

Predicting the future

Global Catastrophes and Trends: The Next Fifty Years

by Vaclav Smil. Cambridge, MA: MIT Press, 2008, 295 pp.

Predicting the future of the global human community often seems to be a fool's errand. The track record of futurism is notoriously deficient; mid-20th century prognostications of life in the early 21st century are now used mainly for generating laughter. The failure of prophecy has many roots. Forecasters often merely extrapolate existing trends, unreasonably assuming that the underlying conditions will remain stable. Wrenching discontinuities are often difficult even to imagine, yet history has been molded by their inevitable if unpredictable occurrences. Many futurists also allow their ideological commitments, if not their underlying personalities, to shape their conclusions. Thus pessimists and environmentalists commonly see doom around the corner, whereas technophiles and optimists often envisage a coming paradise. As years go by and neither circumstance comes to pass, the time of fulfillment is merely put off to another day.

Vaclav Smil is well aware of these and other problems that confront any would-be seer. As a result, he has written a different kind of consideration of the global future, one marked by careful analysis, cautious predictions, and a restrained tone. "In sum," he tells us in the book's preface, "do not expect any grand forecasts or prescriptions, any deliberate support for euphoric or catastrophic views of the future, any sermons or ideologically slanted arguments." Smil readily acknowledges that we live in a world of inherent uncertainty in which even the near-term future cannot be accurately predicted. Yet he also contends that a number of risks and trends can be quantitatively assessed, giving us a sense of the relative likelihood of certain outcomes. Such a modest approach, limited in its purview to the next 50 years, is unlikely to generate public excitement or large book sales. It can, however, provide a useful corrective for the inflated claims of other futurists as well as generate constructive guidelines for risk minimization.

Few authors are as well qualified to write about the coming half-century as Smil, a Czech-born polymath who serves as Distinguished Professor at the University of Manitoba, Canada. Smil works in an impressive array of languages; reads voraciously; skillfully engages in economic, political, and ecological analysis; and is fully global in his concerns and interests. He initially gained attention as a Sinologist, his 1984 book *The Bad Earth: Environmental Degradation in China* easily counting as pathbreaking if not prescient. More recently, Smil has emerged as a leading expert on global issues, his topics ranging from energy production to food provision to biospheric evolution. In general, he aims for a broad but highly educated audience. Readers of *Global Catastrophes and Trends* should be prepared for a good dose of unadorned scientific terminology and quantitative reasoning as well as a qualified style of argumentation in which both sides of heated debates are given due hearings.

As his current title indicates, Smil divides his consideration of the future into two parts: the first examining the possibility of catastrophic events, the second turning to the playing-out of current trends. Smil initially focuses on potential catastrophes of global scale, whether human-induced or generated by nature. He concludes that the risks of

"fatal discontinuities" emerging from fully natural events are real but small. Some possible hazards, such as those posed by volcanic mega-eruptions, must be accepted as unavoidable but highly unlikely. Others, such as the cataclysmic collision of an asteroid or comet with Earth, could potentially be addressed. Threatening objects, for example, might be nudged away from Earth-intersecting trajectories by docked rockets. Smil urges NASA to reorient its mission toward gaining such capabilities.

Overall, Smil is less concerned about possible physical calamities than he is about epidemic diseases. He downplays the significance of new pathogens, such as the Ebola virus, to focus on novel strains of influenza, concluding that the likelihood of a flu pandemic in the next 50 years approaches 100%. In a similar vein, he worries more about the possibility of a "megawar" than he does about terrorism, the risks of which he considers overstated and manageable.

Major trends

After having dealt with possible catastrophes, Smil outlines the trends that he thinks will be most influential over the next 50 years. He wisely begins with energy, contending that the world's most momentous near-term change will be its "coming epochal energy transition." Smil will disappoint both environmentalists and high-tech enthusiasts, however, with his argument that the movement away from fossil fuels will be protracted because of the continuing economic advantages of oil, coal, and natural gas and the inherent limitations of solar, wind, and other green energy sources. He debunks alarmist concerns about the imminent exhaustion of oil, excoriates all forms of biomass-based energy as environmentally destructive, and dismisses the quest for fusion power as quixotic. Smil is guardedly supportive of nuclear fission but rejects it as any kind of panacea. In the end he calls for governmental programs to increase energy efficiency and reduce overall use.

From energy, Smil abruptly turns to geopolitics and international economics. His main goal here is to assess which parts of the world are likely to occupy positions of leadership 50 years from now. He argues that Europe, Japan, and Russia will probably see their influence diminish, largely because of their imploding populations and the resulting stresses generated by mass aging. In the case of Europe, he is also alarmed by growing immigrant populations, mostly Muslim, that are not experiencing social integration. Smil is no more sanguine about the prospects of the demographically expanding Islamic world, which he sees as producing a dangerous surfeit of unemployed young men. He is also concerned about "Muslim countries' modernization deficit," warning us that for "sleepless nights, think of a future nuclear Sudan or Pakistan."

Overall, Smil contends that the two countries that will matter the most are China and the United States. Based on deeply entrenched trends, he foresees the continuing rise of China as the world's new workshop, coupled with the gradual decline of the spendthrift, deindustrializing United States. By the end of the period in question, he thinks that the Chinese economy will outrank all others in absolute terms. Such economic prowess will translate into geopolitical clout; as early as 2020, Smil argues, China could match the

United States in defense spending. He insists, however, that such trends indicate a likely rather than a preordained future. As a result, he takes care to summarize the weak points of the Chinese system that could disrupt the country's ascent. Similarly, near the end of the book, Smil reconsiders the future position of the United States, this time stressing its economic and political resilience. The final substantive chapter in *Global Catastrophes and Trends* turns to the world's environmental predicaments, especially those posed by climate change. Although Smil accepts the reality of global warming, he emphasizes the uncertainty intrinsic to all climate forecasts. Because of the complex and poorly understood feedback mechanisms involved, he concludes that "even our most complex models are only elaborate speculations." And although he does expect continued warming, he thinks that the overall effects will be manageable, with little damage done to crop production and a relatively small rise in sea level. Smil also cautions that excessive concern about climate distracts attention from other pressing environmental threats, including those generated by invasive species, water shortages, and the excessive use of nitrogen-based fertilizers. Basic biospheric integrity, he argues, ultimately underwrites all economic endeavors, yet is often taken for granted.

Global Catastrophes and Trends concludes by urging a calmly rational approach to crucial problems, avoiding extreme positions. Smil fears that society at large has embraced a kind of manic-depressive attitude in which "unrealistic optimism and vastly exaggerated expectations contrast with portrayals of irretrievable doom and indefensibly defeatist prospects." He correspondingly calls for a strategy of prudent risk minimization that would emphasize "no-regrets options." Reducing energy use and carbon-intensive commodities and services, developing new antiviral drugs, protecting biodiversity, and guarding against asteroid collisions are all, Smil argues, not only possible but economically feasible.

Prediction's pitfalls

Smil's moderate and rational approach to major issues of global significance has much to recommend it, as does his rejection of sensational predictions of impending collapse. He is also right to remind us that climate change is such an inordinately complex matter that we should avoid making unduly confident forecasts. But that said, global warming might prove far more damaging to both the economy and the biosphere than Smil expects, especially if the time horizon is extended beyond 50 years. On this issue, Smil seems to have adopted an attitude of optimism that many sober climatologists would find unwarranted.

Smil can also be faulted for occasionally ignoring his own warnings against extrapolating trends into the future.

He thus captions a graph showing China's economy surpassing that of the United States in 2040 with the bald assertion that China's rapid growth will make it the world's largest economy. Perhaps, but perhaps not, as Smil readily admits elsewhere. More problematic is Smil's belief that some trends are so deeply embedded that they will prove highly resistant to change, leading to his assertion that low birthrates will essentially doom

Europe, Russia, and Japan to relative decline. Yet in just the past two years, fertility rates in both France and Russia have significantly increased. It is not inconceivable that the birth dearth of the industrial world will eventually come to an end, as did the baby boom of the post-World War II era.

One of the more underappreciated forces of social change is that of conflict between the generations. Rising cohorts often differentiate themselves from those that came before, adopting new attitudes and embracing distinguishing behaviors. Such generational dynamics potentially pertain to a number of tendencies analyzed in *Global Catastrophes and Trends*. Many Muslim young people today react against their parents and grandparents by espousing a harsh form of Islam, but such an option will not necessarily be attractive to their own children 30 years from now. By the same token, can we be sure that the coming generation of Italian and Japanese youth will be as averse to reproducing themselves as were their parents' peers? Perhaps they will respond to the impending crises of national diminution and aging by changing their behavior on this score. In any event, fertility rates will almost certainly continue to fluctuate, ensuring that any precise forecasts of future population levels will be wrong.

Another generator of unpredictability is the so-called unknown unknowns: future events or processes of potentially world-transforming magnitude that we cannot postulate or even imagine, given our current state of knowledge. Although Smil by no means denies the possibility of such occurrences, I think he gives them inadequate attention. As such, he could profitably engage with the work of Nassim Nicholas Taleb, perhaps the premier theorist of randomness and uncertainty. As Taleb shows in *The Black Swan: The Impact of the Highly Improbable*, the rare and unprecedented events that he calls "black swans" have repeatedly swept down to make hash out of many of the world's most confident predictions.

But one could hardly expect Smil to deal with every form of unpredictability or with every author who has written on risk and uncertainty. The pertinent literature is vast, as is the subject matter itself. Smil has written a terse, focused work on the world's main threats and trends, not an all-encompassing tome on futurology and its discontents. In doing so, he has digested and assessed a huge array of scientific studies, economic and political analyses, and general prognostications. For that he is to be commended, as he is for his dispassionate tone and rational mode of investigation. Readers interested in large-scale economic, political, environmental, and demographic tendencies will find *Global Catastrophes and Trends* a worthwhile book. Those suffering from sleepless nights as they fret about the world's dire condition or enthuse about its coming techno-salvation, on the other hand, may find it an invaluable emollient.

SMIL DEBUNKS ALARMIST CONCERNS ABOUT THE IMMINENT EXHAUSTION OF OIL, EXCORIATES ALL FORMS OF BIOMASS-BASED ENERGY AS ENVIRONMENTALLY DESTRUCTIVE, AND DISMISSES THE QUEST FOR FUSION POWER AS QUIXOTIC.

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