

## PARAMETERS OF ENVIRONMENTAL CRISIS AND SOME APPROACHES IN DEFINITION OF ENVIRONMENTAL EDUCATION IN RUSSIA

K. A. BOYARCHUK AND YU. W. BOYARCHUK

“...Certainly, our attention now should be drawn not by an artistic utopia pictures of a further social development, but only to a scientific elaboration of a social future, even in its feature form.”

W. I. Vernadsky

### Thesis 1. Threat of Global Environmental Crises.

Presenting tremendous achievements in science and technology development, reaching unimaginable high standards of living and welfare of the people, our modern civilization has appeared at a worldwide environmental collapse on a turn of the XXI century.

On the one side of this phenomenon — the environment pollution arising from various human activities. And due to that the garbage utilization, the refuse water purifying, the clean air and soil restoration and the other problems of such kind arise.

On the other side — natural resources reduction. That involves: the large scale forestry felling, the oxygen combustion, the soil depletion, the reduction of various minerals and ore, alongside with the energy resources stocks, such as natural gas, petroleum and coal.

Nevertheless, the electrical energy is, at present, one of the principal conditions of the human civilization existence in its current way.

On the first sight the modern world seemed to have already achieved some balance in manufacture and consumption of the electrical energy. The most developed countries of Europe could be a good sample of such stability.

However if we consider the whole world, it becomes obvious, that an essential growth of the energy consumption is soon expected in the developing countries, countries of Asia and the Pacific. Perhaps it will cause the balance destruction in European countries too. The latest OECD/IEA researches (Organization for Economic Cooperation and Development/ the International Economic Association) specify that the global electric power requirements can increase by 75% as quick as by 2010 A. D. [2]

The organic fuel consumption is limited by its mining potential. As it is accounted by a present day experts valuations, the economically profitable petroleum, coal and gas resources as the traditional energy sources will be enough only for the nearest 50-100 years, estimating in their current consumption rates.

Alongside with the above mentioned problem, the coal burning renders the adverse effect on the environment and is becoming more and more unacceptable in the majority of regions of the World. The Club of Rome 3 years before publication clearly stated that the coal and

petroleum application may be more dangerous for the people than the nuclear energy manufacturing, because of the coal and petroleum transformation product-Carbon Dioxid CO<sub>2</sub>. [2]

That makes more and more arguments for the benefit of nuclear power manufacture. Evidently the mankind will be compelled to intensify the development and the exploitation of the nuclear power manufacture in the nearest future.

The beginning of the development of the World nuclear power peacefull manufacturing was fixed in 1954, in Obninsk (USSR), where the nuclear reactor was initiated as a first electric energy source of such kind. As for the present Russia, the 12% of its total electric power consumption is manufactured by nuclear stations. As for the whole World this parameter is even higher and riches 17%, it is approximately the same figure as manufactured by the hydro-electric plants. [2]

In turn at misuse development the nuclear engineering can result in local environmental accidents and with its all over the World spread-in global environment radioactive pollution.

Up to nowadays the problem of the nuclear power manufacture waste products utilization still continue to be not solved satisfactorily.

## Thesis 2. The Nuclear Waste Environment Pollution in Russia and the Attempt of Its Undergoing

First we'd like to examine attentively the problem characteristics in Russia. The early years of the nuclear manufacture development in our country where characterized by serious underestimating of the danger, connected with the nuclear waste utilization.

During the creation of a nuclear weapon (1949-1951) at the radio-chemical plant close to the city Chelyabinsk (Plant "Mayak") the liquid waste was thrown out directly into a river system. During two years it was thrown out more than 2.5 million Ci total amount radioactive waste.

The tragic consequences of this action were evident, and the administration was forced to stop uncontrolled dumping of the liquid waste, and they begin to accumulate it.

After accumulation an explosion of one of the 80 ton containers with a 20 Ci active liquid waste inserted occurred in 1957. As a result of the explosion the 2 million Ci radioactive suspension was raised in an air on height up to 1 km and spread out by the wind on a site of a territory 5 km width and 120 km length. This polluted territory was called "The East Ural trace". [6]

After this failure the technology of liquid waste storage has been modified essentially, nevertheless a problem of its concentration, localization and utilization remains practically unsolved.

Recently Russia has published the data indicated places of radioactive waste dumping into the seas around the country. The main regions of dumping are The Kara and The Barents seas of the Arctic Ocean.

Also the radioactive dumping took place in the coastal regions of the Pacific in the Soviet Far East. According to an official data the total activity of nuclear waste in our seas are estimated as 325 kCi, while the independent experts estimations prove, that real nuclear waste maximum activity could be close to 2500 kCi.

The heaviest potential danger is presented by the nuclear power ice breaker ship Lenin's reactor cover and the several nuclear power submarines reactors dumped with nuclear fuel unloaded in the shallow coastal bays of the New Land Archipelago in the Kara sea. [8, 9]

The radioactive waste marine dumping began in 1946 and was suspended by the international moratorium only in 1983. The heaviest part of the nuclear waste dumping in Northern Atlantic belongs to The Great Britain, which presents 77. 5% of total amount of nuclear marine dumping in this region. [8, 9]

As for the all northern seas, in 1959-1992 there were dumped liquid nuclear waste with the sum activity of approximately 315 TBq and as for the Pacific Far East these figures are 12, 3 kCi. According to the International Atomic Energy Agency data the sum radioactivity of the Global Ocean presents 46 PBq. [8, 9]

The additional sources of radioactive pollution of the sea appears the experimental nuclear explosions and the nuclear power fleet use. The heaviest pollution of the Global Ocean is marked in a shelf zone. It corresponds to a model of the firm substance spreading in a coastal zone. [8]

The shelf is a geological and chemical barrier, that is a place where a sharp reduction of the intensity of chemical elements migration occurs and as a consequence grows up their concentration. Thus the shelf zone is huge accumulator of all kinds of a pollution, including radioactive.

The special significance this problem has for countries, possessing extended coast line, such, for example, as Russia and Japan. Russia, Byelorussia and the Ukraine as the Soviet Union successors underwent the misfortune of the largest failure in the nuclear power manufacturing — the nuclear reactor explosion at the Chernobyl Station.

Meeting with the Chernobyl Accident consequences, we have appeared ignorant in such essential aspects, as the radiation influence on the biology of an extensive territory, on the whole biological process. [10] Even small dozes of irradiation, which some experts use to call "stimulating" and consider to be safe, can result in the terrible consequences, causing deformation of the species structure. This problem is especially serious on the point considering fishing in a coastal zone.

Recognizing entirely mistakes in environmental strategy during the Soviet time, the new Russian government is putting much attention, in comparison with other countries, to the environmental safety.

Realizing the opportunity of global application of the nuclear power plants, the government of Russia supports researches in the field of control for radioactive safety along the country intended on the establishment of the State Unified Automatic Radioactive Situation Monitoring System. [11, 12]

At present the development of the power strategy of the Russian Federation is coming to a completion. It provides intensive reduction of the power consumption by the applying of power economizing, power resources structure development, including natural gas wider application, substantial reduction of a power engineering pressure on the environment, including the stabilization of the green-house effect gases. On this problem the World experience and the specific character of modern economic situation in Russia are taken into account.

Thanks to the fact that Russia possesses large amount of natural resources, we can expect the application of a natural gas as a source of electrical power, which consider to be the most environmentally safe fuel. Already today most Russian power stations use natural gas,

and that is the reason why our CO<sub>2</sub> atmospheric blips are insignificant — 2.9 mln ton a year, while in USA they make 22 mln ton a year.

The power strategy in Russia is expected to keep the following proportions till 2010: 72%-heat-, 18%-hydro-, and 10%-nuclear power stations. [3]

However the gas resources of Russia are not boundless to, therefore since 2010 the share of nuclear power among the electricity manufacture sources will grow. At the present stage of scientific and technology development the human society can consider seriously only the nuclear energetic as a power crisis way out.

In this situation Russia again appears to have better conditions in comparison with other countries, due to high technology of a production and enrichment of uranium. According to this technology uranium is extracted without use of human labor in a drifting mine.

Thanking that already only extracted and prepared for using uranium stocks in Russia will be enough for about 100 further years with present rates of the energy consumption growth in the world. And accounting the already prospected uranium deposits the nuclear fuel will be enough for 300 years. [4] Nevertheless it does not give us guarantee from possible accidents, that could transform a successful output from power crisis into global environmental catastrophe. It is necessary to define some new installations of the development of the human society itself.

### Thesis 3. To Global Environmental Catastrophe the World Is Directed by the European Model of the Civilization Development

We have examined the increase of an ecological collapse problem within the current model of human development, that is presented by European civilization. This pattern of development is natural for the West-European countries and for The Northern America, while the other countries only follow the sample.

As the fundamentals of this kind of development is a religious philosophical doctrine, which forms and supports a tradition of European consciousness. The greatest modern sociologists, such as L. White, A. Toinby and others, considered the sources of present day biological destabilization just in Jewish-Christian philosophy. [13, 14]

According to Christianity a human being is obliged to exercise dominion “over marine fish and over sky birds, over cattle and over the whole world and all the creatures in the world” [Bible]

Created by the look of a God a human being largely shares the God’s status in relation to a nature. Moreover in the Christian doctrine dominate also over a biology-space cycle of a time for he is obliged to use all the earth creatures for his own success in this world. [1]

The modern civilization constructed on such ideological basis is obviously demonstrating the “human-in-the-centre” tendencies.

The main idea of modern global existence of European in essence civilization is the following: the human is in the centre of the World, each person is considered equally respected, everyone’s needs complete satisfaction becomes the aim of the community, and the community cares to make good conditions for the luxurious life of a person.

The spiritual values are not excluded but the main components are the financial prosperity, housing accommodation, feeding, rest, everything for one’s comfort. Proceeding from

such philosophy nobody would do something for the nature, instead for himself.

Maybe this desire exactly, the idea of all the human wishes satisfaction, forced so rapid rate of progress. In that case, removing the aim we could stop the development, its sense will be lost.

#### Thesis 4. Inevitable Progress of Global Civilization and the Recognition Personal Responsibilities for the Nature

We recognize that the progress of the global civilization is inevitable. Probably any other ideas the people are working for exist in the World.

Modern philosophy trends and the world outlook concepts, prevailing among European culture adopters show nothing opposite, have no internal protection against the temptation of mass consumption society ideology. So it doesn't hinder, but leads, early or lately, to the situation equivalent to the environmental accident.

If we try to examine the West European religious thoughts and philosophy ideas, we'll find out, that in fact one problem has been always in the middle of the discussion — to justify the dominant status of a person in a complex of all natural relations, to construct ideological preconditions, including scientific, to incarnate the principle of human dominion.

Obviously, preservation of this ideology will aggravate the contradiction within the "human-society-nature" system and result in naturally achieved biological balance distraction.

The exacerbation and the scale of current environmental disharmony all over the world proves that the European model of development can not be accepted by the whole civilization, it will lead it to a crash. [15]

But if the western philosophy can not find an output on the threshold of the environmental ecological collapse, whether we should search for rescue in the oriental thought and experience, as just the eastern culture is concerned as idealizing harmony between a person and nature?

In the Middle East religion the Moslem, as well as in the Christianity, a human appears to be a dominating force: Allah placed under his rule "everything in the sky and everything in the earth". [Koran, Sura 45, 12]

Nevertheless the "human-in-the-centre" tendencies in the Bible has more expressed character. For example, as for the Koran the human dominion in relation to other creatures has different sense, than in a Bible, it means only the Gods favor, Gods donation. [1]

The main idea of Confucianism is the search of a harmony not only inside the human society but also within the nature process.

In Buddhism the person is considered not separately from other Earth inhabitants or like an opposite to them, but first of all, like a kind of living beings of a world, recognized completely one's rights and duties within the nature relations system.

Daosism teaches, that the nature is going its own way, which would not be infringed by an unproppreate humans interference. The Dao (way) is a search of the harmony of "macrocsm" and "microcosm" — the human and the nature. [1]

That proves that in an environmental context the Eastern model of a "human-nature" relations looks more perspective. However the sharpness of the environmental disharmony is gradually moving to the oriental countries.

Probably the countries of the East appeared infected with the idea of western civilization “everything for an individual” and the “east” stereotypes are transformed in consciousness of the people for the benefit of the “society of mass consumption”. If we observe Russia separately from European countries, it becomes obvious, though it is a Christian country, the Christian branch accepted in Russia — the Greek Orthodoxy, incorporated a lot of national traditions, and doesn’t intend to use the nature for the human benefit.

It comes true not because this religion highly appreciates human being, but it simply calls for the soul rescue, and this aim entails the relative passiveness in real earthly life, all earthly life benefits rejection, and concentration on a soul perfection.

According to Orthodoxy the person's life in the world is temporary and the life of a soul in a heaven is eternal. This eternal life is a gift for a person after his death in the award for the endurance of the earthly life troubles.

From this point of view to facilitate, to make luxurious earthly life for an individual means to destroy the soul to be deprived opportunity of eternal life. So the Orthodoxy adherents are traditionally ascetic, they keep sparing attitude to nature, and use to take from the nature only a nutrition minimum. The idea of personal needs satisfaction is in general not inherent and perceived as an oddity by the conventional and consecutive adherents of the Orthodoxy.

Some Russian philosophers find also conventional synthetically combining perception of the world by the Russian people, which was called as “integral” by I. Kirievsky, “all-humane” by F. Dostoevsky, “universal” by W. Vernadsky. In any case, they minded Russian integrative type of consciousness, uniting in uniform conceptual structure the most diverse processes of the World. As noticed famous writer and philosopher Joseph Brodsky “the Russian consider the World as though from inside, as its participants, as its victims”. [16]

But as well as in case with the countries of the East, the question is, whether can the world outlook traditions, existed in mind of people two or three, or four generations ago, revive in conditions of new Russia, experienced the ideological stress of communism and now going through the democratization, when in essence Russia is been putting on those rails, which advanced civilized countries have already passed, and which, as we see, conduct to environmental catastrophe?

Perhaps no one of present models of behavior provides the harmonization of mutual relations of the human race and the nature. At the same time, taking no heed of national, cultural and religious distinctions, all peoples of the world agree in opinion that the real well-being is possible only under existing of natural healthy environment, as the main condition for the human life and activity.

It is natural, that every nation, which have reached comparatively high level of the social development, stands on a edge of understanding: the following stage of a civilization should be “environmental”.

Its main principle will be “nature-in-the-centre” and the preservation of balance of a “human-nature” system will mean not only the biological survival of Homo Sapiens, but also the precondition for further progress of mankind. The “human-in-the-centre” approach refusal will allow to reconstruct the harmony of the natural relations, when a human is only one of its components.

It is impossible to overcome at once the ideology of human needs full satisfaction as it

has become dominant at present. It is necessary to create a new ideology, a concept explaining in another way the sense and the purpose of the mankind being and its task on Earth.

This idea should be taught during a long time, only then it could benefit, and the result appears, may be not earlier, than in the next generation. As the precondition for such society will be the concept of reasonable consumption and life of the people not for the sake of the person but for the sake of the whole nature. Only with such purpose the human civilization can exist long.

In modern Japan the idea of recycle is very popular. However we think, it can be successful only during short period of time, as far as the recycle is the cost of energy, time and labor resources as well. Instead of the recycle, it will be desirable to introduce the system of consumption, which doesn't entail a problem of waste conversion.

## Thesis 5. A Hypothesis of Environmental Education in Russia - Theory of W. I. Vernadsky

The progressive mankind all over the world agrees already in a point, that the young generation should grow up with consciousness of personal responsibility not only for one's own existence, but also for all plants and animals, and other earth creatures variety in their natural harmony.

The matter is how, in what way, we should influence the formation of such consciousness. By all means we have to organize the propagation of this idea in school classrooms.

At school it can be a separate subject "environment" or "environmental studies", moreover the knowledge in this area should be advocated in process of all other subjects teaching and transmitting through other kinds of school activities.

As a hypothesis of ecological education the Russian teachers assume to take ideas and philosophy thoughts by our famous natural scientist W. I. Vernadsky.

"Nowadays, when great achievements are reached in scientific development and as a consequence terrible environmental accidents happen, we often hear about the approach of vandalism, the wreck of civilization, about self-destruction of mankind. We consider this judgment to be the consequence of deep misunderstanding the nature within the process of its composite and development. The scientific knowledge can not lead to a result of contradiction to a process, the product of which it is"-wrote Vernadsky in 1938. /W. I. Vernadsky "A scientific thought as the planetary phenomenon"/. [17, p. 28]

Wladimir Vernadsky conducted researches in biology, chemistry, geology. Not concentrating attention separately on each of these field of knowledge, he tried to give a synthetic description of interrelation and interdependence of processes involved animate and inanimate nature in the world.

Using all knowledge about the nature, accumulated up to his epoch, Vernadsky considered the development of all processes on the earth as the uniform natural phenomenon, thinking the Earth itself a kind of a "living essence", a "system alive".

As the basis of evolution of the Earth he thought the development of its geological structure, in other word an inanimate nature, which he called an "inert substance".

The availability of the inert substance has caused the development of the animate nature: plants, animals, insects, viruses, the living ability of which not only depends, but renders

direct influence on inert natural substance.

As far as the phenomena of animate nature in the Earth are improbably diverse, considering general laws of their development, Vernadsky has named then in a whole "living substance". "The living substance of the planet is a complex majority of living bodies, existing within it". [17, p. 22]

Vernadsky scientifically demonstrated, that the living substance of the Earth has its specific organization and construction, and the evolution of the living substance can be called the function of biosphere. The appearance on the Earth of wise life Vernadsky also thought a natural stipulated process and all kind of human activity and it's organization he named noosphere. "Influenced by human activity and with the progress of science the Earth biosphere comes to a new stage of the evolution — to noosphere." [17, p. 27]

Considering the occurrence and the progress of reasonable activity of the human, the noosphere, on the Earth as a evolutionary consequence and necessary function of biosphere, Vernadsky did not agree with the point of view, that the intelligence can cause an irreparable damage the biosphere itself.

As often happens, the philosophical thoughts by Vernadsky were not favored by contemporaries. Nevertheless at present the works by Vernadsky are becoming more and more popular among natural scientists, sociologists and teachers.

GENERAL PHYSICS INSTITUTE, RUSSIAN ACADEMY OF SCIENCES AND MOSCOW STATE PEDAGOGICAL UNIVERSITY

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