

---

# On the Next Stage of Earth's Macroevolution: Criteria for Identifying Leading Elements

---

**Pavel L. Krupkin**

*Centre for Modernity Studies, Moscow, Russia*

## ABSTRACT

*This study develops and applies criteria for identifying the leading structural elements of Earth's next macroevolutionary stage – through analysing previous evolutionary transitions from unicellular life to modern social structures: spatial restrictions for previous leading elements, emergence of 'incomprehensible-for-them' phenomena, and novel forms of systemic constraints. The application of these criteria to contemporary global developments suggests that clusters of states coordinated by ideologically-unified movements might represent emerging carriers of next-level complexity. The paper examines historical precedents of such structures and discusses potential paths for their development, including the possibility of multiple competing clusters. This approach offers a novel perspective on both the identification of evolutionary transitions and the analysis of current global transformations.*

**Keywords:** *macroevolution, evolutionary transitions, complexity theory, global development, social structures, evolutionary singularity.*

## INTRODUCTION

In his review of the rather popular idea of technological singularity, where he provided, among other things, an excellent literature review on the topic, Andrey V. Korotayev (Korotayev 2020), based on data from Alexander D. Panov, Ray Kurzweil, and Theodore Modis on Earth's macroevolution/Big History, showed that presentations of the

Recommended citation: Krupkin P. L. On the Next Stage of Earth's Macroevolution: Criteria for Identifying Leading Elements. *Social Evolution & History*, Vol. 25 No. 1, March 2026, pp. 92–100. DOI: 10.30884/seh/2026.01.05.

© 2026 'Uchitel' Publishing House

time series of significant innovations in this process from different sources lead to practically the same equation describing the growth of the temporal density of new developments in history (p):  $p = 2 / (2027-t)$ .<sup>1</sup> Korotayev also cites the results from Heinz von Foerster and Sergey P. Kapitza on the approximation of world population between 0 and 1950 (Korotayev 2020):  $N = 215000 / (2027-t)$ . These approximations (and many others – see the topic ‘technological singularity’ in existing literature, including the excellent book ‘*The 21<sup>st</sup> Century Singularity*’ [Korotayev and LePoire 2020] listed in the references) create expectations of some significant change in Earth's macroevolution that may occur soon, possibly even marking the discovery of an entirely new stage/level comparable to the emergence of life or mind. However, it is important to note that infinities exist only as mathematical abstractions, and the presence of a singularity in a model only shows the inapplicability of models in the vicinity of those parameter values where the model ‘goes to infinity.’ Discovering a singularity should prompt the search for additional factors that, while negligible in the normal range of the model, correct the model in the critical parameters area, thus eliminating the singularity. In particular, in population growth curves, such a factor has already appeared – the curves of the human population over time have already noticeably begun to slow down.

However, identifying the emergence of a new stage/level from the position of the leading elements/agents of the previous level is quite difficult. The structures and their behaviours at the new stage/level are typically ‘incomprehensible’<sup>2</sup> to the elements/agents of the previous level. For instance, in *biological cells*, atoms and molecules can be replaced by equivalents without affecting cellular functions. Similarly, diverse organisms have comparable cells organized into organs. On the other hand, it is known that the ‘leading structures’ of the next evolutionary level usually already exist during the previous stage, playing a secondary role in its ecosystem.

The present article is devoted to developing criteria for identifying such already existing structures that have the potential to become leading structures at the next evolutionary stage. It also identifies such structural elements in the present and discusses the obtained results.

## LEADING STRUCTURES OF EARTH'S MACROEVOLUTION AT DIFFERENT STAGES

Based on data from the works of Erich Jantsch (1980), Andrey Korotayev (2020), and Alexander Boldachev (2014), we can present the system of evolutionary stages/levels as follows:

### Life:

- L1: Pure biological adaptation, inter-generational flow of genes only.
- L2: L1 + proto-cultural adaptation, alongside genes, information (Dawkins's (1976) meme flow) is also transmitted between generations of certain species, *i.e.*, offspring training occurs.
- L3: The emergence of hominids/hominoids with their use of tools.<sup>3</sup>

### Mind:

- M1: Proto-mind, the beginning of conceptual thinking; petroglyphs, rock paintings, cave paintings, primitive figurines of Venus, jewelry; manifestations of beliefs.
- M2: Mind: compensation for the tribe division instinct in human tribes with more than 30 adults; settlements with large numbers of adults/extended families, temples, schools; counting and writing; along with learning errors and copying 'from nature,' task awareness and solution become a significant source of novelty; the beginning of the social stage/level of evolution.
- M3: The institutionalization of the cognitive sphere: scientific and technological institutions.

By their structure, the leading elements – the primary carriers of the complexity of the appropriate stage<sup>4</sup> – are distributed across these stages in the following way:

*Table 1*

**Leading Elements across the Stages of Earth's Macroevolution**

L1	Cell => Organism => Group =>
L2	Group+ (+ means offspring training) =>
L3	Tribe (hominids/hominoids + stone tools + fire) =>
M1	Tribe+ (humans + tools + fire + jewelry/art and manifestations of the sacred) =>
M2	Clusters of tribes/settlements => Clusters of tribes + clans/cities => Clusters of tribes + clans/cities and countries => The same + corporations
M3	Clusters of corporations/modern states => The same + social insurance systems

As previously noted, it is difficult for elements/agents of the previous evolutionary level to comprehend<sup>2</sup> the structures and order of the next evolutionary level. However, let us try to identify indicators that could allow lower-level imaginatively intelligent agents,<sup>2</sup> who have not been integrated into any symbiotic relationships with the 'new reality',<sup>5</sup> to reasonably assume that the next evolutionary stage has already begun. Let us consider several such scenarios:

1. *Cell => Organism*: Imagine ourselves as a single cell/microbe. How is it understood that organisms have become the leading element? First, I see entities similar to myself in some rigid connection, and outside this connection, they neither live nor survive. Those in the connection are somehow incomprehensibly differentiated by their roles, and overall, areas of space appear where I am not only 'unwelcome' but they try to kill me (an organism's immune system).

2. *Groups/organisms and transition L2 => L3 (tools)*: How can an element/agent from the outside understand that a fairly developed culture has already emerged? Some others begin to use something that I cannot. Stones fly at me, fire burns me, *etc.*, and I clearly recognize the spatial limitations for myself: it is better not to approach a proto-human settlement as it is dangerous for my life.

3. *Hunter-gatherer*: How is it understood that the social stage/level – M2 – has already started? I see unnaturally large groups of people, cities where people are somehow differentiated by their performed roles. These urban people are weak outside the cities, but they can bring large detachments that our tribe cannot handle. Inside and around cities there are many wonders – from abundant grain and livestock to large and decorated buildings. Moreover, space is essentially forbidden to me (and to us) – I am not welcomed, they try to kill me (or us) or deprive my (our) freedom, not only in the city but also around it, where there are fields and livestock, which I somehow cannot take to eat...

Analysis of these examples yields a set of indicators that allow the elements/agents of the previous level to infer the emergence of the next evolutionary level.<sup>6</sup>

a) In all transitions above (1–3) there were always spatial restrictions imposed on previously leading elements/agents, who suddenly become outsiders for some incomprehensible-for-them system within this space. Moreover, in this space, they 'see' many things that they poorly understand based on their experience of 'previous life'.

b) The permanent emergence of something new and incomprehensible; many ‘wonders’ emanating from the spaces described in point (a).

c) Unexpected ‘punishments’ that did not exist before; moreover, these ‘punishments’ are poorly understood from the agents’ previous experience.

#### **APPLICATION OF CRITERIA (a-c) TO HISTORICAL DATA**

Analysing the Western countries’ experience in recent decades through application of the criteria (a-c), we identify something unexpected and interesting (December 2024). Regarding points (b) and (c), we observe (I remind that we investigate the situation in these countries from an external perspective, from the standpoint of an ‘observer outside the new reality, who keeps the customs of the ‘old life’):

- *Dramatic changes in the lifeways of Western countries: a peculiar enforcement of social norms in favour of the LGBTQ+\* community, with punishments in the form of Cancel Culture and direct criminalization of attempts to limit the spread of these subcultures; the weaponization of global infrastructure within their sphere of control (global currencies, banking networks, etc.); American internal division and many things in the USA that were impossible before<sup>7</sup>; irrational decisions regarding European economy; the waves of anti-Russian and anti-Chinese propaganda and media; etc. There has been also a sharp devaluation of ‘peace’ and ‘peace dividends’ in world media, favoring militarization; total mobilization of countries of the Rules-Based-Order coalition<sup>8</sup> against Russia has occurred, with similar mobilization against China on the horizon.*

Regarding point (a), we can also note:

- *Consolidation of elites from 50 Western civilization countries, a high degree of coordination in actions of these countries. A trend toward ‘expulsion’ of Russian and Chinese citizens from controlled territories.*

Thus, the discovered criteria (a-c) identify a cluster of states with highly coordinated policies – states of the Rules-Based-Order coalition. The policy coordination within this cluster of countries is often attributed to influential networks, which include international corporations, intergovernmental organizations (e.g., those within the UN system), and prominent non-profit organizations, philanthropic founda-

tions, and academic institutions. The core of these networks is called by the Kremlin (outsider) as 'Western globalist elites' (GE).

Criteria (a-c) also applied for the early USSR and the Comintern – there was also much that was incomprehensible 'from outside', external to the countries and regions involved. Perhaps, the community of Catholic countries during the period of the Catholic Counter-Reformation (in the 17<sup>th</sup> century), when state policies were largely determined by the Vatican and the Jesuit Order, also fits criteria (a-c).

Generalizing these examples, we can say that the structural element/agent that falls under criteria (a-c) the found earlier is a cluster of states supplemented by various other corporations, whose policy coordination is provided by some kind of *order/movement*.

This structural element is a natural continuation of the sequence of leading structural elements across different stages of macroevolution (see Table 1 above).

### **SOME ASPECTS OF THE FOUND ELEMENT FOR FURTHER MACROEVOLUTION**

The previous section led to the proposal that the leading element of the next level of earth's macroevolution is a set of states united by elite with a certain common worldview, which enables coordination of large groups of highly skilled administrators and managers. Moreover, the collapse of communism demonstrates that not every such alliance can enter the organic structure of a new evolutionary stage. Whether the Rules-Based-Order/GE coalition will 'catch on' to the new stage is questionable. The main argument against this – no 'flow of wonders' is visible yet. However, this may be due to insufficient time, as the formation of this coalition occurred very recently in terms of earth's macroevolution timescales.

Another interesting problem arising from the current situation is the uniqueness of the identified candidate for structural leadership in the future. Each previous evolutionary stage functioned as an ecosystem characterized by a diversity of leading and secondary elements/agents, all contributing to the system's overall complexity. At each stage, there were multiple leading elements developing in parallel and competing with each other: many settlements emerged after the Neolithic revolution, many city-states emerged at the next stage, and there were many agrarian states after that... and even the industrial stage of

evolution was launched by several Western European states with fairly equal power.

The way to the ‘normal’ ecosystem in the next evolutionary (sub) stage could be several clusters/interstate associations united around already existing civilizational platforms. An equally ‘good’ option for macroevolution could be the division of the current Rules-Based-Order coalition into several parts.

Also, a possible way of forming a new stage/level ‘from the bottom up’ could be bringing existing large, highly differentiated states to the level of the Rules-Based-Order coalition. After all, China, Russia, India, and Brazil are already federations, i.e., unions of regions similar in size to small countries in the GE coalition, as well as the USA, which is incidentally its leading polity. However, currently these states – except for the USA – do not yet meet the criteria (a–c).

\* \* \*

Here we could also discuss how a candidate for leadership at the next (sub)stage of macroevolution might be structured in terms of its internal communication, knowledge circulation, hierarchy-network dichotomy, content of its ideology, degree of people-technology integration, usage of LLMs in its knowledge circulation and decision-making, *etc.* However, it's better to leave these topics for future work.

## CONCLUSION

Thus, a serious contender for the role of the leading element/agent of the possible next (sub)stage of Earth's macroevolution is a *cluster of states* supplemented by various other corporations whose policies and behaviours are coordinated by some overarching *order/movement*. Moreover, general selection criteria have been identified for such contenders from an external perspective:

- a) Spatial restrictions for non-included elements/agents, which were leading elements of the previous evolutionary stage/level; moreover, within this space, these elements ‘see’<sup>2</sup> many things that they ‘poorly understand’<sup>2</sup> based on their previous experiences.
- b) Constant emergence of something new and incomprehensible; many ‘wonders’ emanating from these spaces described in (a).
- c) Unexpected ‘punishments’ that did not exist before; moreover, these ‘punishments’ are poorly understood by victims from the previous experience.

## NOTES

\* This organization is forbidden in the Russian Federation.

<sup>1</sup> This equation is copied from Korotayev (2020) with rounding of numerical coefficients.

<sup>2</sup> Here, in my argumentation, I will use the imaginary 'presence of mind' in lower-level elements/agents in their 'upward look' at the structures of the next evolutionary level based upon them – purely for the sake of clarity of presentation.

<sup>3</sup> Alexander Boldachev, like some other researchers, proposes considering substage L3 of this article as already a part of the history of mind (Boldachev 2014), or, in the language of this paper, as substage M0. This approach is based on the view 'from the future,' when biological ancestors of humans (hominids and hominoids) are placed in the position of leading elements – just as tool producers – keeping continuity with the evolutionary stage that begins with substage M2 and is associated with developed human sociality. However, being 'inside that situation,' hominid tools, as a means of adaptation to the environment, differ little from other species' means of similar adaptation, for example, complex nests of birds and various collective insects – ants, termites, and bees. The stone industries did not change for thousands of years. And even before M1, when art emerged as an indicator of a certain threshold stage in the development of conceptual thinking, practices such as burials and caring for disabled people were observed for both Cro-Magnon and Neanderthal people.

<sup>4</sup> It should be noted that the process of defining macroevolutionary stages and assigning leading structural elements – carriers of complexity at these stages – already establishes the logic of consideration, the 'optics' through which we work. For example, in a different 'optics,' if we take the mass of an element in the Earth's ecosystem as a measure of its 'importance' (data on the masses of different biosphere components taken from <https://clck.ru/3Fpgsn>), then in such a metric, plants (90 %) and microbes (about 7 %) would currently 'lead,' while all animals contribute less than 0.5 % of the biomass of the Earth. However, among mammals (whose contribution is in the hundredths of a percent), humans and their livestock would undoubtedly dominate.

<sup>5</sup> A focus on 'how it was' and independence from newly emerging structures are important characteristics in the practical application of these indicators.

<sup>6</sup> These criteria align closely with Fred Spier's 'Goldilocks conditions,' which describe the optimal factors enabling transitions between macroevolutionary stages (Spier 2012).

<sup>7</sup> A well-documented description and analysis of current events in the USA can be found in the book (Turchin 2023). However, it is important to remember that our interest here is not in the break of the state's self-reproduction, which usually occurs during revolutions or elite overproduction crises, but rather in the emergence of a new self-reproduction that 'refines' the previous social order.

<sup>8</sup> The ‘Rules-Based Order’ is the flag under which the coalition of Western countries presents itself currently (December 2024). This coalition meets the criteria (a-c) developed in this article, emerging as an example of a possible leading element of the next (sub)stage of macroevolution. The brand of the coalition began to be used in the mid-2010s (Scott 2021). Some details about the coalition can be found in (Krupkin 2023). A characteristic feature of the Rules-Based-Order coalition is the ambiguity of these very rules (often expressed as ‘*but this is a completely different case!*’), and the transformation of all globally controlled common good structures – global currencies, banking infrastructure, social networks, *etc.* – into instruments of influence.

## REFERENCES

- Boldachev A. V. 2014. Structure of Global Evolutionary Levels. *Philosophical Storm: Website*, March 16. URL: <http://philosophystorm.ru/node/5296>. Accessed December 1, 2024. *In Russian*.
- Dawkins R. 1976. *The Selfish Gene*. Oxford University.
- Jantsch E. 1980. *The Self-Organizing Universe: Scientific and Human Implications of the Emerging Paradigm of Evolution*. Pergamon Press.
- Korotayev A. V. 2020. The Twenty-First-Century Singularity in the Big History Perspective – A Re-analysis. In Korotayev, A. V. and LePoire, D. J. (eds.), *The 21<sup>st</sup> Century Singularity and Global Futures: A Big History Prospective* (pp. 19–76). Springer.
- Korotayev, A. V., and LePoire, D. J. (eds.) 2020. *The 21<sup>st</sup> Century Singularity and Global Futures: A Big History Prospective*. Springer.
- Krupkin P. L. 2023 Heroes of the Rules-Based Order. *Russkaya Pravda*, November 21. URL: <https://clck.ru/3Fq48y>. Accessed January 19, 2025. *In Russian*.
- Scott B. 2021 Rules-Based Order: What’s in a Name? *The Interpreter*, June 30. URL: <https://www.lowyinstitute.org/the-interpreter/rules-based-order-what-s-name>. Accessed January 19, 2025.
- Spier F. 2012. Big History. In Northrop, D. (ed.), *A Companion to World History* (pp. 171–184). Wiley-Blackwell.
- Turchin P. 2023. *End Times: Elites, Counter-Elites, and the Path of Political Disintegration*. Penguin.