



The Main Trouble of Humanity is Misunderstanding of the Principles of Biological Systems Regulation and their Evolutionary Development

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Received: 📅 November 19, 2021

Published: 📅 November 30, 2021

Introduction

According to thermodynamics, to control a biological system, no matter what system it is - microbes, plants or animals (including human society), two conditions must be met.

- a) It is necessary to study and understand the features of internal regulation of this system. And having understood that:
- b) Create most favorable conditions for its self-development. Do not force the system to change in the direction desired by certain individual, but to promote self-development, creating conditions required for that.

Unfortunately, this principle is most often not taken into account and not observed by the human. After all, to do it correctly, one needs to think carefully, instead of destroying everything around and showing his coolness. And which is most important, prevent violation of the objective laws of nature, which sooner or later would end with environmental disasters. In this regard, the slogan "human is the ruler of nature" should be considered the most harmful and strongly propagated by the authority's thesis. This opinion arose under the influence of certain achievements of the human in the creation of highly productive plant varieties [1]. We should note that humans immediately absolutize every achievement, even minor, but a new one. When formation of ATP under the influence of light was discovered, it was immediately declared that the main regulation mechanism is ATP deficiency. After discovery of the regulatory involvement of cell membranes, everything was explained by a change in membrane permeability. They discovered genetic codes and genetics became the main thing in all the regulations. During the Lysenko period in Russia, genetics was suppressed, but then it returned to normal. But now the role of genes is being absolutized. And their role as an executive mechanism for the accumulation of information has become dominant, and even more important than metabolism itself.

But humans' actions change a lot without understanding the consequences. Selecting plants with large fruits, people did not see what was happening with a root system that was outside their field of vision [2]. As a result, all cultivated plants have a root system 2-3 times smaller than that of their evolutionary predecessors. The consequences of that were tragic. A small root system provided an increased yield only with sufficient moisture and a high concentration of minerals in the soil. This promoted hydroponics. In such conditions, the use of mineral fertilizers has intensified with a simultaneous increase of plants quantity per unit of sown area (hectare). There was even an idea of "PROGRAMMING THE HARVEST". Its principle is as follows. If you want to get a high yield, add the appropriate amount of minerals to the soil. In Europe, where soil fertility is insufficient and humidity is high, the role of mineral fertilizers has especially increased. While teaching economics and ANALYSIS of economic activity to students in the 1960s, I proudly told the students that in Holland they apply 1 ton of mineral fertilizers per hectare, while we (in Russia) are only 60-100kg / ha. At that time, students were told about the small root system of cultivated plants, that the plant does not need a large root size, since we give it all the necessary resources (water and minerals). And then we get a high yield.

But, as it turned out later, the plant uses no more than 10% of the fertilizers applied to the soil. The rest is washed out into springs, rivers and gets into the seas and oceans, in which there are very few minerals (primarily nitrates). As a result, seaweed synthesizes more proteins and tastes better. They are actively consumed by aerobic bacteria (water bloom), which at the same consume oxygen in the water. According to the international organization (RJ Diaz / phys), which measured oxygen content in the water of seas and oceans (Figure1), the amount of dead water (oxygen deficiency) over the past 10 years of measurements has increased tenfold. Citing these data, I would like to ask the reader a question: "Let's think about

what will happen on Earth in 50 years, if every 10 years the amount of dead water increases tenfold." But, to check information, the following phrase was sent to the Internet via Google: "In fifty years,

humanity will disappear." Surprisingly, after a while, the answer came: "And Australian scientists believe that this will happen "in thirty years".

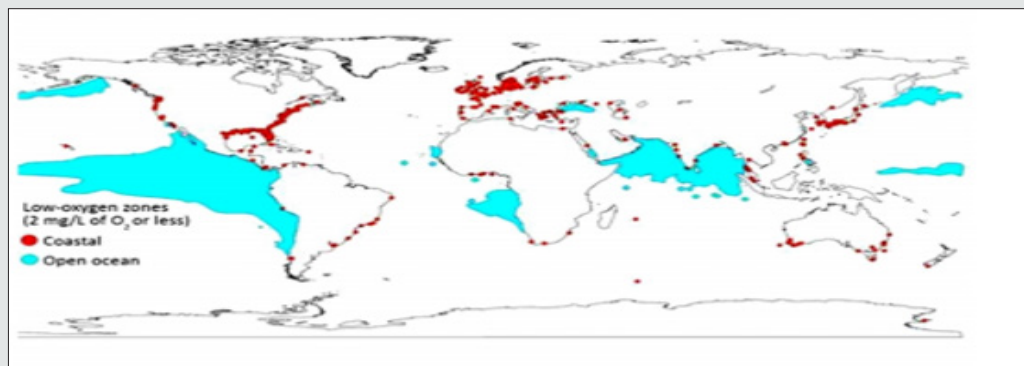


Figure 1: The amount of dead water has increased tenfold in the last 10 years (2003-2013), according to the 2013 Atlas of the World's Oceans International (RJ Diaz/phys.org).

The author has been studying photosynthesis and its regulation for 50 years. In our laboratory (Chikov et al., 1982; 1985; 1987; 1998; 1999; 2001; 2015; 2016; 2017a, b; 2021), we were the first who after 250 years after the discovery of photosynthesis, has shown this process regulation at the level of leaf and the whole plant. Based on this, a method was found to influence the formation and export of photosynthetic products from leaf to acceptor organs, which made it possible to outline the ways of purposeful control of the production process of plants. Then, the obtained data on nitrates effect on photosynthesis [3] made it possible to explain the reasons and propose a way to prevent massive fires in forests. As it turned out, any decrease in the carbohydrate orientation of photosynthesis (a decrease in sucrose synthesis, the main transport product of photosynthesis), leads to a decrease in the formation of oxygen by plants and photorespiration increase (light-stimulated formation of carbon dioxide). This process is especially expressed when using mineral fertilizers (primarily nitrates). Thus, the large-scale formation of carbon dioxide in the atmosphere occurs not only due to human combustion of energy resources, but also in the plants themselves when using nitrogen fertilizers. These works of ours ended the long-standing debate about the parasitic role of photorespiration [4] and showed the important regulatory role of photorespiration in matching the power of light and dark processes of photosynthesis [5]. What should be done to prevent a brewing environmental catastrophe? The answer: It is necessary to stop large-scale production and use of mineral fertilizers in agriculture. But what about the productivity of plants without fertilizers? We should understand how nature acts. After all, our (Russian, Ukrainian) two-meter black soils were formed by nature without any mineral fertilizers. Moreover, the use of mineral fertilizers in agriculture over the past 100 years has halved the content of organic matter and the fertility of these black soils. To prevent these changes, it is necessary to restore the former size of

cultivated plants root system. All that requires cooperation of soil microbes (free nitrogen fixers) with plants. If more photosynthesis products are transported from the leaves to the roots, the microbes will bind more nitrogen from the air to the plant. Phosphorus and potassium are used by the plant cyclically (repeatedly) and they are usually in the soil. But they are not available to the plant. Free nitrogen fixers will make them available. But the main thing is that humanity spends half of its energy resources on the production of mineral fertilizers. Imagine all benefits for humanity if it stops the production of fertilizers.

Do the Actions of the Humans Correspond to the Objective Laws of Nature?

Man is one of the many species of living beings on planet Earth. The entire evolution of its development accords with the laws of nature. Since the author is a biologist, he tries to consider any actions of the humans primarily from the position of whether a person (each individual, and the entire population) lives in accordance with the objective laws of nature. In living systems (from microorganisms to human society), everything develops in accordance with the theory of probability. Thereat, the development is headed to the accumulation of helpful information and decrease in the entropy (orderliness) of the entire system. That means that if a mutational change in some properties in a given individual occurred in only one instance, then the probability of its inheritance is almost zero [6]. That is because in the process of further development, reproduction and accumulation of a sufficient number of new individuals with these properties, this feature may be lost at the very beginning. A sufficiently large initial quantity of identical individuals with such a mutation is required for this property to be preserved and fixed in the offspring. And that happens always, everywhere and with all kinds. Otherwise, that important positive change will be lost.

The Human, of Course, is a Special Kind of Living Creature on Earth.

Human development has reached a high level. Humans developed a very perfect way of communication between individuals, the transmission of a speech signal for information exchange. However, meanwhile this method of communication turns from informational to disinformational. How does this happen? Strange as it may seem, but there is reason to believe that deformations of all those primary features were caused by productive power development. As time goes by, the mankind needs less population to maintain conditions for human sustenance. As a former economist, I thought that 5-10% of population is enough for that. But once an economist on the radio "Echo of Moscow" told, that this index equals to 2%. He probably made reference to Russia, because Russia lives on oil and gas sector of economy, which makes exactly the stated figure in terms of labor efforts and involved population [7]. What comes out there? It means that the majority of the population piggybacks on the labour of those 2%. Let us also put aside the workers from the service sector, because they are also supported by those 2%, creating though a surplus product. This is the essential point that influences the motivation of a person in the course of evolutionary development. There are two way for a man to rise in the estimation of the public. A man works intensively, he learns more, and this is combined with natural skills. Sooner or later, the wider public will acknowledge him as the leader. He is better educated, well-respected. Or there is another way - to suppress the others and to make others esteem you. To dominate through the use of force. The second principle prevails in Russia. The one who is "tough", who has everything and does nothing - he is in favour [8]. The toughness is being actively promoted. However, such a person does not create any means of subsistence. He can defraud, re-distribute or even destroy the competing persons. This leads to intensification of competition between the rest. And this competition is special. You can compare it with the competition of a chorus members - who sings better and lifts up the general harmony. Let's turn our attention to the offers in the Internet: how to earn big money for doing nothing. It doesn't work that way, otherwise money will lose its mission—the measure of labour. When the labour aimed at creation of means of subsistence is left to the minority, it becomes both out-of-fashion and invisible. Every person evolves in condition of clambering over each other.

The main motivation is to take away other's labour. The basic idea is to take away, and it doesn't matter what (business, apartment, idea). Observations suggest that a particularist finds delight in the "take-away" process itself. Even if he needs no fruits of labour. This principle applies to all levels: production, science, family (look how many family conflicts are reported by mass media). It is important to understand, that this is not about any specific context, but about changes in the global process inside the human population. Motivation of the very evolutionary process changes. There is every reason to believe that this is indeed the main reason for the rise of extremism. A man can do nothing to improve his status but kill a

competitor(s) [9]. That happens because another person's success is not respected, but envied. Every biosystem (mankind - is also a biosystem) develops through accumulation of information in order to improve intellectual capacity and to resist most effectively the current adverse conditions for the population (or its part). What is information? Information is a choice of a wide range of scenarios. Number and contrast level of scenarios increase the information value. The information that contributes to well-being of species is automatically assimilated in its genepool. And there is no one to fix it. Only random mutants with the improved (genetic variations included) competitive ability survive. We do not know about any failed variations. There are none. They could not compete with more useful options for the given population. So, they disappeared. Some traces of this information probably remain in the depths of dormant genes. And they may manifest themselves someday. But we do not know, where and which of them. The less often there were conditions that were associated with such (disappeared) genes, the deeper they plunged into the dormant genes zone. And even disappeared.

The fundamental motivation of the evolutionary development of species - is to increase population and to occupy more territories. This is the essence of existence of each biosystem. It prevails with all living beings (plants, animals, microorganisms and a human being). By the way, there is one more law of nature - the worse conditions, the higher fertility. Everything is clear here. This is the balance of biochemical processes in population that was formed by evolution. In difficult conditions high fertility leads to preservation of population in future. And this is not the only reason [10]. More importantly, this increases the possibility of appearance of clones that develop new characteristic(s), feature(s) required for survival in such conditions. This clone(s) will become the guarantee of preservation and prosperity of this species. However, when increase in number is accompanied by elimination of the part of population that creates the living conditions for all, we all know how it ends. Achievements obtained by arrogant and unprincipled actions create for a "tough guy" an illusion of greatness and superiority over others. In such conditions, the less a person knows, the more he believes that he knows everything. But most importantly, the parasite lives only as long as there is someone to parasitize on. The higher the complexity of a new activity, production, social structure, the more reasons (and opportunities) to blow smoke.

Moreover, the more complex is the environment, the less individuals are able to evaluate it as an integrated system. After all, few people understand how complex the process is. (Recently I have discussed this problem with a man from a company engaged in establishment and liquidation of plants. He said that "people who are able to think disappear dramatically"). More and more the activities are substituted by tokenism. Persons' mental activity is aimed at inventing methods or techniques (supposedly) designed for creation, but in fact aimed at taking, distribution of others' (state) money, "milking" their own country. Look around and you will see examples of it abound. Very few people cares for others.

In a civilized society, a human is highly valued. Especially if he creates something useful for the whole community [11]. And the public tries to find out, what an individual can do useful for the society. Attention to a man of ability increases manifold. Specialized schools for the gifted children are being created. But there is no true competition to select the best. Thus, as a rule, "crony" ones can get in such institutions (in Russia). As a result, the output of such a "gifted" person, even if higher than average, will cost much more to society. And if the state and society effectiveness are assessed in terms of life years spent per a unit of intellectual output, it becomes quite clear which states have the highest rating. Many states, such as Sweden, Japan, China, India tries to create a Silicon Valley, but failed. It's very telling.

In Soviet times, when I registered my first patent, the Japanese asked to sell them the contents of wastepaper basket of the patent office in the USSR. Our people refused. "If I can't have it, neither can you". Instead of thinking, why do they ask? Wouldn't that be useful to us? Shall we create the best possible conditions for our own inventors? The bureaucracy brains do not work that way [12]. There is a lack of strategic thinking. I hold two useful patents. None of them has found its practical use. But they were actively and repeatedly used by other people "as a pretext" for embezzlement of private or public funds. And nobody would ask "who is the holder of the patent?" I could tell a detective story, how some such scoundrels from the military-industrial complex (Doka company) used my idea and created a business project for bank financing. Oddly enough, but bank representative came to me for expert determination. And I saw they talked absolute nonsense to get the money. Surely, I helped the bank to substantiate the refusal of funding. But that was a single instance.

Decent people have one very important feature that creates problems for them. Being honest and decent, he (she) feels uncomfortable (ashamed) to suspect another person of dishonesty. How can I suspect someone of dishonesty. As a result, it is shameful and excessive to control such person. All scum (arrogant, unprincipled people) profit by it. Such additional restrictions create difficulties for the very existence of honest and decent individuals. This also reduces their fertility. And, as a consequence, decreases their share in the general population, the population of a given country, and in the whole of humanity. And this stratum of people, which feeds the moral level of society, is gradually disappearing. It follows, that a highly moral decent society for its existence and progression requires an additional reduction in entropy (increased orderliness) of society. To reduce the minor impression of the above, I will give you some optimistic idea. In the animal world, learning is performed through imitation. Young parents do keep that in mind. The cub (or chick) sees the action of its parents and repeats after them. This is how it learns. All this fully applies to humans. Any persuasion to your son to behave good is useless unless you do it yourself. Do not even try to hide it. It is impossible within the family. That means that it is possible to overcome even

genetic deficiencies in human. Impudence and shamelessness will be drowned in the depths of sleeping genes. It is only vital that we all act in the furtherance of humanity and set an example to the children. What UN laws should be applied and how to implement them? It's up to all of us to decide. But we must do everything that human decency would always lead the style. And people should fight for it, not pretend. So, what should we do in Russia now in this situation? I think, first of all, it is essential to issue a law on criminal liability for beating children. Then in 20-30 years, probably, humane society will develop in Russia. The author himself was beaten in the childhood by his father, who used to repeat: "The man who has not been flogged is not educated". This slogan flourished throughout the centuries-old Russian history. Already grown-up, I asked my father: "So where are those unbeaten in Russia? Halloo! Where are you? There's NO UNBEATEN ones in Russia. That is the main reason.

Turning to the principles of biological systems management, the parent's main task is to use his/her experience to prevent the very possibility of the child causing damage to itself (through lack of knowledge). Legislative ban on whipping of children has existed for a long time in Japan. An episode was once described on the Internet. A Japanese mother came to the hairdresser with a baby. The hairdresser served the client and both silently watched the child. The baby checked all the lockers. But as soon as it approached a dangerous place with electrical equipment, it was distracted by something. They just explained why the baby should not do that. That is all. It is so easy, isn't it? .

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DOI: [10.32474/CTBM.2021.02.000143](https://doi.org/10.32474/CTBM.2021.02.000143)



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