Background Memo (IV) for Comparative Historical Collapse Workshop Princeton, Friday-Saturday, April 26th-27th

What follow is some thoughts from the Princeton folks on the conference and background thereto.

Some wisdom to get us thinking….

"Happy families are all alike; every unhappy family is unhappy in its own way".
— Tolstoy

"*…the decline of Rome was the natural and inevitable effect of immoderate greatness. Prosperity ripened the principle of decay; the causes of destruction multiplied with the extent of conquest; and as soon as time or accident and removed the artificial supports, the stupendous fabric yielded to the pressure of its own weight. The story of the ruin is simple and obvious; and instead of inquiring why the Roman Empire was destroyed, we should rather be surprised that it had subsisted for so long.*"
— Gibbon

"*We have met the enemy and he is us.*"
— Pogo

"Don't wake me for the end of the world unless it has very good special effects."
— Roger Zelazny

"So I think the world will come to an end amid the general applause from all the wits who believe that it is a joke."
— Søren Kierkegaard

"*Every society is three meals away from chaos*"
— Attributed to Lenin, but many others

"For the want of a nail the shoe was lost,
For the want of a shoe the horse was lost,
For the want of a horse the rider was lost,
For the want of a rider the battle was lost,
For the want of a battle the kingdom was lost,
And all for the want of a horseshoe-nail."
— Benjamin Franklin

"*Big problems that pose grave dangers to large numbers of people, including the possibility of human extinction, serve as a mirror of society".*
— Robert Wuthnow

About suffering they were never wrong,
The old Masters: how well they understood
Its human position: how it takes place
While someone else is eating or opening a window or just walking dully along;
How, when the aged are reverently, passionately waiting
For the miraculous birth, there always must be
Children who did not specially want it to happen, skating
On a pond at the edge of the wood:
They never forgot
That even the dreadful martyrdom must run its course
Anyhow in a corner, some untidy spot
Where the dogs go on with their doggy life and the torturer's horse
Scratches its innocent behind on a tree.
— W.H. Auden

Agenda for conference

We envision this workshop as the first of **TWO** meetings leading to the production of both a synthesis article and an edited book. The motivations are in a sense illustrated by the quotations above. Are all collapses alike? To what extent do we bring them on ourselves? How fragile are societies to disruption? What of the role of cascading failures? How can we understand our modern society better through the study of collapse? What if no one notices the collapse and life goes on?

The plan is for us to meet Friday & Saturday, April 26th-27th at Princeton University to teach each other about our particular expertise. Presentations should **NOT** be original papers, but rather **PRIMERS** on the various presenter's expertise. We begin with ecological collapses and what these can teach us. Then we move to broad theories of collapse and associated methods, especially quantitative techniques. Next, we analyze comparative cases[1]. Finally, we end with a discussion of dystopian fiction and what it can tell us about our fears.

Hopefully armed with new knowledge and perspectives, we return home to prepare (a) a section of an article, and (b) a chapter for the edited book including our thoughts on the specific cases on which we have expertise, but now in a comparative framework. We meet again (for perhaps a longer time and in a more public setting) to re-think our pieces and hopefully consider venues for publication.

The agenda would be full:

Friday AM: Intro and Ecology
Friday PM: Broad Theories of Collapse
Saturday AM: Comparative Cases
Saturday PM: Comparative Cases and Conclusions with Dystopian Fiction

PLEASE SELECT ONE CLOSEST OT YOUR AREA AND SEND ME AT LEAST A TITLE ASAP!! YOU CAN SIGN UP TO PRESENT A PRIMER OR TO SERVE AS A DISCUSSANT.

[1] e.g., What did the collapse of American Southwest in the 13th C look like? Mesoamerica? How much variance do we find in the response to the Black Death? Why does the Eastern Empire survive challenges while the Western does not?

Studying Collapse

Some thoughts on thinking about collapse:

1) What Collapses?

   If there is one central theme in the "collapse literature" it is that there is notable disagreement about the meaning of the term "collapse." (McAnany and Yoffee). One area of debate is what exactly constitutes a "collapse." Another criticism is that our historical view of "collapse" tends to have all sorts of biases—cultural biases, survivorship bias, etc. Another critique is that speaking only of collapse ignores comparable scenarios where civilizations survived hardships and shocks, and thereby conceals or ignores significant elements of robustness and resilience that are important to identify.

   We can begin with the standard definition of a system: *"a regularly interacting or interdependent group of units forming an integrated whole"* (Merriam-Webster). What we are interested in are the changes in the scale and scope of systems. When does the "whole" system increase or decrease in scale and/or scope? When does the central axis of action of the system move from the system itself to its constituent parts? Can we speak of coherence in systems? In such discussions of systems, collapse refers to the disaggregation and breaking apart of a connected network. What happens is that complex systems break down or fragment into smaller units requiring less order, complexity, coordination, and organization to function. The systemic dynamics are thus reduced on a macro scale.

   In this type of analysis, what "collapses" is not necessarily an entire society, but instead it is the larger organizational framework. So, the Maya late-classic city states become smaller agglomerations of farmers, but the larger Maya "civilization" remains (Yoffee and Cowgill). The Western Roman Empire becomes a series of much smaller political units—with significantly fewer interaction between them than they previously experienced. We can therefore speak of dynamics of fragmentation and aggregation over short to long-term periods.

Sources of collapse

I) Political authority:

   Two different stages:

   a) Power and violence: This, in its most obvious stage, is the breakdown of the monopolization of control over the means of violence. In its most Hobbesian

stage, it is literally "all against all," where "mere anarchy is loosed upon the world." In most fictional accounts of a global collapse, the predominant political feature is rule by the strongest and best armed. In the most optimistic utopias, the only danger can come from outside the aggregated system. We can imagine levels of aggregation of the control of the means of violence from extended family through villages, small regions, nation states, and empires. Renfrew associates collapse with the decline of hierarchical authority structures. Marcus writes about the cyclical states of Mesoamerica.

b) Communal legitimacy and cohesion: A much more important breakdown might precede or succeed the above: the diminution of disunion of the idea of communal legitimacy. All systems rely on some understanding of "the rules that need not be spoken." This can range from the epistemological authority (what is true), to ethical authority (what is good), to most mundanely bureaucratic authority (which rules do I need to follow). Again, in fictional accounts we usually go from assumed decent behavior to the breakdown of any and all norms. Surely, there are identifiable stages. We could measure this using proxies such as the hegemony of a single currency (with the other end point being no exchange except for use value—see below). Or we could also measure the homogeneity of systemic beliefs (so, for example, the US is going through a fragmentation of its notion of nationalism/patriotism). We might also distinguish between unconstrained and constrained visions of the world between societies centered around systemic processes to co-ordinate humans self-interested struggles that creates a beneficial social order (Hobbes, Burke, Smith etc) and the unconstrained version, where we are capable of huge feats of wisdom, virtue and intellectual firepower and that the constraint to this is the result of irrational institutions (the Rosseau, Condorcet & Godwin view).

II) Economic Consumption and Distribution

a. Interdependence. This may be the most obvious form of systemic aggregation/fragmentation. On one end of the spectrum is complete and total individual/household autarky and self-reliance (Robinson Crusoe). The transition in the area of the Western Empire between the 4th and 13th C is a classic example of a cycle (Pirenne). We are currently living through the most extensive economic aggregation of world history where virtually all societies depend on some sort of merchandise or capital flow. This can be measured by distance traveled by basic goods. See Helbing on contemporary issues.

b. Distribution battles. Here, it is no longer the supply that causes the crisis, but rather disputes about distribution (i.e. who gets what and how much).

c. Breakdowns of network connections. Lessons from the first wave of globalization in the late 19th C and its collapse post WW1? Roman imperial economy?

III) Cultural interdependence/human contact

How much does any person have any contact with others? Or hear about others? How far away? We can imagine a society with limits of the sound of a human voice, a horn, or a church bell. Today, we possess the technology to make it almost impossible for people not be aware of what is going on thousands of miles away and to have at least intermittent contact with people around the world. While multiple connections are usually a sign of order, it can also lead to contagion.

IV) Infrastructure

These are the mechanisms through which the first three dimensions flow. We can think of infrastructure as the command and control of the military, the maintenance of roads (quality, distance, quantity), and of communications. Water systems are always critical (Ouellette; Ortloff). We can also estimate the degree of a society's sophistication by examining its dependence on a certain technology or infrastructure. The most primitive one depends in the end of human motion through space, while today's depends on the maintenance of the internet.

It would be interesting to discuss the role of technology on societies and the disruption caused by successive waves of development that caused minor disruptions yet eventually transformed the societies they initially destabilized. What effects will increasing dependency on technology have is a subject of huge importance and current study (Christensen 2003) so can we review past societal disruptions caused by technology adoption?

We may want to think about the concept of human knowledge and its role in creating and disrupting societies? There is some interesting work from David Deutsch (the Oxford Physicist – addressing the work of Popper) regarding the growth of 'knowledge' in societies and its role in human societies.

V) Four horsemen: war, conquest, famine, and plague.

Here we have to distinguish between the appearance of the horsemen that is due to cosmic bad luck and HOW a society responds and reacts. Some societies can afford a major "hit" (e.g., the German rebirth after both "Thirty Years Wars" of the 17th and 20th C.) Some societies fragment with a small push (former USSR).

2) When Does it Collapse?

One of the most common critiques of the "collapse" literature is that it has a binary bias—civilization and barbarie, that it occurs very quickly, and that once it does, it leaves little comprehensible residue. (Thus, the common Armageddon trope of post-apocalyptic savages not understanding what a car is or what buildings were for.) We can think of these as critical variables of the "timing" of collapse:

I) What survives? Just because a large system with a clear hierarchy collapses does not mean that daily life at the household level is disrupted. Those at the social bottom may not even recognize that anything has happened for some time. The key task here is to measure the territorial/demographic scope of fragmentation and aggregation. This is particularly useful for comparing parts of a previous system that undergoes dramatic change, but with very different consequences (e.g., The West/East Roman Empire(s)).

II) How long does it survive? With the new interest in resilience, we can also imagine a series of cycles of fragmentation and aggregation as the system reorganizes itself. Thus, a "civilization" or a cultural system may persist in its individual branches following a systemic "collapse."

III) When we think of a collapse, we often imagine it in a short time span—a day as in the case of nuclear aftermath, a generation in terms of an eroding empire. But the velocity of a collapse may vary across time and space and we need to recognize "stages" or "tipping points."

IV) Cycles: Yoffee discusses intervals of urbanism, ruralism, and local autonomy. Schwartz et al. focus on what they call "second generation" states following some initial disintegration. Holling provides a theoretical model of the cycles of ecosystem organization that attest to "adaptive capacity."

3) Why Does it Collapse?

We can divide these causes into two rough groups—exogenous and endogenous—but the line between these can become quite fuzzy. Cumming et al. suggest that we should pay attention to the interaction between pre-existing structures and the challenges faced. (See Avin et al. for a contemporary classification.)

I) Purely external: The most obvious forms of these are invasions or natural catastrophes. In these instances, nothing about the society would lead one to expect a collapse, but the entry of some other factor (conqueror) or event

(volcanic eruption) destroys the basis of the system. Weiss and Bradley and Diamond suggest that many historical collapses can be traced to significant climactic changes.

II) Purely internal: The system collapses because of its own endogenous qualities. Either it depends too much on a tightly knit and complex base, which cannot endure, or it creates an atmosphere where an elite becomes corrupt and no longer does the system maintenance required by its function in a society. The classic case here is what Tainter calls the decreasing marginal returns of complexity. Helbing focuses on the degree of interdependence and the possible limits of organization. Downey et al. have identified a "boom-bust" cycle in the European Neolithic that seems to indicate a loss of resilience due to the introduction of agriculture. Diamond speaks of a hubris not allowing the necessary adaptation. Turchin et al., identify "principal components" of societal organization that may explain crises and outcomes.

III) Catastrophic risks and failed adaptations (Villa Martin, et al.); Linkov et al. Reuveny suggest that we re-read Malthus.

IV) Mixed causality: This is where it gets most interesting because it is the interaction of some exogenous factor (a new disease vector) AND the existing social structures. The most obvious example here are the many cases where social structures could not meet the challenge of an environmental change. Butzer focuses on how identified options, understanding and other aspects of resilience may explain different outcomes to similar crises. Homer-Dixon, et al., focus on "synchronous" failure. Scheffer writes that societies may tend to resist change in environment until too late. Downey et al. do the same for Neolithic societies.

V) Other distinctions: We could also separate the origins of fragmentation into natural and human driven actions?

Participants

Name		Affiliation	Expertise
Anderies	Marty	ASU	Systems
Belfied	Haydn	Cambridge	Theory
Bookstaber	Richard	independent author	Theory
Burrington	Ingrid	Artisit/Researcher	Dystopian fiction
Callahan	Peter	Princeton	Team
Centeno	Miguel	Princeton	Intro
Cline	Eric	GWU	12 C BC East Med
Cohn	Samuel	Glasgow	Black death
Danpeckgruber	Wolfgang	Princeton	Global
Derlugyan	George	NYUAD	Russia
Elga	Adam	Princeton	Philosophy
Galaz	Victor	SRC	Team
Garon	Sheldon	Princeton	Japan
Grenfell	Bryan	Princeton	Epidemiology
Grozinger	Christina	PSU	Bee collapse
Haldon	John	Princeton	Roman Empire East
Hall	John	McGill	Theory
Hass	Jeff	Richmond	Stalingrad
Katz	Stan	Princeton	Philanthropy
Kemp	Luke	Cambridge	Theory
Kinzig	Ann	ASU	American SW
Kohler	Tim	WSU	American SW
Krakauer	David	SFI	Ecology/Systems
Kreike	Emmanuel	Princeton	African environment
Larcey	Paul	Cambridge	Team
Lenton	Tim	Exter	Climate change
Linkov	Igor	US Army	Russia/Venice
Metcalf	Jessica	Princeton	Epidemiology
Mian	Zia	Princeton	Nukes
Nichols	Deborah	Dartmouth	Mesoamerica
Patterson	Thayer	Princeton	Team
Pelopidas	Benoit	Sciences Po	Nukes
Prins	Gwythian	LSE	Models/EU
Pyne	Stephen	ASU	Fires
Rocha	Juan	SRC	Methods/data
Sandberg	Anders	Oxford	Crisis

Scheibel	Walter	Stanford	Rome/China
Shafir	Eldar	Princeton	Psych
Shapiro	Jake	Princeton	Military
Stenseth	Christian	Oslo	Ecology
Tainter	Joseph	Utah State	Theory
Thurner	Stefan	Complexity Hub	Trade
Trump	Ben	ERDC US Army	Russia
Turchin	Peter	Uconn	Theory