BOOK REVIEW

COLLAPSE: HOW SOCIETIES CHOOSE TO FAIL OR SUCCEED by Jared Diamond, Viking, 2005

TWILIGHT IN THE DESERT by Matthew R. Simmons, Wiley & Sons, 2005

Reviewed by Jonathan D. Schneider*

"A need or problem encourages creative efforts to meet the need or solve the problem."

- Plato in the Republic

"And here we have a serious problem: America is addicted to oil, which is often imported from unstable parts of the world."

- President George W. Bush, State of the Union Address, January 31, 2006

Jared Diamond's *Collapse: How Societies Choose to Fail or Succeed* gives the lie to the adage that necessity is the mother of invention. In his walk through a selected history of human catastrophes, Diamond concludes that in more cases than not necessity is simply the precursor to further deprivation and eventual disaster. As Diamond's history demonstrates, the success of human endeavor is not inevitable, and the choices made by a people and their leaders regarding the assumptions underlying their economic organization and the use of their resources can be critical to survival. The world is littered with the remains of civilizations that failed to alter their productive processes, even when it became apparent that they were unsustainable, and there were viable alternatives.

A biologist and geographer by training, Diamond has been classified as an environmentalist. Yet, in *Collapse* he pays little attention to the preservation of a pristine environment for its own sake. More hard-headedly, Diamond's survey focuses on the use to the point of exhaustion of resources upon which economies have been based, and upon the failure of many societies either to recognize impending disaster or to find a means or reorganizing their productive resources in order to accommodate the scarcity of critical assets. While histories of the demise of communities and civilizations have obviously been written before, Diamond's effort to link these stories with a common economic and ecological thread is unique. His accounts include: the demise of civilization on Easter Island; the disappearance of Norse settlements in Greenland; the destruction of the American West's Anasazi civilization; and the collapse of the Maya.

Diamond's history of Easter Island is perhaps the most dramatic. The Island's massive stone sculptures, left by the Easter Islanders amidst what is otherwise a completely denuded landscape, are compelling evidence that the Island once supported an ecological system that was completely decimated. In an analysis substantially drawn from the work of others, but no less compelling for that fact, Diamond demonstrates that like other South Pacific islands, Easter Island was once fully forested (as would have been necessary to erect and transport the massive sculptures) and that it supported an environment which included substantial agriculture and a significant domestic and wild bird

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population. With no evidence of significant climate change, Diamond concludes that the Easter Islanders simply used up their resources. The deforestation of the island and the resulting erosion of topsoil spelled destruction of the entire habitat. Should the Easter Islanders have seen this coming? Diamond's conclusion is that their direction was as obvious as the fact that they were toppling the last of the trees. The Islanders simply couldn't help themselves.

Similarly compelling is Diamond's account of the Norse settlements in Greenland. Near the start of the first millennium, wandering Vikings settled in verdant meadows alongside Greenland's fjords, and imported a way of life that had supported them in Norway, including a dependence on livestock for food. While Greenland looked superficially similar to Norway, its topsoil was dramatically less durable, the growing season shorter, and the impact of logging far greater. While the settlements lasted nearly 500 years, the effect of the settlers on the land eventually took its toll, with deforestation, followed by massive soil erosion, the starvation of livestock, and, eventually, of the inhabitants themselves. Forensic evidence of the remains of the settlements shows that the settlers consumed the last of their livestock, down to the calves and household pets, and starved to death. Remarkably—and this is what drives much of Diamond's thesis—an analysis of the settlement's detritus shows that the Norse refused to fish for food. As the Norse starved to death, their Inuit neighbors, expert fisherman, went about their affairs. Equally remarkable, kinsman of the Greenland Norse settlers in Iceland, who had adapted to fishing to survive, continued in existence, with their ancestors inhabiting what has become one of the richest countries in the world.

Collapse is not without flaws. Not all of Diamond's evidence serves his purpose, despite an inclination to lump events together in the search for a unifying theory. His survey of the decline of Mayan civilization points to evidence of significant deforestation, soil erosion and resulting malnutrition. Yet, there is also evidence of the impact of ongoing warfare and drought. Diamond's survey of the work involving the disappearance of the Anasazi community is similarly inconclusive, but suggests that the population was decimated by climate change over which the Anasazi could have had no control, and to which there was no obvious solution. Moreover, Diamond's politics are sometimes more on display than is seemly for an objective scientist. At one point, Diamond likens the Easter Island statues, Anasazi necklaces and Maya temples built with the byproducts of scarce trees to the "extravagant conspicuous consumption by Modern American CEOs." As little as we know of the basis for any of these civilizations, the cross-cultural analogy and associated slur does not seem the work of a careful empiricist.

But having said this, Diamond's overall theme is more than thought-provoking. The proposition that there are circumstances in which communities must question their customs and basic organizational ideas in order to adapt to an environment which no longer supports a way of life seems indisputable. As Diamond makes clear, civilizations incapable of making these fundamental adjustments risk extinction.

In *Twilight in the Desert*, Matthew Simmons makes the disturbing case that there is reason to believe that oil production in Saudi Arabia may be on the verge of precipitous decline. He further concludes that there are no known reserves worldwide that will approach replacing these resources. Coupled with the unremitting growth in the demand for oil, both here and abroad, Simmons'

concern should be setting off alarms at the highest levels. Simmons is no-one's idea of a tree-hugging environmentalist. He is an energy-industry banker and the CEO of Simmons & Company, a Houston-based investment bank specializing in the energy industry. He a member of the New York Council on Foreign Relations, earned an MBA at Harvard, and served as an advisor to George W. Bush on energy matters prior to the 2000 election. He is an insider, and since his business has been about investments in energy resources, he has made a career of getting to the bottom of claims regarding oil reserves.

The West's reliance on oil produced in the Persian Gulf region is enormous, with the Persian Gulf nations supplying 27% of world's daily consumption of 80.7 million barrels/day in 2005, according to Energy Information Administration statistics. Combined North American production (U.S., Canada, and Mexico) together come in a distant second at 16%. As to the relative resources of the Persian Gulf nations, Saudi Arabia predominates by far, supplying 43% of the oil produced in the Middle East daily. Even more dramatically, as Simmons reports, BP's Statistical Review of World Energy estimates that over 63% of the world's proven petroleum reserves are located in the Middle East, while it is estimated that 23% (262.7 billion barrels) of the world total is located in Saudi Arabia. Together, Iraq and Iran account for 145 billion barrels, each in roughly in equal measure.

Simmons' concern rests, first, on the observation that there has been no reliable information on the state of oil reserves controlled by the OPEC nations since 1982, the year then-Saudi Oil Minister Ahmed Zaki Yamani saw to it that OPEC members would refrain from publicly reporting field-by-field oil production data, as they had since 1950. As Simmons reports, most incredibly, what information the world has on daily Middle Eastern production largely rests on intelligence such that gleaned by Petrologistics, a consulting group which employs Persian Gulf "harbor spies" who count the number of tankers leaving Persian Gulf ports. This paucity of good information suggests to Simmons that the Saudi's indeed have something to hide. As Simmons puts the issue:

> This sustainability question has suddenly emerged as the world's most important energy issue. Sadly, we may have begun asking this question too late to alter the course of energy in any meaningful way, simply because the question was ignored for so long while the mortality of the Saudi old fields was concealed by three veils—secrecy, sovereignty and self-delusion.

The core of Simmons' analysis of Saudi capabilities points to the Saudi's Ghawar oil field, a resource supplying fully 66% of the Saudi's daily production in 1976, near the time the last reliable data was last reported from the region. The Ghawar field is the world's largest, by a factor of three. Discovered in the 1940s, this field grew in relative importance throughout the 1960s and 1970s, as daily production was increased first by the injection of natural gas, and then water, to increase output pressure. Yet, as Simmons points out, based on his years working with oil fields, these techniques for improving oil field production eventually spell the end of a field's productive life. It is now estimated that Aramco injects up to 20 million barrels of water into the Ghawar field daily, in order to extract over 5 million barrels of oil each day. There is no precedent for this pattern continuing much beyond the present day. The analogous large oil fields whose life cycles Simmons reviews generally exhibit a decline in production of 50% within ten years of peak production. The entire life cycle for significant production from most major fields has been in the thirty year range, a

period now exceeded by the Ghawar field. When production of these fields is increased past a certain natural breaking point, Simmons reports that the decline often precipitous.

With the decline of the Ghawar field potentially in the not-distant future, Simmons' review of the resources that will take its place is not promising. As to the Saudis, Simmons reports that despite a significant effort, Aramco has failed to make any significant new discoveries since the late 1960s. Nor is Simmons optimistic about the prospects for substantial new production elsewhere in the world. Declines in oil production from fields located in Canada, Russia (largely due to mismanagement), China, Mexico and the North Sea, along with the fact that few new significant discoveries have been made, portrays, at the very best, a static supply picture for years to come. More likely is a significant decline in available production.

Against these concerns, Simmons weighs the unrelenting growth in world demand. In 1970, global oil demand was just shy of 50 million barrels/day, the same year in which U.S. oil production peaked at 9.5 million barrels/day. World demand then rose to a little over 60 million barrels/day, before falling back to approximately 53 million barrels/day, in response to the energy crisis and oil embargo of the mid-1970s. Following that, consumption has increased steadily to a high of 80.7 million barrels/day in 2005, and is anticipated by OPEC (as reported by Reuters in March of this year) to rise to 84.5 million barrels/day by the end of 2006.

To be fair, Simmons' worry is not shared by all energy industry analysts. In the March/April 2006 edition of *Foreign Affairs*, Daniel Yergin makes a case for Simmons having gotten it entirely wrong.[1] In fact, Yergin states that a recently conducted study by his consulting group, Cambridge Energy Research Associates, concludes that oil supplies may increase by as much as 20–25% over the next ten years. Yergin suggests that some of these new supplies are in the works, and he assumes that some will be brought forth in response to periodically higher prices. Moreover, Yergin argues any drop-off in production will result in a soft-landing. Putting the best face on what he acknowledges is our increasing reliance on foreign supplies from dangerous regions, Yergin argues that we must manage what he refers to as our "energy interdependence."

Yet, Simmons' fundamental concerns remain: We simply do not know when oil supplies will decline; information regarding the world's largest supplier is opaque; and we cannot be certain that new supplies will be made available. Whether or not Simmons is right to be concerned that a rapid decline in Saudi Oil production is upon us, it is beyond doubt that our situation is not tenable in the longer term. Rapidly escalating demand, the emergence of China and India as a competing purchaser (nations without significant oil resources of their own) and the failure of new discoveries to materialize, all spell the eventuality of a substantial dislocation.

Added to this mix of course, although it is something upon which Simmons does not dwell, is that fact that the Middle East is an increasingly unstable place. Yergin himself acknowledges this reality, and emphasizes the importance of energy security, even if he is not worried about the vitality of the supply itself. Yergin acknowledges that after 2010, our sources of supply will be less diversified, and increasingly focused on the Middle East. Whether or not we are

1. Daniel Yergin, *Ensuring Energy Security*, 85 FOREIGN AFFAIRS 2 (2006).

successful in stabilizing Iraq, the fact remains that the region is in the grips of forces over which we either have no control, or control only at what may be an unthinkable cost in terms of lives and resources. In his 1991 book, *The Prize*, Yergin argued persuasively that the concern of the Japanese military over access to oil supplies for their fleet was a principle factor motivating their drive to wage war in the Pacific. The stakes for the health and development of our economy and economies like China and India are no less serious now than they were in 1942, and the certainty of supply is no greater.

In his accounts of civilizations on the verge of collapse, Jared Diamond hypothesizes what it must have been like as populations competed for ever more limited resources, while their leaders either could not or would not alter their ways of life and the organizing principles of their economies to adapt to changing circumstances. These images are nightmarish, but potentially the source of inspiration if we are to take their point. Perhaps more than any people in history, we have the technological and creative ability to reorganize our economic lives. However we do it, whether through technological innovation, a serious commitment to alternative modes of transportation, a commitment to population density that minimizes transportation costs, or the abandonment of the internal combustion engine, it is plain that the time for serious commitment is upon us. As President Bush aptly commented, we do indeed have a serious problem in our addiction to oil, and addressing it may be the most significant challenge we face in this first part of the 21st century.