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Battling Conceptual Inertia: Decoupling Pathways from Process across the Holocene

A Review Essay on *The Great Holocene Transformation* by Peter Turchin (Beresta Books, Chaplin, CT USA, 2025)

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This review assesses Peter Turchin's *The Great Holocene Transformation* (2025), a synthetic account of long-term human history grounded in cultural evolution, complexity science, and the Seshat Global History Databank. While recognizing the landmark nature of Turchin's project and its significant empirical advances, the essay critically evaluates key assumptions that shape the book's central narrative linking demographic scale, political hierarchy, military technology, and cooperation. Attention is given to limitations in Seshat's proxies for governance and inequality, which may obscure important temporal and regional variability in power distributions, institutional diversity, and economic inequality. The review highlights areas where recent archaeological, historical, and biomolecular research complicates linear or global models of Holocene change, emphasizing instead the heterogeneous, contingent, and often non-uniform pathways societies followed. Despite these critiques, the essay affirms the value of GHT as an important milestone and calls for further comparative efforts to refine and expand its analytical foundations.

Introduction

From the christening of Seshat: Global History databank roughly 15 years ago (in 2011), Peter Turchin has made repeated and significant contributions to the comparative study of long-term history. His contributions include, but extend beyond, the organizational and synthetic orchestration of the coding and analysis of multiple dimensions of diachronically organized information for 35 Natural Geographic Areas (NGAs), which are distributed spatially across the globe and constitute the empirical core of the Seshat project. Importantly, Turchin also has leveraged the analyses of these cases to draw theoretical implications that have

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built, supported, and refuted narratives advanced to understand the great transitions that have characterized the last 12,000 years of humanity's past.

The Great Holocene Transformation (GHT) represents an important milestone in Turchin's quest for a generalizable narrative of human history, underpinned by quantitative analyses and tailored principally for an academic, interdisciplinary readership. The book draws on and integrates arguments and materials that he previously discussed in an array of his academic publications as well as in his earlier trade and academic books. The approach followed in this volume (as well as in earlier publications) is framed by a giant, messy question and rests on three pillars. The question is why has the social scale and complexity of human societies shifted so radically over the last 10–12,000 years? The pillars are (1) his conceptual framework, cultural evolution; (2) the Seshat (and other smaller) empirical archives, compiled and managed by Turchin and his collaborators; and (3) a complexity science approach that provides computational and analytical tools that facilitate the linkage of theory to data.

Turchin's cultural evolutionary armature rests heavily on two theoretical constructs, cultural multilevel selection (CMLS) and cumulative cultural evolution (CCE). CMLS outlines the conjectural links and interpretations that are used to account for the integrative and disintegrative factors and forces that are hypothesized to determine whether polities expand or decrease in scale. CCE serves as the interpretive logic between technologies (computational, transport, economic, institutional) and polity scale. Although across human history it would be hard to argue with the notion that cultural affiliations and practices can operate at multiple spatial scales, the overwhelming focus of the Seshat project and GHT has been at the scale of polities, which often seem roughly equated with (or are at least centered in or near) the Natural Geographic Areas.

Before preceding further, I should identify myself as a contributor to the Seshat databank as one of the information providers for two cases (NGAs), the Valley of Oaxaca, Mexico, and the Middle Yellow Valley, China. With this role as a foundation, I have collaborated on more than a few publications that have drawn on the Seshat databank over the years in concert with Peter Turchin and his associates (e.g., Turchin et al. 2017). For these reasons, I initially hesitated when asked to prepare this review. Nevertheless, on deeper reflection, I decided to proceed as I came to realize that sharing the project's overarching aim—gaining greater understanding of the long-term human past—and having familiarity with the composition of the databank gives me a potentially helpful vantage to reflect on the suite of findings and ideas presented in GHT. In so doing, I endeavor to answer Turchin's (GHT:xv) call to welcome constructive question, comment, and critique.

In the remainder of this essay, I focus on points of both agreement and disagreement. Some of the issues that I raise stem from shifts or growth in the

depth of empirical knowledge or conceptual advances and reformulations that post-date the early days of Seshat and dovetail with the continued evolution of my own thinking. Others reflect matters discussed with the volume's author over the years concerning variables and proxies that in my opinion should be rethought or additionally coded when the opportunity arises.

At the outset, I recognize that creating Seshat, with its potential for diachronic comparison, was an exceptionally good idea, both in its emphasis on cross-global, systematic synthesis and especially for its coding of historical cases over deep time. When the databank was birthed, there was nothing comparable, a notable attribute that largely remains the case. Peter Turchin also deserves credit for keeping his focus on big much-debated questions regarding long-term changes in human history. His approach in GHT to evaluate alternative interpretations and to reject those not empirically supportable is made explicit and is in order given the recent explosion of archaeological and historical data (Feinman and Neitzel 2025; Feinman and Nicholas 2025).

The GHT approach is reliant on the empirical analyses of NGAs over time; yet it also is grounded in presumptions and tenets, some of which are debatable, that shape the framing and findings. For example, by focusing on NGAs largely as polities, great weight is given to group-level selection at the polity scale. Likewise, from the outset, Turchin makes clear that his emphasis is on broad evolutionary processes that lead to predictable patterns or stepped stages of change (GHT: 5). This global scenario is transparently presented (GHT: 314–322) outlining a proposed sequence that starts with the transition from small groups and mobility in the Pleistocene to Holocene aggregations with sedentism and agriculture and then proceeds through a sequence of scalar expansions that incorporated neighboring political units. Growth is seen as causally underpinned by a series of revolutions in military technology. A transition from archaic states to larger more bureaucratic ones is then proposed to occur at a later point in the sequence with the advent of moralizing religions (coincident with the Axial Age), which are interpreted to facilitate larger collectivities through the enhancement of cooperative behaviors via the distribution of public goods and other prosocial behaviors that generally have been viewed as administered from the top down. To his credit, Turchin (GHT:6–7, 16) recognizes that his postulated sequence of Holocene transition is not linear or inevitable, nor did it take place at a uniform tempo across different regions, but the core question and the crux of the present answer is a generalized global trajectory of change.

At the empirical heart of GHT's scenario is the important, yet perhaps unsurprising, finding that demographic scale and vertical political complexity are closely associated when examined across the sample of NGAs. Unsurprising, as I (Feinman 1998, 2013; Feinman and Neitzel 2023) along with many others have

noted this relationship in prior comparative analyses and that it can be linked to human cognitive constraints and shifts in interpersonal relations that emerged to eclipse them (GHT:62; Dunbar 2011; Feinman and Neitzel 2023). Guided by recent studies (e.g., Blanton and Fargher 2008), Turchin (GHT:48) rightfully recognizes that social complexity may take different institutional forms, and that two socioeconomic dimensions that often have been coupled with demographic and political/hierarchical scale, inequality and the concentration of power, are not necessarily associated as closely with scalar increase as prior neoevolutionary models presumed. Nevertheless, in my opinion, the Seshat proxies for governance (gov) and inequality are not adequate to capture these critical dimensions. I suspect if they were, the divergence of these two dimensions (concentration of power and inequality) from and variable interrelations with scale and hierarchy would be more pronounced in space and time (Feinman et al. 2025; Feinman et al. 2026), issues that I elaborate later in the essay.

Succinctly, the crux of the volume's argument is that increasing scale (demographic and political) serves as GHT's main explanandum or key metric for the Great Holocene Transition, with the data-derived correlations between major increments in military technology and scalar increases argued to be the impetus, selecting at the polity scale for social norms and ultrasocial institutions that enhance cooperation (GHT:63). And yet, leaving aside that the empirical anchor found between scale and military technology is far less robustly demonstrated for the cases in the Western Hemisphere, the relationship also can be accounted for without resort to polity-scale selection or selective competition between group norms or mental modules (Blanton and Fargher 2013). Alternatively, people generally may rationally select residential security and safety, especially in the face of new, expanded military threats that often may have resulted in movements to more defensively protected, nucleated, aggregated locales.

Furthermore, in the face of volumes of new data from isotopes, aDNA, and other sources (Cameron 2013; Feinman 2025a, 2025b; Feinman and Neitzel 2020; Furholt 2021; Holland-Lulewicz 2021), the long-held axioms that envision premodern worlds as traditional and distinct—static, self-sufficient, demographically bounded/closed, and internally homogeneous, all of which underpin reliance on polity-scale selection—no longer fit the facts. As we amass more information regarding the deep past, we see that human networks, settlements, and political affiliations generally fluctuate markedly over time; so too does cooperation, which is situational and contingent on rational, mental assessments and not exclusively on rigid, inflexible norms or strict adherence to them (Blanton and Fargher 2013, 2016).

Conceptually, Turchin's primary emphasis on polity-scale selection and generalized global processes/grand narratives has the further limitation of shifting

focus away from variable internal dynamics and diverse tempos of change (especially in the relative concentrations-distributions of power and material wealth) across the sample of cases. Here, some grace is in order, as Seshat's original coding scheme predates the intensified focus on variability across these dimensions archaeologically (e.g., Feinman et al. 2026; Kohler et al. 2025). Nevertheless, readers should note that while the number of offices tallied (Seshat gov) may serve as a potential proxy for bureaucratic scale, the latter is not an adequate metric for an equally crucial axis of governance: the degree to which political power is concentrated (Blanton and Fargher 2008, 2016; Feinman et al. 2026). Contrary to earlier frames, larger bureaucracies do not imply more despotic rule, in fact at times they (may to a degree) check concentrated power. So, while it is not surprising that a significant relationship is found between scale and the Seshat variable (gov), the other important spectrum of governance, which compares the relations between leaders and institutional functionaries (the degree to which personalized, concentrated power is checked or not), is left largely under-examined in GHT.

Even more problematic is the reliance on the extent of human sacrifice as a main Seshat proxy for inequality. My concerns begin with a definition of human sacrifice that seems to exclude the Spanish inquisition and the Salem witch trials, but then also adopts a narrow, uncontextualized economic lens on sacrificial practices and their diversity (e.g., see López Austin and López Luján 2008; Løvschal et al. 2019; Swenson 2003, 2015:232). I question, past or present, whether the line being drawn between religion and politics is as categorically sharp as this application demands. An even more central issue for this books' aims to understand the Holocene transition is the absence of other comparatively implemented (and inherently relational) metrics for economic inequality for the premodern era that are now broadly applied (e.g., Feinman et al. 2025; Kohler et al. 2025; Kohler and Smith 2018).

The selection of this metric is not a minor quibble as Turchin's temporal shifts in his inequality measure led him to propose that economic inequality declined both in the first millennium BCE (with the Axial Age) and then again in the second millennium CE with the European Enlightenment. He views both episodes as responses to leaps in military technologies (first iron and cavalry, and then naval technologies), which are interpreted as then prompting new more responsive institutional forms and normative modes that promote the dissemination of public goods and, hence, lesser degrees of inequality. I see many issues with this logic that begin with both the evidence for markedly distinct and more granular (space, time) variation (past and present) in material inequality (Chancel et al. 2022; Feinman et al. 2025). Yet, at the same time, it would be hard to argue that wealth inequality in the past reached greater levels than are recorded today (Maitland et al. 2026).

For me, the argument also breaks down with the notion that rulership only became more responsive during the two aforementioned eras, when, in fact, less autocratic governance arrangements have been noted before and after the Axial Age as well as in contexts where iron, cavalry, naval warfare, and the Axial Age had little or no relevance (e.g., Blanton and Fargher 2008; Carballo and Feinman 2024). Although to his credit, Turchin repeatedly eschews an overtly linear, uniform view of humanity's past, I suspect that as we continue to broaden the lens on our global history, the patterns will only get more granular, variable, and less linear than he outlines in GHT. Certain processes and their interrelationships are likely to recur in patterned, consistent (though not uniform) ways, but specific regional sequences of change and their tempos are apt to be variable (Feinman 2023, 2025a).

To this point, I have offered critical and hopefully constructive thoughts in the spirit of making progress on the big issues at the heart of GHT. Yet I also think it essential to enumerate points of accord that I have with the arguments and/or empirical results presented in GHT, many of which signify Turchin's vitally significant deviations from earlier manifestations of neoevolutionary thought. One key finding is that agriculture may be a necessary factor for the great scalar transitions of the Holocene, but it is not sufficient (cf. Diamond 1997). So, the adage long entrenched in Western social science that farming leads to private property, inequality, and then institutions to protect inequities simply cannot and should not be generalized. Based on diachronic analyses, the Seshat findings also illustrate that the tempo of changes following transitions from foraging to farming were diverse from region to region and often slow, in many instances elapsing over millennia (see also Duffy et al. 2025; Kerig et al. 2025).

Likewise, the Seshat findings do not align with James Scott's (2017) hypothesis that "grains make states". In a similar vein, cogent arguments (GHT:256–258) are offered to counter both Carneiro's (1970) oft-cited environmental circumscription model as well as the premise that population pressure was a driving mover of greater political complexity (GHT:95–96). Turchin (GHT:312) appropriately rejects these models as overly reliant on the now empirically refuted axiom (see Blanton and Fargher 2008, 2016; Feinman et al. 2026) that outside of Athens and Republican Rome, premodern polities were ruled despotically and held together through coercion. The data-grounded defenestration of these "sticky" notions that have long dominated and lingered in the neoevolutionary conceptual quiver are notable attributes of both the Seshat findings and this volume, but there remain more hurdles to cross. For example, Turchin (GHT:226) still views large-scale polities prior to the Axial Age as uniformly led by divine kings who ruled with iron fists, an old inference that is no longer empirically supportable (Blanton and Fargher 2008; Carballo and Feinman 2024; Feinman et al. 2026; Stasavage 2020).

The deep historical roots of large-scale cooperative polities that in some instances endured for centuries (e.g., Fargher et al. 2011; Feinman et al. 2023; Green 2021) at a minimum serve as a source for sober reflection concerning the overarching sequential model of emergent degrees of cooperation at scale presented in GHT.

I began by describing GHT as representing a milestone for its author and the Seshat project, a stock-taking of key findings and how they have refined our understanding of humanity's last 10–12 millennia. But as an advocate of archaeological and historical syntheses, I foresee that this book and the responses to it also can serve as a hinge point. I envision it as an opportunity for project participants and other interested parties to advance and modify what has been a long-standing agenda as well as the conceptual tools that we bring to it. Greater comparative attention to understanding the causal underpinnings of variation and change, with a focus on institutional diversity, in long-term regional sequences, as well as the outcomes from the different paths taken, might yield lessons that are not just relevant for grasping the complexities of the past but also are fruitful for navigating the present and meeting our futures (Feinman 2025a).

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