Rethinking Connectedness from Past to Future: An Archaeological Perspective on the Covid-19 Pandemic.

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The Covid-19 pandemic has dramatically impacted lives across the globe and will have lasting effects for years to come. How can we as archaeologists reflect on these changes and inform our understanding of their implications for the future? If we are to understand how to properly address this situation or future ones like it, we need to consider the implications of connectedness on multiple scales, that is, interactions and exchanges between people, groups, societies, and states across the globe. Can we use the past to gain new insights on how to act during and after a pandemic? We have several potential historical points of comparison, such as The Athenian Plague in 430 BCE, the Black Death in the fourteenth century CE, or the global flu pandemic in the aftermath of World War I. While I will draw attention to one particular historical parallel—the Roman empire—I want to go beyond direct comparisons with the past, and rather focus on using the theories and methods of social-ecological sciences in long-term perspectives to interpret the current situation and provide insights for the future.
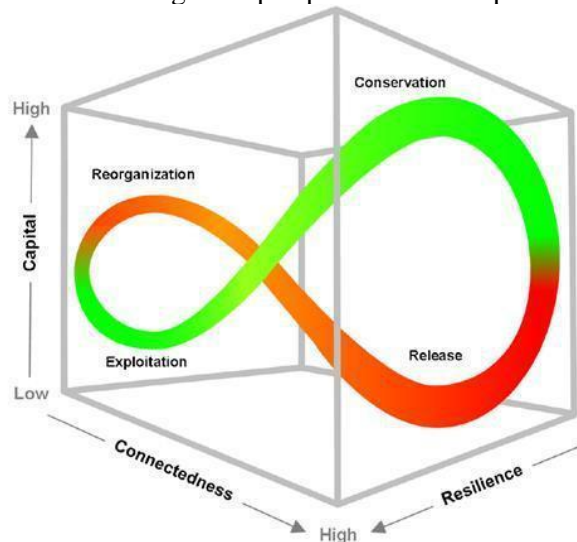

Figure 1: Adaptive cycle (Gunderson and Holling 2002, 41).

In my work, I use the model of adaptive cycles to study long-term patterns of social change on multiple scales.[1] The adaptive cycle (Figure 1) describes changes in available capital, connectedness, and resilience of a society through four phases: exploitation, conservation, release, and reorganization. The first two respectively refer to rapid initial growth and the sustained conservation of the system, whereas the latter two refer to its disruption and (potential) reorganization into a new cycle. The model predicts that, as societies develop, they will become increasingly interconnected, resulting in an increase in availability of capital as well as a decrease in resilience.

Let us take the example of the Roman empire, which at its height during the second century CE, comprised regions as far apart as Britain and Iran. As the empire grew, evermore regions were incorporated in a densely interconnected social, political, and economic network of people, goods, and ideas. The empire prospered through this connectivity, ushering in a period of economic growth, social mobility, and wealth (at least for parts of the population). However, it also became less resilient to disturbances. At the end of the second century CE, the empire was hit by a pandemic, followed by a second outbreak around the middle of the third century CE. Ancient sources relate how the disease first appeared during the Roman siege of Seleucia, a Parthian city in Mesopotamia in what is now Iraq, and was subsequently spread throughout the empire by the Roman armies. Estimations of the casualties vary, but numbers of up to 20 percent of the population are not uncommon. The effects of the disease were not limited to the Roman empire either. Historian Rafe de Crespigny has suggested that descriptions of a pandemic ravaging the contemporary Han Empire in China could be related to the same disease.[2]

We are dealing here with a disease spread across large parts of the (Eurasian) world by the movement of individuals and groups, facilitated by a densely connected network of people, cities, and regions. The similarities with circumstances today are obvious. For *past* events, however, we can already trace their long-term effects. From the perspective of the adaptive cycle, the Roman empire was at the height of the conservation phase when this shock induced a first shift towards release and reorganization. Typical of the latter is the loss of connectedness between system components. While trade, mobility, and interaction did not cease in the Roman empire, connections across the network became far sparser. The

loss of interregional integration (among others) led to the gradual dissolution of the empire, first in a western and eastern part, and later in its regional components.

Connectedness is what makes a society tick. This is true for today as much as for the past. Yet, as in Roman times, the Covid-19 pandemic is caused by over-connectedness on multiple levels. In contrast to the Romans, however, we have a better understanding of the underlying mechanisms of the disease and can act accordingly.

All viruses work by hijacking transmission mechanisms between organisms. As connectivity between organisms increases, so does the transmission rate. *Ergo*, more densely packed spaces result in higher infection rates. In this case, however, it is not only micro-level biological transmission that is affected, but macro-level social transmission too. Global connectedness in modern-day society has turned this disease into a worldwide pandemic. Over the last few decades, humans have expanded their presence throughout ever more parts of the world, destroying or usurping existing environmental niches, a process typical of the exploitation phase of the adaptive cycle. One of the hypotheses regarding the origins of the virus states that SARS-CoV-2 was transmitted from bats to humans, caused by our co-existence in the same niche, paving the way for the virus to transmit from animal to human. As connectedness between the human and natural worlds increased—in other words, as the system moved toward a conservation phase—potential dangers grew accordingly.

It is likely that the current pandemic will prove to be a major disturbance event with significant long-term effects. However, if we want to deal with these effects on our own terms, we will need to act proactively to self-induce a reorganization phase of society and define the course of a new adaptive cycle, built around fundamental solutions for the trade-offs between advantages and downsides of connectedness.

One common policy response has been to break up connections so that the virus is given no chance to be transmitted. Individuals self-isolate, societies go in lockdown, and countries close their borders. But is this a viable long-term solution? As lockdowns are dragging on, psychologists and other mental health practitioners are increasingly sounding the alarm for our well-being. In today's technology-obsessed society, we often seek salvation in technological innovation and scientific discoveries. Contact tracing apps have already proven useful in tracking the spread of the disease among individuals, albeit in some countries more effectively than in others. The rapid development of Covid vaccines seems to justify our trust in science as supreme saviour. As an academic, you will not hear me object. I will add, however, that the time has come to fundamentally rethink our societal structures and ways of interaction in order to move beyond the immediate threat of the current crisis and raise the resilience and sustainability of our society and environment for years to come. As aptly noted by the historian Arnold Toynbee, it is ideas, not technology, that drive the biggest historical changes.[3]

One potentially fruitful approach would be to rethink connectedness as a fundamental property of human societies. Rather than the dramatic and society-wide ruptures in connectivity implemented today, an informed policy of 'thinned' connectedness with selective targeting of connections to regulate the flows of people and goods may come to play an important role. The burgeoning field of network science will be indispensable to provide deeper understanding of network structures and the role of hubs across multiple scales (local, regional, national, international, global) and domains (social, political, economic, and so on). This scientific knowledge then needs to be embedded in proactive and goal-oriented policies. These need to be tailor-made for the task at hand, without discarding previous experiences, for example from the Ebola outbreak in 2014 where the key breakthrough came from medical policies targeting the surrounding areas rather than directly addressing the centre of an outbreak, in order to dam further spreading. Again, proper understanding of network structures and targeted interventions are key. Finally, we must thin connectedness between society and nature. This does not mean that humans will not be allowed to go into nature anymore, but rather that spatial planning policies must be geared towards distinguishing human and natural zones of activity. Such policies include increasing and protecting our natural assets, as well as optimizing land use related to human habitation and food production.

These are only some examples of policies with the potential to radically change connectedness and the ways we interact with the wider world. The ultimate goal of this overhaul is to boost the resilience of our society in drastic, yet sustainable ways, both for ourselves and the environment. This will be a massive undertaking, requiring active engagement and collaboration between academics from various disciplines, and between practitioners, politicians, and the general public. Do we know for certain where we are going next? Probably not. However, the importance of understanding the dynamics of complex networks and social-ecological systems employing long-term perspectives cannot be overstated if we are to adequately sketch potential scenarios and develop policies to deal with this new reality. One thing is certain—if we are to find the proper ways to steer society towards a sustainable future, scholars able to contextualize the present through our past will need to sit at the table. Luckily, us archaeologists are eagerly awaiting to be invited to the conversation.

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[1] Gunderson, Lance H. and C. S. Holling, *Panarchy: Understanding Transformations in Human and Natural Systems*. Island Press, 2002.

[2] Crespigny, Rafe de, *A Biographical Dictionary of Later Han to the Three Kingdoms (23-220 AD)*, Brill, 2006.

[3] Toynbee, Arnold J., *A Study of History: Volume I: Abridgement of Volumes I-VI*. Oxford University Press, 1988.