

## BIO-ENVIRONMENTAL PROBLEMS AND CHEMICAL ENGINEERING IN RUSSIA

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The ideas of biopolitics are now widespread among scientists and statesmen of all countries including Russia. The founding of the International University for the Bio-Environment (I.U.B.E.) and the propagation of biopolitics' ideas among youth, especially students, are now becoming the most important directions of the Biopolitics International Organisation's activities. At the same time, we think that the process of learning the basics of biopolitics could and must be included in the framework of existing educational systems in all countries.

We want to share our first experience of including biopolitical notions in the curricula of the Mendeleev Institute of Chemical Technology (M.I.C.T.) – one of the largest institutes of that branch of science in Russia.

### **Principles of Environmental Protection and Biopolitics**

The Mendeleev institute was the first chemistry and technology institute in Russia to start a new educational program in 1983: industrial ecology. Most importantly, all the students of the institute started a new course on the 'basis of industrial ecology' to become acquainted with the basic principles of a modern approach to the development of chemistry plants. It was possible, although the spectrum of specialties studied at our institute is very wide, including almost all branches of chemistry manufacturing, from the manufacturing of acids and salts, ceramics and cement to biotechnology, plastics and nuclear fuel.

Our first experiment showed that students are very interested in environmental problems: some wanted to become specialists in this field and others wanted their professional work in some way to be connected with the problems of environmental protection.

The next possible step should be in the direction of the systematic and qualified study of biopolitical ideas by all students within the existing framework of humanities teaching. Traditionally, technical universities of Russia have paid more attention to the teaching basis of humanities such as philosophy, political economy and history. Lately, students are showing greater interest in the sciences which are determining and forming the people's outlook, and their relation to other people, nature, and society. Taking all this into account this year, students were able to study biopolitics as one of the most important elements of the human outlook.

In March 1992, students studying the basics of humanities were able to attend lectures given by the Founder and President of the B.I.O., Dr. Agni Vlavianos-Arvanitis, and Professor Rusen Keles from Ankara University. The speakers were asked many questions and had a very lively discussion about biopolitical problems with our students. Our guests also met with teachers and members of the scientific staff of the humanities faculty and the faculty of industrial ecology. The lectures of these leading specialists and enthusiasts of biopolitics were received with great interest.

While discussing the role of biopolitics as one of the humanities subjects, students have proposed the idea of holding an international youth seminar in 1993-1994 in Moscow for students of various specialties devoted to the problems of biopolitics. The administration of the institute supports this idea and is ready to provide necessary rooms and equipment for seminar organization. Also, accommodation is guaranteed for all participants. Leaders of the B.I.O. have been asked to help in holding such a seminar by acting as leading specialists and heads of the sessions. In addition, the I.U.B.E. could carry out the overall guidance of such seminars in various countries. It is considered very important to hold such seminars every year. The administration and scientific council of M.I.C.T. are going to use the proceedings of the B.I.O. in educational programs for both undergraduates and post-graduate students. From this point of view, the preparation and publishing of a text-book of biopolitics' basics and approaches is very important for teachers and students of all schools, institutes and universities. The I.U.B.E. could be responsible for this publication.

### **Biotechnology and Biopolitics**

Educational programs on chemistry and technology in Russia include biotechnology, one of the modern branches of science and manufacturing which is rapidly developing in the world. In the last 15 years, the educational program for biotechnology engineers in our institute includes not only very good fundamental courses in mathematics, physics and chemistry but also courses providing comprehensive biological knowledge and practical experience. The specialists who always work with what we call bios are the most receptive to the ideas of biopolitics and the bio-environment. At the same time, it is clear that for these specialists, the principles of biopolitics must become the basis for their outlook and practical applications.

For the last several years, the problems of environment and development of non-wasteful technology became very important and urgent in Russia. In many regions of Russia, environmental pollution has become a very serious problem. One of the ways to change the current situation is an active biotechnological influence which can help carry out recultivation of land, make dangerous pollutants harmless and finally replace dangerous production plants with less and less dangerous ones. All these activities are considered to be environmental biotechnology.

M.I.C.T. is now starting to prepare biotechnology engineers who will specialize in the field of environmental biotechnology. In our mind, for these students, the ideas of biopolitics must not only be elements of outlook, but the basis of practical activity.

We consider that the right of bios to exist in optimal conditions and to continue must become the first principle in evaluating all new technological processes in industry and also in agriculture. Only the restoration of natural eco-bioprocesses in every manner can guarantee the survival of humanity and provide the possibility to live in harmony with nature.

At the department of industrial biotechnology of M.I.C.T., actual scientific research on environmental biotechnology is now carried out. Students and post-graduates are taking active part in this research. The goal of this research is to discover real changes in the environment caused by specific kinds of industry. The detailed study of land and water microbiocenoses near the plants, enables us to determine the danger of any particular plant. Based on this research, measures aimed at protecting the environment from dangerous influences are being proposed.

Thus, the ideas of biopolitics are not only being accepted by students, but they have also come to form a real basis for their practical activity with members of scientific groups.

## Conclusion

Finally, it is important to emphasize that the foundation of the I.U.B.E. is very timely and plays a special role in the system of world ecological education. We are sure that biopolitics and bio-environment must become one of the most important elements in the human perspective. For this reason these branches of science must play a major role in all educational programs. The role of the I.U.B.E. is not only in the propagation of these ideas by direct education—but also more importantly—in the methodological guidance and coordination of efforts of all universities and institutes in the world in disseminating the ideas of biopolitics among youth, students, and scientists of all nations.

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