

## Book Reviews

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**Katherine Kaufer Christoffel**

*Private Guns, Public Health*, by David Hemenway, Ann Arbor, MI: University of Michigan Press, 2004, 344 pp., \$27.95 cloth.

“The public health approach is ideally suited to deal with our gun problem. Public health emphasizes prevention rather than fault-finding, blame, or revenge. It uses science rather than belief as its basis and relies on accurate data collection and scientific analysis. It promotes a wide variety of interventions—environmental as well as individual—and integrates the activities of a wide variety of disciplines and institutions. Most important, public health brings a pragmatic attitude to problems—finding innovative solutions . . . .” (p. 25)

Based on that laudable view, David Hemenway wrote *Private Guns, Public Health* to provide an authoritative overview of public health thinking about gun injuries and deaths in the United States. The perspectives and data summarized were developed over several 20th-century decades, and refined over the last 15 years, that is, in the wake of the tsunami of urban youth gun homicides in the late 1980s and early 1990s. The material is well-known to those who were involved in gun injury prevention research and advocacy during this time. It is not as well-known to the general public, policymakers, or young public health professionals. This book is an excellent summary for all of us and a good introduction to the field for newcomers. It will be a superb textbook for courses on violence as a public health problem and resource for legislative aides and others working toward better policy approaches to the ongoing toll of over 25,000 deaths—and many more nonfatal injuries—per year.

The book is organized in ten chapters: Guns and American Society; The Public Health Approach; Gun-Related Injury and Death; Self-Defense Use of Guns; Location (home, school, public); Demography (children, youth, women, African-Americans); Supply, Policy Background (2nd Amendments, public opinion, evaluating regulation); Policy Lessons (rebutting the NRA, Lott and Kleck; analogies to tobacco and alcohol; international aspects); and Policy Actions. The chapters cover overlapping topics, and

Jonathan B. Wiener

*Catastrophe: Risk and Response*, by Richard A. Posner, New York: Oxford University Press, 2004, 322 pp., \$28 hardcover.

*Collapse: How Societies Choose to Fail or Succeed*, by Jared Diamond, New York: Viking, 2005, 575 pp., \$29.95 hardcover.

One might think that we live in the safest epoch in human history: Life expectancies are the longest they have ever been, childhood diseases are in decline, nutrition is improving, the Cold War is over, and even the eradication of poverty is within sight. But in spite of these successes—or perhaps because of them—our worries now turn to other threats.

Every culture has a mythology of the end of the world, usually triggered by some extrinsic force. But serious thinking people are supposed to dismiss such prophecies. The bearded man on the corner holding up the sign announcing “The End is Near” is a cartoon icon of lunacy.

Now in meticulously researched and yet highly accessible books, Richard Posner and Jared Diamond, two very serious thinkers, are warning that we should worry a good deal more about catastrophe and collapse triggered by human choices. Posner is a judge on the U.S. Court of Appeals for the Seventh Circuit, a law professor at the University of Chicago, and perhaps the most prolific legal scholar in history. He is also one of the founders of the law-and-economics movement, which has often cautioned against government regulation to solve problems that markets could handle on their own. Diamond is an eminent biologist at UCLA, whose last book, *Guns, Germs and Steel*, won the Pulitzer Prize.

This pairing is reminiscent of earlier combinations of biologists and economists who, writing independently, proved influential in the theory of environmental protection in the 1960s: Rachel Carson (whose *Silent Spring* warned of toxic contamination) and Ronald Coase (whose “The Problem of Social Cost” showed how externalities are the product of transaction costs and how transferable entitlements could solve such inefficiencies); and Garrett Hardin (whose “The Tragedy of the Commons” called for restrictions on depletion of shared resources) and Mancur Olson (whose *The Logic of Collective Action* showed why cooperation to protect shared interests is so difficult).

Diamond’s concern in *Collapse* is similar to Hardin’s: the depletion of valuable resources, such as forests, because of the lack of institutional constraints on resource use. Hardin warned that individual rationality could lead to mutual ruin. Diamond amplifies that theme with detailed case studies of Easter Island, the Anasazi, the Mayans, the Viking settlements, and other societies in which resource depletion apparently destroyed the economic and political system. He identifies five key factors—environmental damage, climate change, increasingly hostile neighbors, decreasingly friendly trade partners, and failure to respond to environmental problems—of which he argues the last is most pivotal (while he recognizes that it does not explain every societal failure—he notes the Soviet Union as a counterexample). In the final chapter, Diamond enumerates 12 problems of resource depletion, pollution, and population growth facing modern societies. These problems are gradual and cumulative: extended overuse eventually triggers decline or even a crash. The question is why institutions do not respond earlier to head off this crisis, which Diamond attempts to diagnose in Chapter 14. He laments that societies often forget past shortages or overlook gradual trends, and overconsume water,

forests, and energy as if good times will last. Like Hardin and Olson, he worries that individually rational behavior will thwart collective action.

But as Douglass North, Elinor Ostrom, Harold Demsetz, Gary Libecap, Robert Ellickson, Carol Rose, and others have shown, in many cases these dire results do not occur, because institutions do develop to manage and prevent overuse. Diamond, too, recognizes some success stories; yet his selective sample of cases of collapse, rather than a diverse array of both failures and successes, prevents him from testing which variables influence the outcomes. Via signals of scarcity (such as rising prices), reciprocity, monitoring, and sanctions, markets and societies can successfully rein in overuse. The limits-to-growth alarmists of the 1970s overstated fears of “overshoot and collapse” because they neglected the roles of price signals, market responses, and institutional change. Even in large societies lacking close-knit reciprocity, and even in cases of externalities not reflected in market prices, collective action to protect the national or global environment can succeed, as in the Clean Air Act and the Montreal Protocol to phase out CFCs (despite Mancur Olson’s prediction that collective goods will go unprovided, thus implying that either his theory is wrong or that these ostensibly public-interest policies are actually cases of special-interest rent-seeking). The tragedy of the commons is mainly a serious threat where markets and institutions fail to respond to signals of scarcity with incentives that redirect behavior appropriately. Resources priced in markets, or governed by effective democratic institutions with secure tenure, externality taxes, or tradeable quotas, are better shielded from depletion than are resources not priced in markets, such as clean air or biodiversity, or governed by myopic, unresponsive or corrupt institutions, such as many forests and fisheries.

Whereas Diamond addresses the classic “tragedy of the commons” through historical field studies, Posner’s focus is on scientific forecasts of what one could call the “tragedy of the *uncommons*.” *Catastrophe* treats the extreme: events with very low or unknown probabilities and very high impacts. Indeed, Posner says he is only speaking of true catastrophes that would threaten all human survival, or all life on Earth; even pandemics killing 20–40 million people (like the 1918 influenza) do not count for him as true catastrophes. In a long Chapter 1, he assesses a wide variety of potential catastrophic risks, including particular attention to four: a large asteroid collision causing a mass extinction event; abrupt climate change leading to a hothouse or snowball planet (as contrasted to gradual global warming, to which humans and even ecosystems could adapt); an accident in a high-energy particle accelerator that produces a “strangelet” cluster of quarks that convert the Earth to a small lump; and a bioterrorism attack using a newly engineered pathogen against which there is no defense. These catastrophic risks are particularly problematic because they may exhibit no signal of gradually worsening scarcity; there is only a sudden, rare, annihilating event, with little or no chance to respond. And although some of these events, such as past asteroid collisions and climate shifts, can be observed in retrospect to gather empirical evidence of their incidence, causes, and remedies, that is not possible for others, such as the strangelet problem. Moreover, Posner argues at length in Chapter 2 that we are psychologically and politically disinclined to give serious attention to low-probability catastrophic risks. (Diamond even assumes an asteroid collision is “beyond our control,” confirming Posner’s concern.)

Posner uses benefit-cost analysis (BCA) to argue in favor of significant protective actions to prevent these risks. This may not be persuasive to those who reject BCA altogether, at least when it relies on quantification and monetization of all consequences. Nor will all of Posner’s calculations please economists who favor and con-

duct BCA: many of his estimates are crude stabs at very elusive numbers. Posner himself calls his estimate of the benefits of particle accelerator experiments a “wild guess,” and he does not offer a quantified value for the losses due to abrupt climate change (because he says he cannot assign a probability). In Chapter 3, he offers a number for the value of a statistical life lost to a very low-likelihood catastrophe—\$50,000 per life—that is far lower than the \$7 million figure used by the U.S. government to assess health regulations. (Diamond uses BCA with a value of \$5 million per life to argue that air pollution control is justified.) Posner bases the \$50,000 figure not on a global average value (which might be around \$1.5 million), but on the premise that people would pay almost nothing to avoid very unlikely events. Yet Posner recognizes that economic theory does not support the lower figure (because the value of a statistical life barely changes as the probability of its loss declines from small to smaller), and that public disregard of unlikely risks may be erroneous. Still, Posner “supposes” just \$50,000 per life saved in order to show that his argument in favor of precautions is robust even at such a low value. Hence he finds that the loss due to the extinction of all human beings (he assumes 6 billion alive today, plus, arbitrarily, another 6 billion of future generations) would be only \$600 trillion. He notes that this figure is a minimum estimate, and that it would rise significantly with a higher value per life or a larger number of future descendants. (At \$7 million per life, just the 6 billion alive today would be worth \$42 quadrillion.) These figures also neglect the special difference in kind (not just multiplicative degree) of losing the existence and option values of *all* of humanity, or *all* of life on Earth. As Michael Toman has remarked about efforts to value all of nature’s services, these numbers are a “serious underestimate of infinity.” Posner summarizes these efforts by saying that applying BCA to catastrophic risks confronts “a host of obstacles” but is still “invaluable in cutting through the psychological and political fogs that surround and obscure the terrifying possibilities.” Posner adds that conducting BCA is itself costly, and may not be worthwhile for extremely low-probability risks. The question is not whether BCA is or could be perfect, but whether it is a better method for evaluating catastrophe-prevention measures than alternative approaches—and whether Posner’s BCA could yet be improved.

Nonetheless, Posner still finds that BCA recommends taking serious actions, even at significant cost, to prevent low-probability catastrophes. His book is a bold experiment in the use of BCA to favor risk protection and new government intervention, rather than to criticize and reject regulations. It thereby echoes Carson’s call to arms against pollution, now against catastrophe risks. And it shows that BCA is not methodologically skewed against regulation—just as the Office of Management and Budget, which traditionally used BCA only to reject costly agency regulations, has now innovated the “prompt letter” to use BCA to urge agencies to adopt beneficial new regulations. Given the low value of life that Posner employs, he understates the case in favor of protective interventions.

The most important quality of these two books, however, is neither the specific risks they assess nor the specific remedies they favor. It is that serious, thoughtful experts are saying that worrying about disaster is not crazy. Domsayers are typically dismissed as fanatics on the left (limits-to-growth alarmists crying wolf) or on the right (religious zealots who may even invite the end). Hollywood depictions of asteroid collisions and other disasters make them seem silly to the public. Michael Crichton, who has made a career of books that hype improbable calamities, has just written a novel complete with appendices to attempt to debunk the alarmists. But Posner and Diamond do not fit these extremist caricatures. Their texts are detailed and sober. Neither is a luddite; Posner ascribes some risks to rapid technological

change, but others he studies, such as asteroids, are not caused by technology (but will require technological solutions). Diamond is worried about social rigidity in the face of change. Posner is a conservative exponent of law and economics who is arguing that the *risks* of catastrophe, including abrupt global climate change (which some conservatives have labeled a “hoax”), are worth reducing, even at significant cost. That posture is especially persuasive precisely because it is not what narrow-minded pigeon-holers would expect. It is the counterpart to a moderate-to-liberal jurist writing a book arguing that the *costs* of risk regulation are worth reducing—namely, the book *Breaking the Vicious Circle*, written by Justice Stephen Breyer in 1993. Both Breyer and Posner are pragmatists who wish public decisionmakers would weigh the expected consequences of their actions.

Still, Diamond’s and Posner’s arguments are open to some questions. Posner’s BCA methods are often quick and crude, as noted above. Diamond’s research focuses mainly on islands, which may not be generalizable to modern open economies integrated into world trade and politics (though perhaps they generalize to the Earth as an island). The claim that people tend to disregard low-probability, high-consequence risks—which forms a key part of Posner’s argument in Chapter 2—is complicated (as Posner mentions in Chapter 3) by research by Paul Slovic, Elke Weber, and others finding that people sometimes neglect routine (high-probability) risks and *overstate* rare and dreaded risks.

Moreover, there are at least two major questions about the remedies for risks of catastrophe and collapse. The first is how to prioritize among the wide array of potential end-of-the-world scenarios. The number and diversity of such doomsday forecasts in the literature is bracing, as evidenced by Posner’s own extensive survey, Martin Rees’s *Our Final Hour* (2003), John Leslie’s *The End of the World* (1996), and Corey Powell’s article “20 Ways the World Could End” in *Discover* magazine (October 2000), as well as prior retrospective studies cited by Diamond such as Joseph Tainter’s *The Collapse of Complex Societies* (1988). The lower the probability of catastrophe that one is willing to consider, the greater the number of conceivable catastrophes. Indeed, as the probability asymptotically approaches zero, the number of imaginable scenarios approaches infinity. And if the end of all life on Earth is valued at infinity, rather than at \$600 trillion, then the expected value of the catastrophic risk is an infinitesimal probability multiplied by an infinite impact. These conundrums make priority-setting nearly impossible. Attempting to sort out which are “real” or “plausible” risks (remember the Y2K computer disaster?) can recapitulate the error that Posner seeks to avoid, of neglecting low-probability risks. At the same time, Posner worries that crying wolf—false positives—lull the public into inattention. Diamond argues that we must tolerate some false alarms in order to have warning systems sensitive enough to issue true alarms; zero false alarms would imply the failure to issue some true alarms. His calculus of optimal alarm accuracy is very similar to Posner’s BCA. Ex ante, the real question is not whether the risk is “real” or “true,” but whether the expected value of the low (but non-zero) probability multiplied by the catastrophic impact (with a premium for risk aversion) justifies some cost of prevention.

The second problem is that interventions to prevent one catastrophe may induce others (Graham & Wiener, 1995). For example, perhaps Posner’s greenhouse gas taxes would stimulate a switch from fossil fuels to another energy source such as nuclear fusion, which in turn might pose some very small but non-zero risk of catastrophe. Perhaps attempts to deflect an incoming asteroid could actually worsen the collision, or splinter the object into smaller but more numerous projectiles now even more likely to hit us, or bring back an alien pathogen to contaminate

Earth. Perhaps military intervention in Iraq to disarm state-backed terrorists could accelerate the recruitment of new terrorists, and could set off a period of chaos in which biological weapons are stolen. (Posner briefly recognizes this kind of problem in Chapter 3, but he treats risk-risk analysis as a form of partial BCA, rather than as the more holistic analysis of full portfolio effects it is. Diamond briefly mentions in chapter 14 that some solutions backfire, and repeatedly cites Barbara Tuchman's *The March of Folly*, but he neglects the possibility that collapse might ensue from misguided efforts to prevent risks.) Such risk-risk tradeoffs will not always be in the offing, nor will they always warrant rejecting the proposed intervention. Some interventions might also yield the ancillary benefit of reducing other risks. But if the problem is that low-probability high-impact risks are neglected, it would be ironic and mistaken to ignore the low-probability high-impact countervailing risks induced by interventions to protect against low-probability high-impact risks. A better approach is to weigh the tradeoffs among the portfolio of risks, and to seek risk-superior moves that reduce multiple risks in concert.

Ultimately, the question raised by both Posner and Diamond is whether and how institutions can be motivated to respond intelligently to risks of catastrophe and collapse. Diamond puts his hope in interdependence and long-term planning, but does not offer specific recommendations for institutional reform. Much research indicates that Diamond's concerns are often well handled by markets, norms, and institutions that do respond to signals of gradually rising scarcity. By contrast, Posner's concern is more worrisome because rare extreme events may strike with no advance signals or no time for institutions to adapt. Posner makes several specific and deliberately provocative reform proposals, including expanding research on potential catastrophes, investing in much better asteroid detection, canceling or modifying high-energy particle experiments, imposing catastrophe-risk review on new science projects, creating an international environmental agency and an international bioweapons agency, taxing greenhouse gas emissions to stimulate rapid technological change, and intensifying security measures against potential bioterrorists (including limiting some civil liberties). He hopes that BCA will help surmount the psychological and political obstacles to adopting such measures to prevent low-probability catastrophic risks. BCA might well persuade experts and funders to cancel particle accelerators and invest in asteroid detection. But solving abrupt climate change and bioterrorism (and stubborn resource depletion) will also require broader social changes and institutional innovations—perhaps learning, in part, from the success stories in Diamond's history. In this era of prosperity and longevity, Posner and Diamond may make it respectable to discuss disaster; the question is whether institutions can rise to the challenge.

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