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JAN BENEŠ

ARE WE THE CULMINATION OF NATURE OR HAS NATURE REACHED HER APEX IN US?

ABSTRACT — The author considers the position of man in the biosphere in the course of his biological and social evolution. He stresses the double role of man in the biosphere — transforming and checking or analysing the cause of breach between man and nature. The elimination of this breach is an urgent task because its continuation and deepening lead not only to environmental crises, but also to the destabilization of the human society. Besides, its absolutization is extremely dangerous for the fate of life on the earth as well as for the fate of making in this form and in this state are inseparable from each other. Nobody will change it without the risk of destroying everything living and this also himself.

KEY WORDS: Dynamical equilibrium — Biosphere — Ecological and social succession — Human society — Limited anthropocentrism.

I think E. Haeckel was one of the first evolutionists who in the spirit of Darwin's theory of the origin of species through natural selection portrayed the developing Nature as a tree with patulous branches, with a thick trunk, gnarled twigs, bearing fruit in the form of biological species. On the lowermost branches we can see the monocellulars, in the middle of the crown the winged insects, while at the top of the crown are the mammals, with man on the topmost branch. The botanical conception of the developing nature (or as it is called nowadays — the biosphere) was without doubt interesting and bold and it was accepted for a long time both by the evolutionists and by laymen. Then it was suddenly realized that on setting up this demanding and ostentatious image of the evolution many things have been omitted. Among other things the very fact that perhaps there was not only a single tree sticking out from the primitive ocean of the evolutionary "broth" and that in the course of time a great number of similar evolution trees may have existed, forming whole avenues or even evolution forests. It was formed by biological species arising in the course of stormy adaptive radiations. And all of them — in competition or in cooperation — were imbibing energy stormily streaming in the tissues of evolution undergrowth. It has been also forgotten that the individual species did not sprout at the tips of the twigs by chance, according to the rules of some stochastic game — they themselves were at the same time players and inventors of the game. In other words, it has been omitted that biological species were at the same time elements of the biosphere, by means of which and through which in the words of I. I. Shmalgausen the biosphere evolutionized itself. Was man also one of these elements? No doubt he was. But what kind of element was he?

No appropriate answers have been found so far to these seemingly simple question. It may be so due to the fact that modern anthropology with its revolutionary theories, no matter how daring, has evidently not overcome the limits of the past. It is depressing to see how little the degree of dependence has been understood in this connection, and on the other hand how misunderstood has been the degree of man's independence from the biosphere, since the very origins of man up to the present. The above facts can

be documented by the surviving theories of "man the hunter", with encoded information that man was the master of nature, a leader and a killer, or the opposite theory of "man the altruist", collaborating with everybody and under all circumstances. Other evidence of the above facts and a direct one is the unshakable belief in the omnipotence of the sphere of technology and the ensuing passivity of the not yet awakened masses, supported by the passive silence of the scientific circles at a time when mankind has released a number of irreversible geochemical processes endangering the stability of the biosphere. All these extremes constituting the opposite poles of our views of man and his relation to the biosphere evidently reflect the present disruption of anthropological thinking, a disruption following from the crisis of limited anthropocentrism, deepened by the problems the turn of the millenium is going to face.

The discovery of man's double function in nature has been recently enriched by never-thought-of facts. Owing to the merits of the Leakey's, F. C. Howell, J. Jelínek, G. L. Isaac and other prehistorians our impression (perhaps quite a justified one) is that the first people were evidently able to make use of the natural sources of materials, energy and to transform them, to amass and hand over information on these phenomena already 1.5 million years ago, and they were able to do so much faster than any other biological species. This can be documented by the origin of the Acheulian, ascribed by some anthropologists to the first hunters and gatherers of our species, to Homo sapiens erectus. The time these people had for their evolution was immensely long and in the course of its slow flow they were gradually tuned, both physically and socially, into modern shape. At the same time there were numerous setbacks, followed by the time for recovering the lost balance.

The periods of evolutionary storms and periods of quiet characterized above all the social development, which in the form of new types of adaptations helped man to get liberated from the evolutionary regularities of the biosphere, as it were. The conflict between man and evolutionary forces of the biosphere was evidently hard and it took place on the level of the flow of materials, energy and information, to culminate in an unstable balance lasting for some 1.5 million years. Then of course came a reversal in the form of the origin of agricultural economy, occurring parallelly at several places of both the Old and of the New Worlds.

The hunting-gathering economy on the one hand, and the agricultural economy on the other (including the rest of the periods of social development up to these days) are chronologically, and also otherwise incommeasurable. If the hunter and gatherer realized the exchange of material and energy only knowingly and purposefully (which is quite a justified assumption), the primitive farmer began to control consciously the process of reproduction both in natural and artificial environments (there is documented evidence of it!). Many scientists rightly think that in the Neolithic the dialectical contradiction between man and biosphere became absolute. And this absolutization meant only one thing a dangerous depletion of the ecosystems beyond the limits of their regeneration. This rupture with nature, however, did not remain without response. The Neolithic societies were shaken by demographic processes during several generations and the denaturation of the environment worsened the situation. At a certain moment most of these people solved their problem by emigration.

The signs of the lost balance inside these human societies remind us of the signs of the lost balance inside the natural ecosystems and in the associations they consist of. And the ecologists know the correct answer to these signs, e.g. by increasing the internal complexity of the ecosystem, including the creation of new forms of mutual dependence and the following specialization. Did the demographically and socially destabilized human society respond in this ecologically tested way? No doubt it did. The Neolithic proper, also all the social revolutions following it, including the modern industrial, scientific and technical revolutions give evidence of it.

If we express some social phenomena in the ecological language, then the division of tasks in the Neolithic and in the modern societies (incommesurable as they are in their complexity) is fully comparable with the specializations of econiches in the biological systems.

However, any comparison with other populations and societies constituting the ecosystem, the human society has a unique feature. With the continuing diversification of its social niche it has the capability of adapting itself with the help of its cultural and information contents. And its continuously developing information contents enable it (e.g. through a simple division of labour), to make use not only of the information supplies of its own ecosystem (nature), but to utilize also the information supplies from the sphere of culture.

The continuous differentiation of the developing human society followed by specialization is becoming more and more dramatic. It is reflected by two very sensitive spots of the economic reproduction; in the mutual relation of production forces to production relations and from the adaptive manifestations ensuing from it.

The most important thing, manifestly differentiating the present human society from the rest of systems in the biosphere is its steadily growing primary production, absorbing more and more energy. The energy is obtained from the biomass of plants and animals, but also from the so-called fossil fuels i.e. from coal, natural gas and oil. And since the supplies of fossil fuels are limited, when they are exhausted, but sometimes much earlier, we shall face crises of resources and of the environment in general. Such crises are evidently nothing new, either for the biosphere or for the human society. In the past, however, these crises were of local character and the animals and people could leave the endangered area at any time. But the environmental crises accompanied by a population explosion in the developing countries have a global character and people have nowhere to escape — except the outer space. Mankind is challenged by the inevitable task of assuming overall control and by the gloomy considerations, whether

it will succeed in due time to reach a new level of social and biological homeostasis, and whether it will be able to reach it at all.

People have always admired the harmony of nature and of the human society, interrupted from time to time by great catastrophies. The harmony of nature, seemingly, very stable in fact it is a dynamic stability, if not rightaway a dynamic balance, has not escaped the attention of biologists, nor of the scientists of the related or theoretical sciences. But its explanation has remained a puzzle. Mathematicians have developed a mathematical theory of stability, but somehow it does not fit in with the biological systems. Why is that so? Because of the simple reason that it is too complex for them. Nor have the physicists succeeded with their principle of dynamical balance, according to which any arbitrary system with a limited flow of materials and energy is developing with great probability towards a balanced state, towards the so-called flow of equilibrium, differing from the classical thermodynamical equilibrium (maintained by self-controlling homeostatic mechanisms). Why has even this conception failed to bring about the desired success? It is so evidently because the thermodynamics of the open system is a conception of a rather general character. It cannot be used for the deduction of any method that might be used for assessing the rate of stability inside a biological system. Successful have been, however, the ecologists with their recently reviewed theory of ecological succession, which in its modern form bears admiringly many analogies with the evolution of the biosphere, with the development of the individual, but also with the development of the human society. The culmination of the theory in the form of a climax, in which a mature ecosystem has reached dynamical equilibrium with the non-living environment, is evidently rather attractive for the sociologists. Although the ecologists so far do not know how and why the dynamical equilibrium of the ecosystem works and it should not be rejected in connection with the human society, on the very contrary, it should be developed further. Evidently the only alternative that remains is to reach a new level of the dynamical equilibrium of the human society. Such an equilibrium, established not by an accidental use of some of the homeostatic mechanisms, as demonstrated by the present market model, but based on their actual control and regulation, so as not to be in absolute contradiction with the biosphere.

Once we have become a planetary phenomenon, a long-forgotten and deeply buried feeling of appurtenance with the biosphere seems to have awakened in us. Our feeling of responsibility for life in general, for the biosphere, for our planet as a whole, has shot up and begun to develop. But this feeling is emerging from our selfish interests (individual, group, national, class, etc. interests) only slowly. What is the cause of such inflexibility in our thinking? Why have all these ecological, raw-material and population crises caught us unprepared? The answer should be sought deep in our natural and social history, and above all in the traditions of European thinking. Written history confirms our dominance over nature and the maintenance of this dominance with constant struggle. This conception has not been limited to Europe only. During the colonial expansion it spread into the remaining parts of the world and it seems that this idea still survives in the industrially developed countries.

Since human society in the latest stages of its social evolution has been developing so rapidly that nature with its "slow" adaptation mechanisms is unable to keep pace with it, mankind has become without doubt an important element of the biosphere. But is it the ruling element?

To find an answer to this critical question of the present epoch we should realize that the further existence of life on the earth and the further existence of mankind in the present form are inseparable from each other. This state is the result of the evolution of the biosphere. Nobody can change it without risking the destruction of everything living, including himself. If we have the power to destroy ourselves, on the other hand we have also the power to learn about ourselves, revealing thus the roots of our limited anthropocentrism. If we succeed in these efforts, which I personally do not doubt at all, we shall be able to understand finally that we aren't the culmination of nature, that only nature has reached its apex in us.

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Dr. Jan Beneš, CSc.
Department of Anthropology
University of J. E. Purkyně
Kotlářská 2
611 37 Brno