

Books

**Water 4.0: The Past, Present, and Future of the
World's Most Vital Resource**

By David Sedlak

Review by Eric Stowe

Stanford Social Innovation Review
Spring 2014

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BOOKS

REVIEWS OF NEW AND NOTABLE TITLES

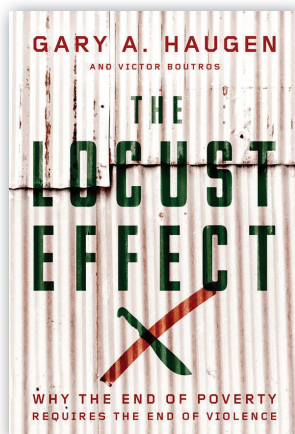
Safety as a Civil Right

REVIEW BY CONNIE RICE

I imagine that half of the little girls (and three-fifths of the adult women) you meet have been raped or molested in their home, school, or church, or in some other place where they should be safe. Imagine that one-fifth of the boys you meet have been molested as well. Imagine that your pleasant, easy-going gardener has just had his land and his entire life savings stolen by a local strongman. Imagine that the workers in the brick factory down the hill are slaves who work without pay and under the constant threat of being beaten or raped. Now imagine that the police are so corrupt that they not only fail to stop such abuses, but actually abet these and other crimes.

That's the reality faced by a large portion of the global poor. And that's the disturbing picture that Gary Haugen and Victor Boutros paint in *The Locust Effect*—an indispensable book that urges readers to confront the “massive epidemic of sexual violence, forced labor, illegal detention, land theft, assault, [and] police abuse” that strikes poor people throughout the developing world and prevents them from escaping poverty.

In the developed world, too, the poor suffer from violence in a way that is disproportionate to any threat faced by more affluent people. In 2000, researchers surveyed poor children in the Los Angeles Unified School District and found that 90 percent of them either had been victims of a felony-level act of violence or had witnessed such an act. In many of these kids, moreover, there were signs of serious long-term distress: 32 percent of them showed symptoms of post-traumatic stress disorder, and 16 percent showed symptoms of depression. (To put those figures in perspective: US veterans of the Iraq war exhibit the same symptoms at roughly comparable rates.) But, as Haugen and Boutros make vividly clear, the



THE LOCUST EFFECT: Why the End of Poverty Requires the End of Violence

Gary A. Haugen and Victor Boutros
368 pages, Oxford University Press

violence experienced by the American poor pales in comparison with the uncontrolled mayhem that poor people elsewhere suffer. Like a plague of locusts, the lawless violence that festers in the developing world destroys everything in its wake.

Ultimately, it's not fetid water, rundown shacks, unpaved roads, or empty pantries that make global poverty such an intractable problem. It's the hidden nightmare of violence that we in the developed world do not see. Advocates have rallied on many fronts to combat poverty. And yet, Haugen and Boutros write, “there has been very little attention paid to the devastating way that violence continually pulls the rug out from under the global poor just as they are struggling to get to their feet.” Even the Millennium Development Goals, whose stated purpose is to end extreme poverty, fail to include the goal of ending violence against the poor.

The Locust Effect sets forth, in horrifying detail, the concrete reality of such violence. In the remote Peruvian mountain region of Huánuco, the mass rape and murder of 10- to 13-year-old girls happens routinely. In Nairobi, men rape girls and then toss them a pittance; the going rate for sexually assaulting a poor girl is about 50 cents. By

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presenting anecdotes of this kind, Haugen and Boutros offer a compelling view of what they call the “massive sinkhole of violence that is swallowing up the hope of the poor.”

More important than the violence itself is the way that predators can terrorize the poor with impunity. Efforts to escape poverty, Haugen and Boutros argue, are “fundamentally undermined by forces of common violence that run rampant in the developing world in the absence of functioning criminal justice systems.” In much of that world, the authors observe, the criminal justice process is rife with corruption, bribery, and Kafkaesque rules that are (it seems) designed to exonerate rich and powerful people who commit heinous crimes.

Safety is the first civil right. That is the main thesis of *The Locust Effect*. Without safety, the poor cannot meet any of their other needs. Dead people can't repay microloans, and people who have undergone violent trauma rarely have the will or the resources to build a well, complete an education, or follow a vaccine schedule. As long as we in the privileged regions of the world fail to understand the effects of chronic exposure to violence, our efforts to end extreme poverty will fall short.

As Haugen and Boutros note, there are proven remedies for the kind of pandemic violence that afflicts the global poor. They describe how American society in recent decades was able to emerge from a period marked by flagrantly corrupt policing and ineffective justice systems. Through sustained campaigns by civic groups, professional police leaders, academics, and other advocates, one American city after another has replaced an openly corrupt policing and justice machine with a relatively professional system of public justice. In Los Angeles, for example, the police have taken steps to build trust within low-income communities. Partnering with organizations like the Advancement Project (of which I am executive director), the LAPD works with people in those communities to deliver not only public safety services, but also basic health and education resources. Policing

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and justice systems in the United States today are hardly perfect, but they are far more capable of protecting the poor from lawless violence than they used to be.

The Locust Effect should be required reading for every politician, every law enforcement professional, and every anti-poverty advocate. It is a tour de force that will change your frame of reference and banish your sense of complacency. After you read it, you will have no excuse for ignoring the enormous toll that unchecked violence takes on the global poor. ■

Future Thirst

REVIEW BY ERIC STOWE

If water supply is “the essential ingredient of civilization,” as David Sedlak contends in his book *Water 4.0*, why do most of us know so very little about how the water in our cities is retrieved, cleaned, distributed, and disposed of? Why do we know even less about the history behind the hard-won social and technological advancements that resulted in the water distribution systems that we rely on today?

Sedlak aims to remedy that gap in knowledge by recounting nearly 3,000 years of progress in water technology. He walks readers through each pivotal stage in the evolution of water infrastructure—from the achievement of effective water distribution on a citywide scale during the Roman era (Water 1.0) to the advancements in water treatment that enabled the delivery of safe drinking water in the fast-growing cities of the 19th century (Water 2.0) to the developments in sewage treatment that emerged during the 20th century to protect the larger water ecosystem (Water 3.0).

These evolutionary leaps represent social innovation at its very best. They exemplify how people and governments, working through an iterative process, can create vast systems that improve every aspect of life. Throughout *Water 4.0*, Sedlak pays homage

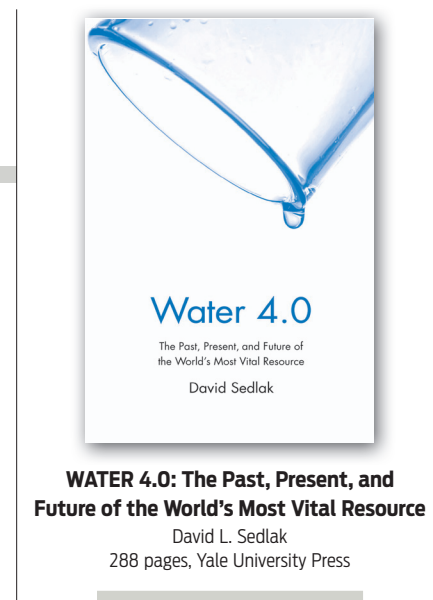
to those he calls “unsung heroes”—to the scientists, engineers, public health experts, environmental activists, lawmakers, politicians, and city planners who have made our cities both livable and prosperous by reducing the epidemiological hazards associated with unsafe drinking water and sewage-choked waterways.

But the crux of the book lies in Sedlak’s exploration of the next stage in the evolution of water infrastructure: Water 4.0. In his estimation, the effort needed to sustain the cities of tomorrow will require an ambitious combination of innovative conservation techniques, serious improvements to centralized water systems, and experiments in adopting decentralized urban water systems—systems that exist locally, apart from the water grid as a whole.

The target audience for this book is people in developed countries who operate and use advanced treatment systems. These systems, although they are undergoing acute stresses caused by climate change and population growth, are able to meet the functional needs of present-day consumers. For this audience, *Water 4.0* presents both a terrific synthesis of how we got where we are today and a solid overview of the steps that we should take next.

How, though, do we deal with the leap to Water 4.0 in countries that are still operating with (at best) Water 2.0 distribution technologies? I began writing this review while working in Kathmandu, Nepal, a city of more than two million people with a water system that can adequately serve only about 500,000 residents. Year after year, under pressure from a rapidly increasing urban population, the city’s water supply continues to degrade significantly in quality, quantity, and reliability.

Sedlak pays little attention to such communities in *Water 4.0*. Yet, as he points out, every advance between stages (from Water 1.0 to Water 2.0, and so on) has been the by-product of a profound crisis. “Quite often,” he writes, “the solution is developed on the front lines of battle—[in] the cities facing the toughest problems—and from



WATER 4.0: The Past, Present, and Future of the World's Most Vital Resource

David L. Sedlak

288 pages, Yale University Press

there the solutions spread to the rest of the world.” The deepest forms of water-related crisis that most developed countries will face in the near term (tax hikes, higher utility bills) likely won’t be enough to incite the kind of action that Sedlak envisions. Instead, the next cycle of innovation may well originate in the developing countries that he overlooks.

The cities of tomorrow must have the resources to fund, operate, expand, maintain, and, when necessary, reinvent their water systems to meet the increasing demands of a growing number of customers. The strain that those customers will place on already taxed water utilities, let alone the nascent water systems in developing countries, should be of paramount concern to everyone.

Sedlak, a practicing engineer as well as a professor of civil and environmental engineering at the University of California, Berkeley, is well suited to lay out the history of water utility development. Yet the conflicting impulses of the professor, the engineer, and the environmentalist within Sedlak have led him to write a book that’s often uneven in tone. At times, the book flows easily, like a detective novel. At other times, it reads like a polemic by an aggrieved activist. And occasionally it drifts into hyper-technical, jargon-filled analysis. (I doubt that most readers will need to know the details of the “Streeter-Phelps dissolved oxygen sag curve.”) The variability in tone may cause readers to stumble as they make their way through the book, or even

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to abandon the book altogether. But they should stick with it.

Water, as Sedlak suggests, is the element that holds a city together and allows it to grow. Although the road signs that will lead us toward Water 4.0 may be hard to read now, *Water 4.0* provides a useful map of where we have been—and of where we need to go. ■

Going With the “Idea Flow”

REVIEW BY AMIR GOLDBERG

Auguste Comte, the founder of modern sociology, coined the phrase “social physics” back in the 19th century. Comte and others in that era aspired to explain social reality by developing a set of universal laws—the sociological equivalent of physicists’ quest to create a theory of everything. Since then, social scientists have become generally disillusioned with that notion. But their skepticism seems to have eluded Alex Pentland, director of the Human Dynamics Laboratory at the Massachusetts Institute of Technology and author of *Social Physics*. Along with fellow data scientists, computer engineers, and, yes, physicists, Pentland is a pioneering member of a movement that aims to harness information technology to create a data-driven mathematical model of social behavior.

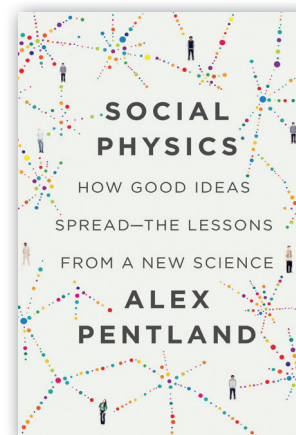
Social Physics offers a summary of the groundbreaking work that Pentland, together with an army of graduate and post-doctoral students, has been conducting over the past decade. Pentland and his collaborators have used ingenious methods—including, most notably, the “sociometric badge,” a wearable device that records interpersonal communication—to discern patterns of human interaction in settings that range from dorm rooms to commercial banks to call centers. The central theme of this work is that the overall structure of a given network of interaction, rather than the

content that people exchange through that network, determines the quality of “idea flow.” That is Pentland’s term for the way that behaviors and beliefs spread across a web of interpersonal relationships.

According to Pentland’s theory of idea flow, certain network structures are more conducive than others to the emergence of innovative ideas or to the coordination of collective action. In one study, for example, online day traders whose patterns of interaction give them access to different parts of an information network outperformed isolated mavericks or groups of traders who operate within informational “echo chambers.” In another experiment, the practice of equitably taking turns in conversation proved to be a stronger predictor of small-group performance than the intellectual capacities of individual group members. Pentland and his co-authors on that study use the term “collective intelligence” to describe this dynamic.

By itself, the idea that the structure of a network matters is hardly new. Neither is the finding that the best structure for developing and diffusing novel ideas is one that is poised between rigidity and randomness. The contention that critically important action emerges on the “edge of chaos” is a prevalent theme in the science of complex systems—a field that, in many ways, laid the theoretical foundations for the kind of computational social science that Pentland’s work exemplifies. What’s new about the research surveyed in *Social Physics* is the sheer volume and diversity of the data that it draws on, as well as the mathematical elegance and computational horsepower that Pentland and his colleagues bring to bear on this body of “big data.”

Social Physics is very much a work of practical science. In the second part of the book, Pentland moves from modeling social reality to suggesting tools for improving it. He describes a network visualization tool that can help managers identify how the informal structures of interaction in their organizations might impede social learning. He also demonstrates how the data collection tools made possible by digital technology



SOCIAL PHYSICS: How Good Ideas Spread—The Lessons From a New Science

Alex Pentland
320 pages, Penguin Press

can enable the design of effective incentive systems. Used correctly, in other words, social physics can be an instrument for creating organizations that are more efficient, more adaptive, and more productive. In the third and fourth parts of the book, Pentland extends that idea to argue that social physics can help us build “data-driven cities” and “data-driven societies.” This “new science,” he contends, will allow us to chart a future that avoids both the competitive frenzy of a market-based society and the fatalism of a class-based society.

At this point, the very meaning of “social physics” becomes a source of confusion: Is it a science, or is it an ideology? The toolkit of a social physicist comes with the potential for social engineering, and that prospect likely make some people uncomfortable. After all, the utopian vision of mastering the secrets of human interaction can easily transform into an Orwellian dystopia. When we apply the model of physics to social reality, perhaps we need to understand it not as a scientific framework, but as a metaphor. And that metaphor, illuminating though it is, eventually breaks down. Unlike the elementary particles that make up the natural world, the units of analysis in Pentland’s social physics—namely, people—are complex, varied, and unpredictable. Their social interaction invariably reflects the content that they exchange with one another; the structure of that interaction tells only part of the story.

Which isn’t to deny that *Social Physics* is a work of great value. Among the many recent books about the new science of networks,

this one stands out for the breadth and ingenuity of its data-driven science, and for its commitment to translating scientific exploration into practical knowledge. Organizational scholars and organizational leaders alike will find it fascinating and useful. Those who seek to leverage the power of big data will no doubt find it inspiring as well. ■

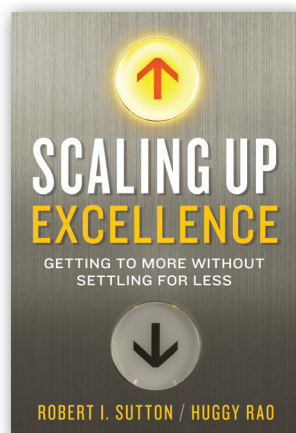
The Long Race

REVIEW BY SAM GOLDMAN

Robert I. Sutton and Huggy Rao call it “the Problem of More”: Leaders spend much of their time trying to scale up their organizations, even as they also strive to create and multiply pockets of excellence. Increasing scale drives financial valuations, provides the resources needed to support innovation, and enables a company to deliver products—in some cases, life-changing products—to millions of people. At the same time, Sutton and Rao write in *Scaling Up Excellence*, the work of scaling up a company is often “akin to running a long race where you don’t know the right path, often what seems like the right path turns out to be wrong, and you don’t know how long the race will last, where or how it will end, or where the finish line is located.”

Scaling Up Excellence is a compendium of lessons and practical tools that will help leaders overcome this vexing problem. Sutton and Rao, who both serve on the faculty at the Stanford Graduate School of Business, draw on seven years’ worth of research, including in-depth interviews and case studies that cover both successful and disastrous scaling efforts at organizations such as the Girl Scouts, Facebook, Jet Blue, Stanford University, the US Navy Seals, and Wyeth Pharmaceuticals.

Throughout *Scaling Up Excellence*, Sutton and Rao present compelling and memorable examples. (If you’re like me, you’ll be sharing stories with your family all week after you read the book.) Want to create “hot causes” that people will eagerly adopt? Consider how



SCALING UP EXCELLENCE: Getting to More Without Settling for Less

Robert I. Sutton & Huggy Rao
369 pages, Crown Business

the Stanford men’s soccer team helped lead a campaign to encourage students to wear bike helmets. Want to reduce the cognitive burden on your employees and to help them improve their decision-making? Take a tip from Adobe’s successful effort to create an alternative to time-consuming performance reviews. Want to build a sense of ownership among employees? Read Sutton and Rao’s comparative analysis of the Taj Group of Hotels, which excels in that regard, and United Airlines, which doesn’t.

Sutton and Rao don’t go deep on any single topic. Instead, they provide high-level perspective on the crucial elements of any successful effort to achieve excellence on a large scale. Their most important lesson, they suggest, is that scaling up isn’t something that leaders can do from on high. “Those who master what venture capitalist Ben Horowitz calls ‘the black art of scaling a human organization’ act as if they are fighting a ground war, not just an air war,” they write. Such leaders grind out change in their organization step by step, person by person, year after year. This insight rang especially true for me. I’ve spent the past eight years working to scale up my company, d.light, and I can see now that our team would have benefited enormously from following a ground-war strategy from day one.

My company, like many other multinational companies, would also benefit from adopting another lesson of the book. Every organization, Sutton and Rao contend, should strive to balance two forms of scaling up: There is the “Catholic” path, which leads

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toward a centralized, preordained replication of beliefs and practices, and there is the “Buddhist” path, which leads toward a decentralized structure in which teams vary—often dramatically—in *what* they do but share an underlying mindset about *why* they do it.

The art of scaling isn’t just about structures, though. People matter as well. “Scaling starts and ends with individuals—success depends on the will and skill of people at every level in an organization,” Sutton and Rao argue. To support that assertion, they offer numerous examples of effective recruitment, training, retention, and team-building strategies that are in use at organizations like Netflix and Facebook. They also include a how-to guide on removing “bad apples” from an organization.

Particularly instructive, to me at least, are the parts of the book that explore ways to test new offerings. Sutton and Rao explain how to find the right balance between “standard” and “custom” approaches to scaling up a new organization, idea, project, or product. “Relying on prebuilt, replicable, and proven ‘subassemblies’ usually produces cheaper, faster, and more reliable solutions,” they suggest. Instead of rolling out an “unproven mishmash of best practices,” the authors advise, leaders should aim to “identify a template that can be ‘seen’ and ‘touched’ in a single, specific location.”

The lessons of *Scaling Up Excellence* aren’t rocket science. In addition, the authors’ choice of case studies has a US bias, and those stories come in a dense, rapid-fire succession that makes them hard to absorb fully. Still, the book is a quick read that delivers nuggets of insight that may well save an organization from years of pain and struggle. My advice is to read it without hoping to find quick answers or one-size-fits-all solutions. Instead, use it to motivate discussion and sustained action among people on your team. Have a highlighter ready, take notes in the margins, and treat this work as a guide that you and your team will want to revisit again and again. As Sutton and Rao note, “scaling well requires never leaving well enough alone.” ■