Since before the days of Archimedes, scientists have assisted their nations in dealing with war. They have also improved the ability of societies to cope with the vagaries of Nature with safer and more robust transportation, dams, waterways, and buildings. By and large, their contributions have been in the physical domain of physics, chemistry, and engineering. In the current era, we are faced with what may be a long-term threat of terrorism intended to cause massive disruption and perhaps massive deaths. To this must be added potential threats such as the rapid emergence of new and lethal strains of influenza. A characteristic feature of these threats is that success in avoiding or coping with them will depend fundamentally on individual and collective human behavior. This is not new, of course, as illustrated by how important such matters were in the dark days of World War II. Something similar in spirit but very different in detail may be needed in the years ahead. How can today's science help to harness citizen power in response to crisis?

Professor Amy Ding's book is remarkable for addressing this very issue, and by exploiting modern science involving human cognition, decision making, and behavior. She not only describes relevant concepts, but uses mathematics and computer simulation to apply the concepts pragmatically. Much of the book is therefore quite technical, as befits its text-book nature. Readers, however, will be motivated by its being organized around real, important, and all-too-familiar problems such as: How can the broad "situational awareness" of the public be improved to help avert or respond quickly and effectively to threats? How can government, private institutions, and the public cooperate effectively in times of unexpected events and potential chaos? It turns out that science, mathematics, and modeling can actually help answer such questions! We need not just fall back on common intuition, which is often quite wrong. At the same time, we can systematically build better intuition.

Some people doubt that much can be done to prepare for turbulent circumstances, but that simply is not true. A more subtle skepticism (based on recent experience) is that governments can be trusted only to do things poorly. In fact, however, local, state, and national governments are intensely concerned about how best to prepare for and deal with crises of the sort discussed in this book. Great dedication and enormous resources are going into such matters. This book helps to inform those efforts and is spot-on in its attention to such concrete matters as how government information can be structured and communicated so as to be maximally valuable. The prescriptions are not in the form of foolish detailed plans that would fall apart as real events proved to be different from those anticipated, but rather about tools and organizational approaches that would prove useful for rapid adaptation, and about building systems and organizations so as to be flexible in what they can do and robust to shock. In effect, the book is laying out elements of a strategy to allow for flexibility, adaptiveness, and robustness (FARness)—attributes highlighted by me and other researchers concerned with planning under uncertainty.
It is one thing to agree with this type of philosophy; it is quite another to identify practical steps to pursue it. Here the book laudably translates the challenges into what I think of as concrete “engineering problems,” such as how to characterize, communicate, and reinforce information to the public, or how first responders can sensibly (although by no means “optimally”) allocate their resources rapidly amidst confusion. Addressing such problems can benefit greatly from science-based principles and from clever at-the-time use of heuristics and tools to assist assessment, decision, and action. Professor Ding’s book attempts to teach such principles and approaches to practical problem-solving. It is an unusual and welcome contribution.

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