Mega-History and the Twenty-First Century Singularity Puzzle

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ABSTRACT

A series of calculations carried out independently by the Australian, Russian, and American researchers have demonstrated that a crucial global polyfurcation is expected somewhere near the middle of the twenty-first century. This result is drawn by extrapolating into the future the logarithmic acceleration law, which involves the phase transitions in the evolution of biosphere and anthroposphere. The paper investigates the palliatives of the planetary civilization beyond the big evolutionary Singularity in the context of Mega-history and complexity theory worldviews. It gives a universal ground to the mathematical deduction and besides, helps involve some recent discoveries in psychology and cultural anthropology to tracing the forecasted attractors and scenarios. The destiny of the Earth (as well as of any other planetary) civilization may conclusively depend on whether or not the intellectual actor succeeds in developing the inner regulation to balance the potentially unlimited developments in technological power. Particularly, this includes overcoming the macro-group identities, religious and quasi-religious ideologies, which always suggest a friend-or-foe discrimination matrix.

THE CONSTRUCTS OF WORLD, GLOBAL AND UNIVERSAL (BIG; MEGA-) HISTORY

Three competing patterns kept on the agenda in the historical discussions throughout the nineteenth and twentieth centuries. One

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was a Eurocentric, linear and teleological view of history as a consistent progress 'from the worse to the better' aimed at a perfect future state. Another (unintentionally fortified by thermodynamics) was a descent from the deific past to an atheistic chaos. The third one argued that there had never been a 'human history' but the cycles of ascent, flourishing and descent of regional civilizations without causal successions or universally valid events.

Meanwhile, the multiple discoveries in the twentieth-century sciences made it possible to single out no less than seven crucial landmarks in panhuman history and prehistory (like the Neolithic Revolution or the Axial Revolt, *etc.*) and a distinct succession in humankind's development in spite of never-ending cycles in regional stories. Moreover, the prevailing vectors in social evolution continue those observed in the evolution of biosphere and after all, the cosmo-physical evolution of Metagalaxy.

From there, we can discriminate between the subjects of *world history*, *global history* and *Universal (Big or Mega-) History*, which together give us an integral view of the past so far as it is traceable today and a context for careful anticipations. In continuation, the adapted fragments from the monograph (Nazaretyan 2015) are exposed with minimal references. For more detailed arguments, examples and bibliography see the author's publications available in English (Nazaretyan 2005a, 2005b, 2009, 2010a, 2010b, 2014a, and 2014b).

The world history paradigm was formulated by the end of the eighteenth century, together with national histories, under the influence of the ideas of humanism and progress. It is based on the evolutionist methodology, and nowadays involves all of social and cultural events since the Paleolithic up to modern times.

The global history concept is a product of the first half of the twentieth century, as the close mutual influence of geological, biotic and social processes was discovered. It studies successive births and transformations of the planet's spheres in which first biota and thereupon culture became the leading agents. The global history founders, Pierre Teilhard de Chardin and especially Vladimir Vernadsky, like most of their contemporaries, believed that Earth and Solar system were the maximum domain of evolution, for the universe was infinite in space and time, invariant and therefore deprived of history.

Later on, cosmology expelled the stationary model and so the integral image of the past enlarged up to the evolving Metagalaxy. The final crystallization of Mega-History subject has happened due to the discovery of another crucial fact: *we can distinctly trace back the common vectors for the successive transformations in cosmic Universe, Earth's crust, biosphere, society and intelligence*. For all that, though no direct contradictions with the physical irreversibility laws are found, the orientation of the vectors discord with the classical natural science paradigm.

Namely, the Metagalaxy has been successively evolving from the more probable random states (or 'natural' ones, from the 'entropy' point of view) to the less probable ('unnatural') ones, so that the histories of biosphere and anthroposphere are the localized phases of the single universal process. To give it a sharp graphic form, the pivotal evolution vector may be drawn as 'moving away from the natural state'. The growing complexity mega-trend so apparently contradicts the suggestions inferring from the classical natural history (time as growing entropy; heat death theory) and so reliably corroborated by the empirical data of modern sciences and humanities that the astrophysicists have to distinguish between the *thermodynamic arrow of time* and the *cosmological arrow of time* and look for their causal relations (Chaisson 2006) (see Fig.1).

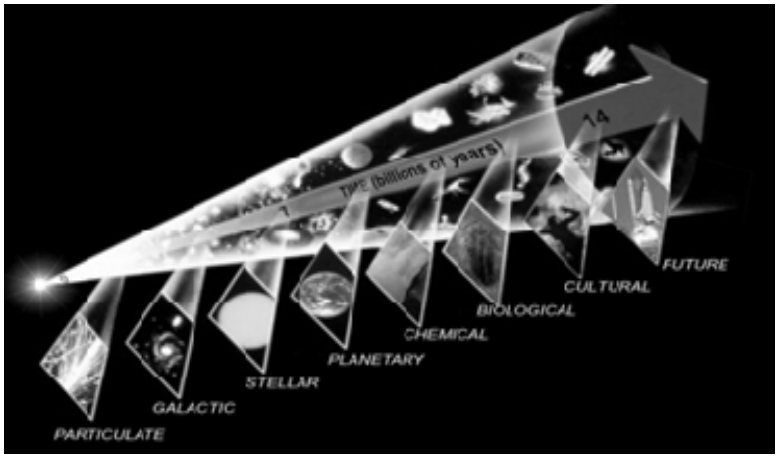

Fig. 1. The stages of cosmic evolution (from http://www.eskesthai.com/2010/07/cosmic-evolution-and-powers-of-ten.html). The picture is published by the courtesy of its author Eric Chaisson

A question at the heart is why the evolution has gone in such a strange direction; we find various answers up to the obviously teleological and theological ones in relevant literature. An effective background for cross-disciplinary patterns free from the divine and/or telic assumptions is provided by modern *complexity theories* (their equivalents are called *synergetics* in Germany and Russia, *non-linear thermodynamics* in Belgium and France or *dynamic chaos theory* in the USA). Such theories allow seeing the perfection of negentropy mechanisms not as the aim but as a means for non-equilibrium systems' (nature and society) resistance in the conditions of decreased sustainability. Thus, in the self-organization pattern, 'human history is the story of one… system, which exists on the scale of a million or so years' (Christian 1991: 238), and has to evolve to sustain itself.

However, is it true that the vector mode correctly describes the empirical data of social history? The heated discussions around these issues are mainly due to the opponents' unwillingness to alternate the distances, the exposures and the optic instruments in order to vary the pictures.

Many details are perceived through the microscope, whereas perspectives and trajectories vanish. Wide-angle lens shows how civilizations, tribes and families grow, flourish and degrade, and how all the lines break, branch out and often curve down. At the same time, in this case the researcher finds no correlation between the parameters of social transformation in different local objects and comes to the conclusion that history is multiline or cyclic. He notices separate trees, bushes, branches and leaves, each of which is mainly original, but a wide-angle lens captures no long-term trends or regularities.

Not to miss the forest for the trees, a telephoto lens is required, which opens the smallest scale and thus very large time and space blocks. It makes possible to compare the states of society for highly remote time sectors. In this case, we may observe a set of reliable correlations, and also reveal that neither tribes or states, nor 'civilizations' but the humanity in its broadest sense, and even the whole *hominidae* family, has been the subject of evolution. Similarly, to discover the global biological evolution one should de-emphasize separate populations, species or even ecosystems and compare the conditions of the biosphere at different levels of the

geological time table; this way the successive growth of morphological and behavioral diversity and 'intellectual' qualities, and the increasing influence of the biota on the geological processes are evident.

Since hominids have once and for all turned to tool making, in spite of countless divergences, migrations and isolations, culture as a super-natural reality has been a single and common planetary phenomenon, which is proved by multiple particular observations. As to the explosive growth of local varieties since the Middle Paleolithic, it was a typical process of the evolving system's inner diversification.

Turning to the telescopic retrospection, it makes obvious the fact of directional social transformations in the sweep of time, as well as the conjugation of the vectors, which can hardly be shown at the scale of separate societies. We have singled out six conjunct social evolution vectors: *growth of world population, of technological power, organizational complexity and information capacity of the intelligence, the improvement of mechanisms for cultural regulation* and *growing specific weight of virtual realities*.

The first three vectors are deduced as 'empirical generalizations' and can be easily supplied with mathematical figures. The other three have been traced back via special methods and arguments. However, all of them keep within the integral grotesque formula 'moving away from the natural state', *i.e.* the integral society-nature system has been successively withdrawing from the 'natural' ('wild') condition, assuming more and more anthropomorphic and culture-centered features; the degree of tool (including sign) mediation in society-nature and intra-social relationships and individual psychic reflection has been increasing. So the kernel of global causalities was successively shifting towards the mental phenomena, especially after the first Neolithic agrocoenosis had marked the initial regeneration of the wild biosphere into the anthroposphere or Noosphere which is an integral nature-culture system.

Leadership in the many-thousand-years marathon has intermittently shifted from one region or continent to another including Australia (the first cave pictures, stone tools with polished handle and blade, and the first boats were invented there); Europe and then North America were preeminent for the latest centuries. The most paradoxical fact is discovered by the analysis of the anthropogenic

crises, especially the global ones. Contrary to some modern ecologists' slogans ('Back to Nature!' *etc.*), each aggravation in society-nature relations has been radically overcome not by convergence between society and nature but vice versa, by a next spire of 'denaturalization' of the society together with its native habitat.

We may easily reveal this fact by comparing the hunter-gatherer economy with the food production, or the industrial civilization with the agricultural one, or the information society with the industrial one. Each leap was foregone by a complex crisis of the former activities and accompanied by transformations of all the conjunct parameters. As a result, the humans' ecological niche broadened and deepened, the population increased, along with technologies, needs and ambitions, and… the movement towards the next crisis continued.

THE PATTERN OF TECHNO-HUMANITARIAN BALANCE

During World War II, the German philosopher and sociologist Norbert Elias, a Jew who had lost his relatives in the Holocaust, demonstrated by figures that the 'civilizing process' had been reducing the percentage of violent deaths (Elias 2000 [1939]). Later on, this suggestion was confirmed by the comparative calculations made by British, American (Pinker 2011) and Russian scholars. Thus, we used a cross-cultural index – *Bloodshed Ratio (BR)*, or the ratio of the average number of killings *(K)* per unit of time to a population size (*P*) during a given period (*Δt*). The number of killings included wars, political repression and everyday violence:

$$BR = \frac{K\left(\Delta t\right)}{P\left(\Delta t\right)} \qquad (1)$$

A more specified formula is applied to consider the *BR* per centuries. In general, the specific estimates have demonstrated that over the course of millennia the violent death rate has been nonlinearly but successively decreasing while both the destructive potential and population densities have had a distinctly upward trend.[1]

It can hardly mean the humans' 'lowering aggressiveness': inversely, the psychological experiences show that population densities beyond the natural ecological niche make humans, similar to the animals, increasingly aggressive. To explain the contrasting combination of the long-term trends, we should assume a more

likely factor, which has compensated for the growth in tool potential. A hypothesis to explain its essence arises from different empirical data; in fact, our calculations are conducted to check a corollary of the hypothesis.

Summing up the diverse information from cultural anthropology, history and historical psychology concerning anthropogenic catastrophes, we find a regular relation between three variables: technological potential, quality of cultural regulation and social sustainability. *The law of techno-humanitarian balance* states that *the higher the power of production and war technologies, the more advanced behavior-restraint is required to enable self-preservation of the society.*

What we refer to as the *law* is inferred from empirical observations. Respective *hypothesis* claims that this has been a selective mechanism of viable social systems over the time of human history and prehistory.

The circumstances of the early hominids' existence were of the kind that only an essential development of tool intelligence gave them a chance to survive. Meantime, having begun tool making, they dramatically interfered with the *ethological balance* between the force of wild animals' natural weapons and the instinctive inhibition of intra-species killing. The power of artificial weapons rapidly exceeded the power of instinctive aggression-inhibition (the *Homo habilis* in the Olduvai Gorge used to crush one another's skulls with their choppers), and the proportion of mortal conflicts grew to the extent incompatible with the original tool-makers' further existence. This can be the main reason for the fact demonstrated in archeology: many groups seem to have been on the borderline between animals and proto-humans, yet very few could have crossed it.

Since the individuals with normal animal motivation were doomed to mutual destruction in the new unnatural conditions, certain psychastenic and hysterical individuals got selective privileges. Their survival required artificial (beyond biological instincts) collective regulation, which was paradoxically provided by pathological changes in the psycho-nervous system, abnormal mental lability, suggestibility and phobias. Thus, the origins of animism and irrational fear of the dead and posthumous revenge is supposed to strongly restrain in-group aggression and stimulate care for the

handicapped: archeology gives us evidence of such biologically senseless facts in the Early Paleolithic.

The assumption of a 'herd of neurotics' as our remote ancestors has been thoroughly argued by neurologists, cultural anthropologists and psychologists. Here, the relevant point is that the initial forms of proto-culture and proto-morals emerged as an outcome of the first *existential crisis* in human prehistory.

From the *Habilis* on, hominids' unnatural intra-species killing facility seems to have been a key problem of pre-human and human history: the ways of solving this existential problem influenced essentially the forms of social organization, cultural and spiritual processes. So far as further life of the *hominidae* family (including our own species, the *Neoanthropes*) has not had a natural background any longer, it was to a great extent enabled by the adequacy of cultural regulation with technological power. As the tool makers were increasing their power and aggressiveness, culture developed more and more intricate means of aggression-sublimation to adjust to the growing destructive facilities; the mechanism of techno-humanitarian balance was discarding social organisms that could not adapt to their tools' power.

The pattern resolves the paradox of decreasing physical violence versus growing destructive resources. Besides, it helps explain causally both the sudden collapses of flourishing societies and the breakthroughs of humanity into new historical epochs (which often look still more mysterious).

For an initial and rough guide, a formal apparatus distinguishes between *internal* and *external sustainability*. The former *Si* expresses the social system's capability to keep away from endogenous catastrophes. The latter *Se* is capability to withstand fluctuations in the natural and geopolitical habitat.

If we refer to the quality of cultural regulation as *R*, and technological potential as *T*, a simple equation represents the pattern

$$Si = \frac{f_1(R)}{f_2(T)} \qquad (2)$$

It stands to reason that $T > 0$, for in case of no technology at all we are dealing with a *herd* (not a society) where biological causalities are effective. If technological potential is very low, primitive regulation means is sufficient, as in case of the Paleolithic tribes

(like the regular infanticide to prevent demographic overflow). A system is highly sustainable, up to stagnation, as cultural regulation quality exceeds the technological might (Medieval China is a textbook example). Finally, the denominator growth raises the probability of anthropogenic crises if it is not compensated by the numerator growth.

The aggravating misbalance usually provokes the psychological effects, which entail a crisis-causing behavior. Shortly, once the new technologies exceed the former cultural restrictions, public attitudes and sentiments get peculiar features. A sense of omnipotence and permissiveness is intensified together with the increasing needs and ambitions. Success euphoria produces an impatient expectation of new successes and an irrational thirst for 'small victorious wars' – a *mass complex of catastrophophilia*, in terms of Peter Sloterdijk (1983). The subjugation process and a search for new moderately resisting enemies are getting self-valuable, while as we know from the specific experiments (Petrenko 2010), strong emotions flatten the worldview (reduce the semantic space dimensionality). A more primitive worldview entails impulsive decision-making, and the numerator index in Equation (2), instead of increasing in proportion to the denominator's growth, is falling. Thus the cultural imbalance lowers the society's sustainability.

Abstracting here from more psychological details, suffice it to note that the unbalance is fraught with ruinous effects either in case of war or production technologies. For instance, Toynbee (1987) cited various examples to illustrate the inverse relationship between 'military and social progress' and was puzzled by the fact that this was true about production tools as well as weapons. William McNeill (1992: 148) wrote: 'It certainly seems as though… every heightening of efficiency in production were matched by a new vulnerability to breakdown.'

Numerous facts gathered in relevant papers testify to the distressing destiny of societies that could not anticipate the delayed effects of their economic activities. In spite of all peculiarities, a common script was simple: increasing intervention into the ecosystem → landscape destruction → social catastrophe.

In contrast, particular studies of wars and natural hazards have demonstrated that the external sustainability is the technological potential's positive function:

$$Se = g\,(T...) \qquad (3)$$

Hereby, *growing technological potential makes a social system less vulnerable to external fluctuations and more vulnerable to the internal ones, i.e. mass mental states, failed decisions of influential leaders or other destructive individual activities (less 'fool-proof').*

One more conclusion is that the specific weight of anthropogenic crises versus the ones caused by outside factors (spontaneous climate fluctuations, geological or cosmic cataclysms, aggressive nomads, and so on) has been historically increasing. Accordingly, time intervals between the global man-made crises in history have been successively shortening. What is still more remarkable, this trend keeps on the biospheric trend of evolution-acceleration.

THE SINGULARITY PUZZLE

The cosmological arrow looks rectilinear on Fig. 1; yet, the cumulative changes have not been uniform. The first billions of years after the Big Bang, the evolution was slowing down until heavy elements were synthesized in the depths of the first generation stars and ejected into the cosmic space by supernova explosions. This initiated an additional self-organization mechanism with competition for free energy (the heavy elements unlike the light ones need energy feed from outside). Thus about 10 billion years ago, as the evolution went its way towards organic molecules and living matter, the slowdown changed into acceleration (Panov 2005b) (see Fig. 2).

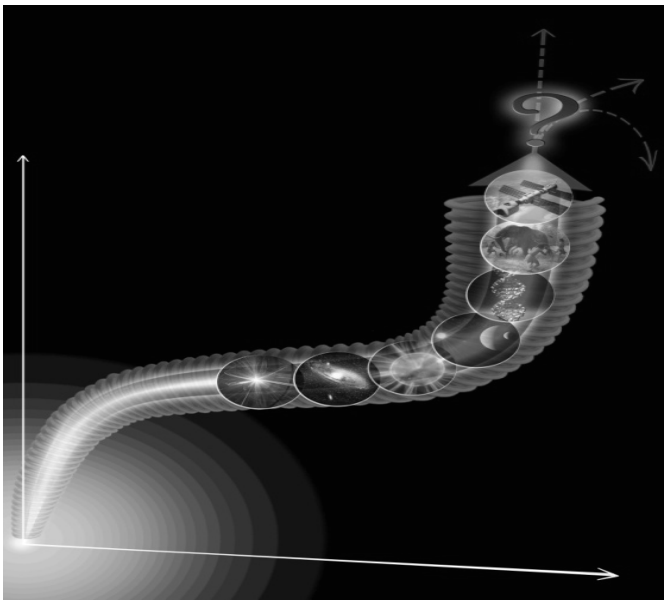

Fig. 2. The two hoses of universal evolution (by Alex Pinkin). Nazaretyan 2015

Solar system emerged near 4.6 billion years ago, and the first signs of living organisms on Earth are recorded since about 4 billion years ago[2]; thus our planet was one of (probably various) points, on which further cosmic evolution was localized. Although the fact of its consecutive acceleration is obvious for any global analyst, an additional and wonderful discovery belongs to the latest decades. The Australian economist Graeme Snooks (1996), the Russian physicist Alexander Panov (2005a, 2005b) and the American mathematician Raymond Kurzweil (2005) independently on different sources and with different mathematical apparatus compared the successive time intervals between the phase transitions in biospheric, pre-social and social evolution. The calculations demonstrate that the intervals have been shortening in accordance with a rigorous decreasing progression, and thus the evolution on Earth has been accelerating under the logarithmic law (see Fig. 3).

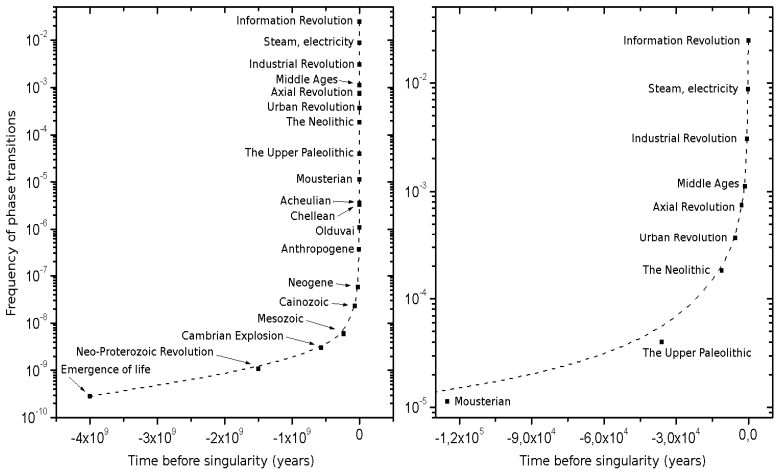

Fig. 3. Scaling law in the phase transitions. From Panov 2005b

Like all of the fundamental discoveries, the scale is highly counter-intuitive, in other words, it strongly conflicts with the intuitive suggestions. Traditionally, the researchers tended to explain the global catastrophes (like the pangolins' extinction on the boundary of the Mesozoic and the Cenozoic or the megafauna extinction on the boundary of the Pleistocene and the Holocene) by appealing to some outside challenges: large meteorites, powerful volcanoes, climate changes *etc*. Those versions are extremely vulnerable in each particular case, but the table of hyperbolic acceleration debunks this approach for good and all.

Continents have been drifting, meteorites falling down, volcanoes erupting and climate changing during four billion years; later on, the wayward *Homo sapiens* intervened with their free will and never-ending extravagances, and near ten thousand years ago (the Neolithic) the Noosphere started to arise. Nevertheless, the global transitions, which were foregone each time by crises and catastrophes, followed as if there were a schedule. This paradoxical fact turns us to the synergetic pattern, which appeals to accrual entropy accumulation and progressive perfection of anti-entropy mechanisms enabled by the growth of complexity.

Particular analysis of the crucial episodes – or transitory singularities – shows that the events could have developed otherwise in

each case: the evolution of biosphere and then anthroposphere could have suspended (in compliance with the Lotka – Volterra oscillation circuit in ecology) or the sustainable non-equilibrium system could have collapsed in a global catastrophe. In synergetic terms, we call *simple attractor* the scenarios related to system's intensive degradation and simplification after the polyfurcation phase. Those related to suspension (interim stabilization on the achieved level of non-equilibrium without complication, which is fraught with system's gradual degradation in a long-term perspective) refer to the *horizontal strange attractor*. Yet, you and me live on this planet and enjoy the fruits (and experience the troubles) of postindustrial civilization thanks to the fact that evolution has gone towards the *vertical strange attractors* in all the turning points, that is global sustainability was each time reestablished on a higher level of non-equilibrium and complexity.

One more consideration is originated in the system theory and its *implementation principle*: all of the possible events do happen. From there, we must assume that there are multiple hearths of evolution in the Universe in which all possible scenarios are realized. Very few of them achieve a level comparable to the one we find on Earth while the others implement all of the dead-end scenarios.

Finally, having extrapolated the curve into the future, the researchers came to a unanimous and still more striking result: around the mid-twenty-first century, the hyperbole comes to the final singularity point. It turns into a vertical, that is the speed of the evolutionary processes tends to infinity and the time intervals between new phase transitions tend to zero.

How can we interpret this mysterious mathematical result? Obviously, the evolution on Earth cannot continue the algorithm it has followed for the latest four billion years and a conclusive phase transition comparable to the emergence of life is to occur over the twenty-first century. In other words, the planetary history intrigue is expected to be resolved in this or that way during the next decades!

The most elementary suggestion is that the anthroposphere is approaching the top of possible complexity after which evolution passes into its ‘descending brunch’: the anthroposphere will degrade to an unmanned biosphere with further degradation to the sphere of equilibrium. Thus, the kernel of the simple attractor is that with a lapse of time Earth will become a ‘normal’ cosmic body

like Moon or Mars free from *res cogitans* and living matter at all. We can trace various scenarios in the network of the same attractor and the duration of the degradation process depends on how exactly the events will go on.

It is always more problematic to trace the strange attractors beforehand or even to clear up whether or not they do exist beyond this Singularity. The horizontal one might be seen as a kind of Hegelian-like 'End of history'. Although the details of a long-term stabilization on the peak of complexity are now hardly imaginable, we must assume its compromise status: sooner or later, the known natural mechanisms will bring the anthroposphere to collapse.

Still more difficult is to imagine a vertical strange attractor. In this context, we pay attention to the remarkable turn in modern cosmological thinking. In the twentieth century, only some of the Soviet astrophysicists (or the dissidents from the USSR) influenced by the 'Russian Cosmism' dared to assume human's potential intervention in the cosmic-scale processes and perspectives. In contrast, serious Western scholars shared the belief that life, society, culture and mind were nothing but epiphenomena (side effects) of spontaneously evolving material structures without any mutual influence on the cosmic processes and doomed to traceless vanish with time. The Nobel Prize winner Steven Weinberg (1993) expressed this common belief by noting that only the awareness of the unavoidable end imparts a tint of a 'high tragedy' to the 'farce' of human existence.

Meanwhile, those 'naturalist' scenarios lost their popularity by the beginning of the twenty-first century: following recent publications, we can note a radical change of mind. Assertions about consciousness as a 'cosmologically fundamental fact', the conclusive influence of the developing knowledge on subsequent evolution of the Metagalaxy and the perspectives of 'living cosmos' are widespread among physicists up to an exotic idea of deliberate creation of new universes with preset parameters for posterior emergence of life *etc*. (see Deutsch 1997; Rees 2003; Davies 2004; Smolin 2006; Kaku 2010 and others).

We also appeal to the studies in gestalt-psychology and heuristics, which have demonstrated that any boundaries imposed on engineering by physical laws, are surmountable by a change of the cognitive meta-system. Specifically, those parameters of the prob-

lem that are uncontrollable constants inside one model become manageable variables within a more complex meta-model; this implies that the facilities of intellectual control may be potentially unlimited. From there, the implementation principle suggests one more conclusion. If the intelligence originated on Earth destroys itself before it realizes those potential universal developments, the role will be fulfilled by another, 'presumably some extraterrestrial intelligence' (Deutsch 1997: 353).

Earlier, by extrapolating some arguments derived from the evolution of creative intelligence and its growing intervention into the mass-energy processes on Earth, we supposed that humanity is now unwittingly participating in a universal natural selection of planetary civilizations (Nazaretyan 1991). As we have assumed that very few of the local hotbeds of evolution achieve the level comparable to the one we find on our planet, it implies a following suggestion. Only those of technologically advanced civilizations (perhaps a single one), which succeed in progressive adjusting their aggression-regulation to unlimitedly growing power, can break out to the cosmic stage of evolution. The rest remain universal evolution's active storage as well as the planetary bio- and Noospheres, which interrupt their evolution at earlier stages. Thus the mechanism described in the pattern of techno-humanitarian balance might remain the determinant at the conclusive stage of civilizations' planetary histories to enable their selective cosmic relevance.

Here, it goes without saying that the humanitarian intelligence has potentially unlimited capacity to perfect its self-control in compliance with the growing technological power; yet, this belief is not indisputable for a psychologist. It may turn out that some intrinsic attributes (like the innate gestalts) restrain mind's flexibility and thus the range of self-control is narrower than the range of technological ingenuity. For instance, the analysis of the historical episodes makes us suspect that both human and perhaps 'post-human' (symbiotic; man-machine) intelligence needs an image of enemy for effective group solidarity ('them – us' archetype) and a strategic meaning formation is hampered by prolonged lack of competing agents. Emotional ambivalence programmed in the limbic structures of our brain intermittently induces an unconscious search for the 'negative' experiences like fear and hatred and provokes corresponding activities. Although since the most ancient

times culture has been developing measures like rituals, art, sports, TV programs or computer games to relieve those functional drives, sooner or later people feel bored with the sublimation measures and the longing for the 'not for fun' passions is activated. Grotesquely, it looks as if there were a kind of natural self-destruction program embedded in the mind's base plate to prevent a cosmic outburst of intelligence.

If no measures to effectively overcome those irrational fluctuations are possible, we must suggest that the evolution of complexity on any planet has an extreme boundary and no planetary Noosphere can escape conclusive self-destruction; thus the 'Silence of Cosmos' gets a most trivial and pessimistic explanation. This would mean that in spite of our intuitive belief, the mental realities are more rigid than the physical ones. In other words, the intellectual agent has potentially more power over the mass-energy world than over his own mental conditions and what is feasible from the physical point of view is excluded by the immanent laws of psychology and cultural anthropology. If it is so, this unexpected circumstance can play a fatal role in civilizations' destiny: just because of it, life and intelligence are indeed no more than epiphenomenal effects and the future cosmic developments are exhaustively described in the naturalist scenarios.

In case we still accept that mind's self-regulating capacity is potentially commensurate to its unlimited technological evolution, we get back to the hypothesis of universal natural selection. So, the nodal question shifts to another realm: whether or not the Earthly intelligence will succeed in upgrading its self-regulation to balance the accelerating breakthrough in technologies prior to their destructive effects become irreversible.

As the latest biophysical and paleontological researches have shown (see in particular Endnote 2), a spontaneous emergence of a living cell is too highly improbable to happen repeatedly on various planets: once appeared, the biota have most probably 'infected' all of the available points in the cosmic space. In all likelihood, if the formation of a Cosmic intelligence is possible, it must be just as unique in its degree and might occur only once at certain stage of the universal evolution.

How high are the chances of the Earth civilization to implement this unique opportunity? More than ten years ago, the famous

English astronomer Sir Martin Rees (2003) estimated its chances to survive the twenty-first century (and get a cosmic relevance) as 50/50. This corresponded to our own estimation at that time, but now it looks too optimistic.

Humanity set up a historical record of nonviolence in the first decade of this century: by the UN and the WHO data, from 2000 to 2010, the total sum of violent deaths in the world (armed conflicts, political repressions and everyday violence) numbered about 500 thousand a year, while population was verging on seven billion (Krug *et al.* 2002; UNODC 2011). Although the number of killings looks terrible, this Bloodshed Ratio is unprecedentedly low (lower than the yearly number of suicides in the same period). Some regions show indexes of one and less killings a year for 100,000 habitants.

The encouraging facts gave the analysts a timid hope that the trend of virtualization (violence was prevailing in the media news, films and computer games) would continue. We expected something like the advanced computer programs for the user's multisensory involvement in virtual battles to undergo intensive emotional experiences and thus relieve the psychological tensions by means of substitute activity and so on.

Perhaps, we underestimated the dynamism of the irrational moods fluctuations among both political leaders and the mass. Unfortunately, since 2011, the situation has taken a turn for the worse. The euphoria and catastrophophilia symptoms were first manifested yet since the late 1990s in USA (as a result of the victory in the 'Cold War') and in some Muslim regions. Lately, the nostalgia for 'small victorious wars' has infected other regions and become a relevant motivation. The political leaders' intellectual qualities and readiness to estimate the delayed consequences are decreasing (compared to their forerunners in the 1970 and 1980s), the international law is being abandoned and the global geopolitical system is losing its sustainability.

The Earth civilization successfully completed the twentieth century for it had managed to solve the global menaces of those times. Actually, we have anyhow learned to deal with the population growth and ecological contaminations and psychologically adjusted to the nuclear weapon, but are facing the new global problems. In Bill Joy's (2000) words, the century of weapon of mass

destruction was changed by the century of knowledge-enabled destruction. The boundaries between the states of peace and war as well as between war, production and everyday technologies are diffusing (so it was in the Paleolithic), while spreading access to education makes the destructive means every year cheaper and more easily accessible. So the 'sophisticated' weapons are slipping out of governments' control and falling in hands of irresponsible groups and individuals free from the habits of long-term and system anticipation.

Another aggravating crisis is still more paradoxically related to the greatest successes in the humanist culture. In the early nineteenth century, one-third of English children outlived the age of five years, while current children's mortality in the post-industrial regions is less than a per cent. The integral longevities have increased four times during the two hundred years and the pay-off for the unprecedentedly high value of individual lives in modern societies is genetic load exponential accumulation. The humans' biological wellbeing depends more and more on life comfort, perfecting medical care and other artificial conditions. A linear extrapolation shows that the trend of biological degeneration can irreversibly affect human brains around the mid-twenty-first century if effective contra-measures are not undertaken. Thus, without genetic engineering and other technological interventions into the most intimate foundations of the humans' existence, our species is doomed to peter out, whereas the newly developing technologies carry new menaces of both destructive errors and abuse.

Researching the global dangers, we find one that may be the pivotal problem in the next decades; it is related to the *meaning formation*. Over millennia, humans have been seeking their meanings of life mainly in the context of religious or quasi-religious ideologies, which are always built in the matrix of friend-or-foe discrimination. Tribes and states, confessions, nations and classes have been designing their inner solidarity (in-group aggression-sublimation) by means of shared aversion to the 'strangers'. Service to the macro-group sacred idols and expected reward for the confrontation against the alien ('hostile') ones has made the background for the group and individual life meanings. As soon as an ideological content with similar group identity involved a vast ge-

ographical and cultural region, next discriminations followed (by religious sects and movements, nations and sub-nations, testament or class confrontations) to abate in-group aggression by venting it outside. This anti-entropy mechanism has worked effectively throughout history.

Meanwhile, the synergetic *law of delayed dysfunction* claims that the productive mechanisms at the previous stages of system's development turn destructive (fraught with a catastrophic entropy growth) at a following stage. Thus, until the task of the humanitarian culture was putting in order and transferring social violence (to escape as much as possible its chaotic forms), the ideological worldviews served for social sustainability. Since the new historical stage has set the task of *removing* physical violence as a condition for global survival, most of the outdated sustaining procedures are counter-productive.

Therefore, turning back to the pattern of techno-humanitarian balance, the key question of the Earth or any other planetary civilization's destiny behind the Singularity is whether or not the strategic life meanings can be designed above ideological worldviews and macro-group discriminations for the non-confrontational solidarity. In other drafting, the same question might sound as follows: How far can the development in morals and concomitant aggression-restrictors go? To what extent of conscience can our mind and even our brain elevate without losing its motivations and the will to activity? Theoretically, modern cross-disciplinary worldviews accumulated in Mega-History, unlike the classical naturalism, might warrant new universal meanings and motivations free from ideologies; yet, how real are the chances to massively assimilate it in the next decades?

Accelerating technological development and spreading education are unprecedentedly raising the global role of the individual activities and mentalities. In view of the approaching Singularity, the crossroads of the current historical phase look extremely dramatic: perhaps, our earthly wives are now giving birth to either the potential gods with access to some forms of immortality and cosmic supremacy or the generation of suicides who will finally crumble the Noosphere…

NOTES

[1] Thus, the twentieth century does not look as incomparably sanguinary as we usually see it proceeding from the habitual Eurocentric position. In fact, Europe had lived relatively unworried (compared to other regions) during 266 years between the Westfall Peace Treaty (1648) and World War I (1914), till the outside world remained a large reservoir for the aggression-overshoot. As we consider globally, the nineteenth century is not inferior to the twentieth century even in the absolute figures of war, genocide and everyday violence (the Chinese historians indicate that from 60 to 100 million people perished in sum of the Opium Wars and the Taiping Insurrection [Wang Yumin 1993; Cao Shuji 2001]) and exceeds it several times in relation to the population sizes. As we compare remote historical époques (even coexisting in time), the difference achieves orders of magnitude (Keeley 1996).

[2] Recent discoveries in paleontology, biophysics and cosmology have reinforced the hypothesis of the cosmic origin of life: the first organisms supposedly emerged somewhere in the Galaxy, were carried by meteorites and nestled all of suitable planets during 215 million years (one Galactic year). In particular, their first signs on Earth precede the appearance of the oceans (Rozanov 2009).

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