

Society And Climate Change: History's Lessons



By *Chuck Dinerstein, MD, MBA* — March 29, 2018



Courtesy of Eduardo Manchon [1]

Climate change has been with us forever. Leave aside the current rancorous “debate” about the causes of our current climate, is there anything history can teach us about how human society copes when the weather around them change? John Haldon, a historian, and his colleagues mash up history, archeology and palaeoenvironmental [1] science to provide some clues. Society is a complex structure, and the ability to respond to environmental changes has varied over time. By combining information from archeologic findings, sampling our ecological history through techniques like core samples and tree rings (admittedly a simplification) as well as our historical record they believe a more layered understanding of the interaction of society and the environment can be achieved.

The point of their paper is a call to researchers for greater integration and interaction in these disparate fields, but they provide several examples which contain lessons for us all. They recognize that their findings are not exhaustive but represent cases where sufficient information from all three specialties is available to make a narrative possible.

During the period from 300-600, the Eastern portion of the Roman Empire flourished coinciding with higher winter precipitation – making ‘marginal’ agricultural environment more productive. As the 7th century closed, these regions were conquered by the Arabs, making the remaining Roman holdings, what is today Sicily, Israel, Jordan and southern Syria, more economically and politically significant in providing grain for the armies and capital of Constantinople. But over the next 300 years, the climate became drier, the marginal nature of their agriculture became more apparent, less grain was produced, rural populations decreased, and there was less interregional trading. In the end, these increasingly impoverished areas were conquered by the Arabs. These intensely cultivated regions, made robust through favorable climatic conditions, collapsed as the climatic

conditions changed revealing their deep interconnection with a period of better weather.

The Carolingian Empire [2] expanded and intensified farming applying techniques that enhance productivity including crop rotation, use of more weather resistant crops and more efficient plows; but experienced 20 or more episodes of subsistence crisis (deaths), over its 200-year existence. Severe weather including long winters as well as periods of severe drought or relentless rain are documented to coincide, although not entirely with the deaths. The authors are quite clear that their work is correlation, not causation, but raise the possibility that the lack of one to one correspondence between climatic adversity and subsistence crisis reflect resilience by this society – that susceptibility to climatic change is not a foregone conclusion.

The Mayan civilization of Central America last for more than 2000 years before a period in 900 when large areas of the southern components of the empire were depopulated – a period historians describe as the “Classic Mayan Collapse” although it was more a large shift in population than societal collapse. Many theories seek to explain why this so suddenly occurred and a hypothesis based upon drought is currently ascendant. But the authors believe a single cause, drought, is a premature conclusion pointing to one Mayan city, Caracol, Belize. A city of approximately 100,000 they had developed systems of reservoirs and control of rain flows for an environment “rich in rainfall but lacking natural standing bodies of water.” They had built resilience into their society, during the periods of drought Caracol did not contract, it expanded. It was a dominant force of the southern Mayan empire, but in the period before the classic collapse it was torn by warfare, and the city’s leadership implemented policies that resulted, intentionally or not, in an increasing divide between elites and commoners. The authors suggest that it was a combination of the socioeconomic changes and drought that caused the rapid abandonment of Caracol; that neither factor by itself was sufficient.

The Little Ice Age [3] is thought to have affected the Polish-Lithuanian Commonwealth contributing to its collapse in the mid 17th century. Again, the authors believe a more nuanced explanation is more informative. The period of the Little Ice Age was Poland’s Golden Age, with increasing population and the growth of manorial farms (an earlier European version of industrial agriculture). Poland increased the production of grain by cultivating more acreage, not by increasing the yield per acre. Despite colder conditions, more crops increased exports and economic growth. Poland grew for 200 years during adverse climatic conditions until wars with Sweden, Transylvania, Russia and Turkey change the landscape, literally and figuratively. Poland lost 30% of its population. Agriculture productivity based upon acreage requires significant labor, and without that labor force, land under cultivation was severely reduced, grain exports and their economic benefit collapsed. War also brought the Plague. The horseman of the Apocalypse, pestilence, war, famine, and death, all contributed to the collapse.

For the authors, the great lesson is that by combining the research and knowledge of seemingly different specialization we can gain insights, challenge simple narratives and identify possible tipping points in the interrelationship of environment and society. But are there any lessons from history that we might learn? From the Romans we see that society can be reshaped by local climatic change; from the Carolingians that resilience to harsh conditions is possible; from Caracol, that socio-political events interact with climatic adversity, and from Poland, we see that even a

resilient socio-environmental system can be overwhelmed by the accumulation of multiple negative impacts.

You know the words of George Santayana, “Those who cannot remember the past are condemned to repeat it.” History seems to be telling us that our relationship to the environment is complicated. Knowing that we are at once a balance of fragile and resilient is a useful perspective.

Source: History meets palaeoscience: Consilience and collaboration in studying past societal responses to environmental change. PNAS DOI: 10.1073/pnas.1716912115

[1] A discipline looking at our past environment based on geologic changes

[2] This is the empire of western and central Europe held by Charlemagne, from about 800 to about 1000.

[3] This was a period of cooling in Europe, among other places, from about 1600 to 1850

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