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## THE GEOGRAPHICAL PROGNOSIS IN PRESENT-DAY CZECH GEOGRAPHY

### 1. Preface

At the present time, during building up of a well-developed socialist society, a rapid progress in science and technical sciences is taking place in Czechoslovakia without any analogy in the past. The scientific-technical revolution results in basic qualitative changes in the present-day system of production forces in Czechoslovakia which affect all components of this system and all sides of technological relationships. The extraordinarily rapid development of science and the prompt introduction of scientific knowledge into production make of the science an immediate production force.

The changes evoked by the building up of socialism and by the scientific-technical revolution strike even the Czech geography. Geography in Czechoslovakia is subjected to changes affecting the bases proper of the said science.

But the processes mentioned above manifest themselves even in the object of geography, i. e. in the changes of the intricate system of the landscape sphere on Czechoslovakia's territory. Mainly the socialization of agriculture and the changes attached thereto by the division of land and the industrialization of agricultural production have substantially changed the character of the landscape of extensive regions in Czechoslovakia. The extension of production and the adoption of new modes of production have not only raised the standard of living of the population but manifested themselves even by some negative effects on landscape and environment (atmospheric and water pollution, cumulation of waste, etc.).

In planning Czechoslovakia's future development, a number of tasks arise therefore, several of them concerning the spatial organization of the economy and life of the society. The quality of the environment in Czechoslovakia also exhibits a distinct spatial structure, from regions with a slightly disturbed nature (e. g. national parks and protected landscape areas) up to regions devastated by mining with strongly disturbed natural conditions. This is why the simple statement of the present-day state of geographical conditions and the state of environment is not sufficient for planning but it is necessary to know the variants of the development of the spatial structure of economy as well as of the life of the society for instance in 1990, 2000 and/or 2050. Czech geographers have, therefore, in recent years paid considerable attention to the problems of geographical prognosis.

### 2. Contents of the geographical prognosis

Prognosticating is a systematic investigation of the future and a formulation of scientific statements concerning objectively possible alternatives and variants

of the subject of prognosis in the future. The result of the investigation is a prognosis as a complex of mutually connected valuations, i. e. aims of valuation, modes of their achievement and necessary costs. It has already been mentioned above that, at the present time, Czech geography is facing two tasks, such as

- a) the prognosis of the geography as a science, and
- b) the prognosis of the development of the subject of geography, i. e. of the landscape sphere especially on Czechoslovakia's territory.

For the purpose of tackling the tasks mentioned, geography creates an implement — the geographical prognosis. The geographical prognosis is a systematically derived and from the viewpoint of reliability theoretically and practically verified system of possible alternative states of geography as science and of the landscape sphere as a subject of study of this science in the future. The geographical prognosis is a very complicated and responsible task. It requires not only a deep insight in the development of science but, simultaneously, a clear idea of time-spatial relationships of nature and society in the future.

The geographical prognosis belongs by its character into the group of scientific-technical prognoses. It should be stressed that the scientific-technical prognostication and the practice of scientific-technical prognosticating are still in the beginning of their development. At the present time, the active process of improvement of the methods of scientific-technical prognosticating is proceeding in Czechoslovakia. Czech geographers have the advantage of being able to base the elaboration of the methods of geographical prognosis on collective co-operation of the member countries of COMECON in the sphere of scientific-technical prognosticating.

The methodological basis of the Czech geographical prognostication are the scientific categories of materialistic dialectics and, above all, the principles of objectivity and law-controlled development, the recognizability and inexhaustibility of the real world. The geographical prognosticating is in relation to general prognostication a concrete branch of geographical research based on its specific theory resting upon general knowledge of the doctrine on science. At the present time, geographical prognosticating in Czechoslovakia is getting the character of a systematic analysis of tendencies and perspectives giving more precision to valuation. The prognoses designed by geographers are based on known objective laws, tendencies, demands and conditions of the development of both, the geography as science and the whole Czechoslovak society. The geographers are trying to formulate the possible alternatives of the development of both — the geography and the subject of its study — the landscape sphere on the whole territory of the country. Experience has shown that prognosticating is more successful if it is more connected with the practice of socialist development, with planning of the scientific-technical and socio-economic development of a well-developed socialist society.

The geographical prognostication is further based on general methods of prognostication, i. e. on the complex of general principles, modes and laws of scientific forecasting.

### 3. Prognosticating of the development of Czech geography

As already mentioned, the geography as science was subjected in recent years to a substantial development affecting the bases proper of this old science. Even Czech geography is quickly developing as a component of Czechoslovak geography,

a component of the geography in socialist countries and, last but not least, as a component of world geography. Czech geography turned from description to the system-structural analysis of its subject, i. e. of the landscape sphere. It does not content itself only with the statement of the present-day state. Czech geographers are searching for and proposing the modes of the control of the development of the landscape sphere on Czechoslovakia's territory and within the frame of the co-operation of the COMECON member countries in the interest of its optimum utilization for the needs of further development of the socialist society. In Czechoslovakia, a rational spatial organization of life and economic activities of the socialist society is becoming a necessary component of the complex care of environment of this society.

The development of Czech geography is planned and takes place both within the scope of the preparation and execution of the different five-year plans of the development of Czechoslovak economy and society, and within the frame of planning for longer periods (10 up to 15 years). The task of Czech geographers is, therefore, to prognosticate the needs of the development of geography for the said periods and to give them precision on the basis of the five-year plans of the State Plan of Basic Research and the State Plan of Technical Development.

The prognoses carried out so far of the development of the Czech geography have shown that it will deal up to 1990 mainly with the problems of

- a) landscape and its development (changes of spatial differentiation and spatial structure especially from the point of view of securing the optimum utilization of natural resources and of securing the optimum environment)
- b) spatial geographical structures with the aim of securing the optimum spatial dislocation of population (investigation of urbanized areas), production and recreation
- c) cartographical models especially with the application of modern means of automation of map compilation and the utilization of the modes of remote sensing
- d) modernization of teaching geography in all types of schools.

The prognosis has shown simultaneously that to secure such a development of geography in the future it will be necessary to develop the theory of geography as well as the further development of geographical prognosis.

#### **4. Prognosticating of the further development of the landscape sphere on Czechoslovakia's territory**

Prognosticating the further development of the landscape sphere on Czechoslovakia's territory is an important task not only of theoretical significance for geography but also of immediate practical significance mainly in connection with securing the optimum environment for the further development of socialist society.

But experience has shown that the geographical prognosis of the development of the landscape sphere is a very complicated task, especially for the following reasons:

- a) the prognosis must be based on reliable data and knowledge of the past and the future
- b) the subject of the prognosis, i. e. the landscape sphere, is an unusually intricate system with many variables
- c) the prognosis must end by a synthesis, i. e. a complex prognosis of the deve-

lopment of the landscape sphere on Czechoslovakia's territory or its parts for 15, 25, 50 or — in the last resort — even 100 years ahead.

The geographical prognosis is always a scientific foreseeing of unknown or partly unknown phenomena. This is why so heavy demands are made on the reliability of the basic data. For the prognosis of a possible development of spatial relationships between the elements and components of the landscape sphere on Czechoslovakia's territory it is necessary to know above all:

- a) the trends and rate of the natural development of the different natural elements and components of the landscape sphere
- b) the changes both of the individual components and the whole natural subsystem of the landscape sphere affected by the economic activities of society
- c) the tendency of the development of the whole society, i. e. both the totality and the different socio-economic subsystems (industry, agriculture, transport, services, recreation, etc.).

The basic data must be related to a certain zero level. But the experience of Czech geographers has shown that in the conditions of the strongly altered nature of Czechoslovakia it is quite difficult to find the scale of the natural development of the individual elements and components of the physico-geographical sphere. In the time, when measurements of climate, waters, biota, with sufficient precision were started (e. g. climatic data from 1775 in Praha-Klementinum), the parameters already concerned a rapidly changing nature with significant and diverse effects of human activities. To acquire exact data on the landscape sphere in the past and partly even nowadays is therefore rather difficult and geographers are often obliged to use estimates and approximate data. This fact is, of course, reflected in the quality of the prognosis.

From the functional viewpoint, three types of geographical prognoses are distinguished by Czech geographers. The first type are geographical research prognoses whose aim are the discovery and formulation of new tendencies in the development of the geography as science and its subject, i. e. the landscape sphere. This type of prognoses is tackled above all in the Institutes of Geography of the Czechoslovak Academy of Sciences and the Slovak Academy of Sciences and at the geographical departments of universities. The second type are geographical program prognoses based on known tendencies and laws of the development of geography as science and its subject and also on social needs. They refer to geographical research prognoses but are more focussed on the requirements of practice. This type of prognoses is examined besides the institutions mentioned above also by geographers in departmental research institutes and institutions (e. g. Research Institute of Construction and Architecture). The third type are geographical organization prognoses based on the knowledge of general laws and tendencies of the development of geography as an organization system. They are based on information supplied by research and program prognoses, on information of human and material resources and formulate the scientifically motivated hypothesis on resources necessary for the achievement of possible and planned aims. An example of such prognoses are the different levels of territorial planning in Czechoslovakia.

At the present time, the scientific prognostication is using about 140 various methods of prognosticating. The real number of the methods applied in geographical prognosticating in Czechoslovakia is, naturally, much smaller. The applied methods can be, in substance, concentrated into three basic groups, such as extrapolation methods, expertise methods and methods of modelling.

In the geographical prognosis, its subject is considered by Czech geographers

principally a system of interconnected components with respect to their hierarchy and importance. The object of the prognosis is simultaneously studied in relationships with other systems as well as an element of the system of higher order. Czech geographers understand under the term system methods in the practice of present-day geographical prognosticating the procedure of the application of different methods and approaches to prognosticating based on a united theoretical hypothesis. In this procedure, the various methods and approaches complement mutually their limited possibilities. This procedure increases, therefore, the credibility of the obtained data. The utilization of system theory in ensuring the solution of the geographical prognosis is a necessity corresponding to the new level of the problems arising before Czech geography within the frame of the scientific-technical revolution.

The geographical prognosis in Czechoslovakia has also different levels. The highest level represents the prognoses of the development of the landscape sphere on the level of the whole federation.

The second level are the prognoses on the level of both states — the Czech Socialist Republic and the Slovak Socialist Republic. An example of such a prognosis can be the prognosis of the development of the environment of the Czech Socialist Republic in the publication J. Demek et al., *Životní prostředí České socialistické republiky* (The Environment of the Czech Socialist Republic, Praha 1978). This geographical prognosis formulates some conceptions of the further development of the landscape sphere of the Czech Socialist Republic about to 2030. These are:

- a) the conception that the atmospheric pollution of the ČSR will go on increasing until 1985 in connection with the increasing consumption of solid fuel (especially lignite of low quality) and with the development of motorism; as late as after 1985 a slight decrease in pollution by solid particles can be expected owing to the increased efficiency of fly-ash separators; but the amount of gas emissions (above all SO<sub>2</sub>) will increase further, even after 1985;
- b) the conception on thermal pollution of the atmosphere in settlement agglomerations and industrial centres where the additional thermal energy will reach about 2000 approximately 1/3 of the total quantity of solar energy incident upon 1 m<sup>2</sup> of the surface of the Czech Socialist Republic per year;
- c) the conception on limited resources of surface and groundwater and on the increasing trend of water consumption by the population from the present-day 296 l. inh.<sup>-1</sup>. day<sup>-1</sup> to 552 l. inh.<sup>-1</sup>. day<sup>-1</sup> in 2000; as well as on the increasing water pollution by agriculture which may be a limiting agent of social and economic development in 2000;
- d) the conception on the rearrangement of the whole landscape of the Czech Socialist Republic and the change of its function especially in the lowland and hilly land regions in connection with the concentration, mechanization and specialization of agriculture;
- e) the conception on growing problems in urbanized regions, mainly as to atmospheric pollution, problems with noise, lack of drinking water, civilization diseases, etc.;
- f) the conception on the spatial differentiation of the environment in the individual parts of the Republic and concentration of significant problems in some regions, such as for instance, in the North Bohemian Lignite Basin and the urban regions of Ostrava, Praha, Brno, Plzeň, Sokolov, Hradec Králové and Pardubice.

The third level is the prognosis of the development of the landscape sphere in the individual regions. A considerable progress has been attained in this level of prognosis, especially thanks to the institutes dealing with territorial planning (e. g. Terplan, Urbion, etc.).

In the geographical prognoses, the possibilities of the special geographical representation means are usually made use of — the thematic maps. But it should be mentioned that this specific geographical language is still more used even by other scientific disciplines (e. g. by territorial planning) which results in a „geographization“ of these branches and their rapprochement with geography. A new higher stage of geographical prognosis will be the starting monitoring and automation of the construction of prognostic maps with the aid of computers.

#### Conclusions

The present-day state of geography as science and the present-day state of its subject of study — the landscape — require not only the establishment of their present-day state but even a prognosis of their development in the future. This is why Czech geographers are developing and will develop the geographical prognosis as a useful implement in fulfilling the tasks of geography in the period of the scientific-technical revolution.

#### Bibliography

- DEMEK, J. (1977): Geografická prognóza. Geographical Prognosis. Sborník Československé společnosti zeměpisné 82/4/:313—317, Praha.
- DEMEK, J. (1977): Geografická prognóza životního prostředí. Geographical Prognosis of Environment. Životné prostredie XI/3/:120—122, Bratislava.
- MAZÜR, E. (1972): Súčasná a výhľadové úlohy našej geografie. Present and perspective tasks of our geography. Geografický časopis XXIV/3/:177—184, Bratislava.
- IVANÍČKA, K. (1974): Význam a postavenie prognózovania v súčasnej geografii. The importance and the position of prognosis in the contemporary geography. Geografický časopis XXVI/3/:267—277, Bratislava.

#### Shrnutí

#### GEOGRAFICKÁ PROGNÓZA V SOUČASNÉ ČESKÉ GEOGRAFII

Prognózování je systematické zkoumání budoucnosti a formulování vědeckých výpovědí o objektivně možných alternativách a variantách objektu prognózy do budoucnosti. Geografická prognóza pak je komplex navzájem souvisejících hodnocení o vývoji geografie jako vědy a vyvoji objektu této vědy tj. krajinné sféry v budoucnosti. Geografická prognóza je úkol velmi složitý a odpovědný. Svým charakterem náleží do skupiny vědeckotechnických prognóz. Je třeba zdůraznit, že vědeckotechnická prognostika a praxe vědeckotechnického prognózování se nachází ještě v počátcích svého vývoje. V současné době probíhá v Československu aktivní proces zdokonalování metod geografického prognózování. Metodologickým základem české geografické prognostiky jsou vědecké kategorie materialistické dialektiky a především principy objektivnosti a zákonitosti vývoje, poznatelnosti a nevyčerpatelnosti reálného světa. Význam geografické prognózy spočívá v tom, že v současné době dochází v Československu k rychlému rozvoji geografie jako vědy, současně však k rozsáhlým změnám v jejím objektu, tj. v sektoru krajinné sféry na území ČSSR pod vlivem intenzivní hospodářské činnosti společnosti při budování vyspělé socialistické společnosti. Zejména socializace zemědělství a industrializace zemědělské výroby podstatně změnily ráz krajiny rozsáhlých oblastí ČSSR. Rozšíření výroby a zavedení nových druhů výroby nejen zvýšilo životní úroveň obyvatelstva, ale projevilo se i některými negativními vlivy na krajinu a životní prostředí. Proto má geografická prognóza nejen teoretický, ale i bezprostředně praktický význam.

Z funkčního hlediska jsou v článku rozlišeny tři typy geografické prognózy, a to výzkumné, programové a organizační prognózy. Jsou probrány hlavní metody používané při geografické prognóze, a to zejména metody extrapolace, expertízy a modelování. Z hlediska měřítka jsou rozlišeny prognózy globální, regionální a oblastní. Jako příklad je uvedena prognóza vývoje životního prostředí ČSR.