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Cliodynamics and State Origins Theory

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

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This article critically examines Peter Turchin's cliodynamic approach to state origins as presented in *The Great Holocene Transformation* (2025). It analyzes key factors of state formation—warfare, demographic pressure, technological innovation, and moralizing religion—and compares Turchin's conclusions with alternative databases, notably the University of Pittsburgh's Chiefdom Datasets Project. Special attention is given to military revolutions, including the emergence of nomadic empires, the development of cavalry, and the introduction of the decimal system among steppe nomads. The article also discusses the ambivalent nature of the state as both a constructive and coercive institution, and critically examines the bureaucratic criterion of statehood, which has provoked debates about the classification of ancient and medieval polities. To resolve these terminological difficulties, the author proposes viewing civilization as a process—an approach that accommodates the multi-linear and multifactorial emergence of state characteristics. The article concludes that cliodynamic data, despite methodological limitations, support a complex and variable understanding of state formation.

Introduction

The origins of the state constitute a recurring theme in the humanities and social sciences. Over the last three decades alone, numerous significant monographs and articles have been devoted to this problem (Earle 1997, Feinman & Marcus 1998, Claessen 2000, Kradin et al. 2000, Haas 2001, Trigger 2003, Grinin et al. 2004, Yoffee 2005, Maisels 2010, Price & Feinman 2010, Grinin 2011, Flannery & Marcus 2012, Berezkin 2013, Turchin 2016, Scott 2017, Bondarenko, Kowalewski & Small 2020; Graeber & Wengrow 2021, Kradin 2021). In this article, I summarize current

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theories of state origins and examine new cliodynamic data on social evolution and the growth of complexity, as presented in Peter Turchin's recent monograph *The Great Holocene Transformation* (Turchin 2025).

It is widely acknowledged that the emergence of statehood may have been shaped by a combination of factors, including favorable ecology, a productive economy, population growth, increased internal conflict, technological innovation, diffusion, warfare and conquest, external influence, long-distance trade, and ideology. Most researchers now agree that state formation was a complex, multivariate process dependent on a large number of variables (Peregrine, Ember, & Ember 2007: 84).

According to cliodynamic analyses, statistical correlations indicate a positive relationship between warfare (as a means of expansion and/or defense) and the development of various mechanisms and institutions, such as economic growth, the adoption of key technologies, and the formation of common identity and ideology (Turchin 2025: 199–202, 312). Moreover, certain factors appear to have been overestimated. For instance, while the transition to agriculture was necessary for political complexity, it involved a substantial time lag of several millennia. Demographic pressure could, conversely, undermine cooperation and lead to disintegration, which challenges circumscription and stress theories. In this context, it is instructive to relate cliodynamic data to Dunbar's number (1993). Turchin argues that, in addition to warfare, moralizing religions played an important role in enhancing cooperation and legitimacy within large states—a claim that is likely valid for the Axial Age.

It should be noted, however, that other efforts to compile databases on archaic complex societies have led to different conclusions. One such initiative is the Chiefdom Datasets Project of the Center for Comparative Archaeology at the University of Pittsburgh (<https://www.cadb.pitt.edu/list.html#Asia>). R. Drennan and his co-authors have found that in nearly one-third of the key studies examined, warfare was not a significant factor (Drennan, Peterson, & Berrey 2026). Several implications arise from this discrepancy. First, it may reflect methodological issues in data selection: different databases produce different results. Nonetheless, it must be acknowledged that SESHAT contains considerably more data. Second, it is necessary to clarify how SESHAT addresses Galton's problem. The expansion of the world system implies active warfare between centers and peripheries as well as among competing centers. Consequently, the number of cases involving war multiplies, leading to autocorrelation of the warfare factor. In any case, cliodynamics may require more sophisticated analytical tools to investigate the various factors of political genesis.

Another important conclusion drawn by Turchin is that the most significant leaps in the size and scale of states are intimately connected with major revolutions

in military technology: (1) the production of bronze weapons and armor (ca. 3000 BC); (2) the introduction of chariots (ca. 2000 BC); (3) the “cavalry revolution” associated with ferrous metallurgy, horse riding, and the invention of the composite bow by nomads (ca. 1000 BC); and (4) the appearance of gunpowder and firearms (ca. 1500 AD) (Turchin 2025: 171, fig. 7.5).

The domestication of horses and camels paved the way for their military use—transporting troops, ammunition, and supplies, as well as for mounted combat and reconnaissance. It is generally accepted that horseback riding was invented around 1000 BC (or possibly earlier). Combined with the development of the composite bow, iron metallurgy (producing cheaper yet more durable weapons than bronze), and effective horse equipment (including the rigid saddle and stirrups), this led first to the creation of mounted troops and subsequently to heavy cavalry armed with long spears and swords or sabers (Turchin 2025: 172). This was a truly revolutionary step, as it dramatically increased the offensive capabilities of mounted armies, thereby intensifying competition and warfare between polities. This conclusion is a key element of Turchin’s framework (Turchin 2025: 319).

An important clarification is necessary regarding the concept of the cavalry revolution, which developed gradually. Two leaps, however, are not explicitly noted by Turchin, and both pertain to the steppe. Table 7.5 in his book records a sharp increase in the number of empires around 250 BC. This period corresponds to the emergence of nomadic empires, as well as the introduction of strict military discipline and the decimal system among nomads (units of 10, 100, 1000, etc.). This was a significant phase in the history of nomadic empire formation (Kradin 2000). Not only cavalry but also a disciplined army and military hierarchy were crucial. Barfield (2000) called these polities “shadow empires,” Kradin (2000) termed them “nomadic empires,” and Turchin himself used the metaphor of “mirror empires” (2009). A second sharp increase occurred around 500 AD, marking the heyday of heavy cavalry. Riders mounted on sturdy saddles with stirrups, carrying long lances and sabers, became the dominant military force in Eurasia. For nearly a millennium, heavy cavalry remained the primary component of medieval armies. Before this period, and again after the Hundred Years’ War, disciplined infantry dominated Western Europe. The final leap in the GHT narrative is the growth of colonial states, often referred to as the “gunboat revolution,” though this lies beyond the scope of a book on the Holocene transformation.

Over the course of extensive debate, two opposing approaches to understanding the state have emerged. Proponents of the first approach emphasize the positive and constructive role of the state. In anthropology, this is known as the functional (adaptationist, integrative) approach (Service 1962, 1975; Flannery 1972). Proponents of the other approach, the conflict perspective, view the state as an instrument of control and violence (Fried 1975). They regard it as a

coercive institution and often as a mechanism for oppressing the lower classes. Consequently, negative connotations predominate in descriptions of the state among representatives of anarchist anthropology (Scott 2017, Graeber & Wengrow 2021).

At present, few researchers are prepared to adopt unconditionally either position. It is evident to most that these are two sides of the same process, which are closely intertwined. The state is ambivalent: it both aids and punishes, while simultaneously fulfilling important social functions such as protecting the population from external and internal threats, maintaining infrastructure, and building cities. At the same time, those in power enjoy greater access to resources and benefits, while subjects are forced to accept their subordinate status. An examination of the SESHAT database reveals that early states rarely performed socially useful functions compared to modern states (Turchin 2025: 198–199). A universal function of states is waging war. According to Turchin, war was the main driving force of evolution—a key factor in natural selection between states. It stimulated various changes in the economy, technology, social institutions, ideology, and other domains. The decisive goal was competition with other polities (Turchin 2025: 199–201); accordingly, all efforts were directed toward increasing cooperation and achieving common objectives. R. Drennan and his co-authors disagree with this view. They cite data showing that their sample contains many cases in which political complexity arises without warfare necessarily playing a significant role (Drennan, Peterson, and Berrey 2026: 162–163).

Another important conclusion concerns the ecological boundary between farmers and pastoralists. Turchin argues that, in such cases, the prerequisite for the centralization of both groups lies in the differences in their way of life, which push them into conflict with each other (Turchin 2025: 264, 317). Empires arise on both sides of the frontier—agrarian empires in the south and nomadic empires in the north. Turchin follows Barfield, who identified synchronous cycles of rise and decline in agrarian and nomadic empires (1992). Turchin has developed an elegant model of the “feedback loop.” Its essence is that nomadic raids presuppose the centralization of farmers, which in turn requires the unification of steppe dwellers into larger formations in order to attack again. Thus, an autocatalytic process is established, which presupposes the continuous growth of polities on both sides of the border (Turchin 2009: 197). As Barfield’s concept was criticized by Oriental historians, Turchin’s model has also come under fire (Di Cosmo 2011: 43, Scheidel 2011: 117–119).

A further important conclusion concerns landscapes in which offensive operations were difficult and cavalry ineffective (for example, due to rugged terrain). This applies primarily to mountain societies. Their small size potentially facilitated less centralized political power (the “Montesquieu law”). Rugged terrain

often provided the opportunity to resist successfully the expansion of lowland agrarian states and empires. Such ideas were argued in detail at the end of the last century (Gellner 1988, Korotayev 1995). Turchin's analysis confirms that regions with rugged terrain are less prone to centralization (Turchin 2025: 257, 317).

As a result, it can be concluded that in the sedentary agrarian world, parallel to the emergence of hierarchical societies (chiefdoms, early states, and mature states), another vector of social or cultural evolution exists. In anthropology and archaeology, it is common to speak of two opposing strategies: hierarchical (network) and heterarchical (corporate). These strategies represent polar opposites of social types. At one end are classical chiefdoms and states of varying complexity, while at the other are complex societies without a clearly defined hierarchical structure. Between them lies a vast array of variations with different economic systems, political institutions, and forms of ideology (Berezkin 1995, Crumley 1995, 2001; Korotayev 1995, Blanton et al. 1996, Kristiansen 1998, Bondarenko & Korotayev 2000, Kradin et al. 2000, Haas 2001, Feinman 2001, Grinin et al. 2004, Bondarenko 2006, Chapman 2008, Earle & Kristiansen 2010, Price & Feinman 2010, Chacon & Mendoza 2017, among others).

Perhaps the most perplexing issue concerns the characteristics that distinguish the state from pre-state formations. Anthropologists, for example, have criticized Max Weber's thesis that the state possesses a monopoly on violence (Carneiro 1981; Gellner 1988). As a result, the view that a professional apparatus or bureaucracy is the sole criterion for a state has become widespread in anthropology. This view is close to that of Turchin (2025: 38). According to him, archaic states lacked the resources to control large populations. To achieve such control, it was necessary to create new institutions that would encourage the elite to behave in a more socially oriented manner and promote cooperation between rulers and subjects. This, in his view, led to the creation of moralizing religions, which would motivate the promotion of ideas of equality and social harmony and foster greater cohesion in the post-Axial empires.

What does archaeology, which is closer to a true science than history and anthropology, have to say about this? Many years ago, V. Gordon Childe identified ten characteristics of the stage of civilization, which he associated with the urban revolution (Childe 1950). In fact, his publication discussed archaeological criteria for the state. That article initiated an endless discussion. The list of features has been repeatedly refined and revised. The most common criteria include urbanization, monumental architecture, elite burials, three or more levels of hierarchy, taxation, codified law, and writing (Feinman & Marcus 1998, Maisels 2010, Flannery & Marcus 2012, Smith 2023; etc.). However, there is no universal archaeological criterion for the state.

Archaeologists do not typically identify bureaucracy as a distinct feature. Nevertheless, it is implicitly linked to administrators and the number of levels of political hierarchy. Here Turchin has made an important discovery: a tenfold increase in the population of a polity leads to the emergence of an additional hierarchical level (Turchin 2025: 178). The threshold for statehood is reached when the population of a polity exceeds hundreds of thousands of people. When a polity reaches approximately one million people, a professional bureaucracy becomes necessary (Turchin 2025: 313, 316).

The widespread understanding of the state as a bureaucracy has led to debates about whether all ancient and medieval civilizations can be considered states. Initially, historians of early Rome (Shtaerman 1989) and ancient Greece (Berent 2000) argued that the polis was not a state because it lacked a professional bureaucracy. This provoked an outcry from historians of antiquity (van der Vliet 2005). Subsequently, some scholars concluded that many nomadic empires were not states but rather highly complex chiefdoms without a bureaucratic apparatus (Kradin 2000, 2014; Kradin, Bondarenko & Barfield 2003). This viewpoint has not found support among certain ancient historians (Scheidel 2011) and has been rejected by scholars from the new post-socialist nations. Similar debates have arisen among medievalists regarding whether feudal kingdoms were states, or whether statehood in Europe arose only in the late Middle Ages and the early modern period (see, in particular, Davies 2003; Reynolds 2003).

This results in a terminological trap. Logically, the state should correspond to the stage of civilization. But understanding the state as bureaucracy leads to the conclusion that civilization emerges before the state. For example, ancient Greece had civilization, but no bureaucracy. To avoid scholastic disputes, I suggest recalling the debate among archaeologists about the Neolithic. There, too, there were disputes about when certain features of the Neolithic appeared. It has long been clear that Neolithization was a long, uneven process that unfolded differently in different parts of the world. For this reason, archaeologists have come to prefer to speak of Neolithization as a protracted, multi-linear process with regional variations. Archaeologists have begun to approach the problem of the emergence of the Bronze Age in a similar way. The term “bronization” has increasingly been used in a similar context (Vandkilde 2016, Nørgaard & Reiter 2025).

More recently, Drennan and his co-authors proposed using the rather unimpressive term “complexification” as a synonym for the process of formation of complex societies (Drennan, Peterson & Berrey 2026). A year earlier, I suggested speaking of “civilization as a process” (Kradin 2025a, 2025b). The idea of civilization as a process goes back to the work of Norbert Elias. However, Elias understood the civilizational process as an internal transformation of the human psyche and the formation of ethics and mentality, using the example of medieval

Western Europe (Elias 1994). I maintain that the formation of a specific ethos is an important part of the development of a civilization (or of different civilizations). However, the civilizational process is a broader phenomenon, including technological innovations and inventions, sophisticated crafts, writing and literature, the beginnings of scientific knowledge, architecture, urbanization, distinctive artistic styles, ideology or religion, and much more.

What does “civilization as a process” mean? The characteristics of the state (or civilization) emerge differently in different regions of the world. Many early African states lacked writing, but the heterarchical societies of the Celts possessed it. Monumental structures are found in many chiefdoms of Europe and Asia. The ancient Harappan civilization had cities, yet no state. Conversely, Hawaii had no cities, yet an early state emerged there. Many other examples could be cited. It is important to note that, overall, this was a gradual process of human societies transforming into states with cities, writing, bureaucracy, taxation, and codified law. During this original transformation, particular features of civilization or the state may appear earlier or later in different polities owing to a combination of specific circumstances. All this suggests that the civilizational process was complex, multifactorial, and multilineal. To varying degrees, this conclusion is confirmed by cliodynamic data.

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