



LAWS & RULES of BIG HISTORY BIOLOGICAL AND SOCIAL PHASES

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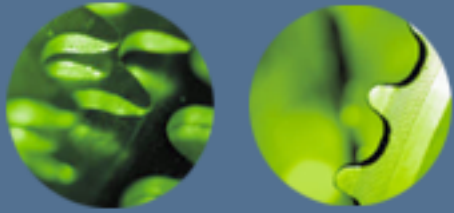
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LAWS & RULES

In our monograph we have collected and formulated more than 70 rules, principles, and laws that may be applied to the both phases of Big History.

In this presentation we discuss only a few rules and laws.

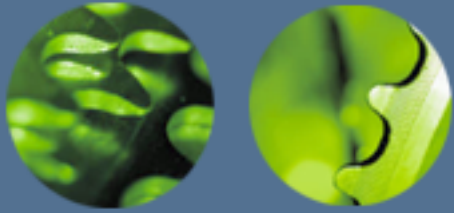




LAWS & RULES

We have subdivided these laws and rules into three large blocks:

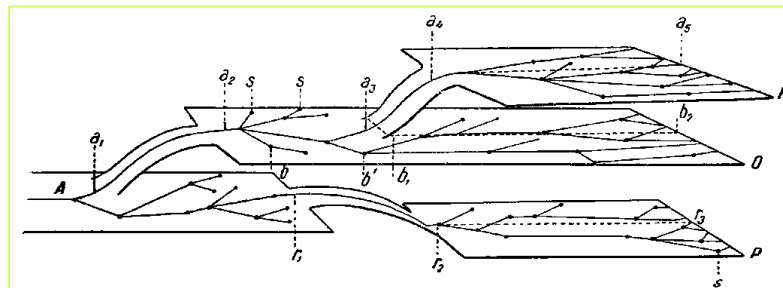
1. a group of rules connected with mechanisms of aromorphosis formation and diffusion;
2. a group of rules connected with the change of macroevolution speed;
3. a group of general regularities connected with directionality of evolutionary processes.



BIOLOGICAL & SOCIAL AROMORPHOSES

Aromorphosis is a concept that was elaborated by Russian scientists in the 20th century.

Aromorphosis is an increase in the organization level that makes it possible for aromorphic organisms to exist in more diverse environments in comparison with their ancestors; this makes it possible for an aromorphic taxon to expand its adaptive zone (Alexei S. Severtsov).



http://www.socionauki.ru/authors/grinin_l_e/other/



BIOLOGICAL & SOCIAL AROMORPHOSES

Examples of major biological aromorphosis:

Emergence
of eukaryotic
cell

Origin of
*Homo
sapiens*

Unicellular
organisms
transformed to
multicellular
ones

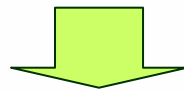
Transition
of plants,
arthropods,
vertebrates to
life on land

Origin of
mammals
from
theriodonts



BIOLOGICAL & SOCIAL AROMORPHOSES

In order to improve the operationalization level as regards the comparison between phases of Big History we suggested extending the term **aromorphosis** from biological domain to the social one.



Social aromorphosis is a rare qualitative macrochange that increases complexity, adaptability, and mutual influence of social systems very significantly and opens new possibilities for social development.



BIOLOGICAL & SOCIAL AROMORPHOSES

Transition
to food
production

Examples of social aromorphoses of the highest type:

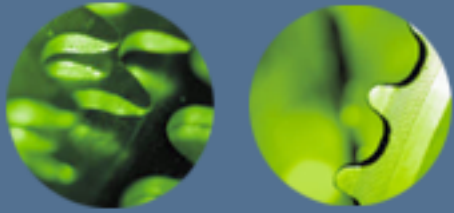
Invention of
computer
technologies

State
formation

Transition
to iron
metallurgy

Transition to
mechanized
production

Development
of electrical
technologies

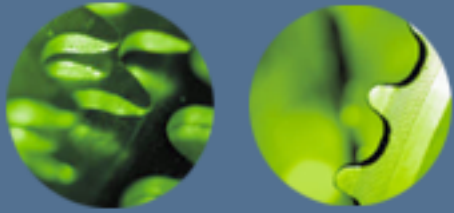


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EVOLUTIONARY ALGORITHM

Four rules formulated by us can be presented as an evolutionary algorithm composed of four steps.

STEP 1. ORIGIN OF CONDITIONS (Sufficient diversity rule)

STEP 2. LEADERS RELIEVE ONE ANOTHER (Rule of the aромorphic 'relay-race')

STEP 3. BIG HISTORY SAVES INNOVATIONS (Rule of 'block assemblage')

STEP 4. FROM EVOLUTIONARY LABYRINTH TO PROGRESS (Rule of 'Payment' for the Aromorphic Progress)



STEP 1. ORIGIN OF CONDITIONS

Sufficient diversity rule means that the niches accessible for the given evolutionary level are to be filled.

Aromorphoses need to be supported by objective necessity to look for new ways of development.



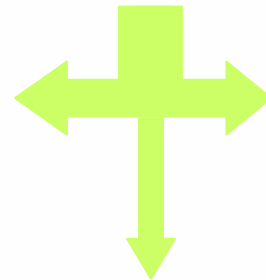


STEP 2. LEADERS RELIEVE ONE ANOTHER

Rule of the aromorphic 'relay-race':

The same group of organisms or societies cannot remain permanently the evolutionary leader that constantly gives birth to a chain of aromorphoses.

Aromorphoses
emerge in new taxa
and societies.



A chain of major
aromorphoses
emerges due to
succession of various
groups.

Arogenic trajectory is
far from a straight line.



STEP 3. HOW BIG HISTORY SAVES INNOVATIONS

The rule of 'block assemblage' or modularity in evolution

Genomes of almost all living beings are very similar. For example, genomes of a mouse and a human have 91% of identical genes; genomes of a chimpanzee and a human have 98% of the same genes.

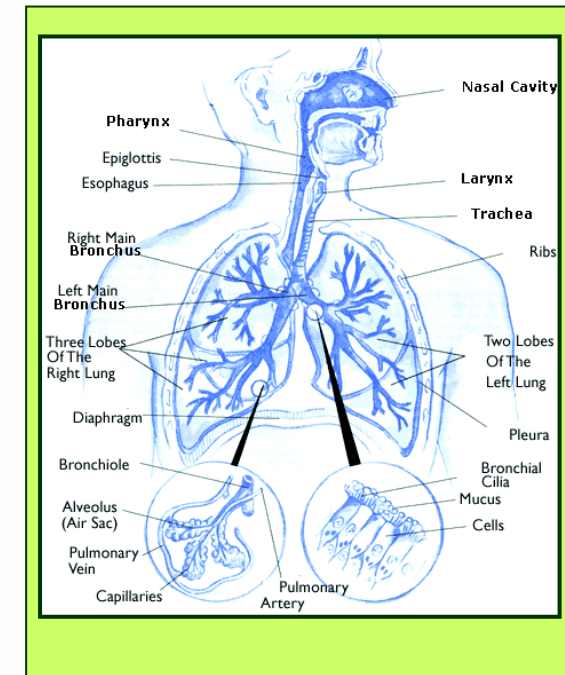


Biotechnologies and genetic engineering are based on this similarity of genes.



STEP 3. HOW BIG HISTORY SAVES INNOVATIONS

- The systems of respiration, circulation of blood, reproduction *etc.* are copied with local variations from taxon to taxon.
- Wholesale systems of political organization, religions, laws, writing *etc.* were borrowed.
- A ‘block assemblage’ accelerates strongly the evolution speed.
- Evolution speed becomes faster with every large aromorphosis.



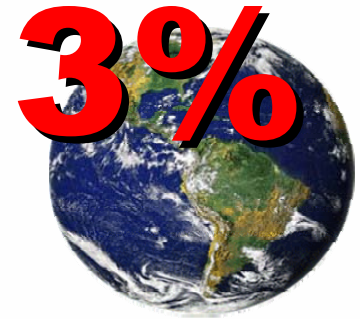


STEP 4. FROM EVOLUTIONARY LABYRINTH TO PROGRESS

The Rule of 'Payment' for the Aromorphic Progress

The emergence of major aromorphoses takes place against the background of extinctions and unsuccessful evolutionary 'attempts' of many species and societies.

Several millions species in biosphere today make up only 3% of all species ever lived on the Earth.



**IT'S KNOWN IN
HISTORY**
many thousands of polities



NOW
over 200
states



STEP 4. FROM EVOLUTIONARY LABYRINTH TO PROGRESS

❖ **Social evolution** should not be compared with a wide ladder but rather with **a labyrinth**, an arogenic way out of which can be found only by a very few societies.





STEP 4. FROM EVOLUTIONARY LABYRINTH TO PROGRESS

The Rule of 'Payment' for the Aromorphic Progress demonstrates triumph & tragedy in evolution.

**Extinction, stagnation,
movement sideways of many
societies**

**for the
sake of**

**Evolutionary breakthrough to
a new level**



STEP 4. FROM EVOLUTIONARY LABYRINTH TO PROGRESS

- ❖ At present, the risk of extinction for societies decreased.
- ❖ Along with the globalization the risk of extremely high payment for progress has even increased, since now it concerns humankind as a whole.





**Thank you
for attention!**

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