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David Carle. *Introduction to Water in California.* California Natural History Guides Series. Berkeley: University of California Press, 2009. Illustrations. xxvii + 261 pp. $18.95 (paper), ISBN 978-0-520-26016-0.

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A Guide to Water in the Golden State

Guidebooks are a wonderful resource for historians. Good ones offer a historical snapshot of a place, its attractions and flaws, and how it fits into its larger surroundings. In his guide to water in California, David Carle does more than describe the places and systems that comprise the state's incredibly complex water network. He also provides an admirably concise version of the state's recent environmental history.

The control of water is critical to virtually all of California's major industries. From tourism to silicon chips to agriculture, California's prosperity is inextricably linked to the ability to move water from one place to another. Part of the University of California Press's extensive series of natural history guides, *Introduction to Water in California* definitely reflects a Berkeley point of view. Carle tells us on two occasions that Southern California's local water sources would support a population of three million compared to the eighteen million who currently reside there. Only the massive importation of water from the Colorado River, the Owens River Valley, and the Sierra Nevada range make it possible for so many people to call Southern California home.

Carle's greatest achievement is his clear description of the complex natural and manmade systems that transport water from the place it falls to earth to the point of consumption. He begins by outlining the essential features of water cycles and follows with a tour of the state's hydrologic regions. The heart of *Introduction to Water* consists of a discussion of the state's major water distribution systems and an examination of the environmental repercussions of large-scale water transfers. The book's statewide focus inevitably leads to abbreviated treatment of topics that have received book-length treatment from other authors. But Carle's comprehensive approach underscores the book's central message: virtually every Californian depends on water transported from somewhere else, in some cases from as far as six hundred miles away. Historians whose primary exposure to California water history is the appropriation of rural water for Los Angeles and San Francisco will welcome the snapshots of such major water systems as the Central Valley Project and the State Water Project.

Carle also shrewdly explores the increasingly blurry distinction between nature and humans. Extensive manipulation of water flows requires a cascading pattern of human intervention to ensure the integrity of many watercourses and animal species. The Salton Sea, a highly saline inland sea that is both a symbol of mistreatment of the landscape and a vital resource for millions of fish and birds, embodies this blending of the natural and artificial. The recipient of enormous volumes of dissolved salts and tens of thousands of tons of fertilizer a year from irrigated lands in the Imperial Valley, the Salton Sea is a thoroughly human creation. Although the below-sea-level basin was historically prone to flooding, the Salton's high salt levels are a direct result of human intervention. The millions of birds that rest and feed there each year depend on the fish and other aquatic creatures they consume to fuel their migrations. With the paving of Southern California, the Salton Sea became a critical alternative site to the wetlands that once sustained migratory birds. But high salinity levels and eutrophication threaten the viability of the sea's fish populations. Carle calls for reducing the amount of alfalfa grown with Colorado River water and reallocating that water to the Salton Sea. Such a decision, he observes, "would signal a major change of public attitude and of water law in California" (p. 155).

The discussion of the Salton Sea is one of many places in *Introduction to Water* where Carle laments the extensive human alteration of the state's hydrology. A longtime state park ranger, his sympathies lie squarely with the fish, birds, and other creatures who struggle to survive in this highly engineered state. He argues that "water development and changes in the waterscape are re-

sponsible for California's distinction as one of the globe's extinction epicenters of the twentieth century" (p. 135). 95 percent of the state's original wetlands and 89 percent of its riparian woodlands have disappeared. Although dam and levee construction played a leading role in transforming the state's landscapes, Carle overstates their significance. The rapid commercial and residential development that stimulated much of this dam construction must also shoulder the blame for the decline in biodiversity. Large-scale water transfers clearly drive growth, but they are also responses to it.

Despite Carle's generally gloomy tone, he offers glimmers of hope that Californians may be embarking on a new relationship with water. The population of Los Angeles, hardly known for its Spartan tendencies, grew by almost a third from 1970 to 2004 without increasing its overall water consumption. Vigorous conservation campaigns and a strong individual environmental ethic are responsible for this significant achievement. Legal changes are also prompting public authorities to revamp their approach to water management.

The legal landscape changed significantly in 1983, when a court ruled that the Public Trust Doctrine applied to Mono Lake, part of Los Angeles's water supply network. The doctrine requires the government to balance the public's desire for navigation, recreation, and other environmental values with the need for drinking water. The city's substantial withdrawals from Mono Lake had caused it to shrink by half, threatening the viability of a water body that sustains millions of migratory birds a year. In response to the ruling, Los Angeles reduced its diversions from the lake and tributary streams. By establishing the relevance of the long-dormant Public Trust Doctrine, the Mono Lake case revived efforts to revitalize degraded rivers and lakes throughout the state. Leery of further judicial action, Los Angeles agreed to restore flows along sixty miles of the lower Owens River. Environmental organizations and water users forged an important settlement to restore salmon runs on the lower San Joaquin River by agreeing to increase flows during critical migration periods.

Readers seeking the latest information on water in California will need to look elsewhere. Originally published in 2004, *Introduction to Water* was republished in 2009 with a new preface. Carle's preface covers the most noteworthy recent developments, including court-ordered reductions in water withdrawals from the Sacramento-San Joaquin Delta and the rewatering of the Owens River, but he offers only the most cursory coverage of the potential impact of climate change on California's water systems. The remainder of the text is the original version. Although this likely will not prevent the book from being adopted in environmental history courses, instructors seeking to use the text to teach environmental studies may find the lack of updating frustrating. Carle frequently offers a glimpse of how a particular water conflict is likely to evolve over the next several years, but readers who do not closely follow California's water issues will be left wondering how things turned out. While the University of California's Press's reluctance to overhaul the book is understandable, the value of a new edition that lacks substantial new information is questionable.

Fortunately, the original version's abundance of photos and images makes it well worth purchasing. The images will appeal to students and enliven sections that describe the state's major water systems. In addition to photos of many of the state's iconic places, such as the Hetch Hetchy Reservoir and Lake Tahoe, *Introduction to Water* includes more than twenty-five color maps and many useful graphics that clearly explain scientific concepts and historical changes.

California's water history is a capsule version of the history of the United States in the twentieth century. From the concentration of agricultural production to the growth of cities and sprawling suburbs to the rise of highly engineered means of controlling nature, the state clearly reflects larger trends in the country's history. As the snowpack in the Sierra Nevada Mountains shrinks, threatening to severely disrupt the state's economy and ecology, California may once again represent a new frontier in America's relationship with the environment. Carle's *Introduction to Water* illuminates the development of the state's water systems and ably summarizes the future challenges Californians face in reconciling conflicting demands on the state's water supply.

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