

### **Matviychuk A.V.: The Ecological Style of Thinking and the Increase of the Bounds**

The problems of global humanity must take into account the questions that underline some of its basic conditions such as its norms, directives and principles, and the personal attitude to environment, which has only recently become highly up-to-date. One of the variants of a new human consciousness in the twenty-first century may be an ecological consciousness and an ecological type of thinking. This article is devoted to the substantiation of the dissemination of important ecological thinking through the distinguishing of the features of a principled thinking style.

A world ecological crisis will begin in 20 years. This prediction was first announced at the beginning of 2005 by Professor Denis Madows, from New Hampshire University, a well-known contemporary scientist, interested in global ecological problems, and famous for his report presented at the Rome Club with the title *The Increase of the Bounds*. This report was the first attempt at providing an estimation of the quantitative processes that have occurred in globalization on our Planet.

In an interview to the network inform agency, [www.ytpo.ru](http://www.ytpo.ru), the scholar explained that the crisis would be caused by the changes of the global climate. According to the scholar's affirmations the energy floods and substances nowadays roughly exceed the level of the earthly ecosystems by 20%, which could otherwise provide for their constant function. This means that the biosphere under human influence has already been overloaded by 20% and in order to save the ecosystem of the Earth it is necessary to decrease these floods. Otherwise the crisis will occur and cause the increase of mortality, and an extreme decline in living standards on the planet. The initial stimulus of this depression will occur, due to the inevitability of the reduction of the quality of goods and environment. This entails that the quality of the soil will deteriorate, and this will increase the usage of synthetic fertilizers and will later influence the quality of customer goods, as well.

According to Denis Madows the natural cataclysms of the recent years show that the climate changes are rather extreme processes. The analysis of the dynamics of "natural surprises" make it possible to confirm that 60% of these changes will happen in 5-6 years and a general world crisis will begin in 20 years time. Of course this prediction has been treated with certain skepticism, but it is worth noting that it was sounded before the destructive tsunami South- Eastern Asian countries suffered from, and also before, the January hurricane and floods in Europe... The question that arises is: What are we to do? To our mind in looking for an answer to this question the approach offered by other members of the Rome Club, such as those of Professor Ervin Laslo, will be extremely productive.

The scholar and a research group headed by him have been working on the problem of creating a new, ecologically grounded and responsible consciousness. In December 1997 Professor Laslo expressed his thoughts at a solemn meeting at the Budapest Club, that "another thinking and another way of activity are needed to live and to act in new conditions ... we cannot enter the beginning of the third millennium without creating the new thinking type, without piling up the new values and perception more corresponding to the circumstances that quickly change" [1, 84].

From this it follows that in the contemporary world the subjective factor's role has been increasing in trying

to solve global problems as never before. Among the conditions of a further development, science and technique improvement, that will certainly cause the increase of human influence within nature, the question arises as to what norms, directives and principles will lead a person in his attitude to consider the environment as being important.

And all this, to our mind, actualizes a task to form the ecological thinking in a person, whose main estimate is valued according to human behavior and its projections of life. The latter is impossible without a thorough development of ecological knowledge. However, the corresponding type of thinking - a scientific form of thinking, - is a form of human consciousness created parallel with the development of certain scientific subjects such as a certain specific activity that is oriented by an objective knowledge producing and corresponding to our reflections of the senses of real relations and resulting in deeply reasonable objective dependencies. This is the development of ecological science as a specific branch of knowledge that is organized according to a difficult system of variously structured totality of facts, regularity, theoretical constructions, reflections, which help form the total imagination of the environment and a human being's place in nature, and helps promote the formation of ecological thinking. It is obvious that the thinking style cannot be fixed explicitly, but the whole mental atmosphere of a certain historical epoch that inspires its prominent figures has penetrated it. It is a so-called power field that organizes the ideas of its time.

Therefore, the analysis of scientific cognition influencing the thinking type shows, that the changes that have occurred during the history of Earth Science in relation to the revaluation of the main directives concerning objective cognition, and cognitive activity, have lead to certain logical consequences as their result, and a determined Earth Science method in certain historical periods of scientific development has found expression in the style scientific thinking. The success of the classical Earth Science method was grounded on mechanical principles, which explains the facts of nature and society, that have brought about the settlement and strengthening of the mechanical style of thinking. The study of the natural scientific object, with due consideration to its changes during many historical epochs, promotes the confirmation of the historical method. Another element was added to dialectical thinking that orientated the scientists towards the development of understanding, not only the quantitative object and its facts, but their quality transformation, as well. Philosophical ideas about the dialectical development of the realistic character, and organic and inorganic worlds have helped to define the dominance of evolutionary images as being norms of scientific rationality in a stage of definite scientific development. The style of evolutionary thinking has been created. The other essential changes in scientific thinking have dealt with the origin of the quantum mechanics that gave the stimulus in the formation of the style of probable thinking that favored the notion of strengthening the process of scientific cognition as a dialectical interaction between the subject and the object. The probability of the thinking style widened the bounds of the field of problematic contemporary science considerably. Science acquired new peculiarities and definite characteristics, which caused in their turn the establishment of a systematic and structural style of thinking. Nowadays, the sin-energetic style of thinking is gaining in strength more and more, and it is, as some scholars think, a modern stage of systematic and structural, as well as, cybernetic style of thinking, which is directed towards the formation of realistic

vision through the universal mechanism that reveals the self-organization of difficult systems. As we have seen, the scientific style of thinking has managed to create a permanent process that occurs mainly under the influence of some scientific subject-leaders, and continues during the whole of scientific history.

However, it would be an exaggeration to admit that the ecological knowledge, nowadays, is the only branch that influences the formation of the style of thinking in contemporary science; and that ecological knowledge today has a prevailing character. The ecological style of thinking as a new scientific style forms mainly in a person's consciousness that is deeply interested in ecological problems. Ecological thinking as a method does not have a precise systematic character. This is presented as a list of peculiarities, as being typical features, which are often revealed through distinctive features that deny the style of classical scientific thinking or even that of modern western civilization. The elements of completeness, quality, mentality, respect, evolution and ecological thinking are opposed to the elements of atomism, quantity, object, mechanic, and consumer style of thinking. I. Novik, for example, mentions that the basis of science is founded on opposite theories establishing a new style of thinking where the importance of thoughts may turn out to be asymmetric (for example, the technocratic style of thinking is better known than the ecological style of thinking).

According to the scientist's opinion, the "harmony of scientific cognition consists not in static, absolutely symmetric, synthesized view of oppositions, but in a science of self-development, in its absolute becoming the motive of which a methodologically unequal opposition being asymmetric in every given stage of cognition in condition to their equivalent in a tendency" can come forward [2, 18]. On the other hand, E. Knyazeva emphasized that any cognitive act and its product (for example, ecological knowledge) rebuilt by its surrounding, transforms, and recrystalizes connections in a scientific environment. A cognitive act modifies this environmental "architecture". In other words, a scientist, who through his results achieves a level of common science and culture (or its narrow sphere), changes the decorative "pattern" of this environment, and with it the network of connections. [3, 216]. Based on this assumption it is possible to conclude, that the obvious cognitive advantages of the ecological style of thinking will definitely cause a change within the scientific environmental "architecture". Ecological knowledge will form a certain "spirit of epoch", and will further engage in a research for ecological problems consisting of other (new) disciplines. The ecological style of thinking, that emerges under an influence of ecological knowledge is a means of distribution within the ecological methodology. The mechanism, described by E.Knyazeva as being intrinsic to not only the scientific environment, but also on a larger scale a social entity. Consequently, the ecological style of thinking acquires further distribution in society. Considering that the ecological problems deviate from the framework of the scientific- theoretical field, and have a vitally important character, the process of the style of ecological thinking and distribution, as well as, all the ecological knowledge is to be stimulated, instead of being allowed to drift.

The ecological style of thinking, which is formed as a direct result of influence of ecological knowledge on the thinking style of modern science, is needed to register a row of characteristic features, which are combined with the features of all ecological knowledge, and also correlate with the world view and the

world of philosophical images, which fix the system of modern civilization with its basic values and priorities. The fact is that the ecological style of thinking (as a certain type of scientific thinking) functions and develops under an aggregate influence of cognitive, social-cultural and institutional factors. The ecological style of thinking is also a difficult multi-component system, which functions in the conceptual-theoretical worldview and logic oriented methodological concept. Therefore, the initial moment of ecological cognition, which determines the specification and correlation of the research separate the different stages as direction, field, ways of further research, method of practical and theoretical environmental learning, and character of theoretical processing of obtained empirical material.

After due consideration of the above mentioned, we can specify the characteristic features of the ecological style of thinking. It is obvious that their sequence of exposition does not testify to the advantage of any of the above features.

In the ecological style of thinking there is a dialog of unscientific and scientific knowledge, a generally used and logically (methodically) motivated knowledge, and there is a co-operation and synthesis of traditional ("old") and new knowledge. This special feature is stipulated in the features of ecological knowledge. The point is that nature, which forms the subjective field of ecological knowledge demonstrates the circumstance that its unity provides for diversity, and that pluralism as a norm guarantees the functioning of the whole biosphere.

The typical feature of the ecological style of thinking is that it is a certain foundation for the creation of reality and (or world of nature) the common understanding of the environment. Thus, the given style of thinking that seems to "cement" this reality, does not allow it to disintegrate into a scientist-researcher consciousness as separate isolated parts, but sets the scientific results and ideas, and provides unity and integrity for all ecological knowledge. As Decart proclaimed, the aim of a thesis is to "divide, while you do not cognize fully", but today there is a leading thesis that says "perceive the integral picture of the phenomenon instead of its fragments" within the eco-knowledge (and in the proper style of thinking). At the same time, ecological knowledge, in which the principle role of complexity is considerable, manifests itself both in cognitive practice and at the level of structural organization of a given field, and stipulates a typical feature of the ecological style of thinking such as complexity. The complexity of the ecological style of thinking may be combined with globalization. Fixing the psychological setting onto an activity of a complex cognitive character shows new possibilities and directions for finding answers to actual questions within contemporary scientific research.

The characteristic integrity of modern ecology, its orientation in decisions concerning human substantial tasks leads to openness in the ecological style of thinking. It is interesting, that the development of ecological thinking promotes not only the production of new ideas, but an awareness of environmental conformities with law and its conceptions, but also in its retrospective and traditionally older ideas of analysis. An address to a series of the fundamental ideas of eastern philosophy can be an example. This concerns the idea of the world being an indivisible organism in which the different parts are in resonance with each other. Therefore, man's activity is directed on external objects, and its transformation was not

believed to having been the purpose of traditional cultures. The vector of human activity, as a rule, was directed not from the outside, but towards the middle, as a form of self-control and self-education, that provides the individual the possibility of adapting to the social and natural environment. Nature is perceived here as a living organism, and not as a non-subjective field, which is determined by the functioning of objective laws. Thus, in the ecological style of thinking, a new vision of the natural environment was placed with man in co-operating in his vital functions: nature is not a conglomerate of isolated objects or a mechanical system, but an integral living organism with certain influences that have an effect only up to a certain limit. Extending these limits can lead to catastrophic consequences.

As far as there is a form of practical-converting human activity within bounds of the ecological knowledge, which acquires a global character with further global consequences, the ecological style of thinking can be characterized as being global. Global thinking is "thinking in the terms of processes, instead of structures, in the terms of the dynamic whole, instead of static parts", E.Laslo writes, who emphasizes that global thinking has the most direct attitude toward environmental preservation [1, 83-85]. The globalization of the ecological style of thinking refutes the perception of a "town" world, where the adaptation to terms of existence is not orientated to a prospect (what will be further?), and is caused by an aspiration to get something done well "here and now". This is because if one is to take into consideration, that the modern way of life in the industrially developed countries is ecologically not perfect, and the ecological situation, most probably, will be even more complicated due to the fact, that the less developed (or simply backward) countries will increase their level of resource consumption, which will in time create a pressure on the biosphere. Under these conditions, the problems of a global environment may be solved only at a planetary level, and the measures concerning environmental protection are to become the priority for the whole world. The ecological style of thinking can be seen as having a bright coloring, that evidently illustrates the modern tendency of science in viewing humanity and sociology, and in particular, the natural histories. We view the necessity of human society on the whole, and education in particular, as a structure that forms the worldview of society, and is under consideration in a scientific and a scientific-popular literature today. A similar discussion was formed in understanding of the humanistic type of awareness of outward things, and by conducting a socially active process on the basis of humanity, which will further many problems and help in solving those, which have appeared before man. However, the same discussions have exposed the presence of polyphony in the term humanism. On the one hand, humanism is perceived as a certain orientation, which has come to take account of man's own welfare. For all that, humanism is spoken about as an approach from man's position, thereby taking the influence of some anthropological description of reality into account. On the other hand, humanism is interpreted as a comprehension of reality that takes man into account. The first position goes from man to the world, that is what man's relation to the world does, and the second one is what the world has done by taking man's presence into account

The positions are different, and sometimes even antagonistic. However, within the ecological style of thinking (within the ecological knowledge) these positions can be synthesized within a new general approach in solving problems of the relation of the "man - world" conception. Certainly, such a synthesis will result in

objecting to some of the previous ideas and traditions, which will expose the reality of disparity, and prepares us for the future.

The ecological style of thinking foresees a substantial change within the principles, which the relations of man and nature have been built on, in particular in the relation to the options of the cognitive activity of the person. The ecological style of thinking foresees the application of the "methodology of participation" (a term by G.Scolimovsci). That is, within the meaning of the ecological not only the standard, classic strategies of scientific search are used, but also new strategies of cognitive activity that overcome the alienation between the subject and the object of cognition. In accordance with the methodology of participation a researcher has, allegedly, to penetrate inside a phenomena that is being explored. Obviously, that methodology of participation well correlates with the options of a new rationality, in which, based on the purpose of cognition, not only the reflection of the surrounding world is proclaimed, but also a penetration into it; not only the knowledge of the phenomena and processes, that are inherent to nature, but also their understanding. That is the way the decision of the task was formulated by Albert Shveytser, - that opens as "...people less frivolous and morally stronger, inducing them to think".

The element of responsibility is the other characteristic feature of the ecological style of thinking. The responsible action means the account of all conceivable possibilities in any sphere of existence. This is not strange, because when the scientific and technical activity begins to seize the difficult systems, that are developing themselves, and a man is included in them, its actions are already not something external in relation to an object - but in transforming these objects, a man changes his own form of communication and function. And these changes, as was said, can be most unforeseen. Therefore, the ecological style of thinking will postulate, that every scientific or technical novelty has been estimated from the point of view of the possible risk and potential benefits for humanity and the environment. Here, we go on to another important element - the principle of "positive inheritance".

According to this principle, every generation of people is under an obligation to try, as far as this is within its power, to leave the environment in a better style than it had received it. It is necessary to avoid the superfluous pollution of the environment and use all that we need, rationally and moderately - and not to expend earthly resources that cannot be restored. Today a person must already look after the biosphere, because if this is not achieved then the options of renewing life on Earth will be in earnest undermined. Consequently, the necessities of the coming generations grow from our troubles. Obviously, our debt to the future comes partly from gratitude, and partly from the conviction of past generations, and their activity in nature, from their memory about victims, who have suffered and results in what we use. Thus, with the distribution of the ecological style of thinking moral responsibility for the fate of the coming generations, inclusive with the state of environment, will become the headstone of subsequent developments of society. And the concentration of the idea of providing a safe and reliable world has to grow into a moral duty and a certain imperative of the behavior of modern man.

The problem of self-restraint in scientific, engineering, and in human activity emerges. And these limitations have been orientated by choice at only such possible scenarios of change with the world, in which the

separate consequences of accomplishing those or other actions are estimated. These limitations are based both on objective natural-scientific or technical knowledge about possible directions of subsequent development and on certain humanitarian values. Notably, one of the leading principles of modern humanism is a right of its own opinion, an independent research, and also a right to one's own way of life, that extends so far, as it does not harm the other. That is, the value of such moral options as restraint, moderation, self-restraint and self-control is determined today. Obviously, man has to use such instruments of morality, which man was awarded by nature, more effectively, and which often helped man to hold back from destroying himself. The image of nature in its status of optimal development provides the normal vital functions of society, - this is the central category of the applied industry of ecological knowledge, termed as ecological ethics.

Another substantial line of the ecological style of thinking is its dying ethics. This is caused by those, that are within the subject field of modern ecological knowledge known as the "lyodinomirni" natural systems (complexes), the study of which needs the introduction of axiological factors within the complement of explanatory positions, the "explication of connecting between fundamental scientific values (the search of truth, the growth of knowledge) with nonscientific values in general lines where a social character is necessary" [4, 10-13]. "Neutral science" and style of thinking inherent to it exposed insolvency in its relation to the explanation of the greatest eventual setting of man. In neoclassical science (that is in ecological knowledge) of naturalism the geocentric or heliocentric view is replaced by an axiological anthropology, where the knowledge of not being a purpose emerges as the greatest credo of understanding the world, and the anthropological principle (knowledge as a means) [Wonders: 5, 108-109]. Therefore, the ecological style of thinking, that contains the anthropological principle, obligates, that any knowledge, any cognitive action, and, in general, all human practice, must become humanitarian.

And finally, perceptive thinking is typical for the ecological style, even when an address to ideological and theoretical works of the past takes place. Ecological thinking comes as an instrument in the achievement of new human aims, it allows for the correction of views and approaches in the light of new achievements in human cognition, quickly and effectively, the changes of the terms of life of humanity, and also in connection with the origin of new unforeseeable problems. The options for the ecological style of thinking are instrumental in the progress of humanity, that both take into account the achievements of modern science and the traditional values of morality. But taking into account the sad experience of civilization it is useful to revise its notion of "progress", which is widely used today. Obviously, progress needs to be interpreted not only as an improvement of the environment. It is necessary to examine progress through the prism of personality. That is, scientific and technical (external) progress is linked with the improvement of man, its nature, with the perfection of the human understanding, the deepening of his feelings, and the strengthening of his will. This view is quite recent, because the idea of self-restraint and self-control, probably, foresees the independent, internal decision and act. And this act needs the substantial act of self-perfection, and the internal progress from modern man.

Thus, it is possible to establish under the influence of ecological knowledge the thinking of modern science,

which has opened a new (in the wide understanding of this word) style of thinking, based on tolerance, on the dialog of the different forms of cognition, and is connected with the search for a way out of the modern global crises. This ecological style of thinking, based on its energy of features and public actuality, acquires distribution not only in scientific circles. This can be explained by those, that provide the basis of the exact style of thinking, on which the synthesis of understanding occurs; overcoming a modern crisis will be necessary by those facilities, which defined its appearance, and awareness of such general interest, in relation to environmental preservation, which condition the existence of humanity. Values, that have been established by the ecological style, and which are founded in a culture, religion, history and tradition of humanity (as planetary integrity), are able to come forward as a guarantee of its unity and solidarity. A society that is formed on the basis of such a style of thinking can be defined as being open. Such a society follows an inherent principle of nature, as the principle of varied forms. An open society that realizes the existence of multiplicity and a variety of cultures has to treat its own values that are subject to discussion, perfection and choice. Here people must have the freedom of thought and action, by taking into account the limitations, which are imposed by the general interest [6, 56].

We must also mark that the forming of the ecological style of thinking has been examined by us as a constituent of the trend of general progress of modern science, namely its humanization that foresees, among others, the transition of new organizational and methodological principles. Clearly, the forming of such a style of thinking is a protracted, difficult process, which needs considerable efforts from specialists of the different industries of human activity. However, nobody will probably deny that one of the most effective "access points" of the noted higher ecological imperatives in the consciousness of society is the education of all levels. Personality belongs to the environment, as it carries out its choice, makes decisions and operates within a framework, lines up a conduct on standards, which are set in society. From another perspective any type of directed action begins in an empty space, but appears on a certain basis of psychological and world view, that is structured by the proper system of options, and "rules the tone" of the internal mechanisms of dynamics within society. Consequently, educational activity today, according to the basis of present theories, is needed to realize certain principles and pedagogical technologies that are directed in the forming of a new, ecological character of attitude and seeing the place of man in the world, as new paradigms of future society, and civilization. Ervin Laslo noticed, that information and education today are the substantial elements for a steady development of humanity: "We need more information in essence, to speak to the masses, to the adults, young people, old people, and people of all ages... The second idea is, perhaps education, in order to make contact with young people, with those, who will continue in the world in the role of leaders and active members of society in ten or twenty years" [7]. If such a contact can be established, and the results and conclusions of research workers, who work in the region of ecological knowledge can extract a wide output on the masses of people, then we will probably get around the conditions of forming a type of consciousness and a set of values, which will allow the development of civilization in all directions, and puts an end to the discussions concerning the range of growth.

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