

A ‘Perfect Storm’ in the Collapse of Bronze Age Civilization? Useful Insights and Roads not Taken: A Review Essay on 1177 B.C.: *The Year Civilization Collapsed* by Eric H. Cline (Princeton University Press)

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Eric Cline’s new book, *1177 B.C.: The Year Civilization Collapsed*, is a detailed account and discussion of how civilization, at least in the eastern Mediterranean, collapsed. The date, 1177 BC, is more or less the midpoint of a process that took many years and was the consequence of changes that occurred in the preceding four centuries. The eastern Mediterranean spans the west coast of modern Greece, to Mesopotamia on east, and just south of the Black Sea through upper Egypt—that is, the upstream portion of the Nile valley approximately parallel to and north of the southern end of the Red Sea. Even more than for the date, this is a variable area. Cline’s book discusses all of these areas, though at times the discussion focuses on only part of this area. Pages vi and vii provide a useful map with the major empires and territories indicated.

Cline’s punch line is that all monocausal explanations are wrong, or at best, incomplete. He concludes that the collapse was due to “A ‘Perfect Storm’ of Calamities?” (Chapter 5). Before turning to a summary of the book and my ruminations on it, I have some disclaimers. First, I am not a specialist, nor do I have special expertise in the Ancient Mediterranean. Second, I approach the issues in this book from a general interest in collapse, primarily using a world-systems analysis “lens,” but drawing on other approaches to collapse, as well. Third, like Cline, I want to see if we can draw any lessons from this early, possible first (depending on one’s definitions of collapse and civilization) collapse of civilization. Fourth, my goal is to provoke reflection on Cline’s arguments. That said, on to the summary.

In a brief Preface, Cline describes the aim of the book: to explain how the Late Bronze Age ended. He also hopes to draw lessons from this study for contemporary times, noting the work of Jared Diamond (2005) and Justin Jennings (2011; but also see Kardulias 2014). A key parallel is that both Diamond’s and Jennings’s books are concerned with “globalized world systems with multiple civilizations” (p. xvi). He further notes that Carol Bell (2012),

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Susan Sherratt (2003), and Fernand Braudel (2001) have made similar calls for such comparisons. However, Cline's book is also a bit of detective story, trying to solve the mystery of the collapse of the Bronze Age. 1177 B.C. is directed toward an audience larger than scholars of the Bronze Age.

The Prologue opens with a discussion of the Sea Peoples, who they were, where they came from, and so on. No texts from the ancient world refer to "Sea Peoples." This term is used to cover a number of groups that invaded many areas of the Eastern Mediterranean in the early twelfth century BC. There was no single invasion, but a series of waves of incursions. Some of the Sea Peoples even arrived by land. They left no texts or monuments memorializing their invasion(s), hence the number of conjectures of who they were and where they originated. Various scholars place their origins in many different parts of the Mediterranean. Cline notes that only the origins of the Peleset (also known as the Philistines) are clearly identified. He cites evidence of their violence, but also notes that we do not even know if they were an organized group or merely poorly organized marauders. While they no doubt played some role in the Late Bronze Age collapse, they were only one many factors that created a "perfect storm."

The first chapter focuses on the fifteenth century BC. He begins with the Hyksos invasion of Egypt ca 1720 BC, which was possibly aided by new military technology. Subsequently, Hyksos trade with Crete flourished; Cline notes that this is a familiar example of how objects originating far away take on value just because of their distant origins. He then turns to Minoans, whose origin is still not certain, though Anatolia is most likely. Egyptian trade extended to Anatolia. In regards to evidence of trade between Minoans and other cultures, we run into a familiar problem: many trade items were perishable. So many trade items left little evidence in the archaeological record, although some evidence exists in documents, whose survival is often a matter of chance. This is a familiar problem in the history of ancient societies. Tracking trade is also a problem since much of it is ancillary to tribute or gifts, being conducted on the side by seamen.

In 1479 BC, there was a battle with Canaan at Megiddo that marked a significant delimitation of one frontier. After reviewing more historical accounts, he turns to discussion of Hittites. A common view is that the Hittites originated in Anatolia, not Canaan, as the Bible suggests. Still, it does cause him "to wonder how the Bible could have gotten it so wrong" (p. 33). His answer is that the Hittite empire was far-flung and only an outpost that was attacked. He then examines the history of Mycenaeans, and argues that they took over trade routes to Egypt and the Near East, which facilitated their rapid rise. He concludes that trade networks extended far beyond what has been found archaeologically. This trade was only the beginning of a "Golden Age."

Chapter 2 explores the fourteenth century BC. Cline notes a shift in trade from Crete to the Greek mainland, and based on archival material, he reconstructs extensive relationships (his diagram on p. 55 is quite useful). Egypt used Nubian gold to attract traders. He suggests that gold may have functioned

much like shells did, as Malinowski describes in his well-known discussions of the Kula Ring. Cline further suggests that "we should not underestimate the importance of the messengers, merchants, and sailor who were transporting the royal gifts and other items across the deserts of the ancient Near East, and probably overseas to the Aegean" (p. 59). He asks whether the various exchanges might account for similarities among the *Epic of Gilgamesh*, Homer's *Iliad* and *Odyssey*, the Hittite *Myth of Kumarbi*, and Hesiod's *Theogony* (p. 59). He then discusses the rise of Assyrians, and later, Nefertiti and King Tut. He reviews various rebellions and battles, and says there is some evidence that captives brought disease from the Hittite homelands (p. 70). He notes that Hittite goods are almost nonexistent in the Aegean and suggests that this may have been due to an Hittite embargo against the Mycenaeans. He concludes by commenting that this may represent one of the earliest forms of globalization.

The archaeological excavation of sunken ships is discussed in the third chapter, especially the Uluburun ship, which had products from at least seven different geographical sources. The Uluburun ship was the second discovery of a wreck that had been sailing east to west, which strongly supports arguments that trade was further and more extensive when the ships sailed (ca 1300 BC) than had been accepted previously. Texts found in Ugarit from about 40 years after the Uluburun ship noted that some merchants were exempted from taxes.

Hittites and Egyptians fought a major skirmish at Qadesh in 1274 BC whose events and results are still disputed. At about the same time, Hittites were fighting against a rebellion in Anatolia, likely underwritten by the Mycenaeans. This may have been related to the Trojan War; Troy VI had imported objects from many places in the Eastern Mediterranean. Cline argues that this was a "contested periphery," that is, a location on the periphery of both the Mycenaean and the Hittite empires. There is evidence of a flow of goods between Mycenae and Hittites, though the direction of flow is debated. Evidence also shows that the Aegean and Egypt were in contact.

The evidence for the Exodus of the Hebrews from Egypt is less well-documented. Even the dating is controversial, with the Bible suggesting 1450 BC and archaeology suggesting 1250 BC. He says the evidence for the latter date is more persuasive. It is clear that the parting of the Red Sea due to the eruption of Santorini had been at least a century earlier. The discussion of these accounts will be of interest to Biblical scholars as well as other historians. Whether the Israelites invaded or migrated over decades remains unclear, but it is clear that they were in Canaan by the end of thirteenth century BC. The Assyrians became a great power from 1400 to 1200 BC and were in correspondence with other great kings in Egypt, Babylonia, Assyria, and the Hittites. Around this time, Cyprus was a major source of copper, which seems to have prompted attacks by Hittites; however, it is also possible that it was connected with the appearance of the Sea Peoples.

The next chapter focuses on the decline of the Eastern Mediterranean in the twelfth century BC. Records of marriages and presence of trade goods indicate that Ugarit was a major entrepôt and vassal of the Hittites. Documents found in Ugarit indicate considerable exportation of perishable goods (p. 104). On page 107, Cline diagrams the reach of royal letters from Ugarit over much of the Eastern Mediterranean (the Map on pp.110–111 is useful in following these discussions). However, Ugarit was destroyed violently between 1190 and 1185 BC, dates which are supported by the occurrence of an eclipse mentioned in other documents.

In the pages following, Cline summarizes in some detail the widespread destruction around this time. The destruction of Lachish during the reign of Ramses III is clear, even if who or what caused it is not. It is also clear that Mesopotamia was not destroyed by the Sea Peoples. Similarly, there was extensive destruction in Anatolia. Some Hittite sites were destroyed, but others were only abandoned. However, there was extensive destruction on the Greek mainland. It seems Cyprus was probably destroyed by Hittites and not by Sea Peoples. This seems to have been accompanied by famine, though abundance of Bronze arrow heads supports warfare, too. Cyprus did survive until 1075 BC, but with serious restructuring of economic and political organization. Meanwhile, there was extensive fighting in Egypt, and new evidence shows that Ramses III had his throat cut, suggesting a possibility of an internal coup. Although massive destruction in the Eastern Mediterranean is well-documented, who or what caused it is not.

For scholars interested in collapse and massive changes in empires or world systems, Chapter 5, “A ‘Perfect Storm’ of Calamities?” is the key chapter. Here, Cline follows Sherlock Holmes in arguing that it is necessary to choose among probabilities to solve the mystery of the collapse. To start, there is no consensus among scholars on cause(s). Earthquakes may have contributed, but their timing often was wrong for causing the collapse. The timing of climate change, drought, and famine are similarly problematic; furthermore, evidence shows that the population decline was not very steep. There is evidence, however, that the Early Iron Age was dryer than the Late Bronze Age. To assert emigration begs the question: what caused migration(s)? Internal rebellions also seem too few and too weak to have initiated collapse.

What about invaders and/or rapid decline in international trade? Again, they may have been possible contributors but insufficient to be the entire cause. A sharp drop in trade may have made some cities more vulnerable to attack because resources became scarcer. The question remains, why were the destroyed cities not rebuilt by survivors. An increase in private merchants—as opposed to state-sponsored merchants—may have been part and parcel of increasing decentralization. Susan Sherratt (1998) argues that Sea Peoples may have been a final phase in the replacement of old, centralized systems, but why did decentralization occur at all? Ugarit was destroyed by external invaders;

possibly smaller declines and partial collapses may have generated chaos which, in turn, may have opened new opportunities to private traders.

What about the celebrated Sea Peoples? Where did they go? Some came by land as well as by sea, but coastal resettlers may not have caused widespread destruction. Others suggest that the incursions were far more gradual over fifty or more years. Still, questions remain. Why did Sea Peoples move? Were they opportunists or maybe refugees?

Finally, Cline raises the issue of systems collapse, that is, failures that carried both domino and multiplier consequences. He draws heavily on Colin Renfrew's (1979) discussion of collapse. Although he finds this explanation intriguing, it still leaves open the "why?" There are many possibilities, dependence on bronze and other prestige goods among them. At best, central rulers could delay collapse, but not ultimately prevent it. Cline reviews these possibilities and turns to complexity theory, which might predict collapse, but not precisely. One condition is "hypercoherence" described by K. R. Dark (1998) under which interconnections in feedback loops are so dense that if any one is broken, it might cause collapse of the entire system. Collapse is nearly inevitable because the costs of stability are very high. In short, complicated systems can break down in a variety of ways. He concludes that monocausal explanations and linear explanations will not suffice.

Cline concludes with a brief Epilogue. He notes that collapse, although a disaster for current elites, can offer opportunities to others. He further acknowledges that 1177 BC is not a precise date for collapse any more than 476 AD is a precise date for the collapse of western Roman Empire. Rather, it is a convenient marker for a complex process that occurred over a number of years. He notes that rebuilding was a very slow process entailing decades and even centuries, citing some discussion of Dark Ages. He closes his account with an argument that new peoples and city-states replaced what had gone before:

From them eventually came fresh developments and innovative ideas, such as the alphabet, monotheistic religion, and eventually democracy. Sometimes it takes a large-scale wildfire to help renew the ecosystem of an old-growth forest and allow it to thrive afresh (p. 176).

Roads not taken and other musings

I now turn to some of the stimulations and provocations it provided for me. Whether readers of this review agree or dispute my musings, I hope the book and my musing will stimulate them to pursue their ruminations on both.

There are only two maps in the book. There should have been more, especially for the wider audiences he hopes to reach. There are, however, many tables and charts of times and people, including a useful *Dramatis Personae* (pp.

177–180) which provides a glossary for all of the people he discusses. Also, there are many black and white illustrations of various sources and monuments which give readers not closely familiar with this time and area an idea of the materials that scholars use to build their accounts.

As noted in “A ‘Perfect Storm’ of Calamities?” (Ch. 5) Cline reviews many possible causes of the Late Bronze Age collapse, and while noting that many events may have contributed to collapse, there was no single cause. He argues that it was more or less a system collapse brought about by convergence of many processes and changes. Thus, no monocausal accounts are correct, or at best sorely incomplete. Also, as is typical of any “system,” the process was nonlinear. All this is persuasive, but could have gone much further. In general, Cline eschews macro-theoretical explanations which he explains in detail elsewhere (Cline 2010). This is where he actually makes his task more difficult and somewhat opaque, at least in my judgment. He quotes K. R. Dark: “complex socio-political systems will exhibit an internal dynamic which leads them to increase in complexity ...[T]he more complex a system is, the more liable it is to collapse” (Cline p. 168, from Dark 1998, p. 121).

Dark is explicating the concept of “hypercoherence,” in which parts of a system are so intensely interconnected that failure of any one part may lead to collapse of the entire system, or at least its breaking into smaller components. For instance, a complex civilization (or world system) would devolve into statelets, chiefdoms, and tribes—all terms which are themselves quite complicated and often disputed.

Older explanations focused on Sea Peoples are quite inadequate, as Cline demonstrated in earlier chapters. Where did they come from? Why did they come? Where did they go? These questions, of course, are similar to many early questions about Central Asian pastoral invasions of Europe. Frederick Teggart (1939) connected them with events in China, as do Hall and Turchin (Hall and Turchin 2009; Turchin and Hall 2003). William McNeill wrote of a “steppe gradient” that pulled steppe pastoralist to move westward whenever pressures of changing conditions—climatic or political—made life difficult in the current location (1982, pp. 265 ff, especially Map p. 266). Steppe pastoralists followed a way of life that was quite mobile, especially in comparison with settled populations. If the Sea Peoples came from some kind of nomadic background, there might have been little archaeological or textual evidence. Thomas Barfield (1989) helped explain this process for central Asia by demonstrating that steppe confederacies rose and fell in sync with conditions in China—confederacies thrived when China was robust. Thus, one source of “push” for Sea Peoples could have been an efflorescence in good times that was followed by scarcity, pushing them to seek new territories. Even if movements of Sea Peoples provide a proximate cause, it raises much deeper questions of why they moved, and why they could move.

This kind of “perfect storm” is rooted in the concatenation of a variety of simultaneous processes. Glen Kuecker also describes a potential collapse in the twenty-first century as a result of a “perfect storm” and ways it might be survived (2007, 2014, Kuecker and Hall 2011). Underlying both is Joseph Tainter’s (1988) and later K. R. Dark’s (1998) analyses of the costs of complexity. Tainter discusses “declining marginal returns to complexity” (see figure in Tainter 1988, p. 119). Basically, he argues that increases in complexity cost more the higher the existing level of complexity. Finally, it hits an inflection point and complexity begins to decline despite further inputs. Soon this will lead to collapse of the system. Of course, this holds under relatively static technological and organizational conditions. Collapse leads to dissolution of the state. Elites are almost always damaged extensively, if not entirely wiped out. Commoners, however, occasionally may actually benefit from collapse, primarily because they no longer need to supply the capital resources to continue high levels of complexity. If, on the other hand, the state provided resources that facilitated commoner production, then they too will suffer decline.

Dark adds to this discussion by noting that a new state, often based on new technology and/or new forms of organization (i.e., complexity) sets a new curve of increasing technology until a new inflection point is reached (see figure in Dark 1998, p. 125). There is some similarity here to Carneiro’s (1970, 2000) argument that circumscription of expansion puts great pressure on social organizations. In cases where a new organizational form (e.g., the state) is not invented, collapse of the competing societies into a simpler form is not uncommon. In some cases, competition among those surviving may lead to circumscription. Again, if a new form of organization does not arise, there may be another simplification. Such cycling might continue for a long time (Anderson 1994, 1996; Hall 2001). Finally, Chase-Dunn and Hall (1997, Ch. 6; 2011, 2012; Chase-Dunn and Lerro 2014; Chase-Dunn 2015) present an “iteration model” which diagrams how many of the factors raised in these discussions interact in complex feedback loops. Occasionally, the cyclical processes break down, and the world-system collapses. Occasionally, a new technology of production or organization is invented that solves the problem. The system then returns to a cyclic iteration process. Peter Turchin provides a complex model of rise and demise built from the logic of evolutionary biology (2003; Turchin and Nefedov 2009).

All of these approaches—Tainter, Dark, Carneiro, Chase-Dunn and Hall, Turchin—have at least one commonality. For all of them, the breakthrough to new technology or organization occurs as a bifurcation point (so-called in chaos theory); in short, a new evolutionary development occurs. It is important to note that this is a new process with a considerable random component to it, hence inherently unpredictable. Chase-Dunn and Hall’s iteration model attempts to show this diagrammatically. Further, these general models account for why states, empires, or world-systems typically seem to cycle or rise and fall, why many states and/or cities are rebuilt in same areas. Only rarely was their radical

change. Thus, the Bronze Age collapse opened the way to development of the Iron Age and larger states, empires, or world systems (more on this below).

Not surprisingly, there is more to Cline's account. Cline largely agrees with Monroe's (2009) account of a general inevitability of collapse, but demurs with Monroe's argument that collapse was "an inevitable result of limited insight" (Cline p. 163, from Monroe 2009, p. 297). Sing Chew (2001) notes in his review of ecological collapses in the ancient world that in virtually all of them there were sages or scholars who had a reasonably good understanding of what was happening and how it might be avoided. If they were listened to at all, instead of being punished for making the ruler look bad, their advice was typically followed too little and too late. Here, I will draw on historians of science Conway and Oreskes's (2010) account of how some scientists were recruited to undermine claims of harmful consequences of smoking and the validity of contemporary global warning. Interestingly, they document how these "merchants of doubt" regarding tobacco and climate change were sometimes the same individuals. Oreskes and Conway (2014) describe the consequences of such denials in a fictional account of a collapse of civilization in the late twenty-first century. To cut through a great deal of convincing data and arguments, their explanation is that some actors—either individual or organizations, typically corporations—have very strong interests in the status quo and so go about, or hire others to go about, casting doubt on the supporting research. That is, it is not due to "limited insight," but rather due to overly zealous pursuit of self-interest, ignoring the dire consequences for everyone else.

It would seem that during the Late Bronze Age this is precisely what happened, based on Cline's detailed descriptions in the earlier chapters. Merchants had specific routes and trading partners and mechanisms for sharing lucrative profits with rulers—the sharing quite often was more or less coerced. This is also an impact of early globalization in the eastern Mediterranean as Cline suggested in the summary of Chapter 2. The antiquity of globalization, or at least globalization-like processes, has been discussed and debated by many (see Hall, Kardulias, and Chase-Dunn 2011, Jennings 2011, Kardulias and Hall 2008, Kardulias 2014; Hall 2014 and the many references cited in these works). Cline's detailed discussions of trade—and the problems with the data upon which is based—is further strong evidence for such antiquity of globalization-like processes.

Furthermore, a great deal of technology, especially in warfare, was heavily invested in the use of bronze. Those who benefited from this technology had strong incentives not to adopt the use of iron and remain dependent on bronze. The collapse allowed those who would adopt new technologies to do so more easily.

In the Epilogue, Cline mentioned that the period after the collapse of the Late Bronze Age might be seen as a Dark Age. While generally in agreement with his suggestion, I thought the leap was too broad. What is missing, in my view, is any

reference to recent discussions of Dark Ages, especially the work of Sing Chew (2001, 2007, 2008). Chew argues that Dark Ages are recurrent in human history. Although some of his work has been criticized, there is considerable empirical evidence to support his claims. Chew argues that Dark Ages occur in about six hundred year cycles. This seems to be the result of human overuse of resources. He argues that the six hundred year period allows the environment time to recover from overuse. He delves into the mechanisms in detail in *Ecological Futures* (2008), arguing, for example, that in the West, monasteries were one way of curtailing population growth by removing large numbers of people from the reproductive pool. It might be interesting to examine whether the spread of Buddhist monasteries served a similar function in the East. What would be worthy of detailed examination such as Cline's would be a study of the rise of the Iron Age from the collapse of Bronze Age. The first focus would be investigations of any mechanisms which allowed ecological recovery of the environment. The second would be to explore if and how peripheral or semiperipheral peoples invented the new technologies and social organizations.

While Cline does not address such questions in his Epilogue to 1177 B.C.—and quite reasonably so, since his book is about the Late Bronze Age—it seems that Iron Age centers began to develop in other regions, and only then could large numbers return to some of their seats of “civilization.” There are several reasons for this. First, iron-making technology is relatively simple and can be carried out by pastoral or “tribal” peoples. That technology can spread relatively easily once the process has been observed. Second, according to Chase-Dunn and Hall, such innovations are most common in “semiperipheral marcher states.” The idea here is that because of their semiperipheral position, such states have relatively clear idea of how current states and/or empires operate. Simultaneously, they are not as vested in those modes of operation as states and cities in core areas. Occasionally, marcher states develop a new technology or organization that allows them to conquer an existing core and replace it. Furthermore, when there is a system collapse, they are well-placed to pick up the pieces and develop into new centers or cores.

So there is a great deal more to Bronze Age collapse than Cline discusses, but that “more” does not so much contradict his arguments and claims as extend them further. What strikes me as a strength of Cline's account, and possibly his eschewing of macrotheory, is that some of the leaps or parallels he makes to contemporary times are in accord with the preceding discussions about collapse. A key point, though, is that older processes cannot be mapped directly to contemporary events. Rather, the logics of those processes can be used to understand later processes, but only when they take into account the specific conditions in the new setting. That is a difficult operation. One value of various macrotheories is that they give some idea of how accounting for those conditions might be done. A further benefit, it seems to me, is that the accounts reviewed here—and no doubt others I have not discussed—show how historical

explanations can both be systematic and rooted in unique circumstances. The art is in figuring out how to do this.

My quibbles notwithstanding, this is an outstanding contribution to the history of the Late Bronze Age in the Eastern Mediterranean and to broader discussions of collapse. Cline's copious notes allow scholars to pursue many different topics and revisit many of the key writings on various aspects of that history. For me at least, its greatest value is the ways in which it promotes thinking about issues of collapse and rethinking about parallels to current issues. Most careful readers of this account will be prompted to explore some of the roads not taken.

References

- Anderson, David. G. 1994. *The Savannah River Chiefdoms: Political Change in the Late Prehistoric Southeast*. Tuscaloosa: University of Alabama Press.
- Anderson, David. G. 1996. "Fluctuations Between Simple And Complex Chiefdoms: Cycling In The Late Prehistoric Southwest." Pp. 231–252 in *Political Structures And Change In The Prehistoric Southeastern United States*, edited by J. F. Scarry. Gainesville, FL: University Press of Florida.
- Barfield, Thomas J. 1989. *The Perilous Frontier*. London: Blackwell.
- Bell, Carol. 2012. "The Merchants of Ugarit: Oligarch of the Late Bronze Age Trade in Metals. Pp. 180–187 in *Eastern Mediterranean Metallurgy and Metalwork in the Second Millenium BC: A conference in honour of James D. Muhly, Micosia, 10th–11th October 2009*, edited by V. Kassianidou and G. Papasavvas. Oxford: Oxbow Books.
- Braudel, Fernand. 2001. *The Mediterranean in the Ancient World*. Urbana: University of Illinois Press.
- Carneiro, Robert L. 1970. "A Theory of the Origin of the State." *Science* 169:733–38.
- Carneiro, Robert L. 2000. *The Muse of History and the Science of Culture*. New York: Kluwer Academic/Plenum Publishers.
- Chase-Dunn, Christopher. 2015. "The Sociocultural Evolution of World-Systems." Pp. 267–284 in Jonathan Turner (ed.) *Handbook on Evolution and Society*. Boulder, CO: Paradigm Publishers
- Chase-Dunn, Christopher and Thomas D. Hall. 1997. *Rise and Demise: Comparing World-Systems*. Boulder: Westview Press.
- Chase-Dunn, Christopher and Thomas D. Hall. 2011. "East and West in World-Systems Evolution." Pp. 97–119 in Andre Gunder Frank and *Global Development: Visions, Remembrances and Explorations*. Edited by Patrick Manning and Barry K. Gills. London: Routledge.
- Chase-Dunn, Christopher and Thomas D. Hall. 2012. "Global Scale Analysis in Human History." Pp. 185–200 in *A Companion to World History*, edited by Douglas Northrop. Oxford: Wiley-Blackwell.

- Chase-Dunn, Christopher and Bruce Lerro. 2014. *Social Change: Globalization from the Stone Age to the Present*. Boulder, CO: Paradigm Press.
- Chew, Sing C. 2001. *World Ecological Degradation: Accumulation, Urbanization, and Deforestation 3000 B.C.–A. D. 2000*. Walnut Creek, CA: Altamira Press.
- Chew, Sing C. 2007. *The Recurring Dark Ages: Ecological Stress, Climate Changes, and System Transformation*. Lanham, MD: Altamira Press.
- Chew, Sing C. 2008. *Ecological Futures: What History Can Teach Us*. Lanham, MD: AltaMira Press.
- Cline, Eric H. 2010. "Bronze Age Interactions between the Aegean and the Eastern Mediterranean Revisited: Mainstream, Periphery, or Margin?" Pp. 161–180 in *Archaic State Interaction: The Eastern Mediterranean in the Bronze Age*, edited by William A. Parkinson and Michael L. Galaty. Santa Fe, NM: SAR Press.
- Conway, Erik M. and Naomi Oreskes. 2010. *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming*. New York: Bloomsbury Press.
- Dark, K. R. 1998. *The Waves of Time: Long-Term Change and International Relations*. London & New York: Pinter
- Diamond, Jared. 2005. *Collapse: How Societies Chose to Fail or Succeed*. New York: Viking.
- Hall, Thomas D. 2001. "Chiefdoms, States, Cycling, and World-Systems Evolution: A Review Essay." *Journal of World-Systems Research* 7:1(Spring):91–100 [E-Journal <http://www.jwsr.org/>].
- Hall, Thomas D. 2014. "Toward Comparative Globalizations: Globalization in Historical Retrospective and World-Systems Analysis." *Journal of Globalization Studies* 5:1(May 2014):3–10.
- Hall, Thomas D., P. Nick Kardulias, and Christopher Chase-Dunn. 2011. "World-Systems Analysis and Archaeology: Continuing the Dialogue." *Journal of Archaeological Research* 19:3(Sept.):233–279. Open access @: <http://www.springerlink.com/openurl.asp?genre=article&id=doi:10.1007/s10814-010-9047-5>
- Jennings, Justin. 2011. *Globalizations and the Ancient World*. Cambridge: Cambridge University Press.
- Kardulias, P, Nick. 2014. 2014. "Archaeology and the Study of Globalization in the Past." *Journal of Globalization Studies* 5:1(May 2014):110–121.
- Kardulias, P. Nick and Thomas D. Hall. 2008. "Archaeology and World-Systems Analysis." *World Archaeology: Debates in World Archaeology* 40:4:572–583.
- Kuecker, Glen D. 2007. "The Perfect Storm: Catastrophic Collapse in the 21st Century." *The International Journal of Environmental, Cultural, Economic and Social Sustainability* 3:5: 1–10.

- Kuecker, Glen D. 2014. "From the Alienation of Neoliberal Globalization to Transmodern Ways of Being: Epistemic Change and the Collapse of the Modern World-System." *Journal of Globalization Studies* 5:1(May 2014):154-170.
- Kuecker, Glen D. and Thomas D. Hall. 2011. "Facing Catastrophic Systemic Collapse: Ideas from Recent Discussions of Resilience, Community, and World-Systems Analysis." *Nature and Culture* 6:1(Spring):18-40.
- McNeill, William H. 1987. *A History of the Human Community*, Vol. I: Prehistory to 1500, 2nd ed. Englewood Cliffs, NJ: Prentice Hall.
- Monroe, Christopher. 2010. "Sunk Costs at Late Bronze Age Uluburun." *Bulletin of the American Schools of Oriental Research* Feb 2010; 357:19-33.
- Oreskes, Naomi and Erik M. Conway. 2014 *The Collapse of Western Civilization: A View from the Future*. New York: Columbia University Press.
- Renfrew, Colin. 1979. "Systems Collapse as Social Transformation." Pp. 481-506 in *Transformations, Mathematical Approaches to Culture Change*, ed. by Colin Renfrew and Kenneth L. Cooke. New York: Academic Press.
- Sherratt, Susan. 2003. "The Mediterranean Economy: "Globalization" at the End of the Second Millennium in the Eastern Mediterranean. Pp. 37-54 in *Symbiosis, Symbolism, and the Power of the Past: Canaan, Ancient Israel, and Their Neighbors from the Late Bronze Age through Roman Palaestina. Proceedings of the Centennial Symposium W. F. Albright Institute of Archaeological Research and American Schools of Oriental Research, Jerusalem, May 29-31*, edited by W. G. Dever and S. Gitlin. Winona Lake, IN Eisenbrauns.
- Tainter, Joseph A. 1988. *The Collapse of Complex Societies*. Cambridge: Cambridge University Press.
- Teggart, Frederick J. 1939. *Rome and China: A Study of Correlations in Historical Events*. Berkeley: University of California Press.
- Turchin, Peter. 2003. *Historical Dynamics: Why States Rise and Fall*. Princeton, NJ: Princeton University Press.
- Turchin, Peter and Thomas D. Hall. 2003. "Spatial Synchrony among and within World-Systems: Insights from Theoretical Ecology." *Journal of World-Systems Research* 9:1(Winter):37-64 [ejournal: <http://www.jwsr.org/>].
- Turchin, Peter and Sergey A. Nefedov. 2009. *Secular Waves*. Princeton: Princeton University Press.