Essay on Evolution and Humanities

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Abstract

Current reductionist evolution theory is inadequate to the immense complexity of multilevel process it describes and cannot be improved by ad hoc revamps. Its implications are degrading both to science and humanities. The only viable alternative is systemic approach based on general principles of seen as comprehensive philosophic synthesis of natural science, consequential for existential theories, epistemology, cognitive modes, social practices, and human perspectives at large. With understanding that internal energy can be augmented only by work invested in the maintenance of biological and cultural complexity, the present day least action survival strategy ought to be replaced with the most action principle of progressive development. People still believe that the only scientific alternative to evolution by means of natural selection is mutational chaos and random drift, because spontaneous directedness, progress of life, and free will are long disproved. But they are not, while meaninglessness is an artifact of epistemological reduction.

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1. Prologue

Ancient science – philosophy was about meaning of life, and only a marginal branch of it called Cynics had denied human intellect any purpose except purely pragmatic, relevant to people and dogs alike. New era has witnessed an intermittent rise of Cynicism over the Middle Ages, with tragic consequences for humanity, and the history is repeating itself as farce before our eyes, with Cynicism on the lead again under the signboard of 'pragmatic science philosophy', replacing the outlived credo '*correct theory wins*' with '*winning theory is correct*', which is a restatement of '*survival of the fittest*' principle in its most basic form.

Pragmatic science is after success rather than truth, circumstantial and illusive. Abstract truth does not exists they say. And how about lie? Does lie deserve being granted undeniable reality for its pragmatic value? People get a lot of pleasure from flocking together and shouting something hilarious like '*Stop climate change*!' That so many people fight climate warming is pragmatic evidence of climate warming if you please.

Pragmatic lying is thought harmless and may be so except that people are getting more and more furious, noisy, and altogether idiotic in the process. Because, contrary to the current evolution theory, acquired characteristics *are* inherited.

2. Darwinism

Most biologists agree on Charles Darwin's *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life* (1859) being imperfect. This does not infringe on their admiration of Darwin as the founder of evolutionism. He was the first; he just could not be right in everything they say. Well, let us get it straight from the beginning. That Darwin discovered evolution is the mainstay lie from which diverse ramifications spread. Evolutionism is an indispensable part of European culture for 2.5 millennia of consistent development.

In the Empedoclean theory (IV century BSE), reverently discussed by such prominent thinkers as Thomas Aquinas, Pierre Louis Maupertuis, and Erasmus Darwin, the goal was defined as perfection (purification) and the instrument of it was *Love*, symbolizing all forces of attraction – cooperation, while opposing all forces of *Strife*, selection among them.

Evolutionism was incorporated into the Progressist Movement that presided over European culture in XVII to XIX centuries. Progress theory of XVIII century laid down the philosophic foundation of the rapidly growing life science, *biology* as Jean-Baptiste Lamarck (1809) called it.

However, in the mid-XIX century, science made a breathtaking volt, 'liberating' itself from humanistic values and the quest of meaning. This was the beginning of 'pragmatic philosophy of science', yet Darwin was not entirely responsible for it but in fact inherited from his sources, the Malthusian demography in the first place.

In his *Autobiography* Darwin fully admits that his idea of evolution was prompted by reading Malthus who stated (1798) that struggle for survival induced by shortage of resources is what made us civilized humans. Without it we would never advance over savage state (Malthus might have implied that having enough resources savages escaped from struggle for life and are happier than civilized people, but this remained unnoticed).

Darwin's theory has sought to downgrade evolution to simple opportunistic mechanism and was supported as such in clerical circles, but scientists, with a few exceptions, did not take it seriously at first. Evidence of evolution from simple to complex forms was amply provided by paleontology and seemed fully congruous with comparative morphology and embryological findings, the repetition of evolutionary trends in individual development. Yet the goal of natural selection is adaptation, and simple forms seem as well or better adapted than complex forms. Darwinism has dispensed with this controversial problem by declaring evolutionary progress an anthropocentric fallacy. For this idea to pass through, paleontology had to be thoroughly discredited, and Darwin has launched a vicious attack on it.

Darwin has never said that fossil record is *incomplete* as those who scarcely read him still use to think. A charge of incompleteness is invitation for further work in order to make it more complete. Instead he said it was '*imperfect*', a euphemism for false/misleading and invitation to abandon and altogether abolish paleontological studies. He predicted a decline of the 'noble science of geology' (= paleontology) on account of drastic imperfection of the fossil record. It was not a figure of speech when he said that who thought fossil record any perfect was justified in outright rejecting what he called 'my theory'.

Darwin never said that morphology and embryology are also 'imperfect' and doomed for oblivion, but these disciplines were linked to paleontology as three pillars of classical evolutionism, steadfast together but vulnerable one by one. Classical biology based on the perfectionist philosophy was ruined as a whole. It turned out amazingly easy. Progress of life is speculation lacking in hard evidence, and this is it. The strategy Darwin introduced to science resembles that of a man commissioned to cross the ocean, but not a swimmer and unfamiliar with fundamentals of seamanship. To admit the failure would be unpragmatic for he had a reputation of ingenuity on the continent. After some hesitation he decides there is no sense in crossing because ocean may turn illusive, in fact non-existent. You say you saw ocean with your own eyes, but this gentleman from Nepal never did, and his testimony is as good as yours. Was the idea of ocean ever rigorously tested? No? Then what are you talking about?

The trick worked well, and those hesitant about occasional mutations and selection being capable of creating people and giraffes were told that everything might happen in millions of years. With paleontology snubbed off this seemed fairly plausible. But organismic development from zygote to adulthood is an immensely complex, fairly precise and obviously directional process recapitulating the history of the race in a condensed way – also an occasional accumulation of accidental events screened by natural selection? Here millions of years were of no help, and there seemed no straw at hand to clutch at, the 100% failure after which the theory would have to be abandoned once and for all. This did not happen, but further developments have turned into a rescue operation in order to keep it afloat. First of all, no viable alternative has to be left.

The rival's theory principle of use/disuse was attacked by August Weisman tirelessly blinding rats and cutting tails; thousands crippled animals. And none of the induced deformities was inherited! This supposedly disproved the Lamarckian 'soft' inheritance through use/disuse, showing at the same time that logic does not matter; two birds killed with one stone as they say (Weismann seemed to confuse subject's effort – use/disuse – with vivisection, an experimenter's effort enabling any adaptive response on the part of the subject of experiment; irrespective of how many rats had been crippled, the result was irrelevant, but this logical blunder passed unnoticed, and the consequences proved dramatic for science as well as philosophy and common sense).

Then fruit flies had been exposed to X ray radiation and acquired an assortment of inherited deformities (mutations), none of any conceivable utility for these insects, thus not a material for evolution. A truce with Darwinism was sought in assertion that in the great multitude of 'spontaneous' mutations (not deliberately induced by X ray), a few might turn out advantageous enough for being picked up by selection. Multiplied by millions of years this mechanism would produce people, giraffes, whatever.

The compromise had received a broad support and was proclaimed the Neo-Darwinian synthetic theory of evolution, reducing contemporaneous research to counting mutation (allele) frequencies in natural populations. Developmental research was discredited on assumption that mutation may happen anywhere anytime, which makes the staginess and directedness of embryonic development of no consequence for evolution.

However, the rescue operation itself has unintentionally exposed more leaks in the theory. When statistically examined, the counts of allele frequencies reduce the chances for selection of a rare allele producing evolutionary novelty to near zero, which encouraged a diversity of non-selective evolution models from Sewall Wright's (1931) genetic drift and founder principle to Motoo Kimura's 'neutralism' (1983); *randomism* actually. Is it still about biological evolution or just an exercise in Markov's stochastics?

3. Implications for Science and Philosophy

The success of Darwin's theory is due mainly to the widely praised simplicity of its major postulates. Variation is immanent in all living beings. It is simply there. It can be neutral or deleterious, but when occasionally advantageous, natural selection simply picks it up. What can be simpler? And simple is beautiful, is not it?

Darwin's was the first scientific theory of standing widely accepted on the criterion of usefulness and parsimony rather than truth content. It mightily pushed forth the pragmatic philosophy of science trading truth for success and proclaiming reduction to be the only realistic program of human advancement. False theory makes us false; or just pragmatic?

An empirical scientists giving up a major source of empirical evidence may seem paradoxical, but when truth is subordinated to success such attitudes become normal. *Evidence* is not what we observe but what we make of observation in the light of such and such theory, the circularity admitted by the godfather of modern positivism Auguste Comte (1855) already. Darwin knew that evidence is his weak point. He relied on breeding practices for evidence of evolution by natural selection, although artificial selection decreases adaptedness rather than increasing it as natural selection is supposed to do. Moreover, *examples of natural selection* if any are no evidence of *evolution by natural selection*, for which no evidence was ever presented. His supporters sensed the failure, but it was *less action* to maintain the paradigm than replace; to a point at least.

The *Principle of least action* is as old and rusty as Occam's razor, and paradigms have certainly existed, as figments of doxaic reasoning, before Thomas Kuhn and before Charles Darwin even. But only after Darwin it has become obligatory for 'normal science' to have a conventional set of assertions all normal scientists agree upon; the condition to be in. Otherwise, Kuhn said scientists waste too much time on general matters of no pragmatic utility.

There are objective limits of epistemological reduction indicated by the Gibbs – Duhem state equation that predicts (i + 1) meaningful parameters for a system of (i) distinct components (see Callen, 1985). We are living in the world of considerable complexity and the theories about it must be adequate. The attempts at simplifying below the Gibbs - Duhem limit immediately bring us down to the level of convention and doxaic common sense.

Modern randomism supported by misunderstood *Uncertainty Principle* is puffed out to cosmic dimensions (the *Universal Darwinism*: Campbell, 2009). In global politics it is known as '*chaos theory*': we spur chaos and stochastics plus natural selection find way out; because we are the fittest it almost certainly will be our way.

Though represented as a technical problem of genetic research, the nature of heredity ever exited public interest in connection with the lingering *free will controversy* in the first place. The fathers of Christian church have launched a lingering debate on the issue and passed the button to religious philosophers like Kierkegaard and Dostoevsky on one hand and to skeptics on the other who made a somewhat discontinuous line from Shakespeare to Kafka and contemporaneous art, affirming and re-affirming absurdity of existence. But all existential talk was rendered meaningless by triumphal advent of DNA that efficiently replaced three blind women, oracles, augurs, prophets, Black Square, and the Russian roulette.

New culture was erected on the premise that evolution is random and meaningless, the monotonous ticking of molecular clock. At last science affirmed there being no free will.

Yet recent developments suggest that enthusiasm for experimental results lacking in theoretical justification and the wholesale reduction based on it might have been somewhat premature. Ideas spring from thought and are tested by means of reasoning, with experiments thoughtfully staged as instrumental representations of it, otherwise confusing.

4. Implications for Sociology

Perhaps it will be an exaggeration to blame the reductionist evolution theory for the bloodiest century of all times that followed its triumphal ascent. Indeed, there were philosophers among the ideologists of genocide who modeled their *Dasein* standpoint and *völkisches* worldview upon the theory of natural selection and survival of favored races in the struggle for life, yet the majority of those directly responsible for the atrocities of two world wars and their cold war aftermaths were indifferent or just unaware of evolution theory, existential philosophy and the rest of share nonsense. But is not the indifference, as well as cynicism, ignorance, and moral callousness, just a logical denouement of reduction?

Selection is supposed to work against occasional deleterious mutations, thus protecting population from collapse under mutation load. In human populations selection is slackened by humanitarian aid and medical care, a potential risk of increasing deleterious mutation rates. Before the World War II, genetic research seemed to confirm public fears about insufficient selection, with mutation load allegedly approaching the red line. Such threatening developments was sought to be halted with eugenic programs.

Eugenics introduced by Francis Galton, Darwin's cousin, as a program of support for especially gifted (1869), soon turned into elimination of especially unfortunate. Hundreds thousand people were denied normal life and sterilized as bearers of deleterious mutation or on account of ethnic inferiority in Canada, Sweden, Germany, Japan and elsewhere (Adams, 1990). In the face of these hideous, presently hush-hushed developments I am not going to conceal the fact that all founders of the struggle for life philosophy, including Thomas Hobbes, Augustin de Candolle, Robert Malthus, Herbert Spencer, and Charles Darwin after *Beagle* had serious clinical problems of physical and/or psychic nature, although none of them ever considered being a potential subject of eugenic treatment. Darwin has referred to his breeding experience to the effect that deficient individuals have to be excluded from reproduction, although he called for mercy when human beings were concerned. It will be better, he said, for the deficient to make it voluntarily, but would they?

The nickname 'Darwinian specimen' was introduced for inveterate competitors and unashamed social climbers soon after the World War I by Aldous Huxley, a grandson of Thomas Huxley, Darwin's patron. Darwinism is insistently imposed on us from schooldays as the only scientific worldview; the most insistent form of coercion owing to which we all are Darwinian specimens, but some more than the others.

Nazis made eugenics less popular, yet after WW II Julian Huxley, Aldous' brother, has headed UNESCO in order to propagate eugenic programs worldwide. With eugenic selection thought theoretically justified, although temporarily abolished for humanitarian considerations, the threat of genocide is there all the same all the time. It may help to know that eugenics is based on misunderstanding of heredity, a blunder of classical genetics, and not only morally objectionable, but also biologically harmful for human perspectives (more on this below).

Competition selects not the best, but the fittest, and this is the one (person, race, life style, theory, whatever) doggedly and dextrally ousting potential competitors by all means, and the means are as a rule disgusting. War is an extreme form of competition that would end only with competitiveness being recognized as shameful rather than commendable. Genocide is an extreme form of selection seen as final solution for unfavored races in the struggle for life. Fifty millions had to die during the WW II for the Universal Declaration of Human Rights being adopted and UN being committed, among other humanitarian obligations, to guard national minorities from majority's assault. Yet social practices are still emphatically Malthusian − Darwinian.

The death toll of 'cold war' is still considerable even in comparison with the World War II, but its moral consequences are even more far-reaching and persistent. Human conscience and natural sense of justice are reduced to simple scheme: all 'ours' is good and true, whilst 'theirs' is bad and false. Previously the West and Soviet Empire have preached somewhat different versions of Darwinism, viciously accusing each other in scientific misconduct.

Recently, over the East Ukrainian crisis, democratic West has discovered a new race, the 'pro-Russians', definitely unfavored. Even their bombed and molested old people and children were hindered in receiving humanitarian aid from the other side. Democracy and natural selection make a bitter cocktail.

Modern democracy is juggling with words living the demos utterly confused. It is supposed that economic revival justifies reduction of social programs, at the same time requiring a more vigorous and unrestrained competition in all spheres of life, including scientific research.

It is deliberately left unnoticed that sanitation of economy is only possible under strict measures against financial machinations beneficial to unscrupulous competitors in the first place. It is believed that competition promotes business, sustains activity, and drives inventiveness thus encouraging personal and social advancement. In fact it does just the opposite.

In competition, quality is not the first priority and inventiveness is suppressed as too risky unless in advertising, the most advanced and prosperous field of the present day pseudo-economic activity. The antimonopoly legislation is aimed at boosting competition instead of protecting producers from competitive elimination by those who produce nothing but know how to sell it. And the same with pragmatic scientists, who do not care of what their subject is, but suffice in having a simple easily adopted mathematical model of it. Tolerance and pluralism make sense in respect to choice between several simultaneous lies, but when truth comes there is nothing to be tolerant/pluralistic about.

Fears of ozone holes, climate warming, killing bolides, etc. are part of big companies' competition strategy. The world is permanently in state of war because under slogans of liberation, religious zeal, peacekeeping, etc. the lords of arms compete for markets. We are leaving in a precarious world of dangerous illusions sustained with dreary mythology. Worse, this world, once thought sinful but amendable, is now declared the only pragmatically feasible.

5. System Theory of Evolution

The intricacies of human existence are due to our simultaneous membership in natural, social, and metaphysical systems we belong in by our origin. To keep the membership we must understand how these systems work. Fortunately, they are much alike when described in thermodynamic terms, which makes general system theory plausible, although far not fully developed yet. I applied thermodynamics (Krassilov, 2014) in order to substantiate teleology of life as a persistent, ever increasing effort, with the life maintenance work converted in and stored as internal energy, in turn converted into structural design that captures and enriches the genetic memory of all previous efforts, our evolutionary heritage. This is 'evolutionary learning' by means of which complexity is built up and the value of individual life with it, enhancing free will, but providing for multilevel regulatory devices, from genome to biosphere, in order to sustain the directedness of the process.

A Darwinian version of thermodynamic theory has it as entropy disposed from favored members toward less favored, and this is natural selection in thermodynamic sense (Kaila and Annila, 2008). But in fact such arrangements ever balance on the brink of collapse because entropic sinks draw the whole system down. EU is typically such a system. The richer members suck in resources, financial investments and brains leaving the less favored barren and desolate. The favorites have to redistribute their gains in the form of 'aid' to keep the system afloat, but it does not seem a viable strategy at the moment, because, as long as there are winners and losers, the basic interaction mode will be competition rather than cooperation. Stability requires division of labor and diversity of functional niches that restrict and eventually eliminate competition by reducing the niche overlap. Similar compete, but dissimilar do not.

5a. Ecosystem

The main problem with reduction theories is their neglect of systemic levels, like supra-organismic systems in biology, beyond their narrow focus (organism or recently the DNA). It is like a theory of pictorial art contrived by a color blind person who does not know what color vision means and tends to consider it sheer nonsense.

Accepting prolificacy as the criterion of fitness, selection theory missed the fact that reproduction rates are regulated by ecosystem, the functional unit of organism – environment interaction with the pioneer stages and lower trophic levels rich in species that survive by numbers in the face of high mortality rates (the *Niobe strategy*: Krassilov, 1995, 2003), giving room up developmental sequences to the better protected species that compensate for lower proliferation rates by a higher homeostasis and efficient parental care (the *Leto strategy*: Krassilov, 1995, 2003), hence *evolutionary advanced*.

In essence, ecosystem is a biomass producing machine the efficiency of which is manifest in the standing biomass (*B*) to the waste (dead mass, *D*) production which is directly proportional to its structural complexity (biological diversity, S):

$$\Delta S \propto \Delta\left(\frac{B}{D}\right)$$

In thermodynamic form, with *B*, *D*, and *S* equivalent to Volume, entropy and internal energy, respectively, the equation is applicable to any functional system.

Autotrophs at the bottom of trophic cascade use solar energy, in principle inexhaustible unless they shade each other in a competitive way (the same with energy resources used by humans). But volume decreases up the trophic cascade, because no more than 10% of the lower level can be consumed without derailing the whole system. Ten percent of ten percent of ten percent is not too much, so that those on top cannot afford boundless prolificacy and had to survive at *minimal population density*, which is advancement rather than decline.

Pioneers of early successional stages are the Niobe strategists as a rule. In them, an increase in volume may not be accompanied by an adequate grow of internal energy, causing population density waves that range from mildly depressive to catastrophic for ecosystem as a whole. Stability increases up the developmental sequence (sere), with the upper level capturing the most of the ecosystem's biomass and diversity, thereby stable, sturdy and persistence, the characteristics associated with ecological dominance. Above all, to maintain ecologically dominant position for geologically appreciable time requires interaction with positive feedback which is *creativity* in its basic form.

Evolution is *coherent* when volume growth is matched by increase in diversity which means diversification of ecological space and constriction of niche overlap. With diversification of ecological (in humans also metaecological) niches the role of natural selection diminishes, approaching zero in humans who enjoy the practically unlimited metaphysical space. Functional complexity increases in the process, and diversity is the structural manifestation of it. As in symphonic orchestra, the performers cannot dispense with each other and none of them can be turned into a sink for entropy without dragging the whole system down. Sustainability depends on cooperation rather than competition, an entropic interaction mode impeding efficiency in utilization of spatial, trophic, and reproductive resources.

In nature, early successional species are poor competitors, but their loss is too costly for ecosystem as a whole because regeneration capacities decrease. Dinosaurs experienced four mass extinctions through their 200 million year history. The mid-Cretaceous about 100 million years ago was the most severe, but the group survived on account of pioneers like small protoceratopsian and avian forms. At the end of Cretaceous Period, there were no such reptilian forms and the larger gregarious species could not maintain their population density in the face of the trophic problems imposed by reduction of wetlands and decrease in aquatic phytomass production (Krassilov, 1981 and elsewhere).

5b. Population

Population is traditionally defined as a reproductive unit the members of which freely interbreed. The mathematical models of it conventionally admit panmixia or random mating, although mating in nature is usually assortative, in respect to age mainly. Panmixia is a statistic convention of no real significance. What makes population a natural unit is more like sharing a language.

After a short learning period, Pavlov's dogs physiologically responded to bell ringing in the same way as to a piece of meat, a 'conditioned reflex' as the phenomenon was called (Pavlov, 1903). In fact the phenomenon is fairly widespread. Even plants know to shed leaves before frost or draught by reacting to a concomitant change of the length of day (photosynthetic activity) associated with such seasonal impacts. I am not sure about bacteria, but in principle all living beings are capable of associative (symbolic) learning, a major qualitative distinction of life.

World is full of sights, sounds, smells, and ductile sensations that are not critical as such, but acquire symbolic meaning through associative learning. *Population is a gathering of organisms that respond to symbolic stimuli in the same way* owing to which it change as whole rather than one by one.

People who leave abroad for a long time usually preserve their native tongue, but acquire an accent that makes their speech slightly foreign, usually not a reason for discrimination. Mice are more fastidious; a few days out is enough for being ostracized from the breeding community. In population bound by conditioned responses, an adaptive change does not depend on either genetic drift or selection: all individuals are capable of adjusting their reflexes to a new symbolic stimulus. Blowing horn can be as stimulating as ringing bell if you have learned the semiotics of it. Species usually consists of more than one population, their conditioned reflexes variously accented. What makes species a unit is the *potential energy* of physiological and behavioral responses at the base of morphological similarity, but realizations are situational, therefore a diversity of geographic populations, ecological types and races. In fact, none of the constituent populations betrays the whole range of evolutionary potentials, but together they do more or less (Vavilov, 1930).

Now we understand that racial distinctions, in human species also, are not to be underrated. Many good wishing geneticists assert that human races differ in minor and insignificant features, better to be altogether ignored. They intend to mitigate racism this way, but actually turn it inside out. Well established races, as well as biological and cultural mixes potentially giving rise to new races, are our most precious heritage capturing evolutionary potentials of human species, its priceless treasure, not to be lost either in struggle for racial domination or in futile attempts at obliterating racial distinctions. It is racial selection that has to be abolished, not distinctions.

Human skin colors 'alleles' are a matter of a lingering debate. Emanuel Kant already has ascribed the variation to climatic differences. Darwin has argued that because black people remain black when transferred to temperate latitudes, the distinctions cannot be environmentally induced. Recent studies reveal a complex regulation system of melanin production definitely having environmental constrains (Jablonski and Chaplin, 2010).

Darwin's objection is invalid because in a stepwise environmentally induced change involving many components it is pretty improbable that a reversion of the trend would change all them back. This statistic argument was advanced by Kant, worth being designated the '*Kant's rule*' (1775). It is relevant to any attempt at reducing complex system to a simpler one, be it for 'teaching purposes' or staging an experiment.

5c. Genome

Once thought to be a major scientific breakthrough, the 'central dogma' of classical genetics claimed one-way transmission of developmental information from nuclear acids to proteins. Yet there are no natural systems functioning without feedback. In the case of genome – proteome interaction, feedback is in fact provided by the hordes of various transcripts, including a diversity of protein molecules.

The genome cannot be understood as an autonomous, supposedly immortal and by this reason implicitly unnatural entity, but has to be considered in the context of systemic development and evolution. Environment is pressed for resources, with feedback felt as external pressure. Organismic system responds with a thermodynamic Volume – internal pressure maintenance work. This does not disappear in thin air as the reductionist theories unaware of physical laws imply, but is converted and stored at the molecular level as the *Gibbs energy potential* of nucleotide bonds. Information on external pressure and response is this way preserved ('memorized') to be transmitted through the genome processing and renovation. Schematically, a change in environmental pressure is adequately responded by redistribution of gene activity and repatterning of energetically 'upregulated' and 'downregulated' DNA regions that govern not only the stepwise protein production, but also the rates of DNA renovation, and are this way inherited.

The thermodynamic work – energy – work circuit thus makes the inheritance of acquired characteristics not only possible but also unavoidable. Actually the problem is not the lack of mechanism, but on the contrary, the ubiquity of induced inheritance. Not to inherit an acquired characteristic is next to impossible, and all living organisms are provided with the means, like the genome repair and recombination, of restricting this kind inheritance in order to skip a fleeting or maladaptive acquisition.

Thirty five years ago I argued (Krassilov, 1980) for a leading role of interspersed repetitive DNA in the genome processing regulation and against the 'parasitic DNA', 'selfish DNA' and the other models inspired by the Darwinian competition theory. Far from being a ballast on DNA processing, the repetitive DNA is the energy source and time keeper for DNA transcription and replication. What is used through life tends to appear earlier in development and enhanced. What is not used tends to be retarded and eventually lost. What happens in development is this way projected over evolution. Classical evolution research amply illustrated *heterochrony*, a repatterning of developmental rates at the base of evolutionary change.

In molecular biology, the theory of occasional mutations and selection was applied to genes coding for structural proteins thought to be the only that really matter. For many years so called 'regulatory genes' were lightheartedly

left out of the picture. But molecular biologists, for all their reverence to the blunders of classical genetics, have exposed the notorious 'promiscuity' of structural proteins (Aharoni et al., 2005) that dance under the music played by hormones on the strings of regulatory ensembles.

Be there no such basic regulators, our spine cord would not match the enlargement of our brain case, and our facial angle would not provide for the nose, all these features evolving independently under incoherent selection pressures or randomly. What a sight when occasionally caught in the mirror!

Evo-devo is a recent experimental approach revealing complex regulation systems under transcriptional gene activity. Causation of DNA mutagenesis was exposed by knocking down specific regulation element, and this was the end of randomism in genetics, although not immediately recognized and even now not fully admitted. However this promising field is hampered by neglect of organismic developmental research (*phylembryogenesis*) that was discredited by classical genetics on assumption that mutation may happen anywhere anytime, which makes the staginess of embryonic development of no importance for evolution. Without phylembryogenesis, molecular 'devo' would never meet 'evo'.

In a model advanced in (Krassilov, 2014), *staginess* is related to sequential activation of transcription regulators through development parallel to their appearance through evolution. Mutations do not happen anywhere anytime, but where and when induced by the genomic regulation system in turn regulated by organismic and supraorganismic systems in a top down manner with bottom up feedbacks. Multilevel regulation makes development and evolution directional and to extent predictable.

Development is a directional process that confers directionality over evolution. This is the major postulate of classical biology now developing into a promising model of phylembryogenetic (advanced 'evo-devo') research. The directional genome evolution toward a higher energetic state and regulation efficiency is associative learning rather than selection. My studies in the origin of angiospermy (summarized in Krassilov, 1997, 2012) show ubiquitous parallel developments. What is acquired by one plant group is potentiated in the other groups of a broad structural grade of 'seed plants' and can be realized when functionally opportune.

It is important to keep in mind however, that what is epigenetically inherited is not a morphological deformation caused by environmental or experimental hazards, but the maintenance work in response, and energetic potentials derived from it. Maintenance response at the base of directional change can be elicited not so by a direct impact as by symbolic substitute of it like in Ivan Pavlov's conditioning experiments on which the behaviorist concept of melioration is based. Symbolic learning propels cognition in its unconscious form available for all life. Human cognition is to a large extent subconscious, so the distinctions are gradational.

The problem of 'soft' epigenetic inheritance is not a technical one. Admitting that practically all our doings are consequential for the progeny radically change our attitude to life. Decent or wasted life is a matter of potentiating future developments. In particular, the pragmatic adherence to the *least action principle* is not our private matter because evolutionary potentials decrease with it.

6. Progress of Life

Because all living beings pursue certain goals, be it photosynthetic production or salary increment, a theory of no goals makes no sense unless as a premise for suicide. Recognition of goal-directed behavior as typically human is a tacit admission of the fact that teleology is correlated with complexity. Complex systems are more determinate than simple systems, which is why simplification predictably results in indetermination.

Complex systems are more creative than simple systems, and this is why evolution has been tantalizingly slow over two billion years of microbial life, with the major achievements relatively recent.

Blunt denial of natural teleology erects separation wall between nature and humankind. Though human identity is shared between natural and supernatural systems, it is not true that part of us is biological and the other part metaphysical. Dualism is not a solution. Even *René Descartes* realized this when a teenage princess put his body/mind dualism to ridicule. We belong to earth and heaven simultaneously as a whole rather than in parts. Alienating humane from natural is detrimental for both. It is like separate love from sex, both dreary when disconnected.

Structural complexity is based on internal energy that increases through evolution with amount of work (effort) invested in sustenance of life in all its physical and cultural manifestations and at all functional levels from molecular genome to social system and further to metaphysical world of ideas, with feedback. Irreversibility of evolution is a function of complexity: simple designs change reversibly, but complex do not (Kant's rule, above). The relay of dominant forms through geological times documented by the fossil record epitomizes progress of life, a creative process, in which humans occupy their natural place on the top owing to their superior mental powers and unprecedented cultural complexity they created.

What is not used is lost or at least simplified. This is Lamarckian degeneration principle that is always there as a tendency, in progressively evolving groups overcome by the increasing diversity of functions. Our forelimbs have evolved in relation to arboreal life, with digits adapted for grasping twigs. With terrestrial biped locomotion, forelimb digits might have been reduced like in biped dinosaurs, but hadn't because we manipulate needles, make gestures, and play piano with them. Owing to immense functional complexity we don't have spare parts.

The opponents of evolutionary progress often say that from ant's point of view it is ants rather than people who are the highest beings, but had they ever met an ant preoccupied with meaning of life or directedness of evolution? Kindly introduce me to such an ant and I would immediately give up the idea of general progress of life and declare myself a loyal Darwinian specimen. For us, vertebrates, insects are a parallel world with some evolutionary tendencies in parallel. Some have developed sophisticate social instincts that grant them a place on the top of their world. However division of social roles in insects is based on special breeding with suppression and reduction, of sexuality in worker bees for example, a female sterilized through the queen's hormonal coercion. This is very much like what Plato recommended in his *Republic*, fortunately never realized in full swing, because 'breeding', 'coercion' and 'people' belong in incompatible semantic domains.

Insect sociality produces cohorts of identical individuals, while in the progressively evolving groups of vertebrates physical and mental *individuality* increases through evolution. Egalitarian societies encourage diversity by providing each individual with equal opportunity for self-realization, a humane social strategy not to be perverted by semantic confusion of 'equal' and 'identical'. Competition and natural selection ever reduce physical and mental diversity sustaining statistic norm, the mob of 'ordinary people' for whom social progress is habitually associated with economic stability, security and health care, otherwise what for? Their fragile happiness is permanently threatened in one way or another, on account of which a sizeable part of their human rights and implementation are delegated to governmental structures, their respective personal structures degenerating in the process (the use/disuse principle). Ordinary people are summoned from time to time for vociferous appreciation or indignation, their cheerleaders tell them what. The emphasis on individuality is lost in crowding, standardization, unification, globalization, protests against climate change, etc. Do we converge on ants?

Presently, some physical and cultural functions and habits, like reading books, are reduced on account of technological developments. An ensuing structural degradation is inescapable, unless it is but a temporary decline related to competitive interaction, in particular the arm race on account of warfare and cold war, the extreme forms of competition imposing the ant/bee sociality on us. To prevent such developments it must be realized that being 'ordinary people' is the *least action* survival strategy resulting in decrease of developmental potentials. There is no way of amplifying internal energy other then through work invested in maintenance of structural complexity against external pressure mounted by competition, coercion, manipulation, incompetent leadership, and pragmatic lie. To be personality one must work on it. This is the *most action*.

7. Epilogue

Modern utopias are no utopias, neither are they anti-utopias, but logic projections of contemporaneous state of things, with mutants and clones more common than now, unleashed on ordinary people by the would be bad guys who are more sophisticated and unyielding than our neighbors. The impression is that only bad guys evolve. Among the good ones, a pretty girl fancifully undressed is given a fair portion of screen time; at least this is permanent. Otherwise the leaving conditions rapidly deteriorate, and we are presented with a morbid picture of shag rags with Kalashnikovs on string, despondently roving among huge garbage heaps. Such are the results of permanent cold war with occasional fierce fighting between local groups of survivors seeking access to each other's garbage heaps and clones. What year is it, 2114?

Supposedly, natural selection would take some time before turning this gloomy vision into reality. Yet the mobs of tough guys easily recognizable as our contemporaries (2014) installing democracy by means of selective sinking parliamentarians into garbage cans in the streets of Ukrainian cities make paranoiac future nearer than we expected.

Don't ask who is guilty because we all are. We turned ourselves into 'Darwinian specimens' by glorifying pragmatic lies and preaching reduction. We forgot that life has meaning beyond apish fitness display and skirmish for leadership. We confused 'scientific' with 'meaningless'. The origin of species by means of natural selection lacks factual evidence, but extinction resulting from a discrepancy between volume and complexity is amply recorded. Let us take it as warning.

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