

ENVIRONMENT

A Saga of Industrial Pollution

Jouni Tuomisto

Toms River offers a fascinating, carefully written description of chemical industry malpractices during the past five decades and the subsequent actions of citizens, authorities, companies, employees, and lawyers. It helps us understand why chemical industry tends to produce health hazards, why that is happening in new areas (such as China) even today, and how these problems could be reduced.

In 1952, the Swiss company Ciba (later Ciba-Geigy and now Novartis) built a chemical factory for producing dyes and, later, other chemicals in sleepy Toms River, New Jersey. The town's enthusiastic welcome gradually turned into complaints and eventually outrage. Through illegal dumping of Union Carbide waste, Toms River came to host another hazardous site. The careless disposal of solid and liquid hazardous wastes at the two sites polluted the nearby river, soil, groundwater, and ocean and caused suspicion of a childhood cancer cluster. Both sites were included in the Superfund program, which identifies and attempts to clean up contaminated sites in the United States.

Describing in depth and with credible data what happened, the book also recounts who made the decisions and the reasons for and the outcomes of the actions. Dan Fagin (who teaches environmental journalism at New York University) lays out the practices through the different decades. He shows that many actions that readers may think of as outrageously stupid were at the time widely accepted standard practice and were based on rational although short-sighted thinking.

Fagin weaves his narrative from stories of individuals passionate about something—whether protecting children against cancer, finding methods to produce bright colors using

coal tar chemistry, or assembling elaborate patient studies to understand the development of cancer and other diseases. He presents dozens of key researchers from Paracelsus (in the 16th century) to Richard Doll (in the 20th) along with their contributions to the understanding and practices of what we now call environmental health sciences.

A similar case of drinking water contamination in Woburn, Massachusetts (*1*), became the basis of a 1998 feature film. The complexities Fagin presents suggest that the saga of Toms River could not be captured in a two-hour movie. However, it has the makings of a fine television series: numerous interesting characters, the spectacle of a growing industrial town with a complex social ecosystem, and a story spanning more than five decades (with flashbacks into even earlier history of chemistry and science). Indeed, *Toms River* synthesizes Fagin's extensive work. He interviewed 140 people and mentions more than twice that number.

Despite the huge amounts of detail and sometimes-difficult scientific concepts, the lucid text remains fairly easy to read. Fagin impressively discloses the web of contacts that stimulated the flow of ideas among

people who then applied their knowledge to new areas and challenges. Absorbing reading, the book also serves up excellent educational environmental case studies and stories. Although not a textbook (it contains no equations or chemical formulae), it provides

informative discussions of the limitations and opportunities of various methods. These should help readers understand the capabilities of environmental health.

Much of the regretful looking back in the book should not have been hindsight. Fagin convincingly demonstrates that in very many cases

enough was known for people to have made better decisions. So why did the chemical companies go on dumping and the authorities keep ignoring future trouble? There seem to be two main reasons. Either the existing information did not reach the decision-makers, or the decision-makers' outlook prevented them from recognizing the hazards and opportunities. In other words, the business-as-usual approach seems to be such a strong default that even clear alternatives tend to go unnoticed. As the book shows, the approach was shared not only by the chemical industry and authorities but also by most researchers and citizens. Leaps of progress came only after a determined few succeeded in shaking the status quo.

This implies that we should systematically promote an open flow of environmental information, especially among people holding different views and different interpretations. In

Toms River, fear that open information would cause public outrage was repeatedly expressed. But the book shows that when at some point the information leaked out anyway, the largest outrage usually stemmed from the secrecy, not the bad news per se.

In the book's final part, Fagin describes how lawyer Jan Schlichtmann (who also was deeply involved in the Woburn case) pushed strongly for such a shared understanding about childhood cancer cases in Toms River. Not only did he succeed, his open approach was able to create trust and a feeling of understanding among the opposing

Toms River
A Story of Science
and Salvation

by **Dan Fagin**
Bantam, New York, 2013.
559 pp. \$28, C\$34.
ISBN 9780553806533.



Troubled environment. The site of the Ciba chemical plant at Toms River, New Jersey.

The reviewer is at the Department of Environmental Health, National Institute for Health and Welfare (THL), Post Office Box 95, FI-70701 Kuopio, Finland. E-mail: jouni.tuomisto@thl.fi

groups. That promising outcome supports claims that openness improves outcomes (2). Therefore, we seem to need more open assessments as early as possible. Once the damage is done, all we can do is estimate its scope and seek the culprits—as events played out in New Jersey.

A balanced book, *Toms River* does not push a political agenda, unlike Rachel Carson's *Silent Spring* (3). But both books offer many valuable lessons to those around the world who wish to improve environmental and occupational health.

References

1. J. Harr, *A Civil Action* (Vintage, New York, 1996).
2. M. V. Pohjola, J. T. Tuomisto, *Environ. Health* **10**, 58 (2011).
3. R. Carson, *Silent Spring* (Houghton Mifflin, Boston, 1962).

10.1126/science.1240379

HEALTH ECONOMICS

Can We Afford More Health Care?

Amitabh Chandra

William Baumol is among the most thoughtful economists of our time—over his prolific career he has covered everything from entrepreneurship to institutions to operations research. In the 1960s, he along with Princeton colleague William Bowen put together a clever thesis to explain the increasing share of incomes that go to relatively unproductive sectors. That thesis is now referred to as “Baumol’s cost disease,” and in *The Cost Disease*, Baumol applies his theory to the debate on health care spending.

Assume (as we economists are superb at doing) that there are two sectors in the economy that differ in the speed of innovation; call them fast and slow. In the fast lane, innovation is rapid. Wages grow because employees are more productive as a result of new technologies that allow them to do more for less. In the slow sector, where innovation is jaundiced, we might expect wages to stagnate and the industry to wither and ultimately disappear. This would be true if the two sectors compete with each other, as was the case of steamships and sailboats. But the cost-disease hypothesis posits that if the slow sector doesn’t compete

with the fast sector and the slow sector is necessary (as is the case with health care), then wages will rise in the slow sector in order to persuade people to enter it. The faster the growth of productivity in the fast lane, the faster wages will also rise in the slow lane. And so the rapid productivity growth that we have seen in computers and automobiles pulls up wages in health care, education, the arts, and garbage collection. The central claim in *The Cost Disease* is that the “crisis” of health care spending may not be a crisis at all: innovation in some sectors increases incomes (or reduces prices), allowing us to spend more on health care. In Baumol’s view, as long as there is a steady stream of innovation outside of health care—and he believes that there will continue to be—we’ll be able to spend even more on health care.

Baumol is careful not to argue that the health care system lacks wasteful spending, and he devotes a fair bit of space to noting the scope of that problem. His “however” is that the cost-disease hypothesis explains the rapid growth of health care spending but doesn’t defend the level of spending (which could be rife with waste). The distinction between the level of spending and the growth of spending is central. For Baumol, the waste lies in the level of spending, but the growth of spending simply reflects the lack of productivity growth in health care. Prices in health care rise in order for it to be produced. The same logic can be used to explain why the wages of barbers have increased over time, even though there has not been innovation in barbering (at least not since barbers stopped being surgeons and dentists).

The Cost Disease offers a fresh take on an important phenomenon. It uses tantalizingly simple ideas to illustrate the perils of curtailing the growth of health care spending. While Cassandras have sounded the alarm over the rapid growth of health care spending, Baumol tells us to keep calm and carry on. Who should one listen to?

There are four issues that one should think about in refereeing this debate. The first is to note that health care spending is the product of health care price and use. Baumol’s study focuses only on the rapid increase in prices and is silent on the quantity of health care that people receive. But we’re surely getting more done to us today—e.g., stents, cardiac computed tomography, visits to the intensive care unit, new oncology drugs, robots, and

proton-beam therapy. More things are constantly being discovered in health care (which pushes against the poky view of health care innovation), and they have high prices because of market power, patents, or research and development costs.

In addition, several commentators have noted that the price of health care on a per-unit basis and adjusted for quality is actually falling. Quality in health care is admittedly difficult to measure, but at least for heart-attack treatments, a careful quality-adjusted evaluation shows falling prices (1). Connecting the dots to the first point about use, it’s possible for prices to

fall but use to increase. In other words, the price of treating cardiovascular disease may be dropping as bypass is replaced with stents, and brand-name statins with generics, but we may be still spending more because we are diagnosing and treating more people.

Furthermore, the distinction between the level of spending and the growth of spending is central for policy debates. There is no denying that growth of health care today will influence its level tomorrow. But if that’s true, the growth of health care yesterday influenced its level today. Baumol is open to waste being an explanation for the level of health care spending—yet as this simple example illustrates, his forthrightness opens up a Pandora’s box of concerns about waste in health care.

Lastly, regardless of the cause of the rise, one thing that everyone agrees on is that health care spending is increasing rapidly. Given government’s role as the largest purchaser of health care, this means that taxes have to go up. The U.S. Congress has shown little appetite for that, and other Organization for Economic Co-operation and Development countries can’t raise their taxes any further. Confronted with this reality, it is difficult to ignore the pressures to reduce waste, increase competition, and adopt high-value technologies. In *The Cost Disease*, Baumol cautions us that in the zeal to reduce health care spending, we should not forget the central role of innovations outside of the sector. As those enrich us, we can surely afford more health care.

References

1. D. M. Cutler, M. McClellan, J. P. Newhouse, D. Remler, *Q. J. Econ.* **113**, 991 (1998).

10.1126/science.1232064

The reviewer is at the Harvard Kennedy School of Government, Harvard University, Cambridge, MA 02138, USA. E-mail: amitabh.chandra@harvard.edu

The Cost Disease Why Computers Get Cheaper and Health Care Doesn’t

by William J. Baumol;
with contributions by
David de Ferranti, Monte
Malach, Ariel Pablos-
Méndez, Hilary Tabish,
and Lillian Gomory Wu
Yale University Press,
New Haven, CT, 2012.
271 pp. \$30, £20.
ISBN 9780300179286.