

FOREWORD

This issue of *Kosmos* — presents the proceedings of the “Conference on Global Environmental Changes — a Challenge for Humanity” held in Cracow, 22–23 October 1992. The inspiration was given by the Polish National Committee for IGCP — Global Change. The Conference was prepared in cooperation with the Polish Academy of Sciences and Letters in Cracow, the Ministry of Environmental Protection, Natural Resources and Forests, and with the Man and Environment Committee of the Polish Academy of Sciences.

The shrinking of the natural resources, such as water, soil, biomass or mineral resources, the environmental pollution, and finally the distinct climatic change due to the greenhouse effect all of which during the last 30–20 years caused organized actions and development of research projects to recognize the causes of these changes, as well as to forecast their results for the environment and economy. Among the first who undertook those themes were the UNEP (United Nation Environmental Programme), FAO and IUCN (International Union for the Conservation of Nature).

In the structure of UNESCO there were founded special programs such as MaB — Man and Biosphere, IHP — International Hydrological Programme, and others. The World Meteorological Organization founded the World Climate Programme (WCRP) and later on IPCC — Intergovernmental Panel of Climatic Changes.

In the ICSU (International Council of Scientific Unions) there were organized: SCOPE (Scientific Committee on Problems of the Environment) and in 1986 the Committee for the International Geosphere-Biosphere Programme — Global Change. This IGBP programme is put into practice in the decade 1991–2000 by means of several core projects and satellite projects, in which thousands of scientists are engaged. The objective of the IGBP is “to describe and understand the interactive physical, chemical, and biological processes that regulate the total Earth system, the unique environment that it provides for life, the changes that are occurring in this system, and the manner in which they are influenced by human activities”.

In the last two years the International Council of Social Sciences started to create the parallel programme on Human Dimensions (HDP), to learn the reaction

of the society to environmental changes, and to the scenarios how to counteract unprofitable changes. The engagement of nations was realized by organizing the United Nations Conference on Environment and Development and signing the first international convention on the climate, the ozone hole, the protection of biodiversity, and the agreement on the forest ecosystems.

The Conference in Cracow had as its aim to inform the wide circles of Polish scientist about the main directions of international research on the global environmental changes and their implications for the humanity, as well as the discussion on the main conclusions in the context of the degradation of natural resources and socio-economic changes in Poland. Therefore the program of that meeting covered a wide scope of multiscale problems in relation to the global perspective. Unfortunately, not all the papers distributed among the participants were orally presented, and this eliminated some important questions from the discussion; moreover some were not delivered in time to be included in this issue.

After the opening speeches made by Vicepresident of the Academy of Sciences and Letters in Cracow A. Bielański, the host of the Conference, and by Vicepresident and General Secretary of the Polish Academy of Sciences L. Kuźnicki, S. Kozłowski presented the results of the United Nations Conference on Environment and Development held in Rio de Janeiro in June 1992. Next L. Starkel characterized the global environmental changes in the geological past; he emphasized the problem of unrenovable resources. J. Topolski spoke on evolution of the social and economic structures in relation to the natural resources. T. Florkowski presented the different scenarios of the production and consumption of energy on the background of the gaseous composition of the atmosphere. The mechanism of the greenhouse effect and its acceleration connected with the increase of CO₂ were described by B. Obręska-Starkel, and the changes of the content of ozone in the stratosphere and troposphere by A. Dziewulska-Łosiowa.

The next group of the papers distributed during the Conference was related to the environmental changes studied by several international core projects of the IGBP and other programs. Z. Kaczmarek characterized the changes of the global water resources, A. Hillbricht-Ilkowska the changes of the lacustrine ecosystems, and L. Ryszkowski and A. Kędziora the transformation of agriculture due to the changes in the global climate. The consequences of the rising of the sea level were elucidated by K. Rotnicki. M. Sadowski discussed some geopolitical aspects of the global warming. The human response problems were presented by R. Domański (social dimensions of the degradation of natural resources) and by A. Biela (psychological reaction under the conditions of the global climatic change). The presentations were followed by a very vivid discussion concentrated on the explanation of the mechanism of the global climatic change, as well as on the expected by various scenarios effects of changes for the economic and social development of our country.

Another substantial part of the Conference was formed by the poster session, presenting the new results of the research carried out mainly in the Cracow center and related, directly or indirectly, with the Global Change Program.

The team of climatologists: B. Obrębska-Starkel, J. Trepińska, Z. Olecki (Jagiellonian University), T. Niedźwiedź (Institute of Meteorology and Water Management) and Z. Bednarz (Agricultural Academy) presented the studies on the long term trends in the climate changes in Southern Poland. The impact of the climatic changing parameters on the water circulation in the river catchments was illustrated by M. Gutry-Korycka, J. Jaworski and B. Jakubiak (Warsaw University and Institute of Meteorology and Water Management). A. Kotarba (Institute of Geography, Polish Academy of Sciences) indicated to the role of the catastrophic events in the Tatra Mts. on the background of climatic fluctuations. A. Bytnerowicz, K. Grodzińska and others (Institute of Botany, Polish Academy of Sciences) studied the impact of the change in the content of ozone on forest communities. K. Grodzińska and G. Szarek presented the measurements of the role of vegetation in the transmission of heavy metals. E. Helios-Rybicka (Geological Faculty of the Academy of Mining and Metallurgy) showed the deposition of heavy metals in the bottom sediments of Polish rivers. M. Ralska-Jasiewiczowa (Institute of Botany, Polish Academy of Sciences) together with the interdisciplinary team, presented the results of studies on the reconstruction of climatic changes and human impact based on the laminated sediments of the Gościąż Lake, covering the last 12000 years.

All the materials presented during the poster session will be published in the first issue of the new series "Environment of Poland and Global Change" — showing the Polish research related to the IGBP.

It is my privilege and pleasure to express cordial thanks to all authors, who presented the papers and posters as well as to all those, who helped in the preparation of this Conference and thus in the propagation of the problems of the global environmental changes. I also appreciate the invitation the of Editorial Board of *Kosmos* to publish the proceedings of our Conference.

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