

WHEN THE PART BETRAYS THE WHOLE: BETWEEN-LEVELS CONFLICT, SUBSYSTEM CARCINOGENESIS, AND THE LOGIC OF ENDOGENOUS COLLAPSE

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ABSTRACT: This paper delineates a unified theoretical framework for civilizational collapse by conceptualizing decline as a structural “betrayal of the whole by the part.” Moving beyond the traditional dichotomy of environmental determinism and aggregative eclecticism, the study anchors the logic of collapse in Multilevel Selection (MLS) theory. It posits that civilizations operate as high-level complex organisms that inevitably encounter “subsystem carcinogenesis”, a systemic dynamic wherein localized entities, such as predatory elites, self-referential bureaucracies, or decoupled markets, maximize their own fitness at the expense of the societal totality. By scrutinizing the developmental trajectories of Modern Europe, Greco-Roman antiquity, and Classical China, the research demonstrates how the “Great Dis-embedding” of these subsystems leads to an endogenous exhaustion of both moral and material reservoirs. This framework suggests that civilizational collapse is not a contingent historical accident but a deterministic evolutionary-physical process, structurally isomorphic to the self-destruction of malignant neoplasms within biological hosts. Ultimately, the paper bridges the gap between classical historiography and contemporary complexity science, framing the fall of civilizations as a terminal manifestation of between-levels conflict ubiquitous across the cosmological scale.

KEYWORDS: Collapsology, Between-levels Conflict, Evolutionary Suicide, Modernity, Greco-Roman Antiquity, Early China

1. INTRODUCTION: THE STORY OF A BAKERY

Let us commence with a rudimentary thought experiment: suppose you operate a well-functioning bakery. To sustain the viability of this establishment, two

fundamental categories of inputs are required. First, *external resources*, necessitating a continuous procurement of flour, yeast, and fuel; second, *internal order*, requiring the employment of personnel to manage baking and sales. Simultaneously, you must remain vigilant against environmental threats, such as preventing vermin or mold from compromising your inventory, which necessitates the implementation of a rigorous storage system. However, a day arrives when, despite an ample supply of flour and the absence of external calamities like fire or infestation, your bakery suddenly teeters on the precipice of insolvency: output is diminishing, while financial losses mount. As the administrator, you are compelled to diagnose the etiology of this decline. Is it attributable to a deterioration of the external environment, perhaps a surge in flour prices driving costs out of control? It is not. Consequently, the dysfunction must be internal. Is it merely that the staff have become indolent and inefficient? Or has a more pernicious dynamic emerged, is the warehouse custodian illicitly siphoning off flour? Is the cashier skimming revenues? Or are the very employees meant to serve the clientele engaging in the unrestrained consumption of inventory intended for sale, thereby transmuting the establishment's profits into their private luncheons?

This rudimentary thought experiment presents little cognitive difficulty to a reader possessing basic social intuition, and its underlying pattern is readily discernible. The tribulation of the bakery stems either from a paucity of raw materials (*external resource constraints*) or from internal betrayal driven by the self-interest of the staff. This latter scenario implies that the agents have ceased to serve the *collective utility* of the establishment; instead, the bakery has disintegrated into disparate, *self-referential* components. Manifestly, the very ontology of the bakery embeds a dynamic wherein the private utility of the parts and the holistic interests of the whole, while capable of alignment, inevitably harbor the latency for structural antagonism. However, when we extrapolate the logic of this vignette from a simple commercial unit to the hyper-complex, multifactorial architecture of human civilization, the inquiry assumes an exponentially greater gravity. Is human civilization, indistinguishable from a biological organism, subject to an obligate mortality? Do civilizations perish from starvation, commit suicide, or fall victim to homicide?

The endeavor of this paper is to delineate a preliminary blueprint for a "Grand Unified Theory" of Collapsology, one that not only describes *how* civilizations decline but also elucidates *why* they do so, rendering it "applicable

across cultures” (Kintigh, et al., 2014: 880). While the proposition may appear deceptively trivial, this paper posits that the collapse of civilizations fundamentally adheres to the same logic as the insolvency of the bakery. It is precipitated by a dynamic comprising external metabolic constraints, internal extractive overshoot, or a synergy thereof. Consequently, the cyclical oscillation of complexity is the systemic manifestation of a “betrayal of the whole by the part” occurring across distinct hierarchical levels. Succinctly, civilizations perish because the human collective “betrays” the environmental substrate; because the elite stratum betrays the community; because the incumbent generation betrays posterity; or, most broadly, because the localized rationality of an economic, military, political (or any other) subsystem betrays the sustainability of the societal totality. All these instances are, in essence, structurally isomorphic to a malignant neoplasm betraying the host organism to the point of mutual destruction—an event of ultimately trivial significance on the cosmic scale. In its totality, the overarching endeavor of this article is to reach a theoretical consilience: it seeks to bridge the epistemological chasm between classical historiography and the philosophy of history on the one hand, and the robust explanatory architectures of the contemporary natural sciences (encompassing both biophysics and evolutionary dynamics) on the other, anchoring its central analysis specifically in Multilevel Selection (MLS) theory.

Section 2 begins with a review of existing collapsesological theories. While highlighting the disproportionate emphasis current scholarship places on environmental constraints (i.e., nature-society dynamics) (**Section 2.1**), this section attempts to establish a macroscopic taxonomy for the currently labyrinthine array of explanatory models. Section 3 endeavors to explore the general patterns of “between-level conflicts” (part-whole conflicts, or the struggle between “good and evil”) and the underlying evolutionary-physical dynamics that govern all complex structures (**Sections 3.1** and **3.2**). This theoretical grounding allows us to transcend the descriptive approach that merely presents a “laundry list” of the combined action of various internal and external factors. On this basis, we investigate the universal dynamics of the rise and fall of civilizations (**Section 3.3**). As an application of these evolutionary-physical dynamics to the specific stratum of human civilization, arguably the most complex system known in the universe, this framework enables a brief examination of the parallel

developmental processes of three civilizations: Europe (**Section 4**), Greco-Roman antiquity (**Section 5.1**), and Classical China (**Section 5.2**). Finally, the Conclusion summarizes the (relative) theoretical advantages of this explanatory model and outlines prospects for future research.

2. AN OVERVIEW OF EXISTING COLLAPSOLOGICAL THEORIES

2.1 *Will Globalized Modern Civilization Also Perish?*

Karl Jaspers once remarked: “Everything in the world has its time and must perish. Only man knows of his death.” (Jaspers 2017: 55) From Plato (Pol. 8, 546a) to Hegel (TW 5: 139–140), and from Polybius (2012: 155) to Montesquieu (2011: 229), virtually every thinker of human culture has expressed this seemingly banal truth. However, applying this dynamic of universal transience to human civilization proves far more complicated: On one hand, the very fact that we are situated within it often precludes us from adopting a completely objective, third-person perspective. Instead, we are inclined to assume that it follows a *sui generis* form of regularity (*Gesetzmäßigkeit*)¹ that is distinct from physical existence. On the other hand, this difficulty arises from its extraordinary complexity. If we apply the quantification method of complexity centered on energy rate density (measured in W/kg) provided by Eric Chaisson (2002, 2011, 2013), human civilization has been, since the Agricultural Revolution, the most complex entity in the universe, second only to (and, following the Industrial Revolution, surpassing) the human brain (Spier 2015). From the vantage point of classical antiquity, the morphological isomorphism between human collective entities, ranging from city-states to nations, and biological organisms was perceived as axiomatic: both are transient structures subject to obligate senescence and eventual dissolution (Demandt 1985, 2011: 48ff, 2017: 20ff; Häussler 1964; Engels 2009, 2015: 22ff). In stark counterpoint, since the Enlightenment, Western historical consciousness and future vision have oscillated in a wave-like dialectic between two poles: a Condorcet-style linear progressivism (Nisbet 2017), a

¹ This fierce anti-naturalism and the dichotomy between social and natural sciences, emerging as a response to positivism and physiological materialism, originated in 19th-century *Lebensphilosophie* and found explicit articulation in Wilhelm Dilthey (Beiser 2011; Descola 2013: 57ff), retaining proponents within radical constructivism to this day.

paradigm that, by postulating infinite expansion, fundamentally contravenes the entropic constraints of physical law (Herrmann-Pillath 2015), and a recurrent, corrective strain of declinist pessimism (Herman 2007; Slaboch 2017; Parvini 2023).

Following the peak of liberal optimism in the 1990s, the last two decades have witnessed an explosive increase in literature on “Collapsology,” driven by a consciousness of crisis and decline, an eschatological awareness that “we are living in end times” (Fink & Rollinger 2023: 6). This consciousness is partly attributable to concerns over deteriorating ecological environments and the impending exhaustion of fossil fuels (Middleton 2018: 91–92), and partly to the inherent unsustainability of the modern (neoliberal) world system. Within this horizon, might modern industrial civilization be unable to escape the fate of the Mayan and Aztec empires, ultimately collapsing into ruins composed of concrete grids? Such an outcome may represent a boundary condition imposed by external environmental constraints (Brown 2011), or conversely, the product of an endogenous dissolution of internal cohesion. If this collapse is indeed imminent, or, in accordance with the Seneca effect (Bardi 2017), is already silently accreting latent destructive potential before our very eyes, then what diagnostic revelations can the morphology of past civilizational decay offer for our contemporary predicament?

Yet, what constitutes “civilization”? What defines “collapse”? Does it truly exist? Before embarking on the formal discussion, it remains necessary to provide a basic theoretical clarification of these seemingly self-evident concepts. This paper understands “civilization” as a macroscopic socio-political entity composed, at the micro-level, of a vast number of human individuals. Proceeding from the metaphysical stance of non-reductive physicalism and emergentism², it is both safe and natural to posit that this entity possesses autonomous regularities, which cannot be directly observed within the micro-constituents but instead emerge from the complex interactions between individuals. As for “collapse,” I

² The author strongly identifies with the emergentist stance of Elder-Vass (2010), which effectively circumvents two extremes: eliminative reductionism (which posits that high-level structures do not exist, only individuals/physicalism) and radical holism (which views high-level structures as mysterious entities completely detached from individuals). From this perspective, high-level structures are ontologically constituted by low-level structures (society is composed of individuals, and individuals of more fundamental physical units), yet they remain causally and explanatorily irreducible to underlying microscopic laws.

adopt the definition provided by Jared Diamond, according to whom collapse means:

a drastic decrease in human population size and/ or political/ economic/ social complexity, over a considerable area, for an extended time. (Diamond 2011: 3)

Consequently, since even under the most ideal circumstances, “collapse” can only be qualitatively identified as “an extreme form of several milder types of decline” (Diamond 2011: 3), meaning that this inevitably implies a somewhat subjective attempt at fuzzy positioning³ along a continuous spectrum of decline, we are permitted to endow the concept of “collapse” with indispensable elasticity: In various specific cases, situated at one end of the spectrum may be the mildest forms: the demise of the macro-structures of the “great tradition” that primarily affect the elite class (Cowgill 2012; Lawler 2010: 907; Haldon et al. 2020), such as bureaucracies, central authority, long-distance trade networks, and luxury goods markets. Conversely, at the other end, one observes phenomena of systemic catastrophe wherein the biological carriers of the entire civilization approach near-total demographic annihilation⁴.

To establish the necessary theoretical predicate for the formal argumentation in Section 3, the subsequent section offers a critical survey of the two dominant paradigms within contemporary Collapsology.

2.2 Climate Change, Environmental Constraints, and Natural Disasters: Environmentalist Determinism

Today, the prevailing interpretive approaches in Collapsology can be broadly categorized into two distinct paths. The first approach, which currently enjoys

³ Furthermore, humanity’s extraordinary resilience itself, which sometimes manifests as cycles of growth and decline, or resilience, defined as the capacity to “absorb disturbance and still retain its basic function and structure” (McAnany & Yoffee 2010: 10), does not negate the reality of collapse, whether such collapse occurs on a demographic or a cultural level (McNeill 2010).

⁴ However, notwithstanding this necessary elasticity, the collapse of “civilization” must fundamentally be distinguished from the collapse of large-scale polities such as “empires.” The latter often merely implies the fragmentation and decentralization of socio-political power, wherein society continues to function within smaller units, without necessarily entailing the termination of a way of life, identity, material culture, or the demographic population. Archetypal examples include, but are not limited to, the end of the Old Kingdom of Egypt (Bárta 2019; Wilkinson 2010: 103ff; Seidlmayer 2000) and the Tang Empire of China (Lewis 2012: 58ff), where central authority was gradually hollowed out by the burgeoning autonomy of local elites.

dominant acceptance among professional historians and archaeologists, given that environmental determinism has never been fully supported by archaeological evidence (Middleton 2012), may be tentatively termed “Aggregative Eclecticism” or “Amorphous Pluralism.” According to this approach, collapse possesses no single dominant cause but is merely the result of a simple summation of multiple endogenous and exogenous factors in a contingent and context-specific manner:

Collapse = A (Climate Change) + B (Corruption) + C (Barbarian Invasion) + D (Plague) + E (Lead Poisoning) + F (Social Hubris) + G (Environmental Destruction) + H (Inequality)...

In this model, once the system reaches a pressure tipping point, collapse is directly triggered by any arbitrary element (the “last straw”). However, this tedious and descriptive “shopping list” style enumeration of various correlations, i.e., that the collapse of supra-individual large human entities is “triggered and driven by an accumulation of a series of different factors” (Gehler, Rollinger & Strobl 2022: 6), is deeply flawed. Not only does it leave the complex hierarchical relationships and cascading structures that necessarily exist among distinct collapse-driving factors obscure (an issue, admittedly, also constrained by the quality of source materials), but it effectively abandons the attempt to further explain “why.”⁵ In this regard, the theoretical value of this approach ranks even far below that of the environmentalist (monocausal) determinism, for the latter can at least be grounded within a thermodynamic-metabolic ontological framework: namely, that any complex structure depends on the consumption and extraction of available energy external to the system.

The second extremely prevalent approach is environmentalist (exogenous) determinism, a perspective intimately familiar to contemporary readers. It asserts that large human societies perish either actively by shortsightedly destroying their own ecological-environmental underpinnings, such as soil salinization caused by over-tilling in intensive agriculture, deforestation (Hughes 2011), and today’s fossil fuel extraction (i.e., “ecocide” or “overshoot”) or passively due to an inability to adapt to (chronic or abrupt [Mordechai 2018]) climate and environmental

⁵ For example, Richard Bookstaber directly asserts: “Thus, rather than address why civilizations rise and fall, to search for ‘patient Zero’ as the prime mover, we can more successfully address the question of how they rise and fall.” (2023: 334)

changes (e.g., the Little Ice Age, river course shifts, droughts, etc.). Although specific manifestations vary kaleidoscopically, they ultimately boil down to a scarcity of natural resources, whether this scarcity results from conscious over-exploitation, unconscious overpopulation⁶, or uncontrollable climatic mutations. Widespread anxiety regarding this potential for collapse by no means originated with *The Limits to Growth* in 1972; rather, it existed sporadically as early as the 19th century (Middleton 2017: 32). Today, in the early 21st century, driven by the deluge of climate doomerism, it has undoubtedly become common knowledge. For instance, James Lovelock (2006) argues that the climate system has already crossed the tipping point of collapse, leading inevitably to the total destruction of existing human civilizational structures amidst global warming. Pentti Linkola (2011) likens humanity to a cancer of the Earth, advocating for population control and self-primitivization to resolve the severe ecological crisis. Similar concerns are ubiquitous (see, e.g., Diamond 2006: 349ff; Cribb 2017; Oreskes & Conway 2014; Kolbert 2014; Rockström et al. 2009) and are often articulated through an “intersectional critique” of the existing capitalist system (see, e.g., Kettle 2024; von Weizsäcker & Wijkman 2017).

Therefore, it is hardly surprising that, propelled by this intense contemporary concern, this hypothesis has long been employed to explain the collapse or “fatal transformation” of historical human polities or societies (see, e.g., Diamond 1994; Linden 2006; Weiss & Bradley 2001; Lenton 2023: 266). Since the first half of the 20th century (Huntington 1917; up to the present, see Büntgen et al. 2011, Harper 2018), attempts have been made to explain the fall of Rome through this lens. Today, it is applied even more broadly to explain the failure of large collective entities worthy of the title “civilization”, such as Sumer, Mycenae (Marshall 2012), Harappa (Coningham & Young 2015: 268ff; Possehl 2002: 238–240; Robinson 2015: 131ff), the Maya (Gill 2001; Iannone 2014), the Aztecs, Sassanid Persia (Shayegan 2022), and Angkor (Buckley et al. 2010), as well as smaller human communities like the Anasazi (Diamond 2011: 136–156) and Easter Island (Diamond 2011: 79–119).

⁶ Admittedly, Malthusian dynamics fundamentally represent a structural failure of coordination, a scenario where the logic of intra-group selection overrides the imperatives of inter-group survival. In this context, the optimal strategy for the collective—namely, the maintenance of reproduction within sustainable limits—stands in stark contradiction to the immediate fitness maximization of the individual members.

Anchored in a rigorous bio-physical substrate (see Section 3.2), the theoretical veracity of this collapsological model assumes an axiomatic status: Complex sociopolitical architectures, homologous to all negentropic systems, whether biological organisms (Nicholson 2018; Schrödinger 2012), ecosystems, or human societies, are contingent upon a continuous energetic flux. This metabolic necessity intrinsically entails the structural simplification or degradation of the underlying support matrix, utilizing energy dissipation to export the internal entropy spontaneously generated by systemic complexity. Consequently, it may be posited that since the Pleistocene, the human chronicle has unfolded as a recursive trajectory of parasitic simplification, wherein individual and collective endeavors have been invariably predicated on the entropic degradation of the very ecosystem requisite for survival. This anthropogenic trajectory delineates a continuous arc of ecological simplification, spanning from the Pleistocene extinction of megafauna and biodiversity reduction precipitated by hunter-gatherer regimes, through the soil depletion and deforestation induced by agrarian intensification in early states, to the hyperbolic acceleration of fossil fuel consumption defining the Industrial Revolution (Ponting 2007; Smil 2017). Within this physical process, energy is conserved in quantity yet qualitatively degraded, i.e. dissipated into states of higher entropy and diminished utility, a transformation inexorably accompanied by escalating extraction costs (Hall 2017). This bio-physical logic constitutes the epistemological bedrock of the transdisciplinary “Big History” paradigm (Spier 2015; Christian et.al. 2014) that has ascended since the late 20th century, positing that the evolution of sociopolitical complexity is fundamentally driven by the capacity for resource extraction. Consequently, societal collapse is re-conceptualized as a metabolic failure occurring when the exponential accretion of complexity breaches the carrying capacity of the supporting resource base, manifesting as a rupture in environmental-social dynamics (Tainter 2023: 28-29; Brozović 2023: 2-12).

But the simple question remains: Can it serve as a catch-all explanation?

2.3 Can Everything Be Reduced to Environmental Constraints?

At the risk of enunciating a truism, it must be acknowledged that while environmental factors indisputably function as potent force multipliers of systemic stress, and theoretically retain the capacity to monocausally annihilate

a collective human entity, the hypothesis that they constitute the exclusive or ultimate determinant of civilizational destruction confronts formidable empirical and theoretical hurdles (Butzer 2012). This epistemological nuance is conceded even by Jared Diamond, the doyen of the environmentalist paradigm in contemporary Collapsology: “I don’t know of any case in which a society’s collapse can be attributed solely to environmental damage.” (Diamond 2011: 11; see also Smil 2017: 435; Butzer & Endfield 2012).

A fundamental empirical reality challenges the “silver bullet” status frequently claimed by monocausal environmentalist paradigms: namely, that the architecture of a human collective is not uniformly grounded in the direct metabolic consumption of the natural environment. Rather, it is entirely plausible, and historically precedented, for a civilization to succumb to the malignant hypertrophy of specific internal structures. These subsystems replicate the unilateral, extractive relationship humanity maintains with nature, turning it inward against other constituent parts of the civilizational body, a phenomenon of recursive predation. From Sumer (Kramer 1981: 222ff) to Ancient Egypt (Enmarch 2009), and from Greco-Roman antiquity (Biesinger 2016; Widmer 1983; Koestermann 2016; Malik 2019; Lintott 1972; Harrison 2008; Bracher 1987; Edwards 2002) to Classical China, countless narratives of decline are replete with widespread laments over the corruption of a moral core and the disintegration of divinely sanctioned societal justice, coupled with the idealization of and yearning for an ancient Golden Age of social harmony. Although specific manifestations vary kaleidoscopically, this nostalgia ultimately crystallizes into a critique of the present flawed state characterized by a fatal tension between *the part* (the individual, ruler, elite, contemporary generation, state, or bureaucracy) and *the whole* (the intergenerational civilizational community). It is precisely this tension that, in the eyes of ancient writers (Demandt 1972: 20ff, 2011: 42–46), allowed for a civilization’s *external prosperity* (power and money) to be built upon the foundation of *internal (moral) decay*, which in turn eventually leads to external collapse.

This observation prefigures the pivotal thesis to be rigorously explicated in Section 3.1: namely, the frequent decoupling of fitness landscapes between the constituent subsystems (lower-level) and the civilizational totality (higher-level). In the classical worldview, this decay was often compressed, via a subtle psychologistic reductionism, into the nomenclature of intrinsic moral deficits, such as “selfishness, greed, ignorance, or short-termism” (Darlington 2023: 87).

Even recently, Scott Johnson claimed that “social hubris”, i.e. excessive pride or arrogance, is “the causal link in the decline of every civilization” (Johnson 2016: x), preventing humanity from taking proactive action before crises strike. However, leaving aside the complex question of whether humans possess free will, assuming such a rigid essentialist position, akin to an anthropologically unchangeable “factory settings” of human beings, cannot be defended today from either an evolutionary (Sapolsky 2017; Jablonka & Lamb 2014) or metaphysical standpoint. Nevertheless, anti-social behavior patterns are indeed “easier,” which is because large-scale human communities are high-energy state organizations built upon a costly and complex dual mechanism: adapting to a harsh external environment and suppressing internal defectors. Consequently, even when accounting for the theoretical infirmities of rival paradigms, and acknowledging the understandable methodological drive toward material observability and the aversion to the normative teleology of traditional decline narratives, contemporary collapsological scholarship manifests a systemic blindness regarding endogenous factors (Middleton 2012). This lacuna is theoretically startling⁷: it tacitly postulates that social cohesion—or “moral capital”—operates as a “free lunch”: an inexhaustible, zero-cost reservoir of resource potential, available for ad libitum extraction by any agent, in any epoch.

Of course, given recent developments in the public sphere, such as severe wealth polarization and the rise of the “1% elite”, concern over the process of sociopolitical decay driven by predatory elites (manifesting as state failure, economic stagnation, and mismanagement) is gaining increasing attention in current research. This interest is disproportionately concentrated in recent political science studies (Acemoglu & Robinson 2013). However, this is by no means a novel insight. Since the 19th century and the first half of the 20th century, numerous researchers have attempted to emphasize the endogenous dimensions of the collapse of the Roman Empire from multiple perspectives (Demandt 2015), including class conflict, political despotism, internal strife (Goldsworthy 2009), and the separation of state and society. In the vanguard of contemporary

⁷ This may bring to mind an analogous narrative in population biology (see Turchin 2011): In 1924, Charles Elton published a paper regarding periodic fluctuations in animal populations, yet insisted that these fluctuations must be driven by climate change, while (like many others) completely overlooking the interactions between predator and prey.

collapsology, Luke Kemp (2025) distinguishes himself by explicitly synthesizing endogenous collapse with the frameworks of evolutionary psychology. Kemp posits that the synergistic intersection of innate human “Dark Triad” psychological traits with specific Holocene conditions, most notably the emergence of lootable resources, or “Goliath Fuel”, precipitated the genesis of autocatalytic extractive architectures. These systems, conceptualized as the “state” (a structure of extreme hierarchical inequality) or “Goliath,” harbor a structural, if not deterministic, predisposition toward systemic self-termination.

Viewed through the prism of modern European historiography, the “State” indeed emerges as the paradigmatic locus of intrasocial extraction. In his seminal treatise *Seeing Like a State* (1998/2020), James Scott destabilizes the hegemonic progressive teleology that equates (political) modernization with the continuous, linear accretion of societal complexity. Contra this narrative, Scott demonstrates that the modern state apparatus, finding its architectural prototype in the absolutism of Louis XIV, operates via a logic of radical simplification. It does not merely perceive the ecological and social substrate through a reductive, utilitarian optic; rather, it actively and systematically imposes a schematic order upon the social terrain, enforcing a forced homogenization to render the complex reality legible for administrative extraction. The concrete driver behind this simplification is state-sponsored social engineering, aimed at promoting homogenization and standardization to maximize economic surplus and military potential, i.e. yielding short-term competitive advantages, while minimizing administrative costs. Just as profit-driven modern industrial agriculture, as observed by Scott, homogenizes traditional farmland, once fragmented and characterized by less efficient but more resilient polyculture, into efficiency-oriented intensive monoculture of genetically modified crops (Mann 2018); So too, with the increasing complexity of bureaucratic, fiscal, and conscription systems, diverse local identities, traditions, and authorities such as dialects, guilds, autonomous cities, and feudal lords, were gradually absorbed and simplified, incorporated under the central control of absolutist monarchs and the emerging nation-state (de Jouvenel 1993; Nock 2014). Of course, James Scott was not the first political theorist to note that the modern state not only leads to the simplification and homogenization of the rest of society but is built upon this very process of flattening. For example, Alexis de Tocqueville had long ago pointed

out that excessive administrative centralization, while capable of providing the state with short-term military competitive advantages, weakens social cohesion in the long run (Tocqueville 2010: 147, 1215), thereby destroying the very foundation of the state's existence. Comparative historian Oswald Spengler also observed: "Decline of the family, society, class, all social forms—strengthening of the state as 'us,'" (Spengler 2021: 219). Ernst-Wolfgang Böckenförde (2020: 165–167) famously asserted that the modern state is like a machine responsible only for reaping the fruits of freedom, yet it does not itself plant the religious and moral soil required for such fruit. Similarly, Roger Scruton (1980) and John Courtney Murray (2005) expressed the view that the modern state is built on foundations it cannot guarantee itself. From this perspective, the modern state, a revolutionary force that has gradually emerged since the 16th century, transcending traditional communities and personal relationships, indeed constitutes a consumer of complexity within society, or, in Kemp's words, a "macro-parasite of the populace" (Kemp 2023: 45).

It is imperative to underscore, however, that the State apparatus and the elite stratum do not hold a monopoly on this structural betrayal of the civilizational totality. This caveat obtains not merely because the "masses" retain an equipotent capacity for systemic defection, but also because the inventory of potential vectors for internal dissolution is manifold (a taxonomy to be rigorously explicated in the subsequent analysis). Critically, the antecedent analysis licenses a provisional taxonomy of the dominant explanatory paradigms within contemporary Collapsology, revealing a structural bifurcation into two archetypal modes: "environmental constraint determinism," which primarily focuses on first-order nature-society dynamics, and the "social suicide model," which prioritizes the second-order intra-societal dynamics. Synthesizing these two dynamics allows us to conceptualize the comprehensive hierarchical structure involved as a three-level pyramid of nested dependency, i.e. natural environment $\Rightarrow$ civilization $\Rightarrow$ intracivilizational extractors. In this hierarchy, each level subsists by simplifying and degrading the tier beneath it, while the ultimate foundation for all strata remains the (currently) near-infinite supply of solar energy:

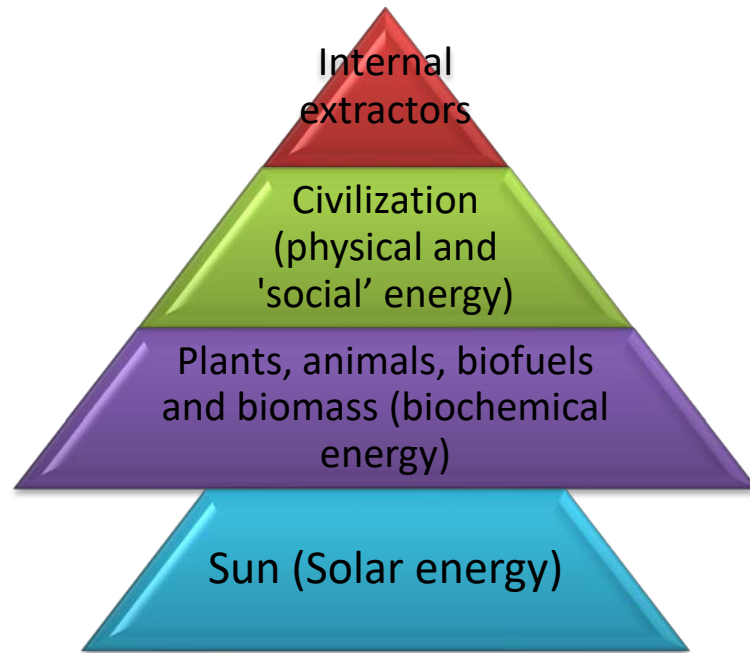


Figure 1. The Energy Pyramid: From the Sun to Intra-civilizational Extractors

As can be seen, most authors support some version of a hybrid model: when marginal rate of return on metabolic inputs provided by the natural substrate enters a phase of decline (exogenous constraint, or “pressure from above”), while the extractive appetite of internal parasitic subsystems accelerates along an exponential trajectory (endogenous overshoot, a “pressure from below”), the intermediate “civilizational entity” would be pulverized. However, the core issue is not whether endogenous dynamics exist: they clearly do, much like how the failure of heroes in Greek mythology often involves both external divine intervention and self-destruction caused by a fatal character flaw (Middleton 2017: 5). The real question lies in their relationship to exogenous dynamics: the two may exist in a relationship of supervenience, or they may be completely independent. Regrettably, most researchers, owing to the aforementioned stance of “amorphous pluralism”, maintain complete silence on this matter. This paper asserts that both dynamics are capable of autonomously initiating the process of civilizational decline, i.e. each can lead to the decay of civilization in the complete

absence of the other.

Readers supporting the view that internal social predation supervenes on environmental coercion might immediately object: The trivial fact of internal resource constraints in human society does not automatically prove that the disintegration or rapid simplification of large-scale sociopolitical complexity can, in some cases, be fully explained solely by internal dynamics. This is because moral disintegration could very well be an exogenous result of environmentalist dynamics, incapable of constituting an explanatory model independently. Therefore, to effectively refute the environmental factors' ultimate monopoly on the explanation of decline, one must provide solid empirical evidence for each premise of the following argument. Let E be Environmental constraints (scarcity of natural resources), D be the Decline of civilization, and I be Internal extractive structures. We can conceive an argument of the following form:

- Premise 1: I exists within human society.
- Premise 2: Even under the condition of $\neg E$, there exist certain circumstances where I spontaneously generates and grows.
- Premise 3: The growth of I is sufficient to cause D .

Conclusion: Even if $\neg E$ holds, D may still occur. Therefore, E cannot be the sole explanation for D .

This effectively refutes the universal proposition of environmental determinists: $\forall x(\neg E(x) \rightarrow \neg D(x))$, where x represents an individual human civilization. As previously noted, the veracity of Premise 1 and Premise 3 is indisputable. However, attempting to find empirical evidence supporting Premise 2, that is, civilizations that perished solely from social “cancer” (which, as analyzed below, is **not** a trivial analogy) rather than starvation, presents unimaginable difficulties. These difficulties stem primarily from the scarcity of historical samples and the quality of available materials. Since all currently known civilizations exhibit the coexistence of declining EROI (Homer-Dixon 2010) and internal extractors, existing materials allow neither the precise identification of the initiating factor of decline nor the application of *ceteris paribus*. Fortunately, the model by Safa Motesharrei et al. (Motesharrei, Rivas & Kalnay 2014) demonstrates that economic stratification (excessive elite predation) or ecological strain can independently lead to societal collapse, which is analogous

to population biology, where the mere existence of predator-prey dynamics can cause drastic cyclical oscillations in the prey population, even when the prey's food supply (e.g., grass) may be infinite.

Nevertheless, the attentive reader will inevitably inquire: How exactly is the explanatory model presented thus far distinguished from the “Aggregative Eclecticism”, emphasizing a “complex superposition of distinct factors” that you previously critiqued? For instance, the review study by Miguel A. Centeno et al. classifies explanatory frameworks of collapse into three categories: “Purely exogenous, purely endogenous, and a combination of both exogenous and endogenous” (2023: 11). Similarly, Aimers (2007) summarizes the hypotheses regarding the collapse of the Classic Maya as follows:

Table 1. Proximate causes of Maya site abandonment

<i>Environmental</i>	<i>Sociopolitical</i>
Soil erosion/loss of fertility/change to untillable savanna	Peasant revolt or class conflict
Climate change/drought	Intersite warfare
Overpopulation/ subsistence stress	External Explanations
Earthquakes	Change in trade routes
Hurricanes	Competition from Central Mexico
Ground slope change	Invasion with resettlement
Volcanic activity	Invasion without resettlement
Deforestation	Political-ideological pathology, fatalism
Disease/plague	
Insect infestation/plant blight	

Source: Aimers 2007: 333.

Indeed: if we were to halt here, this paper would be rendered entirely superfluous and devoid of value. It would amount to nothing more than a reiteration of that “nothing burger”, seemingly explaining everything while in reality explaining nothing. Beyond mere taxonomy, what substance would remain? Therefore, to avoid this theoretical cul-de-sac and to answer the question of “*why* collapse occurs” in a fundamentally deterministic manner, for unless it is grounded in “a unified cosmic law extending from the smallest to the largest”

(Engels 2021: 419), even the most sophisticated collapsological model remains merely an empirical description of “*how*.”

It is imperative, therefore, to transcend the disciplinary silos of Collapsology to interrogate the trans-hierarchical isomorphism of the “part betraying the whole”, a phenomenon ubiquitous across the cosmological scale, along with its governing evolutionary-thermodynamic dynamics. The subsequent section undertakes a preliminary derivation in this regard.

3. BETWEEN-LEVELS CONFLICT AND “THE PART BETRAYING THE WHOLE”: FROM NATURE TO HUMAN CIVILIZATION

3.1 The Ubiquitous “Struggle Between Good and Evil”: Cooperation and Betrayal in Mitochondria, Insects, and Multicellular Organisms

*If a kingdom is divided against itself, that kingdom cannot stand.
If a house is divided against itself, that house cannot stand.*

Mark 3:25, NIV

In the preceding section, we have outlined in a broad manner that civilizational decline and its ensuing collapse are propelled by “hierarchical conflicts” on two distinct levels:

1. Upward (Internal) Conflict: The Whole vs. Internal Subsystems (Society vs. Internal Extractive Structures).
2. Downward (External) Conflict: The Whole vs. External Supersystem (Society vs. Natural Environment).

Manifestly, this dynamic constitutes a recursive manifestation of “parts expanding at the expense of the whole,” iterated across the distinct strata of a “Matryoshka-like” nested macro-system. Indeed, as early as two millennia ago, Cicero explicitly posited a structural homology between the sociopolitical act of “disadvantaging others to benefit oneself”, to appropriate the formulation of the Chinese Warring States philosopher Mozi (? – 376 BCE), and the morbid predation of constituent organs within the human corpus (Cic., *off.* 3.22, Newton 2016: 132):

If each one of our limbs were so disposed to think that it could strengthen itself if it sapped the health of a nearby limb, it would necessarily follow that the whole body would weaken and perish; likewise, if each one of us seized for himself the advantages of others, and took what he could for his own gain, it would necessarily follow that association and community between human beings would be overturned.

Assuming the conclusion implied by this passage of Cicero, namely, that there exists no natural bond between individual and group interests, which stands in stark conflict with the position of the “harmony of interests” advocated from Mandeville through Ayn Rand to today’s market fundamentalists. Conversely, it harmonizes with the fundamental principles of Multi-Level Selection (MLS) theory in contemporary evolutionary biology: “***Selfishness beats altruism within groups. Altruistic groups beat selfish groups.***” (Wilson 2015: 23) The persistence and reproduction of all hierarchical architectures constitute, *au fond*, the chronicle of a perpetual evolutionary arms race between the suppression mechanisms of the higher-level (the whole) and the centrifugal instincts of the lower-level (the parts). Given the axiom that natural selection operates ubiquitously across all (biological) levels (Okasha 2006: 11), optimizing strictly for the maximization of immediate local fitness, and positing that the very ontology of the higher-level unit manifests as a resource, specifically, the “cooperative surplus” that incentivizes lower-level defectors to seize an evolutionary advantage in intra-group competition, it follows that this dialectic of betrayal and policing represents an ineradicable structural feature that can never be fully transcended.

Indeed, we ourselves are frequently the victims of this very betrayal, namely, cancer. For a long time, traditional cancer research tended to focus on the pathological mechanisms of tumor development, reducing it to a disease caused by impaired DNA replication (Arney 2020: 63–66). It was not until the 1970s that the underlying evolutionary dynamics (the “why”) gradually entered the researchers’ field of vision (Nowell 1976). Today, it is clear to us that the evolutionary essence of cancer is essentially cellular cheating and betrayal within multicellularity (Arney 2020: 39–59; Aktipis et al. 2015; Aktipis 2020; Greaves 2001), which is (primarily) rooted in the inherent tension⁸ between two levels of

⁸ This implies that, distinct from infectious diseases such as tuberculosis, cancer can never be completely eradicated unless multicellular societies, including human beings, cease to exist, as Kat Arney (2020: 349)

selection: the cell and the individual (Aktipis & Nesse 2013; Merlo et al. 2006; Laplane et al. 2025). As the “oldest betrayal” among multicellular life forms, cancer is ubiquitous in metazoans: from the hydra and fruit fly to the elephant and dinosaur (Rothschild et al. 2003), and from ancient mummies (David & Zimmerman 2010) to modern humans. To provide a contrast with the endogenous collapse process of civilization discussed below, here is a minimalist sketch of the “cancer-driven endogenous collapse of the human body”:

Act I: The Order of “Good” — The Multicellular Cooperation Mechanism of the Normal Body

In daily life, we often assume, without a second thought, that we are indivisible, perfect individuals. However, as a multicellular society composed of 30 trillion cells, each of us has always been a collective, **no more** “real” than an ant colony or a nation (assuming one adopts a nominalist stance). The functioning of this collective relies on cells adhering to collective “rules”: “Don’t divide out of control; self-destruct if you are a threat; share and transport resources; do your job; and take care of the environment” (Arney 2020: 47). This is a breathtakingly complex and highly functionally differentiated cooperative system, wherein every individual occupies its rightful place within the whole. However, this cohesive mechanism merely appears flawless, because—

Act II: The Birth of “Evil” — The Selfish Betrayal of the Cancer Cell

Potential traitors are being generated at every moment due to genetic mutations (whether from random replication errors or external stimuli), a process beginning as early as your fetal stage, and begin to adhere to a brand-new, yet essentially primordial law: maximize self-replication and proliferation. From the perspective of the human body, this constitutes an evil betrayal that shatters the “cooperative contract” of multicellularity. However, from the perspective of the dedifferentiated malignant cell, it is merely doing what single-celled organisms have been doing for 3 billion years⁹: “...evolving in response to the ecological

observes: “Cancer is the price of life. We can no more declare war on it than we can declare war on multicellularity or evolution.”

⁹ This thereby explains why cancer gene expression exhibits a distinct retrospective or “atavistic” character” (Davies & Lineweaver 2011): the most active genes are the phylogenetically oldest, having existed since the era of unicellular organisms (such as genes driving cell proliferation), whereas the least active genes are often the more recent evolutionary products of the era of multicellular organisms (Trigos et al. 2018).

conditions they are in” (Aktipis 2020: 7). Now that this “primal impulse,” previously bound by the oppressive coercion of the cellular society, has been fully liberated, what is the next step?

Act III: The Evolutionary Advantage of “Evil” and its Diffusion

Because this self-referential behavioral pattern possesses a massive evolutionary advantage compared to normal cells, it inevitably expands continuously, at the expense of the whole. The good news is that, in the vast majority of cases, small-scale betrayals are culled by the multi-level surveillance systems within our bodies (intracellular, intercellular, and the immune system), or otherwise you would not even survive puberty. Alternatively, they may remain in a stalemate with the immune system in an “equilibrium state” (Dunn et al. 2004). Only a tiny minority of “lucky” malignant cells, through constant mutation and selection, breach layer upon layer of defenses. They successively evolve all the “hallmarks of cancer” (Hanahan & Weinberg 2000, 2011): Sustaining proliferative signaling, evading growth suppressors, resisting cell death, enabling replicative immortality, inducing angiogenesis, activating invasion and metastasis.

Act IV: Evolutionary Suicide, or the Self-Destruction of “Evil”

When cancer cells begin to relentlessly invade new tissues, expanding throughout the body’s various organs via the blood and lymph systems and colonizing new environments (invasion and metastasis), the host’s life enters its final countdown. This is a game with no ultimate winner: Since the vast majority of cancer cells cannot survive independently of the host¹⁰ (with the exception of transmissible cancers), all cancer cells will be annihilated along with the death of the host. This necessitates that their evolutionary process must start again from scratch within every new individual. Therefore, analogous to a predator that endangers both its prey and itself by evolving overly developed predation abilities (Parvinen 2005: 259), the malignant tumor evolves into a cul-de-sac that leads to the dual annihilation of itself (the individual/part) and the host (the

¹⁰ By the time of our death, cancer has often evolved for hundreds of generations within our bodies, adhering strictly to the evolutionary logic of maximizing self-replication and energy extraction within the specific environment of the human host. As England (2020) points out, the emergence of dissipative structures is not random; rather, they form a “matching” relationship with a specific type of external energy flow in a highly specialized manner.

group/whole), thereby constituting a textbook example of “evolutionary suicide.”

As we cast our gaze toward other, perhaps less familiar realms, it becomes evident that the phenomenon of “organs” that originally constituting higher-level units abandoning cooperation for the sake of private (local) interest is ubiquitous throughout nature and the cosmos. From the microscopic eukaryotic cell to eusocial insects such as ants (Hölldobler & Wilson 2008, 2010; Wilson 2012: 109ff, 2020) and bees (Delaplane 2024), organizational unity, or “wholes” at every hierarchical level (including cancer itself)¹¹ face the inherent risk of being disintegrated (a decomposition into a heap of simpler and less interconnected constituents) at any moment by the innate anti-social tendencies of their parts. Eons prior to exacting its contemporary toll of approximately ten million human lives annually, cancer likely constituted the vector for the extinction of the earliest canines in the Americas (Aktipis 2020: 87ff). Notwithstanding the paucity of the fossil record, endogenous “Darwinian extinction”, predicated on the bifurcation of optimality between the individual agent and the aggregate group, is posited as a robust, rather than anomalous, mode of species termination, operating independently of or alongside exogenous environmental stressors (Rankin & López-Sepulcre 2005; Webb 2003). By logical extension, this bio-evolutionary mandate applies with isomorphic force to the trajectory of human civilization (as explicated in the subsequent analysis). Consequently, it is no stochastic coincidence that the collective human imagination recurrently models the Ideal Society, or Golden Age, through the prism of an Integralist organicism or the superorganism metaphor (e.g., the medieval trope of the apiary; see Burkhardt 2022). Concomitantly, as previously articulated, the grand narratives of decline and degeneration that span millennia can, in the final analysis, be distilled into a singular structural dissonance: the fatal misalignment between the micro-motives of the constituent parts and the macro-integrity of the societal whole.

Synthesizing the preceding analysis, if the definitions of “Good” and “Evil”

¹¹ Intriguingly yet plausibly, in explaining the phenomenon of the absence of correlation between animal body size and cancer risk, namely, the celebrated Peto’s Paradox (see Caulin & Maley 2011), Nagy et al. (2007) hypothesized the existence of a “tumor-within-a-tumor,” termed a “hypertumor.” They profit by defecting from the cooperation mechanisms already established within the tumor (Axelrod et al. 2006), such as the secretion of chemical signals capable of constructing blood vessels (Merlo et al. 2006: 931), and may ultimately destroy their host: this is a recursive story of selfishness, where the betrayer is in turn destroyed by a betrayer generated from within itself.

can be extrapolated from human civilization, the latest and most complex player in this ancient battle, to encompass complex systems across all scales of organization, then the “Struggle between Good and Evil”, defined as the eternal conflict between “higher-level oriented” (integrative) and “lower-level oriented” (disintegrative) behavioral patterns (as argued by Wilson 2007: 125ff, 2019: 75ff), could be summarized in the following table:

Table 2. The “Struggle Between Good and Evil” in Biological Systems across Different Hierarchical Levels

<i>System Level)</i>	<i>The Whole</i>	<i>The Part</i>	<i>“Good” (Higher-Level Cooperation)</i>	<i>“Evil” (Lower-Level Betrayal)</i>	<i>Policing Mechanism / Immune System</i>	<i>The Self-Destruction of “Evil”</i>
<i>Eukaryotic Cell</i>	Cell as a whole	Mitochondria	<i>Metabolic Synergy:</i> Genome simplification; dedicated to providing ATP.	<i>Selfish Expansion:</i> Sacrificing energy production function to gain replication speed advantage.	<i>Mitophagy:</i> Targeted elimination of selfish mitochondria via mitophagy.	Accumulation of defective mitochondria exhausts host energy, leading to total annihilation.
<i>Multicellular Organism</i>	Organism / Body	Somatic Cells	<i>Programmed Cell Death (Apoptosis):</i> Cells initiate suicide mechanisms when	<i>Carcinogenesis:</i> Mutant cells break the “suicide contract” and resume infinite proliferation.	<i>Immune Surveillance:</i> Immune cells recognize and kill malignant cells.	Death of the host; all cancer cells perish along with it.

			internally damaged.			
<i>Eusocial Insects</i> ¹²	Ant / Bee Colony	Non-reproductive Castes (Workers)	Reproductive Division of Labor: Workers forgo reproduction to fully serve the queen.	Reproductive Cheating: Workers secretly lay their own male eggs.	Worker Policing: Other workers detect and eat the “illegitimate eggs.”	The entire colony starves to death; all bees perish along with it.
<i>Human Civilization</i>	An ordered whole ultimately grounded in religious transcendence (e.g., <i>scala naturae</i>)	Any Subsystem (Politics, Economy, Military, Elites, Individuals, Present Generation)	Normative Integration: All subsystems serve the Common Good (<i>bonum commune</i>).	Subsystem Betrayal: Egoism (betrayal by the individual), Political Realism (betrayal by the politics), Extractive Institutions (betrayal by the elites).	Religion / Tradition / Law: The suppression and punishment by the Integralist order of the “self-realization” impulses of constituent parts.	Civilizational collapse; all subsystems perish along with it.

Imagine a ship sailing the open seas (the Host), where the crew (the Cells) are

¹² Regarding cheating behaviors (primarily reproductive cheating) and their punishment mechanisms in ant and bee colonies, see Wenseleers & Ratnieks 2006; Dobata & Tsuji 2009; Ratnieks & Visscher 1989. In the case of honeybees, when the chemical signal from the queen that suppresses the inherent reproductive tendencies of workers weakens or disappears (e.g., queen decline, death, or the colony becomes too large), female workers will lay their own unfertilized eggs, which will hatch into male drones. Under normal circumstances, these eggs are eaten by other workers. However, if this dynamic is uncontrolled, the labor force collecting nectar for the whole colony decreases while the number of drones requiring support increases, until the colony collapses.

expected to perform their respective duties. Suddenly, a group of mutinous crew members (the Cancer Cells), driven by the desire for more food and larger cabins (local fitness advantage), begins to dismantle the hull planks to expand their own quarters and seize the rations of other crew members. They achieve “victory” in the internal struggle for the ship, successfully occupying the entire vessel. However, their actions cause the ship to sink, and ultimately, all the mutineers perish together at the bottom of the sea: This is the entirety of the story regarding cancer cells and their counterparts across different hierarchies.

“And History, with all her volumes vast, hath but one page.” — George Gordon Byron (1788-1824)

In the following section, we approach the phenomenon through a distinct theoretical lens. This analysis is offered as a conceptual framework for future inquiry rather than a conclusive proof, focusing on the thermodynamic and physical principles that drive these dynamics.

3.2 *The Thermodynamic-Physical Explanatory Model*

Man has been unconsciously fulfilling a law of nature, according to which some physical quantity in the system tends toward a maximum.

Alfred J. Lotka

As Elon Musk famously stated, “Physics is the law; everything else is a recommendation.” In line with this view, environmentalist collapsology often utilizes a thermodynamically grounded metabolic ontology, a concept widely accepted in complexity science. This approach, predicated on the Second Law of Thermodynamics, provides a robust framework for explaining the dependence of civilizations on their environment and the inevitable crises that arise when this resource base is exhausted.

In short, setting aside the complex issue of how to translate the thermodynamic concept of “entropy” into other domains (Davis 2022), the basic rationale of this theoretical model can be broken down as follows (Lineweaver et al. 2013: 10–15; Lineweaver 2013: 43–45; Davies 2013: 19–26; Ladyman & Ross 2007: 250):

- *Core Logic:* The entropy of an isolated system never decreases. Assuming the universe itself is the ultimate isolated system (though not

necessarily), the default state of the cosmos is a drift toward thermal equilibrium. Anything exhibiting “organization” or “structure” is resisting this trend.

- *Metabolic Ontology*: All existence comes at a “cost.”¹³ Given that all real processes generate entropy, this implies that to self-sustain against it, any local order must extract available energy from a non-equilibrium environment, at the cost of greater global entropy.

Applying this to civilization (e.g., De Molina et al., 2024: 81–108) yields the following inferences:

- *Mapping Civilization*: Civilization is a highly ordered complex structure (buildings, laws, knowledge systems, social division of labor). To maintain itself, it requires a continuous extraction of energy flow (e.g., biochemical energy) from the natural environment, degrading it into forms of lower quality (thermal energy).
- *The Role of Environmental Constraints*: When the environment cannot provide sufficient energy flow (e.g., resource depletion, crop failure, climate deterioration), civilization can no longer “export” entropy by extracting free energy from the outside. Consequently, entropy begins to accumulate within the system.
- *Result*: Civilizational collapse and societal disintegration.

This same logic can be generalized to explain the dissolution of any environmentally dependent complex structure, extending far beyond the specific interaction between civilization and the environment: Whether it is a vortex formed by water currents, or the human body (and carbon-based life in general), which necessitates the continuous intake of food (= highly ordered macromolecular structures storing vast amounts of chemical energy), or a star, reliant on photon flux and material convection. When the energy flow is depleted and the environmental gradient vanishes, the structure disintegrates into a more homogeneous, simpler, and lower-energy state.

¹³ It is worth mentioning that many ancient civilizations also possessed similar conceptions that *order necessitates sustained (human or divine) effort to be maintained*, lest it disintegrate into undifferentiated chaos (see Assmann 2017b: 174–177; Lewis 2012: 1–5). Furthermore, Spengler (and many others) shared the notion that history draws energy from heterogeneity (Winthrop-Young 2018: 33ff), explicitly comprehending the post-historical “Fellah” state as a “formless” (*formlose*) dispersion, where all pronounced boundaries of once-distinct hierarchies, classes, states, nations, cultures, and local collective identities are thoroughly liquefied (Merlio 2019; Hughes 1991: 85).

However, the answer remains less clear when the focus shifts to a more fundamental dimension: why do extractive structures—whether civilization itself or its internal, “cancerous” complexities—emerge spontaneously in the first place? And why, once formed, do they invariably tend toward unsustainability by proliferating until they exceed the carrying capacity of their resource base? This inquiry necessitates looking “beyond the Second Law” (Lineweaver 2025) toward the Maximum Entropy Production Principle (MEPP). Often proposed as a potential “Fourth Law of Thermodynamics” (Beretta 2020; Morel & Fleck 2006; Swanson 1997; Martínez-Kahn & Martínez-Castilla 2010), its fundamental tenets and corollaries are as follows:

- *The Extremal Principle of Path Selection:* In open systems far from equilibrium, if multiple paths exist for energy to flow from high potential to low potential, the system will “spontaneously” select the path that dissipates the energy gradient at the fastest rate, thereby maximizing the rate of entropy production. In short: “Nature abhors a gradient” (Schneider & Sagan 2005: 72).
- *Order as a “Catalyst” for Entropy Increase:* The growth of complexity in local subsystems is not the antithesis of entropy, but rather a dissipator “created” by the universe to produce entropy more rapidly at the global (higher) level. Therefore, as long as a gradient exists anywhere, more complex structures can spontaneously emerge.
- *The Physical Inevitability of Transience:* The ultimate consequence of MEPP points to the inevitable unsustainability of all complex order: they either self-destruct by exhausting their resource base, or “burn themselves out” by generating structures that “consume” their own gradients. “Sustainability” is, in essence, a non-physical concept.

This principle manifests even in simple, observable phenomena. Imagine a heated cabin in a cold winter environment; once a door is opened, heat dissipation does not occur evenly across all media, such as windows or planks. Rather, the system directs energy preferentially toward the doorway—the path of greatest thermal contrast—to satisfy the requirement for rapid entropy production. Currently, a multitude of researchers (Kleidon 2010; Whitfield 2005, 2007) argue that MEPP (or, in a weaker sense, gradient reduction) constitutes the most potent law for understanding the essence of Darwinian evolution (Swenson 2010; Lineweaver) and the “purpose” of life (Sagan & Whiteside 2004; Schneider & Kay 1995). It thereby explains why evolution consistently favors species selected

to allow the maximal amount of energy flow to pass through themselves in the shortest possible time (Schneider & Kay 1994: 37ff; Hall & McWhirter 2023: 2–6). It also elucidates “major transitions,” because (for instance) multicellular organisms formed by the cooperation of vast numbers of cells possess a greater advantage in entropy competition than single cells operating in isolation. It is reasonable to hypothesize that this also provides a framework for comprehending the basic patterns of civilizational collapse in these two distinct directions:

- *Exogenous Explanation (Exhaustion of Environmental Foundation)*: The inherent propensity of civilization to rapidly exhaust its ecological foundation is not attributable to superficial moralistic factors such as “short-termism,” “greed,” or “hubris.” Rather, civilization, whose emergence is inevitable from the perspective of MEPP (Martyushev & Seleznev 2006: 40), is essentially designed as a gradient-driven gradient destroyer. For instance, an industrial civilization consumes fossil fuels (eliminating geochemical energy gradients) at a rate far exceeding the natural decay of primeval forests.
- *Endogenous Explanation (Exhaustion of Moral Foundation)*: While civilizations drive their environmental substrates toward equilibrium, they simultaneously cultivate profound internal “social gradients,” embodied in Asabiyyah, institutional trust, and the cohesion of complex solidarity structures. We may hypothesize that systemic dynamics accelerate entropy production by generating extractive complexities at lower levels. These sub-structures feed upon this internal free energy, “burning” through society’s “moral kindling” far more rapidly than if the system were merely awaiting external environmental exhaustion. Consequently, whether it is Early China “incinerating” feudal virtues through Legalist totalitarianism, or the modern West liquidating the residues of traditional solidarity through neo-liberalism, these are, fundamentally, banal physical processes. They are structurally analogous to bacteria exhausting a nutrient medium or malignant cells metabolizing glucose at rates far exceeding the somatic norm.

Before the immutable laws of physics, the splendor of human achievement and the vicissitudes of civilizational cycles are rendered as mere routine phenomena. Drawing upon the insights of Lineweaver (2005: 5) and Lineweaver & Egan (2008), the Maximum Entropy Production Principle (MEPP) permits a radical inversion of perspective: rather than “human civilization devouring the environment,” we see the “environment engendering human civilization as a

strategic instrument for its own consumption.” From this physico-thermodynamic vantage point, existing collapsological frameworks function as vital secondary mechanisms. This macro-framework effectively subsumes Joseph Tainter’s theory of “diminishing marginal returns” and demand-side inflation¹⁴, as well as the “overshoot and collapse” behavioral patterns identified by William Ophuls (2012: 11).

We shall now turn our thematic focus to the specific dynamics of civilizational rise and fall.

3.3 *The Rise and Fall of Civilizations*

By leveraging the theoretical yields of the preceding discussion to systematically evaluate human civilization, can we derive certain tentative conclusions? Before proceeding, a concise conceptual clarification is necessary. Complexity is one of the most confusedly used interdisciplinary terms in contemporary usage (Ladyman et al. 2013). While it is impossible to provide a precise definition here, complex structures often exhibit the characteristic of “the optimal development of both differentiation and integration” (Csikszentmihalyi 1994: 157). Giulio Tononi, for instance, defines neural complexity (Tononi et al. 1994) as the coexistence of “*integration*” and “*differentiation*” (Tononi & Edelman 1998), and provides specific methods for its quantification. In the case of the brain, if differentiation (the degree of non-uniformity) is absent or too weak, comparable to an orchestra where everyone plays the same note (analogous to epilepsy), or, if a vast number of differentiated elements fail to cohere into a unified whole, comparable to an orchestra without a conductor where everyone plays a different tune (analogous to schizophrenia), then the conscious experience as we normally know it will not be produced (Tononi 2012). Therefore, the marvel of the brain lies in its ability to functionally interconnect highly heterogeneous local modules into a global whole that transcends its constituent parts, *unitas in varietate*.

¹⁴ In essence, Joseph Tainter’s concept of “problem-solving” (Tainter & Taylor 2014) is an exceptionally ambiguous expression, as problems may arise at distinct hierarchal levels. If occurring at the environmental level, the economic term “diminishing marginal returns” refers to nothing more than the extremely trivial fact that resource extraction leads to a decline in quality and ROI. Of course, what Joseph Tainter truly intends to emphasize is the inherent propensity for “inflation” on the demand side (the extraction structure), which can be entirely explained as an inherent corollary of MEPP. Furthermore, Tainter has also completely overlooked the question of *cui bono* (Kemp 2023: 43), namely, for whom is the problem solved, and who stands to benefit.

In my view, besides serving as an analytical framework for concepts such as “organism,” “superorganism,” and “eusociality” within the context of evolutionary biology, these two complexity-defining *vocabula potissima* can also be invoked to theorize the basic pattern of civilization building. This trajectory spans from the highly mobile and primordially egalitarian fission-fusion society of foragers (Kelly 2013; Woodburn 1982), where only a few dozen distinct social personae exist (McGuire 1983: 115), to states characterized by “parcelized sovereignty,” with increasingly solidified hierarchies and social divisions of labor. Consequently, the growth of civilization is almost synonymous with the synchronous increase of “Diversity/Differentiation/Many” and “Unity/Integration/One.” To use the vocabulary of Herbert Spencer, this is a transformation from “incoherent homogeneity” to “coherent heterogeneity” (Taylor 2007: 63; Ruse 2013: 291–2). Due to the essential complementarity between the two, there is no binary movement of “one” versus “many”: if diversity¹⁵ struggles against each other while detached from the higher-level whole, it will ultimately dissipate into an undifferentiated homogeneity.

Secondly, given the marked phenomenon of primitivization in its terminal phase, the life course of a civilization exhibits a typically cyclical character. Drawing here upon David Engels’ (2021: 375–434) dialectic-based reconstruction of Oswald Spengler’s¹⁶ cultural morphology, and simultaneously referencing Konstantin Leontiev’s (1831–1891)¹⁷ three-stage model of simplicity –

¹⁵ For historical dynamicists, once the general mechanism driving this “Great Disembedding” has been elucidated, the identity of “Patient Zero” is of little consequence. Just as nearly every category of somatic cells (such as epithelial cells, blood cells, and bone cells) and germ cells (spermatogonia) within the human body can undergo malignant transformation, so too can the various constituent parts of human civilization.

¹⁶ Although similar attempts had appeared earlier (e.g., Nikolay Danilevsky), Spengler nevertheless made immense pioneering contributions to the development of comparative historical research, proceeding from the fundamental perspective of parallel individual cultures. (By comparison, Arnold Toynbee, despite incorporating significantly more material, failed to make any substantial theoretical contribution; see Wangenheim 2015). However, setting aside the material limitations of historical scholarship in the early 20th century, Spengler’s overall scheme (see Lewis 2022: 42–66; Engels 2021: 23–42; Demandt 2017: 20–36; Farrenkopf 2001) remains marred by a major theoretical flaw: namely, vitalism, a position completely untenable under the research conditions of the 21st century, which postulates an unbridgeable chasm in the form of existence and logical operation between organic matter (constituting merely 0.01% of the total mass of the universe) and inorganic matter. Most significantly, the dynamics underlying the metaphors of age stages and seasons have never been clearly elucidated (Engels 2021: 392; Wangenheim 2022: 5–6).

¹⁷ Perhaps drawing upon Spencer’s concepts mentioned here, Konstantin Leontiev (2020) divides the development of individual civilizations (and all organic matter) into a triune cyclical process of “primary

complexification— re-simplification, this cycle can be condensedly formulated as follows:

- I. *The Initial Stage*: Characterized by loose integration under the leadership of “Big Men” relying on personal charisma, essentially a form of “charismatic state” (Breuer 2014). While social differentiation remains minimal (with a priest-warrior group prevailing over the vast, unorganized ruled population), the society relies heavily on the visual-mobile display of violence capacity. This can be termed an “Early Big Man-based Society.”
- II. *The Zenith Stage*: Manifested as highly functionally differentiated and stratified subsystems achieving near-complete integration within a transcendental ordered whole (typically embodied as *hierarchical complementarity*)¹⁸. This can be termed a “Civilizational Organism.” As society develops into a polycentric network with soft hubs, the robustness (risk tolerance) of its integration is significantly enhanced.
- III. *The Decline Stage*: Upon the ruins of all differentiated complementarity and intermediate modes of association, there rises again a universal state possessing the dual nature of bureaucratic coercion and personal union. This star-shaped order network once again relies on a single central hub for its existence. Thus, it can be termed a “Late Big Man-based Society.”

If even this fragile monarchy centered on an “Alpha-male” cannot be maintained, civilization may either thoroughly disintegrate into a Hobbesian struggle between individuals competing for biological resources, or be annihilated by external militarized elements possessing high Asabiyyah, thereby ceasing to exist (Stage IV). Therefore, the “Great Cycle” of an entire civilization

simplicity,” “flourishing complexity,” and “secondary simplification.” He explicitly compares the homogenization process occurring during the death of an organism with the social massification and equalization of the 19th century, regarding the latter as an unconscious obedience to the cosmic law of dissolution. Apart from similarly asserting a “life cycle” of 1000–1200 years for individual civilizations, his historical thought (see Cronin 2021; Walicki 1979: 300ff) bears systematic similarities to that of Spengler, which cannot be discussed in detail here.

¹⁸ Modern liberals often reject the ancient concepts of hierarchical complementarity (Charles Taylor) and *sum cuique tribuere*, assuming that all hierarchies and inequalities are inherently unjust structures of exploitation (Pluckrose & Lindsay 2020). Setting aside the question of whether this judgment is valid (considering the role of cooperation-promoting that hierarchical structures play in large-scale society, see van Vugt 2006; Henrich & Gil-White 2001), if it is uncritically imported into historical research, it will inevitably lead to catastrophic consequences.

is a process that: (I) it departs from an initial state of primitive simplicity, where both integration and differentiation are low—analogous to an ideal gas defined by random thermal motion; (II) it reaches the peak of its complexity after approximately five to six hundred years, akin to a polycrystalline solid; (III) it ultimately undergoes an atavistic regression, returning to its (relatively) primordial, amorphous starting point.

The transition from (I) to (II) can be viewed as the process of civilization formation driven by MEPP. It manifests as a positive feedback loop where material-agricultural surplus, at a “just right” level (referring to Spier’s [2011] “Goldilocks Principle”), mutually reinforces cooperative capacity and population growth. As mentioned, the growth of biological complexity is essentially a “community-building” process where higher-level individuals “emerge” from lower-level units through their escalating interactions (e.g., Prokaryotes → Eukaryotes; Single-celled → Multicellular organisms), referring to the “Major Transitions in Evolution” (Smith & Szathmáry 1997, 2000; Michod 1997, 2000). Similarly, the growth process of human civilization (social complexity) is a matter of functionally organizing low-level small groups from the hunter-gatherer era, the “factory setting” of *Homo sapiens*, consisting of roughly tens to hundreds of individuals, into high-level units capable of unified action and coordination (Turchin 2015: Table 1; Powers, Schaik & Lehmann 2016), typically scaling to millions or tens of millions. By outsourcing functions previously required for independent existence to an interdependent network, individuals may locally become simpler in certain aspects¹⁹, which does not contradict the elevation of overall complexity.

The process from (II) to (IV) represents the gradual decline of civilization, developing from an internal hollowing out (III) to an eventual bankruptcy on the material-demographic level (IV). Although the implosion in stage (IV) may occur within a relatively short timeframe (e.g., within decades), this abruptness is merely superficial: the trend of disintegration is a *longue durée* process spanning several centuries that commences right from (II). Therefore, the truly crucial question is:

¹⁹ This phenomenon is observable across various hierarchies; for instance, mitochondria lost their independent reproductive capacity after integrating into eukaryotic cells, and civilized humans have lost the extremely diverse wilderness survival skills and athletic motor skills possessed by their hunter-gatherer ancestors.

what dynamic drags civilization away from the optimal state of (II)? Synthesizing the aforementioned discussion on historical geometry, it becomes evident that the inverted U-curve of civilizational complexity cannot be exhaustively explained by civilization *alone*²⁰. This allows us to introduce two ideal types of decline modes based on distinct evolutionary logics to serve as reference coordinates for analyzing real history:

1. The Purely Environment-Driven Mode:
 - (1) Environmental Surplus;
 - (2) Civilizational Development ;
 - (3) Environmental Depletion;
 - (4) Civilizational Regression.

2. The Purely Endogenous Complexity-Consumer Driven Mode:
 - (1) Formation of a Higher-Level Cultural Organism;
 - (2) Betrayal and Victory of Lower Levels;
 - (3) Civilizational Destruction and Self-Disintegration of Cancer-like Structures (Evolutionary Suicide).

From the perspective of MLS, the consolidation of civilizational integration leads to the attenuation of inter-group selective pressures, thereby allowing intra-group selection to reassert its dominance. While the exact timing of this transition remains a subject of debate—Peter Turchin²¹ posits that it follows the emergence

²⁰ Most importantly, given the inerasable fitness differential between the civilizational whole and its local parts, the approach of indiscriminately depicting the rise and fall of civilization as the fluctuation of *a single variable* on a timeline is bound to be fundamentally flawed, such as the method employed by some (e.g., Turchin & Hoyer 2020) which calculates overall complexity by simply summing up the (superficial) complexities of various constituent parts (population + territory + administrative hierarchy + currency + infrastructure). This inevitably leads to an inability to distinguish between functional growth and pathological hypertrophy, thereby theoretically negating the possibility of endogenous collapse from the very outset. It is just like on a weighing scale: gaining one kilogram of muscle (effective complexity) and gaining one kilogram of malignant tumor (parasitic complexity) produce the same reading, yet their significance for the human body is worlds apart.

²¹ In light of his background in population biology, Peter Turchin was a prominent representative of Neo-Malthusianism within the field of history twenty years ago (Turchin 2003, 2005), arguing that the dynamics of overpopulation should be employed to comprehend the rise and fall of polities and civilizations. Notably, his research focus over the past decade has shifted toward the Multi-Level Selection (MLS) theory of cultural evolution, positing war as the central driving force behind the evolution of complex societies (Turchin 2025). However, due to a fatal misconception regarding the unit of selection (see subsequent note), which is, regrettably, invisible within the data, Turchin's theory now appears to be fundamentally flawed. An evaluation of it will not be undertaken here.

of universal states (like the Roman Empire), though substantial evidence suggests the shift may occur much earlier—the outcome is a systemic redirection of evolutionary forces. Complementarily, according to MEPP, this internal decay is driven by “mutinous” subsystems, which are more efficient at rapidly dissipating the social gradients of the civilizational whole than the integrated structure itself.

Invariably, as late-stage civilizational architectures, exemplified by contemporary financial-industrial capitalism, push extraction toward the absolute limits of both environmental and moral reservoirs, a synergistic “death spiral” emerges. In this mixed mode, internal predation and exogenous overexploitation catalyze a multi-level desertification of the socio-ecological landscape. On one hand, the natural world’s ecological diversity is rapidly “rewound” to states reminiscent of the Eocene or even the Cretaceous. On the other hand, the endocivilizational tumor, propelled by its own hyper-complexity, erodes society’s spontaneous cooperative capacity, regressing the social fabric toward a state of absolute atomization. This regression often bypasses the ancestral hunter-gatherer stage, descending instead toward the solitary behavioral patterns of mammals from tens of millions of years ago—a state where even the most rudimentary kinship structures fail to self-maintain²². Ultimately, the varying intensity of collapse across history can be traced to the specific depth of these two forms of desertification.

Given that these three hierarchical levels possess their own distinct cycles of rise and fall, their visualization would constitute different variants of a ternary predator-prey dynamic. For instance, invoking the research of Safa Motesharrei et al., one visualization of purely endogenous collapse might appear as follows:

²² For reasons awaiting further investigation, this state persists for a prolonged period even after the collapse and subsequent recovery of civilization: as Peter Turchin (2005) correctly observed, many core regions of former civilizations (including but not limited to: Southern Italy, Egypt, North India, North China; see, e.g., Banfield 1967; Fukuyama 1996; Putnam 1994) remain to this day deserts of cooperative culture, characterized by extremely low levels of bridging social capital.

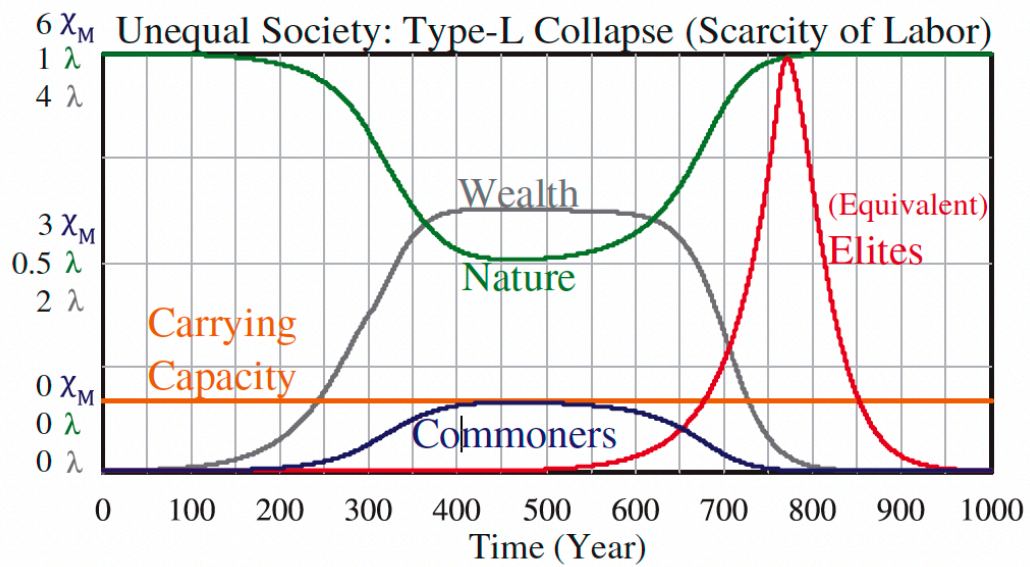
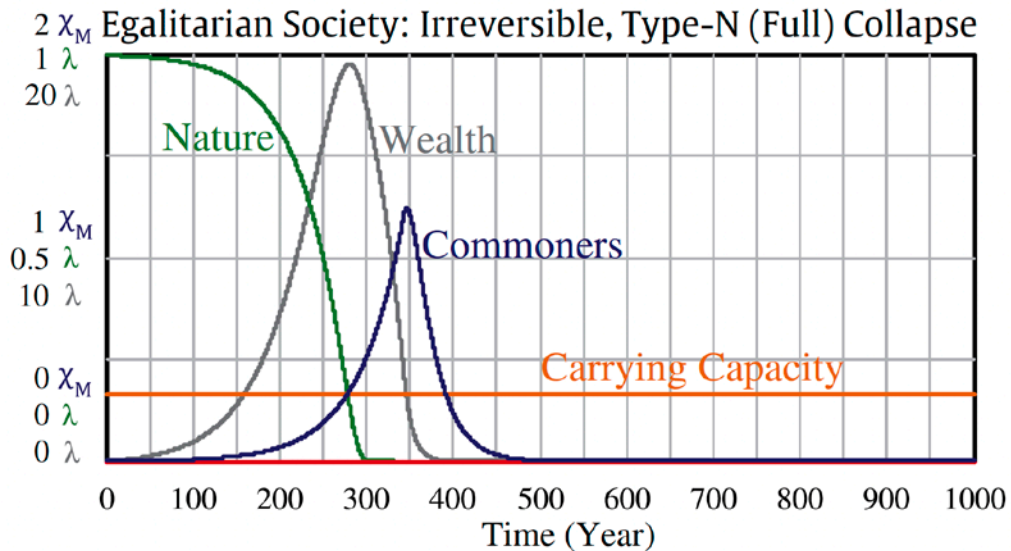


Figure 2. Source : Motesharrei et al. 2014: 98. Although natural resources (green curve) consistently maintain saturation levels, the excessive extraction by the elite class (red curve) causes the commoner class (blue curve), who serve as the productive foundation, to collapse first due to a scarcity of subsistence resources.

In contrast, one visualization of purely exogenous collapse might appear as



follows:

Figure 3. Source : Motescharrei et al. 2014: 96. The graph illustrates that even if internal predation is eliminated, the exponential growth of the population (blue line), if left unchecked, will directly breach the regenerative limits of natural resources (green line), resulting in resource depletion and forcibly triggering a drastic collapse of the population

Moving forward, our analysis will shift toward the specific developmental trajectories of distinct civilizations, initiating this inquiry with an examination of the Western-European arc.

4. PROGRESS OF THE WHOLE OR PROGRESS OF CANCER-LIKE STRUCTURES: WHAT IS MODERNITY?

It is a tale told time and again, that the saga of Western triumph and global hegemony (Morris 2010) traces its genesis to the sixteenth century and the dawn of “modernity.” What is, then, the “modernity”? Since the era of Condorcet, despite periodic resurgences of pessimistic critique, modernity has largely been conflated with “progress”: specifically, the liberation of humanity from medieval ignorance and various “institutions of exploitation and oppression” (Morris 2019:

11–12), a narrative predominantly anchored in material and technological domains. However, our preceding discussion compels a rigorous re-examination: Does modernity signify a genuine advancement for the civilizational totality, or does it merely represent the hyper-development of a localized, parasitic subsystem? If the latter is true, is this partial progress achieved at the expense of the whole? If so, we must ask whether the mainstream historical narrative has committed a fatal category error, one that conflates the healthy accretion of muscle with the malignant proliferation of a tumor. For the prospective patient, would such an error not constitute a catastrophic validation of the very frameworks accelerating their own dissolution?

Over a century ago, Max Weber identified the “separation of value spheres” (*Differenzierung der Wertsphären*) as the core process of modernity (Schimank 2010), characterized by each specialized sphere acquiring its own independent, exclusive operational autonomy (*Eigengesetzlichkeit*), thereby disregarding the moral demands of the whole and of other constituent parts. Therefore, in the final analysis, the formation of this “polytheism of values” fundamentally concerns the disintegration of the medieval value-normative wholeness, specifically, the *scala naturae* (Lovejoy 1976) or what Albert Mirgeler termed the “*reichskirchliche Weltganze*” (imperial-ecclesiastical global whole) (Böckenförde 2020: 155). Adopting this vantage point, Charles Taylor’s conceptualization of the “Great Dis-embedding” emerges as perhaps the most potent and heuristic framework for elucidating the essence of modernity. This process of structural and ontological decoupling manifests primarily across three constitutive dimensions (Taylor 2004: 49ff, 2018: 146ff):

- *The Desacralization of the Cosmos*: Nature was progressively reduced from a sacred locus replete with transcendent symbols to the mere mechanical processes of matter and its motion.
- *The Anthropocentric Turn*: While liberating humanity from a holistic order that was essentially “anthropoperipheral” (Lewis 1994), this shift simultaneously severed humans from the natural world, establishing them as human subjects standing in opposition to it.
- *The Individualistic Turn*: As individuals discovered their own spiritual interiority, they became “disembedded” from various forms of traditional solidarity. Instead of becoming Robinson Crusoes, they are now

constituent parts of impersonal mechanisms such as the State and the Market.

This precipitated the disintegration of the continuum structure characterized by the triple embedding of “human agents – society – cosmos” (Smith 2014: 45). Crucially, Taylor astutely observes that the process of distancing and the emergence of the “buffered self” was not a development unique to the half-millennium ascent of modernity. Rather, this it had already been foreshadowed and meticulously prepared during the “Axial Age”, a period that served as the indispensable precursor to the modern reorientation of the self (Assmann 2012: 370ff). By explicitly conceptualizing this phenomenon, which had been noted in an unthematized manner since the 18th century (Assmann 2017a: 45–6, 2018), Karl Jaspers²³ correctly identified that the “separation of value spheres” was already (partially) achieved in several ancient civilizations long before European modernity, accomplished through the breakthrough discoveries of individuality, rationality, and critical-reflective thinking. This “breakthrough” was described by Eric Voegelin (2001) in strikingly similar terms as a “Leap in Being,” characterized by a differentiation from the previously compact and correlative cosmological order.

Such an observation is hardly unexpected, as the underlying dynamics were already discerned—albeit in a pre-theoretical mode—by thinkers across diverse cultural landscapes over two millennia ago. For instance, the *Zhuangzi*, a seminal text from the late pre-imperial period of Classical China, draws a compelling analogy: it likens the *homo mensura* condition, emerging from the collapse of a unified normative integrity, to a state of sensory dissociation, wherein the various perceptual faculties of the human body no longer function in holistic concert (Ziporyn 2020: 267):

But the world is presently in great disorder. [...] The Course and its intrinsic powers are no longer unified. Many in the world congratulate themselves complacently for their insight into some single aspect of it. It is as if the ears, eyes, nose, and mouth each had their own understanding, without being able to interconnect. [...] **Each**

²³ However, the absurdity of this approach lies in fabricating a non-existent cross-cultural process bound to the universal level of human history, proceeding merely from chronological coincidences (Breuer 1994, Engels 2017b). Conversely, substantial evidence indicates that from the very beginning, it has been a pluralistic phenomenon rooted in the developmental processes of specific cultures, observable with varying degrees and emphases in almost all civilizations both before and after the period of 800–200 BCE.

man in the world now fashions his own technique out of whatever part of it happens to suit his own desires.

Analogous somatic metaphors were extremely prevalent among ancient writers (see, e.g., Demandt 1978: 17ff; Hiligruber 1996; Nestle 1927). The celebrated fable of “The Belly and the Limbs,” recorded by Livy (Liv. 2.32.8–12), draws an analogy between the harmony among the constituent parts of the State and the mutual interdependence of the parts of the human body. Menenius Agrippa admonished the plebeians that if the limbs (the part) refused to sustain the life of the body (the whole) by withholding nourishment from the belly, they themselves would inevitably perish in the wake of their detachment from the body. Crucial to this metaphor is not merely the distancing and disembedding of the parts relative to the whole, but, more significantly, the self-destructive mode of their “cancerous” expansion at the expense of the totality.

Redirecting our focus to the Western trajectory, it becomes manifest that the “betrayal of the whole by the part” is by no means restricted to the three dimensions delineated by Charles Taylor. Rather, it constitutes a systemic ubiquity that permeates the entire civilizational fabric. From this pervasive landscape, we may isolate several salient manifestations for closer scrutiny:

- *The Disembedding and Carcinogenesis of the Economy:* At the risk of sounding clichéd, the economy of medieval society never existed as an independent sphere; rather, it was consistently “embedded” within a complex web of Christian and feudal obligations (Polanyi 2024). In this context, profit-seeking behavior not only lacked derived legitimacy but was viewed as a moral sin isomorphic to the lust for power and carnal desire. As internecine aristocratic strife and religious wars precipitated the dissolution of traditional bonds, what was once considered sin (McCarraher 2019: 1) began to be reconceived as a rational tool capable of curbing human “passions” (Hirschman 2013). Alongside the sovereign state, it became an alternative cornerstone for reconstructing social order. However, contrary to Mandeville’s presupposition of a continuity between private vices and public benefits, market liberalism, purely self-referential and actively othering society, often endogenously generates extreme wealth polarization and monopoly after abandoning the guild mechanisms that historically provided identity and curbed malignant competition. This potential for social unrest, in turn, paradoxically compels the intervention of state power. Consequently, since the late 18th century, laissez-faire and

state intervention have exhibited a cyclical, dialectical oscillation (Blyth 2002; Gerstle 2022) while expanding synchronously. Situated within the neoliberal order dominated by 21st-century financial capitalism, all domains are subsumed by the managerial calculation of “ROI”: Education is alienated into an assembly line for the reproduction of human capital (Brown 2015: 175ff); Art degenerates into filler material for algorithmic traffic; Interpersonal relationships devolve into the husbandry of “relational capital.”

- *The Disembedding and Carcinogenesis of the Individual*: A universal characteristic of medieval society was that the individual was submerged within various “universal categories,” such as the village, parish, guild, and noble estate (Burckhardt 1990). While the discovery of individuality since the Renaissance undoubtedly possess intellectual-spiritual origins, they cannot be abstractly conceptualized in isolation from the rise of the State-Market complex, spanning from 17th-century Absolutism, through the 19th-century Nation-State, to 20th-century Totalitarianism, and finally to today’s global Financial Capitalism. The former (individuality) from the bottom-up, and the latter (state-market) from the top-down, jointly constituted the disintegration of the traditional cascading holistic social order. Today, where expressive (Bellah 2007) and possessive individualism (Macpherson 1962) have achieved total victory, the transformation described by Tocqueville, from the “long chain” (*longue chaîne*, 2020: 881ff) to “grains of sand”, is complete. As “formless human sand” (Spengler 2016: 63) has been fully liberated, virtually all types of supra-individual frames of reference, even though many initially served as cancerous structures betraying the medieval normative wholeness, have crumbled (Engels 2023: 139ff; Gregory 2015: 378). The consequences include: the evaporation of the public sphere and the de-politicization of society (Sennett 2017; Brown 2015; Mair 2023), the proliferation of a narcissistic culture that instrumentalizes the human fellows (Twenge & Campbell 2009; Lasch 1979/2018; Storr 2017), the disintegration of the family (Murray 2013; Regnerus 2017; Kearney 2023) and the currently unpredictable demographic tailspin (Bricker & Ibbitson 2019; Morland 2022, 2024; Pearce 2010).
- *The Disembedding and Carcinogenesis of the Present*: In a certain sense, medieval society was ahistorical. To borrow Reinhart Koselleck’s (2004) formulation, its “space of experience” and “horizon of expectation” nearly completely coincided. The “present” was merely a fleeting instant suspended between God’s Creation and the Last Judgment. Since the 16th

century (Rosa 2017), parallel to the shift from a sacred order measured in eternity, through the nation-state and the corporation (Thompson 2009), and finally to the individual measured in years, days, or even hours, the rocketing of the time discount rate has proceeded synchronously with the disintegration of the higher-level civilizational totality. The total domination of immediacy and presentism (Hartog 2015) that we witness today, along with the “McDonaldization” (Ritzer 2016) of every conceivable social sphere, are undoubtedly the ultimate logical conclusions of this process. This manifests across a spectrum: From high-frequency trading (millisecond-level algorithms) to the tyranny of quarterly financial reporting (Lewis 2014; Foroohar 2016) in the economic sphere, through political short-termism, epitomized by “Giveaways” (Achen & Bartels 2017; Caplan 2008) in the political sphere, down to the hyper-competition and opportunism in contemporary interpersonal relationships (see Sandel 2020; Han 2015), let alone the proliferation of various “short-term mating strategies” in the “mating market” (Illouz 2019; Perry 2022). This infinitely expanding short-termist structure (Fisher 2023; Krznaric 2020) is ultimately driven by the maximization of the immediate satisfaction of *hic et nunc* material interests. While it appropriates resources that should have been transmitted to future generations (Willetts 2010), it simultaneously ruthlessly extracts from and weeds out the long-termists within the current generation, thereby inevitably steering toward its own self-destruction.

This enumeration could theoretically proceed *ad infinitum*. For instance, Art underwent a similar transition from “whole-serving cell/organ” to “self-serving cancer.” It evolved from the medieval mode, where it served the integration of the holistic sacred order (statuary, religious frescoes, icons), into an autonomous system possessing independent evaluation rules (Belting 1994; Shiner 2001; Baur 1978). It further devolved into the structureless, amorphous form witnessed today (Taylor 1991: 55ff), serving the catharsis of the instantaneous sensory desires of atomized individuals, or being swallowed as a mere appendage of the economic system (Adam 2014; Thompson 2010). Similarly, social elites metamorphosed from the medieval *bellatores* and *oratores* serving the *bonum commune* into the self-interested, predatory elites of the financial capitalism (Foroohar 2016; Wolf 2023; Mazzucato 2018), whose behavioral logic strictly adheres to the theory of *homo economicus*. To borrow David Sloan Wilson’s (2015: 104, 2020) critique of Ayn Rand’s Objectivism, this is indeed the ethics of the cancer cell: Instrumental rational thinking, which filters out all global “background noise” irrelevant to the

realization of local goals, is *per definitionem* the realization of the “Great Disembedding” in decision-making modes. Furthermore, in the political sphere (from political realism and the sovereign state to the pan-politicized society of totalitarianism; see Wolin 2016; Elshtain 2008) and the military sphere (from the dissolution of medieval war ethics to the gradual development of “Total War” modes that devour all societal domains, see Bell 2007; Parker 1996), one can likewise observe “organs,” once submerged in the whole, disembedding into autotelic entities serving their own self-proliferation. However, there is no need to elaborate further here²⁴. Finally, the discussion above can be visually summarized as follows:

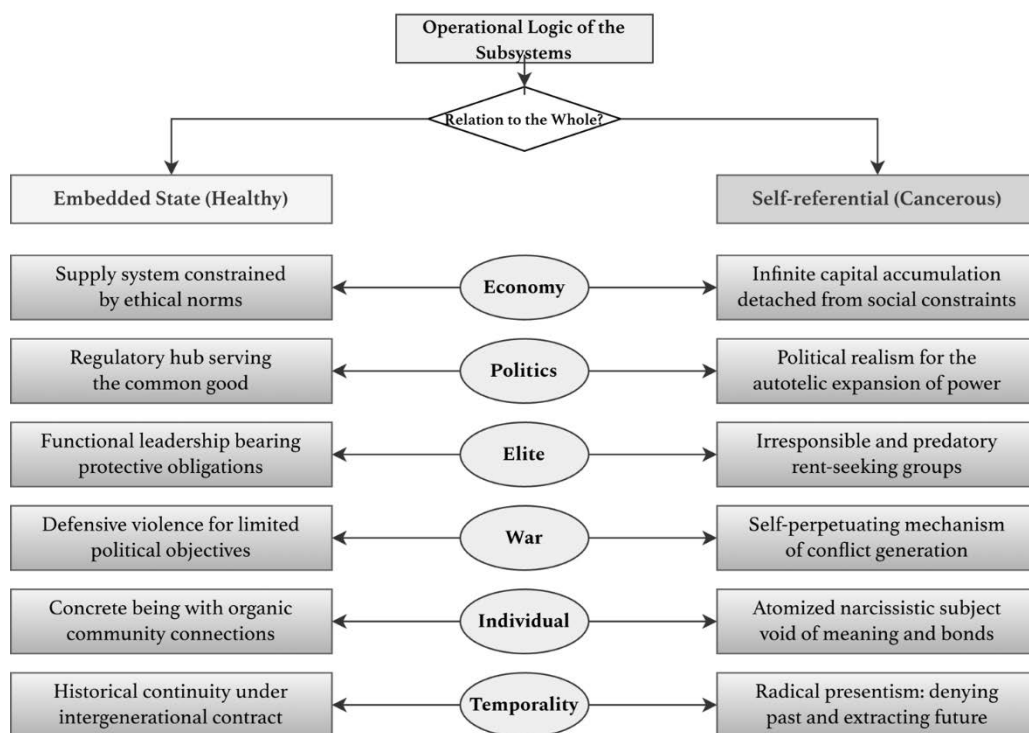


Figure 4. Specific Modes of Subsystemic Self-proliferation at the Expense of the Civilizational Whole

²⁴ For comprehensive studies regarding the slow process of disintegration of the cultural integrity of Western civilization since the 16th century, particularly the dissolution of the normative whole, see MacIntyre 2013; Dupré 1993; Weaver 2022.

Synthesizing the tentative explorations outlined above, a coherent theoretical architecture now emerges. The structural configuration of so-called “modernity”, particularly the triangular dynamic within the sociopolitical domain centered on the state, the market (capitalism), and the atomized individual (cf. the classic analysis in Nisbet 2023), despite its unprecedented evolved complexity, appears to follow a long-term trajectory indistinguishable from systemic disintegration. Rather than serving a conscious teleological purpose, this structure operates through a mechanism of structural isomorphism with malignant neoplasia in multicellular organisms: by maximizing the reproductive velocity of a specific subsystem, it accelerates the depletion of the host substrate, thereby trending toward mutual annihilation. When synthesized with the ecological constraints discussed in Section 2.1, and with the proviso that “liberalism” be terminologically substituted with “modernity,” the validity of the following observation becomes evident: “The liberal project is ultimately self-contradictory and that it culminates in the twin depletions of moral and material reservoirs upon which it has relied” (Deneen 2018: 41). Fundamentally, this analysis posits *no* moral value judgment, *nor* (!) does it offer an apology for conservatism. On the contrary, it represents a rational hypothesis derived from the strict application of universal bio-physical dynamics to the developmental trajectory of Western civilization in a value-neutral manner²⁵.

Ultimately, the verdict on the sequence of revolutionary transformations since the 16th century remains contingent upon the observer’s adopted vantage point: viewed either from the perspective of the civilizational totality, manifesting as decline, disintegration, and self-destruction, or from that of its carcinomatous subsystems, appearing as progress, liberation, and freedom. To an omniscient observer, the former perspective holds no inherent superiority over the latter.

²⁵ Unfortunately, contemporary historical education (Guldi & Armitage 2014; Scheidel 2025) and university education in general have squandered excessive resources on an over-specialization characterized by continuously diminishing ROI. This specialization, ironically, is itself a projection of the “Great Disembedding” within the realms of academia and education, as academia has degenerated into a state of separation from the various sectors of society (manifested in the total collapse of the Humboldtian ideal, see Bill 1996, Engels 2024), becoming either a self-referential mechanism serving entrenched power-interest structures and maximizing the efficiency of publication production (Menand 2010; Biagioli & Lippman 2020; Berg & Seeber 2025), or being absorbed by the economy (Nussbaum 2016). Simultaneously, within the academic system itself, the horizontal linkages between disciplines have also disintegrated.

After all, under the aegis of the MEPP, both are situated along a vast continuum of dissipative structures—spanning physical, chemical, and biological domains—whose sole existential function is the dissipation of solar energy. Accordingly, by systematically dissipating the Asabiyya resources cultivated through seven centuries of arduous accumulation by their countless anonymous ancestors to achieve “self-realization,” modern Westerners have served, unwittingly, as catalysts for the accelerated production of cosmic entropy. Yet, if “the tree existed only for the sake of these fruits” (KSA 3: 396), on what grounds do we privilege the phenomenon of civilizational decay over the lysis of a eukaryotic cell, the death of a multicellular organism, or the collapse of a beehive—forms of mortality ubiquitous in the natural order? *Sub specie aeternitatis*, all things are destined to perish; even the sun will extinguish in five billion years. Why, then, should civilization be an exception, simply because it is the vessel in which we reside?

Building upon this framework, the subsequent sections will examine Greco-Roman civilization and Classical China as paradigmatic case studies. We shall elucidate how these divergent civilizational arcs converged upon a common terminal trajectory, driven by the same underlying mechanism: the structural decoupling of localized sub-optimizations from the global optimum.

5. CASE STUDIES

*History is a gallery of paintings where there are
few originals and many copies.*
Alexis de Tocqueville (1805-1859)

In the following section, we utilize Greco-Roman and Classical Chinese civilizations as primary case studies to assess the empirical alignment between our theoretical model and the historical realities of civilizational trajectory. This inquiry seeks to scrutinize how the dynamics delineated in the preceding sections resonate with the actual processes of development and decline. Our selection is predicated not only on the exceptional density of extant records but also on the recognition that these two civilizations, owing to their chronological proximity and profound morphological parallels, have emerged as a pivotal nexus in contemporary comparative historiography.

This scholarship spans diverse dimensions, ranging from state-empire formation (Auyang 2014; Scheidel 2019) and disintegration (Scheidel 2023), to monetary systems (Scheidel 2010), rhetorical traditions (Lu 1998), normative construction (Engels 2017a), and imperial cults (Robinson 2023). Of even greater intrigue is the observation that both civilizations, during their respective phases of imperial formation, invariably exhibited decisive isomorphic features akin to Western modernity, albeit with differing emphases²⁶. This evidence refutes the prevailing tendency within “Big History” to relegate the pre-modern era to a monotonous interlude of stasis, bracketed by the Agricultural and Industrial Revolutions (e.g., Harari 2014; Bregman 2018). Far from being a “tedious footnote” where “nothing happened,” the ancient world constitutes a critical laboratory of systemic complexity that defies such narrative reductionism.

Let us commence with Greco-Roman antiquity.

5.1 *Greco-Roman Antiquity*

a. Formation of the Cultural Organism (Higher-Level Totality)

In stark contrast to many contemporary ancient civilizations that were heavily reliant on alluvial plains, the geographical character of Greco-Roman civilization was defined by fragmented coastlines and mountainous basins. As is well known, its historical genesis must be traced back to the Mycenaean civilization preceding the Dark Age, the state formation of which bore significant secondary characteristics. Characterized by the rule of chariot elites with the priest-king (*wanax*) at the apex, this phase featured a redistributive palace economy, an unusually developed early bureaucracy, and opulent burials for rulers

²⁶ The modern characteristics of the Mediterranean world from the Late Republic to the Imperial period (see, e.g., Demandt 1984; Gay 1995; Mount 2010) have been sufficiently noted for centuries, considering the special status of Classical Antiquity as the “Mirror of Europe” (Albrecht 1998; naturally also applicable to the United States, see Ricks 2020; Malamud 2009), there is no need to elaborate here. By contrast, Early China / Classical China possessed a bureaucracy and a data-driven administrative management system second only to the modern West in complexity in the entire human history (even developing a “rank and yank” system within its performance assessment system), along with social atomization on an unprecedented scale, a fact that has only received full attention with the research of the last two decades and the emergence of newly excavated documents.

(Shelmerdine et al. 2008; Nakassis et al. 2012; Breuer 2014: 277ff). It was this very society that served as the wellspring of the brutal heroic individualism depicted in the *Homeric Epics*. Here, a select few god-like heroes, driving horse-drawn chariots (a technology imported from the Eurasian Steppe) and relying on bronze weaponry fashioned from similarly imported copper and tin, superimposed over a diffuse subject population that existed merely as a backdrop and as *de facto* human resources. This material basis implied that their affinity with the East Mediterranean elite club far exceeded their ties to local society. As we shall see, this form of “roving bandits” state (Olson 2000), where predatory > protective, mobility > locality, and the display of violence > shared normativity, also emerged, strikingly, at the other end of the Eurasian continent during nearly the same epoch.

Following the collapse of the Mycenaean palatial systems and the (more decentralized) “Big Man” era of the Dark Age (Finley 2002), antiquity witnessed a progressive consolidation toward normative integration (Ober 2015; Waterfield 2021). Driven by a co-evolutionary feedback loop between intensive agriculture (Hanson 1995) and demographic expansion, this shift culminated in the early Classical polis. At this zenith, the triad of “Politics (citizenship) – Military (hoplite service) – Economy (land ownership)” became inextricably embedded, forming a homeostatic system of profound internal cohesion. External pressures necessitated equitable land distribution and political franchise, ensuring a robust citizenry capable of sustaining the phalanx. Within this framework, warfare remained a ritualized endeavor, governed by agricultural cycles and sacred norms, aimed at restoring equilibrium rather than total annihilation. Internally, traditional elites retained religious and judicial authority. This “differentiated complementarity” represents a historical embodiment of Cicero’s *concordia ordinum* and Hegel’s *Sittlichkeit* (Taylor 1977: 365ff).

b. The Great Dis-embedding, the Betrayal and Victory of Lower-Level Structures

From the Peloponnesian War through the twilight of the Roman Republic, the cultural integrity (*kulturelle Ganzheitlichkeit*) of Greco-Roman civilization underwent a protracted erosion. Accelerated by fratricidal conflicts among city-states, the unprecedented expansion of geopolitical scales, and the systematic displacement of the peasant-citizenry, notwithstanding ongoing debates over

Malthusian pressures, the foundational subsystems of the community began to “betray” the whole. These institutions, once the pillars of social stability, metastasized into autonomous, free-riding structures that prioritized localized expansion over systemic integrity. We shall now examine this metamorphosis within the economic and military spheres, viewed primarily through the Roman experience:

- *The Rise of Economic Rationality*: During the Roman conquest of the Mediterranean, a massive influx of wealth and enslaved populations into Italy enabled market- and efficiency-oriented large estates (Latifundia) to exploit economies of scale and low-cost labor. It is little wonder that Eduard Meyer perceived herein an ancient counterpart to the global economy of the 20th century (Reinard 2023: 10–11; von Reden 2015: 91–94). This transformation devastated the class of independent smallholder that had served as the very cornerstone of the Republic (Hopkins 1978). “Latifundia perdidere Italiam”: the pursuit of economic rationality (local optimization) resulted in the forfeiture of social rationality (global sustainability). Dispossessed and mobile citizens ceased to be organic components of the Roman state; instead, they devolved into an amorphous mass, susceptible to agitation by demagogues wielding *panem et circenses*.
- *The Privatization of Military Affairs*: Concomitant with the prolongation of campaigns and the expansion of territorial frontiers, the traditional citizen-militia system moved toward disintegration in the late Republic. Professionalized armies transferred their allegiance, as explicitly perceived by Appian, from the abstract community of *res publica* to specific military strongmen (Keaveney 2005). Entering the Imperial period, this political “dis-embedding” further evolved into an institutionalized segregation defined by geography and culture. Ultimately, from the Crisis of the Third Century onward, the Empire was gradually reduced to mere spoils of legionary contention (Goldsworthy 2009). In the eyes of military adventurers (both indigenous and foreign) the provincial inhabitants existed de facto merely as a backdrop, a dynamic effectively recapitulated the regime of “*magna latrocinia*” (*Aug.*, civ. 4.4) characteristic of the Mycenaean era.

c. Metastasis, Self-Dissolution of Cancer-like Structures, and the Destruction of Civilization

While the Principate established a facade of order through the concentration of

power (to suppress the vicious intra-elite competition)²⁷, exhibiting an atavistic resemblance to earlier personal-bond states (*Personenverbandsstaat*), it offered no cure for the fundamental decay of the Roman world. The dominant trend remained unaltered: a relentless expansion of extractive complexity and continuous societal disintegration. Across the long arc from the Late Republic to the Dominate, the march of autocracy was mirrored by an increasing fragmentation of the elite. The era's "winners" may have secured unprecedented wealth through governorships and (imperial) patronage, but the systemic foundation was hollowed out as the intermediate social strata became dangerously fluid and fragile (Scheidel 2017: 72–75).

Simultaneously, as territorial expansion ceased due to the diminishing returns on military conquest (Tainter 1988: 128ff), the "predatory dividend" evaporated. Consequently, the structure rapidly pivoted toward an involutionary self-cannibalization. During the Crisis of the Third Century, the state systematically preyed upon private wealth through the debasement of coinage, triggering hyperinflation (Harl 1996). Local elites (the *curiales*), who had originally functioned as the cellular units of the Empire, were crushed by, and fled from, onerous collective tax liabilities.

Throughout this process, accompanied by the continuous shedding of nodes capable of autonomous order formation, the entire Mediterranean world trended asymptotically toward simplification and homogenization. Beneath the veneer of universal citizenship, the *populus Romanus* had, in reality, devolved into a loose agglomeration lacking regional identity, cohesive elites, self-governance, and the capacity for autonomous cooperation, becoming heavily reliant on top-down coercion to maintain order. Absent the state's top-down order-maintenance institutions and the means of production supplied by state factories or large estates, the capacity of the late Roman *coloni* to spontaneously organize cooperative communities against external military or economic risks would likely have paled in comparison to that of their ancestors in the era of early Italian communes. Consequently, while local complexity and robustness may have appeared to increase, the global network became increasingly fragile and amorphous. This outcome was not solely attributable to the cascading effects and risk amplification driven by hyper-connectivity (Anderies & Levin 2023; Johnson

²⁷ For a general introduction to the crisis of the Late Republic, see Christ 2019; Linke 2015.

2016: 107–124) or “hyper-coherence” (Cline 2021: 176); rather, it was fundamentally because such local complexity was sustained precisely through the embrittlement of the global system itself.

Under the systemic consumption of this multi-level social cancer, save for the extractive fiscal-military machine acting as a lighthouse barely emitting a localized glimmer, mirroring John Bintliff’s observation of Late Antiquity as “a polarisation of activity levels into juxtaposed low energy and highpoints” (Bintliff 2013: 73), all other subsystems exhibited a universal, eschatological gloom: depopulation, *agri deserti* (land abandonment), the decay of urban centers and infrastructure, the contraction of the economy (Ruffing 2008) and trade (Ward-Perkins 2006), and a trend toward monotony and simplification in art and craft. To borrow Robert Graves’ (1989) classic metaphor, the Mediterranean civilization of Late Antiquity enacted a tragedy of rot spreading from the core to the rind: social dissolution radiated from Rome to Italy, and from Italy to the provinces, until the new “barbarians”, those capable of retaining their distinct identity and resisting assimilation, refused to continue to serve merely as fuel to prolong the dying civilization (like the Pannonians). In this scenario, what the invaders confronted was no longer the organic body composed of resilient citizen-soldiers, but a hollow shell: over-extracted, depopulated, and spiritually vacuous.

This was by no means the scenario imagined by Niall Ferguson (2010)²⁸, where a “normally functioning” imperial system in the 4th century faced a “sudden and dramatic” fall. On the contrary, while the conquering exogenous groups could not rival the Western Roman Empire in terms of economic complexity, such as specialized production or cross-regional division of labor, they absolutely exhibited greater complexity in numerous other domains, in stark contrast to Prudentius’ caricature of barbarians as “four-footed beasts” (*quadrupes*) (Ladner 1976). For example, these rising forces possessed a density of social capital and multi-layered communal bonds that stood in stark contrast to the late Roman climate of systemic corruption and moral attrition (MacMullen 1988; Edwards 2002). Culturally, they retained a vibrant linguistic plurality, defying the

²⁸ Although it may sound nearly cliché, this undoubtedly demonstrates once again that “GDPism”, the reliance merely on a single, most easily quantifiable variable (such as GDP, the power density of economic organizations, and the rate of natural resource extraction) to assess the resilience and complexity of civilization as a whole, may entail a fatal risk of oversimplification.

stagnation of an increasingly homogenized Latin (Mullen 2023). Most decisively, they wielded a superior military organizational capacity, a martial vitality that threw into sharp relief the paralysis of an Imperial defense system that had become both sclerotic in its bureaucracy and dangerously reliant on foreign mercenaries.

In the final analysis, collapse functioned as a necessary purgation rather than a tragedy. Only through the extinction of the host structure could the contagious social malignancy be fully neutralized. Escaping the gravitational pull of the “Universal Empire”, a monolithic prison for a dying civilization, the European continent found a new vitality in the competitive, fragmented landscape of its successor states (Scheidel 2019).

5.2 *Classical China*

a. Formation of the Cultural Organism (Higher-Level Totality)

The geographical center of Classical China (Early China)²⁹ was situated upon the vast North China Alluvial Plain. Here, the mineral-rich, friable, and easily tillable loess provided greenhouse-like favorable conditions for the agricultural revolution. Nevertheless, the critical technologies that catalyzed state building, specifically bronze production and horse-drawn chariot warfare, originated from the direction of the Eurasian Steppe (Shaughnessy 1988). It is highly probable that the founders of East Asia’s earliest major polity, the Shang, obtained a disproportionate military advantage and consequent hegemonic status relative to surrounding competitors precisely because of the pivotal intermediary role they played in the diffusion of these two technological factors. Similar to other early states (e.g., Wilkinson 2010: 5ff; Trigger 2003: 71ff), in Shang China, an almost unbridgeable chasm existed between the priest-warrior rulers interred in opulent tombs and the ruled, who were often literally indistinguishable from prey. The sheer scale of “the ancestral ritual complex of war, sacrifice and burial” (Campbell 2018: 252) was unrivaled in Bronze Age Eurasia, reflecting an

²⁹ Here, I employ the term Classical China, defined as the history of China from the Shang-Zhou to the Qin-Han periods, prior to the systematic introduction of Buddhism, synonymously with “Early China” that is currently prevalent in the academic community. For a general introduction to the history of Early China, see Li 2006 and the relevant chapters in Vogelsang 2023.

extremely violence-based mode of integration. The frequent relocation of ruling centers, coupled with equally frequent royal tours and hunting expeditions, underscores the “peripatetic nature” of authority relations (Keightley 2000: 58). In summary, this was a fragile integration mechanism, heavily contingent upon a central node (hub), akin to a “Big Man” (Keightley 1999: 290) like the Shang King, continuously and visually displaying his violence capacity to the “Four Quarters”.

Subsequently, driven by a parallel feedback loop between agricultural intensification and population growth, the period from the Late Shang to the Early Spring and Autumn witnessed a transition toward a fundamentally different mode of integration. This new paradigm moved beyond the coercive force of a mobile, singular center, instead anchoring itself in institutionalized hierarchical dependencies. The stabilization of marriage-family patterns and inheritance rights became intricately synchronized with the rise of a hereditary aristocracy, facilitating the reliable transmission of status across generations. Internally, this aristocracy was unified by the sacred-normative bond of Heaven-Ancestor worship. This spiritual framework did more than merely connect individual elites to their ancestral lineages (Kern 2009); it acted as a cohesive force that hierarchically integrated disparate noble houses into a stable pyramidal architecture, with the Zhou King serving as the ritualistic apex. It is thus clear that the Western Zhou model represented a sophisticated departure from its predecessor, characterized by the cultivation of stable norms that bridged the ruling strata and anchored them within the broader social fabric. Within this polycentric, networked mode of integration, the system did not rely on any single node, at times not even the King himself, for its survival. Consequently, the social mechanism attained a level of structural resilience and cooperative complexity previously unknown.

b. The Great Dis-embedding, the Betrayal and Victory of Lower-Level Structures

By the twilight of the Spring and Autumn period, the “Western Zhou model” had undergone a process of ideological apotheosis, emerging as the definitive paradigm of a harmonious, unified order (Leung 2019; Rogacz 2022). By the Western Han, this was codified into a three-stage historical schema of linear

moral degeneration, spanning the Spring and Autumn, Warring States, and Imperial eras. In the self-perception of contemporary observers, the world was increasingly viewed as a fractured landscape, defined by an widening schism between Heaven and Man, ruler and subject, and virtue and power. This process of decay, which shares striking structural affinities with Western modernization (Bai 2012, 2023; Fukuyama 2011; Hui 2005; Roberts 2017), manifested as the “atavization” of an once-organic whole. Elements that formerly sustained the collective became “dis-embedded,” transforming into fragmented entities that competed with and cannibalized one another. We shall analyze this phenomenon through two primary dimensions:

- *The Disintegration of Normative Wholeness:* The collapse of the “Old Regime” in the late Spring and Autumn period rendered the foundations of any traditional order suspect (Roetz 2005, 2018). This vacuum spawned a diverse array of moral-political philosophical schools, including: Confucianism, which advocated for the restoration of traditional hierarchical order and the cultivation of moral autonomy (Roetz 1993, 2006); Mohism, which championed universalism, egalitarianism, and consequentialism (Fraser 2016); and Daoism, which revered naturalism (Laozi) or individual spiritual freedom (Zhuangzi; see Jiang 2021: 287–338). Although this explosion of intellectual diversity is frequently romanticized by contemporary scholars under the banners of an “axial breakthrough” or an “anticipation of modernity” (e.g., Roetz 2012, 2020a, 2020b), the reality was far grimmer for those living through it. As the previously cited passage from the *Zhuangzi* illuminates, the majority of historical participants experienced this era not as a leap forward, but as a process of decay characterized by normative disintegration.
- *The Rise of Political Realism:* As with other civilizations of “the pattern of continuity” operating under a sociocosmic order (Chang 2009), within the holistic order of the Shang and Zhou, a strictly defined, autonomous political sphere did not exist. However, commencing from the mid-Spring and Autumn period, driven by the collapse of traditional martial norms and the discovery of “instrumental rationality” within the military domain (Galvany 2017)³⁰, early practices of political realism emerged in tandem. Detaching themselves from the traditional quasi-

³⁰ For the military drivers underlying the emergence of statutory law and the administrative system during the formative period of the early Chinese empire, see Yates 2009.

feudal order, these practices would later be explicitly theorized within the *fa* tradition (Legalism) (Pines 2024b; Scharfstein 1995: 21–54). As power was redefined as its own end (Fu 2016: 35ff), these political realists explicitly conceptualized the people, standing in absolute opposition to the state-ruler, as instrumental resources to be manipulated and extracted (Schwermann 2024), which constitutes a textbook example of the “self-assertion of the social cancer.”

The underlying dynamics behind this shift were likewise propelled by the dual squeeze from both above and below, as elucidated earlier:

- As HAN Fei (280–233 BCE) presciently observed³¹, Malthusian dynamics indeed played a definitive role: the gradual exhaustion of land available for enfeoffment precipitated the decline of the “stratified universalism” kinship, a system predicated on the “favor for loyalty” model, during the mid-Western Zhou period (a period from which significant demographic changes are observable; see Vogt 2017: 404; Li 2006: 91–140). During the Spring and Autumn period, agricultural constraints and land scarcity exacerbated the pressure exerted by surplus elites and population growth upon small-scale aristocratic polities and their manorial economic foundations. This ultimately pushed them to a breaking point, manifesting as intensified internecine struggles among the nobility (Yoshimoto 2005). In the Imperial era³², this same dynamic compelled the peasantry to continuously partition the property and land of the nuclear family, rendering social units increasingly atomized and fragile.
- The military norms and social resources, such as inter-aristocratic trust, accumulated within the quasi-feudal structure provided a short-term fitness advantage within aristocratic group selection for those employing deceptive diplomatic and military strategies. This was particularly potent in the absence of a top-level monitor-punisher akin to the Zhou King. Conversely, the prolonged and intense competition among polities during the Warring States period (Zhao 2015)

³¹ To the best of the author’s knowledge, Han Fei may be regarded as one of the earliest “Malthusian” thinkers in human history to explicitly account for the historical dynamics by citing environmental constraints and the scarcity of natural resources (see Schleichert & Roetz 2021: 222; Sabattini & Schwermann 2021: 24; Schwartz 1985: 333–4; Flanagan & Hu 2011: 299ff; Zinn 1995).

³² It must be noted here that many ostensibly Malthusian phenomena are in reality driven by excessive elite extraction, rather than necessarily deriving from environmental constraints in an absolute sense.

systematically selected for states (fiscal-military actors) capable of maximizing the utilization of land resources (natural energy capture) and capturing social³³ (such as knowledge, decision-making capacity, and social trust [Adachi 2018: 169–173]) and human resources with maximum efficiency. This consequently engendered a dynamic of “competitive opportunism.”

c. Metastasis, Self-Dissolution of Cancer-like Structures, and the Destruction of Civilization

Over the course of this disintegration of civilizational integrity, spanning approximately five centuries, the cancer-like organization structured according to *faist* principles achieved ultimate victory. This structure was a quasi-totalitarian (Pines 2016) construct featuring a technocratic bureaucracy, atomization-promoting social engineering (Robinson 2021), thought control, and an extractive economic model (evolving from the “Gulag economics” of Imperial Qin [Cai 2026; Scheidel 2017] to the state capitalism of the Western Han). As this structure continued its “metastasis,” all other subsystems of the original cultural organism indiscriminately trended toward simplification and flattening (with the social “gradient” vanishing). The multi-level, networked overlapping possession of land characteristic of quasi-feudalism (akin to Brunner’s [2015] concept of “Gewere”) was reduced to state-distributed, clearly demarcated small plots (Zhang 2004: 1–113). Hierarchical complementary structures and autonomous institutions that fostered cooperation were supplanted by a quantifiable, standardized social hierarchy, tantamount to a social credit system two millennia prior, and state-sponsored “communities” (Korolkov 2023; Hafner 2009: 88–97). Furthermore, the complex pyramid of motivations underpinning human behavior was reduced by political realist theorists like Han Fei to a *homo oeconomicus* model based solely on cost-benefit calculations (Pines 2024a), allowing for behaviorist regulation through a highly quantified, impersonal (Graziani 2024) performance assessment system. In summary: *All forms of intermediate solidarity that had slowly matured over the first five centuries were obliterated* (mass social “homofragmentation”), which

³³ Incidentally, this also elucidates why military competition does not invariably foster the growth of overall social cohesion within the conflicting parties (as postulated by Peter Turchin et al.): for the unit of selection does *not* necessarily operate between the respective societal wholes, but may quite plausibly *take the form of a „parasitic struggle“ between the associated military-fiscal systems*, which in turn extract and plunder the remainder of society as a mere resource base.

permitted unprecedented material surplus and military potential to be compressed into an island of complexity: a *single-hub state* whose degree of organization reached a high-end level unimaginable in human history prior to the Napoleonic Wars.

However, such a formidable and complex state machine cannot, in the long run, be sustained upon an amorphous society that it actively and continuously pulverizes, even given infinite arable land available for external conquest. As resource extraction reached critical thresholds, both externally (military expansion hitting geographical limits) and internally (the exhaustion of moral capital), the complexity of this structure, having peaked under the reigns of Qin Shihuang and Han-Emperor Wu (two representative “*kolossalen Individualitäten*” [TW 12: 376]), began to exhibit an oscillatory decline. Entering the Imperial era³⁴, the inherent ambiguity of absolute power was fully laid bare: the increasingly deified “August Thearch” served, on one hand, as the final life-support system for this fractured world; yet, on the other, no force existed to prevent the institution itself from “metastasizing,” thereby turning the entire civilization into a gargantuan playground for the self-realization of this individuality. While the highly standardized administrative apparatus (Korolkov 2024; Staack 2023) was corroded by corruption (Barbieri-Low 2017) and personal ties, and broadly synchronous with the Confucianization of imperial ideology (Cai 2014), local elites, predominantly large landowners who had previously been physically liquidated, resurfaced. Unfortunately, the continuous waning of the state’s infrastructural power and the declining degree of economic commodification (see von Glahn 2016: 129–167) did not translate into a corresponding recovery of social connectivity. The winner-takes-all, internecine warfare among intra-elites at the end of the Eastern Han (De Crespigny 2016: 418ff; Tse 2018) precipitated the massive disintegration of both state and society, resulting in the unnatural death of approximately three-quarters of the population (translating to roughly one-fifth of the total world population at the time) (Ge 2002: 436ff), an event perceived by contemporary authors as the very termination of humanity and the universe. As previously articulated, this “shock-style” die-off was not an accidental mishap caused by top-level power imbalances;

³⁴ For a general introduction to the history of the imperial era of Early China, see Lewis 2009, 2021.

rather, it was the ultimate culmination of a long-term process of social dissolution initiated since the Spring and Autumn period. The vacuum of order released by this collapse created the conditions for the massive immigration of (semi-)nomadic populations into the empire's border regions.

Ultimately, in the first half of the 4th century, paralleling the situation of the Western Roman Empire in the 5th century, the empire was subverted by internal and external centrifugal forces. This led to profound transformations in language (Szeto & Yurayong 2021), artistic style (Schafer 1963; Watt 2004), and (in local regions) population-genetic composition (Wang et al. 2000) over the ensuing centuries. Consequently, whether adopting the Stone Model (emphasizing material composition, such as demography or architecture) or the Vortex Model (emphasizing identifiable patterns, such as culture or specific spiritual forms), Classical China as a civilizational entity had perished, subsequently inherited by the later East Asian continent and Japan merely in the form of a treasury of fragments.

Ultimately, whether in Classical China or the Greco-Roman world, we observe an identical evolutionary arc: civilization is forged in the primordial violence of “big men,” reaches its apogee in a state of cooperative complexity, which is subsequently cannibalized by “social cancers.” This process culminates in a terminal regression toward late-stage monocratic empires, structures where the intricate social fabric has dissolved, leaving behind only the residue of naked coercion.

CONCLUSION: WHEN THE PART BETRAYS THE WHOLE

Thus far, within this necessarily condensed framework, we have tentatively conceptualized the rise and fall of civilizations as the emergent outcome of a triadic extraction dynamic: the interplay between natural resources, the civilizational aggregate, and parasitic, “cancer-like” internal organizations. This historical trajectory is, in essence, a localized manifestation of a more fundamental, law-like pattern governing the dissolution of all complex structures: the betrayal of the whole by the part. To invoke Hegel, this represents the ontological act of “elevating one's own particularity to the guiding principle over the universal” (*die eigene Besonderheit über das Allgemeine zum Prinzip zu machen*, TW 7: 261), i.e., the very definition of “becoming evil” (*böse zu sein*).

1. According to MLS, this mechanism is rooted in the inherent conflict between distinct levels of selection. As long as higher-level selection fails to suppress lower-level selection, the malignant “suboptimization”, defined as the increase of individual fitness at the expense of group fitness, will inevitably occur (in accordance with the Price Equation). In certain instances, this trajectory leads to endogenous Darwinian extinction (= evolutionary suicide), the textbook example of which is the malignant tumor.
2. According to the physico-thermodynamic explanatory framework prominent in complexity science, the very existence of complex structures at any level in a far-from-equilibrium state spontaneously drives the emergence of substructures that consume the parent structure itself (via certain “entropic forces,” such as the depletion force). This process thereby accelerates the full system’s trajectory toward equilibrium, mediated by an increase in the complexity of local subsystems (Frenkel 2015; Wolpert 2013).

Ultimately, offering a “third way” that transcends the dichotomy between environmental monism and amorphous pluralism, this elegantly simple model of civilizational geometry exhibits three fundamental merits:

- By reducing civilizational decline to the interplay among three fundamental strata, this model compels us to channel our scholarly attention toward the most paramount structural patterns, while disregarding trivial factors that possess narrow applicability and negligible universal explanatory power (e.g., lead poisoning [Nriagu 1983]). Furthermore, it enables the unified categorization of a multitude of causes for decline that, while superficially disparate, are in reality governed by identical structural dynamics.
- In contrast to prevailing environment-centric collapsological hypotheses, which place disproportionate emphasis on the friction between the civilization/society and natural resources, this model not only elucidates the non-negligible role of non-environmentally driven factors in decline, but also demonstrates congruence with the self-observations and causal attributions made by the majority of civilizations throughout history (namely, moral decay and the loss of religious piety).
- This paper posits that the decline and collapse of civilizations transcend the mere aggregation of individual pathological symptoms; rather, they constitute an *absolutely deterministic process* governed by the very

evolutionary-physical dynamics *that initially orchestrated the genesis of civilization*. This distinguishes the present framework from a “shopping-list Collapsology”, which fundamentally lacks explanatory power (and predictive capacity) by offering a flat enumeration of various endogenous and exogenous factors, thereby transcending the banal approach that simply asserts “everything matters.”

Given the preliminary nature of the endeavor undertaken here, namely, the integration of existing insights dispersed across disparate disciplines into a body of unified knowledge regarding why civilizations (and indeed, all complex systems) collapse, it by no means implies that the exploration of theoretical possibilities has been exhausted. On one hand, the exploration of the manifold potential modes of interaction among these three strata (and their specific manifestations in the decline of distinct civilizations) necessitates substantial support from empirical research. However, a decisive difficulty lies in the formidable challenge of grounding the hypotheses herein on a rigorous scientific foundation. This stems both from the scarcity of source materials inherent to historical science and from the absence of operational quantitative measures (Middleton 2017: 41; Zhao 2006: 308) regarding a civilization’s cohesive-cooperative capacity, whether labeled as “morality,” “piety,” “civic spirit,” “Asabiyyah,” “social gradient,” “cultural vitality,” or any other nomenclature. Even in the contemporary era, with its advanced means of communication and transportation, social capital (Fukuyama 2001; Field 2016) can often only be roughly gauged through a handful of not-necessarily-reliable proxy indicators or survey questionnaires. By comparison, for the majority of historical civilizations, we are frequently restricted to highly qualitative macro-evidence, such as evolutionary patterns of macro-political-social organization or extant texts of highly moralized period critiques. As a result, it is reasonable to posit that computer simulation will inevitably assume a non-negligible, if not central, role in future historical research.

Simultaneously, and perhaps of even greater import, it is imperative to transcend the restrictive horizons of hyper-specialization imposed by solitary disciplines (Christian 2017), which are increasingly devolving into scattered islands within an “Ivory Archipelago” (Wilson 2007: 2). This necessitates the collaborative incorporation of the latest advancements from history, political science, sociology, philosophy, physics, biology, computer science, and

complexity science. Given that planetary-scale integration is materializing before our eyes at an unfathomable velocity, the reintegration of ostensibly disparate facts into a holistic body of knowledge, akin to the *arbor scientiae*, constitutes an inevitable mandate imposed by the historical necessity of our time upon every researcher; that is, provided he or she does not content themselves with what Timon of Phlius (320–235 BCE) termed “wrangling in the birdcage of the Muses” (δηριόωντες Μουσέων ἐν τάλάρῳ; Clayman 2009: 11), or what Spengler disparaged as “*Ameisenarbeit*” (ant-work).

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