

Drinking Water: A History

James Salzman

Reviewed by G. Tracy Mehan III

In his concise and compelling book, *Drinking Water: A History*, James Salzman describes the famous scene from director David Lean’s Academy Award-winning movie, *Lawrence of Arabia* (1962).

Lawrence, played by Peter O’Toole, having traversed a parched desert, is drinking water from a forlorn well belonging to the Harif tribe. He is accompanied by his guide, a member of the Hazimi tribe. A small figure appears on the distant horizon. Lean holds the shot for an excruciatingly long time as a figure, a rider on a camel, appears on the horizon, “slowly becoming visible in the shimmering waves of the desert sun.” The guide runs to grab his gun. A shot rings out, and he collapses, killed from a great distance by Ali ibn el Kharish, played by Omar Sharif. “A wonderfully terse dialogue follows.”

Ali ibn el Kharish: What is your name?

Lawrence: My name is for my friends. None of my friends is a murderer.

Ali ibn el Kharish: You are angry English. He was nothing. The well is everything. The Hazimi may not drink at our wells. He knew that. Salaam.

This classic scene opens the chapter titled “Who Gets to Drink?” which, in and of itself, is a clue that this volume is more than just a straightforward history of treatment technologies, distribution systems, or, say, western water law. *Drinking Water* is history, but it is more than history. It encompasses science and technology, it touches upon law, politics, and economics, but it encompasses more than all those things put together.

Salzman, who holds a chair at Duke’s School of Law and Nicholas Institute, offers the reader “the first book to take a broad look at drinking water, how we and past societies have thought about and managed this most vital of all resources.” He has written what can be described as a work of cultural anthropology with the aim of helping readers understand why, for instance, no one expects to obtain food and lodging for free but assumes water is basically a “free good” for the taking. He surveys myth, superstition, legend, tribal lore, culture and religion in support of his argument “that how we conceive of drinking water has always been fundamental to our relationship with the liquid.

“And the relationship is ever evolving,” writes Salzman. “Drinking water has long been the source of both conflict and veneration, of healing and sickness, and it has always been central to our sense of well-being.”

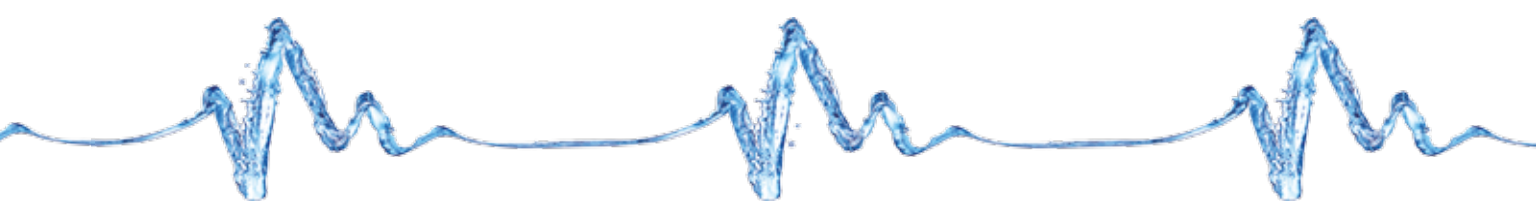
Salzman says “there is no question that drinking water holds a special place deep within our collective consciousness . . . But since time immemorial, long before Perrier’s chic green bottles, long before Ponce de Leon’s futile quest for the Fountain of Youth [something he never even heard of or sought after], long before tales of

Jesus offering his followers ‘living waters,’ we have sought more from drinking water than simple hydration.” Salzman offers a kaleidoscopic tour through the centuries of diverse human customs, rituals, and practices relating to water.

Since the nineteenth century, after it was reported that the Virgin Mary appeared, Lourdes, France, has been a destination for devout pilgrims seeking healing in its holy waters. “The town now hosts roughly five million visitors a year with seven churches and upwards of 270 hotels—incredibly, the greatest concentrations of hotel rooms in France outside of Paris,” notes Salzman. This intersection of water and religious practice is the rule rather than the exception.

Water has multiple roles as a physical, cultural, social, political and economic resource, simultaneously, which is why Salzman’s useful book is relevant to our current debates on access to water and how to pay for its collection, treatment, distribution, and reuse or disposal. Salzman poses a fundamental question: “Should water be a basic right or a marketable good?”

The Talmud proclaimed, “Rivers and streams forming springs, these belong to every man.” This, writes Salzman, amounted to a “Right of Thirst.” The Koran said, “Anyone who gives water to a living creature will be rewarded. . . . To the man who refuses his surplus water, Allah will say: ‘Today I refuse thee my favor, just as thou refused the surplus of something that thou hadst not made thyself.’” Neither the Talmud nor the Koran could have anticipated massive infrastructures supporting potable water and wastewater disposal for millions of people in dense cities. This had to await the rise of the Romans.



Salzman properly honors the marvelous engineering accomplishments of the Romans, especially the 11 aqueducts built over five centuries, some spanning more than 50 miles, providing more than 30 million gallons of water daily to the empire's capital itself. "Always maintaining a downward slope for the water to flow, the aqueducts forded rivers, crossed ravines, even ran beneath the earth," states Salzman. "Built to last, many of these tributes to engineering acumen still stand across the former empire, witness to the Romans' mastery of water, stone, and cement."

Central to Salzman's discussion is not just Roman engineering but the Roman "water-financing scheme" that recognized drinking water's "dual nature."

"To the wealthy Roman, water in the house—whether for drinking, an ornamental fountain, or domestic uses—effectively was a priced good," argues Salzman. "The water itself was free, but charging for the service of delivery made it a commodity. To the average Roman resident, however, water in the city was available by right, as free for the taking as water from the Tiber River." Treating drinking water as a priced good, "enabled cross-subsidization to ensure its public nature."

Much of the book tracks the confusion over water financing, pricing, privatization, and the United Nations' debates on the "right to water" stemming from our collective amnesia that set in after the fall of the Roman Empire. In this sense, we are still living through the Dark Ages in which watering lawns and filling swimming pools is cross-subsidized by low water rates for all while the underlying infrastructure is deprived of adequate funding.

Salzman views the current "rights-versus-markets debate" as being "highly contentious." He insists that "framing access to drinking water as a binary conflict of rights versus markets, of public versus private management, forces a false choice." He takes heart from a 150-year-old report from the New York Committee on Fire and Water that dealt with this very same "private versus public provision that we continue to fight over today." In its 1835 report, the committee recommended a "hybrid approach." Let the wealthy pay. "But to the poor, and those who would be content to receive it from the hydrants at the corners and on the sidewalks, it should be free as air, as a means of cleanliness, nourishment and health."

"Markets and rights both have coexisted and can coexist, one reinforcing the other," said Salzman.

The terms "rich" and "poor" are, of course, relative terms. What is rich in sub-Saharan Africa may be poor in Manhattan. But how poor is a US household, complete with cable television, cell phones, Nike shoes, two cars, and an array of appliances? Many authorities, including the United Nations, view a sufficient amount of water for prevention of dehydration and disease, which is also safe, acceptable, accessible, and affordable (not free), "as seven to fourteen gallons a day per person."

"Raising water rates, though, seems almost as taboo in America as talk of raising taxes," observes Salzman. "Most people seem to assume that cheap water should be ours by right and that government, somehow, should find the means to pay for it on its own. We have taken the ready availability of water for granted in the past and intend to do so in the future."

This review, focusing as it does on the major theme of Professor Salzman's stimulating book, cannot do justice to the richness and variety of topics addressed therein. For example, he incorporates into the text eight different insert boxes, two to three pages long, which discuss various and sundry topics or questions related to water that a layperson, or even a ratepayer or council member, might ask.

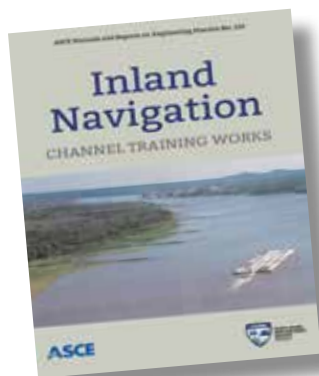
"Should we drink eight glasses of water a day?" Or "Can drinking too much water kill you?" . . . an interesting twist on the aphorism, "the dose makes the poison." And for the science-fiction crowd: "Are companies really going to mine water in outer space?"

In addition, *Drinking Water* describes the early days of water treatment in New York City and Philadelphia, the rise of chlorination, hydraulic fracturing, Singapore's NEWater project and a variety of innovative technologies and funding ideas for water provision in developing nations. This list is illustrative not exhaustive.

With a growing population, and a return to a vibrant economy, water will become even more critical to US citizens' health and prosperity. James Salzman has provided an insightful guide to managing our precious water resources in the challenging days ahead.

Available from the Overlook Press; www.overlookpress.com; ISBN 978-1-59020-720-8 (2012, hardcover, 320 pages, \$27.95).

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Inland Navigation: Channel Training Works

Thomas J. Pokrefke, editor

This book presents design guidance on structures that reshape a river channel to create reliable depths and widths for safe and dependable vessel transit. It is a key reference for navigation engineers working on US Army Corps of Engineers projects or in the private sector, as well as state and local government officials charged with managing river systems.

Inland Navigation focuses on training structures used in open-river channels with flow in one direction (nontidal). Many of the structures are also appropriate for use on low-head (no reservoir storage capacity) lock-and-dam river systems. It describes in detail the proper use of dikes and revetments and explains how to design channel dimensions and alignment so that little or no maintenance dredging is required.

Available from the American Society of Civil Engineers, www.asce.org; ISBN 9780784412354 (2013, softcover, 171 pp., \$75.00).

Responsive Membranes and Materials

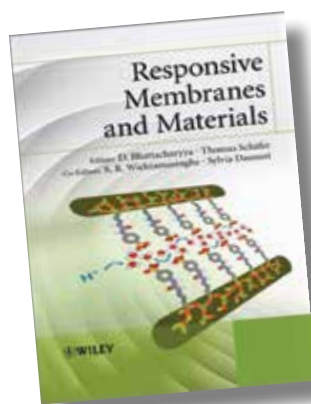
D. Bhattacharyya, Thomas Schäfer, S.R. Wickramasinghe, and Sylvia Daunert, editors

The development of new multifunctional membranes and materials that respond to external stimuli such as pH, temperature, light, bio-

chemicals, or magnetic or electrical signals represents new approaches to separations, reactions, or recognitions. With multiple cooperative functions, responsive membranes and materials have applications that range from biopharmaceuticals to drug delivery systems to water treatment.

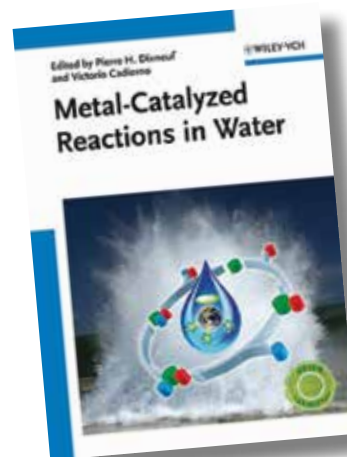
This book covers recent advances in the generation and application of responsive materials and includes

- Development and design of responsive membranes and materials
- Carbon nanotube membranes
- Tunable separations, reactions, and nanoparticle synthesis
- Responsive membranes for water treatment
- Pore-filled membranes for drug release
- Biologically inspired responsive materials and hydrogels
- Biomimetic polymer gels



Responsive Membranes and Materials provides a cutting-edge resource for researchers and scientists in membrane science and technology and also for specialists in separations, biomaterials, bionanotechnology, drug delivery, polymers, and functional materials.

Available from Wiley, www.wiley.com; ISBN 9780470974308 (2013, 432 pp., \$155.00).



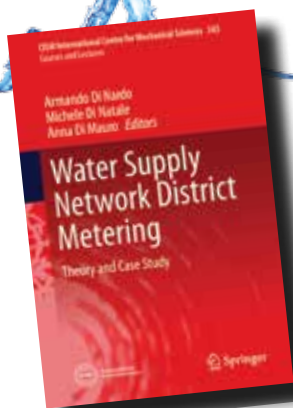
Metal-Catalyzed Reactions in Water

Pierre Dixneuf and Victorio Cadierno, editors

Water is abundant in nature, nontoxic, nonflammable, and renewable; therefore, it could be safe and economical for the chemical industry wherever it is used as a solvent. This book provides a comprehensive overview of developments in the use of water as a solvent for metal catalysis, illustrating the enormous potential of water in developing new catalytic transformations for fine chemicals and molecular materials synthesis.

A group of international experts covers the most important metal-catalyzed reactions in water and brings together cutting-edge results from recent literature with the first-hand knowledge gained by the chapter authors. This book is for scientists in academia and industry involved in the field of catalysis, greener organic synthetic methods, water soluble ligands, and catalyst design, as well as for teachers and students interested in innovative and sustainable chemistry.

Available from Wiley; www.wiley.com; ISBN 9783527331888 (2013, hardcover, 426 pp., \$210.00).



Water Supply Network District Metering: Theory and Case Study
Armando Di Nardo, Michele Di Natale, and Anna Di Mauro, editors

The management of a water supply network can be substantially improved by defining permanent sectors or districts that enhance simpler water loss detection and pressure management. However, the water network partitioning may compromise water system performance because some pipes are usually closed to delimit districts in order to avoid having too many metering stations, decrease costs, and simplify water balance. This may reduce the reliability of the whole system and not guarantee the delivery of water at the different network nodes. In practical applications, the design of districts or sectors is generally based on empirical approaches or on limited field experiences.

The book proposes a design support methodology based on graph theory principles and tested on a real case study. The described methodology can help water utilities, professionals and researchers define the optimal districts or sectors of a water supply network.

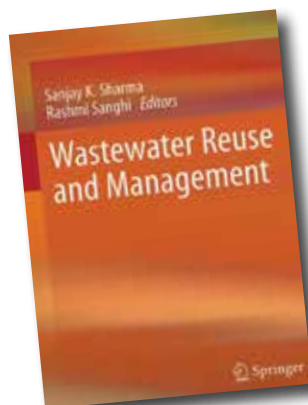
Available from Springer; www.springer.com; ISBN 139783709114926 (2013, hardcover, 103 pp., \$129.00).

Wastewater Reuse and Management
Sanjay K. Sharma and Rashmi Sanghi, editors

During the past 50 years the volume of wastewater has grown exponentially as a result of the increasing world population and the expansion of industrial develop-

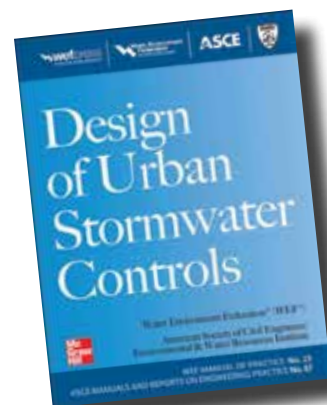
ments. Researchers throughout the world have been trying to address this issue in order to fight water scarcity, but it is only recently that wastewater recycling has caught their attention as an effective and responsible solution.

Wastewater is a resource that can be adequately treated to successfully satisfy most water demands as well as decreasing wastewater discharges and preventing pollution. This book presents the studies of international scientists and gathers them in three sections: "Wastewater Management and Reuse," "Wastewater Treatment Options," and "Risk Assessment." The result is an insightful analysis of wastewater management, its treatments, and the processes that have been studied, optimized, and developed to sustain our environment.



This book presents recent wastewater treatment technologies; encompasses a broad range of studies promoting effective and responsible water use, treatment, and disposal; and gathers contributions from international experts in the field. *Wastewater Reuse and Management* is a resource for academic researchers, students, institutions, environmentalists, and anyone interested in environmental policies aimed at safeguarding the quality and quantity of water.

Available from Springer; www.springer.com; ISBN 9789400749412 (2013, hardcover, 500 pp., \$179.00).



Design of Urban Stormwater Controls, second edition
Water Environment Federation, Environmental and Water Resources Institute of ASCE, editors

This book promotes the protection of urban water resources by controlling stormwater runoff. Fully updated to address the paradigm shift in the way stormwater is viewed and managed, *Design of Urban Stormwater Controls* focuses on consolidating technologies to foster a convergence between traditional stormwater controls and green infrastructure. It explains how systems of stormwater controls can be designed to meet multidisciplinary objectives, including flood control; stream channel protection; groundwater recharge; water quality improvement; protection of public safety, health, and welfare; and multipurpose public benefits.

Topics include effects of stormwater on receiving waters; performance goals for stormwater controls; unit processes and operations for stormwater control; selection criteria and design considerations; swales and strips; basins; filters and infiltrators; gross pollutant traps and mechanical operations; maintenance of stormwater controls; performance assessment; and analytical tools for simulation of stormwater controls. This manual replaces *Urban Runoff Quality Management*.

Available through ASCE; www.asce.org; ISBN 9780071704441 (2012, hardcover, 768 pp., \$130.00).