
DISCUSSIONS

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THE WAYS OF ECOLOGICAL EDUCATION IN UKRAINE

Outstanding ecologists of USA, such as E. Odum and J. Hatshinson, mark the important role of V. I. Vernadsky's ideas for understanding the modern problems of Ecology (Hatshinson, 1970; Odum, 1971). It was recognized, that "the concept of biosphere, which we accept now, is mainly based on V. I. Vernadsky's ideas" (Hatshinson, 1970). In searches of an optimum path of development of human society V. I. Vernadsky pinned all hopes on scientific organization of mankind activity under condition of the high moral responsibility of the scientists for the consequences of realization of their discoveries.

In his book "Sketches and speeches" published in 1922 V. I. Vernadsky wrote: "The time is not far off when a man will receive in his hands an atomic energy ... Will a man be able to take advantage of this force, to direct it to good, instead of to self-destruction? Has he grown enough skill to use this force, which inevitably should be given to him by science? The scientists must not shut their eyes to the possible consequences of their scientific activity, scientific process. They should feel themselves responsible for the consequences of their discoveries. They should connect their activity with the best organization of all mankind" (Vernadsky, 1922).

The founder of cybernetics, Norbert Wiener wrote: "Many of us do not realize that the last four years are a specific period in the world history. The speed at which the changes occurred over the years, has no resemblance to past history. Such is the case with the very nature of these changes ... We are so radically altered our environment, now to be in this environment, we must change ourselves» (Wiener, 1950).

By decision of the Club of Rome in 1970 started the project "The Predicament of mankind", which was performed and the results presented March 13, 1972, in Washington in Smithsonian Institute (Meadows, 1972). Scientific processing of information collected allowed to offer 12 models of possible ways of development of world civilization and some conclusions of which are given only the first and the last:

1. "We are convinced, that the comprehension of the quantitative limitations of capabilities of the ambient natural medium and the tragic consequences of the excess of their marginal level is a necessary starting-point for the appearance of the new forms of thinking, which will lead to the substantial revision of the existing patterns of human behaviour and, as a corollary, of the whole nowadays social order".

10. "And, at last, we confirm, that any realized attempt to reach a reasonable and long-term condition of equilibrium by the implementation of preliminary planned measures should in the long run be guided by radical changes of the system of values and purposes at individual, national and world levels. This change, is probably, already wandering in the air, though it can be hardly sensed. But our traditions, education, current activity and the shaped interests complicate and decelerate such transition" (Soros, 1991, 1994).

But the main environmental problems of the country to decide on its own, and one of the solutions is focused in the development of a new concept of educational technology environmental education of pupils and students. The task is not a simple in connection with the fact that in the

modern system of education there is a significant mismatch between technology education and the real needs of society.

Over the scientific and methodological support to overcome the said discrepancy worked special committee of UNESCO, which was commissioned to create an effective educational model for the twenty-first century, the century of acclaimed education. As referenced model one of the priorities identified environmental education (Lutay, 1998).

As suggested by this report the concept of environmental protection under the new educational technologies of environmental education, which is based on system-position. First position – to enter the list of courses compulsory component of public secondary school education and educational discipline in environmental education. Only under such conditions can be realized social order to implement the priorities of Sustainable environmental Ukraine, especially in view of the need to overcome the consequences of the Chernobyl disaster – man-made catastrophe of global scale, which was the result of lack of environmental consciousness and ecological awareness being raised from the school years and even before. The second position – it refers to the technology of environmental education in secondary and in higher education. At the present stage of technology interdisciplinary environmental education is "without rudder and without sails": the so-called ecologization of teaching different disciplines, the need of which have been a lot of talk and no one controls and no educational-methodical structure in each school is not responsible for the coordination and quality of environmental education of the individual. With the new technology will be established on the basis of compulsory education and educational courses on environmental education teaching center of ecological culture, teachers who not only teach their discipline, but also to coordinate the implementation of the environmental component in teaching other subjects, being responsible for the quality of environmental education and education of pupils (students) in their schools. Third position – according to the new concept must be brought into conformity title educative discipline of environmental education with the primary purpose of environmental education, which is important both in methodology and in methodological terms.

Keywords: education, culture, environmental problems, Ukraine.

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ШЛЯХИ ВИХОВАННЯ ЕКОЛОГІЧНОЇ КУЛЬТУРИ В УКРАЇНІ

Видатні екологи США, такі як Е. Odum та G. Hatshinson, відзначили важливу роль ідей В. І. Вернадського в розумінні сучасних проблем екології (Hatshinson, 1970; Odum, 1971). Було визнано, що «Концепція біосфери, яку ми приймаємо тепер, в основному опирається на ідеї В. І. Вернадського» (Hatshinson, 1970). В пошуках оптимального шляху розвитку людського суспільства В. І. Вернадський покладав всі свої надії на наукову організацію діяльності людства за умови високої моральної відповідальності вчених за наслідки реалізації їх відкриттів. У своїй книжці «Очерки и речи», опублікованій у 1922 р., В. І. Вернадський писав: «Недалеко той час, коли людина одержить у свої руки атомну енергію... Чи зуміє людина скористатися цією силою, спрямувати її на добро, а не на самознищення! Чи доросла вона до уміння використати ту силу, яку невідворотно повинна дати їй наука? Вчені не повинні закривати очі на можливі наслідки їх наукової роботи, наукового процесу. Вони повинні відчувати себе відповідальними за наслідки їх відкриттів. Вони повинні пов'язувати свою роботу з кращою організацією всього людства» (Вернадський, 1922).

Засновник кібернетики Норберт Вінер писав: «Багато хто з нас не розуміють, що останні чотириста років представляють собою специфічний період у світовій історії. Швидкість, з якою відбувались зміни впродовж цих років, не має собі подібності в минулій історії. Така ж справа і з самою природою цих змін... Ми так радикально змінили наше середовище, що тепер, щоб існувати в цьому середовищі, ми повинні змінити себе» (WienerN., 1950).

За рішенням Римського клубу 1970 року почалось здійснення проекту «Складне становище людства», який був виконаний, а результати викладені 13 березня 1972 року у Вашингтоні в Смітсонівському інституті (Meadows, 1972). Наукова обробка зібраної

інформації дозволила запропонувати 12 моделей можливих шляхів розвитку світової цивілізації та ряд висновків, з яких приведені тільки перший та останній:

1. «Ми переконані, що усвідомлення кількісних обмежень можливостей зовнішнього природного середовища та трагічних наслідків перевищення їх граничного рівня є необхідним відправним пунктом для виникнення нових форм мислення, які приведуть до ґрунтовного перегляду існуючих взірців поведінки людей, і, як наслідок, всього існуючого на сьогоднішній день суспільного устрою.

10. І, нарешті, ми підтверджуємо, що всяка усвідомлена спроба досягнення розумного та довгострокового стану рівноваги шляхом здійснення заздалегідь запланованих заходів повинна в кінцевому підсумку спиратись на корінну зміну системи цінностей і мети на індивідуальному, національному та світовому рівнях...» (Meadows, 1972).

В розробці вказаного підходу виявилось корисним вивчення основних положень теорії історичного розвитку, запропонованій Джорджем Соросом (1994).

Але головні екологічні проблеми країни необхідно вирішувати власними силами, і один із шляхів вирішення зосереджений в області створення нової концепції організації навчальної технології екологічної освіти школярів і студентів. Завдання це не із простих у зв'язку з тим, що в сучасній системі освіти існує значна невідповідність між технологіями освіти та потребами реального життя суспільства.

Над науково-методичним забезпеченням подолання вказаної невідповідності працювала спеціальна комісія ЮНЕСКО, якій було доручено створити ефективну освітню модель для XXI століття, проголошеного століттям освіти. В указаній моделі одним із пріоритетів визначена екологічна освіта (Лутай, 1998).

В представленому повідомленні пропонується концепція захисту навколишнього середовища за новою навчальною технологією організації екологічної освіти, основу якої складають системоутворювальні положення. Перше положення – необхідно ввести в перелік дисциплін обов'язкового державного компонента середньої загальноосвітньої школи освітньо-виховну дисципліну по екологічній освіті та вихованню. Тільки при такій умові можлива реалізація соціального замовлення на здійснення пріоритетів стійкого екологічно безпечного розвитку України, особливо з врахуванням необхідності подолання наслідків Чорнобильської катастрофи – техногенної катастрофи планетарного масштабу, яка виникла в результаті відсутності екологічної свідомості та екологічної культури, які виховуються із шкільних років і навіть раніше. Друге положення – воно відноситься до технології організації екологічної освіти та виховання як у середніх, так і у вищих навчальних закладах. На сучасному етапі міждисциплінарна технологія екологічної освіти існує «без руля і без вітрил». Так званою екологізацією викладання різних дисциплін, про необхідність якої так довго та багато говорять, ніхто не керує і ніяка навчально-методична структура в кожному навчальному закладі не відповідає за скоординованість і якість екологічної освіти та виховання особистості. За новою технологією передбачається створення на базі обов'язкової освітньо-виховної дисципліни з екологічної освіти виховання навчально-методичного центру екологічної культури, викладачі якого не лише викладають свою дисципліну, але і координують реалізацію екологічного компонента при викладанні інших дисциплін, відповідаючи за якість екологічної освіти та виховання учнів (студентів) у своєму навчальному закладі. Третє положення – згідно нової концепції необхідно привести до відповідності назву освітньо-виховної дисципліни з екологічної освіти та виховання з основною метою екологічної освіти та виховання, що дуже важливо як в методологічному, так і в методичному відношенні.

Ключові слова: освіта, культура, проблеми навколишнього середовища, Україна.

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ПУТИ ВОСПИТАНИЯ ЭКОЛОГИЧЕСКОЙ КУЛЬТУРЫ В УКРАИНЕ

Изложено обоснование приоритета В. И. Вернадского в создании основ воспитания экологической культуры и антропогенного механизма повреждения биосферы. Приведены пути минимизации загрязнения окружающей среды, предложенные В. И. Вернадским, Н. Винером и в проекте Римского клуба «Сложное положение человечества».

Показана приложимость основных положений теорий исторического развития человечества Джорджа Сороса к процессам развития глобального экологического кризиса и его локальных проявлений.

Предложена новая учебная технология организации экологического образования школьников и студентов как основа новой концепции защиты окружающей среды от антропогенного повреждающего действия.

Ключевые слова: образование, культура, проблемы окружающей среды, Украина.

Awareness of the technogeneous threat of the global damage of the environment has its own intricate and in many respects dramatic history, which is not properly investigated yet, though the actuality of the stated problem in deciding on the optimum way for the survival of mankind in the third millennium of the new era is growing from one year to the next (Бачинський, 1994, 1995, 1998, 2003–2006).

V. I. Vernadsky was the first who – in the twenties of the XX-the century, in his teaching on biosphere and the role of the living matter, – gave a profound scientific substantiation for the anthropogeneous nature of the global damage of the environment (Бачинський, 2002, 2004, 2008, 2009, 2013; Вернадський, 1919). On the basis of the researches performed during his stay in Ukraine, V. I. Vernadsky has created such a fundamental principle of biogeochemistry as organogeneous paragenesis of chemical elements. This for the first time scientifically explained unusual confusion of a number of chemical elements in living organisms and in the earth crust: "Living matter is not indifferent to the chemical bodies surrounding it, it selects from the environment some chemical elements and adds them into the structure of its own body. Its life largely consists in extracting the certain chemical elements out of the environment, taking them through compounds or fluids of its own organism and giving them back into the environment and quite often in the form of the new compounds. Due to this in the organism there always are a joint unity of some chemical elements, and such joint presence of chemical elements in the earth crust we shall call their organogeneous paragenesis, as it is not caused by the elements chemical properties, but by the properties of the organism" (Вернадский, 1922). Fundamentals of Biochemistry incorporated by V. I. Vernadsky, for a sufficiently long time were not realized by the majority of the representatives of Geological science, though Biochemistry created important practical directions of the scientifically justified search of deposits. Extremely important thing in V. I. Vernadsky's doctrine on biosphere is untangling of the increase of men's damaging activity on biosphere on a global scale and searches of the ways of minimization of the damage inflicted on the environment. This was stated by V. I. Vernadsky in the lectures to Sorbonne's students in Paris, which he read in 1923–24, and the texts of which were published in Paris in 1924, the book was reissued in French (1929), twice – in Russian (1927–1934) and in German (1930) (Vernadsky, 1924, 1929).

V. I. Vernadsky wrote: "A man has administered into the structure of the planet a new form of living matter activity on the exchange of atoms of living matter with osseous matter. Earlier the organisms only influenced a history of those atoms, which were necessary for their growth, duplication, feeding, breathing. A man has expanded this circle, influencing the elements which were necessary fo engineering and for creation of the civilized forms of life. A man acts in this case not as Homo sapiens, but as Homo sapiens' faber... We see for the first time in the history of our planet the formation of the new bodies, improbable change of the Earth's face. From the geochemical point of view all these products are masses of free metals, such, as metal aluminium, never existing on the Earth before, iron, tin or zinc, masses of coal add made by lime burning or coal burning, huge quantities of sulfuric anhydride or sulphide hydrogen produced during chemical and metallurgical processes, and constatly increasing quantity of other technical products, not differring from minerals. They change the eternal run of the geochemical cycles. With the

further development of the civilization the influence of these processes should increase, the migration of atoms on the biogeous basis will extend and, at the same time the number of the atoms seized by it will grow" (Vernadsky, 1929).

The last principle on the growth of the number of atoms, seized by migration, on the biogeous basis at further development of the civilization is a key to the scientific explanation of the mechanism of the development of ecological crisis, which constitutes mutual damaging actions of Homo sapiens' labor on the environment and the damaged environment on the organism of a man.

Outstanding ecologists of USA, such as E. Odum and J. Hatshinson, mark the important role of V. I. Vernadsky's ideas for understanding the modern problems of Ecology (Hatshinson, 1970; Odum, 1971). It was recognized, that "the concept of biosphere, which we accept now, is mainly based on V. I. Vernadsky's ideas" (Hatshinson, 1970). In searches of an optimum path of development of human society V. I. Vernadsky pinned all hopes on scientific organization of mankind activity under condition of the high moral responsibility of the scientists for the consequences of realization of their discoveries. In his book "Sketches and speeches" published in 1922 V. I. Vernadsky wrote: "The time is not far off when a man will receive in his hands an atomic energy ... Will a man be able to take advantage of this force, to direct it to good, instead of to self-destruction? Has he grown enough skill to use this force, which inevitably should be given to him by science? The scientists must not shut their eyes to the possible consequences of their scientific activity, scientific process. They should feel themselves responsible for the consequences of their discoveries. They should connect their activity with the best organization of all mankind" (Бачинський, 2004; Вернадский, 1922). Soon after V. I. Vernadsky's death several books of the most talented mathematician and bright scientist, the founder of cybernetics Norbert Wiener have appeared. In these books the attempt was continued to help the world community to realize the threat of the global damage of the environment from the technogeneous action of people on biosphere. H. Wiener wrote: "Many of us do not understand, that the last 400 years represents rather specific period in the world history. The speed at which the changes took place all these years, has no similarity in the former history. And so are things with the nature of these changes ... We have changed our environment so considerably, that now in order to exist in this environment, we should change ourselves" (Wiener, 1950). Evaluating the results of the application of cybernetic systems to various areas of human activity, H. Wiener comes to the conclusion, that Cybernetics can be used both for the boon of mankind, and for its destruction.

H. Wiener thought that the passive faith in progress is not a manifestation of hardness and reliability of convictions but submissiveness and weakness. In the indicated book he pinned his hopes to the increase "of a level of public consciousness", to "germination of grains of good", to "the social responsibility of business circles". In order to focus the attention of the importance of the problem of suspension of the further damage of the environment by mankind with the purposes of self-preservation, H. Wiener wrote: "Time has come, the choice between good and evil is at our door" (Wiener, 1950).

Unfortunately, the ways offered by V. I. Vernadsky and H. Wiener, were not taken for the basis by the world community.

One of the optimum ways of withdrawal from ecological crisis

The dramatic events of the development of the world civilization in the second half of the XX-th century testified the increase of manifestations of a paradox of mankind technical power: the scientists dispose enormous technical possibilities in the field of chemistry, atomic energy, automated systems of information and in other areas, but it does not facilitate a becoming complicated situation of mankind at present, and the near future in connection with the prompt deterioration of the environment represents itself as it is

predicted in Apocalypse. According to the Rome's club solution in 1970 the implementation of the project "The Predicament of mankind" began. The project was carried out and the results were reported on March 13, 1972, in Washington in Smithsonian Institute. (Meadows, 1972). The scientific processing of the assembled information has allowed to offer 12 models of possible ways of development of the world civilization, and a number of conclusions, from which only the first and the last will be adduced:

1. "We are convinced, that the comprehension of the quantitative limitations of capabilities of the ambient natural medium and the tragic consequences of the excess of their marginal level is a necessary starting-point for the appearance of the new forms of thinking, which will lead to the substantial revision of the existing patterns of human behaviour and, as a corollary, of the whole nowadays social order".

10. "And, at last, we confirm, that any realized attempt to reach a reasonable and long-term condition of equilibrium by the implementation of preliminary planned measures should in the long run be guided by radical changes of the system of values and purposes at individual, national and world levels. This change, is probably, already wandering in the air, though it can be hardly sensed. But our traditions, education, current activity and the shaped interests complicate and decelerate such transition" (Meadows, 1972).

The final conclusion is extremely important by that fact that it allows to schedule one of the optimum ways of withdrawal from ecological crisis, which is a key for the solution of the majority of global problems. For this purpose it is necessary to select ways of radical changes of a system of values and purposes at individual, national and world levels, organizing in a new way ecological education of schoolchildren and students. For development of the indicated approach it appeared to be useful to study the basic principles of the historical development theory offered by George Soros:

1. For an individual the understanding of the world, in which he lives, is immanently imperfect.

2. The majority of individuals acts without proper understanding of realities of the events, as realities of events arise as a corollary of realization of the solutions of their participants.

3. Frequently there is no conformity between an individual's vision of the world and its actual state. That is, there always is a certain discordance between the actual state of things and our notion of it; in the definition of the degree of this discordance there is a key to the true understanding of the realities of historical development.

4. In the history of mankind development there occur some periods, when the indicated discordance is rather insignificant, i.e. when the actual state of things and the notion of people about it tend to considerable approach, that allows to take into account aspirations of people and to coordinate their notions with practical capabilities. Under the conditions of such almost-equilibrium the discordance does not render essential influence to the events and can be practically ignored. But there are periods, when the discordance between the reality and the notion of it is very great and does not present the slightest downward tendency of such discordance. Then the events develop under completely other laws and none of the conventional rules can be applied in such cases. Such situation of moving away from the equilibrium arises under condition of a total invariance, i.e. stagnation, on the one hand, and prompt changeableness, i.e. full instability - on the other hand (Soros, 1991, 1994). The adduced earlier course of events of the development of the global ecological crisis integrating huge quantity of local anthropogeneous damages of the environment, among which the explosion of the 4-th power unit at Chernobyl nuclear power plant in Ukraine takes the special place, confirms the main principles of the historical development theory offered by George Soros. The existing technology of organization of ecological education of schoolchildren and students in Ukraine before and after the explosion of the 4-th unit at Chernobyl nuclear power plant was one of the leading mechanisms of conditioning for the origin, of the period, when a discordance between the

ecological reality and the notion of it all the time was increasing and has not in the least the downward tendency of such discordance. Only in 12 years after the world's greatest technogeneous ecological catastrophe – the explosion at Chernobyl nuclear power plant – the Supreme Soviet of Ukraine has ratified "The main directions of the state policy of Ukraine in the field of protection of the environment, use of natural resources and maintenance of ecological safety" (Верховна Рада України, 1998).

In "The main directions ... Maintenance of ecological safety" when characterising the state of the environment the paths of formation of the prompt moving away from the ecological equilibrium are marked: "the Present ecological situation in Ukraine can be characterized as crisis, which was formed during a long period of time as the result of ignoring of the objective laws of development and reproduction of the natural resource complex of Ukraine. The structural deformations of national economy took place and the advantage was given to the development in Ukraine of raw materials extracting industries, the most ecologically dangerous ones". It was further marked, that the high densities of resources-consuming and energy-intensive technologies is characteristic of a structure of capacities of Ukraine, the introduction and increase of such volumes implemented without the construction of the appropriate purification facilities, that resulted in contamination of the environment on a large scales. The abovesaid was possible for want of effectively operational legal, economic and administrative gears of rational use of the natural resources and disregarding of requirements of protection of the external natural environment. In the indicated characteristic the allocation of the most essential causal factor of development of ecological crisis – low level of ecological consciousness of company was very important which directly depend on the existing training technology of ecological education at secondary schools and higher educational institutions. The consequence of the listed factors activity was and is "the significant degradation of the environment in Ukraine, redundant contamination of the surface and underground water, air and lands, accumulation in extremely large quantities of harmful waste of production, including high-toxic waste. The indicated processes proceeded for decades and have resulted in sharp deterioration of the human health, reduction of birth rate and increase of mortality level, and it threatens with extinction and biological-genetic degradation of the people of Ukraine" (Верховна Рада України, 1998). It is the 13-th year of the period, when a discordance between the reality, which was created by the explosion at Chernobyl nuclear power plant, and the notion of it, both in broad public circles of Ukraine, and in a number of large international organizations (especially IAEA) and also in imperious structures of the countries (excluding Canada) remains rather considerable. Due to the large efforts and to consistent persistence of President of Ukraine L. D. Kuchma and the Ministry of Foreign Affairs of Ukraine the downward tendency of the size of the indicated discordance was achieved. But the main ecological problems of the country are necessary for deciding by our own forces, and one of the ways for solution is to concentrate in the field of creation of the new concept of organization of educational technology of ecological education of schoolchildren and students. The problem this not a simple one, as in the modern system of education there exists a significant discordance between technologies of education and the needs of the actual life of the society. Above scientific-methodical maintenance of overcoming the indicated discordance the special commission of UNESCO works, it is entrusted to create the effective educational model for the XXI century, which was proclaimed the century of education. In the indicated model ecological education is defined as one of the priorities. (Луцай, 1998).

Therefore it is very important, that in "The main directions ... The creation of the system of ecological upbringing, education and information" (Верховна Рада України, 1998), is stipulated "to ecological safety" in section II "Main priorities of protection of the ambient natural environment and rational use of natural resources" with the purpose of realization of selected priorities. The adduced record testified on the one hand of giving the

state weight to the fulfillment of a task of creation of the system of ecological upbringing, education and information, and on the other hand – that in scientific-methodical maintenance of ecological education there exists a too large discordance between the actual state of things and the notion of the effectiveness of ecological education. It is necessary to mark, that the attempts were already undertaken to create model of organization of ecological education in Ukraine (Copoc, 1991). But in the offered project "Concepts of continuous ecological upbringing and education in Ukraine" except for some important principles the main ones were either disputable, or wrong, and above all – there were no system-forming principles. Last is the main reason of the fact that the indicated project "The Concepts..." does not find the completion till now. In the project of "The Concept" as the basis the principle inter-disciplinary approach on the formation of ecological culture is taken in its old, previous form, which was developed at the Academy of pedagogical sciences of USSR by Academician I. D. Zverev. But for several long years the indicated principle is making a subject of acute controversies as in the literature on the problems of the pedagogical bases of ecological education, and on International ecological forums on problems of ecological education and culture and does not find an unambiguous evaluation. It is known, that just this very indicated principle for many years remains as the basis of training technology at organization of ecological education in Ukraine, and that has resulted in rather sad consequences, which are stated in "The main directions... Ecological safety" when characterising the ecological state of the environment (Верховна Рада України, 1998). A sizeable discordance between the actual state of ecological safety and the notion of the efficiency of the inter-disciplinary approach as fundamentals of ecological upbringing and education here is visible (Бачинський, 1998). The leading role of the old form of the inter-disciplinary approach was fixed in the project "The Concepts..." also by the fact that the course "Fundamentals of Ecology" for the secondary school was determined as selective, instead of as the constituent of a compulsory state component. It was the basic methodological error, for lecturing the course "Fundamentals of Ecology" as selective has exhausted itself and was transformed into the destabilizing factor during the process of creation of the system of ecological upbringing and education. In the present report the concept of protection of the environment via new educational technology of organization of ecological upbringing and education is offered, the basis of which basis are three system-forming principles.

The first principle – it is necessary for entering into a list of disciplines of a mandatory state component of secondary schools educational-upbringing discipline on ecological upbringing and education. The indicated principle is based on the fact that the contents of mandatory state standard of formation in secondary schools is determined by the Academy of pedagogical sciences of Ukraine as a peculiar model of the social order on preparation of the young generation for life and one of the leading factors, that influences the efficiency of upbringing and education. Just during the realization of the first principle of the concept are mortgaged fundamentals of the system of ecological upbringing and education enveloping the most mass youth quota of the country. Only under such condition the realization of the social order on implementation of priorities of stable ecologically safe development of Ukraine, especially when we take into account the necessities to overcome the consequences of Chernobyl catastrophe – technogeneous catastrophe of the planetary scale which has happened as the result of the absence of ecological consciousness and ecological culture, which must be formed since school years and even earlier. The second principle – it concerns the technology of organization of ecological upbringing and education in secondary schools, and in higher educational institutions. At the present stage inter-disciplinary ecological education exists "without any sense of purpose": so-called ecologization of teaching of various disciplines, the necessity of strengthening of which has been spoken of for so long and so much, nobody supervises also any educational-methodical structure in each educational institution is not responsible for coordination of

both the quality of ecological education and the quality of formation a pupil as a person. As shows pedagogical experience the indicated condition is one of the main reasons of low productivity of existing technology of organization of ecological education on the principle of inter-disciplinary approach. Via new technology the creation is provided on the basis of compulsory educational-upbringing discipline on ecological upbringing and education of educational-methodical centre of ecological culture, where teachers not only teach the discipline, but coordinate the realization of the ecological component at teaching the other disciplines, answering for quality of ecological formation and education of the pupils of their educational institution. The indicated second principle is the second system-forming factor and represents a core of the system of ecological upbringing and education. The offered new technology of organization of ecological upbringing and education raises on the higher methodical level a principle of inter-disciplinary approach, giving it "the second breath" and promoting improving of the quality of "ecoiogization" of various disciplines. The third principle – according to the new concept it is necessary to result in conformity the main purpose of ecological upbringing with the title of educational-upbringing discipline on ecological upbringing and education. It is very important both in methodological, and in the methodical respects. It is necessary, that in the title of discipline both the main purpose, and direction of the contents of an educational subject was reflected. Existing title of a type "Fundamentals of Ecology " or "Ecology" does not reflect neither the main purpose, nor the direction of the contents of an educational subject. Presently exists more than thirty varieties of Ecologies and the number of them will grow. The concept means the educational-upbringing discipline, which main purpose "is the formation of ecological culture of the person as the forms of regulation of interaction of the person with nature" (Проект..., 1995). The idea that deserves attention is that "there is a need for replacement of existing ecology-educational paradigm by the one, which would maximumly represent a humanitarian sphere (Бачинський, 1996, 1999, 2002; Дробноход, 1997). At secondary schools the title of such discipline would be expedient to define as "The fundamentals of formation of ecological culture of schoolchildren". In higher educational institutions and special secondary institutions the last word in a title of the discipline can be replaced in accordance with speciality. For example, "The fundamentals of formation of ecological culture of the doctors" instead of the existing – "Human Ecology". The realization of the principles of the offered concept via new educational technology of organization of ecological upbringing and education of ecological culture of schoolchildren and students is directed to protection of the environment against a destroying activity of people and to the same degree is directed to protection of the internal environment of each person against the harmful impact of the damaged external environment. The urgency of the development of the new concept of protection of then environment is essentially increasing, as the working group is created on development of the state standard of education in the "Ecology", direction speciality – "Ecology and environment protection". From a history of pedagogics it is known, that the doctrine on the fundamentals of Newton's mechanics and optics for a long time was not perceived by the majority of the scientific and school teachers. But after it was included in the educational programs as an obligatory component of education, I. Newton's doctrine gradually took possession of teachers' and pupils' minds and over the course of several centuries was the basis of the world-view of the majority in the scientific world of Europe, America and Australia (Bachinsky, 1999). The authors of text-books and manuals played important roles in this process – the most famous among them is Voltaire, who played an essential role. At present there are serious problems, connected with text-books and manuals on Ecology. There are not quite successful text-books for the secondary school (Білявський, 1998) and for the students of natural faculties of higher institutions (Бачинський, 2013). In these text-books a number of important didactic principles of the text-book theory are not realized: Principle of conformity of the contents to modern development of science and the character of educational-cognitive activity of pupils,

principles of fusionism – integration of pupils' knowledges at different levels of education. Here are less successful text-books because of technocratic approach to the solution of the problems of ecological upbringing and education (Кормилицын, 1997).

There are text-books, which can render the essential help in mastering the ecological education and grant the necessary help during formation of ecological culture (Шилов, 1998). The indicated text-book is made in such a way, that convinces of the necessity "to voluntarily adhere to certain principles of ecological ethics: principle of ecological imperative, principle of preservation of biological diversity, principle of production humanization and other".

CONCLUSION

The ecological upbringing and education is one of the central problems of the XXI century, requiring the urgent solution exactly as a biosocial problem, by the way of reduction of the discordance between the actual effectiveness of the ecological upbringing and education and our vision of the state of things in this area, where the fate of preservation of a human being as a kind on the Earth is at stake...

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