

# Civilizationology: Subject and Tasks of a New Meta-Science

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## Abstract

This article substantiates the necessity of establishing a new meta-science — civilizationology — whose subject is civilization as an integral phenomenon. It is shown that existing knowledge about civilizations is fragmented across numerous specialized disciplines, which hinders the formation of a general theory of their emergence, development, and interaction. The article proposes a definition of the object and subject of study, key phenomena, primary parameters for quantitative analysis, as well as the theoretical and applied tasks of the new discipline. The article relies exclusively on generally accepted scientific terms and concepts.

Keywords: civilization, civilizationology, meta-science, interdisciplinarity, civilizational dynamics, parameters of civilizations.

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## 1. Why Civilizationology Is Needed: The Problem of Fragmented Knowledge

Civilizations are currently studied by many sciences: history, archaeology, sociology, economics, political science, anthropology, cultural studies, astrobiology, and others. Each of these disciplines makes an important contribution, but does so fragmentarily, from its own methodological positions and using inconsistent conceptual frameworks.

As a result:

- there is no unified theory of the civilizational process;
- there is no commonly accepted system of parameters for comparing different civilizations (Earthly civilizations from different eras and, potentially, extraterrestrial ones);
- long-term trajectory forecasting of the development of human civilization in the face of global challenges is hindered.

Civilizationology is intended to fill this gap. It does not replace existing disciplines but serves as a meta-disciplinary framework that ensures their synthesis and the development of a common language for describing and analyzing civilizations as integral systems.

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## 2. Object and Subject of Civilizationology

### 2.1. Object of Study

Civilization — understood in its broadest sense: as a large-scale form of social organization characterized by:

- large population;
- developed division of labor;
- presence of writing (or other systems of external symbolic information fixation);
- creation of cities and other artificial living environments;
- existence of state, legal, economic, and other institutions not reducible to biological forms of coordination.

This concept includes both ancient civilizations (Sumerian, Egyptian, Chinese, Indus Valley, etc.) and modern ones (industrial, post-industrial, the global technospheric civilization), as well as, prospectively, hypothetical extraterrestrial civilizations.

### 2.2. Subject of Study

Universal patterns of genesis, structure, functioning, dynamics (growth, crises, transformation, decline, inheritance) of civilizations as complex adaptive systems.

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## 3. Key Phenomena to Be Studied

Within the framework of civilizationology, it is proposed to distinguish three groups of phenomena.

### 3.1. Phenomena of Civilizational Genesis

- Conditions and triggers for the transition from pre-class/pre-agrarian societies to civilization.
- The role of demographic, environmental, technological, and informational factors.
- Comparative analysis of the emergence paths of known civilizations.

### 3.2. Phenomena of Internal Dynamics

- Energy and material metabolism of civilization: resource flows, their extraction, transformation, and utilization.
- Informational dynamics: accumulation, storage, transmission, and transformation of knowledge and cultural codes.
- Social stratification and institutional evolution.
- Cycles of growth, stabilization, crises, and collapses.

### 3.3. Phenomena of Interaction

- Competition, cooperation, diffusion of technologies and cultural practices between different civilizations.
- The impact of civilizations on the environment (up to the planetary scale in the modern era — the Anthropocene concept).

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#### 4. Primary Parameters for Quantitative Analysis

To transition from qualitative description to measurable and comparable analysis, the following primary parameters are proposed (the set may be refined and expanded as the discipline develops):

- Population (N) — the basic demographic scale of a civilization.
- Per capita energy consumption (E) — an indirect indicator of technological level and economic activity.
- Urbanization level (U) — the share of the population living in cities and other artificial environments.
- Literacy / access to information level (L) — an indicator of the prevalence of symbolic information processing.
- Technological Complexity Index (TCI) — an aggregated indicator (e.g., based on the diversity of technological classes, degrees of freedom of tools, knowledge-intensiveness of products).
- Degree of social stratification (G) — e.g., the Gini coefficient or other inequality measures.
- Environmental Transformation Coefficient (T) — e.g., the share of territory directly transformed by human activity (cropland, pastures, cities, infrastructure).

In the future, these parameters can be operationalized for retrospective measurement (historical civilizations) and extrapolation (hypothetical extraterrestrial civilizations, e.g., in the context of SETI).

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#### 5. Research Methods

Civilizationology as a meta-science does not create its own methods "from scratch" but systematically uses and synthesizes methods from other disciplines:

- historical and archaeological reconstructions;
- comparative analysis;
- mathematical modeling (agent-based models, network theory, nonlinear dynamics);
- big data analysis (digital historical corpora, databases on energy consumption, urbanization, etc.);
- methods of astrobiology and SETI for extrapolation to extraterrestrial civilizations.

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## 6. Theoretical and Applied Tasks

### 6.1. Fundamental Tasks

- Development of a general theory of civilizational dynamics.
- Creation of a comparative taxonomy of civilizations based on available empirical parameters.
- Identification of stable patterns (universals) and factors leading to civilizational crises or transitions.

### 6.2. Applied Tasks (Earthly Horizon)

- Development of "civilizational audit" tools for diagnosing the sustainability of modern societies.
- Forecasting the consequences of long-term global trends (climate change, resource depletion, demographic transitions).
- Formulation of long-term development scenarios for human civilization within natural-economic and geopolitical dynamics.

### 6.3. Cosmic Horizon

- Development of predictive models for the search for technosignatures of extraterrestrial civilizations (based on patterns identified from Earthly material).
- Preparation of conceptual frameworks for the interpretation of possible contacts.

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## 7. Relationship to Existing Disciplines and Conclusion

Civilizationology is not a replacement for history, archaeology, sociology, political science, or other sciences. It offers a meta-disciplinary integration of their results and the development of a general explanatory scheme, analogous to how ecology integrates knowledge about the interrelationships of organisms, or how cliodynamics formalizes historical processes.

The emergence of civilizationology is timely in the era of globalization, the Anthropocene, and the active search for extraterrestrial intelligence. Without a holistic understanding of civilization as a phenomenon, humanity risks searching for answers to global challenges within the framework of partial disciplines, failing to see the full picture.

The development of civilizationology is an urgent task for the science of the 21st century.

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## Literature

1. Vernadsky, V. I. (1944). A Few Words on the Noosphere. *Uspekhi Sovremennoi Biologii*, 18(2), 113–120.
2. Danilevsky, N. Ya. (1871). *Russia and Europe*. St. Petersburg.

3. Kardashev, N. S. (1964). Transmission of Information by Extraterrestrial Civilizations. *Astronomical Journal*, 41, 282.
4. Sorokin, P. A. (1937–1941). *Social and Cultural Dynamics* (4 vols.). American Book Company.
5. Toynbee, A. J. (1934–1961). *A Study of History* (12 vols.). Oxford University Press.
6. Huntington, S. (1996). *The Clash of Civilizations and the Remaking of World Order*. Simon & Schuster.
7. Spengler, O. (1918–1922). *Der Untergang des Abendlandes*. C.H. Beck.
8. Turchin, P. (2003). *Historical Dynamics: Why States Rise and Fall*. Princeton University Press.
9. Diamond, J. (1997). *Guns, Germs, and Steel: The Fates of Human Societies*. W.W. Norton & Company.
10. Wilson, E. O. (1998). *Consilience: The Unity of Knowledge*. Knopf.

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#### Author's Note

This article postulates civilizationology as a meta-discipline based on generally accepted terms and approaches. The concepts developed by the author — the Symbolic Circuit of Civilization (SCC) and the status of civilization as a special form of matter (within the framework of the hypothetical "Seven Forms of Matter" model) — are not required for accepting civilizationology and will be presented in separate works as additional tools for in-depth analysis.

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