ACTA Geographica Szegediensis Tomus XXXV. 1994-95. pp. 44-50.

ON THE GEOLOGY AND GEOMORPHOLOGY OF VIGYÁZÓ MOUNTAINS (Vlãdeasa)

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Introduction

Knowing the geomorphological surfaces of the study area, the Vigyázó Mts, is essential for the survey of the planated mountainous regions. Geomorphologic surface practically answers the orographic surface of known genetics. All its development cycles are known, representing the stages of elevating surface formations. If the investigated area did not undergo post-orogenesis, the uppermost geomorphological surface is the oldest and the underlying ones are younger. Geomorphological surfaces are being buried in the sinking structural formations. Geomorphological surfaces of the Transylvanian Inselbergs have been being elevated some 1000 m during the old and new Roumanian tectonic movements up to now. Elevation is 1-2 mm a year.

Vigyázó Mts (Vlãdeasa) are situated in the central northern part of the Transylvanian Inselbergs (Muntii Apuseni), see Figure 1. The 600 km^2 large, 35-40 km long mountain range form a horseshoe and open to the north. Its geomorphological surfaces have not been yet surveyed. We have some general information only on the classic planated areas. The field work done ensures the description of the geomorphological surfaces.

The mountains are considered as part of Bihar by Szádeczky (1904), csíki (1941) and Savu (1982). They are mentioned as Bihar in studies published in the beginning of the century. In spite of this, their geology and geomorphology define them as a meso-region, a seperate mountain range.

The Vigyázó is situated in a tectonic trough system. Its geological structure includes banatite and dacite with crystalline shale in the west and Mesozoic sediments; mainly limestone in the south (Figure 2).

Formation of the planated surface

Planated surfaces are mainly large, plain or slightly rolling products of long degradation.

Several authors (de Martonne, 1922; Cotet, 1977, Nordon, 1933) dealt with the planated surfaces of the Inselbergs and the Southen Carpathians (Carpatii Meridionali). De Martonne (1907) outlined three seperate peneplains of different ages. These are the Borãscu (at 1800-2200 m), the Râu-Ses (at 1300-1800 m) and the Gornovita (at 400-1000 m). The equivalent surfaces were identified in other ranges of the Southern Carpathians. E.g. Nordon (1933) in the Radnai Mts defined the Nedeia, Batrãna and Stiol surfaces and the Poina Ciungi, Dorna, Bîda surfaces in the Beszterce Mts. They are named Semenic, Tomnacica and Teregova in the Szörényi Mts (Rosu, 1980).

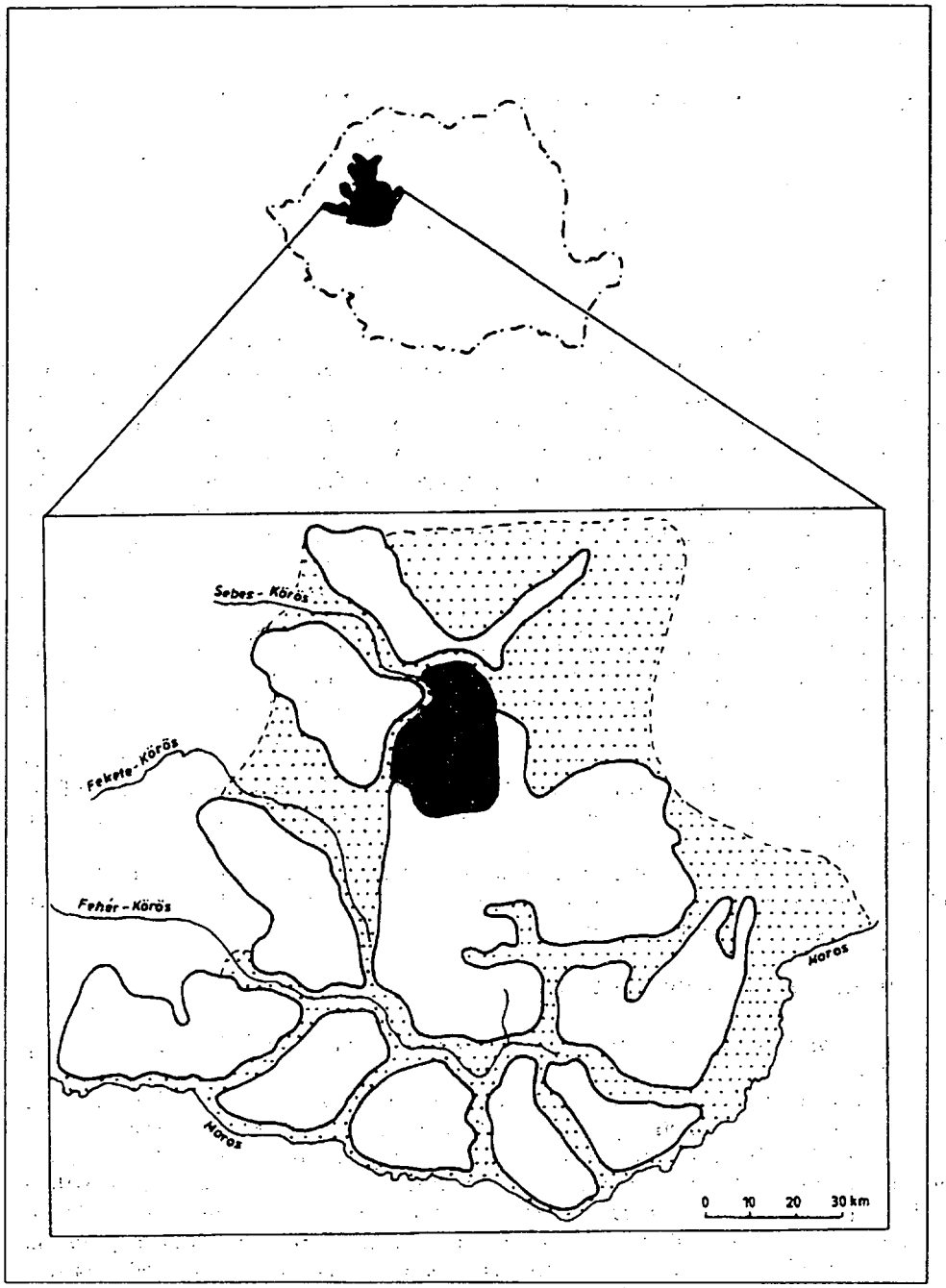

Figure 1 *Location of the Transylvanian Inselberg including the Vigyázó Mts*

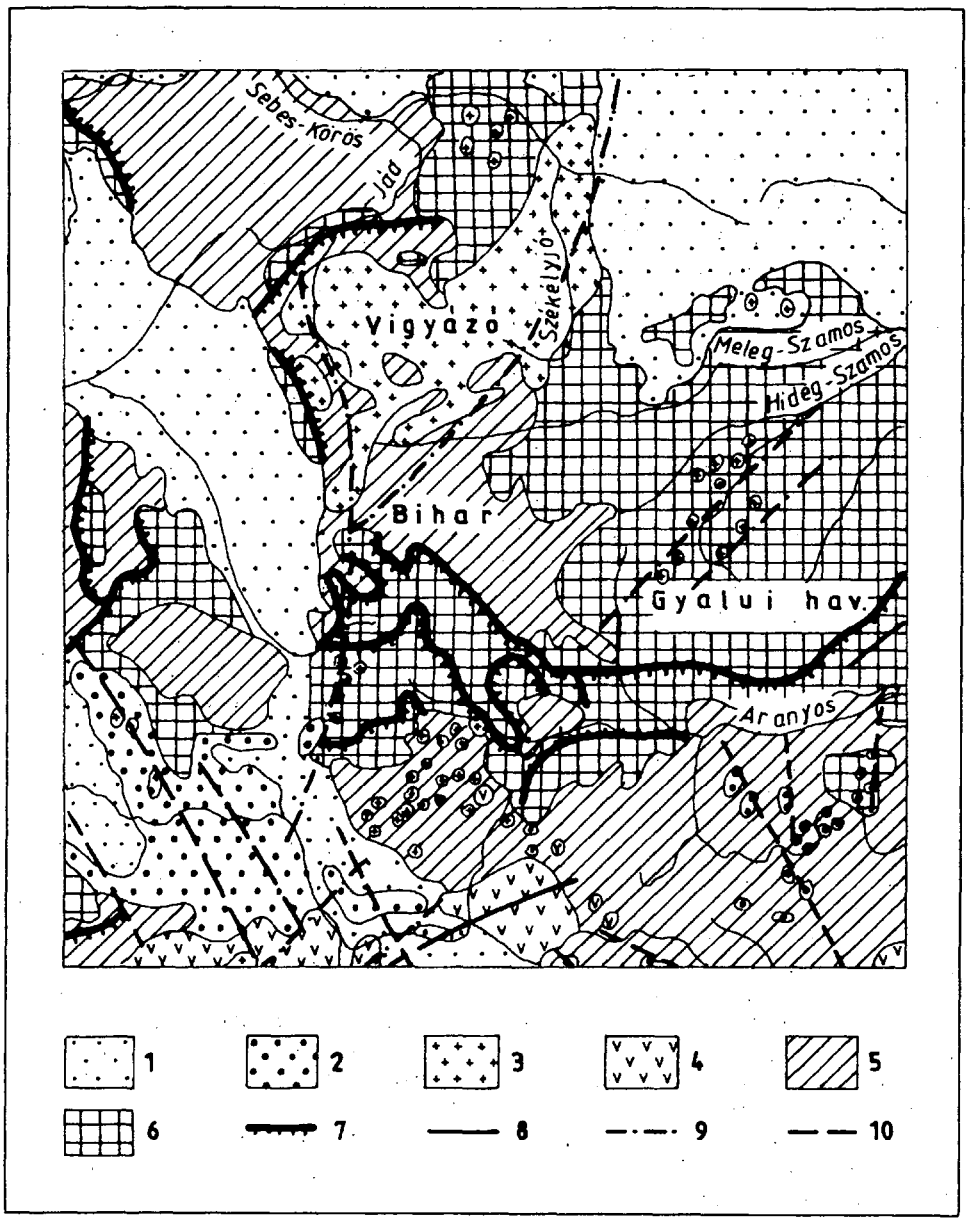

Figure 2 *Draft of the geological and petrogenetic lines*
1 - Tertiary, intramontane sediments, 2 - Subsequent neogene magmatism
3 - banatites, 4 - initial magmatism, 5 - Mesozoic sediment sequence
6 - Prealpine basement, 7 - faults and overthrust zones,
major petrogenetic lines: 8 - ophiolites, 9 - banatites, 10 - Neogene volcanics

The three erosional surfaces in the middle of the Transylvanian Inselbergs are named Fărcas, Mărisel and Fenes (de Martonne, 1992). Referring to the dominating rock type, Blehau M. names the surfaces in the Torockó Mts (Ciumărna-Bedeleu, Râmet-Ponor and Nades) as karst planines (Vecea, Savu, 1982).

According to de Martonne, the highest planated surface is Eocene. Pedimentation following elevation took place then, burying the Lower-Cretaceous layers with Lutecian deposits on top. This is the opinion of Nordon, while Gh Pop claims the oldest surface be of Cretaceous origin (Rosu, 1980). The second surface is Pannonian according to de martonne, while in Cotet's opinion it is but a transitive zone between the upper and lower denudation surfaces. The peneplane is a coherent massive block, not made of small parts of different ages. It was formed between Upper Creta and Oligocene. Cotep says that this large block of peneplane was dissected by the Styrian, Moldavian and Attic epirogenetic movements. Thus the Borescu and the Râu Ses are parts of the once massive block elevated to different heights. According to de Martone, the Lower-Sarmatian-Pliocene surface is of complex origin that is to say an erosional, accumulative and abrasional (Baden-Pliocene) pediment (Cotet, 1977). After a correlative examination of the sediment layers exposed in the Zsibó (Jibou) Basin, they were found to have been formed during the Creta Period. Thus climatic morphological and paleogeographical surveys allow us to consider the Vigyázó Mts in the Inselbergs as one planated surface (Farkas-Fărcas) that has been dissected and elevated in different degrees. No planated surface from the Upper-Creta Period has been proved to exist here, though their formation might as well be possible. The denudation of the Farkas surface began in the Upper-Creta. The presence of the Gosau and flysch facies proves the intensive peneplanization before the Lamian epirogenetic movements. After the Laramian tectonic activity, pedimentation till the end of Eocene played an important role in the formation of the present morphology of the Carpathians. In this period the Vigyázó Mts got into a relative tectonic balance, got elevated from the sea and became dry all over.

During the Upper Maastrichtian and Danish orogenesis, favourable climatic conditions for denudation were dominating. Kaolinite was formed under and owing to the humid tropical climate. The area of the mountains had been dryland till the Ypresian and Lutecian Age, then, parallel with the elevation of the mountains, its pediments began to sink along the post-formed faults. The tectonic elevation and sinking continued throughout the Paleogene. Meanwhile, in the underlying layer of the detritus cover, the Predanish surface was exposed, then eroded completely owing to the areal and linear erosion and chemical weathering begun in the cracked rock surface. During the Lutenian transgression and the following sinking, pedimentation did not work. Denudation slowed down in the peneplanes, due to climatic effects. At the end of the Lutenian Period and at the beginning of the Lattorfian one, there was another elevation. The deposited aleurit sand proves the renewed pedimentation in the Oligocene. Chemical weathering was rather limited under the unfavourably cool climatic conditions.

The Savian movements occurring at the transition between the Kattian and Acquitanian Periods, the Baden sinking, the general tectonic instability and the cool climate drove the denudation processes to the pediment surface. Thus the more or less coherent, homogeneous, planated, Danish-Rupelian block surface was dissected by the Styrian, Baden-Sarmatan Moldavian and Upper Sarmatian Attic movements.

Unlike the Bihar Mts, there are five planated surfaces to be spot in the Vigyázó Mts (Figure 3).The first and the highest surface is that of the Horgas Mt (Cârligati). It includes the peaks of Tolvajoskő (Piatra Tâlharului 1621 m), Horgas (1691 m), Bocsásza (Buteasa 1792 m), Kis-csúcs and the wide, plain ridge of the Vigyázó. This surface encompasses the Néma (Nimãiasa) and Mikó (Micău) Mts over 1600 m. The most perfect, plain surface can be found in the south, in the zone of the Horgas and the 1759 m high Síkhavas (Britei) Mts.

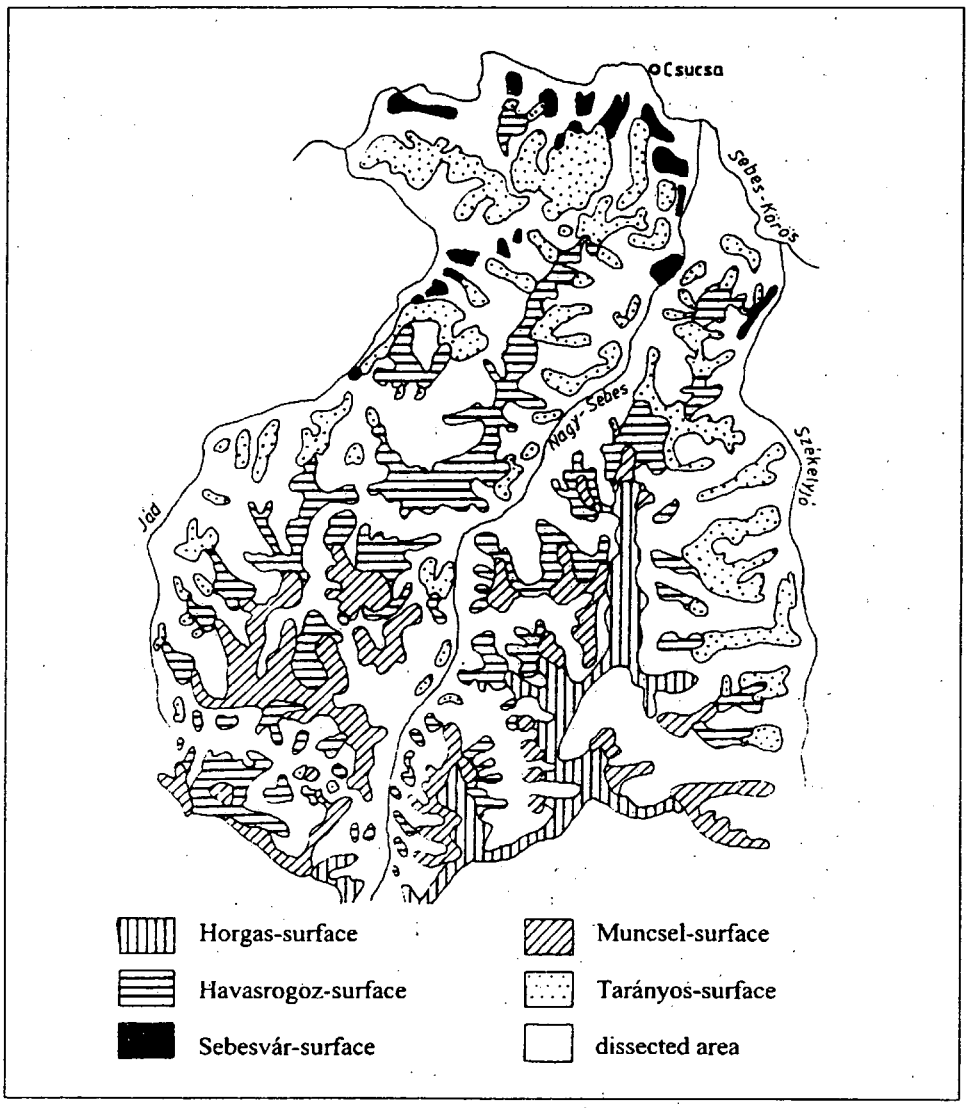

Figure 3 *Planated surfaces of the Vigyázó Mts*

The following surface, the Muncsel (Muncelu) got its name from the wide, flat divide between the Jád and the Nagy-Sebes. Its average elevation is around 1500 m. The lowest part of it can be detected at the Ördöngös Peak (Ordincusa) on 1014 m. This surface can be found as islands, west of the flat ridge of the Vigyázó and along the Zerna (Zârna) Stream flowing into Nagy-Sebes. It is answers the block surface described by Mãrisel.
The third surface, the Havasrogoz (Rogojel) is named after a village on 1100 m. The centre of the settlement of scattered houses is on 1019 m above sea level. Much of this surface is situated between the Jád and the Nagy-Sebes in N-S direction. In the valley heads near Biharfüred Basin (Stâna de Vale) it is situated on 1200-1300 m, therefore it can be easily mistaken for the upper surface. According to de Martonne (1922) this surface is situated at the junction of the planated block surfaces of Fãrcas and Mãrisel. Isolated, it appears in the west of the Bánffyhunyad Basin too.

The Tarányos (Tranis) surface can be found in the plateau of the village of the same name (Tarányos-Magura 947 m), and on the heights along the Sebes streams and the Jád, like on the Bükkös Plateau (Podisul Frãsinet).

The last, the lowest surface is that of Sebesvár (Bologa) along the Sebes-Körös, the Kis-Sebes and the lower section of the Jád on 700 m. Allong the Sebes-Körös it can be spot on 500 m right above the oldest terrace.

Conclusions

The Farkas (Fãrcas) block is a real peneplane with five surfaces and is the result of denudation processes having occurred under a favourable tropical climate intensifying chemical weathering which had a significant role in widening the valleys and in the degradation and peneplanation of the inselbergs. The following tectonic processes disecceted the homogeneous surface, elevating its parts into different heights. The Farkas peneplane and all the other planated, similar surfaces of the Carpathians were formed between the Danish and Upper Oligocene Periods.

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