

Social Evolution and Health of Man

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Abstract

A problem, that is while noticed by neither science nor public, stands before humanity. This problem carries the name «Biological degradation of type of Homo Sapiens». She is characterized by the decline of viability of population, epidemic chronic uninfected diseases, by the speed-up rate of aging of and other. In basis of this phenomenon is a decline of stability of the thermodynamics system - organism of man. The ways of decision of problem are offered.

Keywords: social evolution, demographic transition, individual health, strategy of healthcare

Introduction

In the evolution of our planet it is possible to distinguish a few aspects: astrophysical (forming of mainlands, air environment, climate, etc.); biological (appearance of life and her development) and social (forming and development of human society).

The astrophysical aspect of planetary evolution, undoubtedly, influences on the health of man, but we will not examine him: he is contradictory, built and difficult predictable (for example, prognoses - from the global warming to the new ice-age). In respect of evolution of biosphere, then she was accompanied by complication of internals of the biosystems at increasing efficiency of the use of power resource. A living substance consistently retired from the equilibrium state, perfecting antientropy mechanisms. And man as a representative of class of primacies appeared on the top of biopower evolutionary stair (6).

Features of Social Evolution

If to talk about a social evolution, then the series of the independent

calculations conducted by the scientists of different countries and different specialties showed that evolutionary processes had been accelerated, and near the middle of the XXI century an exponential curve, reflecting the acceleration of evolution, grows into a vertical line. It can mean that an evolution on Earth enters into a polyfurcation phase comparable on a scale and by value with appearance of life (9). Waits Us, as specialists, grandiose phase transition, assert, what neither humanity nor biosphere of Earth yet experienced. A breach must happen to some quality new state, or the downleg of planetary evolution will begin, and subsequent ion changes in society and in the wild will be irreversibly directed toward a thermodynamics equilibrium, i.e. disappearances of life(8).

What way from the presented alternative will be chosen by an evolution? Unfortunately, it is now possible to talk about unfavorable for humanity development of events.

One of signs that an earthly biosphere already enters on the post-singular way of evolution, the surprising phenomenon of demographic transition can serve. The population of the developed countries *stopped a height in the conditions*

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of material abundance. First the organized matter does not aspire to unlimited physical expansion, in spite of presence of material terms for this purpose. The basic law of evolution, that was unchanging executed during 4 milliards of years (9), is so broken.

Is there it it by a direct threat for humanity?

There are all grounds to assert that humanity degenerates as a biological kind (8). For the great achievements of humanistic culture it is necessary to pay worsening of «biological quality» of population. Already a few generations are free of natural selection, and it means that every subsequent generation is weaker than previous. That is about it a specialist talks in area of evolution of man A. Markov (7)

:«Degeneration in the conditions when there is not a natural selection, takes place quickly and inevitably. Very soon we will get a generation so weak, sickly, sickly and powerless, that no super modern medicine will help».

About the Problem of Individual Health

Solid arguments for proof of the outspoken position are got by us and at research of problem of individual health of man. The greatest paradox of modern medicine consists in that, putting the task the achievement of health, she engages in illness. Because of this paradox, we with every year all anymore know about illnesses, curatively-diagnostic methods, etc. But this way will never bring us over to the put aim - achievement of health. Because a health is not absence of illness, but something another. Medicine «thought» of from 40 to 60 thousand terms, reflecting properties of illness, and only two ten of words, characterizing a health. Thus, the modern system of health protection is a complex of measures on a management by illness (the guided object is illness). The necessity of new strategy is logical are management strategies by the health of individual.

The problem of individual health medicine investigates more than two thousand years. The result of these

researches represented R. Doll: there «Were many attempts to build the scale of positive health, but until now measuring of health remains the same illusion, as measuring of happiness, beauty and love»(5).

We succeeded to show the fallaciousness of this statement. Having an unique experience in area of extreme medicine, we came to the conclusion, that a general sign of stability of organism of man is to unfavorable influences is energy potential of the biosystem. Otherwise speaking, in addition to thermodynamics conception of life *thermodynamics conception of health (1)* was clearly set forth. If life thermodynamics nonstability is the basis of, then the degree of stability of this non-equilibrium state can be used for the quantitative estimation of viability, or «amount» of health.

A basic condition of existence all living on Earth is possibility to take in energy from an environment, to accumulate her and use for realization of processes of vital functions. What higher accessible for the use backlogs of bioenergetics, that an organism is more viable. And than more formation of energy on unit of mass of organism, the more effective the biological function of survival comes true. Ability to increase a oxygenation if necessary determines that reserve of energy, that can be used for intensification of processes of vital functions. What anymore this ability, that an organism is more viable.

Thus, a criterion that can be fixed in basis of «measuring» of health was marked. At organism level this criterion (energy potential of the biosystem) can be described by maximal aerobic possibilities - power and efficiency of aerobic mechanisms formation of energy, that, in turn, reflect functional possibilities of vehicle of mitochondries.

Mitochondries are the «power station» of cage, as due to oxidization of nutritives in them greater part of necessity is synthesized to the cage of energy source - ATP. The main function of mitochondries is a capture of high-energy substrats (f at acids, carbon skeleton of amino acids) from a cytoplasm, their oxidizing breaking up with formation of CO₂ and H₂O with a

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simultaneous synthesis ATP. Passing of cages to making of energy by means of mitochondries it is possible to compare to industrial revolution. Instead of that arc wise to grow the size of elements, cages went on a quality change: they built a «plant» and put the rows of the specialized «machine-tools» in it. That is why, in spite of milliards of years of existence, procariots (cages without mitochondries) and until now remained relatively simple creatures, and eucariots, armed with mitochondries, invented new facilities of transmission of signals between cages and took a step toward the multicellular forms of life (including - us with you).

All forms of adaptation are related to energy of cage. Thus most exogenous factors (industrial contamination, nicotine, alcohol, etc.) result in suppression of energy of cage and only optimal for an individual physical activity - towards her increasing.

Taking into account the educed by us system reactions of organism, accompanying the increase of his stability to different influences (expansion and economization of functions), the scale of

express estimation of health level was worked out. She was entered by the simplest indexes of functions that reflected found out conformities to law. Appeared, that the estimation of health level, got on the express system, has a high coefficient of correlation with the maximal consumption of oxygen (0,806), that reflects the state of power function of mitochondries at organism level.

Small labour intensiveness and cheapness of the use of the indicated system of express estimation, availability of her for qualification of middle medical staff allowed to undertake studies of thousands practically healthy and sick people 80 from 6 to that gave an opportunity to educe and describe the new phenomena of individual health(2).

Even more convincing are the results of studies by American scientists who showed the dependence of mortality risk versus the maximum aerobic abilities (MAA) of an individual (Fig. 1). When an individual's MAA indicator falls below a threshold of 10-12 MET, then mortality increases sharply (4).

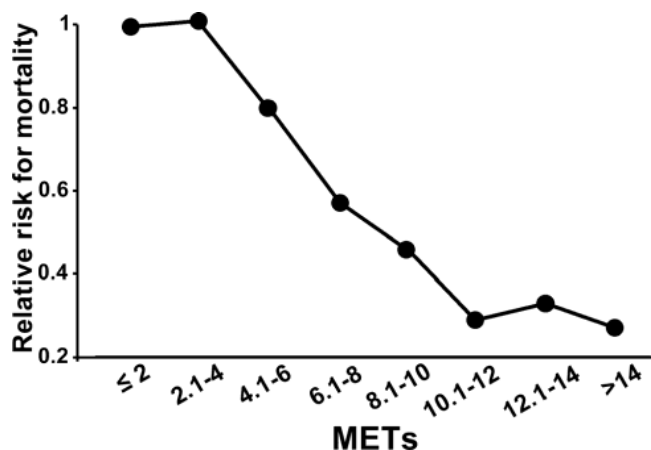


Figure1: Risk of death among US war veterans depending on the MAA. 1 MET=of 3.5 ml (kg · 1(min - 1 of mass of body).

Thus, energy potential of the biosystem really reflects her viability and can serve as the integral criterion of health and biological age level.

The analysis of literary and own data allowed to ground positionus that by direct reason of epidemic chronic uninfected disease (CND), overcoming the world in the second half of XX of century and being principal reason of death rate in

the modern world, there is the mitochondrial insufficiency conditioned by the row of social and socially-hygienical factors, including by the way of life of modern man and contamination of environment. Thus, there is a single leading risk of development of CND factor is insufficiency of functions of mitochondries, going beyond the limits determined by the laws of evolution, and indicative on the decline of stability of the non-equilibrium thermodynamics system.

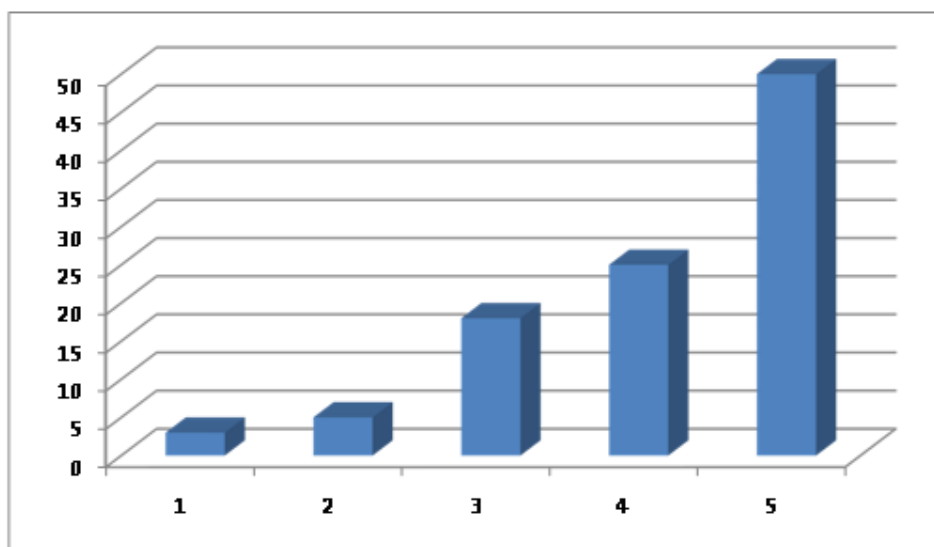
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It is set as a result of researches of the Ukrainian population, that now only an about 1% population is in the «safe» zone of health (on the step of biopower stair of evolution); it is basis of depopulation and quick-ageing. 25 back this index made 8% (2).

Social Evolution and Biological Age

Getting in a few dissertations of our students reliable data about the

catastrophic decline of health level («amounts»), and also parallel speed-up rate of aging of student young people of Ukraine (fig.2), we these data did not hurry to parade, supposing that it is clean the post-soviet phenomenon. But the results of research of the Dutch National institute of public health and environment appeared recently, it is shown in that appearance of «senile» illnesses for modern Dutch youth registers oneself on the average on 15 before, than for their grandmothers and grand-dads (12).



Ранги старения 1-5

Figure2: Rate of aging (grades 1-5) of students of 20-24. Aging grades : 1 - very subzero, 2 - subzero, 3 - optimal; 4 - speed-up, 5 - extraordinarily speed-up(10). On a y-axis - % entering a group, for abscise axis - aging grades

A conclusion is based on the results of research with participation 6 thousand adults in age 20, 30, 40 and 50(research overcame a 25-years-old period). Analysing their state of health, researchers set that at the young generation a weak «metabolic health» is marked. This term, unfortunately, explains nothing. More logical to talk about found out by us «mitochondrial insufficiency»: a power function of mitochondries is below than the limit, conditioned by a biological evolution, what is direct reason of quick-ageing.

Our conclusion is confirmed by the solid researches conducted in the institute of gerontology of Ukraine (12). It is set that between functional age and maximal consumption of oxygen of individual there is the close dependence described by the

coefficient of correlation 0,840 for men and 0,813 for women.

About a Demographic Transition

So, a problem, meaningfulness of that is while realized by neither public nor state, - biological degradation of type of *Homo sapiens* stands before humanity. She shows up : by the speed-up rate of aging, decline of «amount» of health(to viability), epidemic of CND, decline of reproductive function, birth of weak posterity and other. With every year she will be more intensified, showing up the decline of quality of human potential. From our point of view, there are all grounds to talk about a fourth demographic transition. If the first demographic transition was expressed in the changes of levels of birth-rate and death

rate, second - in the changes of sexual behavior, organization of life of family and her forms, and the third demographic transition affected his composition(11), then a fourth demographic transition characterizes the decline of quality(to viability) of population.

Thus, a social evolution enters into contradiction with a biological evolution, hampering biopower progress. Thus, if evolutionary processes in living flow very slowly, then degradation - far quicker.

Is counteraction to the presented prospect possible? Radically changing nature of evolutionary processes hardly will be succeeded, but to counteract to them, up to a point, it is possible. Getting to know nature of processes, man as creature socially the active will be able to manage them. And it is constrained, to our opinion, with the radical change of strategy of healthcare - transition from strategy of management by illness to strategy of management by a health(by viability).

Becomes obvious also, that no improvements of curatively-diagnostic process in a health protection are not able radically to influence on the indexes of stability of the thermodynamics system - living organism, because the low level of health (subzero thermodynamics stability) does not treat oneself pills. Only passing of basic part of population to the higher level of aerobic energypotentiale of functions (to efficiency of activity of mitihondries) is able to decide this problem.

Conclusion

Essence of problem is obvious. Radically leaving from the nature in the process of social evolution, humanity already in earnest to sawa that branch on that sits - decreased stability of the non-equilibrium thermodynamics system being the basis of the phenomenon of life. Orthodox medicine with her methodology and technologies with this problem will not manage. For the decision of problem creation of span-new direction of activity in a social sphere(out of sphere of healthcare), having goals, tasks, is needed - to stop the loss of stability of thermodynamics неравновесия, - and methods of their decision. In fact, unfortunately, humanity

did not think of more accessible and cheap way of decision of problem of charge of mitohondries, except the physical training . But it yet needs to be told and prove to the people. And they are people - still hope on pills and future high-tech of improvement of human nature. We suppose that it is time for the change of strategy of healthcare.

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