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Panarchy and dystopia

WILL KYMLICKA

This is an ambitious book. In *The Upside of Down*, Thomas Homer-Dixon sets himself three large tasks, each of which could have been a book in itself. The first is an overview of the main economic and environmental challenges facing the world today, and why he thinks these are likely to lead to “catastrophe,” the literal breakdown of social order. His second task is to elaborate a more general theory of social breakdown, one that applies not just to our circumstances, but throughout history. The third task is to suggest what we can do either to prevent this impending catastrophe, or at least to be better prepared for it, and perhaps even to build a better civilization in its ashes.

In the course of pursuing these tasks, Homer-Dixon covers an extraordinary array of issues and debates, ranging from the engineering feats of the Roman Empire to the melting of the polar ice cap to the chaotic development of Third World mega-cities, all presented in a clear and engaging style. Those familiar with Homer-Dixon’s earlier work, such as his bestselling and Governor-General’s Award-winning 2000 work *The Ingenuity Gap: Can We Solve the Problems of the Future?*, will not be surprised by the wide-ranging scope and technical virtuosity of his writing.

By any measure, this book is an impressive achievement. It is a thoughtful and thought-provoking book. However, Homer-Dixon’s success in the three tasks he sets himself is uneven. His discussion of the main challenges facing us in the 21st century is particularly well done. He identifies five “tectonic stresses” that might generate the equivalent of a social “earthquake”: uneven population growth between rich and poor countries; the impending oil shortage; environmental degradation; global warming; and the growing economic instability and inequality generated by global capitalism. In each case, he argues that we typically underestimate these stresses, partly because their negative effects are initially felt most strongly in the global South. But increasing interdependence means that instability at the peripheries of the global system will eventually affect the West as well.

While Homer-Dixon’s goal is to persuade us that these five challenges are more serious than is often realized, he doesn’t overplay his hand. He continually acknowledges the limits of our knowledge, the depth of scholarly disagreements and the difficulty of making reliable predictions. It is possible, he concedes, that none of these stresses on its own would lead to catastrophe. However, he worries that there is an ever-increasing likelihood of “synchronous failure” that would “overload” the system.

Of course, none of this is particularly new. There has been a mini-explosion of books in the last couple of years -- most prominently Jared Diamond’s *Collapse* -- predicting social catastrophe, for similar sorts of reasons. But for those who want a clear and accessible overview of this catastrophist debate, and one with a Canadian flavour (Homer-Dixon teaches at the University of Toronto, where he is director of the Trudeau Centre for Peace and Conflict Studies), this is a useful place to start.

He has less success regarding the second task, the construction of a general theory of social breakdown. Throughout the book, Homer-Dixon draws analogies between the stresses we currently face and those faced by earlier societies, and he insists that our impending breakdown fits a general pattern. In fact he offers two general patterns.

The first is a theory of “energy return on investment,” or EROI. When he introduces his five tectonic stresses, declining oil supply is listed as just one among the others. But as the book develops, it becomes clear that energy supply is in fact the key variable for him. He argues that every society is sustained by a predominant energy source -- in our case, oil. Societies develop quickly when they can find cheap and plentiful sources of this energy, but over time they must expend more and more resources to locate ever smaller and more inaccessible supplies. The initial Texas oil fields offered an EROI of 100 to 1; the Alberta tar sands offer an EROI of less than 5 to 1. As the EROI declines, a society’s development trajectory becomes unsustainable.

In this way, our predicament mirrors that of the ancient Romans, whose food-based economy expanded beyond available agricultural resources. When the Roman Empire was at its peak, it had to expend more food to sustain the people involved in producing and transporting grain in its far-flung regions than these people were actually growing. So, too, we are now having to invest more and more energy to locate smaller and smaller pockets of remaining oil, and “societies that don’t have access to enough high-quality [i.e., high-EROI] energy are likely to disintegrate.”

The second general pattern is a theory of “panarchy,” which Homer-Dixon adapts from Canadian ecologist C. S. (Buzz) Holling. According to this theory -- initially developed to understand the life-cycle of forests -- all complex systems, human or ecological, become increasingly complex and connected over time, but this inevitably increases rigidity and hence vulnerability to external shocks. Homer-Dixon claims that our society is reaching the upper limits of its capacity for complexity, and that some form of breakdown is therefore inevitable.

EROI and panarchy are both complicated ideas, and as always, Homer-Dixon does a nice job of explaining them for the general reader. However, it’s not clear that they really help us predict or prevent social breakdown. It may be true that we are witnessing a decline in EROI, and that none of the renewable alternatives to oil can match the extraordinary 100 to 1 EROI that characterized the initial vast oil discoveries in Texas or Saudi Arabia. But it’s not clear that declining EROI inevitably leads to “disintegration” rather than adaptation. Societies historically have evolved from one fuel source to another -- consider the shift from muscle power to coal to oil -- without breakdown. Why won’t we be able to manage the transition from fossil fuels in the same way?

And even if all systems exhibit a tendency toward panarchy, it’s not clear why we are at or near the upper limit of complexity and connection. It seems to me that someone living in 1920 could equally have speculated that the new technologies of communications and transportation were making society too complex and connected. How do we know at what point increasing specialization and interdependence ceases to be efficient, and instead leads to rigidity and vulnerability? Homer-Dixon suggests that the five tectonic stresses are evidence that we are reaching the critical threshold, but it’s not clear to me that these five stresses are best understood as problems of “complexity” and “connection.” Perhaps the problem of economic inequality, for example, is simply that: a problem of inequality, not of panarchy.

In short, while his discussion of the five tectonic stresses is powerful and provocative, it’s not clear that the general theories add much to the narrative. Even more disappointing is Homer-Dixon’s third undertaking, namely his discussion of what we should do in response to these challenges. As the title of the book indicates, Homer-Dixon states that these tectonic stresses present opportunities as well as dangers, and open up space for creativity and renewal. He even invents a new term -- “catagenesis” -- to capture this idea of rebirth emerging out of breakdown.

In the end, however, Homer-Dixon says very little about what we can or should do. He dismisses what he calls the “managerial approach,” for example, setting up another office in the government bureaucracy to deal with climate change or migration. This, he says, “simply adds another layer of complexity on top of an already cumbersome and dysfunctional management system.”

His alternative, however, remains murky. He extols the virtue of what he calls “a prospective mind,” which is comfortable with uncertainty and open to innovation. He also extols the virtues of local community experimentation, using “small-scale experiments to see what kinds of technologies, organizations and procedures work best under different breakdown scenarios.” But his treatment of these alternatives is sketchy, and it’s difficult to see how either individual mental agility or local community experiments can match the magnitude of the challenges he has laid out.

In this sense, the title of the book is misleading. There is very little upside to the down that he describes, despite his repeated invocations of “resilience,” “renewal,” “catagenesis” and the “prospective mind.” The problem, I think, is that Homer-Dixon has boxed himself into a corner in his appeal to “panarchy.” According to the theory of panarchy, complexity and connection are the problem, and so any response that involves greater complexity and connection will exacerbate the situation. Yet any effective response to the stresses that Homer-Dixon rightly identifies will surely require precisely such a response -- for example, creating a new global regulatory system for carbon emissions to reduce global warming, or a global regulatory system for currency exchange to reduce economic instability in the Third World.

Homer-Dixon says very little about such “managerial” solutions, since they cannot fit within his theory of panarchy. Focusing on government legislation and international regulation, he implies, simply exacerbates the problem of complexity and rigidity. The only response that is consistent with the theory of panarchy is small-scale experimentation, disconnected from larger collective action. And that seems wholly inadequate to the task, if not fatalistic. Homer-Dixon’s discussion of the five tectonic stresses is enlightening; his attempt to subsume these under the heading of panarchy is at best misleading, and at worst paralyzing.

Will Kymlicka is the Canada Research Chair in Political Philosophy at Queen’s University.