

9-1-2009

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Chris McNicholas, Book Note, James Lawrence Powell, Dead Pool: Lake Powell, Global Warming, and the Future of Water in the West, 13 U. Denv. Water L. Rev. 189 (2009).

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BOOK NOTES

James Lawrence Powell, *Dead Pool: Lake Powell, Global Warming, and the Future of Water in the West*, Univ. of Cal. Press, Ltd. (2008); 283 pp; \$19.99; ISBN 978-0-520-25477-0; hardcover.

Dead Pool is a historical analysis of environmental, geopolitical, and policy issues arising from the unique and arid climate of the West. James Lawrence Powell, the author and Executive Director of the National Physical Science Consortium at the University of Southern California, depicts the past, present, and future of water in the West, specifically regarding Lake Powell. Powell takes an in-depth look at the expectations and limits of big dam building, and its effect on water in the West. This book is a good historical reference for anyone interested in water development in the West.

Dead Pool divides general issues into sections, which contain specific chapters dealing with the historical minutiae of the rise and fall of water in the West. The first section, *River of Surprise*, contains two chapters, *The Dam Is Not Going to Break*, and *Playing Dice with Nature*. These two chapters show how two major crises threatened the West within a 17-year period.

In *The Dam Is Not Going to Break*, Powell discusses the 1983 flooding, which concerned experts who were unaccustomed to floods. These experts feared that the Glen Canyon dam would collapse, leading to human and environmental devastation within the West. That year, spring water runoff into the Colorado River, along with unusually high amounts of precipitation caused stress within the Glen Canyon dam. Technicians opened spillways on both sides of the dam to prevent catastrophe and used pieces of wood to expand the spillway gates to allow an increased flow of water into the Lake Powell reservoir. Engineers once questioned the necessity of the Glen Canyon dam spillways, and in 1983 these spillways ended up saving the West by preventing the Colorado River from breaking through the Glen Canyon dam and wrecking havoc on the surrounding land.

Next, in *Playing Dice with Nature*, Powell discusses the drought in the West, which occurred from 2000-2004. During this time, Westerners had no recourse but to wait for moisture to return to the West. The move from a crisis on one end of the spectrum, where the West had too much water, to a crisis on the other end of the spectrum, where the West did not have enough water, in only seventeen short years, raised many questions about the past, present, and future of water use in the West. Powell discusses these questions in the subsequent chapters.

The second section, *River of Empire*, contains the next five chapters, which discuss the historical impact of water on the world, and how that translated into North America's use of water. Specifically, these chapters delve into the humble beginnings of the Bureau of Reclamation and the Bureau's attempted rise at becoming a legitimate governmental agency. The third chapter, *Appointment in Samarra*, begins with a historical look at ancient empires, correlating powerful empires with abundant water supplies. Powell surmises that political quarrels, salt, silt, and a lack of control of water, each contributed to the fall of great empires.

The fourth chapter, *One Simple Fact*, describes the beginning of the Bureau of Reclamation. Congress passed the Homestead Act, encouraging people to move west and settle the land. In exchange for moving west, the settlers would receive land, as long as they continually irrigated it. At the time, the arid climate of the West shocked the settlers, who were unable to sustain farms and crops on the land. The government decided to sell land to settlers, who in exchange, would make interest-free payments to the government, and the government would use that money to fund irrigation projects in the West. However, General John Wesley Powell, then director of the United States Geological Survey, reported his belief that not enough water existed in the west to irrigate all of the land.

The fifth chapter, *The Reality of Empire*, describes the difficulties that many people faced when they began to settle the West, and how the government's plan for creating many irrigation projects failed. The settler's crops did not create much profit, and thus, the settlers began defaulting on their loans to the government. Because of this, the Bureau of Reclamation faltered and needed to prove its worth within the governmental system. The Bureau of Reclamation settled on a plan to build a dam so large that it would be a wonder of the modern world, but the Bureau needed to decide where to place this dam.

The sixth chapter, *This Vast Plain of Opulent Soil*, continues with the Bureau of Reclamation's attempt at locating the perfect place for the dam. The Bureau tasked the Colorado Development Company with studying how to divert the Colorado River for irrigation purposes. The Bureau believed that if it could control the Colorado River, it could create a welcoming expansion of the West. Since the United States Supreme Court upheld prior appropriation in 1922, Mexico and both the Upper and Lower Basins claimed a need for Colorado River water. During this time, Delph Carpenter, a Commissioner of the Colorado Water Commission ("Commission") proposed the Colorado River Compact, which divided the water within the Colorado River among Mexico, the Upper Basin states, and the Lower Basin states. The Commission based the amount of water divided within the compact on average flows between 1906 and 1921. With the Colorado River Compact in place, the West then looked to control the water within the Colorado River.

The seventh chapter, *Lonely Lands Made Fruitful*, details the construction of the Hoover Dam, the obstacles faced, and the lives lost in

the process. According to Powell, the building of this dam showed the Bureau of Reclamation's importance to the government. When the government created the Bureau, the original reclamation law restricted the amount of land each person could own, and the law required that the owner of the land actually live there. Once the Bureau completed the Hoover Dam however, it did not attempt to enforce this law as promised, but rather focused on parlaying the success of the Hoover Dam into more dams, a larger budget, and bureaucratic longevity.

The third section of the book, *River of Controversy*, contains chapters eight through twelve, which profile the Bureau of Reclamation's steadfast desire to expand the West by controlling the water. The Bureau believed that the best way to control the water was by building many dams. In the eighth chapter, *Natural Menace Becomes National Resource*, Powell discusses the transformation of the Bureau of Reclamation. This transformation expanded the Bureau's responsibility from solely reclaiming land, to becoming a program intended to power the nation and put it to work. Skepticism abounded regarding the change, and the Bureau published a report, nicknamed the "Blue Book," which described 134 separate projects within the Upper Basin that the Bureau hoped to implement. The Bureau believed that if most of these projects could come to fruition, it would bring the Colorado River under man's domination and allow the West to expand by exponential proportions. The Bureau began lobbying to implement its next project, now called the Colorado River Storage Project. The Bureau set its sights on Echo Park, even though conservationists, including the relatively then unknown Sierra Club, opposed damming the Colorado River at Echo Park because it would ruin Dinosaur National Monument. This dispute set the stage for the first menacing war between the Bureau and conservationists.

In the ninth chapter, *Shall We Let Them Ruin Our National Parks?*, Powell discusses the establishment of the National Park Service and details the power struggle between the Bureau of Reclamation and conservationists. Powell discusses the opposing goals of the groups regarding the Bureau's hope to control the Colorado River and move water across the West while also generating hydroelectric power for the region. The conservationists wanted the pristine wilderness and the scenic beauty of the West to live eternally. Through much political strife, the Sierra Club compromised with the Bureau, surrendering dams within the Grand Canyon, in order to protect other national parks and monuments from the destructive expansion of the West.

The tenth chapter, *We Want to Be Dammed*, discusses the specifics of the environmental movement of the 1960's and 1970's, especially the National Environmental Policy Act of 1969 ("NEPA"). This chapter also discusses the rise of David Brower, who led the Sierra Club in fighting the Bureau of Reclamation from drowning the vast lands of the West. Powell details the struggle of preventing a dam in Echo Park. Powell considers this conflict about Echo Park seminal to the American environmental movement, and the outcome of this conflict not only saved many beautiful parks and nationally protected lands from the

Bureau, but also allowed the building of a dam at Glen Canyon, which would create Lake Powell through the long awaited passage of the Colorado River Storage Project.

In the eleventh chapter, *To Have a Deep Blue Lake*, Powell describes the building of the Glen Canyon dam and the flooding that created Lake Powell. He also details the political struggle of this project and the broken promises of the Bureau of Reclamation. The Bureau claimed that it would not destroy Rainbow Bridge in its expansion and building of the Glen Canyon dam; however, the Bureau did allow water to ruin Rainbow Bridge as the Bureau hoped to dam the Grand Canyon in the future. However, the Sierra Club knew its power and used the media to dismantle the Grand Canyon project by gaining citizen and political opposition. Into the 1970's, attitudes towards preservation of the wilderness continued to gain footing, posing a large obstacle for the Bureau.

The twelfth chapter, *The Biggest Boondoggle*, discusses the Bureau of Reclamation's reasoning behind building the Glen Canyon dam. Powell also addresses the power of the Bureau of Reclamation, and he questions if either the Bureau or the conservationists have really won. Powell delves into the costs of these large projects and their intended benefits, and wonders if future generations will also consider these projects beneficial to sustaining population growth in the West.

The fourth section of the book, *River of Limits*, covers the next five chapters, exploring the balance between supply and demand on the Colorado River and the shift in priorities from when the Bureau of Reclamation first built Glen Canyon to the issues in the West today. In the thirteenth chapter, *Time Machines*, Powell details the supply and demand issues of the Colorado River. Specifically, Powell describes the mistakes made during the negotiations of the Colorado River Compact. The engineers mistakenly used data from some of the wettest years in recorded history to determine the amount of water each state would receive under the compact. Powell also goes into limited detail about global warming and the its effects on the Colorado River, which politicians and engineers alike never took into account when determining water flows.

The fourteenth chapter, *A New Climatology*, discusses global warming, models pertaining to weather patterns, evaporation, and the predictions that the West will become drier and hotter in the future. Powell specifically uses the common CROSS model, which most engineers utilize to predict water variances, to show how dire the water situation in the West may become. Powell also hypothesizes about reservoirs drying up if the West does not change its ways of handling its limited water. Powell optimistically hopes that as reservoir levels continue to fall, comity and peaceful negotiations between the states will continue.

The fifteenth chapter, *Rainmakers*, discusses alternatives for the future, as Powell believes that the Colorado River does not have enough water to keep supporting business as usual. Powell discusses desalting seawater, seeding clouds, and transferring water from other basins.

Powell details the upside and downside of these alternatives, especially comparing costs and efficiency.

The sixteenth chapter, *Let People in the Future Worry about It*, amplifies Powell's belief that change needs to happen now. Powell discusses the problems of silt and salt, compromising reservoirs, dams, and the water quality of the Colorado River. He discusses the burden of repairing dams and keeping them functional. Powell also writes of dams being a short-term solution that eventually must fail. Powell bases his assertions of failure on the problem of silt, which is the most prevalent culprit to the downfall of dams. Powell notes that few solutions exist to combat silt. According to Powell, flushing muddy water through openings in a dam may be a solution, but this would not affect any silt below the level of the hydraulic generators. Thus, the most obvious strategy is to dredge the sediment. However, with a lake the size of Lake Powell, the author estimates that 120,000 tons of silt would need dredging each day, and there is no place to hold this dredge even if the actual feasibility of a project of this magnitude were not an issue in itself.

In the seventeenth chapter, *A Hundred Green Lagoons*, Powell further depicts gloom, especially for wildlife, as the Colorado River Compact becomes unworkable and Lake Powell dries up. Changes are necessary, but past failures in rebuilding and sustaining dams leaves Powell with little hope that the West can sustain itself by staying on the path it carved out years ago.

The fifth part of the book, *River of Tomorrow*, contains the last two chapters, *River of Law*, and *The West Against Itself*. These chapters further discuss the breakdown of the Colorado River Compact. Powell provides a detailed vision of the West if it continues on its current path. Powell ends by discussing the changes in society over the last several decades, and how water adaptation to a new, man-made climatology is the only hope for the future of the West.

Dead Pool vividly portrays the history in developing the West and the water needed to sustain it. It gives a glimpse into the future of water law in the Southwest, and focuses on how past decisions of the government may have grave, unintended consequences in the future.

Chris McNicholas

P. Andrew Jones & Tom Cech, *Colorado Water Law for Non-Lawyers*, University Press of Colorado (2009); 276 pp; \$26.95; ISBN 9780870819506; soft cover.

In *Colorado Water Law for Non-Lawyers*, P. Andrew Jones and Tom Cech direct their discussion of Colorado water law towards non-lawyers, effectively explaining the state's complex water allocation scheme. The book is more thorough than most materials now available to the general public, but less detailed than a traditional textbook. Each chapter describes a specific aspect of Colorado water law, providing the reader with a basic understanding of all elements of Colorado's