

The Romanian School of Geomorphology

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Abstract: The Romanian school of geomorphology developed within geography by the end of the 19th century with the first studies influenced by the west European schools. There are stages of theoretical and practical directions of research and world renowned scientists (and their followers):

- *The first stage* (until 1925) - with a combination of papers made both by geographers (the first geomorphologic PhD theses) and Romanian and foreign geologists; the studies were based on the evolutionary interpretations of west European and American concepts; relevant figures were Simion Mehedinti and Emmanuel de Martonne.

- *The shaping stage of the geomorphologic school* (1925-1960) had the following characteristics - deepening and widening of doctrines, imposing university centers (Bucharest, Iasi, Cluj, Chernovtsy) as centers of research and promotion of ideas regarding landforms, numerous PhD theses, dominant geomorphologic leaders of exceptional geographical culture, sizable regional research of different Romanian and foreign geomorphologists (G.Vâlsan, C. Brătescu, M. David, V. Mihăilescu, V. Tufescu).

- *The completion stage of geomorphologic school* (1960 - end of the 20th century) – development of geomorphologic university education, outstanding research contributions in all branches of the geomorphologic system, training within doctoral programs, volumes of papers and participations in numerous national and international conferences (leaders: T.Morariu, Gr.Posea, C.Martiniuc).

- *The current stage* (after 1990) is characterized by: the significant increase in number of geomorphologists involved in various national or international research institutions and programs, doctrinal diversification, differentiation of leaders and followers on domains and sub-domains (periglacial, glacial, karst, landslides, coastal morphology, river morphodynamics, etc.).

Keywords: geomorphology, geomorphologic school, geomorphologic leaders, doctrine.

1. Introduction

The scientific school is a system resulted gradually in a certain area where there is a certain community of practitioners of the laws, principles and methods of a specific domain, that leads to the overall development of theory and research, training and experience of a growing number of followers and informative database.

Within a certain school, there were high spiritual and talented leaders that traced theoretical and practical persuasion directions to provide scientific development, research and volume (treasure) information, which define their evolutionary state (level) at some point, in the previous steps, including perspective, preparing their disciples and collaborating with similar schools. Secondly, they seek competent followers and many forms of expressing, transmitting and assimilating doctrinal and methodological elements.

2. The Romanian school of geomorphology developed within Geography

The Academician Simon Mehedinți started and built a modern geographical school in Romania, a process completed and amplified according to the socio-historical settings by a pleiad of geographers - his disciples. Over the years, on various special occasions, or in synthesis volumes (geographical monographs, Geography of Romania), the most significant moments in the evolution of geography school and the roles of different personalities in its assertion were highlighted.

Development was not unitary within the entire system of geographic components. Consequently, there were some directions of a greater extension of thought, research and collaboration with schools abroad, but also between individual scientific cores, especially between the academic centers in Romania. The result was reflected in the tendency to shape personalized groups as school types on certain fields

(components), although in some cases not entered in essence. Naturally, the appellative Romanian geographical science may be applied only for a few areas (Geomorphology, Anthropogeography, Geopolitics, etc.), and only partially in the other directions.

There are different development stages and moments, but with common characteristics as: *a hesitant start* by outlining the main directions influenced by foreign ideas, concepts or other scientific fields (geology, meteorology, sociology, etc.); *a system shaped gradually*; *the current evolution of the system* based on high technique, global view and local trends.

There are relevant situations for the Romanian school of geomorphology.

2.1. The first (debut) stage coincides with the end of the 19th century and the first two decades of the 20th century. There were several disparate studies with a regional character (dominant in some Carpathian units, Dobruja and the Romanian Plain) or methodology belonging to foreign or Romanian geographers and geologists. The concepts were based on the German, French and American ideas on the genesis and evolution of landforms.

There were some relevant studies as Emm. de Martonne's early works on the Meridional Carpathians and southern Romania (glacial landforms, landforms as support of landscapes), then the major contributions of the Romanian geologists: Gr. Cobălcescu (first differences and geographical names of the morphostructural units, the use of terms 'terrace', 'floodplain', etc.); Gh. Munteanu-Murgoci and L. Mrazec (leaders of the Romanian Society of Geography) studied the tectonics and development of the Meridional Carpathians, Subcarpathians, Dobruja and developed genetic ideas on the controversial areas in the Carpathians, Romanian Plain, etc. There were three PhD theses made by S. Mehedinți ('Über die Kartographische Induction' – presented in Germany, Leipzig, 1899 – example of geographic analysis based also on map study), Emm. de Martonne ('La Valachie', Paris, 1902) and V. Meruțiu V. ('The Rodna Mountains', a geographical study based geology). These are examples of complex geographic analyses with special regard on landforms.

Those were two decades of landform studies and regional syntheses, based on field analyses and evolutionary interpretations according to the concepts in vogue in west Europe and the U.S.A.

- There were some significant moments **between 1905 and 1925**, with consequences in

landform knowledge: first, geography became a distinct field in higher education institutions (Bucharest, Iași); than the Society of Geography directed its main activities toward Romanian landform research, applying the doctrinal ideas of the American, French and German schools; the middle school teachers were thought to understand the realities of local and regional horizon from simple to complex; the first atlases and maps representing landforms were published.

Professor Simion Mehedinți had a distinct role in the organization, thematic presentations, especially in guiding students to research topics and PhD theses mainly on landforms, anthropogeography and ethnography. The immediate consequences were some articles published in the Bulletin of the Society of Geography, conferences and scholarships in France, Germany, scientific relations with renowned personalities (W.M. Davis, Emm. de Martonne, A. Penck, F. Richthofen, etc.).

The results of these first decades of research were *the first PhD theses of genetic-evolutional geomorphology on distinct geographical units in Romania* ('Untere Die Donau und Braila zwischen Turnu Severin', Berlin, 1910, by Al. Dumitrescu Aldem; 'The Romanian Plain', Bucharest, 1915, by G.Vâlsan; 'Geological Research in the Moldavian Plateau', Iași, 1919 by M. David; 'The Danube Delta' – genesis and morphological evolution, Bucharest, 1922 by C. Brătescu). Add the second PhD thesis of Emm. de Martonne – 'The Transylvanian Alps' (1907, Paris), and 'The Danube Delta' (1914) by the naturalist Gr. Antipa, and numerous geomorphology papers, rich in ideas, written especially by geographers.

All these must be considered as factors that have led to the creation of specific guidelines for the modern geomorphology in our country, based on deep research and innovative ideas related to the doctrine of great personalities in Germany (A. Penck, F. von Richtohfen), the USA (W.M. Davis), France (Emm. de Martonne) that the Romanian geographers have met at international scientific meetings or during certain stages of training (scholarships).

2.2. The achievement of Geomorphology School was a process that lasted over four decades resulting in:

- *deepening the doctrines* previously used with ideas from the Russian geographical (naturalistic) school, and the *correlations with the results from complex analyses of all environmental factors in diverse regional areas* (landforms are considered

the support and essential component in the genesis and evolution of natural and human systems); the overall realistic combination of these two directions would provide the theoretical background of the Romanian School of Geomorphology resulting in research and publications in various scientific forums;

- *individualizing four landform core research and idea promotion centers* within the universities of Bucharest, Iași, Cluj, Chernovtsy. They were created and promoted by some distinct geographic personalities (S. Mehedintși, G. Vâlsan, M. David, C.Brătescu). The Institute of Geography (founded in 1945) was founded by a group of geographers headed by V. Mihăilescu and belongs to the Romanian Academy. These were the first generation of undisputed geomorphologic Romanian leaders, who made distinct studies, and also research directions (regional geomorphology, geomorphologic components or geographical systems, etc.);

- *significant results of some geomorphologic PhD theses* (V. Mihăilescu – 1924, L. Someșan – 1934, T. Morariu – 1935, V. Tufescu – 1936, N. Al. Rădulescu – 1937, N.M. Popp – 1939, P. Cotet – 1957, etc.), numerous studies published in academic journals including regional Geographic Institutes (Cluj), Romanian Royal Geographic Society Bulletin, volumes of the International Congresses of Geography, etc.;

- *a new generation of leaders with perfect geographical culture and outstanding contributions in the development of geomorphology* through distinct achievements in several directions – university courses (theory, practice – regional) of morphology, very important in teaching geography students; PhD theses and regional syntheses; the activities organized and run by the Romanian Royal Society of Geography resulted in pre-university teachers' better knowledge of landforms; participation in international scientific meetings, documented mainly through scholarships abroad. There were two categories – *leaders strictly related to geomorphologic issues* (N. Popp, P. Cotet) and *leaders with interests in regional geography issues that emphasized the systemic landform analysis* and made correlations especially between morphographical, morphogenesis, current dynamics of slope processes and all environmental components that lead to different consequences in landscape evolution (V. Mihăilescu, V. Tufescu, N. Al. Rădulescu);

- *numerous geomorphologic studies*: the analysis of erosion surfaces in mountainous, hilly and plateau regions (starting from Davis's ideas and

paleogeographic interpretations of geological data), valley formation and evolution (based on morphologic elements – terraces, orohydrographic structure, paleogeographic interpretations to state the genesis of canyons by capture or antecedence, etc.), the Danube Delta (measurements, analysis of orographic maps, correlations with the ideas of foreign researchers on seaside morphology), correlating landforms with human settlements' development (landforms as support and development factor), a theoretical approach of slope morphodynamics (especially landslides, rock falls, mud flows, etc.), piedmonts, terraces, and the study of petrographic and structural landforms in plateau regions (especially in Moldavia), etc.;

- *geomorphologic research of some foreign geographers* (Emm. de Martonne, R. Fischeux, A. Nordon, H. Slaner, M. Pfannenstiel etc.); they published regional studies of geomorphology (emphasizing the evolution of a geographic unit) and collaborated actively with the Romanian geographers (especially Emm. de Martonne, who coordinated PhD theses with Romanian topics) etc.;

- *distinct presences of some Romanian geomorphologists in international meetings* (G. Vâlsan held positions in some boards) or scholars at various universities in France, Germany (D. Burileanu, V. Tufescu, N. Orghidan etc.);

- *diversification of geomorphologic illustration* (by photographs, maps, panoramic sketches, profiles) that is required by a high content of elements supporting analyzes, clarity and accuracy.

All of these contributed to the development of a Geomorphologic School within the geographic system, characterized by a genetic and evolutionary approach of large regional units and in accordance with the theoretical and methodological influences of west Europe (France, Germany). There were also some regional nuances as the analysis of structural landforms (Moldavia) and the differential influence of landforms on human activities and landscapes (with different shares, depending on the university center) etc.

There were two significant periods *between 1940 and 1960*, when the social and historical conditions produced some changes in the evolution of scientific schools (not only in our country). The World War II, in which Romania participated directly, resulted in a decrease (even stagnation) of the directions developed before. Then, after 1950, structural changes occurred in education and research (dissolution and creation of new scientific forums, changes in publication content), all under the active influence of Soviet geographic school, and also pressures and banishments of some

valuable geographers. Some actions supported and developed Geography, and especially Geomorphology after 1960. This process must be linked to the quite difficult organizational and scientific contribution of the interwar leaders and a significant number of students keen to study environmental conditions. Many of them have become researchers and subsequently formed a new generation of leaders. The Institute of Geography (set up in 1944), the Society of Geography and Natural Sciences (set up in 1948) and the departments of geography within the faculties of sciences supported geomorphology, geomorphologic research and publications, publishing theoretical and regional geomorphologic papers in geographic magazines, making large geographical monographs (1957-1960) with Romanian-Soviet coordination, geomorphologic PhD theses, teaching physical geography in several Soviet universities.

2.3. The completion stage of geomorphologic school, developing directions of landform approach and interpretation. This is a new stage of the second part of the 20th century (especially after 1960), with the following characteristics:

- *developing geomorphologic university education* in Bucharest, Cluj, Iași with geomorphology groups (specializations) during certain periods; making collectives of geomorphologists and geographers and sections specialized in landform research at the Institute of Geography of the Romanian Academy (Bucharest, Iași and Cluj affiliates) and the Society of Geography. These would result in achieving several significant features of the Romanian school of geomorphology – *the conceptual unit* (inherited genetically and reconstructed through immediate and future applicability); *studies based on research* (detailed mapping, punctual analyses correlated with the regional situations, realistic interpretation of statistical data or results from the surveys on current dynamic processes and their consequences, etc.); *mapping using a system of symbols and methods widely and worldwide accepted*; *outstanding contributions to the geomorphologic information fund through regional syntheses or theoretical studies*;

- *a new generation of geomorphology leaders emerged* by scientific results, organisation skills, training abilities for a large number of students, PhD students, researchers etc., including the university professors: T. Morariu in Cluj (who coordinated over 50 PhD theses in geography, mostly geomorphology, ran the geographical movement in Romania for several decades,

organised numerous national and international conferences out of which two of geomorphology, created a pleiad of renowned geomorphologists, was member of leading international forums of UIG, etc.), Gr. Posea in Bucharest (a special contribution through geographical works mostly covering all theoretical and practical geomorphology, was the chairman of the Society of Geography in which he organized a section of geomorphology and numerous conferences, brought together many geomorphologists in the department of geomorphology he led at the university, directed over 40 doctors in geomorphology, was the first president of the Association of Geomorphologists in Romania - affiliated to the international one, etc.), C. Martiniuc in Iași (developed geomorphology through studies based on detailed research, organised the geomorphology scientific activity of geographers in that faculty and some institutes of Moldavia, contributed to doctrinal unity and practical training in the field). In addition, there was a large group of geomorphologists at the Institute of Geography, with branches in Bucharest, Iași, Cluj Napoca, and groups made in the last three decades within the faculties of geography from other universities (Oradea, Timișoara, Suceava, Craiova, etc.) led by geomorphologists trained in the secular universities.

- *the geomorphologists were involved in research programs in schools, training camps, research stations, debate societies, scientific sessions organised by different institutions*: the Society of Geography with its section of geomorphology, etc. There have been 21 conferences of geomorphology in Romania by now, and most results were published in special volumes, among which the Journal of the Association or the Journal of Geomorphology (after 1990) at the University of Bucharest;

- *doctoral training programs* (over 1100 doctor degrees, out of which over 400 doctor degrees in geomorphology) and the possibility to publish the research results in geographic or geomorphologic journals or independent publications; they have regional character (all geographic regions were studied) and diverse topics;

- *the research issues aimed all sides of the geomorphologic system*, but some works were appreciated even internationally – the genetic and evolutionary geomorphology (the study of morphogenetic steps correlated with morphochronologic systems), the structural geomorphology, the seaside, glacial, periglacial, karst, slope and river bed geomorphology, geomorphologic mapping at different scales

(especially in Bucharest and Iași centers), the inter-connection between landforms and human society studied dynamically, through its consequences (from hazard to risk), and complex programs meant to ensure a better organisation and valuation of environment, taking into account the favourable or restrictive elements of landforms;

- *the results were published in many scientific publications*, as Romanian and foreign geographic and geomorphologic journals (27), national or international conferences of geomorphology (14), many PhD theses of geomorphology (most of them published), syntheses (papers, books). These works approached representative issues (glaciation, landslides, piedmonts, erosion surfaces, terraces, etc.) of national or regional level ('The Romanian Landforms', 'The Carpathians', 'The Subcarpathians', 'Dobruja', 'The Moldavian Plateau', 'The Romanian Plains', 'The Cross Valleys in Romania', etc.), theoretical approaches with suggestive exemplifications ('The Natural and Accelerated Erosion', 'The Karst Landforms', 'The Quaternary', university courses of geomorphology, landslides, etc.), and diverse and expressive landform mapping (especially atlases published at the Romanian Academy) etc.;

- *participations in numerous national and international conferences* of geography and geomorphology, yearly organisation of some national or international conference on actual topics, membership of many Romanian geomorphologists in different structure of scientific organisation at U.I.G., A.I.G., E.G.E.E.A., Carpatho-Balkanica, Society of Geography, as well as reviewers for journals of the field.

The following institutions have important roles in the organization and coordination of geographical and geomorphological activities in Romania: the National Geographic Committee, the Institute of Geography, the departments of geography of some faculties, the Association of Geomorphologists in Romania (founded in 1990, having annual sessions and its own journals), the Society of Geography (1875, annual conferences). All of these are responsible for organizing scientific regional and interstate scientific meetings (significant for geomorphology – the Italiano-Romanian-Belgian-French-Grece, Romanian-Turkish, Carpatho-Balkan colloquia, etc.).

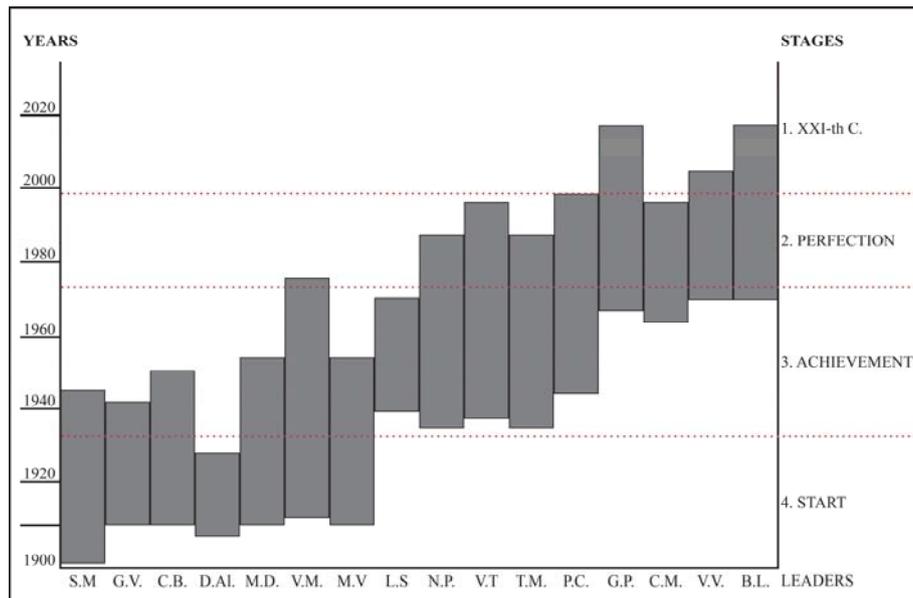
2.4. The current stage represents the latest two decades with looming significant changes, among which:

- *an increased growth in numbers of geomorphology geographers*, involved - in various research institutions – in solving complex problems in variable-sized regional areas where extremely active morphodynamic processes (especially overflows, floods, landslides, torrents) had caused disasters and significant changes not only in the landscape, but also in the local economical organization which required quick solutions based on mappings and top technology recordings;

- *including geomorphologists in major national and European programs* concerning environmental conditions, evolution and protection, ensuring sustainable development, rational exploitation of all resources, which sought continuous perfection through university masters, doctorates, scholarships etc., based on knowledge and application of techniques and methodologies added to the classic ways that are always updated but not negligible;

- *there is no consistent doctrine* whereas to concepts transmitted and passed by Romanian thinking for over a century (that came from the west schools, and in recent years from the soviet school) were added rapidly through multiple contracts (through scholarships, scientific meetings of different rankings, at national and international levels) with centers and scientific personalities from EU, U.S. and Canada, etc., many theoretical and practical ideas based on a methodology that facilitates in-depth analyses, rapid and expressive calculations, graphic and cartographic representations, and finally, ease in evolutionary forecasting; more terrain areas and experimental stations are organized, also analysis laboratories. Inevitably, more stringent needs of organization, preservation and protection of the environment will lead to a *twining of these concepts into an unitary doctrine that combines genetic-evolutional knowledge with practical needs* (immediate and in the future), and *mathematical analysis background*;

- *it is the stage when geomorphology leaders and adepts from various areas of expertise* (glaciology, periglaciology, karst science, landslides, coastal morphology, riverbed morphodynamics) *begin to differentiate, and less throughout all the branches of science, or large morpho-climatic or morpho-structural regions*. There is an informational background so complex and varied so that its synthesis today cannot be done except for lower levels, following that in future decades geomorphology will be able to point out higher-level generalizations, highlighting laws, and maybe universal conceptual systems.



Reports to the table:

I. Founders and leaders:

- SM (Simion Mehedinți, 1869-1962), GV (George Vâlsan, 1885-1935), CB (Constantin Brătescu, 1882-1945), DA.I (Demetrescu Alden, 1880-1917), MD (Mihai David, 1886-1954), VM (Vintilă Mihăilescu, 1880-1978), MV (Martiniuc Vasile, 1881-1943), LS (Laurian Someșan, 1901-1986), NP (Nicolae Popp, 1908-1989), VT (Victor Tufescu, 1908-2000), TM (Tiberiu Morariu, 1905-1982), PC (Petre Coteș, 1914-1988), GP (Grigore Posea, 1928), CM (Constantin Martiniuc, 1915-1990), VV (Valeria Velcea, 1929 - 2008), BL (Badea Lucian, 1929).

II. Romanian geographers from different universities (B – Bucharest, C – Cluj Napoca, Is – Iași) who had different contributions at different stages in the development of geomorphology (1, 2, 3, 4 in the table):

- V. Băcăuanu (Is,3); N. Basarabeanu (B,3); I. Berindei (C,3); I. Bojoi (Is,3); D. Burilanu (B,2); T. Constantinescu (B,3); H. Grumăzescu (B,3); M. Iancu (B,3); Silvia Iancu (B,3); I. Ilie (B,3); I. Ichim (Is, 3), Gh. Lupașcu (Is,3); Lupu Silvia (B,3); Șt. Manciușlea (C,2); T. Naum (B,3); Gh. Niculescu (B,3); N. Orghidan (B,2); Dida Popescu (B,3); N. Popescu (B,3); Gh. Pop (C,3); N.A.I. Rădulescu (B,2-3); I. Rădulescu (B,3); Al. Roșu (B, 3); Th. Rusu (C,3); Al. Săndulache (C,3); I. Sârcu (Is,3), Al. Savu (Cj,3); V. Sencu (B,3); V. Sficlea (Is,3); V. Trușăș (B,3); P. Tudoran (C,3); M. Vârlan (Is,3); I. Vintilescu (B,3).

III. Romanian geologists who have contributed to the development of Romanian geomorphology

- Gr.Cobălcescu (1); G. Munteanu Murgoci (1,2); L. Mrazec (1,2); I. Simionescu (1,2); S. Atanasiu (1); I. Atanasiu (2); V. Mutihac (3); B. Ionesi (3); M. Săndulescu (4); I. Liteanu (3); C. Ghenea (3); N. Mihăilă (3); V. Bandrabur (3); M. Bleahu (3); D. Paraschiv (3).

IV. Foreign geographers who surveyed geomorphological studies on geographic units in Romania:

- Emm. de Martonne (1,2); R. Ficheux (2,3); A.Nordon (2); L. Sawicki (1); J. Cvijic (1) etc.

V. Romanian geographers with special results in geomorphology, some with status of leaders in the making:

- Bucharest:

- University of Bucharest – M. Grigore, N. Popescu, M. Ielenicz, I. Marin, E. Vespremeanu, Florina Grecu, Gh. Vișan, O. Mândruș, Iuliana Armaș, I. Povară, C. Goran, A. Nedelea, Laura Comănescu, M. Ene, B. Mihai, Laura Țirlă, A. Vespremeanu Stroe, Smaranda Simoni (Toma), Anca Munteanu etc.
- Institute of Geography – D. Bălțeanu, Gh. Niculescu, V. Sencu, Maria Sandu, E. Nedelcu, A. Cioacă, Mihaela Dinu, A. Cioacă.

- **Cluj Napoca:**
 - *University and Institute – V. Gârbacea, I. Mac, I. Tovissi, I. O. Berindei, A. Savu, P. Tudoran P. Cocean, V. Surdeanu, V. Schreiber, D. Petrea, I. Irimuş, W. Schreiber, , V. Buz, N. Hodor*
- **Iaşi:**
 - *University – I. Donisă, Irina Ungureanu, I. Hârjoabă, N. Barbu, I. Ioniţă, C. Rusu, E. Rusu, I. Stănescu, Lesenciuc, M. Mândrescu.*
- **Other centers – Timișoara:** *P. Urdea;*
Oradea: *N. Josan, Gh. Măhăra, F. Bente;*
Craiova: *S. Boengiu, E. Marinescu, C. Savin;*
Suceava: *C. Brânduș, Maria Rădoane, V. Chiriță, N. Rădoane etc.*

3. Conclusions

- during a century of intense scientific and practical concerns, and multiple forms of international collaboration, a full and valuable school of geomorphology was established in Romania, with results connected with the entire system of landform analysis.

- the Romanian School of Geomorphology – like many other institutions in west or central Europe – was created through a continuous process within Geography, but preserving and strengthening its relationship with Geology and other sciences from which it took its ideas, methods, techniques, etc. required in analysis and research support, data processing and forecasts.

- it consists mostly of geographers with a valuable interdisciplinary training, based on contemporary realistic concepts, applied in research taking into account the specific landforms of our country. This was always considered a dynamic, complex system, connected with all environmental factors.

- geomorphologic school's onset is followed by two stages in which its definition was enriched with development and deepening, while some great geomorphologists became renowned leaders nationally and internationally for their merits taken in organization and development of this scientific quorum (from small geomorphologic cores to an unified national assembly with a large number of doctors in geomorphology; a considerable volume of materials published in prestigious journals; transition from local geomorphic debate circles to an active Geomorphology Section in the GSS and, since 1990 the National Geomorphology Association became an active member of the International Association of Geomorphology; maintaining contact of Romanian geomorphologists with those in Europe, USA etc.; national and international scientific meetings).

- a new stage have begun after 2000, characterized by doctrinal wholeness (entwining genetic-evolutional concepts and practices with a background of mathematical analysis and use of high-technologies and experiment in research), affirming leaders towards distinct geomorphologic directions, widening international contacts with specialists from EU and U.S. (scholarships, experience exchanges, various scientific meetings, etc.).

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