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The Upside of Down - A Book Review

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Thomas Homer-Dixon is a Canadian writer and academic originally from British Columbia who in 2001 won one of this country's major awards, the Governor General's Prize for Non-Fiction, for his book *The Ingenuity Gap*.

That book described the gap between the necessity for ideas to solve the problems of our age, and how they lag behind accelerating change: technological, social, environmental. In a way, it's about how to approach coming to grips with chaos.

This new book, *The Upside of Down*, circles around some of the same concerns, and incorporates new ones, while examining in a thorough, reasoned way how civilizations function, persist and decline — and then applies that understanding to our own.

This is a large book of complex ideas, although written in a straightforward, engaging manner that allows the reader to follow the thread of Homer-Dixon's arguments. I will only hit the highpoints that stick with me, and I can't pretend that I'm thoroughly examining this work: his scholarship in the fields upon which he touches is beyond my limited reading.

But I'm still drawn to the idea of teasing out some of his main points and seeing how they make sense.

What Happened to Ancient Rome?

Homer-Dixon's touchstone for the understanding of what happens to civilizations is ancient Rome and its empire. The book opens with a meditation on the incredible sophistication of Roman building techniques and what sustained the Roman way of life.

The Roman empire's extensive networks of roads and aqueducts allowed the generation and collection of the energy that sustained it: the transmutation of the sun's energy into food and agricultural products.

As the empire became more and more complex and as it extended ever outward, this energetic network that underlaid its might became over extended and began to break down.

This brings us to the first of a number of useful concepts that Homer-Dixon introduced to me: **energy return on investment (EROI)**. This is a concept in common parlance by experts in today's energy debates, and it describes the ratio between the amount of energy a project or process produces by the amount it consumes. An EROI of much greater than one to one is necessary to run a society.

In Roman times, 2000 years ago, Roman farms were organized as large plantations worked by slaves and oxen. Calculations about the amount of energy it took to raise a hectare of wheat, for instance, must also include what it took to feed the laborers during the times of year they weren't in the field. It turns out that the EROI for Roman wheat was about 12, and for alfalfa, about 27. They invested the energy equivalent of one bushel of wheat to get 12.

The efficiency the Romans developed, and the agricultural energy they gathered, allowed them to sustain the largest city the world would know until nineteenth century London.

Then a combination of stresses combined which led to the empire's farmers abandoning their land, taxation no longer availed as much, the EROI declined precipitously and the system, and the empire, became vulnerable and started to fall apart.

So what? you might say. That's really ancient history. Homer-Dixon contends that our societies are, like the Romans', becoming steadily more complex and more rigid. The stresses building inside our world are all linked to the stupendous energy demands our societies make upon the world. The high EROI we depend on is no longer so easily attainable.

Stresses To Shake the World

Homer-Dixon identifies what he calls **five tectonic stresses**.

- population stress: overall increase and the difference in rate of increase between rich and poor countries
- energy stress: increasing scarcity and cost of conventional oil
- environmental stress from mounting damage to land, sea and air
- climate stress as the atmosphere responds to global heating
- economic stress from the widening gap between rich and poor people within countries and between countries

All of these are heightened by globalization in the broadest terms: the huge scope, connectedness and speed of all human activities and impacts, from disease to terrorism.

Civilizational collapse probably won't occur due to any one of these stresses, but what Homer-Dixon calls **synchronous failure** could easily lead to catastrophe.

“What happens, for example, if together or in quick succession the world has to deal with a sudden shift in climate that sharply cuts food production in Europe and Asia, a severe oil price increase that sends economies tumbling around the world, and a string of major terrorist attacks on several Western capital cities? Such a convergence would be a body blow to global order... .”

The Watch List

Homer-Dixon analyses a “watch list” of three countries and one region that are especially vulnerable to these tectonic stresses: Saudi Arabia, Pakistan, China and Europe.

I don't have space to cover them all, but I have an interest in China, so let me outline his thoughts on that country because they are in line with what I have seen there and what I have read.

As Homer-Dixon points out, there are those who fear China's rising strength and influence in the world. But it is China's weaknesses that should give greater cause for concern.

Of the stresses listed above, China suffers from all of them. China is actually a case study that exemplifies the global situation in a more intense way.

It is overpopulated, with at least half its population in serious poverty. The old social safety nets have disappeared: pensions and affordable medicine border on nonexistent.

The country is extremely vulnerable to energy shocks. Once self-sufficient in oil, it now imports half and in 15 years will import three-quarters.

The country's natural resources are becoming degraded and insufficient. The northern half of the country now suffers from severe water shortages. The Yellow River, the seventh longest in the world and called the Mother River of China, is dry at its mouth for up to seven months each year.

Desertification of cropland and the omnipresent air pollution caused by the insatiable push for coal-fired energy round out the picture.

Homer-Dixon speaks of China's impossible dilemma, which is a mirror for the rest of us: the country cannot stop seeking to expand its economy if it wants to keep civil peace. The coal-fired plants obscuring the air, the chemical factories polluting thousands of waterways, these take priority, even as the expected and unexpected consequences take their toll, and civic unrest begins to arise from other quarters. Synchronous failure may only be a matter of time.

And the economies of China and the US are tightly linked, beyond the obvious trade between the two. China has bought up huge amounts of American Treasury Bills, corporate bonds and short-term securities. If the American debt picture becomes too fearsome, or if China has a currency or banking crisis, there will be worldwide trouble. Especially since in China, and elsewhere, the common practice to redirect your people's ire against the system, if nothing else works, is to go to war.

But it would be unfair in describing this book to leave the impression that it is all scaremongering, all doom.

Ecology of Forests as Civilizational Model?

Homer-Dixon provides a model of civilizational change and a possible way through in his examination of ecologist Crawford "Buzz" Holling's **panarchy theory**, an idea which has its origins in the ecology of forests.

There are adaptive cycles by which forests survive. And not just at one level but over a hierarchy of adaptive cycles at different scales, a hierarchy which Holling calls "panarchy." He believes this theory is meaningful not just for forests but for all complex systems over time.

I will refer you to the book for the details of the model, but the key concept seems to be that of **resilience**: that part of the system that resists deep collapse across several levels of adaptive cycles. And these adaptive cycles aren't just physical but also psychological:

"Panarchy theory also helps us better understand another critically important phenomenon: the denial that prevents us from seeing the dangers we face. Our explanations of the world around us - whether of Earth's place in the cosmos or of the workings of our economy - move through their own adaptive cycles. ... Our explanation moves through something akin to a growth phase: it becomes progressively more complex, cumbersome, and rigid; it loses resilience; and it's ripe for collapse should another, better, theory come along."

And how might some other, better, theory come about? Homer-Dixon offers what he calls **catagenesis**: the creative renewal of our technologies, institutions, and societies in the aftermath of breakdown.

From the point of view of those with a vested interest in the status quo, efforts to manage our problems can actually be a useful diversion: such efforts provide a focus for academics, politicians, consultants, and NGOs, while in practice nothing changes.

There are immense risks of course. At a “moment of contingency”, in his language, when great danger and opportunity arise as some crisis sweeps the globe, there will be opportunity for choices that could not be made before. Of course, the worst of the human race, the ruthless, the greedy, those who manipulate the politics of us and them, may prevail.

Four Actions To Avoid the Worst

Homer-Dixon outlines four actions so that the best might instead have a chance: reduce the tectonic stresses to lower the risk of catastrophic collapse; cultivate a “prospective mind” to cope better with surprise; boost resilience of critical systems such as food and energy networks; and finally, prepare to turn breakdown to advantage because it will occur.

I’m reminded by what I once heard the cultural historian William Irwin Thompson say: it all depends on the rate of bad news. Too slow, and change will not be taken seriously. Too fast, and all hell breaks loose.

This four point list includes both the most fruitful concept in the book to me, resilience, and the most fuzzy one, prospective mind.

Prospective mind is described as a new attitude to adopt that greets the inevitability of constant change and surprise. This is not a managing mind, which is bound for failure, but an imaginative one that can implement real and radical solutions.

One has to be in favor of this, although it sounds like a jazzy form of positive thinking in some respects. I’m not sure what it means exactly. I fear it doesn’t address the depths of what’s needed. A new kind of spiritual stance is needed, not only a thoughtful one.

Resilience, now, that means something to me. A resilient system is not necessarily always economically efficient — often not. As Homer-Dixon alludes, it is characterized by individual elements that are extremely diverse, by decentralization of problem-solving and decision making, by being open to enough instability to allow unexpected innovations and yet orderly enough to learn from successes and failures. Resilience is adaptive. The Internet for instance takes on some of those characteristics.

Homer-Dixon describes the world’s need: the economic-growth-at-all-costs imperative of capitalist society giving way to a resilience imperative where dynamic sustainability can take place, rather than a one-way race to the bottom.