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Emil Mazúr (1925–1990): scientist, educator, manager and visionary of geography

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Abstract

Professor Emil Mazúr (1925-1990) was a key figure in (Czecho)Slovak geography, who shaped the fields of geomorphology, regional geography, geoecology, environmental geography and theoretical geography. The paper analyses the stages of Mazúr's scientific career, presenting the most significant research results, while pointing out key discontinuities and his influential works, which laid the foundations of modern geographical thought in Slovakia. The evolution of his research is characterised by a transition from early geomorphological studies to integrated geoecological and environmental frameworks, with an emphasis on interdisciplinary approaches to landscape analysis and synthesis. The text presents the results of a comprehensive geomorphological analysis and synthesis, the search for a synthesis of natural landscape and its use in the cultural landscape, the formulation of the concept of landscape synthesis and its implementation, key contributions within theoretical geography and especially outputs confirming the relevance of geography in scientific development and in social practice. Mazúr's contributions, through the introduction of systems thinking and regional synthesis, exerted a significant influence on the field of Slovak geography, and, at the very least, on the disciplines of Central and Eastern European geography. Simultaneously, it is important to acknowledge his pivotal role in establishing the primary geographical workplace in Slovakia. Furthermore, his proficiency in orchestrating scientific programmes, teaching activities, leading editorial boards and assuming senior positions in national bodies is also noteworthy.

Key words:
Emil Mazúr, Slovak geography, geomorphology, regional geography, landscape synthesis, geoecology and environmental geography, theoretical geography, relevance of geography

1 INTRODUCTION

The 100th anniversary of the birth of Emil Mazúr (1925-1990), a prominent figure in Slovak geography, provided a suitable occasion to commemorate his mission and legacy as a scientist, educator, manager, and visionary in the field of geography (Fig. 1). In light of this, a scientific seminar was convened on 23 April 2025, bearing the title *Emil Mazúr and his original contribution to geographical thought*. This event was meticulously organised by the Institute of Geography of the Slovak Academy of Sciences, in collaboration with the Slovak Geographical Society at the Slovak Academy of Sciences.

Professor Emil Mazúr came from the mountainous region of Javorníky in northern Slovakia. He was born in the village of Divina, situated in the Žilina district. The subject of this study was born and raised in the village under scrutiny, and received his primary education there. Following his graduation from high school in Žilina, he enrolled at the Faculty of Natural Sciences of Comenius University in Bratislava. His fascination with nature and the landscape prompted him to pursue academic studies in geography and history, which he successfully completed in 1950. During his studies, he was particularly influenced by



Fig. 1. Emil Mazúr (1925 – 1990)

the lectures of Professor Hromádka and his personal contact with Professor Lukniš, who encouraged him to devote himself to geography. His teachers introduced him to the work of the French school of regional geography (Paul Vidal de la Blache, Albert Demangeon, and others), as evidenced by his thesis in regional geography, "*Geografia Javorníkov (Geography of the Javorníky Mountains*)", for which he was awarded the title of RNDr in 1951. Following the completion of his studies, he joined the Geography Institute of the Slovak Academy of Sciences and Arts, which would later become the current iteration of the Institute of Geography of the Slovak Academy of Sciences. His scientific, scientific-organisational, and pedagogical activities were linked to this workplace for 40 years. From 1955 onwards, he assumed the role of external lecturer at the Faculty of Sciences of Comenius University, where he was elevated to the position of associate professor in 1957 and subsequently appointed as professor in 1975. In 1959, he successfully defended his doctoral thesis, thus obtaining the title of Candidate of Sciences (CSc.). He was the first Czechoslovak geographer to be awarded a scientific degree of Doctor of Geographical Sciences (DrSc.) in 1965 at Charles University in Prague. In 1975, he was elevated to the status of corresponding member of both the Czechoslovak Academy of Sciences and the Slovak Academy of Sciences. This was followed in 1980 by his election as a member of the Slovak Academy of Sciences, and the subsequent year by his election as a member of the Czechoslovak Academy of Sciences.

Professor Emil Mazúr is widely regarded as one of the most influential figures in the field of Slovak geography. His contributions to the development of several subdisciplines within the subject, including regional geography, geomorphology, geoecology, environmental geography and theoretical geography, have been significant. The period of his career which spanned more than four decades coincided with significant socio-political changes in Czechoslovakia, which in turn shaped the trajectory of his research. The present study finds Mazúr's work to be remarkable for its interdisciplinary approach, which integrates physical and human geography in order to address the complex dynamics of the landscape.

The objective of this paper is to present the stages of Mazúr's scientific contribution, to identify key discontinuities in his research, and to highlight his seminal works and collaborations that have influenced modern geographical thinking in Slovakia. The present study examines his legacy as a scientist, educator, manager, and visionary of geography, with a view to providing a comprehensive understanding of his mission in advancing Slovak geography.

2 MATERIAL AND METHODS

The present study employs qualitative historical analysis of Emil Mazúr's publications, drawing on archival records, peer-reviewed articles, and monographs available through academic databases and institutions. A systematic review of Mazúr's work was conducted, focusing on his contributions to regional geography, geomorphology, geoecology, environmental geography, and theoretical geography. Key discontinuities were identified through an analysis of changes in research focus, influenced by institutional, political, and scientific developments both globally and within the context of Czechoslovakia.

In order to analyse the work of E. Mazúr, a range of sources were consulted, including the works of several authors who evaluated the scientific, pedagogical and organisational aspects of his work (Lukniš, 1975; Mazúr, 1978a; Kvitkovič, 1985, 1993, 1990, 1997 and 2006; Drdoš, 1985; Czudek, 1990; Urbánek, 1993 and 2006; Jakál, 2006; Oťaheľ & Feranec, 2006; Huba, 2010; Matlovič & Matlovičová, 2015; Matlovič et al., 2025) and an overview of his work (Holická & Szöllös, 1997; Ira et al., 2020).

3 STAGES OF EMIL MAZÚR'S SCIENTIFIC WORK

Comprehensive geomorphological analysis and synthesis (Geomorphology and physical geography)

The early work of Emil Mazúr's scientific career focused on geomorphological research, which is of fundamental importance for understanding the diverse physical landscape of Slovakia. During the 1950s and 1960s, his comprehensive geomorphological analysis and synthesis was influenced by systemic and quantitative approaches that emerged within the field of global geomorphology (Chorley, 1962; Howard, 1965; Schum & Lichty, 1965; Davies, 1966). During this period, Mazúr's contributions laid the foundations for subsequent geoecological studies by establishing a reliable understanding of the physical dynamics of the landscape. In his geomorphological work, he concentrated on researching the relief forms of the Western Carpathians, with a particular focus on river terraces, planation surfaces, periglacial, glacial and karst relief (Mazúr, 1954, 1955 and 1962; Mazúr & Lukniš, 1956; Kvitkovič et al., 1956; Lukniš & Mazúr, 1959; Mazúr & Kalaš, 1963; Mazúr & Činčura, 1964; Mazúr & Jakál, 1969). Modern geomorphological research has been influenced by the field of Quaternary stratigraphy and neotectonics (Mazúr, 1965), which is devoted to the main features of the relief of the Western Carpathians. This seminal work was published in a volume edited by Mazúr and Stehlík (1965). Consequently, Mazúr is regarded as a *co-founder of the school* that studies relief from the perspective of the relationship between endogenous and exogenous processes through *detailed geomorphological mapping and comprehensive analysis*.

Notable works from this era include his contributions to geomorphological mapping, which integrated field observations with novel cartographic techniques (Mazúr, 1963a and 1963b). The principles and original approach to the methodology of geomorphological mapping were based on conscientious field research and knowledge of the landscape, and these principles subsequently formed the basis for the development of the Comprehensive Geomorphological Map of Slovakia at a scale of 1:200,000. The most significant work from this period is his monograph "*Žilinská kotlina a priľahlé pohoria. Geomorfológia a kvartér / The Žilina Basin and Adjacent Mountains: Geomorphology and Quaternary*" (Mazúr, 1963c), which is a model of detailed geomorphological mapping and an exemplary interpretation of complex geomorphological analysis and synthesis (Fig. 2).

Emil Mazúr's analysis did not merely entail a detailed examination of the relief; it also encompassed an analysis of the manner in which the relief was presented on the map. The content of the synthesis was presented in the article "*K zásadám geomorfologickej rajonizácie Západných Karpát / On the principles of geomorphological regionalization of the Western Carpathians*" (Mazúr, 1964), which outlines some of the theoretical and practical aspects of dividing Slovakia into geomorphological regions. The author conducts an analysis of two primary areas:

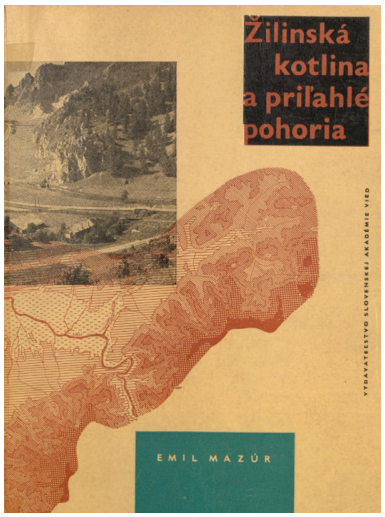


Fig. 2. Cover of the publication: *Žilinská kotlina a priľahlé územia*

the typological classification of relief and the regional division of the territory. The analysis culminates in the development of a scheme for the division of Slovakia into geomorphological regions. The author conducts an analysis of the issue of typological classification of relief on the one hand, and regional division of the territory on the other, developing a scheme for dividing Slovakia into geomorphological regions. His comprehensive understanding of the relief of the Carpathians was preceded by a number of his works from various parts of Slovakia, also in co-authorship with M. Lukniš, J. Kvitkovič, J. Činčura, and J. Jakál. He presented his synthesis in geomorphological regionalisation together with Michal Lukniš (Mazúr & Lukniš, 1978) in the work "*Regionálne geomorfologické členenie Slovenskej socialistickej republiky / Regional Geomorphological Division of the Slovak Socialist Republic*" with a hierarchical context within the Carpathians and the Pannonian Basin of the Alpine-Himalayan System, with precise respect for the logical rules of spatial classification by Grigg (1965). The consistency of his interpretation of the relief and landscape led Mazúr to organise an International symposium on physical-geographical regionalisation in 1967 in Moravany. Mazúr's contributions addressed the challenges of geomorphological regionalisation (Mazúr, 1972a) and the natural-spatial division of the Czechoslovak Socialist Republic (Mazúr, 1972b).

Other significant geomorphological works include studies of high mountain and plateau karst, with a particular emphasis on the typological division of karst areas in Slovakia (Mazúr & Jakál, 1969).

The search for synthesis (Regional geography as a synthesis of natural conditions and their social use – cultural landscape)

In the 1970s, Mazúr's research shifted towards regional geography, reflecting a growing interest in spatial organisation and interactions between humans and the environment. This period marked a significant discontinuity, as Mazúr transitioned from a purely physical geography to a more integrative approach, influenced by the need to address socio-economic challenges in the context of the socialist Czechoslovak state. His work began to incorporate systemic approaches, thus aligning it with global trends in geography that emphasised the connections between physical and human systems (Bunge, 1966). The transition to regional geography was a logical developmental step in understanding the landscape from the synthesis of knowledge of relief as one of the decisive elements that differentiate the Carpathian landscape.

The trend of "rejuvenation of regional geography" was reflected in the regional analysis of the Slovak Karst (Mazúr et al., 1971), with references to French regional geography (P. Vidal de la Blache, A. Demangeon) or the tradition of regional works from Slovakia (M. Bel, J. Hromádka and M. Lukniš). This phenomenon has been extensively documented by "*Mapa členenia kultúrnej (geografickej) krajiny v oblasti Slovenského krasu a priľahlých území / Map of the Division of the Cultural (Geographical) Landscape in the Slovak Karst and Adjacent Areas*" (Mazúr, 1971a). This was preceded by a synthesis of the natural landscape as a suitable basis for interpreting land use, presented in a cultural layer map. In creating this map, he drew upon data concerning settlements and population.

In his inaugural truly pioneering theoretical work (Mazúr, 1968), he expounded upon his vision and the significance of geographical synthesis. Following the completion of regional syntheses (Mazúr et al., 1971), he proceeded to present a synthesis of the natural landscape of Slovakia as the leader of the authorial collective in the map "*Geoekologické – prírodné-krajnné – typy / Geoecological – natural-landscape – types*" (Mazúr et al., 1977). This work built upon the initial synthetic efforts of Hromádka (1943). A generalising view in the context of understanding the horizontal relationships of geoecological types within Central Europe was presented by Mazúr et al. (1985a) in the map *Natural landscape types*.

The study of historical geography, as undertaken by Mazúr, proved to be of considerable significance in the pursuit of geographical synthesis. This interest was reflected in his research into land use as an integrative concept for understanding the relationship between natural conditions and their social use. This research orientation was presented by the author in his analysis of the development of land use in Slovakia (Mazúr, 1974b). In order to analyse the entire territory of Slovakia, the author employed statistical data on land use by cadastral area, which recorded the area of five basic classes. The author employed statistical records from 1895, 1930, 1950 and 1960 to analyse changes in land use (Oťaheľ & Feranec, 2006). In the attached map entitled "*Rozloženie typov kultúr / Distribution of Crop Types*", the author divided Slovakia into areas according to the percentage representation of individual land use classes. This classification was based on statistical data from 1960 and districts from 1961. A reissue of the map was published in the Atlas of the SSR (Mazúr, 1980b).

Data on land use, settlement (settlement size) and tree species composition with basic natural landscape units enabled to create a map of the cultural landscape of Slovakia, with the title "*Typy súčasnej krajiny / Types of Contemporary Landscape*" (Mazúr & Krippel, 1980).

The breadth of Mazúr's research endeavours encompasses not only physical and regional geography but also historical and human geography. In his study "*Národnostné zloženie – Ethnic Composition*" (Mazúr, 1974c), he presented the development of changes in ethnic minorities according to their native language (Slovaks, Hungarians, Ukrainians, Germans, and others). He documented these changes and processes of Magyarization in tables for the years 1880 and 1910, also according to districts reconstructed for 1961. The contemporary ethnic composition of the

region was documented in tabular form for the years 1961 and 1970, disaggregated by district. In the context of socialist Czechoslovakia, he demonstrated a notable degree of political and social courage in his presentation of the authentic representation of the Hungarian minority in Slovakia (Mazúr, 1974c).

A seminal work from this period was "*Geografická rajonizácia ČSSR / Geographical Regionalization of the Czechoslovak Socialist Republic*" (Mazúr, 1971b), which presented a framework for functional regionalization with an emphasis on the synthesis of the interaction between natural and socioeconomic systems. The term "geographical regionalization" was understood as a very broad concept of fundamental theoretical issues of geography as a synthetic science of the landscape, the solution of which is a necessary condition, the "raison d'être", of geography in contemporary society (Mazúr, 1971b, p. 100). The work provided a methodological basis for studies of spatial organisation and was of fundamental importance in the further formation of regional planning policy.

Landscape synthesis (geoecology and environmental geography)

During the late 1970s and 1980s, Mazúr's research was focused on geoecology and environmental geography, a shift that was precipitated by the growing awareness of environmental degradation in Central Europe. These trends had previously been announced in his work Mazúr (1972) and subsequently confirmed with a geoecological synthesis of the natural landscape of Slovakia (Mazúr et al., 1977) as a model of the potential of natural conditions for social use, which received significant international acclaim within the IGU (Kvitkovič, 2006). This stage represented a significant development in his thought, as he integrated ecological principles into geographical research, thereby anticipating modern sustainability issues (Haubrich, 1992). The outcomes of this endeavour were also reflected in the Slovak Association for Nature and Landscape Protection (Mazúr, 1979), during the period in which he served as its chairman, as well as in numerous contributions to the journal *Životné prostredie – Environment* (Mazúr & Drdoš, 1977a; Mazúr & Drdoš, 1977b; Mazúr, 1978b and 1980a). These works represent a significant milestone in Slovakia's environmental research landscape due to their pioneering contributions in two key areas: a comprehensive theoretical framework, and practical methodologies for addressing environmental challenges. The significance of these contributions extends beyond academia, as they have also influenced policy development within the domain of natural risk management and land use.

In his seminal work, Mazúr (1968) advanced a critique of the imbalanced relationship between the analytical-empirical and synthetic-theoretical strands within geography. Building upon this seminal critique, he embarked on a quest for a more comprehensive paradigm, culminating in the formulation of a novel concept. The solution was identified in the development of the synthetic-theoretical line through the transfer of the philosophy of contemporary science, particularly the acceptance of general systems theory in the sense of its founders (von Bertalanffy, 1956; Ashby, 1958; Boulding, 1956 and Hall & Fagen, 1956), but also in the development of new theoretical and methodological approaches presented in the works of Schaefer (1953), Berry (1964), Davies (1966) and especially Bunge (1966). A wide range of theoretical problems in geography were treated with an unconventional approach, especially the spatial-structural aspect. In support of this theory, he cited the works of Ackerman (1965), Armand (1964), Chorley (1964), McDonald (1966), Grigg (1965), Hagget (1965) and Kostrowicki (1967). Furthermore, he explored the potential applications of theoretical and technical cybernetics, as well as modern technologies, in the acquisition and processing of spatial data, citing the work of Hägerstrand (1967) as an example. This hypothesis was later confirmed by the development of geoinformation technologies and the effective integration and interpretation of geographic spatial data through the application of remote sensing approaches and methods and GIS, for which he also created the conditions at the Institute of Geography, including equipment. In this context, he emphasised that systemic and technological approaches offer geography unparalleled scientific and interpretative potential, as well as opportunities to apply integrative and interdisciplinary approaches. Concomitantly, he emphasised the necessity of acknowledging that geography's fundamental objective is the comprehension of the landscape (geosphere), which is to be perceived not as a mere aggregation, but as a holistic entity. In this context, he emphasised works seeking to integrate knowledge about the landscape as a whole (Bobek & Schmithüsen, 1949 and Neef, 1967), building on the work of French geographers and, concurrently, conceptualising the landscape as a system (von Bertalanfy, 1956 and 1968). The notion of landscape as a whole, as "something more", is corroborated by the following citation: "*The landscape as early as in traditional geography, especially in the French school and in others, was something more, when even adequate means of expression for this 'more' might be missing.*" (1968, pp. 207-208). Furthermore, he identified analogous characteristics of landscape in the works of M. Bel, J. Hromádka, and M. Lukniš, who demonstrated an exceptional synthetic emphasis on natural conditions, the economic framework, and social life.

In the context of further developments in geography, he highlighted the importance of understanding the landscape as a system. The landscape is made up of physical (abiotic), biotic, and social elements that, through mutual interactions, increase the complexity and dynamics of the landscape system. By accepting the systemic approach even then (Mazúr, 1968), he pointed to the principles of a new concept, the idea of *landscape synthesis*.

The institute's creative environment, in conjunction with the findings from the inaugural syntheses of physical and regional geography, the stipulations of social practice with motifs of applied, constructive geography (Gerasimov, 1966; Demek, 1968; Haase & Lüdemann, 1972 and Leszczycki, 1972), and the aforementioned theoretical impulses of international authorities (Carol, 1963; Berry, 1964; Bunge, 1966; Davies, 1966; Harvey, 1969; Hagget, 1972 and Schmithüsen, 1976), engendered a conducive milieu for the formulation of the scientific programme of landscape synthesis.

The conceptual genesis was presented by E. Mazúr, J. Drdoš, and J. Urbánek (Mazúr et al., 1980), and the theoretical and conceptual explanation was presented by Urbánek et al. (1980). The methodological procedures were presented by Drdoš et al. (1980). These presentations identified and evaluated the landscape in terms of its potential for rational use and social development. In the programme, they justified and designed methodological procedures for creating a system of geo-ecological information that diagnosed

the state of the landscape, evaluated its potential, and created a relevant basis for forecasting and proposing rational use and management of the landscape. The methodological procedures are comprised of two parts (see Drdoš et al., 1980; Mazúr et al., 1985b and Oťaheľ & Poláčik, 1987). The initial step in this process is a *diagnosis of the landscape*, which is informed by a comprehensive analysis and synthesis of the prevailing conditions and characteristics of the landscape. These characteristics are identified according to the fundamental structures of the landscape, encompassing both *the natural (reconstructed) and human (real cultural) structures of the landscape*. The fundamental procedure in diagnosing the landscape was to evaluate its fundamental structures in terms of the *landscape's potential* to perform social functions. The analysis and evaluation of the landscape's potential is informed by a preventative-therapeutic context, which identifies the possibilities and limits of rational use of the landscape. The concept is predicated on the utilisation of resources as a socio-economic category, encompassing not only the characteristics of the natural environment, but also the tangible structure and the human (cultural) layer of the landscape. In this sense, Mazúr and Drdoš (1984) understand potential as a complex prerequisite for the landscape to fulfil various functions for humans, as a prerequisite for a spatially conflict-free functioning "home of society". The second part of the study presents a *landscape prognosis*. It synthesises partial (sectoral) potentials for individual socio-economic activities and represents the so-called preference of potentials according to their hierarchy of importance, which Mazúr (1980c) referred to as the *functional delimitation of the landscape*. The spatial resolution of potential functions pertains to the realm of landscape development, encompassing alternative proposals for changes that are aligned with geo-ecological and socio-economic conditions, as well as supra-regional and regional priorities. The landscape plan proposal is developed in accordance with environmental principles and the concept of harmonious, sustainable (way of) living.

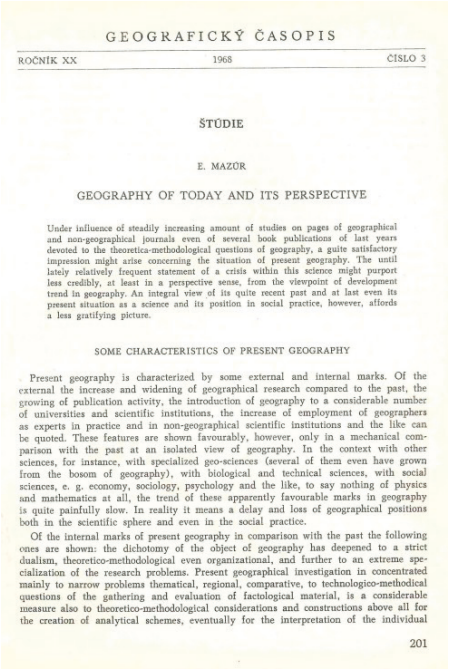
The programme's development was concomitant with an International symposium on the status and prospects of landscape research in Smolenice (1979), which led to the establishment of a Working Group within the *International Geographical Union (IGU*) dedicated to landscape research. This IGU Working Group, titled "Landscape Synthesis – Geoecological Foundations of the Complex Landscape Management", was active from 1980 to 1988. E. Mazúr was appointed to the position of head of the IGU Working Group, comprising 85 workplaces from 34 countries.

The concept of landscape synthesis was developed primarily by researchers at the Institute of Geography, SAS, with the results being presented at several international conferences and published in numerous theoretical and methodological works (Drdoš, 1983; Mazúr et al., 1983; Mazúr & Drdoš, 1984; Huba, 1982 and 1984; Urbánek, 1992 and 1993) and empirical works (Drdoš, Ed., 1983; Mazúr et al., 1985b; Oťaheľ & Poláčik, 1987; Lehotský, 1991, and others). The work of Mazúr et al. (1985b) was a suitable example of the application of methodological procedures of landscape synthesis. In addition to the diagnosis of basic structures, it also included a visual analysis and evaluation of permissible potential functions with the aim of protecting high mountain ecosystems.

Theoretical geography (Geography as a science of landscape, space and landscape/geoecological/ landscape-ecological synthesis)

In the final phase of his career, Mazúr turned his attention to theoretical geography. This was a natural progression from his previous research, in which he had sought to capture the essence of geographical thought and synthesise different approaches to understanding the landscape.

The first theoretical basis for the development of geography was presented by Mazúr in his seminal work "*Geography of today and its perspective*" (Mazúr, 1968). In the preceding section of this study, the fundamental principles of landscape synthesis were analysed (Fig. 3).



GEOGRAFICKÝ ČASOPIS

ROČNÍK XX 1968 ČÍSLO 3

ŠTÚDIE

E. MAZÚR

GEOGRAPHY OF TODAY AND ITS PERSPECTIVE

Under influence of steadily increasing amount of studies on pages of geographical and non-geographical journals even of several book publications of last years devoted to the theoretico-methodological questions of geography, a quite satisfactory impression might arise concerning the situation of present geography. The until lately relatively frequent statement of a crisis within this science might purport less credibly, at least in a perspective sense, from the viewpoint of development trend in geography. An integral view of its quite recent past and at last even its present situation as a science and its position in social practice, however, affords a less gratifying picture.

SOME CHARACTERISTICS OF PRESENT GEOGRAPHY

Present geography is characterized by some external and internal marks. Of the external the increase and widening of geographical research compared to the past, the growing of publication activity, the introduction of geography to a considerable number of universities and scientific institutions, the increase of employment of geographers as experts in practice and in non-geographical scientific institutions and the like can be quoted. These features are shown favourably, however, only in a mechanical comparison with the past at an isolated view of geography. In the context with other sciences, for instance, with specialized geo-sciences (several of them even have grown from the bosom of geography), with biological and technical sciences, with social sciences, e. g. economy, sociology, psychology and the like, to say nothing of physics and mathematics at all, the trend of these apparently favourable marks in geography is quite painfully slow. In reality it means a delay and loss of geographical positions both in the scientific sphere and even in the social practice.

Of the internal marks of present geography in comparison with the past the following ones are shown: the dichotomy of the object of geography has deepened to a strict dualism, theoretico-methodological even organizational, and further to an extreme specialization of the research problems. Present geographical investigation in concentrated mainly to narrow problems thematical, regional, comparative, to technologico-methodical questions of the gathering and evaluation of factological material, is a considerable measure also to theoretico-methodological considerations and constructions above all for the creation of analytical schemes, eventually for the interpretation of the individual

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Fig. 3. The first page of the study: Geography of today and its perspective (published in Geografický časopis in 1968)

In his work "*Súčasné a výhľadové úlohy našej geografie / Current and Future Tasks of Our Geography*" (Mazúr, 1972c), he analysed the state of Slovak geography and critically assessed its lag in social, economic, and media engagement. The primary tasks identified by the author were the resolution of environmental issues and the efficient utilisation of land. In this regard, geography was deemed to be a discipline capable of providing practical data for the purposes of spatial planning and economic development.

The publication "*Krajinné syntézy, ich východiská a smerovanie / Landscape syntheses, their origins and direction*" (Mazúr et al. 1983) represents a renewed call for the revival of theoretical and methodological foundations of modern geography through a systemic and synthesising approach to the landscape, which is a necessary step following the critique of traditional geography. The landscape system is a model comprised of a series of sub-systems, namely the physical (anorganic), biotic and human (social) systems. The organisation of these systems is characterised by a sequential progression of complexity, which mirrors the inherent complexity of the system as a whole. The complexity and sophistication of a system invariably corresponds to its degree of existential dependence. The elements of subsystems do not enter the system

holistically "en bloc", but only through some of their properties that interact (Mazúr et al., 1983). In conclusion, the authors posited that the direction of geographical landscape syntheses stems from two sources, namely practice and the internal needs of science. Concurrently, they substantiated the irreplaceability of geography as a discipline, integrating compositionally equivalent elements (Matlovič et al., 2025).

One of the most significant theoretical contributions of E. Mazúr (in co-authorship with J. Urbánek) to geographical thought is "*Kategória priestoru v geografii / The Category of Space in Geography*" (Mazúr & Urbánek, 1982). In this work, the authors characterised and evaluated the fundamental types of spatial thought in geography, incorporating them into a historical framework and linking them to the development of geography, as well as to certain trends in science as a whole. The authors' original contribution is the introduction of the concept of "landscape space", which they characterize as a relative concept. The concept that landscape space possesses an inherent quality that transcends its mere physical existence has been identified in the seminal works of A. Humboldt and Ch. Darwin, as well as in the contributions of renowned French and German geographers, including C. Ritter, F. Richthofen, A. Hettner, P. Vidal de la Blache, and E. Martonne, among others. However, these characteristics were only implicit in these early works.

Mazúr and Urbánek (1982) consider /discuss absolute space (Newtonian-Euclidian tradition) and critique its utilisation due to its one-sided consideration of spatial relationships, which fails to acknowledge their complexity. The authors justify relative and relational (field and synergistic) concepts of space and examine the consequences of various "schemes" (especially Körner's scheme of things, 1970) for how we understand the landscape, its elements, and their relationships.

The study "*Search for foundations*" (Mazúr & Urbánek, 1984) is a significant contribution to the search for the foundations of geography and provides an impetus for its axiomatisation, following on from the work of E. Neef (1967). The intensive specialisation of geography motivated the authors to formulate basic hypotheses with the aim of shifting geography from a trend of atomisation to a unifying, explicitly axiomatic discipline. The conceptual framework underpinning their work is the notion of the geographical universe as a hierarchically organised system that can be apprehended through the categories of time and space. The authors emphasise that the synthesis of these dimensions allows for the understanding of the landscape as a dynamic event where time and space form an indivisible unity.

Emil Mazúr's final theoretical composition was produced in collaboration with J. Drdoš, and was entitled "*Landscape ecology – geographical research direction, or an interdisciplinary research program?*" (Mazúr & Drdoš, 1988). The authors' detached perspective on the scientific rivalry between disciplines, which served to increase the prestige of scientific institutes and the level of scientific research, is noteworthy. To this day, this fundamental position of Mazúr is often perceived as an unjustified, perhaps even personal, bias. The development of this scientific issue was presented by the authors with their characteristic professionalism.

In the discipline of geography, particularly since the era of A. von Humboldt, a paradigm shift has occurred, with a shift in focus towards the study of the landscape. This shift has emphasised the dynamics and variability of the landscape. The term was initially referred to as *landscape physiology* in the 19th century, subsequently being designated as *landscape ecology (Landschaftsökologie)* in the latter half of the 20th century. The term was introduced by C. Troll (1939) in the context of using aerial photographs to analyse the spatial relationships of surface objects (especially vegetation) and their dynamics in the landscape. In this study, the researcher accepted American ecology, based on Tansley's (1935) concept of an ecosystem that provides a basis for the integration of ecology and geography.

During the 1960s, landscape ecology emerged as a means to address the relationship between humans and the environment, thus establishing itself as a foundation and instrument for environmental management and the rational spatial organisation of the environment. A significant factor contributing to this research direction was the concept of *landscape potential*, developed by Neef's school of landscape ecology (geoecology). Influenced by this school, Troll (1970) also adopted the term *Geoecology* alongside *Landschaftsökologie* (Mazúr & Drdoš 1984).

Mazúr and Drdoš (1988) convincingly argued that landscape ecology is not a "new" external discipline, but rather a geographical approach (cf. Matlovič et al., 2025). In conclusion, two aspects were emphasised: firstly, from a geographical point of view, the research focuses on landscape processes to create a rational spatial organisation; secondly, from an applied research point of view, the programme is interdisciplinary and various environmental sectors can participate.

Mazúr was able to evaluate knowledge critically in the fields of world science and geography. This included systems theory, cybernetics, the quantitative revolution, Soviet constructive geography and German axiomatics. In collaboration with other authors, he transformed this knowledge into methodological procedures for landscape research. These included landscape syntheses, the concept of space, the axiomatisation of geography, and the concept of landscape potential. As the lead author, he predetermined the originality of the resulting contributions and was transparent about the motives and significance of the original sources. Matlovič et al. (2025) presented an analysis of Emil Mazúr's geographical thought. They identified allochthonous and autochthonous impulses, pointing out how these were effectively transformed into original concepts within Slovak geography.

Key works and discontinuities in Mazúr's research (Identification of shifts and challenges)

The publications of Mazúr, frequently composed in collaboration with prominent Slovak geographers, have exerted a profound influence on contemporary geographical thought within Slovakia. The following works merit particular attention:

- Princípy konštrukcie a návrh legendy prehľadnej geomorfologickej mapy 1:200 000 pre oblasť Československých Karpát / The principles of construction and design of a legend for a comprehensive geomorphological map at a scale of 1:200,000 for the Czechoslovak Carpathians (Mazúr, 1963b),
- Žilinská kotlina a priľahlé pohoria (Geomorfológia a kvartér) / The Žilina Basin and Adjacent Mountains: Geomorphology and Quaternary (Mazúr, 1963),
- K zásadám geomorfologickej rajonizácie Západných Karpát / On the principles of geomorphological

regionalization of the Western Carpathians (Mazúr, 1964),
- Major features of West Carpathians as a result of young tectonic movements (Mazúr,1965),
- Geography of today and its perspective (Mazúr, 1968),
- Typologické členenie krasových oblastí na Slovensku / Typological classification of karst areas in Slovakia (Mazúr & Jakál, 1969),
- Geografická rajonizácia ČSSR / Geographical Regionalization of the Czechoslovak Socialist Republic (Mazúr, 1971b),
- Slovenský kras. Regionálna fyzickogeografická analýza / Slovak Karst: Regional physical-geographical analysis (Mazúr et al, 1971),
- Súčasné a výhľadové úlohy našej geografie /Current and future tasks of our geography (Mazúr, 1972c),
- Geoekologické – prírodné-krajinné – typy / Geoecological – natural-landscape – types (Mazúr et al., 1977),
- Regionálne geomorfologické členenie Slovenskej socialistickej republiky / „Regional geomorphological division of the Slovak Socialist Republic (Mazúr & Lukniš , 1978),
- Typy súčasnej krajiny / Types of contemporary landscape (Mazúr & Krippel, 1980),
- Geography and the changing world (Mazúr et al. 1980),
- Landscape syntheses and their role in solving the problems of environment (Drdoš, Mazúr & Urbánek, 1980),
- The search for the new way of the landscape study (Urbánek, Mazúr & Drdoš, 1980),
- Synthèses géoécologiques de l'environnement / Geoecological syntheses of the environment (Mazúr, E., & Drdoš, J.,1981).
- Funkčná delimitácia reliéfu pre hospodárske využitie na príklade SSR / Functional delimitation of relief for economic use on the example of the Slovak Socialist Republic (Mazúr et al., 1981),
- Kategória priestoru v geografii / The category of space in geography (Mazúr & Urbánek, 1982),
- Krajinné syntézy, ich východiská a smerovanie / Landscape syntheses, their origins and direction (Mazúr, Drdoš & Urbánek, 1983),
- Search for foundations (Mazúr & Urbánek, 1984),
- Conception of resources or conception of the landscape potential in geographical research? (Mazúr & Drdoš, 1984),
- Krajinná syntéza oblasti Tatranskej Lomnice / Landscape synthesis of the Tatranská Lomnica area (Mazúr et al., 1985b),
- Landscape ecology – geographical research direction, or an interdisciplinary research program? (Mazúr & Drdoš, 1988).

The contributions of these scholars have had a profound influence on the development of modern Slovak geography, particularly through the promotion of interdisciplinary approaches, systematic thinking, and a focus on sustainable land management. Mazúr's emphasis on the integration of physical and human geography is in line with current trends in geographical education and research (Bendl et al., 2024).

However, in contrast to the relational and post-humanist hybrids proposed by Whatmore (2002), Mazúr's synthesis remained anchored in a systemic and hierarchically ordered ontology, emphasising rational planning and social applicability. Nevertheless, the project may be viewed as a semi-peripheral form of epistemic hybridisation – a para-autochthonous synthesis that domesticated diverse intellectual influences into a coherent geographical framework (Matlovič et al., 2025). In this sense, Mazúr's legacy anticipated later more-than-human sensibilities by articulating an early, contextually distinct bridge between nature and society.

The trajectory of Mazúr's career was characterised by numerous discontinuities, primarily attributable to external factors. The initial transition occurred during the 1970s, marking a shift from geomorphology to regional geography. This transition was driven by the demands of socialist planning, which necessitated a shift in focus from individual landscapes to broader regional perspectives. Additionally, the limited access to international literature during Czechoslovakia's isolation in the 1950s played a role in shaping this transition, as researchers sought to expand their understanding beyond the confines of domestic literature. This transition necessitated a modification of Mazúr's methodological approach, which entailed the incorporation of socio-economic data. This development represented a deviation from his earlier geomorphological and physical-geographical orientation. In a sense, this also marked the development of geomorphology in Slovakia. Significant progress in geomorphological research can be observed during this period (the 1970s and 1980s), for example in Poland, Hungary and the USSR. The second discontinuity occurred in the 1980s with the advent of geoecology, which was prompted by global environmental problems and Mazúr's reflection on the need for interdisciplinary approaches. This transition was constrained in Slovakia by the scarcity of technological resources; however, Mazúr employed innovative methods with the available data, successfully acquiring relatively advanced technologies for processing spatial data (WANG 2200 computer) or interpreting aerial and satellite images (MSP-4 multispectral projector). This, within the context of developing field methods, resulted in substantial progress. Although the political changes of 1989 brought new opportunities for international cooperation, Mazúr's untimely death in early 1990 meant that he was unable to capitalise on his extensive foreign contacts or participate in the latest global trends in geographical research. Despite the challenges and limitations he encountered, his contributions laid the foundations for modern Slovak geography, particularly in the fields of geoecology and theoretical geography.

4 THE RELEVANCE OF GEOGRAPHY IN THE LEGACY OF EMIL MAZÚR

The relevance of geography as a lifelong motif and vision

Mazúr was a passionate geographer and scientist, but also a responsible manager. He was the director of the leading geographical workplace in Slovakia, and was required to defend his institution not only before the scientific sphere, represented by the Slovak Academy of Sciences, but also before the decision-making sphere, represented by the governing bodies of state administration. Scientific organisations were obliged to justify their relevance and defend their positions and operating costs. This experience also prompted Mazúr to engage in self-reflection and evaluate the status of geography as a scientific discipline within the broader context of global scientific advancement (Mazúr, 1968).

According to Mazúr (1972c), the field of Czechoslovak geography experienced a period of underrepresentation in the State Plan for Basic Research, as it did not become involved in the initiative until 1964. The initiative to undertake the nationwide research project *Geographical Regionalization of the*

Czechoslovak Socialist Republic was the result of the joint efforts of J. Demek, director of the Institute of Geography of the Czechoslovak Academy of Sciences in Brno, and E. Mazúr, director of the Institute of Geography of the Slovak Academy of Sciences in Bratislava. The plan, which incorporated this initiative, was made a part of the overall strategy of the Czechoslovak Socialist Republic (Kvitkovič, 1993). Over the following years, the institute played a substantial role in addressing the tasks set out in the state plan. The main tasks included: *Regional classification of geosphere resources and landscape as a territorial system and its potential.*

The conception of the tasks and projects of the state plan attests to a meticulously formulated strategy of applied research and collaboration with praxis, particularly in the context of fundamental research and the professional capacity of the institute (Huba, 2010). Participation in applied research was coordinated with the topics and study areas of basic research, professional guarantees, and cooperating institutions (URBION, Tatra National Park, Slovak Technical University, City of Bratislava, Čadca District).

The completion of the state plan‘s objectives culminated in the presentation of the outcomes to scientific opponents and the attainment of professional approval from select customers in economic practice. As demonstrated in the research conducted by Mazúr et al. (1981), the potential of relief for basic sectors of economic activity can be assessed. The work of Mazúr and Mazúrová (1965) entitled “*Mapa relatívnej výškovej členitosti Slovenska a možnosti jej použitia pre geografickú rajonizáciu / Map of the relative relief diversity of Slovakia and its potential use for geographical zoning*”, especially its interpretation in the context of the concept of relief energy attracted considerable attention. This work derived the processes and dynamics of the landscape from the concept of “relief energy”. The results of the morphometric analysis attracted the attention of the professional community of spatial planning in particular. The work of Mazúr et al. (1985b) was founded on the requirements of social practice and coordinated cooperation with urban and spatial planners. The primary objective of the initiative was to safeguard the integrity of the high mountain landscape from the encroachment of construction developers in the Tatra National Park and to propose a landscape plan for the effective utilisation of tourism facilities in the foothills of the Tatras.

The institute has gained significant social relevance in the field of nature and landscape conservation. The concepts of conservation, traditional protection of nature and landscapes, and the protection of biodiversity and ecosystems have been transformed by optimisation concepts with a geosystemic basis. This concept encompasses the preservation of both relatively undisturbed nature and rare species and ecosystems, while also incorporating the concept of landscape, including cultural landscapes and their historical structures. The transformation was also supported by the infiltration of key positions in voluntary nature and landscape conservation in Slovakia by geographers (E. Mazúr, J. Urbánek, J. Drdoš, J. Jakál, M. Huba, and others), with E. Mazúr also heading a key voluntary conservation organisation in Slovakia from 1975 to 1989: the Slovak Union of Nature and Landscape Conservationists. He advocated for its focus to become more scientific and comprehensive compared to the previous period, among other things by expanding the original focus and name (Slovak Union of Nature Conservationists) to include and highlight the issue and concept of landscape.

As Mazúr (1972c) astutely observed, geography‘s integration into social consciousness was characterised by a notable lag, manifesting through channels such as the daily press, popular science magazines, radio, television, and film. However, it is imperative that the interpretation of the results is comprehensible not only to the lay and professional public, but also to the authorities responsible for decision-making and planning. This necessitates a reformulation of the means of expression and communication, as well as an expansion of the diagnostic aspect of the results to encompass a prognostic dimension. This emphasis on geography, particularly in the context of environmental research, has been corroborated by numerous articles in the journal *Životné prostredie - Environment* (e. g. Mazúr & Drdoš, 1977a; 1977b). For instance, the selection of terms corresponding to technical terms in landscape synthesis procedures was undertaken. The following terms were employed in the journal *Život:* “preventive-therapeutic”, “preventive-prognostic”, and their context in the presentation of geographers as “landscape doctors”.

The field of Slovak geography arguably reached a significant milestone in the realm of global science, particularly in the domain of cartographic creation, exemplified by the publication of the Atlas of the SSR in 1980. This pioneering work represents a significant milestone in Emil Mazúr‘s capacity for organisation and his commitment to the coordination of large-scale multidisciplinary projects. The Atlas constitutes an original contribution to Slovak science and culture, presenting significant analytical and synthetic cartographic outputs of spatial cognition of Slovakia. Mazúr, the originator of the Atlas concept, also presided over three sections (thematic groups) and was the author and co-author of individual maps.

Syntheses of natural (geoecological) landscapes have gained international recognition, particularly those evaluating geoecological and socioeconomic conditions in the context of environmental quality and potential prerequisites for regional development. The concept of the environment is not only an excellent integrative theme of physical and human geography, but the presented results have also become an original contribution to the creation of world atlases.

The growing importance of geography has been further cemented by numerous encyclopedic works, as well as the active and programmatic participation of several institute staff members in the creation of encyclopedic works. Notable examples of this include the four-volume publication “*Slovensko / Slovakia,* particularly its sections *“Príroda a Ľud / Nature and People*”.

It is evident that Emil Mazúr did not produce classic textbooks. His scientific work (Mazúr, 1963c) serves as a model of detailed geomorphological mapping and an excellent example of the interpretation of complex geomorphological analysis and synthesis as study material. In a similar vein, theoretical works on landscape space (Mazúr & Urbánek, 1982), landscape syntheses (Mazúr, Drdoš & Urbánek, 1983), the search for the foundations of geography (Mazúr & Urbánek, 1984), and landscape ecology (Mazúr & Drdoš, 1988) can also be evaluated as convincing teaching texts. The Institute of Geography at the Slovak Academy of Sciences has become a leading training centre for doctoral students in geographical fields under the leadership of Professor Emil Mazúr. This was partly due to its ability to attract talented university graduates and the expertise and professionalism of the institute‘s research staff.

An Evaluation of Emil Mazúr's Contributions as an Organizer of Scientific, Pedagogical, and Social Activities

Mazúr's contributions were of fundamental importance in the transition of Slovak geography from a descriptive to an analytical approach, which is in line with global trends in systems thinking and interdisciplinarity (Bunge, 1966; Haubrich, 1992). His oeuvre constituted a significant intersection between physical and human geography, with a focus on critical environmental and socio-economic issues. However, the ideological, political and technological constraints of socialist Czechoslovakia had a significant impact on his research activities, limiting access to advanced methodologies and international networks. Nevertheless, the library of the Institute of Geography of the Slovak Academy of Sciences and the availability of world geographical literature, which he was able to secure as director, were an exceptional contribution to Slovak geography.

The establishment of a robust research community in Slovakia can be attributed to the scientific aspirations of Mazúr and his collaborative efforts with prominent scientists, including Štefan Bučko, Juraj Činčura, Ján Drdoš, Anton Droppa, Jozef Jakál, Eduard Krippel, Jozef Kvitkovič, Michal Lukniš, Peter Mariot, Valéria Mazúrová, Štefan Poláčik, Anton Porubský, Ľubomír Prikryl, Ján Urbánek, Koloman Tarábek, Ján Verešík, Konštantín Zelenský, Juraj Žudel and numerous Czechoslovak and foreign scientists. Following his initial foray into geomorphology, he proceeded to explore geoecology and theoretical geography, thereby foreshadowing contemporary preoccupations with sustainability and spatial analysis. His contributions have had a seminal impact on succeeding generations of scientists. The geomorphological school founded by the aforementioned researcher was continued by Miloš Stankoviansky, Jozef Minár (Minár & Evans, 2008) and Ján Lacika, while his theoretical and geoecological frameworks were continued by Anton Bezák, Ján Feranec, Anna Grešková, Ján Hanušin, Mikuláš Huba, Vladimír Ira, Milan Lehotský, Ján Oťaheľ, Ľubomír Solín, Dušan Šebo affing of the institute was related to Mazúr's strategy of building a workplace with the aim of covering all relevant geographical subdisciplines with at least one expert without ideological or other restrictions. The implementation of this plan was facilitated by the subject's capacity to identify and recruit highly qualified university graduates, as well as leading experts from other professional backgrounds. This ability was enabled by the relatively ambitious focus of the organisation and the relatively liberal climate that prevailed in the workplace during that period.

Emil Mazúr fulfilled the role of editor-in-chief of Geografický časopis (Geographical Journal) from 1965 until 1990. During the tenure of E. Mazúr as editor-in-chief, which spanned more than 25 years, the journal underwent several strategic shifts and introduced its readership to novel research trends and current topics in geographical research that were gaining prominence on a global scale. The Journal facilitated research that focused on humans in a changing environment (Ira et al. 2020). A significant number of internationally esteemed scientists have contributed to Geografický časopis, including G. J. Ashworth, I. P. Gerasimov, G. Haase, H. Hagedorn, I. P. Isačenko, H. Karrasch, S. Katona, M. R. Moss, M. Pecsi, H. Richter, W. Sperling, L. Starkel, L. Straszewicz, F. Snacken, J. de Vries and J. I. S. Zonneveld. From 1954 to 1988, E. Mazúr published a total of 38 articles, either as sole author or as joint author.

Mazúr was a determined and responsible director of a scientific geographical workplace, whose research results are documented by a basic means of expression – maps. The establishment of the Cartographic Laboratory ensured the professional presentation of the results achieved. The laboratory was equipped with an offset printing machine for printing multicoloured thematic maps. The regional analyses and the creation of a database on the natural and socio-economic elements of Slovakia were facilitated by the use of a very powerful WANG 2200 computer. The technological tools employed for the processing of aerial and satellite images, namely the MSP-4 multispectral projector, which were installed in the Laboratory for Remote Sensing of Earth, have made a significant contribution to geographical research.

Emil Mazúr possessed a remarkable aptitude for critical thinking and expression, which he employed in a variety of capacities. These included the coordination of the institute's scientific programme, the drafting of tasks for the State Plan for Basic Research, his teaching practice, and the management of editorial activities. He was unafraid to address controversial subjects and offer criticism on projects that lacked the necessary professional preparation, despite the favouritism shown to such projects by government and party regulations. As a prominent academic and official of the Czechoslovak and Slovak Academies of Sciences, in addition to his involvement in numerous commissions and advisory bodies, he was well-positioned to influence decisions on pivotal aspects of social life, particularly with regard to environmental issues. He served as the chairman of the Scientific Council for Earth and Space Sciences of the Slovak Academy of Sciences, the vice-chairman of the Scientific Council for Geology and Geography of the Czechoslovak Academy of Sciences, the vice-chairman of the Czechoslovak Academy of Sciences Commission for Environmental Issues, the chairman of the Slovak Academy of Sciences Commission for the Environment, a member of the Slovak Government Council for the Environment, and the chairman of the Slovak Geographical Society (Czudek, 1990).

In his capacity as editor-in-chief of scientific publications (Atlas SSR, Geografický časopis, Edícia o Zemi a vesmíre), he was responsible for the selection of scientific and professional works. In addition, he was an active supporter of the popularisation of science, including the activities of the Slovak Geographical Society at the Slovak Academy of Sciences. In his capacity as president of the Slovak Union of Nature and Landscape Conservationists, he played a pivotal role in the preservation of the Roháčske plesá National Nature Reserve, Bratislava's historic cemeteries, and the designation of the Čiernohronská Forest Railway as a National Cultural Monument.

5 CONCLUSION

Professor Emil Mazúr's scientific contributions have had a profound impact on the fields of Slovak, Czechoslovak, and Central and Eastern European geography. His seminal work in the areas of geomorphology, regional geography, geoecology, environmental geography, and theoretical geography has left an indelible mark on the discipline. The scientist's work went through various stages, which were characterized by discontinuities resulting from socio-political and scientific transformations.

Key publications, co-authored with prominent Slovak geographers, established methodologies that continue to underpin contemporary geographical thought in Slovakia. The cornerstone of Mazúr's legacy is constituted by his interdisciplinary approach and systemic perspective, which continue to guide research and education in the field of Slovak geography.

In conclusion, it can be posited that the legacy of Emil Mazúr and his schools has endured in Slovak geography, overcoming complex developments and progress, particularly in the context of international contacts and programmes (Huba, 2010). His comprehensive geomorphological school and, in particular, his systematic and integrated approach to landscape research, formed in the school of landscape synthesis, are among his significant legacies. These legacies have been perpetuated in educational and scientific programmes at universities and departmental workplaces in Slovakia.

Examples of such projects include research programmes and participation in domestic and international projects of the Institute of Geography of the Slovak Academy of Sciences. The focus of these projects is on research and mapping of land use and land cover, the study of changes in river and riparian landscapes, the management of protected areas and their networking, environmental studies, theoretical studies of a meta-scientific nature, geographically relevant aspects of sustainability and quality of life, and others.

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