

BIOS IN THE NEXT MILLENNIUM REVERSING THE CRISIS OF VALUES

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Introduction to Bio-Education

One of the major themes of the Biopolitics International Organisation (B.I.O.), since its creation in 1985, has been to alert public opinion on the impact of technology on the bio-environment. In modern society, progress in technology provides humanity with completely new dimensions of understanding. However, in the present meta-industrial era, society is undergoing a crisis of values, realized by everyone since it affects our daily lives.

The present destruction rate of the bio-environment threatens not only the aesthetic values but also the very essence of bio-diversity on our planet. Destruction is taking place every moment around us. In the sixties, ecology was developed as a reaction to the destruction of the ecos (the house) that was endangered. However, what is in danger nowadays is bios, life itself. Every moment that a clock is ticking, some form of life disappears.

Bios has existed for about one and a half billion years. In view of the existing threats to bios, progress needs to be assessed not through the prism of competition and financial interest, but through a completely different dimension: bios in the next millennium. In terms of the long chain of evolution of life, a thousand years is only a few seconds. A millennium approach may provide the unifying dimension for the future allowing for the shifting of thought from personal or national issues to the real essence of the continuation of the chain of life. Humanity has no right to destroy within one or two generations the gift of bios, the most precious possession on our planet.

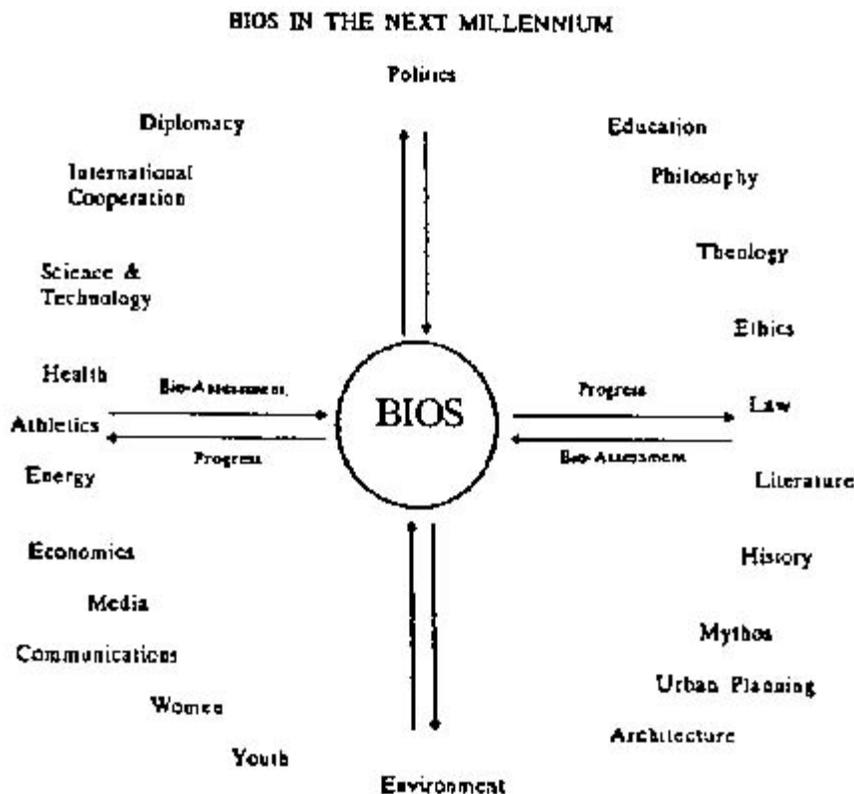
In order to implement this vision, B.I.O. has proposed immediate reforms at all levels of education, by placing the respect and appreciation of the bio-environment as the core of every educational system. Undoubtedly, educational systems have provided enormous progress in our society. However, modern education is based on over-specialization, leading to a lack of general concern for the problems of society, which are considered only the government's responsibility. Many of the problems of our times exist due to the inefficient, fragmented view inherent to the modern educational systems.

The International University for the Bio-Environment - Goals of the B.I.O.

In view of the need for immediate educational reforms, B.I.O. has created the International University for the Bio-Environment (I.U.B.E.), with the goal to stimulate revisions of the present educational structure. The I.U.B.E. will foster, through bio-education, the following B.I.O. goals:

- international educational reforms so as to shift from an anthropocentric to a bio-centric curriculum and place the better understanding and appreciation of the bio-environment as the core of an integrated educational system;
- international cooperation for the better understanding and appreciation of bios and the bio-environment. Bios recognizes no ideological or geographical boundaries, no East-West, North-South or developed-developing countries. Bios provides the unifying force for the harmonious co-existence of all forms of life. Parallel to internal problems, nations will undertake an international task. In order to implement global bio-education, the goal is to seek the cooperation of universities, governments, industries, institutions and individuals in an effort to introduce a new vision in curricula. Innovative educational programs could be devised for teaching via satellite transmission. New course material could be incorporated into existing curricula and programs in order to increase public awareness on life-supporting issues. Lobbying groups could be established to pressure world media organizations to include more news and information on bio-environmental issues in their publications and programming. Satellite television networks, for example, could include a bulletin or update on environmental issues along with the weather and stock market reports which accompany each news program;
- international legislation on Bios Rights. It is important to realize that environmental deterioration constitutes a threat to all forms of bios. In view of the recent technological advances, new dimensions of understanding are arising. Creativity and economic growth may be channeled to foster the defense for bios and bio-diversity, reduce environmental risks and promote compatibility between technological progress and the bio-environment. The respect for bios may serve as the core of thinking and action;
- worldwide bio-assessment of technology as an effort to bridge the gap between technological progress and societal values. Progress

may be viewed under the spectrum of 'Bios in the Next Millennium', so as to retain the positive aspects of technology that contribute to the maintenance of the bio-environment. In a dialectic exchange of views, experts in respective fields will be asked to present the thesis and antithesis, and then create the synthesis of new values leading to a harmonious global community. The effort will be to identify the factors causing the decline of values, harness the damages to the bio-environment such as species extinction, water and atmospheric pollution, ozone layer destruction, greenhouse effect, soil erosion, acid rain and nuclear waste in order to really benefit from the contributions of technology. Greece is proposed as the ideal meeting place for people from all specialties to convene and assess progress and values. Every corner of Greece, depending on its cultural contribution to humankind, may serve for providing the needed new dimensions. Patmos, the island of the Apostle John, may serve as the meeting place for theologians to examine the effects of technology on religion and propose future values for bios. Olympia may serve for the assessment of athletic values. Mythology, history and tradition, as well as modern technology, may combine to provide a future based on a perspective of hope and respect for the creation;



In addition to the theoretical search of values, action will be needed in order to use the progress of technology for preserving the bio-environment:

- develop a bio-syllabus and new curriculum materials for pre-school, elementary, middle and higher levels of education and audio-visual materials on issues related to bios and the bio-environment;
- encourage the creation of a clearing-house for both dedicated individuals and established organizations to provide, through the use of computer link-ups, a network of people wishing to cooperate;
- generate environmental action groups, utilising both the enthusiasm of youth and the experience of retired people to tackle local issues;
- encourage life-supporting economic strategy to replace destructive policies and a world-wide interdisciplinary exchange of information promoting the appreciation of the bio-environment. Exchange of bios-supporting data between cities, individuals, universities, etc;
- promote the establishment of a computerized Bank of Ideas in which scientists, academicians and philosophers, as well as every individual, may bequeath their thoughts to create a rich depository of information and reflections on bios;
- organize a World Referendum so as to allow for people throughout the world to express their willingness to preserve bios on our planet;
- sensitization of public opinion to the ramifications of the biological sciences so that more people will realize that progress in the biological sciences relates to their own specific field of interest. The impact of this progress may open new fields of human endeavor such as bio-legislation, bio-environment, bio-literature, bio-arts, bio-linguistics, bio-economics, bio-communication, bio-history, bio-education and bio-diplomacy. It must have been difficult to predict the endless chain of cars found in the streets of modern cities at the time the wheel was invented. However, a similar revolution is taking place today in biology and

medicine. Until a few years ago, medicine was based on the study of symptoms, the diagnosis and the corresponding treatment. At present, genetic engineering provides a revolutionary approach to medicine due to the understanding of the biological mechanism of disease. For the first time in the multi-million year history of life, the genome can be analysed and changed. The biological sciences are causing the major revolution of our times and raise the awareness for a unified concept of life.

Bio-Ethics and Bio-Legislation

The threatening of bios by human activities includes an ethical dimension. Bio-ethics could provide the philosophical foundations for the concept of peaceful and harmonious co-existence of humanity with the bio-environment.

The diverse forms of bios on Earth are not only important in themselves, but also constitute the bio-environment which is essential for the existence and development of humanity. Thus, the task of maintaining and promoting the bio-environment acquires a bio-ethical dimension. Economic interests and health problems are interrelated with bio-ethics. In view of the critical situation in the world, a major attitudinal change is required.

In view of the ethical dilemmas created by the rapid technological advance, future legislators are facing new challenges daily. Bio-legislation should be complementary to the quest for bio-ethical values. The goal should be to develop international legislation on Bios Rights. These include:

- human rights. Any human being must be granted the right to enjoy living and be protected against the destruction of the bio-environment;
- animal rights. Cruel treatment of animals should be eradicated. The protection of animal species from extinction and the development of legal rules on animal research are issues of a worldwide concern.
- plant rights. Plants on earth form a sophisticated network of global flora. The oxygen released by it is vital for all other forms of life. The enhancement of plant rights can help humanity overcome the ozone hole problem;
- microbial rights. The microorganisms perform extremely important functions in food and feed production, in plant protection against insects and weeds, in energy production and the de-pollution of the environment.

Bio-Ethics and Bio-Legislation are influenced by the progress in bio-technology. Intense efforts are under way to decipher the human genome. This enormous task of determining the sequence of three billion nucleotides and identifying over 100,000 individual genes will completely revolutionize our concept of health and disease. Several thousand diseases will be identified in the foetus by comparing its DNA with normal sequences. This science fiction-like plan will be realized before the end of the century. Many ethical questions arise. Bio-lawyers and bio-legislators will be facing important questions such as:

- should abortion be allowed in the case that lethal diseases are identified in the foetus? Currently, when Down's syndrome is identified, pregnancy is terminated. What will be done when thousands of diseases are identified?
- does a potential human being possess rights from the stage of the fertilized egg, the three-month old embryo, the foetus, the new-born baby?
- rumours already exist regarding women in the Third World who allegedly sell their foetuses. Transplant of foetal tissue removed during abortion provides hope for Parkinson's and Alzheimer's disease, sickle cell anemia and diabetes.
- sex-testing of embryos through amniocentesis or ultrasound examination has raised fears of abortions among certain cultures. Centrifuge separation of male-producing or female-producing sperm may induce additional problems.
- are human tissue and cells our property or do they belong to the laboratory to which they have been donated?
- can patent law protect the developer of new bio-technology products?

In order to allow for the incorporation of new values with the perspective and vision required for the future, enlightened bio-legislators are essential. Legislators with limited technological criteria will be insufficient. Without an informed educational vision, it will be difficult to decide on new legislations and to construct the framework of future societal values.

Bio-Business

In order to promote new values for the next millennium, the contribution of economic factors is also a prerequisite. It is important to realize that new alternatives lead to new opportunities in business. Within this context, a redefinition of the concept of profit is necessary. Production and product life-cycle changes such as recycling, developing substitutes for CFCs and petrol, bio-chemical energy, and solar technologies become increasingly important. The concept of profit now takes on the added dimensions of protecting the bio-environment, preserving resources, and improving the quality of life. In view of the needs and methods created in modern society, many decision makers realize that profitable production and respect for the bio-environment can be completely compatible goals.

Bio-Environment

The threats to bios are increasing dramatically. Urgent action is required in the following areas of global concern:

- species which are in danger of extinction. By the end of the century, one species may disappear every 20 minutes. Out of 30 million species, less than 2 million have been identified; two hundred elephants are massacred each day; 3% of the 8600 species of birds are threatened by extinction;
- polluted waters are responsible for 80% of child deaths in Third World countries;
- rain forests host the majority of the world's species of animals and plants. Close to 11 million hectares of rain forest are destroyed yearly;
- the ozone layer of the atmosphere is under threat. Bios evolved for hundreds of millions of years under the water. It was the prolonged formation of oxygen through photosynthetic organisms that formed the ozone layer. Thanks to photosynthesis, land-life became possible. The destruction of the forests, toxic substances in the water which destroy photosynthetic algae and toxic chemicals in the air, are rapidly destroying the ozone layer thus allowing ultraviolet radiation which damages genetic material to penetrate the earth's atmosphere. Ozone-depleting CFCs come from aerosols, air-conditioning systems and plastic foam cartons;
- soil erosion increases the rate of desertification and degradation. Billions of tons of topsoil are lost from cropland each year;
- the greenhouse effect causes a gradual rise in temperature resulting in sea-level rise thereby endangering many cities;
- acid rain causes extensive damage to forests and historical monuments;
- nuclear waste increases the risk of rising radiation levels in the environment.

The chain of life must be preserved at all costs, for once it is broken, the wheel of the environment may stop turning.

Bio-Technology

Bio-technology opens new horizons in the task of maintaining and promoting the bio-environment. Bio-technology may serve in:

- plant protection, in particular the elimination of harmful insects and weeds by bacterial, viral and fungal agents;
- animal protection through preparation of vaccines, diagnostics and medicines, in order to prevent and treat infectious diseases such as rabies, foot-and-mouth disease, brucellosis and viral diarrhea;
- amelioration of agricultural plants and animals. This aspect of bio-technology can be considered on both the quantitative and the qualitative level. In the former case, the productivity of the organisms is to be enhanced;
- preservation of the environment: bio-degradation of pollutants, establishment of integrated systems of ecological protection with the use of ecosystem bio-technology;
- production of microbial biomass and fuel.

The bio-ethical issues relating to genetic engineering have been a major concern for both the scientific community and the public at large. Some important ethical issues which surfaced are:

- the ethical posture of humans as genetic engineering extends to all the kingdoms of life;
- medical applications of genetic engineering dictate the employment of organisms as closely related to man as possible. In case human cells were used, scientists would be taking a tremendous responsibility;
- do genetic engineering and other advanced techniques in the field of bio-technology favor the tendency towards production concentration?
- will increased productivity of crops or cattle achieved using genetic engineering result in increased employment?

In the course of its almost 20-year long history, genetic engineering has made important achievements, but has also raised a number of new issues and has made the comparison of genetic engineering to the nuclear technology revolution appropriate.

Bio-Energy

An important problem of modern human society is the quest for new energy sources. Until quite recently, the technological progress of human civilization depended on extensive exploitation of fossil energy sources. During the last years, considerable importance has been attached to the research and development of directions involving alternative renewable energy sources.

In the search for new sources of energy, we should turn our attention to plants. Plants convert solar energy directly into food and oxygen.

Diesel motor oil is already being used from the extracts of oil-producing plants. Recently, some bacteria have been found to produce the most expensive fuel, hydrogen.

Employment of bio-energy, apart from being a promising alternative to the use of dwindling stocks of fossil fuel, is expected to have a positive environmental and societal effect.

Bio-Communications

Recently, the information exchange among computer systems of different countries has been considerably facilitated by the establishment of international data banks in different fields of research. It is very important to reunite the efforts of those interested in bios by setting up an international computerized Bios Bank of Ideas. This would enable international experts to assess data from different regions of the world more quickly and to take the necessary measures without delay.

Instantaneous transmission of information using satellites could contribute to the implementation of special educational programs and curricula, as well as worldwide monitoring systems for the bio-environment.

Not only the structural elements, but also the basic principles employed can be based on biological concepts. Biology has served as a model for computer memory storage and the processing of information. Research in the field of the function of brain cells may reveal the mechanism by which cells store memory data in the form of abstract thoughts. Once this has been achieved, the same system of chemical storage of thought may be introduced into expert computer systems, thus widening the scope of analysis.

Using artificial intelligence, which is rooted in the biological sciences, scientists have developed expert systems for the diagnosis of diseases and psychological analyses. Neurocomputing networks can be employed for understanding continuous speech and identifying handwritten characters. This improved artificial intelligence can suffice to cope with such complicated problems as diagnosing a disease.

Bio-Theology

Religion enhances the importance of the global bios body and of the interdependence of its parts and ideas which coincide with the views characteristic of many current secular trends of thought. However, theology introduces an extra dimension to the unity of bios as well. This eternal existence and development of bios in its manifold forms is perceived as the melody of God's love for the bio-environment

The belief in the final victory of life over death is the intrinsic part of the theological teachings. This great belief makes us confident that we will be able to overcome the destructive tendencies threatening bios. The modern era is characterized by rapid increase in the main material means. However, enhancement of science and technology leads to a greater insecurity within the realm of creation. Religion teaches that all human beings are connected by spiritual bonds. They are all interdependent and interrelated. In addition, all forms of bios form one integral entity. They are parts of the whole with each part performing its specific function. New connections between science and religion are being established, emphasizing the unifying perceptions regarding the environment and bios.

Bio-Culture, Bio-Literature and Bio-Architecture

Apart from being an object of scientific research, bios is also an inspiring world closely related to the inner self. It is a unique sense of joy to contemplate living beings. The importance of the bio-environment as the core concept of a new culture is the foundation for the promotion of bio-culture.

Like most creators, artists seek a source of inspiration. Biology, with its stunning features and hidden mysteries, can surely serve that purpose. Throughout the centuries, art has reflected the study of nature. In this respect, bio-art is not an innovation. Already, painters have peered down the microscope to discover a completely new world of existence. The opening of the microcosmos provides unlimited sources of inspiration for artistic expressions in the future. Artists, with better understanding of biomolecular structures, may provide new dimensions for artistic expression.

Literature may serve as the best pathway to propagate understanding and induce inspiration in the appreciation and preservation of bios. All literature deals with bios, but a new awareness may be required to accentuate the joy we may derive from this enormous gift. No moment goes by without writing the most glorious volumes of literature, higher in calibre than any masterpiece of human creation. Every cell synthesizes trillions of molecules. The words spelled by the cell, like proteins, may require as many as a thousand letters each. It suffices for one letter to be misplaced and thus cause the difference between health and disease. Order prevails in the composition of all these volumes of bios literature composed every second by cells. This composition strengthens our understanding of the ongoing process of dynamic harmony.

In fields such as bio-architecture, the beehive, termite nests, cell membranes or other organelles, should serve as structural models for bio-architecture in the future. Bio-materials have been tested and have survived the selection of several hundred million years. For civil engineers bio-materials such as collagen and cellulose could be useful in construction. New trends in the use of bio-materials could be opened by the progress in microbial biotechnology and genetic engineering. The unraveling of the microcosmos and macrocosmos must provide new dimensions in architectural models and city planning. We may avail ourselves of nature as both an inspirational model as well as a view of the progress of bio-materials and a means to break away from stagnant patterns and realize the expanded possibilities afforded by technology and bios-centered thinking.

Bio-Diplomacy

The present threats to bios are international problems; the required solutions relate to the development of educational activities for peace and international understanding. Bio-diplomacy can enhance international cooperation on environmental issues and facilitate the active search for solutions to problems that require prompt and decisive action.

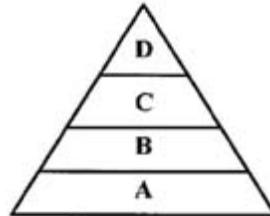
We should realize that all people belong to the same body of humanity. Differentiation in culture, languages and law constitutes the richness of bios. Human knowledge may be used to face the challenges of our interdependence and of our harmonious co-existence. This harmony can be achieved as long as human society changes its philosophy towards bios-centered values.

Moreover, the common roots of all forms of life constitute the body of bios. The abundance in the living varieties, from microorganisms to plants to animals to humans, reveals our interdependence. It is essential to maintain this vision of unity among all forms of life. Bio-education and bio-diplomacy may channel human creativity towards a bio-culture.

Environmental Olympics - Bios Prizes - Biocentric Vision

Prizes to be awarded in about 30 specialties (bio-ethics, bio-legislation, bio-economics, bio-theology, bio-architecture, bio-diplomacy, bio-philosophy, etc.) until 1996.

Example: Bio-Architecture



Bio-education may serve as a lever to uplift humanity from the crisis of values. In an effort to raise the awareness of the need for a faster prevention of the destruction, B.I.O. proposes the enrichment of the Olympics with new bio-centric values. Presently, the Olympic Games, a beacon of world peace and hope, award medals only for physical achievements. In order to promote the bio-assessment of technology and the bio-culture in the new millennium, B.I.O. proposes the creation of international committees in every field of human endeavor, assigned with the responsibility of assessing the progress of humanity and award Bios Prizes every four years during the Olympics to individuals who "have contributed to the preservation and better understanding of the environment". For example, legislators could be awarded for having developed new legislation regarding the bios rights; architects for having worked in the construction of biopolis models.

In antiquity, the Olympics were a period of cease-fire. The hope is that the bio-environment will act as a unifying force for peace leading to a new social structure, and the respect for bios will become the core of every human endeavor.

Conclusion

Since society is flexible and dynamic, educational systems have to be continuously revised. By the time proposals and studies are implemented, they tend to be already outdated. The more we understand the most unique gift of the universe, bios, the more successful we will be in fulfilling the needs of the community, the country or the world. One realizes that humanity possesses the option for alternative futures. The rapid rate of technological advancement provides the ascending ladder of knowledge and the linking bridge between the present and the future.

Dr. Agni Vlavianos-Arvanitis founded B.I.O. in 1985, after having dedicated over 20 years to teaching and research in biology. In 1990, she launched the International University for the Bio-Environment and, in 1992, a campaign for Bios Prizes and cease-fire during the Olympics. A recipient of many high distinctions, she was elected, along with M. Gorbachev, N. Mandela and M. Strong, Honorary President for Life by the UNA of Sri Lanka, and is also an Abdi Ipekci Peace and Friendship Prize laureate. She is Vice President of the International Bioethics Society, Member of the *Journal of Cleaner Production* Advisory Board, Member of the Board of Trustees of the Uganda National Foundation for Research and Development, Vice President of the UNESCO-MAB Hellenic National Committee, Commissioner on the Global Commission to Fund the UN, Corresponding Member of the Pontifical Academy for Life, Member of the New York Academy of Sciences, the International Academy of Ecology, Human and Nature Safety Sciences, the Hellenic Philosophical Society and the National Society of Greek Writers. Author of poetry books, she is also Honorary Professor of St. Petersburg State University for Plant Polymers and *Doctor Honoris Causa* of Mendeleyev University. In 1995 she was nominated for the Nobel Peace Prize, a nomination renewed in 1997, 1998, 1999 and 2000.