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The Aspects of Biological and Medical Knowledge and Their Role in Teaching Philosophy in a Medical Pharmaceutical Institute

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Abstract

The authors of the article single out a number of worldview aspects of biology and medicine that are not only of pure scientific but also of the human nature. They contribute to forming general cultural competencies necessary for students. Presently a task to synthesize biosphere-ecological, medical and other approaches to life experiencing is set which is connected with the specifics of postmodern society's culture and the problem of awareness of the constantly changing the world scientific picture. Considering different stages of the developing biological and medical knowledge the authors of the article draw conclusions on their secondary nature and offer to emphasize their general philosophic character in teaching methods. It is suggested to consider the essence of the subject matter common both to biology and medicine – "life", "living" – through the prism not only of scientific advance but also of bioethical norms.

A special attention is paid to the problem of manifested and predicted social and anthropological consequences of new technological structures. The issues of the future biosphere, the process of formation of the noosphere and the possible appearance of a "new" human with improved functionality cause ambiguous socio-philosophical reflection. Various scenarios for the development of mankind are actively discussed both in the scientific community and in the philistine environment. The authors point out that the element of utopianism is present in any attempt at social forecasting and in any social project, since knowledge about society never completely coincides with the real state of affairs. On the other hand, utopias always reflect the real needs and development trends of society: the issues of eugenics, transhumanism, feminism and much more.

Keywords: biogeotic reality, biosphere, divergence, world scientific picture, noosphere, techno human, utopia, feminism.

1. INTRODUCTION

In modern biological and medical education among the world scientific pictures of specific spheres of knowledge the biogeotic reality picture or the concept of a biogeotic circulation is of particular interest. Active integrative processes in pedology on the basis of available objective reasons contributed to the emergence of such a system of knowledge. With all the differentiation of different fields of knowledge (soil physics, soil chemistry, soil biology, etc.), they have some unity. This synthesis in pedology is mainly due to the formation of general scientific concepts and principles. In our opinion they are as follows: soil as an integral system; the essence of the process of soil formation; invariant characteristics of soil formation: stability and variability, reversibility and irreversibility; biogeotic circulation; soil evolution, etc. Their formation took place on the basis of such philosophical principles as determinism, development and others.

In a methodological aspect the biogeotic reality picture is both a way of thinking and a unified integral approach to research.

Having discovered the law of the struggle for existence and creating on its basis the theory of natural selection C. Darwin simultaneously formulated the divergence principle which laid the foundation for the scientific picture of the development of the organic world. If the divergence principle answers the question of how the process of evolutionary development occurred, then the basic law of the development of the organic world gives a causal explanation of this process, i.e. answers the question why the development process proceeds like this, and not otherwise. This is a principal difference between the picture of the origin of species and the theory of their origin. The genealogical tree of life by E. Haeckel is a concretization of the abstract scheme of divergence by C. Darwin. On the line of progressive development of organic life in its phylogenesis there are "nodes" – bioethical revolutions. Bioethical revolution is an ecological phenomenon, the result of the action of an abstract (general) law of the population, i.e. contradiction between the limited inhabited surface of the Earth and the unlimited reproductive capacity of organisms [1].

2. THE SPECIFICS OF FORMING THE MODERN SCIENTIFIC PICTURE OF BIOLOGICAL REALITY

The reconstruction of C. Darwin's works enables to single out the evolution picture of living nature. An individual creature was a minimal unit of evolution. In the modern scientific picture of biological reality local population is a minimal unit of evolution but not an individual creature.

Under the influence of probabilistic and cybernetic thinking styles established in science in the second half of the 20th century biology started the development of ideals and norms of the system approach which was reflected in the conceptual apparatus of the modern scientific picture of biological reality.

The principle of anticipatory reflection formulated by A.K. Anokhin also serves as a conceptual means of realizing the ideas of the systemic approach in the material of the scientific picture of biological reality. He draws researchers' attention to understanding the fact that the patterns of expedient adaptability of an individual organism to the environment can be disclosed if it is considered as an element of a special kind of functional system that is living nature as a whole [2].

The starting point for forming a scientific picture of organic word was resolution of controversies between Linnaeus's theory, which highlights the ideas of consistency of individual features and naturalness of taxonomy groups, and Lamarck's concept that studies variability of individual features and considers taxonomy groups as artificial structures. Darwinism removes this contradiction. C. Darwin justified the natural formation of subspecies and species by singling out some of the

individual features of organisms as belonging to whole species at the same time [3].

The theory of F. Müller and E. Haeckel comparable to Darwin's theory in terms of logical generalization was the next one that managed to justify the process of origin of supraspecies taxons.

A.I. Oparin's and J. Haldane's coacervate theory of the origin of life became the last logical step in the development of classical biology theories.

The means to study the materials accumulated by the history of biology knowledge and the means to relate research results of biology knowledge are the two aspects that in their unity determine formation of the scientific picture of the organic world.

Linnaeus's attempt to create a comprehensive system of living creatures became the limit of opportunities of empirical stage of biology development. C. Darwin's theory on the origin of species explained many patterns of life in adequate terms developed on the basis of their specific study. This was the creation of a new worldview problem in biology that is the necessity to connect the biology knowledge to the knowledge of other sciences within the world scientific picture. The substantial progress in solving the given problem can be achieved by developing the general theory of living. It should be noted that the biosphere is the means for living to exist and the general theory of living matter should be the theory of the biosphere. The development of both biology and the world scientific picture on the whole is aimed at creating theoretical biology that will take the forms of the theory of the biosphere.

The focus of the developing biosystems is closely connected with progress to which the transition from symmetry to asymmetry corresponds.

The progressive branch of development is characterized by the increasing qualitative complexity of forms of reflection accompanied by ever faster information accumulating and processing that manifests the structured and orderly system. The search for the common, identical in the different and opposite implies finding symmetry and increasing information. However, the accumulation of information is inconceivable without distinguishing differences, opposites in the identical, symmetrical. The transition from randomness to a statistically regular path of evolution constitutes the essence of the transition from symmetry to asymmetry in the cognition of biological motion.

As progressive complication proceeds and the organization of biosystems increases their own time becomes more heterogeneous, asymmetric. The identity of physical patterns regarding space-time displacements cannot be effectively used in the study of biological motion due to the higher asymmetry of the latter.

3. Solving The Problem Of The Essence Of Life

We shall make an attempt to consider only a small number of issues connected with the given problem.

First, the present-day science has not solved the very problem of the essence of life but only offered various approaches to its solution. It primarily concerns biology which considers all living things to be the subject of its study. In order to specify and highlight the main issue of the study of biology it is necessary to consider the historical process of its formation as a science.

Both in primitive and traditional cultures the living creatures were not considered as a separate class of objects as the world was perceived though anthropomorphism principles. The concept of the world was dominated by totemism; a myth about zoophytes, creatures combining the features of plants and animals, appeared which most likely was either a real observation error or a conscientious error or compilation of facts of different origin. All objects of reality were structured according to the degree of perfection into the so-called "ladder of beings" which does not correspond to the idea of the historical development of organic nature.

In XVII-XVIII centuries another area of knowledge advanced into the arena of nature cognition – "natural history" that distinguished three kingdoms in nature, namely animals, plants and minerals. However, this "history" was limited to the description of the denoted objects only. If philosophy and scientific thought were dominated by the idea of the development of plants and animals, within natural history this idea was considered mainly externally and did not enter the given system of knowledge. Natural history studied the elements of natural environment as accidentally connected with each other and external in relation to a human that is why cognition was reduced to random description and classification. However, there was the idea of natural classification based on determining proximity of objects in a system of classes due to similarities of the most part of features and vice versa.

Naturalists of XVII-XVIII centuries made attempts to create such a natural classification in different ways. The first approach required a very detailed description of the subject so as to obtain some standard set of features eventually. After that the received description scheme could be applied to all other studied objects and as a result to create the desired "natural" classification.

The second approach proceeded from the fact that the classification should be based on description of a small number of features belonging to a large number of objects. In the future the initial data should be improved by detailing and bringing them to the state of "natural" classification.

At the same time the type of knowledge that is considered as a standard presently, was developed; this is knowledge of physics and mathematics operating with the concepts of natural law, aware of its prognostic function and using a hypothetical deductive method and formalization.

The decline of natural history and the formation of its disciplinary structure in the form of biology and geology were the results of this development at the end of the VXIII century. It was in the late XVIII-early XIX centuries when terms "biology" and "geology" were introduced. It is especially important that the concepts of natural law penetrate these knowledge branches; they acquire the signs of a natural scientific knowledge of the modern type.

Thus, in biology Jean-Baptiste de Lamarck suggested the idea of evolution of living organisms that proceeds according to certain natural laws which in turn are necessary to cognize. J. Cuvier, for his part, revealed logical interrelations of the organs of an individual organism and regarded them as a definite system to be cognized. Moreover, in his research he proceeded from the idea of logical interrelations between the environment and the living, for instance, between the way of feeding and the organism's structure. Such approaches gave rise to the use of the hypothetical-deductive method in biology and later, already in XX century, to the use of mathematical methods. The similar processes occurred in geology as well [4].

Therefore in the late XVIII-early XIX centuries the subject matter was determined in biology (former natural history), that is animals and plants. However, this fact does not give an answer to the question why in that epoch at the achieved level of knowledge and the way of thinking animals and plants turned out to be studies by on and the same discipline, whereas geology was distinguished as a separate one.

We did not manage to find an answer to this question in modern scientific literature. However, we suggest that an answer should be sought in considering the processes that took place in the science of XVII century, as we shall try to do.

The first question that arises at once concerns knowledge of physics and mathematics appearing already in XVII century: why is it not applied to natural history?

First, the field of traditional application of mathematical methods was limited primarily to such spheres of activity as artillery, building, naval architecture and astronomy. Natural history was related neither to these spheres of activity nor to mathematics. Later, in XVIII century, attempts to implement some physical methods elicited an active protest.

Second, the subject matter of physics included extremely simple objects that were subjected to technically feasible experiments, and a very meager mathematical apparatus was used for their description. The subject matter of natural history was much more complicated, thus, making the application of physical and mathematical methods simply impossible.

However, in XVIII century the situation changed: all the activity in producing knowledge started to be considered as a science and, consequently, the united norm was applied to all this field of activity; institutionalization of sciences occurred. Physics and mathematics became the leading scientific directions of that time (as they are presently), thus, the other spheres of knowledge accepted their methods of cognition as standard. By the way, this was referred not only to biology and geology but also to socio-humanitarian knowledge which made an attempt to develop scientific theories of society in XIX century.

The issue of historicism and uniformitarianism in biological and ecological knowledge is one more interesting aspect of the problem of worldview prerequisites for biology and geology. On the worldview background of XX century uniformitarianism was complemented by historicism to search natural laws. There has been a combination of these principles in biology since its origin. According to the uniformitarianism principle, natural laws do not change over time. This is a factor of "striving for progress", according to Lamarck, it includes variation, and according to Darwin, it includes heredity and selection. As to historicism, it allows changes in natural laws as a result of changes in the properties of the system of objects under study (the biosphere, the Earth, the Universe, society), i.e. historicism appears as a weakened version of uniformitarianism.

Thus, with the advent of biology the question of its subject matter, the essence of life, arose. The early forms of considering this problem were reductionism and vitalism. In the late XIX - XX centuries these tendencies appeared, in our opinion, in the form of opposition of different variants of reductionism (A.I. Oparin, J. Haldane, etc.) and the system approach (ecology, "science of the biosphere class") [5]. Reductionism worldview is associated with uniformitarianism, and the biosphere-ecological approach is connected with historicism. It is not possible to give an argumentation of this point of view, so we will limit ourselves to what has been said.

4. The Problem Of Socio-Cultural Determination Of Biology And Ecology

We are going to deal with another important issue – the problem of socio-cultural determination of biological and ecological knowledge. The given problem is of the most general character for scientology which determines its complexity. For physical science there is an acknowledged solution to the problem of socio-cultural determination of its origin in XVII century but for biology the given issue is not resolved. It is evident that the process of biology's formation varies from that of physics both in terms of history and in terms of their content differences. In general this problem is of another kind for biology: social normative characteristics of biology as a sphere of activity changed significantly in XVIII-XX centuries compared to physics. This mainly concerns ecology. Ecology originated in XIX century as a science of interconnection between organisms and the environment. In XX century ecology developed the theory of biogeocoenosis and started synthesizing with the theory of the biosphere (not yet completed) that originated from geochemistry.

Presently there is a task to synthesize the biosphere-ecology and other approaches to life cognition apparently connected with the specifics of the culture of XX century.

We believe that in the latter case the following factors can operate: 1) the scale of events in society; dependence on them could cause globalist tendencies in thinking (V.I. Vernadsky, the Club f Rome, etc.): 2) relatively independent change in the system of categories (a set of meanings, collective ideas) in the culture of XIX-XX centuries; 3) internal scientific factors – the search for the substrate (the carrier) of the evolution laws, the ecology laws, the laws of metabolism at suborganism and supraorganism levels; 4) the influence of historicism dichotomy and the system approach as a way of thinking in XIX-XX centuries on biology; 5) the processes of reverse influence of ecology-biology knowledge on culture in general and others.

Some of them are to be considered. Rational human activity aimed at transforming the Earth's surface, the scale of changes in landscape comparable to geological factors, according to V.I. Vernadsky, constitute a certain stage in the biosphere's development – the noosphere [6]. It is well-known that the very rational activity is a means for humanity to exist and, consequently, it develops in accordance with social laws. Thus, the noosphere should be considered as a certain characteristic of society from the standpoint of its attitude to the Earth but not as a stage in the biosphere's development. To put it another way, the noosphere is the denial of the biosphere.

The denial manifests itself in the form of governing or subordinating the matter to society. In this context the matter develops according to biology laws, society itself becomes a complete organic system and it begins to master its biological prerequisites. This is a long-term process starting from society's origin and proceeding at the present. Some of the stages are singled out, the latter of which continues nowadays up to the moment of achieving optimal ecological balance: society-biota that is humanity's mastering of the biosphere.

If corporal organization of a human is historically the first biological prerequisite for society, subordination and governance of the very corporeity will become the next stage in mastering the biosphere. Previously mastering and subordinating the biosphere was of external character aimed at consuming its resources. The corporeity was regulated by means of exclusively biological factors (diseases, environment and food). Now the practice sets the task of regulating the corporeity down to governing the amount of the population of the Earth (a country) and life expectancy.

The next aspect of such a regulation includes the transformation of a human as a biological object, namely increasing work efficiency, improving the reproduction of their corporeity, developing new ways of common work together, etc. The stage of so-called "supraorganism" social development begins and is based on the convergence of nano-, bio-, info- and cognitive technologies ("anthropological imagination" of F. Fukuyama and S. Khoruzhy). As a result of such development a techno human will rise as a new stage of the development of *Homo sapiens* [7].

The issues of governing the corporeity are in the field of medicine, health care in general and related sciences. Here a peculiar methodology problem appears. Throughout all history medical knowledge existed in various forms. Their pre-scientific and scientific (empirical) stages of development are singled out. However, the latter conflicts with the prognostic function of medicine that prevents optimization of health care in general, since the theoretical level of medical cognition is based on the biosphere-biology approach (society is connected with the

biosphere by means of the corporeity). Consequently, the formation of the noosphere is possible only with the active development of health care.

It is hard to predict what character the theory of medicine will acquire in future. It is possible to discuss the problems of ecology, diseases and death (or immortality), feminism and eugenics. The latter is represented in two variations: positive and negative one. The first includes improving the quality of the corporeity by means of artificial selection, whereas the second aims at preventing deterioration. In any event, the solution to the given problem will be necessary both at the theoretical and practical levels.

4. CONCLUSION

As it is known, the theory of V.I. Vernadsky on the noosphere emerged as a result of his natural-science research. At the same time, there are reasons to single out the socio-utopian aspect in his views and culture as a whole.

First of all, it is worth noting that the element of utopianism is present in any attempt of social forecasting as in any social project, since the knowledge of society never completely coincides with the real state of affairs. On the other hand, utopias always reflect the tendencies of society development. Finally, one of the functions of science is prognostic, thus, any theory which concerns society inevitably contains an element of forecasting and, consequently, utopia. Therefore, the acknowledgement of utopianism elements does not lead to negative assessment of the theory.

1. Having ascertained that humanity's activity is becoming a geological force in scale and due to the fact that the geochemical balance between a human and the habitat must be preserved, V.I. Vernadsky concluded that in the future mankind basing on scientific knowledge of the biosphere will consciously establish a balance between itself and its other elements. Indeed, in the second half of the XX century this need is realized by society, certain actions are being undertaken in this direction. But, like any trend in the development of society, it can be impeded by other trends without reaching its completion.

2. Russian society of the early XX century, which was in the state of transition from traditional to industrial one, became the social environment in which the theory of the noosphere was being developed. As the history of many countries demonstrates, with such a state of society, many social utopias, diverse in content, arise. These utopias, however, have common features, such as striving to implement present scientific knowledge to solving social problems. This moment is defined in the works of V.I. Vernadsky, anticipated modern environmental problems.

3. V.I. Vernadsky's aptitude towards globalist thinking does not characterize him personally. This is a manifestation of the Russian intelligentsia's worldview in XIX- early XX century which is called "Russian cosmism". Such tendencies of thinking are also characteristic of the turning points in the development of culture (for example, Western Europe of the XVI and XVIII centuries, Ancient Greece of the classical period), which give rise to various utopian ideas.

4. The ideology of feminism is a variation of the ideas of philosophical anthropology [8]. The modern Western culture is considered by feminists as repressive that is suppressing natural, original ways of behavior. In feminists' opinion, his is connected with "masculine" character of the culture which is manifested not only on in males' domination in most kinds of activities but also in the value system and activity norms. The point is that the strict division between female and male stereotypes of behaviour in the process of children's up-bringing characteristic of the Western culture (European culture) affects greatly their psyche. Girls are accustomed either to "second roles" in society. In addition, if a type of a "business woman" is formed, girls are accustomed to the realization of male stereotypes of behaviour which contradicts other social roles of women (for example, family role) [9, 10].

However, it has a more significant, even "ugly" impact on boys. Both girls and boys are closely attached to mothers in early childhood. But at a certain point of their lives, as a rule, at the age of 6-7, when boys start going to school they are demanded to behave differently from girls. This suppresses the forms of behaviour that boys learnt in the first years of their lives, disrupts their contact with mothers, thus, leading to formation of aggressiveness that in various explicit or sublimated forms is manifested in all kinds of activity and is included into modern Western culture as a significant characteristic.

Aggressiveness can turn into direct violence (brawls, sexual violence and different manifestations of unmotivated cruelty) but it occurs mainly in marginal groups. More importantly, the very way of thinking and attitude towards the world is sublimated aggression. This is presented in analytical way of thinking: dividing an object into parts is conceived by feminists as "violence" over them in a psychological sense. This is most clearly manifested in scientific activity as mental and actual "violence" over the object under study. Aggressiveness is also expressed in the desire to transform nature and society which generates the idea of progress. The desire for progress like in general the entire set of phenomena described generates social conflicts.

5. The way out of the situation is seen on the path of creating new culture of non-repressive character which is possible by means of changing the type of family-marriage relations. There are also attempts to implement this in practice: feminist "families" and communities are being created.

We do not try to evaluate the psychological justification of feminist views. We should only note that such broad understanding of aggressiveness makes it possible to interpret any activity as a form of aggression. Hence, any culture turns out to be "aggressive", but the rejection of any culture in general means a return from a human to an animal. Moreover, there are a number of other objections to the feminist interpretation of culture. Culture assumes a system of social roles, so, role-based differences are not removable. Differences in the social roles of men and women are connected with their psycho-physiological differences and they existed not only in the modern Western culture but in all known types of culture.

Conflict Of Interest-The authors confirm that the data do not contain any conflict of interest.

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