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A Society of Seers

Can Thomas Homer-Dixon's "prospective mind" help us thrive after global crises?

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Built in the mid-nineteenth century and once home to a country doctor, Thomas Homer-Dixon's house in Fergus, Ontario, has an austere yet stately dignity, its exterior walls a blue-grey stone, its windows tall. And at first meeting, Homer-Dixon himself has something of the reserved, morally serious demeanour of a Presbyterian minister. The fifty-year-old director of the Trudeau Centre for Peace and Conflict Studies at the University of Toronto and author of the Governor General's Award-winning *The Ingenuity Gap* is classically handsome, tall and rail thin, his hair greying, and his eyes a fierce blue.

When we walk into the house, we encounter all the warmth and disorder of a busy and wildly ambitious family. Homer-Dixon has only recently surfaced from the intensive period of writing that resulted in his new book, *The Upside of Down: Catastrophe, Creativity, and the Renewal of Civilization*; his wife is just days away from defending her doctoral dissertation; and they have a rambunctious eighteen-month-old son. The walls are decorated pell-mell with framed colour photographs taken by Homer-Dixon over the years during extensive travels in India and Africa, rooms are littered with toys, and Homer-Dixon's spacious first-floor office is congested with books and documents stacked on the floor, twin computer monitors glowing.

After completing his doctorate in political science at the Massachusetts Institute of Technology in 1989, Thomas Homer-Dixon came to the public's attention with research that resulted in 1999's *Environment, Scarcity, and Violence*. A synthesis of the findings of an international, multidisciplinary team, the book investigates the claim that shortages of renewable natural resources like clean water and fertile soil are directly linked to violent social unrest—guerrilla insurrections, civil war, terrorism, riots. "Developing countries face increasingly complex, fast-moving, and interacting environmental scarcities," Homer-Dixon writes. "These scarcities can overwhelm efforts to produce constructive change and can actually reduce a country's ability to deliver reform. Consequently, environmental scarcity sometimes helps drive societies into a self-reinforcing spiral of violence, institutional dysfunction, and social fragmentation." Societies like Haiti, with the most irremediably devastated environments, are consequently at the greatest risk of violence and are also the least able to create the ingenuity needed to reform.

"I have an engineering mentality," Homer-Dixon tells me. "I'm not one to sit around wondering about the nature of truth. I like to solve problems." We are sitting at a picnic table in his backyard, a full acre that includes a swimming pool, an English-style garden, and a small, struggling orchard. I ask him about his call for humility in our relationship to nature in *The Ingenuity Gap*, in which he argues that the potential catastrophes arising in the ecological, political, and economic systems of our globalized world are so complex and unpredictable that we will be unable to muster the ingenuity needed to solve them. He replies, "This loss of humility and humbleness is a recent phenomenon, and I think it's one of the explanations of our current situation."

According to Homer-Dixon, ingenuity can be thought of as "sets of instructions that tell us how to arrange the constituent parts of our social and physical worlds in ways that help us achieve our goals." "Technical ingenuity" involves the creation of technologies or approaches that solve relatively specific problems — the vaccine that eradicated polio, the plant hybrids and synthetic fertilizers that have dramatically increased crop yields. "Social ingenuity," on the other hand, is the creation of social conditions that allow for the emergence of technical ingenuity

when needed. Examples include fair and efficient markets, which provide incentives to invent, as well as research centres and universities. These two forms of ingenuity are closely related: without social ingenuity, useful and sophisticated technical ingenuity is unlikely to emerge.

The Ingenuity Gap is largely an account of how the unstable character of complex, interlocking systems like climate, ecology, and international finance pose serious and poorly understood challenges to our ingenuity and to our societies as a whole. We are accustomed to the slow and predictable evolution of significant developments, but changes in complex systems, especially in a world where speed and connectivity are paramount, are often rapid and dramatic, the result of gradually accumulating changes that suddenly cross a critical threshold. Complex systems tend to spiral into turbulence, fed by “positive feedback loops” that amplify initial conditions. Homer-Dixon’s principal examples are global climate change, the run on Wall Street in 1987, and the sudden collapse of Asian currencies in the late 1990s.

“When things are going well, as they were for most people in the 1990s, it’s easy to forget that we live in a world of unknown unknowns,” Homer-Dixon writes. “Not only are we often ignorant of critical components, processes, and possibilities in the complex systems surrounding us, we’re also often ignorant of our ignorance.” In what he refers to as our new, human-created world, a world without frontiers whose every facet is influenced by the presence of human beings and whose natural, social, and technological systems are closely intertwined, “unknown unknowns” abound. While we may know that the thermohaline current, the great conveyor belt of heat that courses through the North Atlantic, is crucial to the temperate climate of Europe and will potentially be affected by the melting of the polar ice sheets, that system is too complex for scientists to model even with the best computers. The presence of unknown unknowns means that we often do not know what kind of ingenuity we need because we don’t comprehend the nature and extent of the problem. We may have created a world whose complexity and speed have outpaced the capacities of the human brain.

The Ingenuity Gap hearkens back to *Environment, Scarcity, and Violence*, but takes a global perspective: increasing populations, environmental scarcity, and a rising ingenuity gap may trigger widespread social unrest and violence. “In recent decades, humankind has created, without paying much attention, a dangerous world of tightly coupled and sometimes highly unstable political, economic, technological, and ecological systems,” Homer-Dixon remarks in an afterword, written in light of 9/11, to the 2002 edition of *The Ingenuity Gap*. “These include an international financial system prone to flip between stable and turbulent modes, a perturbed climate that may be on the cusp of dramatically new patterns of behavior, and a global political-economic regime that’s generating immense stresses and potential for mass violence.” Given the scale of our problems, it is unlikely that we will be able to reduce the ingenuity gap directly by inventing new and better technologies, but we can reduce the need for ingenuity by setting up an international banking system less vulnerable to sudden collapse, reducing our dependence on fossil fuels, and living more humble and prudent lives. We can cultivate the kind of humility in the face of the awesome power of the natural world that Homer-Dixon believes would serve us well. Above all else, we need a “change in our values and in our perception of ourselves.”

It is late afternoon, and we are sitting on lawn chairs having coffee on the far side of Homer-Dixon’s property. Some of the young trees in his orchard, he tells me, are already looking withered and will have to be moved because the roots of an enormous nearby walnut tree actually poison the soil around it. He designed and assembled the elegant wooden jungle gym we are seated beside. Thomas Homer-Dixon is a pragmatic man. He has a preference for problems that can be identified and solved; he likes clear sets of instructions. And practically everything about the world we now live in goes against that.

The Upside of Down opens with two scenes that form a leitmotif for the book. The first recounts the San Francisco earthquake on April 18, 1906, in which ruptured gas lines, burst fuel tanks, and toppled electrical lines combined to create a fire that engulfed the city. The second details the melancholy sight of the ruins of the ancient Colosseum in Rome. Although it nearly razed the city, the San Francisco fire also inspired the city's renewal and led to the creation of the Federal Reserve system, the first far-reaching measure introduced by the US government to forestall financial panic. The final demise of the Roman Empire in the fifth century AD, on the other hand, is an example of an advanced and powerful civilization that imploded because of its inability to adapt to evolving reality. The San Francisco earthquake sparked the ingenuity needed to revive the city; the Roman Empire of the fifth century had no such catalyst. "So rather than resisting change," Homer-Dixon writes, "our societies must learn to adapt to the twists and turns of circumstance." The main contention of *The Upside of Down* is that some form of societal collapse is inevitable, but we may still have time to build enough resilience into our systems that collapse will spur a process of renewal rather than plunging humankind into an era of violence and anarchy.

The territory covered in *The Upside of Down* overlaps with that of *The Ingenuity Gap*, but this time the perspective is oriented toward the future. Homer-Dixon identifies five "tectonic stresses" whose effects are accumulating globally: differences in population growth between wealthy and poor nations, increasing scarcity of non-renewable energy resources, environmental degradation, climate change, and the instability of the global financial system and the widening economic gap between the rich and the poor. Amplifying the effects of these tectonic stresses are "multipliers" such as the speed and interconnectedness of today's global society. Rising temperatures in the far north, for instance, may change global weather patterns, undermine European agriculture, cause mass migrations to cities further south, and increase the gap between rich and poor. The greatest danger will arise if several of these tectonic stresses suffer rapid, synchronous failure. "This would be destructive — not creative — catastrophe," Homer-Dixon writes. "It would affect large regions and even sweep around the globe, in the process deeply damaging the human prospect. Recovery and renewal would be slow, perhaps even impossible."

One of the distinctive features of *The Upside of Down* is its emphasis on energy, whether animal or mineral, solar or nuclear, as the driving force of civilization. For Homer-Dixon, "energy is society's master resource: when it's scarce and costly, everything we try to do, including growing our food, obtaining other resources like fresh water, transmitting and processing information, and defending ourselves, becomes far harder." In order to generate energy for a society, there must be an energy return on investment (EROI) greater than one: the energy created must be greater than the energy expended in creating it. The Roman Empire may have collapsed in part because its EROI fell below this threshold.

The amount of energy needed to sustain a city like Bombay, Tokyo, or Los Angeles is staggering. These cities are ultimately dependent on oil, and with good reason: high-quality crude offers a vast amount of energy given its volume and weight. But crude oil is a non-renewable resource, and there is reason to believe that easily accessible reserves such as the Saudi oil fields are near or past their peak and that most of the world's major oil reserves have already been discovered. "I don't mean we're going to run out of oil — at least not anytime soon," Homer-Dixon writes. "But we are going to run out of the cheapest oil — that is, the most accessible oil — as it becomes harder to find, costlier to produce, and more concentrated in politically volatile parts of the world." A permanent scarcity of oil, combined with advancing climate change and damage to our ecosystems, could easily set in motion the kind of synchronous failure Homer-Dixon believes would lead to a destructive catastrophe.

So what can be done to steer ourselves toward a creative catastrophe rather than a destructive one? In the first place, we need to change our assumptions about economic growth. Classical economists such as Benjamin M. Friedman, author of *The Moral Consequences of Economic Growth*, may be right that steady economic growth has

fostered tolerant, democratic institutions, but economic growth on a global scale would require levels of energy consumption that are simply unsustainable over the long run. Homer-Dixon, by contrast, suggests that we need to think beyond the “growth imperative” to a conception of economics that incorporates our impact on nature. An “economic-ecological system” would recognize that “there are no good substitutes for some of the most precious things that nature gives us, like biodiversity and a benign climate.” Since core natural resources such as fresh water, fertile soil, and fish stocks have no real substitute, we need to assign them explicit value in our economic calculations.

Most importantly, however, we must adopt what Homer-Dixon calls a “prospective mind.” The prospective mind anticipates radical change and collapse across a variety of possible futures and builds flexibility and resilience into our systems so that we can achieve what he calls catagenesis — “the creative renewal of our technologies, institutions, and societies in the aftermath of breakdown.” To address our current situation, Homer-Dixon writes, we also need to reduce underlying tectonic stresses in areas like climate change and technology. That way, when breakdowns occur they will not cause a catastrophic synchronous failure and we can seize on these “moments of contingency” to reimagine our future. “We can’t hope to preserve at least some of what we hold dear,” Homer-Dixon writes, “unless we’re comfortable with change, surprise, and the essential transience of things, and unless we’re open to radically new ways of thinking about our world and the way we should lead our lives.”

Past civilizations have assumed the permanence of their values and way of life, but we can’t afford to do that. Nonetheless, Homer-Dixon remains optimistic that we can adjust. “It’s conceivable that we could end up with a more just and humane human life,” he tells me.

Not surprisingly, *The Upside of Down* is far more effective in its relentless documentation of the impending collapse than in detailing the possibilities for renewal. It is one thing to argue that classical economics does not provide a sustainable model for policy in an era of climate change and radical divisions between the rich and poor, but quite another to offer an alternative view precise enough to be useful. There is little doubt that if a breakdown of global civilization is inevitable, creating resilient systems that avert destructive collapse is advisable, yet Homer-Dixon’s concept of resilience remains abstract, not the kind of weapon that can be deployed in what he argues should be an almost wartime vigilance toward our future problems. It may be that “our institutions are ill-adapted to what we’re facing,” as he tells me, but that falls far short of envisioning what well-adapted institutions would look like, how they would emerge, and how they would work. But in a way this is the point. We are currently ill-prepared for the possible futures we face and we need to devise new, collective ways of solving common problems, perhaps by using an open-source approach to the Internet. “New forms of democracy are essential,” he writes, “because we need as many heads as possible working together to solve our common problems, and because the larger the number of people involved in making crucial decisions that affect everyone, the less likely that narrow elite interests will dominate.” One thing is clear: our values will have to be in line with the natural world upon which we depend.

“Each chapter in this book was a challenge,” Homer-Dixon comments as we get up and walk back toward the house. “I would come out of it deeply traumatized; I would come out and see my little boy.” Perhaps his son is why his mind is so much on the future these days, and also why he clings to hopes of a more just and humane world. “In the last section of my career, when I have the greatest resources, I want to explain things practically,” he says. “I want to set up an open-source system of problem-solving and also try to develop a better understanding of plausible futures as well as to ground ingenuity theory in measurable concepts. And the final component of my agenda is public policy.”

Thomas Homer-Dixon is a public intellectual who is ready to get his hands dirty — and not just in his orchard.

Published January 2007. Daniel Baird is the arts and literature editor of The Walrus.