

THIRD B.I.O. INTERNATIONAL CONFERENCE

Biopolitics - Curriculum Revision
Athens, June 8-12, 1989

A Blueprint for Bios in the Next Millennium

Sponsors: Ministry of Culture; Ministry of Foreign Affairs; A.G. Leventis Foundation; National Tourism Organisation; Commercial Bank of Greece; Rank Xerox; National Bank of Greece; A.G. Petzetakis S.A.; Hellenic Plastic and Rubber Industry; A.B. Vassilopoulos; P. Zeritis; Thrace Paper Mills (DIANA); Hellenic Industrial Development Bank; American Express; N. Kouvaras.

The following participants contributed their views:

- Dr. Agni Vlavianos-Arvanitis, President and Founder, Biopolitics International Organisation, Greece
- Professor Nicholas A. Ashford, Policy Center for Technology, Massachusetts Institute of Technology, USA
- Professor Constantinos Bonis, former President, Academy of Athens, Greece
- Professor Costas A. Cassios, Technical University of Athens, Greece
- Professor Tham Seong Chee, National University of Singapore and President of UNA-Singapore, Singapore
- Terence Duffy, University of Ulster, Northern Ireland
- John Malcolm Forbes, Founder, Teachers' Center for Global Education, and Chairman, Center for American Studies at Concord, USA
- Mayer Gabay, Esq., Civil Service Commissioner, and Former Director General, Ministry of Justice, Israel
- H.E. Ambassador of Israel Mr. Moshe Gilboa, Embassy of Israel, Greece
- Professor Rom Harre, Department of Philosophy, Oxford University, UK
- The Very Reverend Meliton Karas, Secretary of the Holy Synod Ecumenical Patriarchate, Turkey
- Professor Rusen Keles, Director, Center for Urban Studies, Faculty of Political Sciences, Ankara University, President, United Nations Association, Turkey
- Professor George Maniatis, Biology School of Patras, Greece
- Dr. Aldo Manos, Coordinator, United Nations Environmental Program, Plan of Action for the Mediterranean, Greece
- Professor John G. Papaioannou, Athens Center of Ekistics, Greece
- Professor Giulio Pontecorvo, Director, Center for Business and Government Studies, Columbia University, USA
- Dr. Panayis Psomopoulos, President, Athens Center of Ekistics, Greece
- Dr. Robert T. Taylor, Representative, British Council, Greece
- Professor Constantinos Voudouris, Department of Philosophy, University of Athens, Greece

RESOLUTIONS OF THE THIRD B.I.O. INTERNATIONAL CONFERENCE PROPOSAL FOR A BIOCENTRIC CURRICULUM

Decision-makers met for the Third B.I.O. International Conference on Biopolitics - Curriculum Revision in order to initiate a worldwide bio-syllabus. It was acknowledged that there is an urgent need to incorporate the values of appreciation and a better understanding of bios (life) at all levels of education and that efforts would be made to incorporate the progress of the biological sciences in fields such as theology, philosophy, diplomacy, economics, law and media, since technology may be viewed as a pathway leading to a better future.

While setting the long-range philosophy of bio-education, immediate changes need to be incorporated in primary, secondary and university education. Public opinion is changing from day to day and the demands for the preservation and appreciation of bios are of utmost importance.

The fruitful outcome of this important meeting was the proposal for a bio-syllabus.

Statement of Justification

Maintaining and promoting bios (life) has, in general, become the most complex and urgent task facing mankind. Progress in technology has given hope for a more abundant and satisfying future. The horizon of human thought and understanding seems unlimited. Yet, at the same time, technology is also seen as life-threatening, challenging mankind's cherished beliefs and creating in its wake immense moral dilemmas as well as legal concerns. To ensure that bios remains at the center of human concern, it is imperative that technology be guided by appropriate values.

An important recommendation adopted at the First B.I.O. International Conference held in May 1987 was the preparation and promotion of bio-oriented educational programmes in national educational systems. This recommendation was subsequently reaffirmed at the Second B.I.O. International Conference in October 1988 where it was proposed that a bios curriculum for pre-school, secondary and tertiary educational institutions be formulated. The Third B.I.O. International Conference held in June 1989 addressed itself to this task.

The Bio-Syllabus

The bio-syllabus proposed by the Third B.I.O. International Conference stresses the need for a unified approach to understanding life and its multifaceted manifestations and processes. More than just the concern for the protection of the environment, it envisages not only the identification, promotion and institutionalization of values and attitudes that are necessary for the maintenance of bios but also the protection of vital ecosystems by the intelligent application of technological know-how for the enrichment of life. Bios, on the one hand, and bio-technological development, on the other, constitute two interacting components whose relationship with each other must be guided by appropriate values or principles of action to achieve desirable outcomes. A bio-syllabus, then, is both cognitive – emphasising knowledge about bios – and evaluational – emphasizing right values or attitudes towards bio-assessment.

Elementary Level

Appreciation of bios can assume many forms - in the manner bios is presented as a manifestation or in the incorporation of bios topics in teaching subjects such as history, literature, geography, social studies, civics, music and elementary science. In doing so, pupils should be provided with sound basic knowledge of bios and at the same time, learn to relate to bios with sensitivity, understanding and intelligence.

Aims

The aims of this Bio-Syllabus at this level should include inter alia:

- a) familiarizing students with their bio-environment so that they may develop self-awareness and also awareness of the living things around them;
- b) helping students to develop an understanding of growth processes in order to foster love, care and protection of bios;
- c) making students understand the relationships between the various components of bios within a given ecosystem;
- d) helping students to develop moral understanding vis-a-vis bios and the capacity to make moral decisions.

Methods and Procedures

To realize the broad aims presented, consideration should be given to assisting students to acquire an appreciation of nature, its rhythms and processes. This could be achieved by cultivating their powers of observation through sharpening their senses to sight, sound, smell, feeling and touch. Two sets of procedures could be followed: the purely didactic involving telling/explaining, shocking, informing and subject focus teaching and the less didactic involving individual research, information-handling, values clarification, motivating and decision-making skills. In addition to pure teaching, students could be encouraged to develop practical applications protecting the bio-environment.

Learning Principles Pertaining to Bios

Pupils should acquire an understanding of the following important principles pertaining to bios:

- a) the principle of structure and function;
- b) the relationship between the ecosystem (syncology) and the population (autecology);
- c) the interrelation of organisms whether as predator and prey, symbiotic, parasitic, competitive, neutral or commensal;

- d)the difference between potential niche (the sum total of a species' activity in the habitat) and the realised niche;
- e)the meaning and implication of evolution, natural selection, selection pressures, gene pool and gene flow including DNA;
- f)the factors controlling the size of a biotic population with special attention to the concepts of density-dependent versus density-independent;
- g)the principle of photosynthesis;
- h)complexity and diversity as a condition of stability in bios; and
- i)the meaning of conservation - a process requiring control of pollution.

Teachers should encourage students to raise moral, ethical, religious, political, economic and other questions to assist them in arriving at appropriate value decisions.

Secondary Level

At this level, the study of bios can be more focused either in terms of themes or subjects. The presentation of bios topics can be done through the relevant subjects taught at the secondary schools. Though teaching at this level tends to be disciplined or subject-oriented, e.g. language, literature, history, biology, physics, chemistry, mathematics, the need to deal with bios and bio-related topics as a unified area of knowledge and values should be recognized. However, it is important that students gradually come to realise that ecosystems are governed by common laws whether physical, biological or chemical and in the case of human beings, by values and norms.

Aims

The overall aim at this level should be to develop the students' ability both to observe and inquire about bios thus deepening their understanding of the relationship between human beings and the bio-environment. In addition, students can be helped to seek problems pertaining to bios and in the process learn to imbibe the process of inquiry and the scientific ethos. At the more advanced level (grades 10-12 or upper secondary), the aims of the bio-syllabus should include inter alia:

- a)teaching students how to discover regularities or underlying principles in the bio-environment;
- b)assisting students in identifying and analysing causes pertaining to bios and natural phenomena so as to develop unified ways of viewing and thinking;
- c)helping students to understand that there is harmony despite diversity and variety in bios;
- d)teaching students that all natural phenomena have a history governed largely by their habitat thereby heightening interest in the preservation of biotic forms;
- e)helping students to understand that human life is maintained by dynamic balance in the bio-environment;
- f)deepening students' knowledge regarding the action of man and its impact on the bio-environment stressing the role of culture and values.

Methods and Procedures

The focus at this level of study should not only be the appreciation of bios but also consciousness of bios in all its varied forms and manifestations. To realise this as an objective, a variety of activities and approaches may be attempted. To help students develop an appreciation of bios, various experiences should be provided through field studies; the use of audio-visual materials; the setting-up of laboratory experiments and the organization of talks, debates and discussions on bios. Other more innovative methods may also be attempted such as simulating dramatic presentations of bios, record-keeping and bios reportage.

The Bio-Syllabus (Secondary Level)

Both the cognitive understanding of bios and the values pertaining to bios should constitute the basis for the structuring of the bio-syllabus at the secondary level. This means that science subjects should attempt to enrich the knowledge about bios as well as sensitize students to appropriate values pertaining to the promotion of bios. Subjects of a humanistic or social science orientation such as history, geography, social studies and music, should help to develop the sensitivity of students to, and appreciation of, values including the rhythms of life.

The contents of the bio-syllabus should include:

- a)a firm understanding of the chemical basis of life - the development of organic living things from organic matter;
- b)an understanding of cellular structure and function;
- c)a knowledge of heredity and genetics including the interaction of heredity and environment in determining behavioural outcomes;

- d)an understanding of viruses and their role in relation to disease;
- e)an appreciation of the evolutionary sequence, the development of primordial life to the present;
- f)an understanding of the biology of man and its various systems, circulatory, skeletal, digestive, nervous, reproductive, excretory and endocrine;
- g)a knowledge of the invertebrates and their behavioral characteristics;
- h)a knowledge of flowerless plants such as algae, phytoplankton, fungi, mosses and ferns and their evolutionary significance;
- i)an appreciation of ecological relationships including the structure and diversity of ecological communities;
- j)an appreciation of biotic and abiotic factors in an ecosystem;
- k)an understanding of population growth, regulation and interaction including the concept of mutation as the ultimate science of genetic change.

As in the case of elementary schools, teachers at the secondary schools should endeavor to engage students in dialogue sessions on the various problems pertaining to bios and its maintenance. Such dialogue sessions could be issue or subject-oriented. The key concern should be the creation of a balanced and morally-sensitive perspective regarding bios. Given the diversity of cultural traditions and the unique existential circumstances underlying human societies, it is imperative that the approaches proposed to promote bios through education be modified and adapted according to the availability of resources and the perception of needs. It is important that students have both the intellectual and emotional maturity to engage actively in organised efforts to promote the objectives of bios both at the school and community levels.

Tertiary/University Level

Because of the great variety of disciplines and teaching programs at the undergraduate level, it would not be possible to propose a detailed systematic bio-syllabus suitable for all students. However, it is assumed that students at this point of their learning experience would have absorbed the spirit of scientific inquiry and at the same time, deepened their understanding of the bio-environment as it relates to human societies. Similarly, it is assumed that they would have developed appropriate concerns and attitudes towards bios in general guided at the same time by a sense of service and responsibility.

Since university undergraduates are the potential leaders and decision-makers of society, it is necessary that they possess the requisite knowledge and public sense to discharge their responsibilities in the interest of bios. In an industrial capital-oriented society, certain categories of professional expertise play greater roles or exercise greater influence in determining decisions affecting bios. In this connection, tertiary educational institutions are encouraged to make available the following bios or bios-related courses at the undergraduate level on an urgent and formal basis. In doing so, it might be necessary to provide built-in incentive systems to ensure that the students adopt a serious attitude toward the concerns of the courses. The department or the faculty must regard these courses as integral to the overall professional education of the undergraduates.

- a)Science, architecture and engineering undergraduates: A compulsory course on Bio-Assessment and Bio-Design.
- b)Business accounting and economics undergraduates: A compulsory course covering subjects on Production and Production-related Damage to the Bio-Environment.
- c)Law undergraduates: A compulsory course on Law as an Instrument for Social Control over Science and Technology or alternatively, under a broader rubric The Sociology of Law.
- d)Students on disciplines centering on Bio-technology as a professional course: A compulsory course on Bio-assessment and Bio-design.
- e)Students undergoing training in the environment or environment-related science courses: A compulsory course on Reactive versus Pro-Active Approaches in Bio-environmental Management.
- f)Undergraduates in the Humanities and Social Sciences: A compulsory course on the role of values and attitudes in the conservation and management of bio-systems.

The proposed course of study should be supplemented by field experience and multi-disciplinary evaluation of real or contrived bio-technological issues. In doing so, students should be sensitised to the multidimensional nature of bios differentiating the practical or rational demands from the legal, moral and political. As in the other educational levels, universities should adjust or design bio-oriented teaching programmes in accordance with their practical needs and urgency.

In conducting such courses, departmental or faculty staff may bear in mind the following guiding principles:

- a)the need to develop appropriate and value-oriented technology, one that advances sustainable development;
- b)the need to utilize resources equitably, fairly and efficiently;
- c)the need to ensure viable interdependencies between the bio-environment and economic needs;

- d)the need to maximize biological diversity by judicious strategies; and
- e)the need to monitor population growth to ensure the effective implementation of economic and bio-environment programmes.

Further/Continuing Education

To ensure that scientists, engineers, lawyers and biotechnologists are kept up-to-date on the latest or most urgent problems pertaining to bios, it is proposed that a program on Bio-habitability be conducted either as a short or extended course. The target groups would include senior decision-makers of firms and industries including government officials and bio-environment activists. Universities should make available such a course preferably in collaboration with industry.

Basic topics proposed for the course on Bio-habitability include:

- a)the evolution and quality of biological systems;
- b)physical and chemical systems and their effect on the bio-environment;
- c)economics as a guide to regulation and public policy;
- d)the political, legal and moral dimension pertaining to the protection of the bio-environment.

It is recommended that there should be case studies, preferably on a multi-disciplinary basis to clarify issues and propose solutions. If finance is a crucial consideration in organizing such courses, universities may wish to levy a charge on attendance to sustain the program. In doing so, such courses should be well-planned, current and conducted by well-informed and knowledgeable experts.

Implementation

The sustenance and promotion of life in all its variegated forms through a bio-curriculum necessitates both education and propagation. In the case of the latter, the role of the mass media is fundamental. It is therefore proposed that educational institutions promoting bios through the adoption of a bio-syllabus should endeavor to engage all forms of media (satellite broadcasts, newspapers, magazines both at the popular and professional levels and advertisements) to create and generate public awareness and support for bios and bios-related programs and initiatives. Bios and its enhancement, in this regard, should be promoted as a total commitment, a way of acting, thinking and feeling which gives a new dimension to life as a global manifestation.

In this connection, institutions of higher learning with the requisite resources and commitment should provide the lead in implementing programs of study and research whether at degree level or in the form of short courses and learning modules on understanding bios. Universities and colleges with law faculties in collaboration with relevant professional organizations should endeavor to formulate model laws dealing with the fundamental concepts and specific issues pertaining to the impact of biotechnological research on bios. If necessary, relevant international organizations and agencies within or without the U.N. system should be consulted and their assistance sought.

Invitation

This invitation for the inclusion of the bio-syllabus in the curriculum is addressed to the presidents of universities, leaders in the fields of pre-school, elementary, middle and higher education, media specialists and all those who believe that education can provide the most effective pathway leading to the preservation and respect for bios (life). You are kindly informed that a bio-syllabus guideline is now available. You are asked to urgently incorporate these new dimensions.