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THE INVENTORY, EVALUATION AND TOURIST EXPLOATATION OF SOME GEOSITES WITH ARCHAEOLOGICAL VESTIGES FROM BISTRIŢA-NĂSĂUD COUNTY. CASE STUDY: THE ROMANS` ROAD FROM BÂRGAU MOUNTAINS

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Abstract: The territory of the Bistriţa-Năsăud county includes many geosites with cultural and historical values, given by the nearly existence of some important archeological vestiges. One of these geosites can be found in the eastern part of the county, at the junction of three catchement areas: Bârgău, Leşu and Ilva, which preserve an old road named by the local people The Romans`Road. This has a length of 13 km, presents a stoned surface with andesitic blocks, has a quite sinuous route, which values the geomorphological potential of the area and climbing itself from slopes and summits with a large view over the surrounding areas. The tehnical features, size, spreading and perspectives over the landscape make. The Romans`Road a very important tourist and geoarchaeological objective, but insuficiently capitalized because of the reduced advertising and the modest arrangement. As it follows, this scientific research paper has the main purpose to analyse this road from its geomorphological point of view and to emphasize its attractive potential to become integrated in the tourist programs with cultural and didactic character.

Key words: geodiversity, geosite, geomorphosite, cultural tourism, geoarcheology

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INTRODUCTION

The geosites or geomorphosites are relief forms with a scientifical, aestetical, echologycal, cultural and economical value in relation with the human perception, which complete the total patrimony of a region, besides the biodiversity and the human creation (Panizza, 2001; Panizza, Piacente, 1993, 2008; Marthaler, 2003; Reynard, 2005; Ilieş, Josan, 2009).

Within the territory of the Bistriţa-Năsăud county many geosites can be found. This geosites need imediate inventory and evaluation in order to emphasize their cultural-hystorical attributes, reflected in the existence of many important archeologycal vestiges, which could be integrated in the tourist programmes founded on future strategies of tourist capitalization.

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Among these geosites the following can be remembered: The Ciceului Summit, with vestiges dating from the Dacian period (traces of a fortification dating from IX-VIII Century B.C.), vestiges dating from Roman period (fragments from roads, observation towers) and vestiges dating from the Medieval period (the ruins of the Ciceului fortress), Păltinişului Summit from Sita Spermezeului, where we can also find the traces of a Roman observation tower , The Pintic Fortress Hill, where the traces of an early medieval ground-fortress can be observed, The Fortress Hill from Viile Tecii, with archaeologycal proofs dating from the Dacian period until the late Medieval period, The Fortress Hill from Bistriţa, which still preserves the traces of a Medieval fortification dating from the XV Century, the erosional basin Băile Figa, with archaeological vestiges connected to exploitation and capitalization of the salt, dating from the Bronze and Iron age, etc. (Dănilă, 1972; Pădureanu et al., 1995; Marinescu, 2003; Rădulescu, 2004; Szasz, 2009).

Beside these geosites, other that can be remembered are those which preserve fortifications dating from the World War I (trenches, dwellings for firing, communication grooves, locations for firing) and more precise: The Bistricior Summit, which dominates the Dorney Valley and the Colibita Depression, The Tihuţa Hill from Bârgău Gorge or Dosul Zâmbroaiei from the Bârgău Mountains.

The existence of these geosites with archaeological vestiges as part of the territory of the Bistriţa-Năsăud county, creates a series of tourist and educational opportunities, a fact that can sustain the cultural-historical and geodidactic tourism (Pralong & Reynard, 2005; Pralong, 2009). The present scientific research paper has the main purpose to evaluate, from their geomorphological point of view, the vestiges of an old road, known by the local people under the name „*The Romans`Road*" which is an important tourist objective as a part of the Bistriţa-Năsăud county.

This research is part of the project „*The Development Federation of the rural region Bârgău-Călimani*" initiated by the Agricultural Chamber of the Bistriţa-Năsăud County and promoted for financing by the Agricultural Direction for Rural Development of the Bistriţa-Năsăud County on the axis 4 LEADER, and is also part of the project „*The Antique and Medieval Roads in the North-Eastern part of Transylvania*" launched by the Museum Complex Bistriţa-Năsăud.

CASE STUDY: THE ROMANS`ROAD FROM BÂRGĂU MOUNTAINS

Location

The Romans`Road from the Bârgău Mountains is placed in the eastern part of the Bistriţa-Năsăud county at the springs of the Bârgău, Leşu and Ilva Valleys and spreads over the following alignment: Bârgău Gorge (E58)-Gombei Creek-Groapa Gorii-Dosul Zâmbroaiei-Tăşuleasa Summit-Opcioara Summit-Iliuţa Corca Creek-Dealul Îngrădit-Iliuţa Calului Creek-Măgura Calului-Tihuţa Pass (E 58) (Figure 1).

The road, preserved in the collective conscience under this name, appears on some maps like the topographic map from 1984 with a scale from 1:25000 (Figure 2), the Austrian map from 1817 and the Hungarian map from 1891 (Figure 3).

From the historical point of view, The Romans` Road is an old stoned road, whose precise origin hasn't been yet established by the archaeologists. Due to its uncertain origins The Romans`Road is considered to be either antique or medieval. It is for sure that the road represents an obvious archaeological entity, which by its technical features and by its reputation arises the interst of the tourists that come to this region.

METHODOLOGY

For the elaboration of this research paper many methodological stages were required as it follows :

- the documentation stage, when the different maps, referring to „*The Romans`Road*", were studied (the Austrian map from 1817, the Hungarian map from 1891, the topographic maps from 1960-1961 and 1984), different research papers focused especially on the roads from the Roman Dacia to the northern limits (roman fortified frontier) of the province were studied (Miclea, Florescu, 1980; Muşat, Ardelean, 1983; Fodorean, 2006), the aerial images realized for the Bârgăului Valley and the Piatra Fântânele were analyzed and the route of the presumed road was prefigured with the assistance of the program Google Earth, in order to observe the geomorphological context over which it spreads;

- the field stage, which presumed the identification of the road during its entire length, it presumed also to gather the information from the local people, to make some measurements, sections, outlines and pictures, but also the preparation of some evaluation sheets;

- the processing stage of all the data gathered from the field stage correlated with the scientific literature.

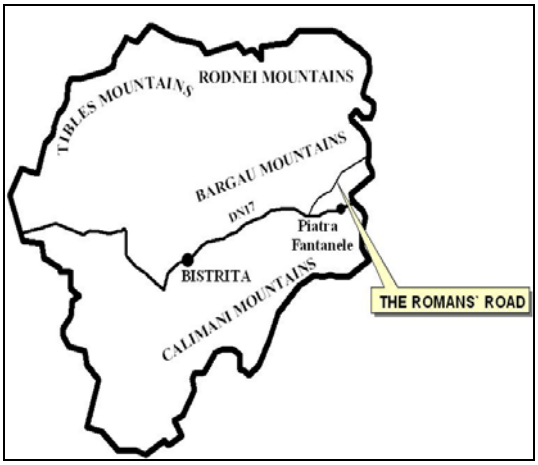

Figure 1. Location of The Romans` Road as part of the Bistriţa-Năsăud county

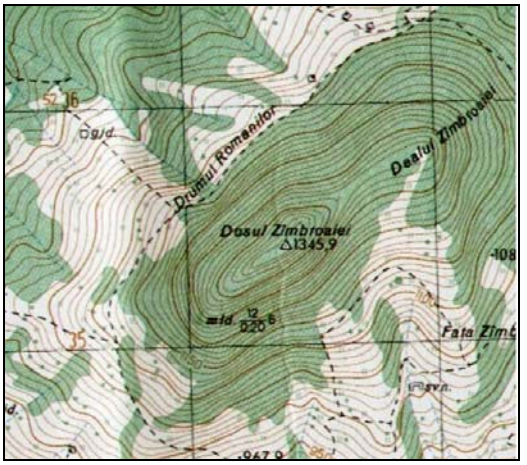

Figure 2. Fragment of The Romans`Road on the topographic map from 1984- scale 1:25000

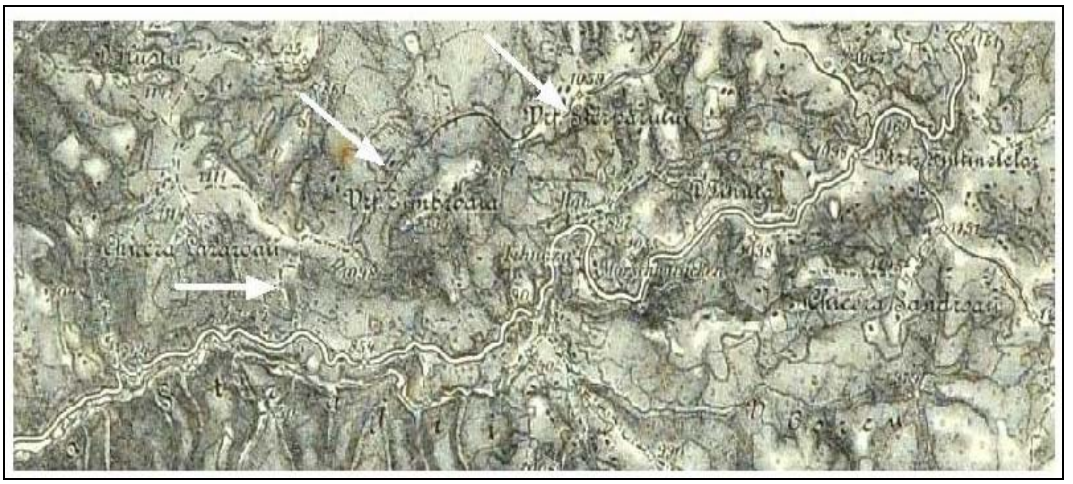

Figure 3. The Romans`Road from Bârgău Mountains on the Hungarian map from 1891
(Source: National Archives of Bistriţa-Năsăud County)

RESULTS AND DISCUSSION

The Romans`Road is a length of 13 km, starts from the European road E58 (Gombei Creek), climbs sinuously the southern slope of the Zâmbroaia-Prislop summit, it goes round the magmatic massif Zâmbroaia on the north-eastern slope, called „*Dosul Zâmbroaiei*" passing in the catchement area of the Iliuța Bozghii valley (tributary of Leşu River), returns then on the Tăşuleasa summit, between Iliuța Bozghii river, in the northern part, and Pârâul Poştei river, in the southern part (tributary of Bârgau River), then headed towards the Opcioara Summit, arriving at the jonction between the catchement areas of Bârgău, Leşu and Ilva, near the Piatra Fântânele village, it descends at the springs of the Ilva river, it intersects the Iliuța Corca Creek, climbs towards Dealul Îngrădit, descends towards the Iliuța Calului Creek and climbs again towards Măgura Calului and Tihuța Pass, returning to the European road (E58) (Figure 4).

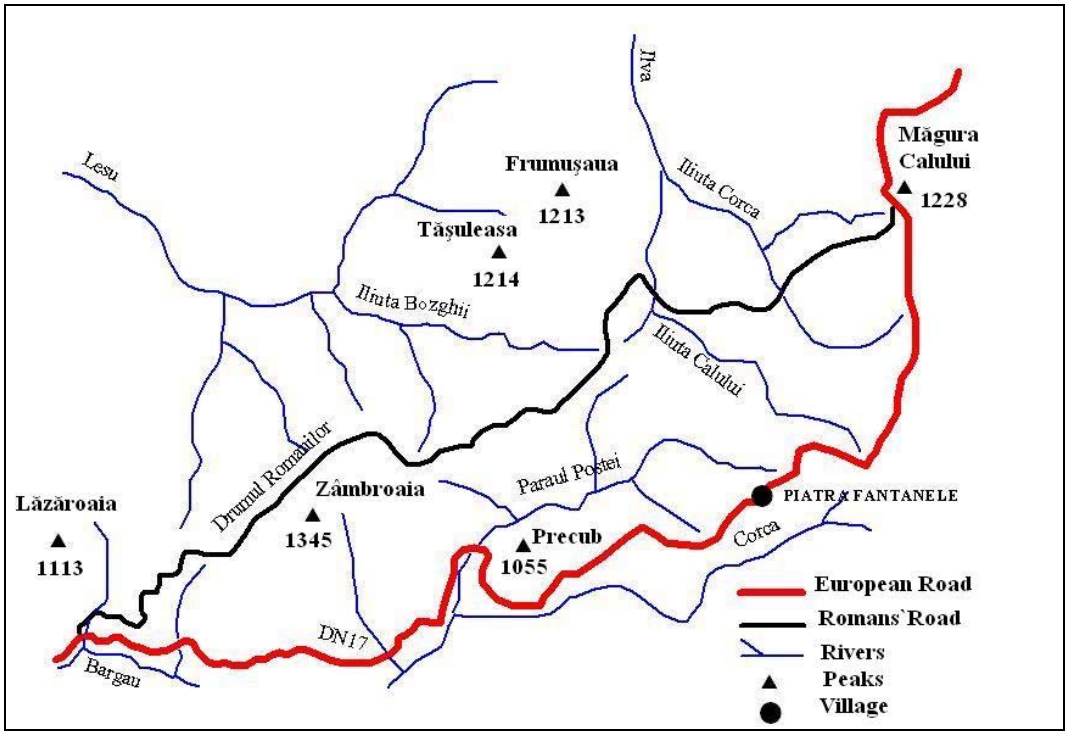

Figure 4. Route followed by the Romans`Road from Bârgău Mountains

In general, the road has an easy sinuous route, including both streight sections (Dosul Zâmbroaiei, Culmea Tăşuleasa, Dealul Îngrădit) and curved sections (Prislop, Culmea Opcioara, Iliuța Corca), fact which reflects its adaptation to the geomorphological features of the ground.

The detailed research made on the relief shows that the road's route overlaps the following categories of geomorphodynamic surfaces (Figure 5):

-the stable sides of the mountains with low gradient slopes (Iliuța Corca, Iliuța Calului);

-summits leveled from the Zâmbroaia Surface, located in this field on a hight from 1000-1200 m (Culmea Tăşuleasa-Opcioara, Dealul Îngrădit);

-deluvial sides of mountains, characterized through fragmentary slopes and energy with bigger values (Prislop-Zâmbroaia).

In a longitudinal profile The Romans`Road has a level difference of 450 m (750m at the entrance in the Bârgău Gorge; 1200m at the exit in Tihuța Pass), having an average slope of 34‰, which causes a high degree of accesibility (Figure 6). Also its profile reveals that the road has a fractal configuration, made of flat segments (0-1°) and more tilted segments (2-18°).

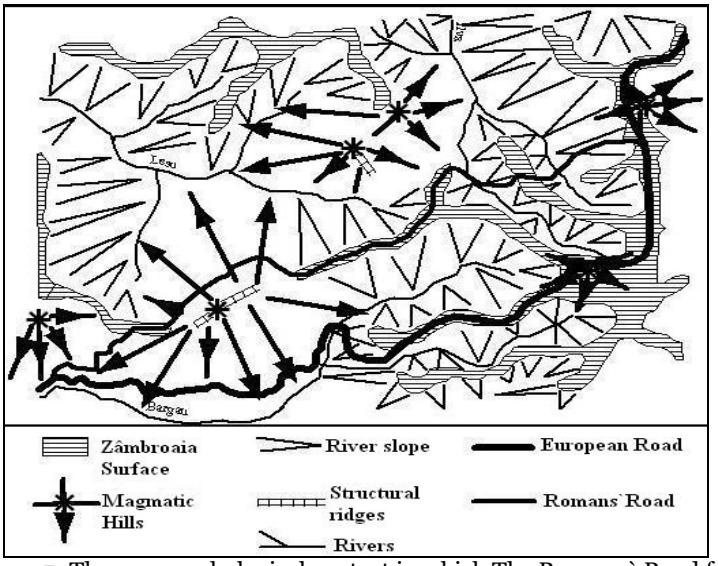

Figure 5. The geomorphological context in which The Romans` Road from Bârgău Mountains its spreading

From the technical point of view, The Romans`Road from Bârgău Mountains distinguishes itself through certain construction features which we will continue to analyze. From its stratigraphic point of view the road is composed of one layer of stone, with thicknesses of 50-60 cm, set on a soil layer. The stone which forms the road's pavement has a predominant magmatic nature (pyroxene andesites, pyroxene and amphibole andesites), originating from the neighbouring intrussive magmatic massifs Zâmbroaia and Măgura Calului, beside the sandstones extracted from the Măgura Calului massif. The pavement includes units measuring dimensions 30 to 50 cm lenght, presents various geometries (blocks, stone slabs, small elements) and reveals vast arrangement and settlement operations to ensure the cohesion of the road.

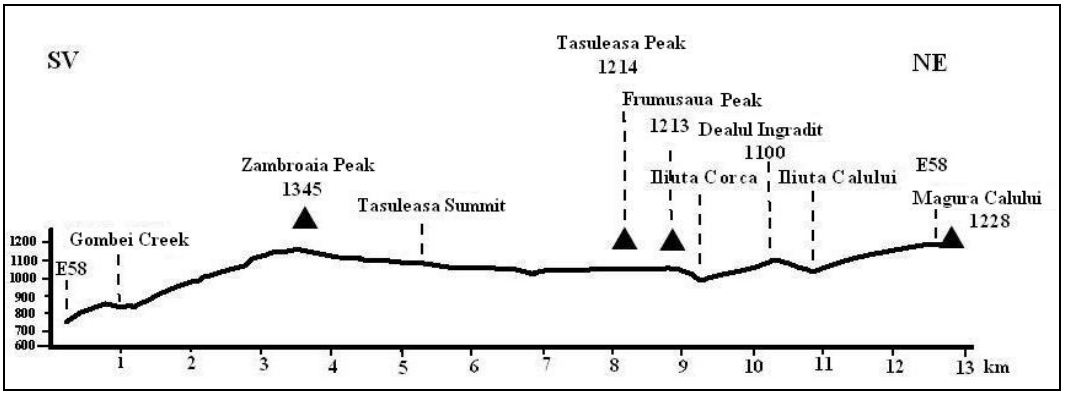

Figure 6. Geomorphological profile on The Romans`Road from Bârgău Mountains

The surface units seem to be shaped for a better joining and the units from the bottom have an angular appearence and are settled in their natural condition, how they were taken from the source. In certain places, on the edge of the stone layer, a kerbstone in shape of paralellipipedic blocks can be observed, beyond which, to the exterior, the stone layer continues in the shape of pavements, being covered by grass (Culmea Opcioara, Culmea Tăşuleasa).

The surface of the pavement is uniform in longitudinal plan, but at the ending part of the road, on the slope which rises from Iliuța Calului to Măgura Calului, appear on its profile a succession of transversal thresholds with heights between 8 and 10 cm, placed on distances from 6-8 m between them.

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This stone layer couldn't be preserved anymore throughout the entire road, being destroyed in many places by the continuous anthropic erosion: the traffic of the splinters, the logs transportation activities, the blocks taken by the local people and the leveling and excavation activities done with mechanical devices (Iliuța Calului, Iliuța Corca, Opcioara, Tăşuleasa, Groapa Gorii). In other areas, like the Dealul Îndrăgit summit, the road is covered by grass and included in a grassland, but its surface is very clearly visible.

The shaping processes are also present on the sections which still preserve the andesitic pavement. Here, the activity of the springs, located at the basis of the slopes on the edge of the road, which determines the appearence of swamps, puddles and leakage grooves (Dosul Zâmbroaiei). Because of this, finely chopped stone was brought in the places with swamps, fact that protects the road, contrary to its historical image. The traffic of the splinters and vehicles lead also to the appearence of 30-40 cm deep grooves (Tăşuleasa Summit, Groapa Gorii).

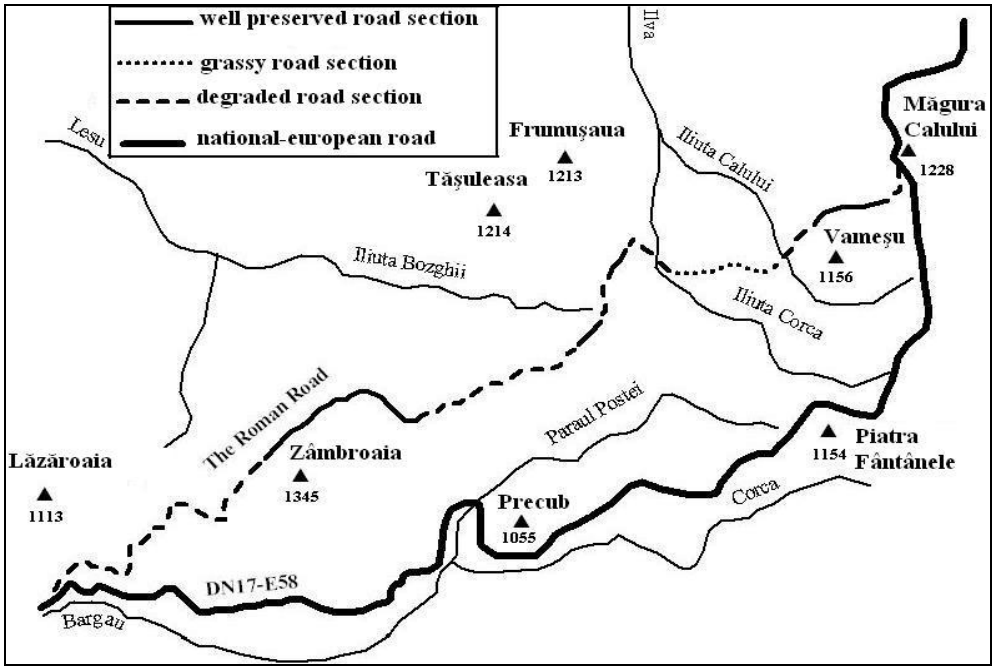

Figure 7. The present state of The Romans`Road from Bârgău Mountains

In transversal section, the road remarks itself through a complex configuration, which denotes specific arrangement working in concordance with the geomorphological conditions. In this manner, many excavation sections can be distinguished (Dosul Zâmbroaiei, Iliuţa Corca, Iliuţa Calului), but also embankment sections (Tăşuleasa, Opcioara, Iliuţa Calului), the last ones being raised up to 1,5-2 m above the route, and throughout the route the road is accompanied by a gutter for draining the rainwater (Tăşuleasa Summit, Opcioara Summit, Dealul Îngrădit, Măgura Calului).

The stone pavement surface of the road is 4 to 6 m wide, curved in its axis, little lowered towards the lateral sides and the total width of the road, including the draining gutter, reaches 6-12m (Dosul Zâmbroaiei, Dealul Îngrădit-Iliuţa Corca). All this elements are clearly visible, allthough in certain places, the road is covered with soil and grass vegetation or is degraded (Figure 7).

Due to the geomorphological conditions and anthropic interventions and for a more detailed analysis under the structural-functional aspect, we devided the road in many sections which will be further analysed. The section Bârgău Gorge (E58)–Faţa Prislopului. From the entrance in this section, at the Gombei creeks opening, The Romans`Road is split in many andesite banks, after which it ascends obliquely, in large curves through grasslands and temporary farms, towards the Zâmbroaia-Prislop summit, having a tilt of 2-80 and winning a level difference of 350 m.

The slope is marked by thick regolith deposits, is fragmented by the tributaries of the Gombei river and its tilt reaching 80 to 140. The surface of the road is very degraded, because of the log transportation activities, because of the agricultural harnesses circulation and also because of the streaming processes performed by the creeks which intersect the road, this being presented today as a country road, deepened through a continuous erosion with 1, 5 -2 m from the initial level. The stone pavement is completely removed, in many places reaching to the basis rock (monoclinal gritstone packages, andesite banks), and its elements are spread through streamings throughout the road's route.

On the superiour part, the road enters, under the summit, in a grassland, towards right, and from place to place blocks made of initial pavement appear, allthough the road is covered by grass or marked by deep ravines left by the harnesses. In the ending section, before curving towards left to reach the Zâmbroaia-Prislop summit, the initial excavation of the road can be observed, raised up to 1,5 – 2 m above the slope's surface from downstream. The last section, strongly degraded by the recent forest activities, is spreading up towards the summit, from 1000 to 1100 m.

The section Dosul Zâmbroaiei. After reaching the summit, the road goes in the Leşu River basin, towards left going arround the Zâmbroaia massif, making for north-east. In this section, the surface of the road is in excavation, and after some tens of meters the stone pavement reappears, the relief's energy is a 100 m and the slope reaches values between 2-30. Along the road's route three segments can be split : first the road ascends from the height of 1100 m to the height of 1150 m on aproximately 400 m, after which it follows the level curve of 1150 m, being located on a modulation from the slope's profile, after which it descends towards the level curve of 1100 m, on which it mantains itself over a 1000 m, until it comes out on the Tăşuleasa summit (Figure 8).

The andesitic pavement is visible throughout this section, but from place to place appear degraded sections, under the shape of swams, deeps or grooves caused by the traffic of the harnesses and vehicles. Also at the basis of the regolith, on the right side of the mountain, many rivers which split the road's surface can be located. Because of this, to prevent the road degradation, chopped stone is regularely seddimented in these places.

The Culmea Tăşuleasa section. This section distinguishes itself through lower relief energy (50 m) and slope values (0-20), and the road spreads itself in embankment, being oriented towards north-east, with an easy descending from 1070

m to 1020 m. The road's route passes through permanent farms, follows the summit that separates the catchement areas Iliuţa Bozghii (tributary of the Leşu river) northwards and Pârâul Poştei (tributary of Bârgău river) at the southwards and can be described through the existence of the stone pavement on a few hundreds of meters from the previous section's exit, after that it dissappears, being lost through the arrangement activities of the communal road since 2008. The new road formed through deeping operations in the surface of the initial road between 1-1,5 m, so that the stone layer was completly removed and pavement blocks can be observed only from the edges. At a time, on the left side of the communal road, a section from the initial pavement is being preserved, having a lenght of 50 m, in excavation at a hight of 1-2 m from the platform of the present road.

Figure 8. The Roman`s Road at the ending of Dosu Zambroii sector towards Tăşuleasa Summit

Figure 9. The Romans` Road on Culmea Opcioara sector

At the end of this section, the andesitic pavement reappears on the left side under the surface of the communal road, and mantains itself, on the traces remained after the harnesses and vehicles, until it reaches the junction of the three catchement areas Bârgău, Ilva and Leşu, close by a farm. From here, the pavement disappear s and the Romans`Road route becomes confusing, giving the posibility to be reconstituted at the entrance on the Opcioara summit, under communal road which leads to Ciosa village, to the right side, where it has been dislocated and deepened with the bulldozer. Here, in the wall formed this way, blocks from the initial pavement can be observed.

The Culmea Opcioara section. From this degraded section the road enters in the Opcioara Summit, towards right, appearing in all its beauty. The stone layer, the kerbstone, the configuration in embankment and the rain water draining gutter are clearly visible on the left side. After many tens of meters, as it descends towards the Iliuţa Corca valley, the road's surface is highly degraded by the traffic of the harnesses and the anthropic arrangements activities. However, the andesitic pavement and the excavation configuration can be observed on the largest part of the road (Figure 9).

The section Iliuţa Corca-Dealul Îngrădit-Iliuţa Calului. After it intersects the Iliuţa Corca creek , the road commits itself in crossing the Dealul Îngrădit summit, ascending in excavation from 1000 m to 1100 m, on a slope of 8-100. After it reaches the summit, the route descends towards the Iliuţa Calului creek, at 1050 m, first in excavation, then in embankment. Throughout its length, this section is cultivated and included in the grassland fields of many farms. Its condition is good, the rain water draining gutter can be observed on the edge, and its length reaches 6-12 m. It is here and there degraded by the stabilized gullys, formed by the traffic of the harnesses and by the activities of some creeks, which have their springs on the right edge of the road.

The section Iliuţa Calului-Măgura Calului (E58). After it descends Dealul Îndrăgit, the road reaches the Iliuţa Calului river bed and from here its route is confusing, because on the other side of the river, a country road, which descends along this one towards Lunca Ilvei village, is spreading itself. However, the stoneroad doesn't disappear, but it reappears after many tens of meters downstream, ascending on the right side of the mountain, which guides from the Iliuţa Calului creek to Măgura Calului on the European Road E 58. In this section the relief energy reaches 50 m and the slope reaches 4-80. The inferior half part of the road is very degraded because of the traffic from the harnesses, having portions with dislocated pavement and ravins with deeps between 30 and 40 cm, but towards the superiour part this preservs itself very good.

The surface of the road is in embankment, it is accompanied by the water draining gutter, the pavement is visible and less cultivated, and here and there transversal stone tressholds with heights between 8-10 cm can be observed. At the exit to the european road E58, near the Măgura Calului peak and opposite to the Măgura Tourist Pension, the stone pavement disappears and the end of the road is anthropicaly arranged with chopped stone and asphalt. The tourist evaluation of the geosite The Romans` Road, established on the basis of the evaluation paper proposed by Reynard (2006), emphasizes its potential and the exploatation possibilities (Table1).

Table 1. Tourist value of Romans` Road geosite

Criteria	Evaluation	Score
Accesibility	Easy acces to the objective on DN17-E58 roads	1,00
Visibility	The road's route is very visible	1,00
The present exploatation and the geomorphological interess	The road is functional and offers remarkable posibilities with the landscape view on the eastern part of Bârgău Mountains	1,00
The present exploatation and the cultural-historical interess	The road's route is marked and included in tourist programs from the county	0,80
The didactic interess	Through it's technical features, the road offers informations about the art of building communication lines in the historical past	1,00
The legal protection and the exploatation restrictions	The objective is not declared archaeological site and it's not archeologically protected	0,00
Equipments and services	Tourist endowments in the Bârgăul Gorge, to Piatra Fântânele and at Măgura Calului	1,00
The global value	Through it's technical features, through it dimensions and through it spreading The Romans` Road represents an important archeological site and an novelty tourist objective as part of the Bistriţa-Năsăud county	**0,828**

It can be observed that the global value of the geosite is sufficiently big, fact which underlines its tourist importance, both in the relaxation activities and in the cultural-instructive activities. Extremely important, for its exploatation, is the existence in close proximity with DN17-E58 roads and the fact is that the biggest part of the geosite is included in the tourist area between Piatra Fântânele and Măgura Calului, which has various tourist constructions (villas, chalets, pensions), but also attractive and notable resources on the cultural plan like: the Piatra Fântânele Monastery and the myth of count Dracula.

Also, in close proximity with the road, on the top of the magmatic massif Frumuşeaua, the traces of an observation tower dating from the Habsburgic Empire period, are being preserved (Figure 10). Some legends, often revealed by the local people,

are closely connected to this tower. This legends were exploated and promoted in many literary-artistical workarts, fact which gives this area an important cultural dimension.

Figure 10. View on the touristic area Fântânele-Măgura Calului
On the background the Frumuşaua mountain top (1213 m)

CONCLUSIONS

The present study represents a first step in the geographical approach of the antique and medieval roads from the north-eastern part of Transilvania, in order of their evaluation to be capitalized on the tourist plan. Through its technical and geomorpho-functional features, The Romans` Road from Bârgău Mountains represents an important archaeological site and a novel tourist objectiv, as part of the Bistriţa-Năsăud county, which is capitalized in the present only as a trekking route .

From the geomorphometrical point of view, the road follows stable ground surfaces, vulnerabilized through anthropic activities, only in the last decades, with high visibility on the surrounding areas (The Bârgău valley, The Tihuţa Pass, the Leşu valley, the summit between Leşu and Ilva), and with a high grade of accesibility, fact which offers it an important attractive potential.

Under the functional aspect, the road is used by the local people, which have properties along it, for move and travel and for different transportation activities (hay and logs), but it is used also by tourists, because of the proximity with the european road E58, with the Dracula Hotel, with the Piatra Fântânele Monastery and with the fascinating landscape view on the pasture lands and hills, which characterize the eastern part of the Bârgău Mountains .

The most important problem of The Romans` Road from Bârgău Mountains, is its continuous degradation on more larger surfaces, through the harnesses and vehicles transportation activities, through forest activities, leveling and pavement activities and through streaming and gully erosion processes.

In the county many institutions exist which envisage to include this geosite in the cultural, tourist and instructive programms like the County Council of Bistriţa-Năsăud, the County Museum Complex, the Tiha Bârgăului Cityhall, The Dracula Hotel, etc., but for the moment there is no solid strategy for resolving this problem.

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