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How (Not) to Look Ahead

Inusitatis atque incognitis rebus magis confidamus vehementiusque exterreamur. (The unusual and the unknown make us either overconfident or overly fearful.)
Gaius Julius Caesar, *Commentarii de Bello Civili*, II. 4

Any one of us may indulge in speculations about global futures tailored to particular moods or biases, from Francis Fukuyama’s (1992) ahistorical “end of history,” foreseeing the universal triumph of liberal democracy, to the Ehrlichs’ (2004) lament that the fate of liberal democracy will be similar to Nineveh’s. Fukuyama rightly complains that he has been misunderstood, that he did not suggest events’ coming to an end. Rather, he maintains, no matter how large and grave any future events will be, history itself (“as a single, coherent, evolutionary process”) is over because nothing else awaits but an eventual triumph of liberal democracy. This claim irritates because of its combination of wishful thinking and poverty of imagination. If we were to believe it, then 9/11, fundamentalist Islam, terrorism, nuclear blackmail, globalization of the labor force, and the resurgence of China are inconsequential because “all of the really big questions had been settled.”

As for our Nineveh-like fate, I am far from convinced, despite the enormous challenges we face, that our civilization will be soon transmuted into a defunct heap. Even if that were the case, we would still not be one with Nineveh: myriads of our artifacts made of steel, other metals, glass, and plastics that we leave behind will be better preserved than the Assyrian Empire’s short-lived capital of clay that was so thoroughly destroyed by invading Babylonians. But these are just asides provoked by Fukuyama’s and the Ehrlichs’ claims, which were introduced in order to illustrate something that such grand forecasts have in common: their outcomes are preconceived, and their arguments are predetermined by strongly held visions, whether of inexorable progress or unavoidable collapse.

And then there is the burgeoning field of specific point forecasts that quantify numerous attributes of populations, environments, techniques, or economies. The Internet has made it a matter of seconds to find the requisite data for particular years: total number of females in Yemen in 2040, CO$_2$ concentrations in the atmosphere in 2030, the aggregate U.S. national debt in 2010, and so on. For all those curious but unwilling to search, here are the forecasts: a medium variant of the UN’s latest population forecasts (United Nations 2005) lists 25 million Yemeni females in 2040 (10 million in 2005); according to scenarios published by the Intergovernmental Panel on Climatic Change (IPCC 2001; 2007), the average global atmospheric CO$_2$ level should be ~450 ppm by 2030 (~380 ppm in 2006); and the U.S. federal debt was expected to approach $11 trillion in 2010, ($7.9 trillion in 2005) (OMB 2006).

Given prevailing life expectancies, most male readers in their early 40s and female readers who have just turned 50 will still get the chance to check the 2030 outcome and find how badly mistaken the original forecast was. This conclusion (the only reliable forecast being our inability to forecast) rests on a voluminous, increasing amount of evidence: the only sensible way to appraise the reliability of modern forecasts is to look back and see how well their counterparts foretold yesterday’s and today’s realities. Such backward-looking exercises are particularly valid because during the past generation most of these specific point forecasts relied on the same suite of intellectual approaches and techniques as do today’s prognoses that look 5–50 years ahead.

Retrospectives reveal that most of the truly long-range quantitative forecasts (spanning at least one generation, or 20–25 years) turned out to be useless within years or even months of their publication. I have demonstrated these failures by a detailed examination of more than a century’s worth of every possible category of
long-range energy forecasts (Smil 2003). Trend forecasts fail so rapidly because they tend to be unrealistically static. But trends are finite: they weaken or deepen suddenly; they can be reversed abruptly.

Population forecasts provide pertinent examples of these failed anticipations. A comparison of the revision for 2004 (United Nations 2005) with the 1990–2025 global population forecast (United Nations 1991) shows a difference of about 600 million people, a reduction about 10% greater than today’s entire population of Latin America. Thus even forecasts that deal with given biophysical realities (most of the females that will give birth during the next 20 years are already alive) and that are issued only a dozen years apart can differ by continent-sized margins.

When looking at the global prospects for the next 50 years I have no desire to add to this almost instantly irrelevant mountain of specific point forecasts. Nor do I want to become an inventive fabulist and proffer assorted scenarios, a practice that has been embraced by individual forecasters (e.g., Hammond 1998), international institutions (e.g., WBCSD 1997; WEF 2006), major corporations (e.g., Shell Group 2006), and government agencies. An excellent example of this genre on the global scale (limited to only four visions of the world in 2020) is an effort by the National Intelligence Council (NIC 2004): it offers a Pax Americana (continuing U.S. predominance), a Davos World (robust economic growth led by China and India), a Cycle of Fear (proliferation of weapons leads to large-scale intrusive security measures in an Orwellian world), and a New Caliphate (“a global movement fueled by radical religious identity politics [that] could constitute a challenge to Western norms and values as the foundation of the global system”).

The principal reason that even the cleverest and the most elaborate scenarios are ultimately so disappointing is that they may get some future realities approximately right, but they will inevitably miss other components whose dynamic interaction will create profoundly altered wholes. Suppose that in 1975 (years before the adoption of the one-child policy in China) a group of scenario writers correctly predicted the decrease in China’s total fertility rate (and hence the country’s much reduced population total). Would they—would anybody in 1975 (during the last phase of the Maoist Cultural Revolution and a year before Mao’s death)—have set that number amidst a more than quadrupled quasi-capitalist economy absorbing annually tens of billions of dollars of direct foreigninvestment and serving as the leading workshop for the world (fig. 1.1)? What expert group gathered in 1985 to rank relative standings of major powers in 1995 would have forecast the collapse of the Soviet Union, Japan’s economic retreat, the first Gulf War, and the resurgent U.S. economy against the background of surging globalization and the emergence of the Internet?
As I have mentioned, I offer no quantitative point forecasts and no alternative scenarios. My intent is to explore those key variables whose impact is likely to be large enough to shape the course of world history during the first half of the twenty-first century. My firm belief is that looking far ahead is done most profitably by looking far back and that this approach works both for natural catastrophes and socioeconomic trends. Naturally, there are no specifics to be learned from such an exercise, yet those extended retrospectives impress with one key lesson: history advances as much by saltations—sudden discontinuities—as it does by gradual unfolding of long-lasting trends.

In this respect, history mirrors, in a much contracted fashion, the record of life’s evolution on Earth, which is marked both by very slow (Darwinian) transformations and by relatively sudden (saltationary) changes (Simpson 1983; Eldredge and Gould 1972). Gradual, but cumulatively astonishing, evolutionary advances are much...
more widely appreciated than are several remarkable saltations embedded in the fossil record. None was more stunning than the great Cambrian explosion of highly organized and highly diversified terrestrial life. This great evolutionary saltation began about 533 million years ago and it produced within a geologically short spell of just 5–10 million years, or less than 0.3% of the entire evolutionary span, virtually all of the animal lineages that are known today (McMenamin and McMenamin 1990). And modern science also came to appreciate the role of rare catastrophic episodes in shaping the life’s evolution (Albritton 1989; Ager 1993).

The increasingly frequent attempts at long-range forecasting (mostly dynamic modeling and scenario building) are of a gradualistic variety, resting largely on following a number of critical trends. I turn to these gradual processes in chapters 3 and 4, which look at the new population realities (differential growth, regional redistributions, aging, migration), socioeconomic trends with capacity for long-lasting global impacts (marginalization of Japan, Islam’s role, Russia’s reemergence as a major power, China’s rise and its checks), the perils of nuclear proliferation, changing global leadership, and worrisome environmental trends.

But I start by focusing in chapter 2 on those unpredictable saltations whose consequences, in terms of lives lost and disrupted, economies destroyed and transformed, and outlooks dashed and altered, could change humanity’s collective fortunes during the next 50 years.

Before I do so, a few paragraphs on the meaning of global, certainly one of the most overused adjectives of the new century. This seemingly straightforward term actually has a number of contextual meanings. It is often used as a synonym for worldwide even if the phenomenon does not encompass the entire planet. There are natural processes operating on truly global scales: atmospheric circulation is a fundamental example of a unified, planetwide, climate-shaping flux that is powered by a single source (solar radiation). Plate tectonics is another example of a planetwide process that determines the basic physical features of every continent and ocean.

Other natural phenomena are global in different sense: their extent is limited either to land or to the ocean, but they are widespread within these confines. Soil erosion and ocean currents belong to this category. Other processes, natural or anthropogenic, are ubiquitous but spatially discontinuous, found in numerous locations on all continents; in this sense there are definitely global problems with invasive species, losses of agricultural nitrogen, increasing income disparities, or governmental pension liabilities. Economic, political, and military uses of global have their analogs of natural “global” categories. Trade is now truly global because
no country can be economically autarkic, and affluent nations could not support their high quality of life without intensive selling and buying of goods and services.

International finance is global: money in modest savings accounts is commingled with the legal but excessive profits of multinational companies and with the illegal and even more excessive profits of cocaine and marijuana wholesalers. So is international telecommunication. The U.S. military reach is global because its vessels cruise all oceans, and its strategic lift and amphibious capabilities can put forces on land wherever there is a suitable runway or a beach. And global is now applied also to individual events that make a distinct worldwide difference. Henisz et al. (2005) asked if hurricane Katrina (fig. 1.2) was a global event and answered yes, based on three considerations: disruption of oil and gas production in the Gulf of Mexico, which helped drive up the world price of oil; worldwide insurance and reinsurance implications of this major loss (more than $40 billion); and a tarnished image of the United States as billions of people saw televised images of distress and devastation with a tardy and limited response from government.
In this book I focus on truly global phenomena that can directly affect the entire planet, either as instant catastrophes or as gradually unfolding trends. Yet some events and processes that are much more restricted can change the course of world history; their eventual consequences are undeniably global. The terrorist attacks of 9/11 are a perfect example of this kind. No individual, no expert group can be prescient enough to separate the matters that will be truly consequential from those that appear important but will eventually make little difference. Inevitably, this book shares that fundamental shortcoming; some of its hoped-for hits will surely turn out to be misses.