities or public utility districts. Finally, it assisted federal agencies in gaging streams, preparing topographic maps, and determining the amount of water needed to grow different crops in different soils. In 1927, Frank Adams noted that "...90% of the time of the State Engineer, all the time of one irrigation engineer,

and occasional part time of several others is consumed in investigation and supervision of irrigation and water storage districts." As mentioned in the last chapter, state supervision made district bonds saleable and gave the district form a vitality it had not enjoyed before 1911.²¹

The Division of Water Rights had less direct influence on irrigation in California, even though its responsibilities were very broad. In theory, it had the power to approve or reject all applications for new water rights (except municipalities) as well as all applications to enlarge diversion works or change the point of diversion. It could also revoke water rights for non-fulfillment of conditions; adjudicate rights; supervise the distribution of water; serve as a referee in superior court water rights suits; determine the supply of unappropriated water in California's streams; and examine all irrigation or power projects which required large quantities of water. However, the division also performed a variety of miscellaneous chores ranging from monitoring the Sacramento River's salinity to inspecting the water supplies of state institutions.²²

Reviewing water rights presented the biggest job. The division had considerable discretion, particularly in deciding how much water remained unclaimed in particular streams. This power had not gone unquestioned. The Tulare Water Company, a subsidiary of the Kern County Land Company, filed suit after the state water commission rejected its application for 2,000 cubic feet of water per second from Buena Vista Slough in December, 1919. The commission ruled that no unappropriated water remained in the Kern River. The case reached the California Supreme Court. The court refused to rule on the powers conferred by the Water Commission Act of 1913, but it did suggest that only the courts could dole out water when contests arose. This defense of property rights persuaded the 1923 legislature to amend the law so that any disgruntled applicant could, within 30 days of the issuance or rejection of a permit, file suit in a superior court for a review of the commission's verdict. The new legislation required the court to review the commission's evidence before it decided to confirm, reverse, or modify the commission's judgment. Since the commission rarely rejected realistic requests, the courts received few appeals.²³

The work of the Water Rights Division increased dramatically during and after World War I. In 1919, and again in 1920, applicants filed for three times the volume of water claimed in any single year from 1915 through 1918. After the war, California's half dozen anticiapted storage projects further swelled the number of applications. In 1922, one of eight applications required a field survey. But because the division had only four hydraulic

engineers available to perform this task, the surveys lagged two to four years behind filings. The need to cooperate with federal officials also slowed down the review process. About 40 percent of the water rights applications laid claim to water within one of the state's nineteen national forests. Before Congress approved the Water Power Act in 1920, the Water Rights Division routinely referred power applications to the supervisor of the appropriate national forest before granting a permit. However, after 1920, the new Federal Power Commission reviewed all filings. State officials claimed sovereignty over all the water within California's borders except the Sacramento River. But they had to defer to the F.P.C., if only because it could block any power project by refusing to grant rights of way across government land.²⁴

From 1915-1928, the Water Rights Division received 6,023 applications to use water. Sixty-one percent pertained to irrigation, 16 percent to power, 11 percent to domestic uses, 9 percent to mining, and the remainder to various municipal uses. In all, the division approved 54 percent of the applications to use water for irrigation, but only 27 percent of the power requests. In 1928, the volume of water claimed totalled more than 8 times the amount filed on in 1918, and the division had become increasingly discriminating in reviewing applications. Of each 100 requests, 43 were rejected. Of the 57 approved, 30 were subsequently revoked for non-compliance with terms of the grant, usually simply failing to use the water. Thus only 27 applicants out of every 100 received clear "title." The division measured its grants in both second-feet and acre-feet. The first measured water diverted directly from a stream, and the second gauged stored water. Of each 100 second-feet of water requested, the division granted only 15 second-feet, and only 7 second-feet were put to beneficial use. Of each 100 acre-feet claimed, only seven acre-feet was allowed and 6.3 acre-feet of that was revoked for non-compliance. Hence, only .7 acre-feet finally received legal sanction. Equally important, the division showed a clear preference for public water projects. For example, from 1924-1926, 78 percent of the direct diversion rights and 88 percent of the storage rights had been granted to irrigation districts. The Division's 1928 report noted: "One of the most fruitful fields of effort...is the elimination of proposed projects which for one reason or another have been abandoned. Hopeless and abandoned projects once formed no little obstacle to proposed new development."²⁵

The Division of Water Rights also adjudicated established water rights. It could initiate proceedings on its own, on the request of a Superior Court, or on appeal from one or more local water users. In all three cases, the administrative procedure was the same.

After the division collected basic information regarding stream-flow, diversions, soils, and crops, it asked water users on a stream to submit evidence to support their claims. Subsequently, the division compiled a preliminary abstract of rights, and provided each claimant with a copy. Those who objected to the list could demand a formal hearing. Once the division reached a final verdict, it again notified water users and forwarded its evidence and conclusions to the appropriate superior court. The court entertained appeals before it ratified or amended to the judgment in its final decree.²⁶ An adjudication by the California Water Commission or Division of Water Rights offered many advantages over court determinations. Proceedings could begin before conflict erupted, and all rights to a stream could be decided, not just those of parties to a suit. Moreover, "disinterested experts" collected the data, suggesting that the evidence acquired was more reliable and systematic, and the process cost less, took less time, and better protected the "public interest." Nevertheless, because of the indeterminate nature of riparian rights and the Water Rights Division's limited budget, the 1913 law did not result in a wholesale settlement of water rights. State officials refused to cast the division in the role of a protagonist and, as of 1922, the division had not prosecuted an adjudication on its own initiative.

The division usually acted on appeal from the courts, but did not materially reduce conflict over water rights. In 1923, the legislature considered a constitutional amendment to abolish the Division of Water Rights and replace it with a special water court. The amendment, prompted by the vast range of interests represented in the Antioch suit, recognized that while an administrative commission could rank appropriative rights, it had no power to define riparian claims. The amendment also suggested that the legislature had little confidence in the division. By 1926, the division had launched 18 adjudication proceedings. Only seven had resulted in court decrees, and these covered only 161 water rights covering 15,470 acres of land. The seven streams, remote and probably unaffected by riparian claims, were Willow Creek in Lassen County; San Pedro Creek in San Mateo County; Hat and Burney creeks, and the north fork of Cottonwood Creek in Shasta County; the west fork of the Carson River in Alpine County; and Oak Creek in Inyo County.²⁷

In addition to granting new rights and adjudicating old ones, the Water Rights Division provided watermasters to help divide up streams covered by court decrees or informal agreements among water users. Every drought prompted violations of decreed rights, but the courts usually proved ineffective--and always proved slow and costly--in attempting to enforce their decisions. This presented the Water Rights Division with a great opportunity to expand

its influence. Moreover, the success of storage projects undertaken in the 1920s depended on a close supervision of distribution so that the "new" supply stored upstream in the mountains could reach its intended beneficiaries downstream without being pilfered by "intermediary" water users. The sheer mass of new claims, spawned by irrigation districts as well as storage and power projects, demanded an expansion of state authority. Watermasters also played important roles in adjudication proceedings on streams where final decrees had not yet been issued. They could testify to actual conditions in the field, and their testimony often made the court's job easier.

The water code of 1913 said little about state supervision over distribution. Nevertheless, in July, 1919, Kings River water users asked the state to appoint a watermaster. The drought contributed to their decision, but they also wanted to clear up water conflicts before beginning the Pine Flat Reservoir Project. The river was 90 miles long and served 625,000 acres of land through 45 diversion ditches. Litigation began in the 1870s, and by the second decade of the 20th century 137 different suits had been filed. The obvious futility of litigation persuaded the Kings River claimants to prepare a schedule listing priorities and amounts due to each diverter according to the total volume of water available. The agreement specified that the schedule should be enforced by an agent of the Water Rights Division paid by the water users themselves. The Water Commission had measured diversions from the Kings River since December, 1917, and supervised distribution throughout the 1920s.²⁸

Before 1921, the State Water Commission supervised diversions only when it could muster virtually unanimous support from water users on a particular stream. But in that year the legislature enacted a law which permitted the commission to appoint watermasters to administer decreed streams when 15 percent or more of the owners of diversion ditches requested the service. The law required regulated water users to provide lockable headgates and suitable measuring instruments; made interference with the watermaster's work a misdemeanor; and gave him the power to arrest violators. However, the law said nothing about how the watermaster would be paid. The Division of Water Rights suggested that California follow Nevada's lead by allowing county assessors to apportion the cost of supervision according to the amount of water used by individual claimants in relation to the total volume of diversions. The legislature refused, perhaps because Nevada's assessors added the charge to property taxes.²⁹

In May, 1922, upon petition from 27 percent of the ditch owners on the west fork of the Carson River, the state appointed a watermaster who began his work in August, 1922. Voluntary contributions paid his salary in 1922 and 1923. However, in 1924, 1925, and 1926, contributions lagged. In its report for 1926 the Division of Water Rights reported that upstream farmers, "...because of their strategic position on the stream, are unsympathetic regarding supervision of diversions." Subsequently, the watermaster abandoned his work and the division refused to appoint watermasters unless requests for the service were accompanied by an iron-clad promise to pay. The division asked California's superior courts to insert a provision in all pending decrees to permit the state to appoint a watermaster on the appeal of one or more water users and require all parties to the suit to share the cost. Under such decrees, the state regulated water use in Shasta County on Hat Creek beginning in 1924 and Burney Creek beginning in 1926. The division also took charge of many small streams in Shasta and Modoc counties following the ratification of formal contracts with water users. And after 1924, as a result of the Antioch suit, the state supervised diversions from the Sacramento River at its own expense. By 1929, the division administered 14 streams which served 1,538,000 acres of land. However, all but 28,500 acres were contiguous to the Sacramento or Kings rivers.³⁰

In 1924, the Division of Water Rights, looking back over the previous decade, assessed the significance of the Water Commission Act of 1913:

The State Water Commission in 1915, when first organized, faced a most difficult situation. Its jurisdiction was limited by the hundreds of Supreme Court decrees and there were many constitutional questions in the act itself....It must be admitted at the outset that the operations of the State Water Commission and the Division of Water Rights have not fundamentally changed the legal situation, nor has litigation over water matters been done away with. It has, however, been greatly reduced, considering the tremendous increase in the rate of development of water projects in the last few years....New rights to the use of water are under state supervision and are recorded and classified, many old rights have been adjudicated, and distribution of water is being carried on in important areas. The value of the public records maintained will increase with the length of their continuity and as they are gradually extended and made more complete.³¹

Admittedly, most western states had more advanced water laws than California, if they were measured by the degree of public control over settlement of water conflicts exercised by the state. But given conditions in California, the Water Commission Act of 1913 was more ambitious than many critics recognized. States like Colorado and Wyoming did not recognize riparian rights, counted fewer water users, and put their water supply to fewer uses. California's water problems were both bigger and more diverse and often not susceptible to administrative control. For example, how could the Water Commission regulate underground

water users when the source of their water was a surface stream that turned underground? The legal implications of such situations--common in southern California--were vast, the basic problem perhaps unsolvable.

Such legal problems, however, failed to capture public attention and paled in significance compared to the search for a state water plan. In 1915, the legislature called a water conference to prepare "...a unified state policy with reference to irrigation, reclamation, water storage, flood control, municipalities, and drainage, with due regard to the needs of water power, mining and navigation..."³² But when the State Water Problems Conference published its formal report to the legislature, it did not provide such a plan, presumably because riparian rights posed an unsurmountable barrier to planning.³³

As noted in an earlier chapter the need for a coordinated state water policy had been recognized as early as 1856 by California Surveyor-General John A. Brewster and reiterated by the Alexander Commission in its report published in 1874.³⁴ Nevertheless, Robert B. Marshall prepared the first comprehensive blueprint for water development during World War I. Marshall was a geographer who began his career with the U.S. Geological Survey in 1889 as a surveyor in Colorado and Montana on John Wesley Powell's staff. In 1890, he was assigned to California and by 1903 supervised all topographic work in the state. In January, 1908, he became "chief geographer" in charge of all topographic work in the United States. But he was much more than a geographer, and formed close friendships with many leaders in the Progressive conservation movement ranging from Gifford Pinchot to John Muir. His deep interest in the national parks won him the post of Superintendent of National Parks in 1916. But in the same year, Congress created the National Park Service, and Stephen Mather was selected to head the new agency. Disappointed, Marshall returned to the U.S.G.S. and supervised the military mapping conducted by the Geological Service from June, 1917 to April, 1919. In 1919, he left the survey to give full attention to his "Marshall Plan."³⁵

Marshall claimed that inspiration for his scheme came in November, 1891 in Folsom, California, not far from Sacramento. In 1937, he recounted that in 1889-1890, he had examined irrigated fields of alfalfa in Colorado between Pueblo and Colorado Springs. He quickly recognized the value of irrigation to transform desert to garden. In the florid prose so characteristic of his writing, Marshall described his revelation:

I saw a lot of water in the American River as I crossed it at Folsom. Was anyone using it for irrigation? The next morning early, the road leading to Galt, the next stop for the night, was along the bluff south of Folsom. The morning was bright, sunshine, blending the brown grasses and the few scattered oak trees under a blue canopied sky--a dream landscape--and west, south and north I saw the [Central] valley

of California, a natural buff canvas of endless beauty as far as the eye could see. There were strips of green shades and here and there green splotches, mixtures of yellowish grass-stubble fields, scattering oaks and strings of green along streams and stream-beds under the sky blue canopy--all aglow with the untempered light of that November sun--what a country! Then and there I paused, overpowered by the picture--an endless plain with not a house in sight. In my mind came the thought--irrigation, Maj. Powell's talks, alfalfa along Fountain Creek [in Colorado], of farms, colonial houses, fruit trees and vines, happy laughing children, health, happiness, wealth, contentment--a new world lay before me. I pledged my effort, that something must be done to reclaim those brown fields--endless. Thus, in November, 1891, was born in my soul the reclamation of the Valley of California, embodied in my Marshall Plan given to the people of California, without cost, in 1919....³⁶

Others told a different story. In 1957, Louis Bartlett, a prominent figure in California's water history in his own right, recounted a trip to the Sierra in 1890 one year before Marshall's "revelation" at Folsom. At Tuolumne Meadows he shared a campfire with Marshall and a survey party:

[Marshall] had been working with the government for some time, had gone through the Sacramento and San Joaquin Valleys, and also the mountains that fed them with water, and he gave us a picture of what could ultimately be done in the Central Valley if the mountain streams were harnessed and the water retained until summer and then released to the valleys for irrigation. He gave us so interesting and graphic a picture that I have never forgotten it.³⁷

Frank Adams recalled hearing Marshall speak several times in Berkeley in the 1890s or opening years of the 20th century. Marshall had an office on the top floor of the civil engineering building on the University of California campus. The panoramic view from his office prompted the geographer to speculate on the vast quantity of water "...flowing out of the Golden Gate from Sacramento and the San Joaquin and this idea came to him, it was an inspiration. Over the years he kept it in mind and finally outlined the plan and proposed it to the governor."³⁸

While the precise date of Marshall's vision is uncertain, he unveiled the plan that bore his name in September, 1919. It included a huge dam on the Sacramento River upstream from Redding at Kennett, the capstone of his project; a major "west side" canal skirting the Coast Range from this dam to Dos Palos in the San Joaquin Valley; a second canal along the east side of the Central Valley terminating at about Madera in the San Joaquin Valley; a third aqueduct along the flank of the Sierra from the Stanislaus River to Buena Vista Slough west of Bakersfield; and a fourth, horseshoe-shaped channel from the San Joaquin River south along the Sierra then north along the Coast Range to Dos Palos. Gravity dictated against the construction of two north-south canals spanning the entire Central Valley. Marshall also promised more water to the counties surrounding San Francisco Bay and to Los Angeles. A branch aqueduct would carry water from the west side canal to farms and communities near the

Bay, and Los Angeles would be served by a tunnel and aqueduct from the Kern River through the Tehachipi Mountains. This watercourse would connect with the Owens Valley Aqueduct and provide four times the water, by Marshall's estimate, than that source. To replace the water lost to Kern River users, the Klamath River would be turned into the channel of the Sacramento near Shasta Springs and diverted south. The Marshall plan also included storage reservoirs near major canals, but Marshall did not mention specific locations. However, he promised that his scheme would reclaim 12,000,000 acres of land in the Sacramento, San Joaquin, Santa Clara, Livermore, and Concord valleys and increase the value of that land by \$500 an acre. And while farmers in some parts of California paid \$15 an acre per year to irrigate their land, Marshall promised that the economies of scale achieved by his comprehensive project would reduce the price to \$1 an acre.

The entire project hinged on damming the Sacramento River at Kennett. The new reservoir, according to Marshall, would store enough water to cover the Sacramento Valley's irrigable land to a depth of three feet; maintain shipping from Red Bluff to San Francisco Bay; improve the navigability of the Bay itself; protect delta farms and communities from salt water intrusion; and create enormous amounts of hydroelectric power to lure factories and canneries into the valley and revive the mining industry. In particular, Marshall noted that the development of iron and copper mines near Redding depended on cheap power to run smelters.

Marshall promised something to everyone and to every section of the state. But the popularity of his scheme derived from more than its grand scale and anticipated benefits to water users. The construction work would provide thousands of jobs, and the reclaimed land thousands of homes, for returning veterans; so the Marshall Plan might help California escape the expected post-war economic slump. Moreover, the project did not require tax revenue. Marshall pledged that a bond issue could be retired by sales of water to farms and municipalities; revenue from hydroelectric power sales would pay the interest. Irrigation districts had used water stored for irrigation to generate power, and hence reduce the cost of water to farmers, for nearly a decade. But the Marshall plan tacitly assumed that the cost of reclamation had reached or surpassed the return from reclaimed land. Consequently, urbanites would bear part of the cost of rural improvement. Every gallon of water they bought would aid California agriculture, even though the cost of electricity might decline. Finally, Marshall sold his plan as a practical flood control project. He challenged the

"foolish levee policy" of the Corps of Engineers, arguing that a network of storage reservoirs in the foothills and canals which could double as overflow channels would offer better protection.³⁹

The Marshall Plan received a mixed reception. Its public debut came at an auspicious time. Food and land prices were soaring, there were no fears of overproduction, and the project's enormous cost seemed less of a burden than it would by the middle 1920s. Moreover, the drought of 1919 had produced severe water shortages in East Bay cities as well as on delta and San Joaquin Valley farms. The Antioch suit raised the specter of a new era of water litigation, litigation far more complicated, expensive, and protracted than earlier rural suits restricted to irrigators. Even though Marshall introduced his plan too late for consideration by the 1919 legislature, he hoped to enlist public support before the lawmakers reconvened in 1921.

A Shasta County newspaper, the Fall River Tidings, described the Marshall Plan as "...a scheme so huge as to stagger conception, and yet so comparatively simple as to commend itself to every sensible man and woman..." The Sacramento Union commented:

His plan is gigantic in its scope and tremendous in its results; for he would solve at once the problems of flood control, irrigation and navigation, and provide a domestic supply of water for all the large cities. He would bring 12,000,000 acres under cultivation by placing water upon lands now useless. He would develop hydroelectric power on a scale heretofore undreamed of. He would provide farm homes for 3,000,000 people, and increase production to an incalculable degree. He would add six billion dollars to the assessed valuation of the state.⁴⁰

By January, 1921, the plan had won endorsements from the San Joaquin Valley Water Conservation and Development Association, the Fresno Realty Board, Visalia Board of Trade, Lodi Business Men's Association, Arbuckle Chamber of Commerce, California League of Municipalities, American Legion, and a multitude of San Joaquin Valley farm organizations. Support for the scheme centered in the San Joaquin Valley, the section hit hardest by the drought.⁴¹

The strongest opposition to the Marshall Plan came from established irrigation districts, private power companies, and professional engineering societies. Many residents of the Modesto and Turlock districts worried that the scheme might drive down the value of land already under irrigation and slow the rate of settlement. Such districts already enjoyed an ample water supply.⁴² The San Francisco section of the American Society of Civil Engineers, which included some of California's best-known irrigation engineers, described the plan as "...physically, legally and financially impossible of accomplishment and the move to promote it, or any consideration of it by the legislature either directly or indirectly may prove

inimical to public interests...." The engineers maintained that there were no storage sites on the Sacramento River capable of capturing all the river's flood water. A complete storage system would still permit 1/3 to 1/2 of the water to escape into the Bay, and the "surplus" water supply would be needed to develop the several million acres of irrigable land in the Sacramento Valley. In effect, there was no surplus water to transfer south into the San Joaquin Valley and the engineers predicted that any attempt to divert the water would produce endless litigation. They also chided Marshall for not providing a detailed statement of the project's cost and estimated that the cost of irrigation would probably run about double the \$50 an acre he had predicted. Moreover, the plan had already delayed the construction of pending irrigation projects because promoters feared, or hoped, that the legislature might ratify the plan at its 1921 session. The project had also encouraged land speculation, particularly on the west side of the San Joaquin Valley. The San Francisco Engineering Council, representing local chapters of the American Society of Civil Engineers, American Institute of Electrical Engineers, American Society of Mechanical Engineers, American Institute of Mining Engineers and other professional engineering organizations echoed these criticisms. Other critics noted that while Marshall assumed that the state could limit riparian rights to beneficial use, the state would probably have to purchase those rights at a price which would further inflate the project's cost. The Marshall Plan also threatened to undermine the existing flood control program on which millions of dollars had been spent. The landowners themselves paid for most of the levee work, and they were reluctant to spend their money if the state would pay to protect them. Whether storage reservoirs and canals could do the job was open to doubt. Many critics believed that large storage reservoirs could not be constructed at a low enough elevation to provide flood protection. Thus, as the 1921 legislature began its work, the Marshall Plan enjoyed substantial popular support, but little favor from the experts.⁴³

Nevertheless, Marshall had the support of a powerful lobby. In late 1920 or early 1921, he formed the California State Irrigation Association to publicize his scheme. The association rented a two-story brick building across from the capitol and spent \$9,000 a month "educating" the public. It contained many warmed-over Progressives dedicated to expanding state control over natural resources. Most were dedicated to efficiency and opposed the increasing power of "the interests." specifically hydroelectric power companies. Some were also devotees of "central planning." The members included M.M. O'Shaughnessy, Harris Weinstock, Joseph H. LeConte, Elwood Mead, David Starr Jordan, Ray Lyman Wilbur,

Chester H. Rowell, and William Kent. An "advisory board" included State Engineer W.F. McClure and State Highway Engineer A.B. Fletcher. These men probably realized that the legislature would not accept the Marshall Plan entoto. However, the association's efforts might prompt the legislature to approve a hydrographic survey which, in turn, could provide the foundation for a comprehensive state irrigation project."⁴

As the legislature of 1921 convened, the post-war agricultural slump had just hit California and the future of agriculture in the state still looked very bright. The average per acre value of California crops was \$59.50, as opposed to \$20 an acre in Illinois, \$21 an acre in Iowa, and \$27.50 in Texas. During the second decade of the 20th century, California's population had increased by 44 percent; only Montana and Arizona grew faster. Who could worry about overproduction under these circumstances? Even though the price of some products had declined in 1920, most California boosters believed that with the help of new technology--such as refrigerated ships--and skillful advertising, prices would resume their climb. In 1923, the Division of Engineering and Irrigation predicted that by 1940 the demand for California farm products would increase by 300 percent over 1920."⁵

A bill authorizing a thorough examination of the Marshall Plan passed the state senate in 1921 and failed by a narrow margin in the assembly."⁶ However, the legislature did approve a \$200,000 appropriation for a general investigation. Forty years later, Frank Adams claimed that the Commonwealth Club, and Adams himself, should have received more credit for the legislation than Marshall:

I asked the state engineer how much he thought he could use profitably in the biennium [for an investigation] and he said \$200,000, so we prepared a bill appropriating that amount to the state engineer's department to make such a study. I took it up to Sacramento and showed it to Mr. Bradford Crittenden--whether he was then senator or assemblyman I don't remember. The club had already authorized us to promote that legislation. Mr. Crittenden said, 'That'll be my bill.'

The Commonwealth Club's bill failed to pass, but a compromise measure containing many of its features--including the appropriation--did."⁷

The Marshall Plan was a scheme to use all the state's water, to provide for maximum use of the resource itself; the legislature called for a plan to irrigate the maximum amount of land and provide maximum protection from floods. The state engineer launched the investigation in August, 1921, following organization of the Department of Public Works. The legislature imposed great responsibilities on the state engineer. The survey including gauging stream flows; searching for reservoir sites; classifying reservoirs according to cost and benefits; mapping the land irrigated in 1920; determining the total amount of

irrigable land in California and classifying it according to quality and yield; determining the water requirements of that land; investigating the feasibility of diversions of water from water-rich to water-deficient areas; estimating the potential power development on California's streams; recommending ways to prevent salt water encroachment; and assessing the effects of deforestation on stream flow.⁴⁹

By the spring of 1921, a rift appeared in the ranks of the California State Irrigation Association. In 1919, the Marshall Plan had been presented to the public largely as an irrigation and flood control scheme. The sale of electric power by the state was a vital feature of the project, but Marshall did not crusade for public power per se. In fact, initially many power companies probably supported the scheme not just because they hoped it would stimulate economic expansion, but also because the state might allow the private companies to distribute the electricity to individual customers, as they would later under the Central Valley Project. If the state built dams and generating plants, and sold the power cheap, the utility companies might enjoy windfall profits. But by May, 1921, the California State Irrigation Association contained many members who wanted the state to sell power directly to users and who considered this the most vital feature of the Marshall Plan. They were represented on the association's five-man executive committee by J.F. Mallon of Colusa and state senator L.L. Dennett of Modesto, who had helped reform California's irrigation district laws in 1909 and 1911. On the other hand, two members of the committee staunchly opposed public power. W.O. McCormick was Vice-President of the Southern Pacific Corporation and Alden Anderson was a prominent Sacramento banker who had served as Speaker of the California Legislature and Bank Commissioner. Opposition to public power was more than a philosophical or constitutional matter. The utility companies had enlisted the support of many "pet" banks by depositing roughly \$1,500,000 in various accounts, then absolving those friendly banks of the requirement to pay interest. In any case, C.A. Barlow--who had been elected to Congress as a Populist in 1896--represented a "swing" vote as the executive committee and apparently tried to mediate between the two factions.

After the power companies helped defeat the \$500,000 appropriation to investigate the Marshall Plan in 1921, many leading members of the California State Irrigation Association abandoned that group and formed the California State Water and Power League. They included Bennett, Rudolph Spreckels, J.R. Haynes, William Kent, James D. Phelan, Louis Bartlett, William Mulholland, and Franklin Hitchborn. Spreckels and Kent contributed part of their vast wealth to bankroll the new organization and put the issue of public power before the voters.

Dennett drafted the Water and Power Act and listened patiently to suggestions and amendments offered at a series of public meetings. The final version was ready in August, 1921. It authorized a \$500,000,000 fifty year bond issue bearing six percent interest. It also provided for the creation of a California Water and Power Board with full power to do "...any and all things necessary or convenient for the conservation, development, storage and distribution of water, and the generation, transmission and distribution of electric energy." The board would attempt to set water rates just high enough to pay the interest and principal on the bonds, but general state revenue could be used, if necessary, to supplement this uncertain source of revenue. No more than 20 percent of the power could be sold to private companies, and contracts to furnish power to such companies would be limited to five years. Predictably, the power companies opposed this measure. So did many irrigation districts and local officials. The opposition of irrigation districts has already been explained. The opposition of local officials grew out of their business ties or support for municipal utility districts. In either case, the Water and Power Act promised to give the state vast new powers and lead to a "centralization" which had become increasingly unpopular following the Russian Revolution. Proponents of the act promised that the state would distribute water through local districts and political subdivisions. Nevertheless, the act did not prohibit the state from selling electricity directly to individual consumers. And given the frequent public charges of corruption and incompetence levelled against the Railroad Commission-- which was responsible for regulating utility rates--this possibility seemed all the more real. In the fall election of 1922, the Water Power Act lost by 243,604 to 597,453 votes.

Robert Marshall's position on the Water and Power Act took a bewildering series of turns from 1922 to 1926. In 1922, he opposed the measure; two years later he supported a virtually identical bill; then in 1926 he returned to the opposition camp. He justified his opposition in 1922 on grounds that the legislation was inappropriate in light of the legislature's \$200,000 appropriation to prepare a state water plan. However, in 1923 Eustace Cullinan, a representative of California power companies who had organized the "Greater California League" in 1922 to oppose the Water and Power Act, admitted before a legislative committee that in 1921 or 1922 he had struck a bargain with leaders in the California State Irrigation Association. Power company officials agreed to pay the association \$1,250, and later \$2,500, a month to oppose the public power bill. Since the association's membership had virtually evaporated following the legislative battles of 1921, Marshall may have seen this source of

revenue as the only way to continue publicizing his plan. He doubtless also hoped to separate his project from the public controversy.⁵⁰

The Water and Power Act met the same fate in 1924 and 1926. In both years the issue of public power overshadowed the Marshall Plan, and in both years that issue floundered on the pervasive fear of "sovietization," what later came to be called "creeping socialism." Of course, by the middle 1920s agricultural conditions in California made a comprehensive irrigation plan less attractive than in 1919. C.A. Barlow, who had managed the California State Irrigation Association through its stormy early years conceded in 1924 that the plan "...cannot be made sufficiently clear to the average business man to get him to tackle it as a real proposition. They all like its idealization and it interests them but to really feel, as I have felt, that on its success depends the future of the State and the happiness of its people, that point you cannot get them to appreciate."⁵¹

Marshall's abortive run for the Republican nomination to a seat in the California Senate in 1926 reflected the waning interest in his plan. His district included Stanislaus, Merced, Madera, Calaveras, Tuolumne and Mariposa counties, and one of his two opponents, a director of the Turlock Irrigation District, pointed to the thousands of idle acres within established irrigation projects as the best argument against a comprehensive state irrigation project. Marshall countered that overproduction resulted mainly from planting the wrong crops, but the voters remained skeptical. He finished a distant third. Then, in 1927, tragedy compounded misfortune. Following a siege of hoarseness, perhaps exacerbated by the tough campaign, doctors removed Robert Marshall's larynx. This incapacitated Marshall for administrative work, and prevented him from defending his plan from the rostrum. Though he lived on into the 1950s, working as a little noticed landscape architect for the State of California, by the late 1920s his particular dream had been all but forgotten.⁵²

Meanwhile, in 1923 the Division of Engineering and irrigation presented the first "comprehensive" water plan to the legislature, one that looked far different from Robert Marshall's project. The division predicted that 18,000,000 acres could be irrigated in California at an average cost of \$80 an acre.⁵³ In all the division collected evidence concerning 1,270 reservoir sites and directly examined 3,500 miles of stream-bed and 176 potential sites. Its report suggested that the ultimate development of California's irrigation system would require 260 reservoirs.⁵⁴

The report considered California "...as a virgin territory with its waters and soils unsegregated in private ownership." In other words, the survey ignored the cost of acquiring

water rights and litigation, though it tried to integrate existing irrigation works into the proposed system. The recommended plan reflected several assumptions: that gravity-fed canals were impractical and too expensive; that some way had to be found to reconcile irrigation with the generation of hydroelectric power; that the project's cost had to be kept to a bare minimum to make it financially feasible; and that any state water project should be built in sections, not all at once.

The plan contained several major features. A dam across the Carquinez Straits of San Francisco Bay would prevent salt water incursions into the delta, help reclaim the tidal flats along the margin of Suisun Bay, provide unlimited fresh water for communities and farms in the Bay Area, and serve as a bridge for automobiles and trains. More important, much of the water captured behind this structure would be diverted into a 200 mile long aqueduct linking the Sacramento-San Joaquin delta with Tulare Lake. Essentially, this was the West Side canal promoted by the San Joaquin and Kings River Canal and Irrigation Company and the Grange in the 1870s--except that the flow of water moved south instead of north. Marshall's gravity-fed canals followed the contours of the Coast Range's foothills, but this canal ran along the valley floor. The report concluded that gravity-fed canals had to be very large and

tortuously [follow] a grade contour on steep mountain hillsides and [wind] in and out around every rocky spur and into each receding ravine. The total length attained in its devious route would double or treble the air line distance of five hundred miles between the source of supply in the Sacramento River and the extreme southerly lands to be watered. The cost of constructing crossings for a gravity canal at the innumerable drainage channels that it would intercept, alone would probably exceed the total cost of all the works of the comprehensive plan.

The division proposed nine pumping plants to lift the water up the valley's gradual grade. Tulare Lake's vast capacity as a storage reservoir would reduce the size of the canal and pumping plants because they could operate eleven months a year. The canal would serve over 2,000,000 acres.⁵⁵

The report paid scant attention to power revenue, probably because most of the energy would be used to run the pump stations. The state engineer had decided that if all storage reservoirs were built below 2,500 feet, the needs of agriculture could be reconciled with those of hydroelectric power companies upstream. In particular, water used to generate power in the winter could be captured for re-use by farmers during the growing season. In addition, by building dams in the foothills, no pump station would be further than 100 miles from a power station and the canals which connected dams and valley farmland would be shorter and cheaper.

The water plan also proposed other feasible diversions including a tunnel to carry water from the Eel and Trinity rivers into the Sacramento Valley; an all-American canal from the Colorado River into the Imperial and Coachella valleys; an aqueduct from Mono Lake to Antelope Valley north of Los Angeles; and a canal from the Carquinez dam through Contra Costa County into the rich Santa Clara Valley. The largest proposed watercourse, aside from the west side ditch, stretched from the Merced and Tuolumne rivers to the south end of the San Joaquin Valley. The plan also included many shorter canals, as well as "spreading grounds" to replenish Southern California's underground water.⁵⁶

The 55 page report was almost as sketchy as the Marshall Plan--which it never mentioned.⁵⁷ Its failure to consider the vast array of legal problems involved in implementing a state water project was matched by the absence of any consideration of the project's possible effects on flood control and navigation. For those like Marshall, committed to the total development of California's water supply, the report was a profound disappointment. Nevertheless, many of its features, including the salt water dam and pump aqueduct, helped shape future state proposals and public discussions.

The frugal 1923 legislature refused to fund further studies of California's water supply. However, in September, 1924, the San Francisco and Los Angeles chambers of commerce gave the Division of Engineering and Irrigation \$90,999 to study Tulare County's rapidly declining water table. Kern County had experienced the same problem, but Tulare County suffered most because it contained only two small streams, the Kaweah and Tule. The Tulare County survey rejected the west side canal as too expensive. Like the 1923 report, it assumed that individual landowners would have to pay the entire cost of dams and canals, and that Tulare farmers could not afford to transport water 200 miles and lift it 250-350 feet. So the state engineer proposed an elaborate "water exchange." First, a gravity canal would divert water from the Upper San Joaquin River at Friant south to the Kings River. This water would serve the two largest users of the Kings River, the Fresno Irrigation District and Consolidated Irrigation District. In turn, the Kings River water saved would be stored in a reservoir at Pine Flat for exclusive use in Tulare County. So much for Tulare County, but what about those farmers who used the San Joaquin? Their water would be replaced by water from the Sacramento River delivered through the channel of the San Joaquin by an elaborate dam and pump system which would literally reverse the stream's flow. The state engineer estimated this project's cost at \$12,876,800, or \$107,30 an acre, excluding the cost of reservoirs. This report also touted the value of reservoirs for flood control,

another major difference from the 1923 water plan. It suggested that foothill reservoirs could cut maximum floods in half without reducing their effectiveness as storage sites, but this assumption was based on little solid evidence. The diversion had just begun to study ways to coordinate the use of reservoirs for different purposes. In addition, the report recognized the value of a reservoir at Kennett, five miles downstream from the confluence of the Sacramento and Pit rivers--Robert Marshall's favorite site--and reaffirmed the desirability of a salt water barrier.⁵⁸

In 1925, following another severe drought, the legislature appropriated \$150,000 and ordered the Division of Irrigation and Engineering to prepare a broader water plan that considered all uses of water, not just irrigation and power generation. This decision came in part because in 1924, as in 1920, the Corps of Engineers seemed ready to cut off or severely restrict diversions from the Sacramento River to protect navigation. It also reflected recognition that drought would continue to ravage California agriculture unless the costs of a state water plan could be spread out among many different groups of water users.⁵⁹

This incipient state water plan received a severe setback on December 24, 1926 when the California Supreme Court issued its decision in Herminghaus v. Southern California Edison Company.⁶⁰ The case began in the Fresno Superior Court in August, 1924, during the dog days of the drought. By the 1920s, the Southern California Edison Company exercised a virtual monopoly over power development on the San Joaquin River. However, since the river's water had long since been appropriated by farmers, power companies, miners and other water users, Southern California Edison, which owned land adjoining the river, claimed the right to store water under its riparian rights. Ironically, it also filed an appropriative claim. Most water lawyers had assumed that riparian rights did not include the "flood water" which emptied into the ocean as the snow melted in the spring, so the power company's claim represented a substantial expansion of the riparian doctrine. This claim was contested by the owners of the 18,000 acre Herminghaus ranch and others. The ranch was on the south side of the river above Fresno Slough, well downstream from the power company's proposed dam. It was leased to heirs of the Miller & Lux estate for a dollar an acre a year and used largely for grazing. The ranch's owners, joined by other nearby riparian owners, insisted that any new dam upstream would violate their "right" to use the river to flood pasture land. By the middle 1920s, even many riparian owners questioned the right to flood land to raise grass for forage, and the electric company claimed that the generation of power was a higher water use than the production natural grasses. The case boiled down to two issues: first, should any

"standard or reasonableness" apply to riparian rights, and, second, did riparian rights include the right to store water to generate electricity?⁶¹

California officials recognized the many dangers posed by this contest between riparian owners. On the one hand, in 1919 riparian rights served less than six percent of California's irrigated land. The state's brief pointed out that the courts traditionally limited riparian owners to diversions "by the ordinary and usual methods"; flooding, it argued, was not a "usual" or "ordinary" method. A decision in favor of the Herminghaus interests would be wasteful for several reasons. Clearly, raising forage was not a particularly valuable use of water. In addition, flood irrigation was inherently wasteful because the diversion was not controlled or measured. Finally, demanding the full flow of a stream to transport the small amount of water which overflowed river banks obviously hurt upstream users.

On the other hand, the power company's claims were even more revolutionary. Power companies, miners and municipalities had traditionally obtained their water through appropriation; every one of the seventy-six reservoirs built primarily to generate power had been filled using such rights. The Southern California Edison Company's claims threatened a race among riparian owners to acquire storage rights. It also challenged the legal premise that riparian rights were limited or defined by geography. If such rights could "shift" upstream, then no rights along that stream were safe. Moreover, the Division of Water Rights' efforts to regulate storage through permits would be undermined and the permits already issued rendered worthless. The already difficult task of determining the state's surplus water supply would become impossible.⁶²

Two federal agencies took nearly as much interest in the suit as the state. The Reclamation Service opposed the power company's claim because it threatened the Orland Project's water supply as well as potential federal storage projects on the Kings and San Joaquin rivers. In addition, the Bureau had recently filed an adjudication suit on the Carson River, a stream which originated in California but served the Truckee-Carson Irrigation Project in Nevada. Riparian owners along the Carson eagerly awaited the Herminghaus decision and refused to cooperate with the Bureau. Meanwhile, project officials in Nevada worried about what would happen to their water supply if the California Supreme Court supported the power company. Ironically, the Service did not have the Justice Department's assistance. The Federal Power Commission had granted the electric company the right to build a dam and generating plant and flood government land in the process. Even though Southern California Edison's claim threatened power projects previously approved by

the F.P.C., that agency demanded legal protection for its permit. Apparently, the F.P.C. wanted to assert or maintain federal sovereignty over water used to generate power.⁶³

The Supreme Court upheld the Herminghaus interests.⁶⁴ While it refused to consider that section of the Water Act of 1913 which limited riparian rights to beneficial use, it did invalidate Section 42 which forbade the use of more than 2.5 acre feet of water per acre to irrigate grasslands. In effect, the court ruled that 98 percent of the volume of a stream could be preserved from use so that the remaining 2 percent could be used. This controversial decision--the most significant water case since Lux v. Haggin nearly fifty years earlier--seemed to undermine the state water plan. State Engineer Paul Bailey predicted that the state would have to buy up all riparian rights before construction could begin.⁶⁵ On November 6, 1928, California voters approved a constitutional amendment limiting riparian rights to "reasonable use," but it had little effect. Defining "reasonable" proved difficult and both the California and United States Supreme Courts ruled that since this limitation on riparian rights destroyed private property, riparian owners deserved compensation.⁶⁶

Meanwhile, the state water plan continued to take shape, however slowly. It was built on several unquestioned, seldom spoken, assumptions. The critical assumption was that benefits outweighed costs. Since no study had been made of the legal obstacles to building a state system--including the cost of condemning riparian rights--this remained an open question. Second, since the state plan would integrate and supplement, rather than replace existing systems, it could not be sold as the most efficient possible water system. It was not based on the "best" uses of water, but on who needed the water most--and, implicitly, who had the greatest political influence in Sacramento. Finally, by 1927 State Engineer Paul Bailey, and many members of the legislature, assumed that the project could not pay for itself even with a substantial "subsidy" from electrical power revenue. Some way would have to be found to persuade the federal government to help bear the burden.

By 1927, the plan included dams on the Sacramento, Feather, Yuba, Bear, American, Trinity, Upper San Joaquin, and Kings rivers, the cost of which constituted over 80 percent of the project's anticipated price-tag of \$358,000,000. The state plan unveiled in 1923 included fewer dams and longer canals, and the canals cost as much as the reservoirs. But reservoirs could serve more purposes than canals. State Engineer Bailey noted that the dams planned for the Yuba, Feather, Bear and American rivers would trap mining debris and help revive that industry. They were also cheaper and more predictable than the salt water

barrier, which Bailey dropped from the state plan. The barrier's anticipated cost of \$45,000,000 to \$90,000,000 nearly matched the price of Kennett reservoir, and many engineers had questioned its feasibility. Even more important, by 1927 Bailey had supervised the first studies of the effect of reservoirs on flood control. He found that floods usually followed predictable patterns; that the heaviest flow came in late January or early February from heavy rains; that the most frequent floods occurred in May or June due to melting snow; that peak floods came during years of heavy run-off generally; and that storage for irrigation and power generation could be regulated to reduce the volume of a "25 year flood" by half.⁶⁷

Bailey recognized that more reservoirs meant more opportunity to generate electrical power. He noted that "...the plan proposes to operate these reservoirs for the first period of years in a manner that will produce the greatest revenue from power" and estimated that the proposed dams would equal the power produced by all of northern California's plants in 1927.⁶⁸ Nevertheless, no one could predict how much income power sales would produce. Who could determine precisely the rate at which California's cities and industries would grow, or which cities would expand the fastest? Then, too, the large new power supply was likely to reduce electricity prices by producing a temporary glut in the market. Finally, the amount of revenue depended on whether private companies, municipal utility districts, or the state itself distributed the power. The state engineer had side-stepped this potentially explosive issue.

The 1927 legislature took several steps toward implementing a comprehensive state water project. First, it formed a joint legislative committee to study the plan and hold public hearings. The committee quickly realized the danger posed by riparian rights and recommended the creation of a special administrative tribunal to speed up the process of condemning private land and water rights and fixing compensation. It also recommended that the state "reserve" most of California's unappropriated flood water.⁶⁹ The legislature complied with the second request and authorized the Department of Finance, with help of the Department of Public Works, to withdraw all the water needed for up to four years. Any withdrawal could be renewed by the legislature. On July 30, 1927, the Finance Department filed 16 permits to use water for irrigation and another nine to reserve water for the generation of power. The streams involved included the Trinity, Pit, Sacramento, Feather, Yuba, Bear, Cosumnes, American, Mokelumne, Calaveras, Stanislaus, San Joaquin, Kings, and Kern rivers and their tributaries. The legislature also appropriated \$200,000 for the purchase of reservoir sites.⁷⁰

The joint legislative committee submitted a formal report to the legislature on January 18, 1929. Since the state engineer's office had paid scant attention to the legal ramifications of the water plan, the committee asked a group of prominent California water lawyers, including S.C. Wiel and E.F. Treadwell, to survey potential legal obstacles. The attorneys devoted most of their attention to riparian rights, in part because they worked in the shadow of the proposed constitutional amendment ratified by the voters in November, 1928.⁷¹

The issues they considered were extraordinarily complicated. Since both the Sacramento and San Joaquin rivers were navigable, the state's rights to such streams became critical. Most state officials assumed that even if the federal government retained ultimate sovereignty over navigable waters, the nation had relinquished much of its authority to the states. But assuming as much, did the state control all water in navigable streams or only that amount needed to protect navigation? Moreover, who owned the bed of such waterways, especially that strip of riparian land between high and low water marks? The legal committee noted that even if the state could deny riparian rights on the navigable sections of streams, such an act would not extinguish riparian rights upstream on non-navigable tributaries.⁷²

Nor did the state's police powers offer an attractive tool to curb riparian rights. Most lawyers conceded the state's right to control the acquisition of water rights, regulate the distribution of water, and even prevent waste. But did its authority to prevent waste extend to limiting riparian rights to beneficial use without condemnation or compensation? The 1913 water code suggested as much, but the legal committee noted:

There can not be much serious question that the Legislature has full power to require such economy in the use of water as is necessary, at all events, in order that all those entitled to use the water may enjoy it. But, whether it can make like regulations for the purpose of making a more extended use of the water by a general plan for the conservation and use of the waters of the state in the interest of the public presents a different question.

Clearly, the police power often extended beyond mere regulation. For example, city, county or state limitations on the height of buildings also imposed a limitation on the value of certain pieces of land; land zoned for commercial development usually sold for more than residential property. But even assuming that the state could restrict riparian rights to beneficial use without compensation, only the courts could define "beneficial" (or "reasonable").⁷³

Condemnation offered a surer alternative, but it, too, raised vexing questions. Aside from the obvious question of who would conduct the proceedings--the superior courts, Division of Water Rights, a special court or administrative tribunal--the legal commission

doubted the feasibility of condemning part of a riparian right. If riparian owners were limited to the amount of water they actually used, what responsibility would the state have in dry years when there was not enough water to go around? By defining riparian rights as specific quantities of water, the state might render itself liable to guarantee those amounts. Yet, the cost of condemning all the riparian rights which might conflict with a state water plan would be enormous, perhaps prohibitive. These problems barely scratched the surface. How to restrict riparian rights used to generate power or, as in the Delta, to prevent salt water incursion, posed even thornier issues.⁷⁴

The report of the joint legislative committee itself contained several surprises. First, the committee supported the salt water barrier even though the state engineer had rejected such a structure in his 1927 report.⁷⁵ A Reclamation Bureau engineer had argued that the barrier would be vital to any state water project. With or without the Kennett reservoir, he argued, diversions from the Sacramento River into the San Joaquin Valley would reduce the flow into San Francisco Bay.⁷⁶ The joint committee also promised that a barrier at Point San Pablo would capture enough water to irrigate 51,000 acres of marshland and 48,000 acres of high land around San Pablo Bay. If constructed at the Carquinez Straits, it would irrigate 70,000 acres of marshland and 93,000 acres of high land surrounding Suisun Bay. The appreciation in land values would exceed \$8,000,000. Moreover, 169,000 acres of delta land threatened by salt water should be spared, litigation reduced, and industrial development stimulated. The joint committee warned that if northern California failed to provide a sufficient industrial water supply to attract new industries, Seattle or Portland could and would.⁷⁷

A second major recommendation of the joint legislative committee involved the sale of electrical power. The committee relied heavily on consulting engineer Lester Ready's survey of Kennett Dam's potential and the anticipated power needs of northern California. Ready estimated that Kennett would yield an average 1,217,000,000 kilowatt hours of power each year, about 38 percent of the electricity used within a 50 mile radius of San Francisco in 1927. He predicted that the future needs of the Bay Area, Kennett's major market, would increase from 3.2 billion kilowatt hours in 1927 to 5.3 billion kilowatt hours in 1936 (the earliest year Kennett could be ready). In short, California's increasing appetite for power insured that the price of electricity would remain stable or increase. The state could expect an annual revenue of \$4,250,000 if it sold the power at the dam, or \$5,300,000 if it delivered the electricity to the Bay Area. However, the cost of stringing transmission lines

and constructing relay stations would add \$110,000,000 to the dam and power plant's \$70,000,000 to \$80,000,000 cost.⁷⁶

The decision to sell Kennett's power to private utility companies at the dam, or "switchboard," was not a "sell-out." State officials recognized that such companies might provide potent opposition to a state water plan, as they had helped block the Water and Power Act in 1922, 1924, and 1926. The support, or a least acquiescence, of these corporate interests was a prerequisite to winning the approval of California voters at the polls. The joint committee also concluded that the cost of building a "power grid" would exceed the revenue returned to the state, and that duplicating existing transmission works would be wasteful. What if the state could not sell electricity at a price low enough to compete with the private companies? By selling the power under contract, the state reduced or eliminated many risks. The power sold at Kennett would pay more than 90 percent of the principal and interest on 40 year bonds and secure valuable political support.⁷⁹

The legislative committee issued a supplemental report in April, 1929, which presented a thorough summary of its conclusions and recommendations. It proposed that the legislature accept the state engineer's Bulletin # 12 issued in 1927 as the state water plan and without the salt water barrier the lawmakers had recommended in January. The decision to drop the barrier was largely political. Southern California's leaders recognized that years might elapse before construction began on the state project, and they decided that local water users could afford to build the Colorado River Aqueduct out of Boulder Dam without state aid. But with only the Santa Ana Flood Control Project left to benefit Southern California, what incentive did its voters have to vote for the plan? The barrier was sacrificed not just because it was expensive and might interfere with navigation, but also because it promised to aid the industrial development of northern California at the expense of the south counties. Without the salt water barrier, more political support could be expected south of the Tehachapis.

The supplementary report concluded that the cost of the Santa Ana Flood Control Project should be shared equally by the state and the districts directly benefitted. It also recommended that the state assure Sacramento Valley residents that the section's "ultimate" water needs would be satisfied before any water was transferred into the San Joaquin Valley. If the joint committee had its way, all future water projects would conform to the state water plan; the state would distribute the water; costs would be apportioned according to

"benefits recieved"; and federal aid would be solicited "...upon the basis of navigation, flood control, irrigation, and other benefits that would accrue to the nation at large."⁸⁰

The 1929 legislature refused to begin building the state water project. Most lawmakers recognized that unless something was done to win greater support in southern California, the plan would die at the polls. Then, too, they hoped to win a promise of federal financial assistance before authorizing the work. Consequently, the legislators appropriated \$450,000, cut to \$390,000 by Governor C.C. Young, to continue engineering studies; ordered the joint committee to prepare a more formal water plan for consideration by the 1931 legislature; and appointed a special committee headed by former Governor George Pardee to travel to Washington in quest of federal aid. Much of the appropriation was earmarked for surveys of the Santa Ana and Mojave rivers in southern California, but it also paid for the first snow survey. State engineers hoped that if in the winter they could predict the spring run-off, farmers would plant fewer acres or less thirsty crops in dry years.⁸¹

Governor Pardee's committee found a receptive audience in Washington. President Hoover appointed a special federal commission consisting of Reclamation Bureau Chief Elwood Mead, Lt. Colonel Thomas M. Robins of the Corps of Engineers, and Frank E. Bonner, Executive Secretary of the Federal Power Commission to confer with the California delegation. Only Robins participated in all the meetings between the two groups, but the other two federal officials concurred in the recommendations of the "Hoover-Young Commission," as it came to be called.

The Hoover-Young Commission ratified the water plan recommended by the joint legislative committee in 1929. It emphasized that the project was a "relief measure," not a scheme to reclaim more arid land, and predicted that 200,000 acres in the San Joaquin Valley would return to desert without water to supplement underground sources. Most important, it promised substantial aid:

We recommend, therefore, that the project be constructed by the Federal Government, it meeting the cost thereof, in the first instance, and that the works, when completed, be operated by the State as far as practicable. We also recommend that the State lend its aid and justify the Federal Government in undertaking the construction of the project by guaranteeing to it the payment of interest and the repayment of principal through sinking fund payments so that the cost will be amortized at the end of fifty years. By cost in this connection, that is, the cost for which government is to be reimbursed, we mean of course actual cost less the amount of such direct contribution as the Federal government may make because of benefits in the way of flood control and improvement of navigation.

Kennett Reservoir could be paid for from power revenue supplemented with federal flood control and navigation grants. But the Friant Dam on the Upper San Joaquin River, without

which no diversion south into Kern and Tulare counties was possible, did not justify direct federal aid and ultimately most of its power would be consumed lifting water up the San Joaquin River from the delta. The Hoover-Young Commission did not suggest how to pay for this dam. But it argued repeatedly that the project could not be built unless the state could sell 3½ percent bonds. Only gilt-edged bonds bore such low interest, and they would not sell unless the federal government participated directly.⁸²

Meanwhile, in 1929 and 1930 the state water plan aroused considerable controversy in California, and not just south of the Tehachapis. Part of the controversy grew out of the prospect that the salt water barrier would be restored to the plan. In a speech delivered in the Suisun Bay community of Pittsburgh, Bert B. Meek, California's Director of Public Works, described the barrier as "an important part of the whole great scheme of water conservation." "When this program is completed," said Meeks, "we are coming down here ask your people to help us put the program over with a bang, and I know you are going to do it as you will be directly benefitted."⁸³ Meeks assured his audience that Governor Young was not, as was commonly reported, opposed to the barrier. State Engineer Edward Hyatt went even further in rounding up political support. At a State Realtors Association convention in Brentwood, just south of Suisun Bay, Hyatt called the barrier "a great thing" and an "ultimate necessity" which would be constructed "at the proper time." Finally, in June, 1930, gubernatorial candidate James Rolph endorsed the barrier. This new-found support was not simply political rhetoric. The War Department, Coast Geodetic Survey, Geological Survey, and state health department were all studying the feasibility of a salt water dam.⁸⁴

Bay Area proponents of the dam claimed a natural alliance with delta farmers and communities upstream on the Sacramento and San Joaquin rivers. They promised that the barrier would protect delta farmland, reduce litigation, and promote trade on the two streams. But the scheme's strongest support came from land developers, real estate companies, and local chambers of commerce. An engineer representing the owners of 60,000 acres of delta farmland warned the Hoover-Young Commission that potential flood damage from heavy run-off captured by the barrier far outweighed any damage caused by salt water intrusion into the water table. And the chairman of the Stockton Chamber of Commerce's "marine committee" charged that the barrier would discourage river transportation and retard or prevent the city's development as an inland port. Of course, Stockton's economic health also depended on the prosperity of the irrigation districts upstream on the San Joaquin whose water claims had been contested by the towns surrounding Suisun Bay and delta farmers.⁸⁵ In any case,

whether the barrier would promote industrial development in the upper Bay Area remained an open question. A special committee consisting of the deans of Stanford's Graduate School of Business and U.C. Berkeley's College of Commerce, along with a consulting engineer reported that if the dam was paid for by a local tax, that assessment might do as much to retard industrial growth as promote it. The available water supply was only one reason companies decided to build in one place and not another; fuel and labor costs were much more important. The committee found no case where a company rejected the upper Bay Area because of saline water. It concluded: "The upper San Francisco Bay area affords a most attractive combination of location factors for industries which require relatively large tracts of land, low cost transportation, proximity to large cities and, at the same time, the comparative isolation of a country site." That the south shore of Suisun Bay offered the cheapest land around the Bay counted for far more than the quality or quantity of fresh water.⁶⁶

Within the Central Valley, there were plenty of additional critics of the state water plan. In the San Joaquin Valley, many upper valley farmers worried that diversions from Friant Dam south would reduce their ample water supply even while they paid higher state taxes to "subsidize" the state project. Other farmers wondered why reservoirs they planned to build to supplement an inadequate water supply, such as the one at Pine Flat, had not been included in the plan. Sacramento Valley water users charged that farmers in the San Joaquin Valley wasted water. They also denied that there was any surplus water to export and worried that litigation over water rights would reduce the value of their land and make it unmarketable. The parochialism and sectionalism characteristic of California water politics since the 1870s often reappeared. For example, an Oroville newspaper resented any effort to "bail out" Tulare County:

The individual frequently guesses wrong and invests improperly, but seldom is the state asked to penalize itself to make good for the incorrect guess of the individual or the group. The Tulare county farmers guessed that their water supply was good, but they guessed wrong and invested improperly. Should the state be asked to make good their investment now that their land is preparing to return to the desert? Should the state be asked to make a great river flow uphill and such water hundreds of miles from a land not yet developed but which may in the near future need this same natural resource for its own development? The farmers of rich Stanislaus county are in great fear that rising water tables will destroy the fertility of their soils. We do not hear them asking relief of the State, and yet if Tulare can do it what is to prevent Stanislaus at some future time asking relief on the same precedent?

The Oroville-Wyandotte Irrigation District's Chairman of the Board commented: "The entire population of Tulare county could be moved up here and every resident given a farm for the amount of the bonds which it would be necessary to issue for the project."⁶⁷

Sacramento Valley farmers knew they could not block the project at the polls, and many tried to console themselves with the hope that the project's enormous cost, multitude of different interest groups, and threat of litigation would prevent it from being built. They found a champion in A.M. Barton, Chief Engineer of the State Reclamation Board. He predicted that the project would take twenty years to complete. In the meantime, he proposed that the state build reservoirs on the American River at Auburn, Folsom and Coloma after negotiating repayment contracts with beneficiaries. These dams would generate power as well as provide flood control and water for irrigation. He noted: "Construction of storage works by the state is so uncertain and so subject to delay as to warrant its rejection as a possible solution. The introduction of a political football into the situation will in no measure benefit the parties now injured or subject to injury."⁶⁸

In southern California, attention focussed on the Colorado Aqueduct and Santa Ana Flood Control Project. The latter was not entirely a flood control scheme; it was also expected to help replenish the basin's underground water and store water from domestic use. The state had spent so much on flood control in northern California, that a southern California project was long overdue. But the aqueduct was much more controversial. The canal, along with Parker Dam, promised both water and power for future industrial development in the Los Angeles basin. As already mentioned, southern Californians feared that construction of the aqueduct would be delayed for years if it was included in the state water plan. Many boosters also worried that if the state underwrote the project, it would find a way to set water rates and parcel out the new supply. State officials also considered contributing to the construction of the All-American Canal which had been included by Congress in the Boulder Canyon Act of 1928. But the state could not compete with the Reclamation Bureau's no interest loans, and the Imperial Valley's handful of voters could provide little help in winning the adoption of the state water plan. The feasibility or actual need for component projects in the plan mattered for less than where the votes were located and in what numbers.

State Engineer Edward Hyatt forwarded his long-awaited formal water plan to the California legislature on March 4, 1931, culminating 10 years of study by his office and over \$1,000,000 in appropriations by the legislature. No one expected the legislature or voters to accept the plan in its entirety. It included 24 reservoirs with an aggregate storage capacity of 17,817,000 acre feet of water, six major canals, and a price tag of between \$500,000,000 and \$600,000,000 depending on whether the dams included power stations. In December, 1933, the state's voters narrowly approved a \$170,000,000 bond issue to pay for the Kennett

reservoir, the San Joaquin-Kern river aqueduct, and the Santa Ana Project. The Central Valley Project, as it came to be known, had faced stiff opposition from the state's power companies, which claimed that California did not need any more electricity and warned of the perils of socialism. The final vote--459,712 to 426,109--reflected both the persistence and attenuation of sectionalism in California water politics. Los Angeles rejected the plan 2 to 1, demonstrating the traditional north-south rivalry. But north of the Tehachapis, the plan attracted rural as well as urban support, and transcended the traditional split between the Bay Area and interior counties. San Francisco voters approved the state project by 2 to 1; Sacramento County voters by 9 to 1; Shasta County voters by 18 to 1; and Tulare County voters by 20 to 1. Unquestionably, the adoption of the state plan depended on drought and depression. California's worst drought descended on the state in 1929 and persisted until 1935; few farmers could resist the lure of a state irrigation project under such circumstances. Doubtless many urban voters believed that the project would contribute to the economic prosperity of the state as a whole. It also offered a more immediate benefit: 25,000 or more public works jobs which would help soften the effects of the Great Depression. The voters had not affirmed the New Deal's faith in Central Planning or Conservation, or even reaffirmed the Progressive devotion to efficiency and the "common good." Most voted their pocketbooks.⁸⁹

The state bonds were never sold. Congress authorized full federal construction of the Central Valley Project in 1935 and construction began in 1937. The Reclamation Bureau, under the leadership of California's old friend, Elwood Mead, did most of the work. After three decades, the Bureau finally got the chance to participate in a substantial California reclamation project but only by stretching the Newlands Act of 1902 to the breaking point. The C.V.P. provided water exclusively to private land already settled, and completely abandoned the anachronistic goal of providing family farms for the homeless. It also abandoned the requirement that the land itself bear the cost of reclamation. Reclamation Bureau subsidies to agriculture date to the depression years of the 1930s, and to the notion that the nation could increase the wealth of a region by increasing the productive capacity of the soil. And, of course, the C.V.P. also popularized the principle of multiple-use water development. Kennett Dam, for example, provided water for irrigation, electric power, navigation, and salinity reduction in the delta besides reducing flood damage.⁹⁰

The 1920s proved to be a turning point in the history of agriculture in California and the West. By the 1920s, few boosters spoke of using irrigation to break up large landholdings,

restore the family farm, provide homes for jobless city dwellers, or reinforce traditional American values. The West had entered a new era. Little public land remained, successful farming required much more knowledge than it had in 1880 or 1890, and the price of farmland had become far more expensive. Irrigation itself had become so costly that farmers demanded subsidies from power revenue, the state, and the nation.

Ironically, the state's responsibility to promote irrigation had increased dramatically during a "conservative" decade when retrenchment became the battle cry. This does not demonstrate the "persistence of Progressivism" as much as it underscores the increasing wealth of California during the 1920s. Not only had farmland become much more valuable, encouraging the use of every tool or technique to tap its full wealth, but the state had much more money to spend. The increase in population and tax base, as well as the state's increasingly diversified economy, made vast public water projects feasible. In 1900, the state was simply too poor to look at specific water problems--such as the San Joaquin Valley's declining water table--as a responsibility of government. One measure of California's new wealth could be seen in the value of its agricultural products. In 1900, the state ranked 16th in the nation in the value of its crops, but by 1930 it ranked second, with an annual return of \$537,378,777.⁹¹

The story of the evolution of a state water plan in the 1920s cannot end without a postscript concerning Robert Bradford Marshall. In 1959, Frank Adams provided a fitting tribute to the Marshall Plan. "It wasn't a plan, it was an idea," explained Adams, "but we need inspirations of that kind." As a result of his proposals great sentiment was created for a state study, right in the grass roots up and down the state. So I give credit to Colonel Marshall for that, as well as for finding Kennett Reservoir." Yet Marshall regretted that the state plan did not provide for full development of all the Central Valley's irrigable lands, that many features of his plan had been abandoned, and that few Californians paid homage to his dream. The old Progressive, deprived of speech, poured out his bitterest feelings on paper. For example, in 1935 he wrote:

Today, as I sit on the side lines I am amused that the State Engineer calls the project the State Central Valley Water Plan. Never has there been given me the faintest suggestion of credit for originating the idea as briefly outlined in the Marshall Plan data. Thank God I am not small enough to resent the intentional discourtesy. I know I did my duty. I am happy that our people will benefit by my unselfish effort in their behalf.

Marshall exaggerated his contribution. The Central Valley Project dated at least from the 1870s and had many fathers. By the 1920s, master builders like William Mulholland and

Bob Marshall were a dying breed giving way to a more cautious breed of engineer more interested in how to get the job done than in the scope and grandeur of the job itself. The 19th century engineer, whose reach often exceeded his grasp, and whose bold projects frequently left the public breathless with awe and anticipation, became an anachronism as water projects became more and more complicated. By the 1920s, the agricultural frontier had been conquered for good. Farming had become agribusiness.⁹²

NOTES

CHAPTER VII - TOWARD A STATE WATER PLAN : IRRIGATION IN THE 1920s

1. See the chart entitled "Precipitation Variability" in the California Water Atlas (Sacramento, 1978), 7.
2. Seventh Biennial Report of the Department of Engineering of the State of California, 1919-1920 in Appendix to the Journals of the California Legislature, 44 sess., v. 5 (Sacramento, 1921), 137.
3. The quote is from Edward Hyatt, "Control of Appropriations of Water in California," Journal of the American Water Works Association, 13 (February 1925), 142. On rice cultivation see Third Biennial Report of the State Water Commission of California, 1919-1920 in Appendix to the Journals of the California Legislature, 44 sess., v. 1 (Sacramento, 1921), 58; Report of the Division of Water Rights, November 1, 1922, Appendix to the Journals, 45 sess., v. 4 (Sacramento, 1923), 95.
4. Third Biennial Report of the State Water Commission of California, 1919-1920, 152-155.
5. Pacific Rural Press, 100 (December 18, 1920), 791, 794; Seventh Biennial Report of the Department of Engineering of the State of California, 1919-1920, 51-53, 77.
6. Biennial Report of the Division of Water Rights, November 1, 1924, in Appendix to the Journals of the California Legislature, 46 sess., v. 4 (Sacramento, 1925), 100-118; The Sacramento Bee, January 25 and 26, 1924. On subsequent efforts to conserve Sacramento River water see the Sacramento Union of July 27, November 2 and December 12, 1924 and the Bee of December 11, 1924.
7. Seventh Biennial Report of the Department of Engineering of the State of California, 1919-1920, 53, 70-74.
8. Biennial Report of the Division of Water Rights, November 1, 1924, 106.
9. Seventh Biennial Report of the Department of Engineering of the State of California, 1919-1920, 58, 68-70, 76-77.
10. "Irrigation and Agriculture," Transactions of the Commonwealth Club, 20 (November 24, 1925), 359, 374; Chico Record, July 28, 1929.
11. J.B. Lippincott, "Recent Irrigation Development in California," California Cultivator, LXII (January 26, 1924), 91, 107, 111; Frank Adams, "California Irrigation Development," in Transactions of the Commonwealth Club, XV (December 1920), 333, 335; "California Has Water Enough for Millions of Acres," Pacific Rural Press, 101 (January 1, 1921), 17; "Water Conservation for Irrigation in California," California Cultivator, LXIV (May 30, 1925), 615, 631.
12. "Irrigation and Agriculture," Transactions of the Commonwealth Club, 346, chart on 348, and 351. The Swett quote is from p. 351.
13. Frank Adams to John Gabbert, October 22, 1925, Frank Adams Collection, California Water Resources Archives, University of California, Berkeley.
14. Frank Adams, "Are We Developing Our Irrigated Areas Too Rapidly?," Transactions of the Commonwealth Club, 20 (November 24, 1925), 375-388. For the conclusions of the Section on Irrigation see pp. 397-399.
15. Frank Adams, "Irrigation Development Through Irrigation Districts," Transactions of the American Society of Civil Engineers, 90 (June 1927), 773-790; S.T. Harding, Water in California, (Palo Alto, 1960), 86.
16. Report of the Division of Engineering and Irrigation, November 1, 1926 in Appendix to the Journals of the California Legislature, 47 sess., v. 5 (Sacramento, 1927) 11, 17-18, 19.

17. For the law itself see Cal. Stats., 1921, 1727. Also see Harding, Water in California, 84 and his oral history transcript, pp. 73-75; and Frank Adams' oral history transcript, 255-258. Both transcripts are at the Bancroft Library and California Water Resources Archives at U.C. Berkeley.
18. S.T. Harding discussed the history of these water storage districts in his oral history transcript, 78-116. Also see Report of the Division of Engineering and Irrigation, November 1, 1922 in Appendix to the Journals of the California Legislature, 45 sess., v. 5 (Sacramento, 1923), 25-26.
19. For the law see Cal. Stats., 1923, 978. Also see Frank Adams, Irrigation Districts in California (Sacramento 1930), 25-28; and S.T. Harding oral history transcript, 117. The Pine Flat Reservoir was finally completed in 1954 by the Army Corps of Engineers under authority of the 1944 Flood Control Act.
20. The California Water Atlas contains a chart which lists the creation of districts decade by decade (p. 63). By the end of the 1960s, 895 different water districts had been formed.
21. Frank Adams, "Irrigation Development Through Irrigation Districts," 774; First Report of the Division of Engineering and Irrigation, November 1, 1922, 11 and 57-58, and Report of the Department of Public Works of the State of California, November 1, 1922, 5, both in Appendix to the Journals of the California Legislature, 45 sess., v. 2 (Sacramento, 1923).
22. Report of the Department of Public Works of the State of California, November 1, 1922, 12-13; Third Biennial Report of the State Water Commission of California, 1919-1920, in Appendix to the Journals of the California Legislature, 44 sess., v. 1 (Sacramento, 1921), 50-52.
23. Cal. Stats., 1923, 161; Report of the Division of Water Rights, November 1, 1922, in Appendix to the Journals of the California Legislature, 45th sess., v. 4 (Sacramento, 1923), 73-75; Biennial Report of the Division of Water Rights, November 1, 1924, 46th sess., v. 4 (Sacramento, 1925), 62-63.
24. Third Biennial Report of the State Water Commission of California, 1919-1920 in Appendix to the Journals of the California Legislature, 44th sess., v. 1 (Sacramento, 1921), 25; Statistical Report of the California State Board of Agriculture for the Year 1921, 45th sess., v. 3 (Sacramento, 1923), 26; Report of the Division of Water Rights, November 1, 1922, 23, 25, 53, 54.
25. Biennial Report of the Division of Water Rights and State Water Commission, November 1, 1928, in Appendix to the Journals of the California Legislature, 48 sess., v. 5 (Sacramento, 1929), 8-15. The quote is from p. 15. Also see the Biennial Report of the Division of Water Rights, November 1, 1926, 47 sess., v. 3 (Sacramento, 1927), 25-26 and 32.
26. The Water Commission explained the adjudication procedure in a pamphlet entitled "Rules and Regulations Governing the Determination of Rights to the Use of Water in Accordance with the Water Commission Act," issued in 1921, a copy of which is at the Bancroft Library.
27. For detailed discussions of adjudication proceedings see the reports of the State Water Commission and Water Rights Division. For a summary of state actions see Biennial Report of the Division of Water Rights and State Water Commission, November 1, 1928, in Appendix to the Journals of the California Legislature, 46th sess., v. 5 (Sacramento, 1929), 16. On Constitutional Amendment #28, rejected by the legislature in 1923, see Frank Adams, "Pending Irrigation and Water Legislation," Pacific Rural Press, 105 (March 31, 1923), 388. One reason the Water Rights Division focussed on small streams in the foothills was that miners had claimed the entire volume of such streams before the adjoining land left the public domain--preventing the creation of riparian rights. Most of those appropriative rights were subsequently taken up by farmers. In the Central Valley, the existence of riparian rights prevented the state from making definitive adjudications. The only stream of any size adjudicated in the Central Valley was the Stanislaus, and

- water users there challenged the determination. To avoid agitating riparian users, the Water Rights Division never pressed suit to define that class of rights under the 1913 Water Act, even after the 10 year grace period had elapsed.
28. Third Biennial Report of the State Water Commission, 1919-1920, 43, 49, 75-76, 133-140; Report of the Division of Water Rights, November 1, 1922, 9, 57-64.
 29. Cal. Stats., 1921, 543; Biennial Report of the Division of Water Rights, November 1, 1926, 48-49.
 30. Biennial Report of the Division of Water Rights, November 1, 1926, 49-54; Biennial Report of the Division of Water Rights and State Water Commission, November 1, 1928, 21-22 and chart on p. 19.
 31. Biennial Report of the Division of Water Rights, November 1, 1924, 9-10.
 32. Cal. Stats., 1915, 514.
 33. Report of the State Water Problems Conference, dated November 25, 1916, in Appendix to the Journals of the California Legislature, 42 sess., v. 6 (Sacramento, 1917).
 34. Annual Report of the State Surveyor General, 1856, in Appendix to the Journals of the California Legislature, 8th sess., (Sacramento, 1857), 24-26; H. Exec. Doc. 290, 43 Cong., 1 sess., serial 1615 (Washington, D.C., 1874).
 35. See Robert Marshall's typescript "Autobiography" in the Marshall Collection, Bancroft Library.
 36. Robert B. Marshall, "California as I Have Seen It," typescript manuscript dated March, 1937, in Box VII, Marshall Collection, Bancroft Library.
 37. Louis Bartlett oral history transcript, Bancroft Library, pp. 138-139.
 38. Frank Adams oral history transcript, Bancroft Library, pp. 297-298.
 39. "Irrigation of Twelve Million Acres," pamphlet dated November, 1920, in folder entitled "Manuscript and published text of 'Marshall Plan'", in Box 6 of the Marshall Collection, Bancroft Library. The Sacramento Union of September 29, 1919 carried a full description of the Marshall Plan along with a map. Marshall estimated the entire project's cost at \$700,000,000 to \$800,000,000. He expected the San Francisco Bay Area to pay \$100,000,000 toward the project and Los Angeles another \$50,000,000.
 40. Fall River Tidings (Shasta, California), October 3, 1919 and The Sacramento Union, September 29, 1919. For editorials reflecting varying degrees of support for the Marshall Plan see The San Francisco Chronicle, September 1, and 27, 1920; The Call (San Francisco), February 10, 1921; Santa Barbara Press, February 23, 1921; Modesto Herald, February 17, 1921; Oakland Enquirer, September 10, 1920 and January 6, 1921; Fresno Republican, December 4, 1920; and Stockton Record, December 4, 1920. Also see the pamphlet entitled "What They Say of the Marshall Plan," dated December, 1920, in the bound Marshall Plan Pamphlets at the Bancroft Library.
 41. San Francisco Pacific Builder, January 3, 1921.
 42. Modesto Herald, February 17, 1921.
 43. The quote is from a resolution unanimously adopted by the San Francisco chapter of the A.S.C.E. on February 15, 1921, reprinted in its undated "Statement of Action on the 'Marshall Plan'," in the Frank Adams Collection, California Water Resources Archives, University of California, Berkeley. For a good summary of the engineers' objections see the untitled memorandum describing the San Francisco chapter's meeting on February 4, 1921, in the Adams Collection, file #376, Water Resources Archives. In the same file see "Report of Meeting [of] Civil Engineers with L.C. Davidson [February 11, 1921]." Davidson was a booster and lobbyist for the Marshall Plan. Also see Clyde L. Seavey, California State Board of Control, to Marshall, June 10, 1919, in the Marshall Collection, Bancroft Library. The Sacramento Bee was one of the plan's most vociferous

- critics. For example, in its March 7, 1921 edition, it called the scheme "the bunko game of a few real estate speculators, who care more for their own profit than for benefit to their customers, or the prestige and permanent welfare of the State."
44. See the folder entitled "California State Irrigation Association, Reports 1921-1922" in the Marshall Collection, Bancroft Library. Marshall sometimes strayed from the Progressive flock, as in 1922 when he refused to support the Water and Power Act. But he always returned to the fold. For example, in the fall of 1924 he campaigned actively for the "Progressive Voters' League of California" which included Franklin Hitchborn, John R. Haynes, Chester Rowell, and C.C. Young.
 45. Water Resources of California: A Report to the Legislature of 1923, Department of Public Works, Division of Engineering and Irrigation Bulletin #4 (Sacramento, 1923), 17, 39, 45, 55.
 46. Mary Montgomery and Marion Clawson, History of Legislation and Policy Formation of the Central Valley Project (Berkeley, 1946), 21-22. Perhaps partly as a sop to Marshall, on June 3, 1921 the governor signed a law appointing a nine-man board to study California water problems. Marshall received a seat on the commission and it held 15 meetings throughout the state in the year from December, 1921, to December, 1922. Transcripts of the meetings are in Box 9 of the Marshall Collection at the Bancroft Library.
 47. Frank Adams oral history transcript, Bancroft Library, p. 302.
 48. Cal. Stats., 1921, Chap. 889.
 49. Report of the Division of Engineering and Irrigation, November 1, 1922, 20-22. This was not the first investigation undertaken by the state. The state engineer had already completed studies of water use in Kern and Tulare counties as well as in the Victor and San Jacinto valleys. It had also completed reservoir surveys on the Calaveras, Kings, Kaweah, Tule, Kern and Sacramento rivers--the latter an investigation of the Iron Canyon Project's feasibility.
 50. For propaganda on the Water and Power Act of 1922 see the series of pamphlets issued by critics and proponents of the legislation in the bound collection entitled California Water and Power Act at the Bancroft Library. For the bill itself--actually a constitutional amendment--see "The Water and Power Act," Transactions of the Commonwealth Club of California, 17(July, 1922), 183-187; the act is discussed on pp. 181-294. For one interpretation of the political maneuvering behind the act see Franklin E. Hitchborn, "The Strange Story of the California State Irrigation Association"(1926), a pamphlet at the Bancroft Library written for the California State Water and Power League. For Marshall's explanation of his opposition to the act see the Stockton Daily Evening Record, October 3, 1924. Other useful sources include Louis Bartlett's revealing oral history transcript, pp. 157-176; Frank Adams transcript, pp. 311-312; and William Durbrow's transcript, p. 177, all at the Bancroft Library.
- The California State Water and Power League was not the first group to advocate public power. In the 1919 legislature, the League of California Municipalities, which included representatives from 240 California towns and cities, sponsored public power legislation and the League participated in drafting the Water and Power Act and actively crusaded for its adoption.
51. C.A. Barlow to Robert B. Marshall, May 3, 1924, in the Marshall Collection, Bancroft Library. For the Water and Power Act of 1924 see "Water and Power" in Transactions of the Commonwealth Club of California, XIX (October, 1924), 335-452.
 52. For a typical campaign debate over the Marshall Plan and agricultural overproduction see the Turlock Journal, August 2, 1926.
 53. The 18,000,000 acres was three times the land irrigated in California in 1919 and more than all the irrigated land in the entire arid West. However, irrigation boosters were often even more optimistic, and frequently predicted that about 25 percent of California's more than 100,000,000 acres could be reclaimed through irrigation.
 54. Water Resources of California: A Report to the Legislature of 1923, Department of Public Works, Division of Engineering and Irrigation Bulletin #4 (Sacramento, 1923), 18, 43, 44.

55. Water Resources of California: A Report to the Legislature of 1923, 47, 48. The quote is from p. 47.
56. Water Resources of California: A Report to the Legislature of 1923, 48-49. Southern California offered few good reservoir sites and those reservoirs could capture little of the heavy rainfall which came intermittently. "Spreading grounds" offered one solution. They were ponds designed to increase the supply of ground water.
57. More significant than the sketchy state water plan of 1923 was the evidence upon which it was based. In 1923 the Division of Engineering and Irrigation also published Flow in California Streams as Bulletin #5 (Sacramento, 1923). This volume contained 300 pages of data, the most extensive compilation of stream-flow statistics ever compiled in California.
58. Paul Bailey, California State Engineer, Supplemental Report on Water Resources of California, Division of Engineering and Irrigation Bulletin #9 (Sacramento, 1925), 15, 17-18, 28, 44, 45.
59. Testimony of Paul Bailey in "Transcript of the Hearings of the Joint Committee [of the Legislature] Concerning Proposed Constitutional Amendments Affecting Water Resources of the State of California," (January 26, 1927), Robert Marshall Collection, Box 11, Bancroft Library. For the 1925 appropriation see Cal. Stats., 1925, Chap. 477. Also see Cal. Stats., 1925, Chap. 180 and Chap. 476.
60. Herminghaus v. Southern California Edison Company, 200 Cal. 81, 252 Pac. 607.
61. For discussions of the Herminghaus case see S.T. Harding's oral history transcript, p.p. 122-135 and his Water in California, (Palto Alto, 1960), 41-42. Harding prepared the State of California's brief in the case. Also see Arthur Maass, ...and the Desert Shall Rejoice: Conflict, Growth, and Justice in Arid Environments (Cambridge, Mass., 1978), 231 and Wells Hutchins, The California Law of Water Rights (Sacramento, 1956), 13.
62. "Biennial Report of the Division of Water Rights, November 1, 1926," 20-22, 63; "Brief on Behalf of the State of California in the Supreme Court of the State of California in the case of Amelia Herminghaus et. al. v. Southern California Edison Company," at the Bancroft Library; and S.T. Harding's "Report on the Effect Which Would Result from the Establishment of the Right to Store as a Part of the Rights of Riparian Owners on the Feasibility of Proposed Irrigation Projects, Particularly Projects on the San Joaquin and Kings Rivers," prepared for the State Engineer and dated October 1, 1925 in file #40, S.T. Harding Collection, California Water Resources Archives.
63. For the U.S. Reclamation Bureau's position see the series of letters in RG 115, Records of the Reclamation Bureau, "(032) General Water Rights; Settlement of Herminghaus, etc.--Southern California Edison Case" at the National Archives, Washington, D.C.
64. For press comment on the verdict see the Fresno Bee, December 27 and 29, 1926 and January 14, 1927; The San Francisco Chronicle, December 30, 1926 and January 28, 1927; the Sacramento Union, January 14, 1927; Sacramento Bee, January 28, 1927; Oakland Tribune, January 5 and 29, 1927; and San Francisco Examiner, December 25, 1926 and January 2, 1927.
65. Testimony of Paul Bailey in "Transcript of the Hearings of the Joint Committee [of the Legislature] Concerning Proposed Constitutional Amendments Affecting Water Resources of California," 84-86.
66. The 1928 constitutional amendment became Article XIV, Section 3 of the California Constitution. See Cal. Stats., 1927, 2373. For discussions of the amendment's implications see Hutchins, The California Law of Water Rights, 230-234; S.C. Wiel, "The Pending Water Amendment to the California Constitution, and Possible Legislation," California Law Review, 16 (March 1928); Harding, Water in California, 42-43; Edward F. Treadwell, "Developing a New Philosophy of Water Rights," California Law Review, 38 (October 1950), 572-587; and Frank Adams, "The Water Situation in California," California Cultivator, LXX (January 28, 1928), 93, 107.

67. Paul Bailey, Summary Report of the Water Resources of California and a Coordinated Plan for Their Development, Division of Engineering and Irrigation Bulletin #12 (Sacramento, 1927), 33, 37, 38, 41, 42. The report included a map of suggested reservoirs on p. 26. Also see Bailey's The Control of Floods by Reservoirs, Bulletin #14 (Sacramento, 1928), 13, 14. Bailey's 1927 report was accompanied by several volumes of engineering data: Bulletin #13 entitled The Development of the Upper Sacramento River; Bulletin #15, The Coordinated Plan of Water Development in the Sacramento Valley; Bulletin #16, The Coordinated Plan of Water Development in the San Joaquin Valley; and Bulletin #17, The Coordinated Plan of Water Development in Southern California.
68. Bailey, Summary Report of the Water Resources of California and a Coordinated Plan for Their Development, 31.
69. "Central Valley Project Documents," H. Doc. 416, 84 Cong., 2 sess., v. 1 (Washington, D.C., 1956) 186-187.
70. Cal. Stats., 1927, 508; Biennial Report of the Division of Water Rights and State Water Commission, November 1, 1928, 28-29; Adams, "The Water Situation in California," 93, 107; The San Francisco Chronicle, April 23, 1927; and Modesto News-Herald, May 18, 1927. S.T. Harding noted in Water in California, p. 47, that by January, 1959, the state had filed 142 water and power applications using the 1927 statute.
71. S.C. Wiel, "The Recent Attorney's Conference on Water Legislation," California Law Review, XVII (March 1929).
72. For the legal committee's report to the joint legislative committee, dated October 27, 1928, see Report of the Joint Committee of the Senate and Assembly Dealing with the Water Problems of the State, January 18, 1929, in Appendix to the Journals of the California Legislature, 48th sess., v. 4 (Sacramento 1929). The discussion of navigable streams is on pp. 29-31. The legal committee's report is also reprinted in "Central Valley Project Documents," H. Doc. 416, 84 Cong., 2 sess., v.1 (Washington, D.C. 1956), 202-219.
73. Report of the Joint Committee...January 18, 1929, 28-29. The quote is from p. 29.
74. Report of the Joint Committee...January 18, 1929, 31-34.
75. The joint committee correctly recognized that river improvements and storage reservoirs in the San Joaquin Basin had contributed to salinity as well as drought and irrigation in the Sacramento Valley. The construction of levees and by-pass channels in the first decades of the 20th century produced better drainage but also reduced the river's volume in the summer. Dredging also contributed to salt water incursion. During the 1920s, the Merced Irrigation District completed a 278,000 acre foot reservoir; the Modesto and Turlock districts a 290,000 a.f. reservoir; and San Francisco's dam at Lake Eleanor and Hetch-Hetchy Aqueduct virtually eliminated all but return flow in the Tuolumne River during the late summer. The 1929 Report of the Joint Committee reported that over two-thirds of the 4,000,000 acre feet of storage space on streams that flowed into San Francisco Bay had been created since 1920--virtually all on the San Joaquin River and its tributaries (pp. 159, 160).
76. Walker R. Young, Report on Salt Water Barrier, Division of Engineering and Irrigation Bulletin #22, 2 vols (Sacramento, 1929), 55.
77. Report of the Joint Committee...January 18, 1929, 161-167.
78. Lester S. Ready, Report on Kennett Reservoir Development: An Analysis of Methods and Extent of Financing by Electric Power Revenue, Division of Engineering and Irrigation Bulletin #20 (Sacramento, 1929). Ready summarized his conclusions in a cover letter dated October 23, 1928 which accompanied the report. The letter was reprinted on pp. 7-10. Ready's conclusions were also reprinted on pp. 49-51 of the joint committee's report.
79. Report of the Joint Committee...January 18, 1929, 18, 101. Also see the elaborate charts on 58-68, 69, 74, 79, 89, 94, and on the insert facing 96. The report implied that power generated at other state dams would also be sold to private companies if it was not needed to move water.

80. The Supplemental Report of the Joint Legislative Committee, dated April 9, 1929, is reprinted in "Central Valley Project Documents." H. Doc. 416, 84 Cong., 2 sess., v. 1 (Washington, D.C., 1956), 228-247.
81. Edward Hyatt, California State Engineer, "Resume and Present Status California Water Plan Investigation," memorandum dated November 5, 1930 in the Edward Hyatt Collection, file #1, Water Resources Archives; Report to the Legislature of 1931 on State Water Plan, 1930, Division of Water Resources Bulletin #30 (Sacramento, 1931), 18; and the Modesto Tribune, June 21, 1929. The San Francisco Chronicle of June 29, 1930 suggested that the power companies had been the main reason construction of a state water project had not been started earlier.
82. Report of the California Joint Federal-State Water Resources Commission, 1930, in Appendix to the Journals of the California Legislature, 49 sess., v. 5 (Sacramento, 1932), 7-8, 10-12. The quote is from p. 12. Also see "The State Water Plan," in Transactions of the Commonwealth Club of California, 26 (June 2, 1931), 73. The state-federal commission recommended that the state guarantee the principal and interest of Metropolitan Water District bonds to help reduce the interest rate. It also recommended against forcing farmers in the southern San Joaquin Valley to pay the full cost of Friant Dam and its diversion canal. The commission proposed that California enact constitutional amendments to guarantee repayment of all federal money spent on construction, allow it to underwrite the M.W.D. bonds, and create a special tribunal to appraise, for condemnation purposes, any property required to implement the state water plan.
83. Martinez Standard (Martinez, California), May 26, 1930.
84. For Hyatt's comments see the Pittsburgh Dispatch (Pittsburgh, California), June 7, 1930; also see the Dispatch for April 28, 1930. For Rolph's position see the Pittsburgh Post, June 6, 1930. The Scrapbooks in the Edward Hyatt Collection at the Water Resources Archives are a rich source of newspaper clippings from all parts of the state during the late 1920s. Many of the newspaper articles cited for 1927 and after can be found there.
85. Martinez Gazette, February 11, 1930; Lodi Sentinel, February 18, 1930; Red Bluff Times, April 4, 1930; and Fresno Bee, April 9, 1930.
86. Industrial Survey of Upper San Francisco Bay Area With Special Reference to a Salt Water Barrier (1930), in Appendix to the Journals of the California Legislature, 49th sess., v. 5 (Sacramento, 1932), 6, 45, 62. The quote is from p. 62. This survey, paid for from the \$390,000 appropriation made in 1929, concluded that a barrier might double the local tax rate, trap sewage discharged upstream, impede navigation, increase shoaling in the rivers, damage industries located below the barrier by increasing the salt content of their water, and destroy fishing. The greatest obstacle to building the barrier was not its cost. Since no comparable structure had been built in the United States, no assessment of its "environmental impact" could be made.
87. Oroville Mercury-Register, August 2, 1929 and January 9, 1930.
88. A.M. Barton, "Memorandum to the Joint Legislative Committee Pertaining to the American River," in "Central Valley Project Documents," 225; The Sacramento Bee, March 8, 1929.
89. Edward Hyatt outlined the formal state water plan in "Report to the Legislature of 1931 on State Water Plan, 1930," in Appendix to the Journals of the California Legislature, 49th sess., v. 3 (Sacramento, 1931). The 1930 plan was presented in greater detail in Division of Water Resources Bulletin #25. The complete plan included the Colorado River Aqueduct, expected to cost \$198,600,000. For the bond issue vote see The Sacramento Bee, December 20, 1933, and the Sacramento Union, December 20, 1933.
90. There is no scholarly history of the Central Valley Project. The best available survey is Robert de Roos, The Thirsty Land: The Story of the Central Valley Project (Stanford, Calif., 1948).
91. Gerald D. Nash, State Government and Economic Development (Berkeley, 1964), 229.

92. Robert B. Marshall to Lloyd McAulay, October 17, 1935, Robert Marshall Collection, Water Resources Center Archives. Also see Marshall to Matt I. Sullivan, October 22, 1931 and Marshall to Earl Lee Kelley, California Director of Public Works, March 4, 1937 in the same collection.