

WATER RIGHTS

Scarce Resource Allocation,
Bureaucracy, and the Environment

Editor

TERRY L. ANDERSON

Foreword by

JACK HIRSHLEIFER

Pacific Studies in Public Policy

PACIFIC INSTITUTE FOR PUBLIC POLICY RESEARCH
San Francisco, California

Ballinger Publishing Company
Cambridge, Massachusetts
A Subsidiary of Harper & Row, Publishers, Inc.

CONTENTS

List of Figures	xiii
List of Tables	xv
Foreword— <i>Jack Hirshleifer</i>	xvii
Acknowledgments	xxiii
Introduction: The Water Crisis and the New Resource Economics — <i>Terry Anderson</i>	1

PART I PROPERTY RIGHTS AND DECISIONMAKING

Chapter 1 Appropriators versus Expropriators: The Political Economy of Water in the West — <i>Alfred G. Cuzán</i>	13
A Political Argument for the Privatization of Water in the West	13
The American Doctrine of Prior Appropriation: A Lockean Experiment in Natural Law	15
Expropriation of Water by State and Federal Governments: A History of Water Policies in the Arid Lands	20
The Iron Laws of Political Science: A Comparative Study of the Bureau of Reclamation and the City of Los Angeles	28
Toward the Reappropriation of Water	41
	ix

Copyright © 1983 by Pacific Institute for Public Policy Research. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopy, recording or otherwise, without the prior written consent of the publisher.

International Standard Book Number: 0-88410-389-7 (CL)
0-88410-390-0 (PB)

Library of Congress Catalog Card Number: 83-3855

Printed in the United States of America

Library of Congress Cataloging in Publication Data

Main entry under title:

Water rights.

(Pacific studies in public policy)

Includes bibliographies and index.

Contents: Appropriators versus expropriators / Alfred G. Cuzán –
The federal reclamation program / Randal R. Rucker and Price V.
Fishback – Water pricing and rent seeking in California agriculture /
B. Delworth Gardner – [etc.]

1. Water-rights – United States – Addresses, essays, lectures.

I. Anderson, Terry Lee, 1946–

II. Pacific Institute for Public Policy Research. III. Series.

KF5569.A2W37 1983 346.7304'691 83-3855

ISBN 0-88410-389-7 347.3064691

ISBN 0-88410-390-0 (pbk.)

PRESIDENT

David J. Theroux

RESEARCH DIRECTOR

M. Bruce Johnson

SENIOR ECONOMIST

Charles W. Baird

BOARD OF ADVISORS

Yale Brozen

University of Chicago

James M. Buchanan

George Mason University

Robert W. Clower

University of California,

Los Angeles

Richard A. Epstein

University of Chicago

Friedrich A. Hayek

Nobel Laureate in Economics

University of Freiburg,

Germany

George W. Hilton

University of California,

Los Angeles

Jonathan R. T. Hughes

Northwestern University

John Kaplan

Stanford University

Israel M. Kirzner

New York University

Gary D. Libecap

Texas A & M University

Stephen C. Littlechild

University of Birmingham,

England

Chiaki Nishiyama

Rikkyo University,

Japan

Edwin G. West

Carleton University

Canada

Leland B. Yeager

University of Virginia



The Pacific Institute for Public Policy Research is an independent, tax-exempt research and educational organization. The Institute's program is designed to broaden public understanding of the nature and effects of market processes and government policy.

With the bureaucratization and politicization of modern society, scholars, business and civic leaders, the media, policymakers, and the general public have too often been isolated from meaningful solutions to critical public issues. To facilitate a more active and enlightened discussion of such issues, the Pacific Institute sponsors in-depth studies into the nature and possible solutions to major social, economic, and environmental problems. Undertaken regardless of the sanctity of any particular government program, or the customs, prejudices, or temper of the times, the Institute's studies aim to ensure that alternative approaches to currently problematic policy areas are fully evaluated, the best remedies discovered, and these findings made widely available. The results of this work are published as books and monographs, and form the basis for numerous conference and media programs.

Through this program of research and commentary, the Institute seeks to evaluate the premises and consequences of government policy, and provide the foundations necessary for constructive policy reform.

Chapter 1

APPROPRIATORS VERSUS EXPROPRIATORS

The Political Economy of Water in the West

Alfred G. Cuzán

A POLITICAL ARGUMENT FOR THE PRIVATIZATION OF WATER IN THE WEST

Economists and philosophers since Locke and Smith have explained the economic laws of property and exchange. A solid body of scholarship, both classical and modern, suggests that aside from enforcing property rights, reducing transaction costs and, in some instances, providing for so-called public goods that are difficult to charge for, government can do little to improve the efficiency of free markets. This relatively unrestrained system, what Oppenheimer called the economic means of appropriation and exchange, constitutes one of the most effective mechanisms for harnessing the energies of enterprising human beings to increase production and raise living standards the world over.¹

The same cannot be said for the other type of social system identified by Oppenheimer—the political means of expropriation and taxation. The indiscriminate use of laws and regulations, even in democracies, generally results in a net loss in efficiency as rent-seek-

1. Franz Oppenheimer, *The State* (Indianapolis: The Bobbs-Merrill Company Publishers, 1914); Ludwig von Mises, *Human Action* (New Haven, Conn.: Yale University Press, 1949).

ing groups team up with the bureaucracy and politicians to reap most of the benefits from public policy. The social costs of acting with institutions that raise revenues through taxes, register popular preferences with infrequent acts of voting, allocate resources in political struggles among small groups and manage them through a centralized bureaucracy generally exceed whatever benefits are bestowed on the public or the small, active minorities who exercise the most influence or control over the government's actions.²

The contrasts between the economic and the political means in the field of water resources has been of interest to economists and lawyers for some time. In their path-breaking book, *Water Supply*, Hirshleifer, DeHaven, and Milliman noted the many failures of water policies at the local, state, and federal levels, arguing that a better method would be to treat water like any commodity, subject to appropriation and exchange in a market economy.³ Water policy in the nineteenth century embodied this approach, so the authors' recommendation actually was a reversal of the policies that had accumulated since 1880. Other writers have arrived at similar conclusions.

My purpose in this paper is not to repeat the economic arguments against government controls, but rather to make a political case for privatization. By examining the machinery of government and the dynamics of politics, I will show that the internal laws that regulate the political means necessarily promote centralization and bureaucratization of the water industry, not in the interest of equity or efficiency, but as a consequence of organized efforts by a ruling class to expropriate income and wealth from the public. This constant relation, as Mosca calls it, is probably the most solidly established law in political science.⁴ In order to escape its perverse power, society must choose the economic laws of the market instead.

I begin with a discussion of Locke's positive theory of property, which explains the way water in fact was appropriated under nearly anarchical conditions in the West during the mid-nineteenth century. I then examine the evolution of public water policies since 1860, demonstrating that they have consistently expanded and centralized

2. See William C. Mitchell, *The Anatomy of Public Failure: A Public Choice Perspective* (Los Angeles: International Institute for Economic Research, Original Paper 13, June 1978).

3. Jack Hirshleifer, James C. DeHaven, and Jerome W. Milliman, *Water Supply* (Chicago: University of Chicago Press, 1969).

4. Gaetano Mosca, *The Ruling Class* (New York: McGraw-Hill, 1939).

the power of those who influence, control, and benefit from the political means. This is followed by an analysis of the organizational instruments that have planned, promoted, and implemented these policies in a comparative study of the federal Bureau of Reclamation and the Water and Power Department of the city of Los Angeles. These two agencies are remarkably similar in their political origins, territorial growth strategies, and evolution toward centralized bureaucratic management. I conclude with a suggested rule for reappropriating water in the United States.

THE AMERICAN DOCTRINE OF PRIOR APPROPRIATION: A LOCKEAN EXPERIMENT IN NATURAL LAW

In *The Second Treatise of Government*, John Locke explains how increasingly scarce common-pool resources come to be appropriated in a State of Nature according to the principles of priority of right and beneficial use, a model that can readily be applied to the history of the American doctrine of prior appropriation.⁵ Locke assumes that, in the beginning, the earth and its products constitute a great common to mankind while individuals have a property in their own persons. Nature compels individuals to apply their labor to take what they need from the commons in order to survive.

A person's right to anything in the commons is established by the simple act of taking it or enclosing it with his or her own labor. With respect to water, Locke observes, "Though the water running in the fountain be everyone's, who can doubt that in the pitcher is his only who drew it out? His labor has taken it out of the hands of nature where it was common and belonged equally to all her children and has thereby appropriated it to himself."⁶ Note that the act of *removing* a portion of the commons establishes an individual's property over it, eliminating the ambiguity associated with the concept of "mixing" one's labor with the earth: "the *taking* of what is common

5. Compare Locke's *The Second Treatise of Government* (Indianapolis: Liberal Arts Press, 1952) with the following two articles: Armen A. Alchian and Harold Demsetz, "The Property Rights Paradigm," *Journal of Economic History* 33 (1973): 16-27; and Terry L. Anderson and P. J. Hill, "The Evolution of Property Rights: A Study of the American West," *Journal of Law and Economics* 18 (1975): 163-179.

6. Locke, *Second Treatise*, p. 18.

and removing it out of the state nature leaves it in which begins the property, without which the commons is of no use" (emphasis added).⁷ Locke calls this principle the "original law of nature."

In some instances, the act of discovery, itself being an act of labor, is sufficient to establish a prior right even before actual enclosure. The hunter, for example, who pursues a hare "has thereby removed her from the state of nature wherein she was common, and has begun a property."⁸ Thus, a man who first discovers a gold mine or a new source of water establishes a right to it by virtue of having found it.

Under conditions of unlimited supply or relative abundance the appropriation of any part of the commons harms no one, as Locke observes with respect to water: "Nobody could think himself injured by the drinking of another man, though he took a good draught, who had a whole river off the same water left him to quench his thirst; and the case of land and water, *where there is enough for both*, is perfectly the same."⁹ (emphasis added). However, under the more usual condition of relative scarcity of either land or water, where each succeeding appropriation leaves fewer or less valuable resources in the commons, an individual's right is limited to only so much as he or she can use to any advantage before it spoils; additional resources exceed his or her share and belong to others. This rule applies not only to the products of the earth, such as wildlife and water, but also to land: "As much land as a man tills, plants, improves, cultivates, and can use the product of, so much is his property. He by his labor does, as it were, enclose it from the common. . . ." ¹⁰

Individuals may give away, barter, or exchange for money anything that they appropriate. It is only if one allows resources or products of the earth to rot or remain unproductive that "this part of the earth, notwithstanding his enclosure, was still to be looked on as waste and might be the possession of any other. . . ." ¹¹

Therefore, in a modern economy, one need not work resources directly in order to retain title. All one need do is to ensure that what one owns does not go to waste, for example, the stockholder in a water company, the buyer of canal bonds, and the speculator in water rights. Locke would not have found the commercialization of

7. Ibid.

8. Locke, *Second Treatise*, p. 19.

9. Ibid., p. 20.

10. Ibid., p. 20.

11. Locke, *Second Treatise*, p. 23.

water irreverent or objectionable in any way; on the contrary, he would have heartily agreed with the authors of *Water Supply* on this point.

Like a modern economist, Locke argued that as resources that were once part of the great commons of mankind rise in value, individuals strive to appropriate them. Far from harming those who fail to acquire a portion of the shrinking commons, the process of appropriation benefits them as well by increasing the productivity of the resource:

He that encloses land, and has a greater plenty of the conveniences of life from ten acres than he could have from a hundred left to nature, may truly be said to give ninety acres to mankind; for his labor now supplies him with provisions out of ten acres which were by the product of a hundred lying in common.¹²

It is not my purpose here to evaluate Locke's theory as a normative principle of justice. Rather, I want to use the positive aspect of the theory to explain the process by which the waters of the West were originally appropriated outside the established legal framework, or as Locke would say, "out of the bounds of society."

Locke's theory of property rests on a natural law of appropriation regulated by economic forces. As resources held in common become more scarce, the most enterprising members of the community—the industrious and rational—apply their labor to enclose and put them to use. In order to minimize the cost or inconvenience associated with disputes over title or the size of possession, the appropriators, by voluntary consent, reach agreement on two fundamental rules for dividing the commons: (1) first come, first served, or priority of right acquired by virtue of discovery or possession, and (2) a person's right is limited to what he or she puts to beneficial use.

It is precisely these two principles upon which the American doctrine of prior appropriation rests. This body of rules was developed by communities of California miners in mid-nineteenth century. Around 1850, thousands of men came from around the world to search for gold in what was then largely a wilderness. They became squatters on the federal public domain, outside the established legal order, with no government to impose order or settle their disputes. In effect, they found themselves in a "state of nature." As Locke

12. Locke, *Second Treatise*, p. 23.

would have predicted, a first come, first served principle was adopted in the establishment of rights over what had been held in common—minerals and water—along with limitations on what any one individual could own.

Following a tradition of collective action on the mining frontiers of other continents, the miners formed districts, embracing from one to several of the existing 'camps' or 'diggings' and promulgated regulations for marking and recording claims. The miners universally adopted the priority principle, which simply recognized the superior claims of the first arrival. But the . . . miner's codes defined the maximum size of claims, set limits on the number of claims a single individual might work, and established regulations designing certain actions—long absence, lack of diligence, and the like—as equivalent to the forfeiture of rights. A similar body of district rules regulates the use of water flowing in the public domain.¹³

In order to ensure that no valuable mineral rights were wasted, local custom sanctioned claim jumping whenever "the prior claimant had abandoned his claim, had failed to diligently work it, had staked it without following local regulations, or held more claims than district rules permitted."¹⁴

These customs spread throughout the West as miners, irrigators, and cattlegrowers took possession of the most valuable portions of the public domain without legal authorization from territorial, state, or federal governments. The first person to work a mine, graze a herd on a meadow, or divert water from a stream acquired a prior right to what he or she took, and these appropriations were for the most part respected by subsequent settlers.

Elwood Mead describes how cattlegrowers on the public domain divided the grasslands among themselves:

There was no law by which men could legally secure control of the land they occupied. All the land laws dealt with farming land. There was no provision for leasing or settling the grazing land in tracts large enough to be of any service. Hence the range stockmen simply took possession of the country. Each man chose a location which suited him, fixed in a rough way the boundaries of his domain, and helped to create a public sentiment which made it unpleasant, if not dangerous, for a late comer to attempt to share with him the terri-

13. Charles W. McCurdy, "Stephen J. Field and Public Land Law Development in California, 1850-1866: A Case Study of Judicial Resource Allocation in Nineteenth-Century America," *Law and Society* (Winter 1976): p. 236.

14. *Ibid.*, p. 243.

tory he had so marked out. In this way range rights came to have the force of law.¹⁵

The custom originated by miners and cattlegrowers had the greatest impact with respect to water used for irrigation. The American doctrine of prior appropriation, or arid region doctrine, was adopted by state constitutions, legislation, and judicial rulings. It sanctioned the diversion of water for use on lands far from the natural watercourse on the basis of priority of right and wrought what Webb called "a revolution in the law of water" displacing the riparian doctrine partially or totally over most of the West.¹⁶ The greater the relative scarcity of water, the more it was appropriated. Thus, the doctrine became most firmly established in the most arid portions of the region—Arizona, New Mexico, Utah, Nevada, Colorado, and Idaho.

The new body of law effectively separated rights to water from rights to land. Companies mobilized private capital to build irrigation works and transport water to where it was most productively used. Writing in 1903, Mead called corporate irrigation "the leading factor in promoting agricultural growth of the Western two-fifths of the United States."¹⁷ Mead credited canal companies with promoting efficient irrigation practices through contractual arrangements, advising the state of Colorado to study canal companies' management of the water they appropriated.

By 1910, over 13 million acres of land were irrigated privately in the 17 western states.¹⁸ In a very short time, thousands of farmers had multiplied by many times the productive value of this region. Mead, who found much to object to in private water development, nevertheless acknowledged that "in the last third of the nineteenth century the arid West became one of the greatest irrigated districts of the globe. In mileage of ditches and in acres of land irrigated it surpasses any country of Europe or Africa and is second only to India and China in Asia. . . ."¹⁹

15. Elwood Mead, *Irrigation Institutions* (New York: Macmillan Co., 1903), pp. 28-29.

16. Walter Prescott Webb, *The Great Frontier* (Austin, Tex.: University of Texas Press, 1951), pp. 254-259.

17. Mead, *Irrigation Institutions*, p. 57.

18. Alfred R. Golz , *Reclamation in the United States* (Caldwell, Id.: Cayton Printers, 1961), p. 12.

19. Mead, *Irrigation Institutions*, p. 349.

By the turn of the century, this remarkable phase of private development of the West, a reflection of the laissez faire era of the late nineteenth century, was in its twilight. A wave of so-called reform was being mobilized by men such as Major Powell and his nephew Arthur P. Davis, Elwood Mead, F. H. Newell, William Stewart, Theodore Roosevelt, and others. They sought to regulate the water industry with the police power, expropriate rights with the navigation acts, develop the American desert with public funds while simultaneously promoting democracy west of the hundredth meridian with the land grants.

EXPROPRIATION OF WATER BY STATE AND FEDERAL GOVERNMENTS: A HISTORY OF WATER POLICIES IN THE ARID LANDS

The history of water policies since 1860 is one of expropriation of property rights by federal, state, and local governments. This trend is manifested in the transformation of the appropriation doctrine into administrative law at the state level; control over canal company water rates by state and county governments; state controls over underground water pumping; the takeover of private water companies by municipal governments; and the imposition of federal controls over rivers, dams, reservoirs, and irrigation works for reclamation and power development. In this section, the evolution of state and federal controls is reviewed in general terms. Part IV compares in detail Bureau of Reclamation policies with those of the city of Los Angeles.

From Rights to Permits: The Evolution of the Water Law at the State Level

In much of the arid West, the appropriation doctrine was being applied by irrigators and miners before state or even territorial governments were organized. A potent political force, appropriators were able to resist or overcome efforts by the newly organized governments to establish bureaucratic controls over them. However, over a number of decades, an accretion of state and judicial controls, promoted by reformers and the federal government, transformed the doctrine of appropriation into a system of administrative law.

In one of its first acts, the California legislature in 1851 sanctioned the local customs by which water and mineral rights had been established.²⁰ Over the next decade, a series of state supreme court decisions lent additional sanction to the appropriation doctrine, which took its place along if not above the riparian doctrine.

The initial victory of the appropriators was relatively short-lived, however. No sooner had their rights been recognized than the political means were organized to expropriate them. State constitutions and statutes universally adopted the principle of public ownership over water. Appropriators were granted the right to use the water (usufructuary right) but ownership over the resource itself (the *corpus* of water) was declared state property. The inherent tension between these two principles eventually was resolved in favor of state controls over water.

The first impetus to state controls over water were water rights disputes. As the population and water demands in the West grew, the decision or transaction costs associated with the establishment and the adjudication of rights increased. In periods of drought, disagreements between senior and junior and upstream and downstream appropriators presented opportunities for judicial and administrative interventions. These were taken partly at the behest of irrigators themselves, who wanted the state to subsidize, at least partly, the settling of conflicting or competing claims. For example, following a series of conflicts over the Cache La Poudre River in 1874, Colorado irrigators "met in convention to demand legislation for public determination and establishment of rights of appropriation, and then state superintended distribution of water in accordance with the thus settled titles. . . ."²¹ These recommendations were incorporated into law in 1879.

The transformation of the appropriation doctrine into administrative law, begun with judicial or administrative interventions to settle disputes, established the following requirements and restrictions:

1. Requirements for the filing of new claims, first at the county, then the state level

20. McCurdy, "Public Land Law Development," p. 239; Samuel C. Wiel, *Water Rights in the Western States* (San Francisco: Bancroft-Whitney Company, 1980), p. 12.

21. Moses Lasky, "From Prior Appropriation to Economic Distribution of Water by the State Via Irrigation Administration," *Rocky Mountain Law Review* 1:3: 173. See also Golzè, *Reclamation in the United States*, p. 10.

2. Limitations on the size of excessive claims and legal specifications on the duty of water (the amount applied to an acre of crops)
3. Attachment of water rights to specific land tracts
4. The disallowal of ownership to water by canal companies that did not irrigate lands of their own
5. Regulation of canal company rates by states and counties
6. State encouragement of the formation of irrigation districts with the power to tax, condemn property, and sell bonds to finance construction of irrigation works and buy out water companies
7. Legislative determination of what constitutes beneficial use, along with the ranking of uses by classes
8. Prohibition on sale of water rights beyond state or irrigation district boundaries
9. Administrative allocation of water during periods of drought
10. The establishment of a centralized bureaucracy headed by a state engineer or water commissioner to administer policies and judicial decrees and, in some states, undertake irrigation projects.

Thus, rights established extralegally in a quasi-anarchistic setting gradually were transformed to the status of permits or licenses held at the sufferance of state officials. As early as the first decade of the twentieth century, Professor Moses Lasky, perhaps prematurely, declared in a three-part article in the *Rocky Mountain Law Review*, that the principle of appropriation had all but vanished.²² In his view, Wyoming and Colorado were leading a new "revolution" in western water law. The thrust of these changes was away "from various forms of extreme individualism and vested property rights of substance in water to the same goal, the economic distribution of state-owned water by a state administrative machinery through state-oriented conditional privileges of user. . . . The transition has been via administration, and in administration is most clearly noted."²³ Fifty years later this trend was confirmed by Milliman.²⁴

22. Lasky, "From Prior Appropriation," p. 269.

23. *Ibid.*, p. 162.

24. J. W. Milliman, "Water Law and Private Decision-Making: A Critique," *Journal of Law and Economics* II (1959): 41-63. See also Hirshleifer, De Haven, and Milliman, *Water Supply*, chap. IX.

The transformation of a system of water rights acquired independently of the government into one of permits secured from a state bureaucracy undermined the security of titles, making it difficult to transfer water to its most productive uses. This system increased the unreliability of water supply, prevented the integration of irrigation works and river systems, and led to a cumbersome structure of regulations and decrees. In a description of the distribution system of a California irrigation district, Mason Gaffney noted:

The Kaweah water distribution system has had to grow in a manner analogous to the law itself, with one principle hanging on another back to the ancient and ultimate fountainheads of authority. It is questionable whether circuitous transfers of this sort are desirable at all, even if each individual operation shows a net gain. For as one ditch is latched on to another, more and more interests become vested in an increasingly absurd tangle and the hope of rationalization recedes even further into the realm of inattentive visions.²⁵

Moreover, vesting property rights over water in irrigation districts and mutual water companies rather than in individuals had resulted in practical prohibition of its sale. Thus, much water "is effectively withdrawn from commerce in a mortmain grip as deadly as that fastened on the lands of medieval Europe."²⁶

The cumbersome and antiquated system of controls described by Gaffney has made it difficult for much of the water to be transferred privately through marginal adjustments made by continuous sales. Instead, the system generates pressures for a step-wise program of monumental water schemes by state and federal agencies, which subsidize low-value crops such as alfalfa and pasture with a policy that produces "too much water, too late."²⁷

Also contributing to political pressures for large projects has been the tendency of state governments to grant permits to a volume of water that is greater than what is, in fact, available. Because the water rights of the most junior appropriators are worthless unless additional volume is made available, support is generated for dams and water transfer projects, which raise the value of junior rights.²⁸

25. Mason Gaffney, "Diseconomies Inherent in Western Water Laws: A California Case Study," *Western Resources and Economics Development*, Report #9, Western Agricultural Economics Research Council, 1961, p. 71.

26. *Ibid.*, p. 74.

27. *Ibid.*, p. 78.

28. See Elco Greenshields, *Journal of Farm Economics* (December 1955): 900.

Ironically, one of Mead's criticisms of the appropriation doctrine was that it sanctioned excessive claims, often amounting to several times the known river flow. Yet the imposition of state controls did not end the practice; it simply made the results far more costly. Individual overappropriations were checked by their resources to invest in diversion works. State overappropriations are constrained only by the amount of money the federal government is willing to spend augmenting local supplies.

Reclamation and Navigation: The Imposition of Federal Controls

As indicated in the previous section, state legislatures and courts had begun to legalize private claims on the basis of the appropriation doctrine. At the initiative of Nevada Senator William Stewart, Congress in 1866 followed suit and gave its consent to the state laws and local customs on which private claims to minerals and water rested.²⁹ From then on, however, public entrepreneurs such as Major John Wesley Powell and future commissioners of the Bureau of Reclamation such as F. H. Newell, Arthur P. Davis, and Elwood Mead seemed to be engaged in a race with appropriators for the control of water and irrigable lands in the region. They claimed that federal control would promote scientific conservation and development of land and water resources; prevent the monopolization of water by corporations and speculators; streamline the system for establishing and enforcing water rights; and encourage the development of rural democracy by war veterans and other deserving pioneers. These policies received the strong backing of at least three presidents, including the two Roosevelts and Herbert Hoover.

In 1878, Major Powell, director of the U.S. Geological Survey, presented to Congress his *Report on the Lands of the Arid Region* in which he urged the federal government to assert vigorous control over its western holdings in cooperation with locally organized districts. While welcoming the impetus given to western development by private efforts, he warned that the separation of water rights from land titles would lead to concentration of ownership. "Monopolies of water will be secured, and the whole agriculture of the country

29. Wiel, *Water Rights in the Western States*, p. 26.

will be tributary thereto—a condition of affairs which an American citizen having in view the interests of the largest number of people cannot contemplate with favor."³⁰

During the next decade Powell single-mindedly pursued what can only be characterized as a massive land grab of the West, withdrawing from entry 850 million acres of the public domain. He designed large-scale plans for their orderly surveying, irrigation, and development under federal guidance. His budget grew from \$50,000 in 1878 to \$156,000 in 1881, reaching over \$750,000 in 1890.³¹

Powell's policies elicited a mixed response from irrigation interests. As chairman of the Senate Committee on Irrigation, Senator Stewart managed to increase Powell's budget and support his plans for federal surveys of irrigable lands and reservoir sites. The senator was particularly interested in the development of the waters of the Carson, Walker, and Truckee Rivers in Nevada, which in his view were being allowed to go to waste. In 1889, the two men, along with other members of the Senate Irrigation Committee, toured the arid region seeking support for a federal role in irrigation. Two years later irrigation congresses began to meet to promote federal reclamation policies.

But soon after the trip the friendship between Stewart and Powell cooled as their personalities and ideas clashed. Stewart simply wanted federal subsidies with few strings attached to water rights or land uses. Powell, on the other hand, wanted greater federal control preceded by years of study and planning. As the latter continued to withdraw additional millions of acres from entry, opposition in the Congress grew, led by Stewart and another Nevadan, Congressman Francis G. Newlands, an owner of land and reservoir sites along the Truckee and Carson Rivers. Newlands, who later became a U.S. senator, opposed Powell's long-term planning schemes because they obstructed "practical" federal irrigation projects such as the one that now bears his name. Powell was forced to resign in 1894 and Congress loosened the controls he had imposed.

30. J. W. Powell, *Report on the Lands of the Arid Region of the United States*, House of Representatives Ex. Doc. No. 73, 45th Cong., 2nd sess., April 1878, p. 43.

31. Wallace Stegner, *Beyond the Hundredth Meridian: John Wesley Powell and the Second Opening of the West* (Boston: Houghton Mifflin Company, 1954), pp. 233, 273, 337, 341. For a less romantic view of Powell and others associated with reclamation see Stanley Roland Davison, "The Leadership of the Reclamation Movement, 1875-1902" (Doctoral diss., University of California, 1951).

Eight years later, the Reclamation or National Irrigation Act was enacted, initiating a new era of federal subsidies and controls. It began as a relatively modest effort designed to win the support from the West without generating too much opposition from the East. The government would sell public lands and put the proceeds into a separate reclamation fund out of which projects would be financed to irrigate new lands. Capital costs would be repaid within ten years and no interest would be charged. Expenditures among the western states would be proportional to the amount of revenues generated by sales of public lands within their borders. Farms would not exceed 160 acres, which would promote rural democracy. Irrigation works and the acquisition of water rights would conform with state laws, provided that the water rights be made appurtenant to the land. Finally, no "Mongolian" labor (a statutory reference to Oriental immigrants seeking work) was to be employed in the construction of irrigation works.

Hibbard summarizes what in retrospect turned out to be remarkably accurate predictions by the opponents of the act:

A New York Congressman estimated that the plan would ultimately cost the country billions of dollars. Dalzell of Pennsylvania believed it a plan to "unlock the doors of the treasury." Mr. Cannon of Illinois dubbed the bill a "direct grant in an indirect way." Payne of New York was of a like mind, while Hepburn of Iowa insisted . . . "that this is a thinly veneered and thinly disguised attempt to make the government, from its general fund, pay for this great work—great in extent, great in expenditure, but not great in results."³²

As it turned out, the critics were right. Within a few years, the federal treasury had to funnel tens of millions of dollars into the fund; repayment periods were extended first to twenty, then forty, then over fifty years as most projects failed financially.

In his seminal study of the relative costs and benefits of land reclamation in the Southeast and West, Rudolph Ulrich estimated that the costs of bringing desert land into agricultural production were from five to fourteen times as great as the costs of clearing, fertilizing, and controlling water inputs to lands in the Southeast.³³

32. Benjamin H. Hibbard, *A History of the Public Land Policies* (Madison, Wisc.: University of Wisconsin Press, 1965), p. 442.

33. Rudolph Ulrich, "Relative Costs and Benefits of Land Reclamation in the Humid Southeast and the Semi-arid West," *Journal of Farm Economics* 35 (1953): 62-73.

Thus, federal efforts to make marginal desert lands bloom made no economic sense. Yet the more resources were spent for this purpose, the fewer remained to invest in the South, as Hibbard observed:

In passing the Reclamation Act in 1902 as a nation we clearly forgot those things which were behind, the millions of unoccupied acres of the Mississippi Valley, consisting mostly of fertile, well-watered land needing only to be drained or cleared. Had we really been concerned over the future food supply as we pretended to be, or, being so concerned, had we calmly asked how to increase it in the cheapest and easiest manner, certain of the Reclamation projects would still be undeveloped.³⁴

While support for reclamation projects was being harnessed, the federal government used the navigation acts to prevent private parties from developing reservoir sites or rivers it had already selected for itself. These acts asserted federal control over navigable rivers and all their tributaries on the basis of the commerce clause of the Constitution. They gave the government the power to expropriate property so that private concerns could not impede navigation without making any compensation. In several instances, such as in the Rio Grande and Colorado rivers, this power was invoked in order to block private irrigation projects that the Bureau of Reclamation later built itself, bringing ruin to the private developers.³⁵

In his critique of the much-abused navigation doctrine, Charles E. Corker noted that it has proved to be a useful judicial device even when it was evident that the river was not navigable.

Both the Congress and the courts have been content to treat the word "navigation" as an open sesame to constitutionality. So long as Congress uses the word in statute and the case relates to something moist, the Court takes at face value the declaration that the legislation is in furtherance of navigation. Moreover, the test of what constitutes a navigable stream has been stretched to embrace most of the waters of the United States.³⁶

34. Hibbard, *History of Public Land Policies*, p. 449. Hibbard quotes a former director of the Reclamation Service as saying, "The fundamental object was to 'make men, not money,' a project in human or social engineering that socialist dictatorships favor in their attempts to build a 'new socialist man.'"

35. Stegner, *Beyond the Hundredth Meridian*, pp. 310-312; Charles E. Corker, "Water Rights and Federalism—The Western Water Rights Settlement Bill of 1957," *California Law Review* 45 (1957): 604-637; Morris Hundley, Jr., *Water and the West* (Berkeley: University of California Press, 1975), pp. 19-26.

36. Corker, "Water Rights and Federalism," pp. 616-617.

It is evident that the long-term trend of federal policy has been to mobilize financial, administrative, political, constitutional, and judicial resources at its disposal to gain—or, perhaps more accurately, regain—control of western waters. It is as if, having been presented with a *fait accompli* in 1867, federal officials entered a race against time to gain control of the land and waters that were left unappropriated and recoup their previous losses. This was accomplished with a combination of subsidies designed to persuade irrigators and state governments to surrender or compromise their rights and open-ended constitutional claims to federal powers.

Note that federal and state policies have pursued similar strategies. The appropriation doctrine has been undermined, water rights have been virtually expropriated and converted into licenses or permits, and control over western waters has been centralized in state and federal governments. The tools may have been different, but the results have been the same.

**THE IRON LAWS OF POLITICAL SCIENCE:
A COMPARATIVE STUDY OF THE BUREAU
OF RECLAMATION AND THE CITY OF
LOS ANGELES**

The long-run trend of public policies to expropriate water rights and centralize control over the resource in federal and state bureaucracies can be explained by two natural laws of politics: *the iron law of political redistribution* and *the law of hierarchical centralization*. Here I present a model of government in which a ruling class of bureaucrats, politicians, and interest groups—Lowi's "iron triangles"³⁷—use political means to transfer wealth from the mass of the public to themselves. Such transfers are more efficiently carried out the greater the centralization of the government. I illustrate the model with a comparative study of the federal Bureau of Reclamation and the city of Los Angeles.

37. Theodore Lowi, *American Government: Incomplete Conquest* (New York: Holt, Rinehart and Winston, 1976).

A Political Model³⁸

In government, individuals act in order to maximize their own utility with the political means of taxation, expropriation, and control or influence over so-called public resources. Those who specialize in exerting control or influence over specific policies constitute what Mosca calls a ruling class. Since the costs of public policy are borne, directly or indirectly, by the entire society, the ruling class in every policy area succeeds in transferring wealth or income from the mass of the public to itself. I call this phenomenon the *iron law of political redistribution*.

Political actors include the following:

1. *Bureaucrats*. The managers of public enterprises, they are control-maximizing actors who strive to secure as many resources—land, water, budgets, employees, or regulatory power—as possible. The more they control, the greater their utility.

2. *Politicians*. These influence-maximizing actors secure votes and consent from the public and its leaders. Politicians run for offices that are constitutionally or legally authorized to make the fundamental policy decisions on behalf of the public. They are the ultimate legitimators of what government does by enacting its laws and approving its budgets. With these decisions they influence the behavior of the bureaucrats. Politicians tend to specialize at influencing those agencies most relevant to their interests, sometimes to the extent that they actually control the agencies. For example, western congresspersons and senators tend to dominate congressional committees that authorize reclamation projects.³⁹

38. This model is part of a theory of politics I have presented in "Political Profit: Taxing and Spending in the Hierarchical State," *American Journal of Economics and Sociology* 40 (1981): 265–275. Among the many contemporary scholarly works that have influenced my thinking, three are of special significance: Anthony Downs, *An Economic Theory of Democracy* (New York: Harper & Row, 1957); Gordon Tullock, *The Politics of Bureaucracy* (Washington, D.C.: Public Affairs Press, 1965); and Randall Bartlett, *Economic Foundations of Political Power* (New York: Free Press, 1973).

39. Helen Ingram, "Patterns of Politics in Water Resources Development," *Natural Resources Journal* 2 (1971): 110. See also Arthur A. Maass, "Congress and Water Resources," *American Political Science Review* 64 (1950): 576–593, and Aaron Wildavsky, *The Politics of the Budgetary Process* (Boston: Little, Brown, 1964).

3. *The Bureaucracy.* This consists of the public employees who carry out public policy under the direction of bureaucrats, who make personnel decisions such as job assignments, hiring and firing, salary, promotions, and so on. In the Bureau of Reclamation, engineers constitute the most important professional group.

4. *Clientele.* This is a collection of individuals each of whom has a substantial stake in the material or symbolic outcomes of public policy, making it economical for them to organize into interest groups. Irrigators, construction companies, real estate developers, banks, suppliers of agricultural inputs, chambers of commerce, naturalists, environmentalists, and others who stand to gain or lose from the bureau's projects make up the clientele of reclamation policies at the federal level. They form national, regional, and local associations on a temporary or permanent basis to press for their preferences and interests. The intensity of their support or opposition is proportional to the expected gains or losses. Group success is in large part a function of their numbers and their density, that is, the degree to which they present a united front. The greater the density and size of the group, the greater its influence. Within limits, these two characteristics serve as substitutes for each other. Examples of interest groups formed to influence reclamation policy are the League of the Southwest, which lobbied for federal projects on the Colorado River during the 1920s, and the National Reclamation Association, formed to protect the bureau from eastern interests opposed to federal subsidies toward irrigation about the same time.⁴⁰

The clientele is organized around the supply of inputs to or outputs from particular agencies. Rents are created whenever an agency increases its purchases from factor owners or expands its supply of goods or services to customers at a price below opportunity costs. The owners of scarce factors, such as land, construction materials, or labor, and the recipients of subsidies, such as irrigators, make windfall gains that are quickly capitalized as property, licenses, or privileges and marketed legally or illegally. In the Westlands Irrigation District of California, for example, windfall gains accruing from the sale of "excess land" (acreage beyond Bureau of Reclamation limitations) have been estimated to average approximately \$1.45 million

40. The origins of the National Reclamation Association are discussed in Golzè, *Reclamation in the United States*; for an account of the League of the Southwest, see Hundley, *Water and the West*, ch. 3.

per owner, while sales of nonexcess land have resulted in average gains of \$49,000 per owner.⁴¹ Naturally, those who paid the market price for this land or made "windfall" gains oppose any change in federal policy that will result in a capital loss for them.

Since support is generated in the process of rent creation, and since rents are quickly capitalized, it pays politicians and bureaucrats to spread the effect of the policy over time. Thus, many projects are started simultaneously and funded intermittently over a period of time longer than is necessary to complete the project economically. While bureaucratic inertia and rigidities were probably partly responsible for Reclamation Bureau projects taking so long to be completed, the incentive to spread benefits of the project over the careers of key bureaucrats and politicians also pointed in the same direction. As of 1973, the bureau had a backlog of construction projects valued at about \$7 billion.⁴²

5. *The Public.* This is the large mass of the population who pay the taxes and bear the cost of public water policies. They are the relatively passive "consumers" of reclamation projects, dams, and state water laws. Their political acts rarely go beyond voting for the politicians who influence these decisions, attending an occasional citizens' meeting, writing a letter to a newspaper, or making a small contribution to a party or candidate. In a study of public participation in water policies in the state of Washington, it was found that only 18 percent of respondents had acted politically to influence water policy. This figure may be exaggerated, since only 61 percent of the questionnaires were returned to the investigators, suggesting that activists were overrepresented in the sample.⁴³

The public's attention is divided over innumerable policies, each of which receives relatively little attention. Due to high information costs, the votes of the public are largely ideological, cast in response to symbols such as "more water," "develop the desert," and "save the farmers," and rhetoric about water "shortages" and "droughts."

41. E. Phillip Le Veen and George E. Goldman, "Reclamation Policy and the Water Subsidy: An Analysis of Emerging Policy Choices," *American Journal of Agricultural Economics* 60 (1978): 929-934.

42. Statement by Gilbert Stamm, Commissioner of the Bureau of Reclamation, 1973-1977, quoted in *Reclamation Era*, Spring 1973.

43. See John C. Pierce, Kathleen M. Beatty, and Harvey R. Doerksen, "Rational Participation and Public Involvement in Water Resource Politics," in *Water Politics and Public Involvement*, ed. John C. Pierce and Harvey R. Doerksen (Ann Arbor, Mich.: Ann Arbor Science Publishers, 1976), p. 172.

Hence their influence over policy is marginal and diffuse, setting limits on the general level of taxation or signalling gross changes in opinions, attitudes, and the popularity of a particular politician, bureaucrat, or policy. It does not specify in any detail programs, organizational structure, budgets, or personnel.

Politicians and bureaucrats are the public entrepreneurs who make and implement government decisions, initiating new programs and agencies, carrying out administrative reorganizations, making policy proposals, planning projects, and deciding on budgets. Major Powell, Arthur Powell Davis, F. H. Newell, Elwood Mead, Senators Stewart and Newlands, President Theodore Roosevelt, and Secretary of Commerce and later President Herbert Hoover were the principal entrepreneurs of federal irrigation policies. They mobilized support for federal controls over western waters, designed and implemented large-scale reclamation and power-generation projects, and organized and defended the Bureau of Reclamation during its formative years. As we shall see, Ezra F. Scattergood, founder and builder of the Bureau of Power and Light, William Mulholland, chief engineer of the municipal aqueduct, and Mayor George E. Cyer performed similar functions in the city of Los Angeles.

Bureaucrats are usually responsible for the creation and growth of public agencies, while politicians provide the necessary support or unwelcome opposition.⁴⁴ Major Powell was the "father" and director for fourteen years of the U.S. Geological Survey, where federal irrigation policies and projects were planned for two decades before the passage of the National Reclamation Act of 1902. F. H. Newell and A. P. Davis, both of whom began their careers under Powell, were the first and second commissioners of the Bureau of Reclamation. The first served twelve years as director and the second nine years.

The entrepreneurs exercise control or influence by accumulating power. Power is net support, or the difference between the support and opposition generated with public policy from other entrepreneurs, the bureaucracy, the clientele, and the public. In government, entrepreneurs allocate and reallocate resources so as to generate maximum support over opposition, which strengthens and expands their

44. A similar argument is presented in J. T. Bennett and M. H. Johnson, *The Political Economy of Federal Growth: 1959-1979* (College Station, Tex.: Texas A&M University, 1980).

control or influence over public resources. As support for or opposition to specific agencies, policies, and individual bureaucrats or politicians shifts, so do the fortunes of organizations, programs, and individuals. Policy and administrative initiatives and changes are taken in the direction that yields an excess of support over opposition and in direct proportion to this difference. If the difference is small, the new agency or program is limited in authority, size or resources. For example, in his discussion of the political struggles that took place in Arizona during the 1940s and 1950s over groundwater pumping, Mann shows that near-equality in the forces supporting and opposing such controls resulted in a relatively weak policy, which was just as weakly enforced.⁴⁵

Water policies at the local, state, and federal levels tend to redistribute income and wealth from the mass of the public to the ruling class of politicians, bureaucrats, and interest groups. Political struggles take place largely within this class as the various actors and entrepreneurs maneuver for position and power. Conflicts are often precipitated by the formation or increase in the power of interest groups that seek to change, initiate, or stop programs, elect, appoint, or remove politicians and bureaucrats, and otherwise change public policy. Though struggles take place within this class and though new groups and individuals may join it, the general tendency is for the class to benefit at the expense of the public, who subsidize the programs, projects, and policies with their taxes. The greater the inefficiency of the projects, the greater the public burden.

The redistributive nature of politics leads to the centralization of the government. Income and wealth are more efficiently redistributed the larger the jurisdiction of the government and the higher the level of decision. The larger the jurisdiction, the bigger the resource base, the smaller the per capita burden of taxes and hence the more passive the public. The higher the level of decision, the fewer the number of decisionmakers and hence the lower the costs of reaching agreement. The implication that federal subsidies to water projects should be greater than state projects, such as those undertaken by the California state government, is supported by fact.⁴⁶

45. Dean E. Mann, *The Politics of Water in Arizona* (Tucson: University of Arizona Press, 1963), pp. 51-61.

46. Gardner Brown, "The Economics of Agricultural Water Use," in Thomas H. Campbell and Robert O. Sylvester, *Water Resources and Economic Development of the West*, no. 3 (Tucson, Ariz.: Western Agricultural Economics Research Council, 1955), p. 17.

The histories of the Bureau of Reclamation and the Water and Power Department of the city of Los Angeles can be interpreted and explained with the use of the theory developed here.

The Bureau of Reclamation

The Bureau of Reclamation is a direct descendent of Major Powell's plans and projects, even though it was established as a service within the U.S. Geological Survey in 1902, eight years after his resignation. Between 1898 and 1900 the Survey examined 147 reservoir sites, many of which no doubt had been selected by Powell during his tenure as director. Within five years, the bureau had secured congressional authorization for twenty-four projects, with at least one in every western state. Most of the projects were begun in great haste with little attention paid to "economics, climate, soil, production, transportation and markets."⁴⁷ It appears that the bureau was more concerned with establishing a political base in the West than in designing economical projects. In this respect, its strategy resembled that of an imperial power securing territorial control with the establishment of "missions" or "forts" over its domain.

It soon became apparent that the reclamation fund as originally established—revenues from the sale of public lands and repayments by irrigators—would not suffice to finance these projects. The costs of the projects turned out to be greater than originally estimated and the ability or willingness of irrigators to repay costs below what had been anticipated. In 1910, President Taft recommended and the Congress approved the issuance of \$20 million in certificates payable out of the reclamation fund. In 1914, the repayment period was extended from ten to twenty years. These were the first in a long series of alterations of the original act designed to broaden the tax base with which to finance the projects and reduce the financial obligations of the irrigators.⁴⁸

After two decades of reclamation, the bureau found itself facing increasing opposition in Congress, particularly from eastern interests who did not want to subsidize increased agricultural production in the West. Also, many of the bureau's project recipients were dissatis-

47. Raymond Moley, *What Price Reclamation?* (Washington, D.C.: American Enterprise Association, 1955).

48. *Ibid.*, p. 7.

ried with the agency's long delays in construction and with the results of the projects. In 1932, western governors formed the National Reclamation Association in support of bureau policies and projects.

President Hoover came to the rescue of the bureau, which was faced with extinction, with the Boulder Canyon project. This massive undertaking, which included Boulder (now Hoover) Dam and the "all-American canal" to transport water from the Colorado to Southern California, expanded the bureau's jurisdiction to include hydroelectric power as a major source of revenue and political support. As Secretary of Commerce, Hoover served as federal representative on a commission made up of representatives of Colorado River states that drafted an interstate compact to divide the waters of the rivers between upper- and lower-basin states.⁴⁹ The agreement made it possible for the federal government to undertake the Boulder Canyon project. The bill was passed under the administration of President Coolidge but it followed Hoover's financial recommendations. Construction and contracts were implemented during Hoover's tenure as president. The city of Los Angeles became one of the operators of the dam's power facilities.

The Great Depression was a "boom" period for the bureau. President Franklin Roosevelt gave the bureau vigorous support. Between 1935 and 1937, \$800 million of projects were authorized, mostly from the general fund. In 1939, a new act was passed relaxing repayment provisions and extending the repayment period up to forty years or more at the discretion of the Secretary of the Interior.

During World War II, new reclamation projects were postponed as resources were shifted to the war effort. But plans for postwar construction efforts continued apace. It was during this period, in fact, that the bureau became embroiled in long and costly struggles with the U.S. Corps of Engineers for control of water resources in the Central Valley of California and in the Missouri basin.⁵⁰ These represent the boundaries of the bureau's territory, which is limited to

49. Hundley, *Water in the West*, pp. 138-214.

50. For a discussion of struggles between the two agencies in California see Arthur Maass, *The Kings River Project* (Indianapolis: Bobbs-Merrill Company, 1952) and Maass, "Congress and Water Resources," *American Political Science Review* 64 (1950): 576-593. On the division of functional responsibilities in the Missouri Basin see Marian E. Ridgeway, *The Missouri Basin's Pick-Sloan Plan: A Case Study in the Congressional Policy Determination* (Urbana, Ill.: University of Illinois Press, 1955), and Carlos Davis Stern, "A Critique of Federal Water Resources Policies: Hydroelectric Power Versus Wilderness Waterway on the Upper Missouri River" (Ph.D. dissertation, Cornell University, 1971), ch. II.

Table 1-1. U.S. Presidents and Bureau of Reclamation Commissioners, 1902-1982.

President	Commissioner	Year Appointed	Tenure in Office	Mean Tenure in Office
T. Roosevelt	F. H. Newell	1902	12	8.75
H. Taft				
W. Wilson	A. P. Davis	1914	10	
C. Coolidge				
W. Harding	D. W. Davis	1923	1	
	E. Mead	1924	12	
H. Hoover				6.8
F. Roosevelt	J. C. Page	1936	7	
	H. W. Bashore	1943	2	
H. Truman	M. S. Strauss	1945	8	
D. Eisenhower	W. Dexheimer	1953	6	
J. Kennedy	F. Dominy	1959	11	3.7
L. Johnson				
R. Nixon	E. Armstrong	1970	3	
G. Ford	G. Stamm	1973	4	
J. Carter	R. K. Higginson	1977	4	
R. Reagan	R. Broadbent	1981		
				$\bar{x} = 6.7$

the western states. The struggles resulted in a division of functions in which the bureau was given control over irrigation projects and the corps over flood control projects. This agreement paved the way for a major expansion in the acreage supplied by the bureau, which doubled between 1945 and 1965 from 4 to 8 million acres.

Today the acreage irrigated partly or totally with bureau-supplied water is roughly 11 million acres, or about 25 percent of the total. But the number of farms directly benefiting from federal water projects is only about 150,000. Thus, "the per farmer stakes can be high indeed. . . . Even a modest farm operation of 160 acres in California may receive a subsidy on water costs, the capitalized value of which

is in excess of \$100,000."⁵¹ Yet, roughly two-thirds of the lands supplied with bureau water are devoted to relatively low-value crops such as grains and forage.⁵² Thus a small minority organized around irrigation has managed to redistribute income and wealth from the taxpayers to itself while misallocating water resources to relatively inefficient uses.

Table 1-1 shows that the bureau has evolved from a relatively autonomous agency controlled by bureaucrats who founded it to one under increased presidential control. For over three decades, the bureau was run by three men who had been active in promoting federal intervention in western irrigation before 1900: F. H. Newell, A. P. Davis, and Elwood Mead. This era of relative autonomy ended with Franklin Roosevelt, who appointed two commissioners. Since then, every new occupant of the White House except Lyndon Johnson has changed commissioners. Note that the mean tenure in office has declined steadily. Thus, the level of decisionmaking in the bureau has been raised to the maximum, a trend in keeping with the law of hierarchical centralization.

Water and Power in the City of Los Angeles: 1890-1950

The political history of water and power in the city of Los Angeles bears a striking resemblance to that of the bureau, at least on those aspects that are relevant to the theory presented in this paper. What follows is a necessarily brief description based on Vincent Ostrom's *Water and Politics*.⁵³

Before 1900, the city of Los Angeles was served by privately owned water and power companies. The water company had a contract to supply the city with water from the Los Angeles River, which the municipal government owned in its entirety on the basis of judicial interpretations of Spanish and Mexican pueblo rights.

51. David Sechler and Robert A. Young, "Economic and Policy Implications of the 160-Acre Limitation in Federal Reclamation Law," *American Journal of Agricultural Economics* 60 (1978): 575.

52. William E. Martin, "Economies of Size and the 160-Acre Limitation: Fact and Fancy," *American Journal of Agricultural Economics* 60 (1978): 923-928.

53. Vincent Ostrom, *Water and Politics: A Study of Water Policies and Administration in the Development of Los Angeles* (Los Angeles: Haynes Foundation, 1953).

Toward the end of the nineteenth century, various reform groups argued that the city should develop its own water. After a long period of agitation, the Los Angeles City Water Company was forced to sell the properties it had developed under a thirty-year lease to supply the city with water. William Mulholland, superintendent of water works for the private company, became the chief water engineer for the city, a position he held for twenty-six years. He came to play the dominant role in the city's water policies.

Shortly after it acquired the local waterworks the city embarked on a vast new project, supported by the Bureau of Reclamation, to bring water to the city from Owens Valley, over 200 miles away beyond the mountains to the north. Valley residents opposed the acquisition of water and land by the city, waging a war against what became the Los Angeles Aqueduct.

This project was begun even though the Los Angeles River could have supplied additional water to serve the urban population at less cost. It was subsequently learned that a syndicate composed of several of the leading civic leaders behind the project had bought large tracts of land in the San Fernando Valley that were later irrigated with water from the aqueduct. In fact, for many years most of the new water was used for irrigation. The owners of the San Fernando properties were able to capitalize a very substantial increase in the value of their property as a result, another instance of the iron law of political redistribution.

Control over water in the Los Angeles River and Owens Valley provided the city with a weapon with which to expand territorially. An aggressive annexation campaign multiplied by many times the original tax base. Also, the city's bureaucrats were one of the leading entrepreneurial forces behind the Boulder Canyon project, the Colorado River project, and the Metropolitan Water District (MWD). An independent agency with taxing powers over an area of more than 3,000 square miles in Southern California, the MWD acts as a water wholesaler to cities and districts of the region. Its biggest project is the Colorado River Aqueduct, which brings water from Lake Davis over 240 miles away. The aqueduct has been relatively inefficient, supplying high-cost water while operating at less than half of capacity between 1940 and 1960.⁵⁴ However, it heavily subsidizes agricultural uses by taxing the urban populations, particularly Los Angeles

54. Hirshleifer, DeHaven, and Milliman, *Water Supply* p. 294.

residents. As late as 1951, 15 percent of the water used by the city, most of it imported from Owens Valley and the Colorado River, was sold to irrigators at a price less than half of what it cost the city to buy water from the district.⁵⁵ Thus, like the Bureau of Reclamation, Los Angeles City pursued a policy of territorial expansion implemented with inefficient projects paid for by the general taxpayer with the support of organized minorities, including irrigation interests.

The Los Angeles Aqueduct also became a source of electric power for the city. Its engineers took advantage of the drops in elevation from Owens Valley to the coast in order to generate hydroelectric power. In 1922, the city forced the private utility companies to sell their properties to the department, subsequently contracting with the Bureau of Reclamation to generate power from Hoover Dam.

As in the Bureau of Reclamation, policy decisions on water and power in Los Angeles were for decades dominated by the men who built the two systems. For twenty-six years Superintendent Mulholland was the most powerful voice on water policy. In 1929, he was succeeded by van Norman, who had been with the department since the construction of the Los Angeles Aqueduct. Van Norman served as director for thirteen years. Ezra F. Scattergood, founder and builder of the Bureau of Power and Light, served as its director for over thirty years and came to rule a veritable political machine. In 1940, a local newspaper observed that Scattergood's bureau "through its many ramifications, its advertising in many small community newspapers and throwaways, and its influence over the thousands of employees, virtually has constituted the balance of power in municipal elections."⁵⁶

Politicians were unable to gain control over the water and power bureaucrats despite several spirited attempts. It proved more advantageous for politicians to support the bureau than to oppose it, as Mayor George E. Cyer discovered. During the 1920s, Cyer "unquestionably made the greatest contribution of any Los Angeles mayor to the development of the program of the Department of Water and Power; but his contribution was in providing political leadership for the policies formulated within the department."⁵⁷

With the passing of Mulholland, van Norman, and Scattergood, who was forced to resign and given a lucrative consulting contract

55. *Ibid.*, p. 308.

56. Ostrom, *Water and Politics*, p. 75.

57. *Ibid.*, p. 108.

that took him away from Los Angeles, the water and power sections of the department were consolidated and centralized. Ostrom, writing in the 1950s, noted that those reorganizations “have tended to raise the level of decision about many of the operational and policy problems that were formerly resolved at the bureau or system level. The office of the General Manager and Chief Engineer has become a vital center of decision-making and leadership for the entire Department of Water and Power.”⁵⁸

Summary

This brief comparative study of the political histories of the Bureau of Reclamation and the Department of Water and Power of the City of Los Angeles has generated a number of parallels between the two agencies:

1. Bureaucratic entrepreneurship and dominance of policy occur during the first thirty to forty years of the agency’s life.
2. Entrepreneurship by politicians is limited largely to providing support for the bureau’s policies and plans; it is unprofitable for politicians to oppose the bureau consistently.
3. Evolution toward centralization or “raising the level of decision” occurs once the bureau founders pass away.
4. Territorial expansion is brought about with the construction of inefficient projects.
5. Costs of projects shifted to the general taxpayer over as large an area as possible, while benefits were concentrated on small minorities.
6. Finally, it is worth noting the role which economic or meteorological “crises” have played in expanding the power of these two agencies. The drought and depression of the 1890s over much of the West generated significant support for federal reclamation legislation, as did the severe winter of 1886 and the slump in agricultural prices between 1880 and 1900.⁵⁹ The Great Depression brought an infusion of public works money into the bureau.

58. *Ibid.*, p. 103.

59. See Stegner, *Beyond the Hundredth Meridian*, pp. 294–304, and Glass, *Water for Nevada*, ch. II.

Ostrom notes the similar effect of drought on the support for public water projects in Los Angeles:

Every major development in water resources programs and water administration has been closely correlated with drought cycles in Southern California. The drought of 1893–1904 produced the Los Angeles Aqueduct; the drought of the 1920s initiated the Boulder Canyon project, the Colorado River Aqueduct, and the organization of the Metropolitan Water District; and the drought of the 1940s produced the “dry cycle harvest” of annexations to the Metropolitan Water District.⁶⁰

TOWARD THE REAPPROPRIATION OF WATER

The history of water policies in the West over the last hundred years shows very clearly the objectives, methods, and results of the political means in action. Irrigators and other beneficiaries of reclamation have capitalized rents created with public policy at all levels of government. Federal and big-city bureaucrats have built impressive monuments to their engineering skills, breaking world records for size and capacity of various dams. And the political entrepreneurs who made it all possible achieved a type of immortality for their efforts: Lake Powell, Lake Mead, Hoover Dam, Lake Roosevelt, and Lake Davis are now part of the political archeology of the Colorado River, the largest in the Southwest. The economic burden of these policies and projects has been borne by the mass of the taxpaying public, who have had to forego the income that western waters would have yielded in uses other than those dictated by the reclamation ruling class.

Currently, federal and state governments are under pressure to engage in ever larger projects or extend bureaucratic controls further. While economists demonstrate the inefficiencies of large-scale water transfers within California, engineers are now making plans for the transfer of tens of millions of acre-feet from the Pacific Northwest, Canada, and even Alaska. It is currently estimated that the most ambitious of these plans would cost \$200 billion and take thirty years to build.⁶¹ At the state level, new or tighter controls are being imposed on underground pumping, sometimes at the insistence of

60. Ostrom, *Water and Politics*, p. 234.

61. Arthur F. Pillsbury, “The Salinity of Rivers,” *Scientific American* 245 (July 1981): 64.

the Bureau of Reclamation. For example, state control over underground pumping has been made a condition for the Central Arizona Project.⁶²

Needless to say, continental water transfers and federally influenced controls over underground pumping would vastly increase the power that the bureau (now the U.S. Water and Power Resources Service) already exercises over the West. In light of the results of the bureau's projects and policies, this policy cannot be to the advantage of the region or the nation, even if a minority in the West and in Washington will undoubtedly continue to benefit.

Today, however, the political means appear to command less enthusiasm and support in the United States than scarcely a decade ago. The ideas of classical liberalism seem to be undergoing a revival in universities and other centers of learning. Perhaps it is only fitting that the American doctrine of prior appropriation be reconsidered as an institution for dealing with the problems of water shortages and conflicting interests over water allocation and use.

In principle, private property over surface and underground water could be reestablished with relatively simple rules of appropriation. The first step would be to establish the physical boundaries of rivers, streams, lakes, and aquifers. In the latter case they could reflect variations in pumping lifts. Next, each basin or watershed would be declared the corporate property of those who currently divert or pump water out of it and of those private or public organizations that manage bodies of water for instream uses. Each individual or organizational share of the basin would be proportional to the capacity of its water-using facilities, including diversion works, pumps, and volume reserved for instream uses. These shares would be bought and sold in an open market. State, federal, and private parks, municipalities, recreational associations, and others interested in nonconsumptive or instream uses of water would be free to purchase as many shares as they wanted. Water would thus be divided among uses and users according to its marginal value to each.

Shareholders would elect a set of officers who would appoint corporate managers. Each corporation would be free to decide whether to conserve, mine, export, or import water. All federal and state irrigation works would be sold or given to these corporations. The only role for government would be to enforce contracts among corpora-

tions and ensure that water is not transferred among owners or corporations without the consent of the participants.

Such an arrangement is not without precedent. Interstate compacts now divide the water of rivers among states. Mead himself described how Utah streams were incorporated by existing appropriators: "All parties having used water from the stream come to an agreement as to their rights, usually on an acreage basis; then form a corporation and issue to each farmer or to each ditch company stock in proportion to their rights. The stream is then controlled by the water master, who is elected by the members of the corporation."⁶³ Mead thought that this solution would be practical only on smaller streams but did not explain how he reached this conclusion. There is no reason why this ingenious device cannot be applied not only to streams, rivers, and lakes, but to underground water as well.

62. Mann, *Politics of Water in Arizona*, pp. 50-60.

63. Mead, *Irrigation Institutions*, p. 233.