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FOREWORD

The interdisciplinary studies conducted during the recent decades resulted in a fuller understanding of the processes and phenomena occurring in the environment. These studies are meant to get an insight into the mechanisms of functioning of particular components of the environment and various forms of their description and modelling. Moreover, these studies deal with preserving the balance in the environment and usage of its resources, and defining rational principles of environmental management.

In the second half of the 20th century, two major trends occurred in the management of environmental resources. The first one was related to a reasonable fulfilment of the human needs with taking into account the protection of the environment. The second, unfortunately, exhibited the features of inconsiderable human impact on the functioning of the environment and resulted in the concern about the future of all the components of the geoecosphere.

The most exciting problems, recently, include the evaluation of the human impact on the climatic and hydrological resources, on changes in plant communities and soil covers. Of utmost importance is finding how the natural and man-transformed ecosystems are adapting to the progressing climatic changes on the global to local levels. Among such problems one may also mention: the rate of the changes; sensitivity and resistance of particular subsystems of soil, water and plants to the concentrated in time multidirectional changes in climate; and ability of the ecosystem to return to its initial state as well as, in the case of the practical aspects, the benefits from the human activity in the field of management of water conditions and transformation of the plant communities and features of a local climate.

The volume of „Prace Geograficzne", presented to the reader, issued by the Institute of Geography and Spatial Management of the Jagiellonian University at Cracow summarises the gleanings of the KBN* project no 6P04G01513 *Topoclimatic*

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and Geoecological Changes in the Wieliczka Foothills in the surroundings of the Dobczyce Reservoir (supervisor of the project Barbara Obrębska-Starkel), that was carried out during 1997-2000. The performed team studies aimed at the evaluation of the effects of the changes in the land use due to the construction and exploitation of the water reservoir on the Raba river, which supplies the drinking water for Cracow and controls floods, since the end of 1987. The influence of the water reservoir on the region of the intensive farming in the reservoir's surroundings is an example of a fast environmental interference of man on a local scale. These terrains seem to be very sensible to any disturbance of a balance of the given ecosystem and, therefore, they require special attention when predicting the effects of the intentional management practices to be introduced.

The thematic arrangement of the papers presented in this volume is based on the following principles. The order of the works reflects the size of the examined objects in the spatial structure of the components of the environment in the Raba valley near Gaik-Brzezowa as well as the degree of minuteness when presenting the transformations occurring in them. Thus, the first position is given to the hydrologic conditions of the Raba catchment, modified due to the construction of the reservoir, described by R. Soja. The author presents the natural rhythm of the oscillations in the Raba discharges, the mean and extreme values of the water level during the years with different amount of precipitation as well as the abrupt changes in the water level due to the specific principles of the water management practised by the Water Supply Works. He has proven that the water reservoir forms a new, strong dynamic system of hydrological net whose influence on the local climate is difficult for forecasting.

The works referring to the soil (by S. Skiba, M. Drewnik and R. Szmuc) and phytosociological conditions (by H. Trzcińska-Tacik and A. Stachurska-Swakoń) were based on the detail mapping and on the comparison of the spatial differentiation of the soil and plant features on the local and regional scales in the Wieliczka Foothills.

The climatic studies were also conducted on various spatial and temporal scales. The station at Gaik-Brzezowa (the Wieliczka Foothills) has been compared with that at Szymbark that characterises the thermal and humidity conditions of the foreland of the Beskid Niski Mts., i.e. the Ciężkowice Foothills, the latter showing more continental features of the annual course of the aforementioned climatic elements (cf. J. Trepińska's paper). The evaluation of the ecoclimate of the patch of the oak-hornbeam forest *Tilio-Carpinetum* in Gaik-Brzezowa, by B. Obrębska-Starkel, is the most detailed study. It refers to the tendencies in the changes in the temperature and humidity of the air during the period from 1971-1997, that is before and after the construction of the water reservoir, analysed against the background of the climatic fluctuations as well as during the periods coinciding with the changes in the land use. This study also tackles the reasons of the changes induced by the atmospheric circulation (B. Obrębska-Starkel) and the effects of insolation on the climate of the air boundary layer (paper by Z. Olecki).

The presented papers, composing this monograph on the environmental changes in the region of the differentiated land use, are summed up by the discussion about the fundamental problems associated with the evaluation of the anthropogenic influences, possibility of predicting the rate of transformation of the particular ecosystems and modelling of the outcomes of the human management in the dynamic systems.