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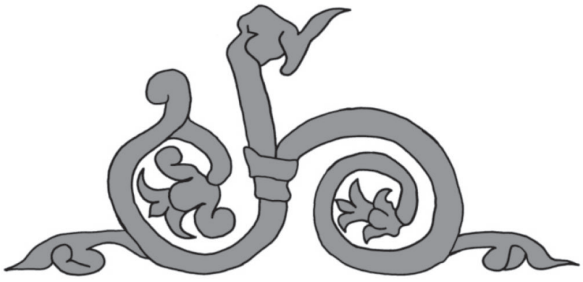

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Contents

Landmarks in the Development of Carthographic Representations of the Dacian Settlement in Ardeu (Municipality of Balşa, Hunedoara County)*

Cristian Constantin Roman

Abstract: The cartographic sources analyzed in this article, that include the micro-sector of Ardeu, can be grouped in three categories: sources with low accuracy, general sources and professional/modern ones created for military goals, and administrative and scientific sources. Each stage is characterized by its own manner of representation and the level and accuracy of its details. According to the topographic base and the means/methods of representation, I followed, from the *Josephinische Landaufnahme* (The Josephine Map) until the latest topographic survey of the site (2001), the development of all details of archaeological and historical significance for the micro-area covered by the archaeological site under discussion.

Keywords: Dacian period, Ardeu, cartography, maps, landscape history.

Introduction

On the general data regarding the Dacian complex in Ardeu (location, spatial limits, types of site, relation to the Mureș Valley and Orăștiei Mountains), one must note our colleagues' study published in 2004[1].

The importance of topographic approaches to the archaeology of historical landscape (*"landscape history"*) in Romania[2] and in its surrounding western regions[3] is a special one, whose theoretical founding has already been established, in my opinion, through synthesis works, monographs, and doctoral dissertations. The synthetic and diachronic approach of the categories of cartographic sources making reference to the settlement of Ardeu (municipality of Balșa, Hunedoara County) is part of an ample study of landscape history focusing on the Dacian site there that I aim to complete in the near future. *Cetăţuie Hill* in Ardeu plays a significant role in the series of radical man-made changes of a type of pre-existent landscape, in the context of the area that connects the Mureș Valley to the auriferous quadrilateral. The result of these interventions motivates a morphological change of the hill, with processes typical to the new natural structure.

Goals and objectives

The main sources (i.e. cartographic ones, approached retrospectively), are completed in the present analysis by elements derived from geography and history, since I aim at reconstructing the elaboratioin structure of the topo-chronological criteria, the structure according to which the objective connections between attributes would be useful to the declared purpose. Rippon's statement remains emblematic: "*different landscape characteristics result from variations in the form and spatial arrangement of a wide rage of features reflecting the different means by which human communities achieved subsistence, communication, recreation, and security in various periods in the past*"[4], for the analysis methodology of the concept of "*landscape history*". The main goal, that of correlating data from cartographic sources with archaeological structures, is followed by the second goal, that refers to the spatial organization

* English translation: Ana M. Gruia.

1 Bodó, Ferencz 2004.

2 For western Romania, the most recent focused approach of the topic, in the case of the site in Dumbrăviţa (Drașovean *et al.* 2004, 14–17).

3 For the latter, one of the best synthesis works in this direction is Balázs, Konkoly-Gyuró 2011. The contributions of the German school remain extremely valuable for the Iron Age (Schuppert, Dix 2007; Schuppert, Dix 2009; Bofinger *et al.* 2006). For the Slovak school one can note recent studies (Lieskovský, König 2007) that are reference works for the topic under discussion.

4 Rippon 2004, 19.

of this micro-sector, occupied by the Dacian complex, as well as constrains imposed by the natural context. The research follows a twofold approach. The first level of analysis envisages the site and its surroundings (ca. 17.5 ha) and follows the traces of possible Dacian-era structures (tombs, terraces, ditches, pits, traces of surface mining of useful minerals resources, shelters etc.). The second level of analysis, on a grander scale, follows the road network and the sources of primary materials over an area measuring 10 km in diameter, centered on the spot of Cetățuie.

Method

The method follows a multi-disciplinary approach, supported by numerous cartographic and non-cartographic sources (aerial photograms, on site measurements/ observations, archaeological and ethnographic data etc.) that aim at identifying, from a historical perspective, the characteristics of landscape dynamics in the micro-sector under discussion. Despite certain graphic, cartographic, and spatial expressions starting with the eighteenth century, included in landscape representation systems, the micro-sector occupied by the Dacian site in Ardeu did not benefit from a detailed representation based on the detailed knowledge of the relief and of certain elements that are typical to "intuitive" knowledge (access ways, man-made terraces etc.), taking into consideration the similarities with other Dacian fortifications. The interpretation and comparison of available maps aimed at stating the planimetric and altimetric characteristics of existing natural micro-structures during the Dacian Era, in order to identify elements that are useful to the present initiative.

Data sources

Our sources date between the first quarter of the eighteenth century and the beginning of the third millennium and I have analyzed each map individually as one must proceed due to the era, the design, the different projections, systems of coordinates, academic significance, including the different scale of these maps. Following only specific elements, imposed by the specificity / size of Dacian-era habitation and interventions (for ex. the *acropolis* on Cetățuiei Hill) one could direct the present study to few quantitative data, apparently having a negative impact on the quality of the conclusions. By studying the landscape representation systems in the area under analysis, on can infer that the cartographic system, initially, then the spatial system, provided specialists with numerous qualitative and quantitative data on the topic[5], influenced by the various motivations (extraction of useful mineral resources, military cartography, civilian cartography with implications on historical research). The fact that geo-morphological profiles are absent from the available material deprived us from obtaining the maximum efficiency of the conclusions, compared to the multiple complex traits of the relief in this micro-sector.

Source analysis. Discussions

Sorin Forțiu has expressed one of the most challenging working hypotheses on the antique identification of the Dacian complex in Ardeu, starting from an ancient cartographic source[6]. In time, almost all Romanian archaeologists and historians have suggested various spatial locations of the ancient settlement without specific conceptual tools and without a critical discussion of the ancient text and of its numerous subsequent translations and comments that I intend to add up here[7]. The analysis of the numerous theoretical determinations of the modern localization of ancient Ziridava[8] and the use of modern technology (translations of Ptolemy's coordinates into present-day coordinates, consulting the primary archaeological literature on the topic), and especially the *sine ira et studio* research of the ancient source and of those *codices secundarii*, among which Codex Vaticanus graecus 191, support, according to S. Forțiu, the hypothesis of identifying Ziridava with the Dacian complex in Ardeu[9].

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5 Grigore 1979.

6 Forțiu 2012.

7 Forțiu 2012, 6–8.

8 Forțiu 2012, 19–25.

9 I employ this term to designate the complex of site types (fortification, necropolis, civilian settlement, traces of mining useful minerals), interconnected in Ardeu. Archaeological discoveries made so far, their partial publication, and

The first known localization of the settlement of Ardeu (*Erdofalva*) (Fig. 1) in our cartographic sources dates to the first quarter of the eighteenth century. We make use of it due to academic and practical reasons[10]. The working manner, derived from a historical-geographic goal of this map, is more careful, insisting on rendering the mountainous aspect of the landscape (without scale), the elements of vegetation, and the name of important settlements. As in the case of other maps, the one under discussion does not employ toponyms. One notes the clarity in the identification of individual mountains and the corridor that connects Mureş Valley and Zlatna. The only element connected to Ardeu is the depiction of the church.

Fig. 1. Location of the village of Ardeu (apud Müller 1709, Augustissimo Romanor)

The first important observation is determined by perfecting certain databases and knowledge on the mineralogical resources in Transylvania (a fact also confirmed by the identification of certain silver and lead resources near Ardeu, a situation reflected by symbols). This aspect of data accumulation culminates for the first quarter of the eighteenth century with Marsigli's works[11] (Fig. 2), a period recently discussed by Gábor Papp in one part of a synthesis article[12]. The areas of interest are stressed through the technique of shading, with the aid of strong hachures (lacking mathematical value) and of certain symbols that are also rendered on the map's cartouche. No toponyms are noted for the area under research.

Compared to the history of cartography, the maps that include the micro-region of Ardeu also reflect both the development stage of general cartography (in the first half of the eighteenth century) (that envisaged the spatial location of significant settlements and major water courses) and the stage reached by military and physical-geographic cartography. The usefulness of these maps is in strong connection to the characteristics of certain elements that can be analyzed both quantitatively and

the advanced stage of documentation processing place the site in Ardeu among the most important Dacian sites in Transylvania (Ferencz 2012).

[10] Müller Johann Christoph, *Augustissimo Romanor. Imperatori Iosepho I. Hungaria Regi Invictissimo Mappam Hanc Regni Hungariae* (1709) – one of the most valuable modern cartographic sources – (apud https://aleph.mzk.cz/F/J2JLFXBICKAP411HYBSF4ESRRSH2CSJB1552RDD3AUK1FHBHXD–22434?func=find-acc&acc_sequence=000324382)

[11] Mappa Mineralographica Fodinas in Hungaria (1741)
(http://mapy.mzk.cz/en/mzk03/001/051/666/2619316354).

[12] Papp 2008.

qualitatively, dynamically and from a developmental perspective (the outlook of Cetăţuiei Hill, the civilian area of the site, the presumed areas with sacred/ceremonial function, the various man-made interventions identified topographically, the outlook of the hydrographic network, the distribution of the forest, the sources of useful primary materials, the roads, the surrounding landscape etc).

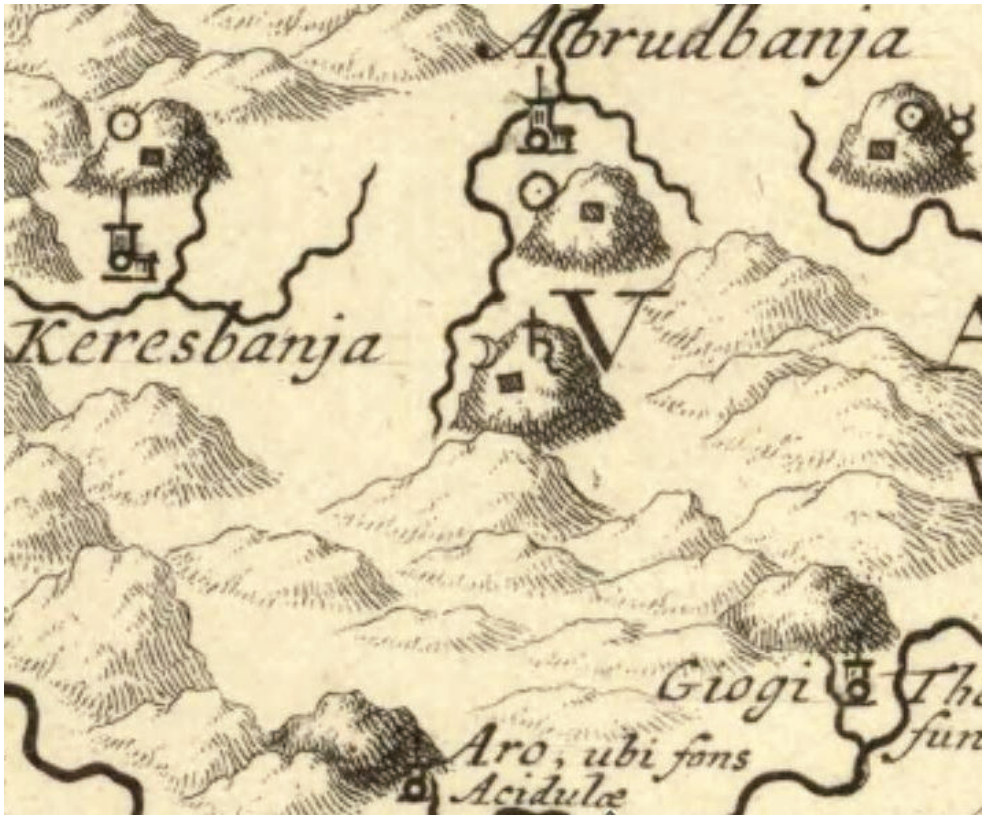

Fig. 2. Sector Geoagiu-Balșa, as reflected in A. Marsigli (1741)

Our starting point is folio 168 of the valuable Josephine Map of Transylvania[13] (*Josephinische Landaufnahme*) (1769–1773), valuable for the historical-documentary perspective it provides. This mapping was at that time the result of the most advanced research and technical operations, scientific but also artistic, based first of all on direct observations, reflected by the accuracy of the documentation, of transcribing toponyms, of bi-dimensional representations, and of certain topographic details (triangulation points, milestones etc); the result is not a map in the current understanding of the word, since it does not render landscape altimetry.

The space imposed by the problematic of the present chapter made me analyze, from a cartographic and topographic perspective, only the perimeter of the Dacian site (the fortification, the civilian settlement, and the areas in their close proximity); the limits of this perimeter were determined by details of the hydrographic network and the base of certain slopes. We shall remember the idea suggested by this map that the slopes at the entrance into Ardeului Gorges are not very steep, since they were not marked with hachures, a fact put to good use during antiquity as several constructions were built there, some of which have been archaeologically researched. Future research will need to reconstruct and analyze the dynamics of the built surface in this sector of the archaeological site as compared to the landscape. Continuous effort was put in recent times, on a European level, into the maximal use of Josephine topographic maps (created despite the lack of a real geodesic basis[14]) with good results that can be employed in both topographic/geodesic researches and historical-archaeological ones[15]. The scale also employed in the case of folio 168 is of ca. 1:28.800, while for the area under discussion no data is provided on the altitude; differences in altitude were rendered through hachures (Fig. 3).

13 Arcanum 2006a.
14 Timár *et al.* 2007; Timár *et al.* 2007a.
15 Podobnikar 2009; Micle *et al.* 2009.

Fig. 3. Location of the village of Ardeu (Josephinische Landaufnahme/ Josephine Map of Transylvania) (1769–1773) (apud Arcanum 2006)

Cetăţuiei Hill has the aspect of a mamelon, surrounded on three sides by Ardeului Creek (Fig. 4). The entire surface of the fortification is uneven, rocky, not covered by thick forest; the aspect is also suggested through comparison with the upper part of Pleşa Mare (*Plesa Mueze Mare*), without arboreal vegetation, as well as with the latter's eastern part, marked by an oblique wall, with rare arboreal vegetation. The hachures in the eastern part of Judelui Hill and the proportion between the first and Cetăţuiei Hill suggest the fact that the road leading to Ardeu was located on a landscape contour higher that the present-day road. The steep southern slope of Judelui Hill is suggested by the oblique intersection of two systems of hachures, while its northern and western sides, through shading rendered as overlapping, very expressive close lines, are presumably a sector that includes a steep slope towards the river. One notes the fact that the perimeter between the southern border of the settlement and Cetăţuiei Hill is rendered as a more elevated area as compared to the outlet area of the gorge that takes the aspect of an everglade: low, easily flooded, strongly influenced by the valley sectors with variable flows, with, at times, significant narrowing areas due to the closeness of the hills downstream from Cetăţuie, represented with a relatively high degree of generality and abstractness of detail. The above mentioned narrowing areas were speculated in the construction of the present-day road, placed on the left bank of the river which it does not intersect between Bozeş and Ardeu. In order to prove the fluctuations of Ardeului Creek I have also employed the details included on the Josephine mapping, despite the fact that one must not assign absolute value to the precision of the stream's contour, shape, and characteristics (size, width, flow capacity). The graphical rendering of this detail is limited as far as morphometric values are concerned, but it has an advanced degree of expressivity. If the river course depicted on the Josephine map is the real one, then one can presume the fact that the area of the Dacian settlement at the base of Cetăţuiei Hill (located on a strip of everglade) ended to the west by the base of Pleşa Mare and to the north and east by Ardeului Creek[16]. Another aspect,

[16] Freshets and land sliding tend to push the creek of Ardeu towards the calcareous hills (Pleşa Mare and those downstream), located on the right side of the creek. The situation was also indirectly confirmed by the identification of a

with a possible impact at least for the medieval era, is connected to the cart road network; these roads followed the contours of the landscape, along the valley, connecting Ardeu to Mureşului Valley and the area of Zlatna[17]. Besides the valley road that follows the course of Ardeului Creek, one notes a parallel hilltop road that, once it descends from the point called Dial Szek, it meets the valley road by the intersection between Ardeului Creek and a minor affluent on the left (Matieşului Crek/Pereu Matyezuluj (a toponym mentioned in the National Archives, Deva Section, Fund Cadastral Technical Inspectorate, No. 12, year 1855, Ardeu). Near the intersection of these two roads, the hachure technique allows one to hypothesize on the existence of a possible access way towards Judelui Hill and implicitly towards the Dacian citadel (Fig. 4).

The second topographic survey of the Habsburg Empire (*Zweite oder Franziszeische Landesaufnahme*)[18] provides new elements on the micro-area of Ardeu[19]. Major contributions in available literature[20] that underline the accuracy/quality of topograhic measurements, of the depiction of settlements, toponyms, rivers etc., shed new light on the complexity of this topographic product for the first half/third quarter of the nineteenth century. The very careful use of the technique of hachures, of different length and thickness, unidirectional, in which the range of color creates contrasting areas, stress all the morphological traits of landscape in the micro-area of Ardeu, as well as the differences in altimetry and elements of topography. On this map, the toponyms are rendered in Romanian (Fig. 5).

Fig. 4. Detail of the sites in Cetăţuie, Dealul Judelui, and Gura Cheilor (Josephinische *Landaufnahme*/Josephine Map of Transylvania) (1769–1773) (apud Arcanum 2006)

possible flooding, that one can hardly date, at the feet of "*Cetăţuie*" Hill during research performed in 2003 (http://www.cimec.ro/Arheologie/cronicaCA2004/cd).

17 There are major advantages to studying, on the road network that might have been used in Antiquity basis of general infrastructure maps and identified archaeological sites. The fact is also supported by the structure of the landscape in the area of Balşa-Geoagiu that can easily clarify certain aspects of the problem.

18 Arcanum 2006a.

19 Our cordial thanks go to Ms. Dr. Mariana Vlad (The Institute of Social-humanistic Sciences in Sibiu), for her help throughout the documentation for the present study.

20 Timár 2004, 2009. Timár *et al.* 2007a; Timár, Biszak 2010.

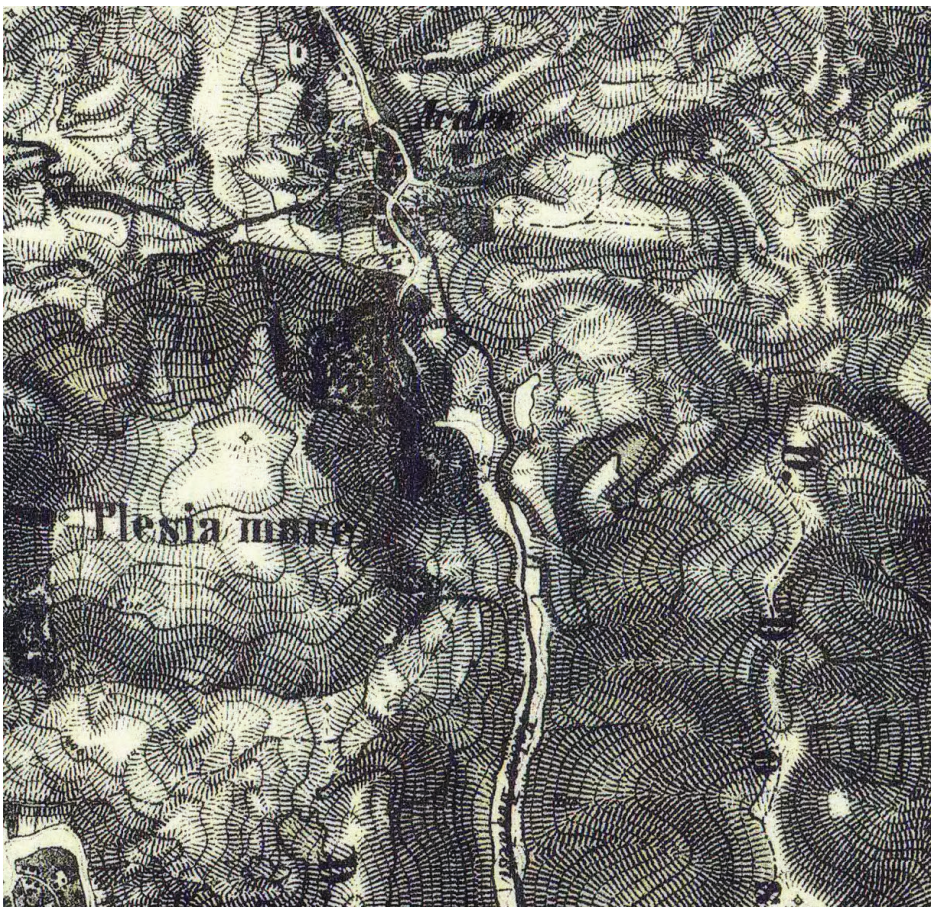

Fig. 5. Zweite oder Franziszeische Landesaufnahme. The area of Ardeu

One of the observations is connected to the presence of forest vegetation on Cetățuiei Hill, the working technique suggesting a relatively flat surface, lacking equally-distanced hachures that suggest steep or relatively steep slopes. The contour of this representation marks, on the south-western side, the sudden contact between the base of the mamelon and Judelui Hill. The northern side of Cetățuiei Hill, i.e. the area towards the creek's meadow (where the civilian settlement was located), draw the attention of the topographer/drawing artist; the center of this area is suggested through a polygonal, relatively flat perimeter, with two altitude levels that are strongly marked (Fig. 6) (this aspect was noted even since the beginning of archaeological research in 2001). On the contrary, the connection between the hydrographic network and the morphology typical to the limestone in the gorge sector is stressed through the use of dark color tones and compact hachures for both slopes.

Fig. 6. Detail of the sites in Cetățuie, Dealul Judelui, and Gura Cheilor (Zweite oder Franziszeische Landesaufnahme)

The Schega map also aids our initiative (Generalkarte Oesterreichischen Monarchie Scheda XV) (made in 1865, scale 1:300.000), created through the technique of hachures and graphical alternation between interfleuves (light colors) and valleys (strong hachures). The micro-sector under discussion is sketchily rendered, with the area of the fortification with vague contours, as compared to the altitudes imposed by Ardeului Valley to the west and by Judelui Hill to the east (Fig. 7).

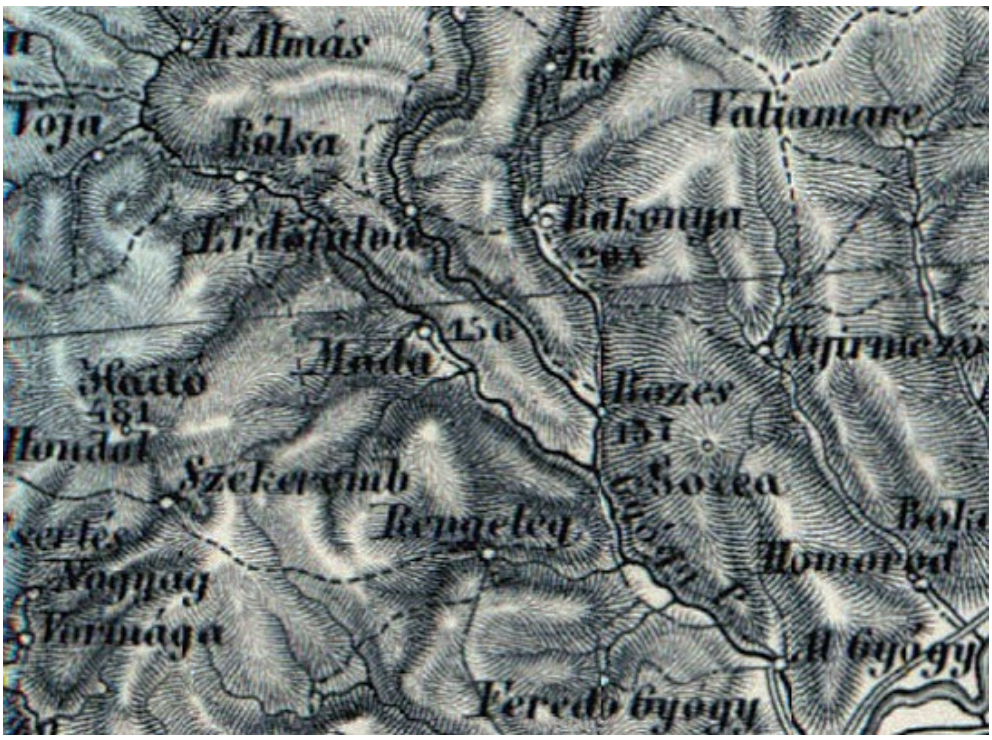

Fig. 7. The area of Ardeu and the surrounding perimeter
(*Generalkarte Oesterreichischen Monarchie Scheda XV*)

Fig. 8. The area of Ardeu and the surrounding perimeter
(*Dritte Landesaufnahme*) (apud Arcanum 2007)

Significant interpretative contributions, on both European[21] and national[22] levels were published on the third topographical survey (*Franzisco-Josephinische Landesaufnahme* or *Dritte Landesaufnahme*)[23]. This map presents, with clarity, the oval contour of Cetăţuiei Hill, clearly delimited from Judelui Hill (Fig. 8). The large scale on which the map was designed cannot provide extra details for the estimation of the dimensions of the mamelon on which the fortification in located. One notes the fact that the creek follows a different route than the one marked on the first survey, i.e. after crossing the gorge sector it turns slightly to the left and then maintains almost a straight north-south direction, on the right side of the road. The hilltop road maintains approximately the same direction.

A map dated to the beginning of the twentieth century (scale 1:20.000) presents numerous novel elements on the micro-region occupied by the Dacian site[24] (Fig. 9). The first observation, according to which the western side of Cetăţuiei Hill is steep and rocky, confirms data provided by older maps. On the other hand, one notes according to the hachure technique, that there are steeper slopes on the eastern and southern sides. The stepped profile of the southern side is suggested through hachures in alternating directions. The plateau is devoid of vegetation, while the area of the first terraces seems suggested by the first two rows of hachures, interrupted by a circle segment placed on the level curve. An interesting element is connected to the presence of a slightly thicker line, at some points interrupted, an element that can depict strictly topographic details (such as a level curve), geological details, or man-made features of archaeological significance (wall? overload of the slope with constructions?). Another line follows the same contour; it is thicker and seems to mark the base of Cetăţuiei Hill.

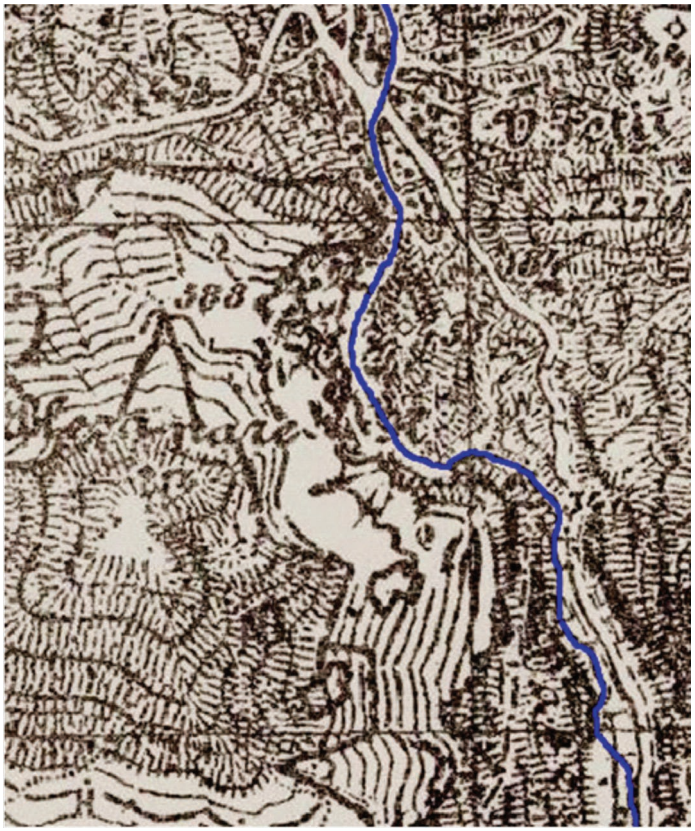

Fig. 9. Detail of the sites in Cetăţuie, Dealul Judelui, and Gura Cheilor (apud Crăciunescu 2010)

One of the earliest written mentions of the toponym Cetăţuia features in Téglás[25] (*Cseteczuja* or *Cetecuja*), the author who mentions the fact that access towards the Dacian fortification was possible

[21] Biszak *et al.* 2007; Biszak *et al.* 2007a.
[22] Rus *et al.* 2007.
[23] Arcanum 2007.
[24] Crăciunescu 2010.
[25] Téglás 1885, 302, 306; Téglás 1898, 501.

from Dealul Hill[26], along a 50 m path carved in the rock ("*sziklába vágott ősveny*")[27], near which bronze items and other artefacts have been discovered[28]. The dimensions of the fortification's plateau (6–8 m in width, 50 m in length), noted by Téglás, its aspect, the existence of certain pits excavated before 1885[29], are no doubt extremely valuable pieces of information in the context of literature published in the end of the nineteenth century. The published drawing, though lacking a scale[30], suggests that Cetățuiei Plateau followed an oval contour, with a very steep slope to the west (Fig. 10). The 4:1 proportion, recorded for the width/length indicators, does not match the description in the text; the above mentioned dimensions in meters – not matching topographic reality – might have been influenced by the rich vegetation there, despite the fact that the author declared that the hill was covered with grass[31].

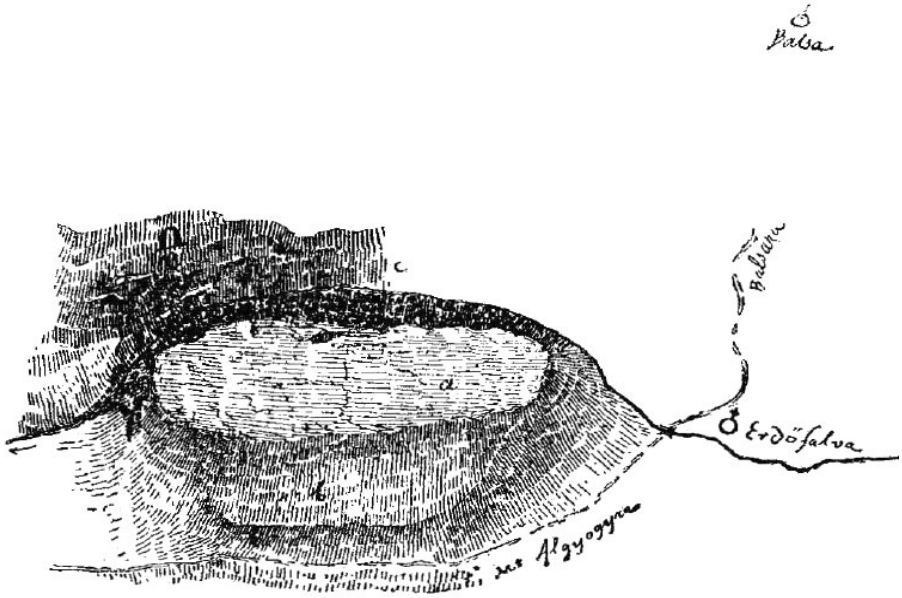

Fig. 10. Detail of the sites in Cetățuie, Dealul Judelui, and partially *Gura Cheilor* (apud Téglás 1885)

Another of Téglás' drawing[32] (Fig. 11) focuses, on another level, on the topographical characteristics of this micro-sector occupied by the archaeological complex. The recorded elements, due to a perpendicular view over the village, correctly suggest the proportion between the prolong hill top unaffected by stone extractions, the hill *per se* and Judelui Hill Plateau. Téglás also published a view from the north over Cetățuiei and Judelui hills[33] (Fig. 12). I believe that the contour of the limestone mamelon is slightly exaggerated in order to stress the level of man-made interventions. One notes that the artist insisted on depicting the advantages of placing the Dacian fortification on this spot, by suggesting a low degree of foresting of the site's area.

The location sketch, with the text written in Hungarian, dated around 1900, which was identified in the archive of the municipality of Balșa[34] brings new data on the topographical description of the area of the Dacian complex and its neighborhood. The technical data include the number of map folio (*10 sz*), the name of points marked with letters, from north to south (points a-b), east-west (points b-c), north-south (points c-d), north-west-south-east (points d-e)[35] (Fig. 13). The analysis of the mate-

[26] Téglás 1885, 306 (mentions a path but does not detail its exact topographical position, possibly the road used during Antiquity).
[27] Téglás 1898, 501.
[28] Téglás 1898, 501.
[29] Téglás 1885, 306
[30] Téglás 1885, 304.
[31] Téglás 1885, 306.
[32] Téglás 1888, fig. 120.
[33] Téglás 1888, fig. 119.
[34] Cordial thanks to Mayor Simion Metești for his continuous support offered to the research team of the site in Ardeu.
[35] The subsequent two points (f, g) were placed on the left side of the road leading towards the settlement of Bozeș.

rial lacks the type (mode) of milestone employed[36], the topographical description (proportion with elements in the vicinity) and the description in words of the position of the points. Judelui Hill is depicted as a parceled surface (1569–1571), while the section south of it, towards Gura Cheilor (1567, 1566/1,2, the latter labeled eé) has contours conditioned by the direction of the road and of the base of the calcareous mamelon, that is correctly rendered. The western limit of the first mentioned lots can suggest the contact between the relatively flat area of Judelui Hill and the start of the slopes of Cetățuiei Hill, but also another perimetral reality in which part of the hill base might have been included in these plots. The un-parceled calcareous mamelon (labeled *ff.*) is bordered on the western and southern sides by Ardeului Creek and the area of the civilian settlement is marked on map 7. The dynamics of the creek bed is one of the elements tracked on this map as well, but its differences from the other maps are minimal.

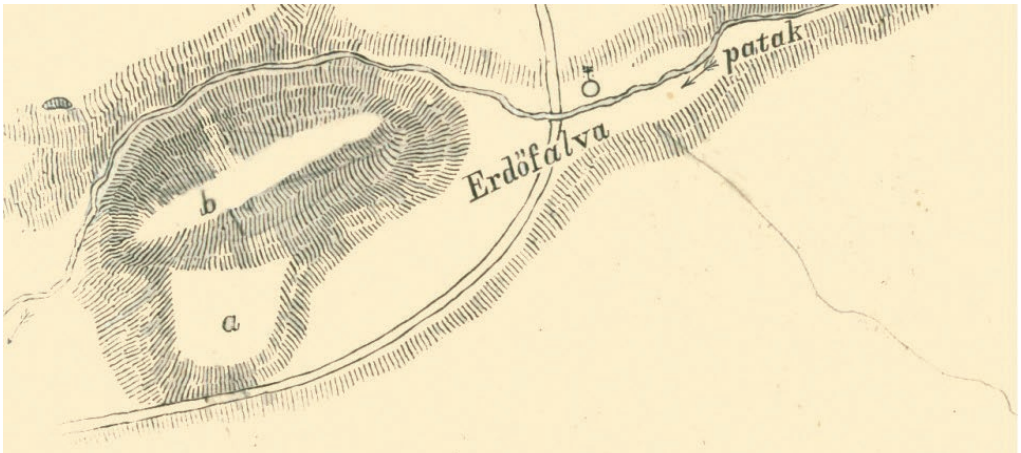

Fig. 11. Drawing (ground plan) of the archaeological site in Ardeu
(apud Téglás 1888, fig. 120)

Fig. 12. View of the archaeological site in Ardeu in the end of the nineteenth century
(apud Téglás 1888, fig. 119)

Military maps created after 1950 allow for the formulation of extensive comments with documentary value for the present issue. One can remark the much more stressed contour of Ardeului Creek as

[36] My attempt to identify these markings on site did not lead to positive results, since they were probably provisional landmarks, typical to local networks.

compared to the other maps and a sometimes detailed drawing of topographic details determined by the morphological traits of Cetățuiei Hill in particular.

The first topographic material analyzed (L–34–71-C) (1970) does not record the stage of limestone extraction on Cetăţuia. The fact that there are few level curves and their route and frequency on Cetăţuia and Judelului Hill suggest the plans scale and implicitly the contour of the upper part of the fortification, though the depiction of horizontal surfaces was not completely ignored (Fig. 14). The scale of the map can be declared as a limitation of this product, determined by the limitation of details. The isolation of this archaeological site, the low industrialization of the area, the specific morphology of the calcareous landscape, and the low productivity of the soil are factors that have determined the absence of man-made interventions after the Dacian Era, the development of which would be recorded cartographically.

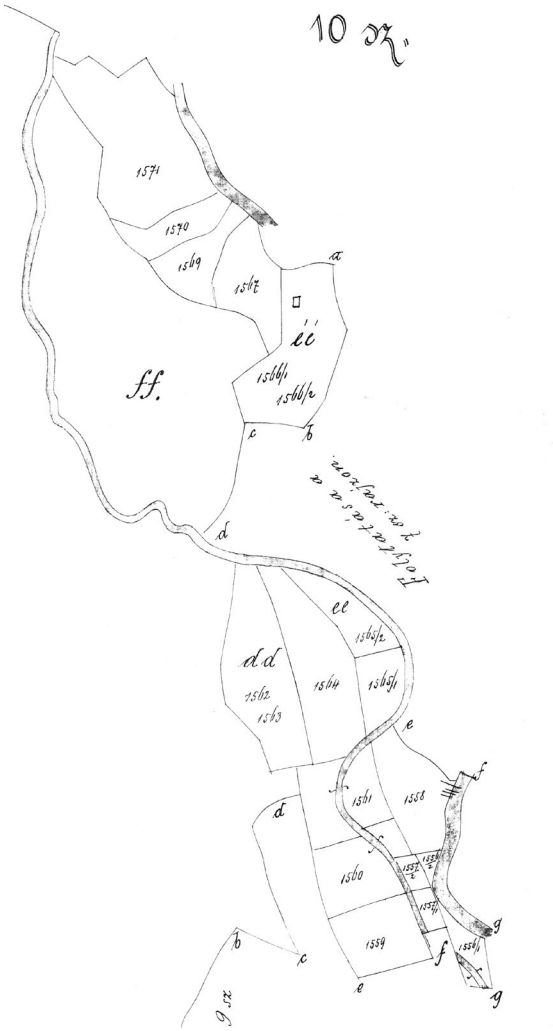

Fig. 13. Location sketch of the area covered by the Dacian settlement in Ardeu (apud Archive of the municipality in Balșa)

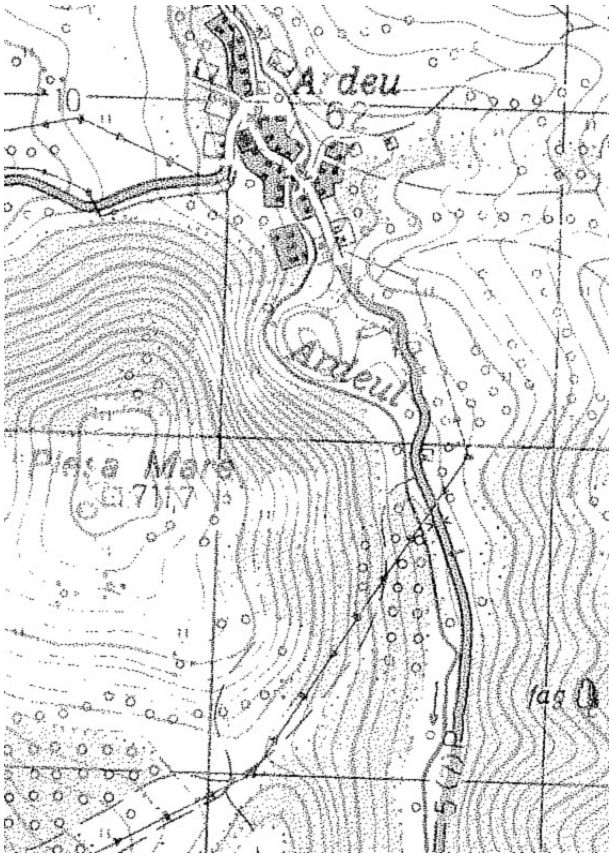

Fig. 14. Detail of the sites in Cetăţuie, Dealul *Judelui,* and *Gura Cheilor* (Topographic map, mark L–34–71-C) (1970) (apud Military Topographic Department)

One of the military maps available shows a clear unfolding of the main and secondary level curves, stressing Cetăţuiei Peak (478 m) as a flat area, similar to the one on Pleaşa Mare. The rendering of the curves that describe Cetăţuiei Hill suggest, on the one hand, the large amplitude of its relief, and on the other hand, the low oscillation of altitudinal values over the surface enclosed by the level curves in the area of the acropolis indicate an ovoid perimeter. The contour of the limestone quarry and the access ways leading to it are clearly marked in the southern side of Cetăţuia Hill. One can also note that north of Cetăţuie, from the north-east to the south-west, the level curves (some with the indication of the value of the main level curves) describe a route that can *also* suggest the route/direction of the road leading towards the fortification; its difficult sector is located between the major curve of the creek and the place where it comes out of Ardeului Gorge. The district of the civilian areas of the

Dacian complex is identified through level curves placed at wider intervals, with minimal differences in altitude (Fig. 15). Cofta Sârghilor cave is not marked on the eastern slope of Pleșa Mare.

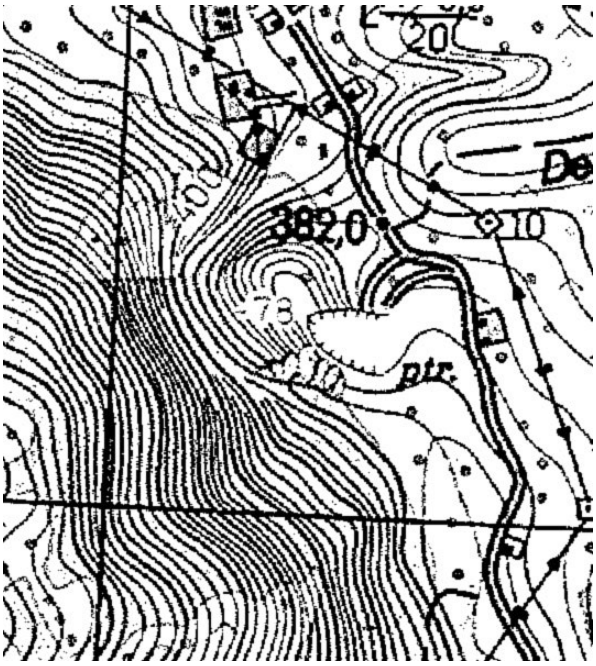

Fig. 15. Detail of the sites in Cetățuie, Dealul *Judelui* and *Gura Cheilor* (apud Military Topographic Department)

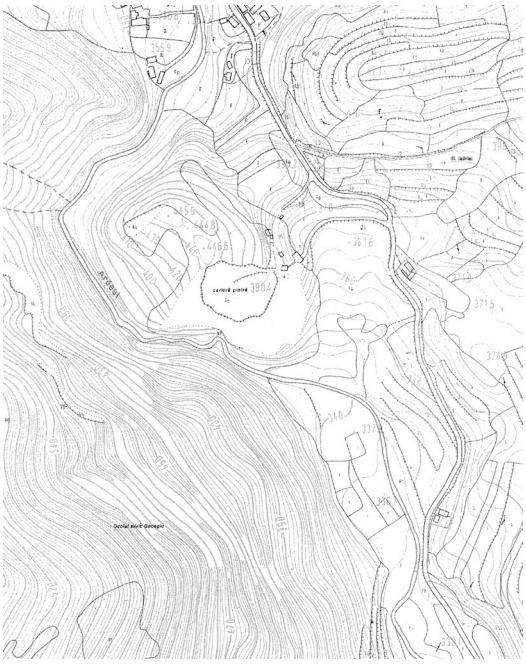

Fig. 16. Detalil of the sites in Cetățuie, Dealul *Judelui* and *Gura Cheilor* (Topographic map, mark L–34–71-C-d–3-III) (1986) (apud Military Topographic Department)

This map (L–34–71-C-d–3-III) (1986) remains one of the most complete topographical sources employed in the present study. The precise implementation of the level curve method allowed for obtaining data on the building of the topographic profile of the height, of its volume and adding the altitude of the points (Fig. 16). The irregular contour on Cetățuie places it among the non-productive lands, limited to the east from Judelui Hill by a forest skirt.

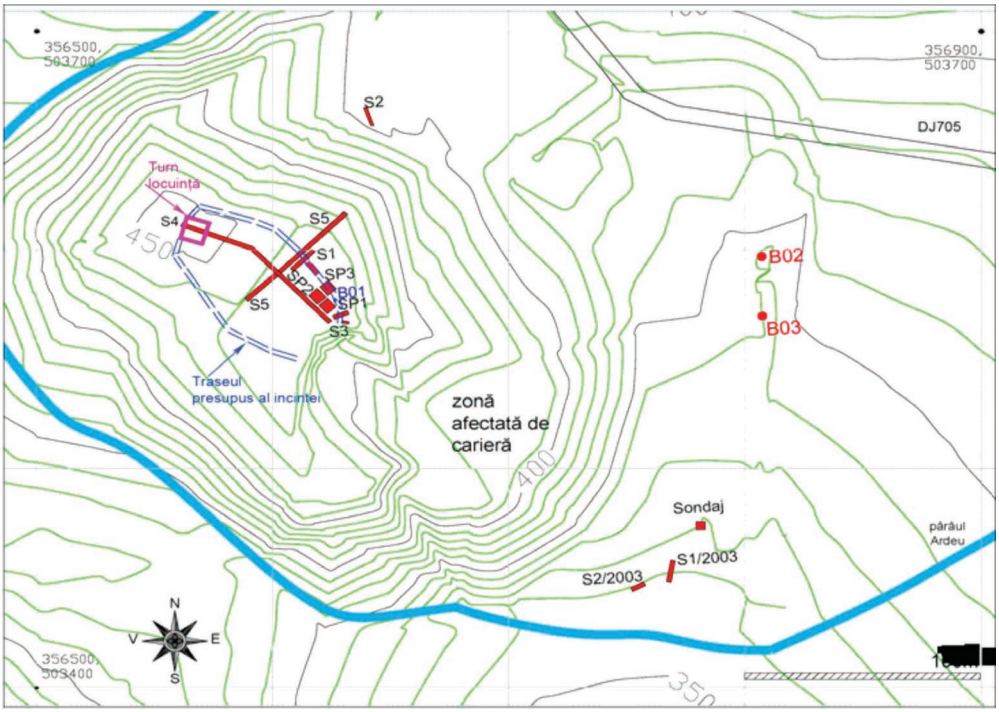

Fig. 17. Topographic survey of the Dacian site in Ardeu

The most recent contribution belongs to the team of geophysicists coordinated by Dan Ștefan. This survey completes the data of the first topographic map in 2001 (Fig. 17). This product includes all the sectors of the archaeological complex, i.e. all pieces of information accumulated during the various research campaigns, an element vital to the construction of a three dimensional model of the site. The team has created a system of landmarks that were the connection between the archaeological and topographical grids, and also with the network of geographical coordinates.

Instead of conclusions

The cartographic sources analyzed here that include the micro-sector of Ardeu can be grouped in three categories: maps of low accuracy (those dated until the first half of the eighteenth century), general maps (those dated to the eighteenth century, including the *Josephinische Landaufnahme*), and modern/professional maps (from the *Zweite oder Franziszeische Landesaufnahme* until the topographical survey that focuses on the archaeological site).

Though the available cartographic sources do not focus on the depiction of the archaeological site in Ardeu, they nevertheless contribute significantly to the historical knowledge of the site. Through the analysis of data extracted from the employed maps, I was able to approximate the shape, size and limits of the fortification, the route of the road leading towards the fortification, and the latter's perimeter. The geographical characteristics that are topographically relevant for Cetățuie reveal the reasons behind the erection of the fortification on that spot which holds obvious geo-strategic value and the spatial relation to the civilian settlement, the funerary and religious areas, water sources, useful primary materials etc.

The possibility and interpretation of following the natural geo-morphological changes of the sector of the Dacian complex (foresting/deforesting, quarries, creation of roads and paths) over a long period was one of the goals of our research team. The main objective remained that of identifying new archaeological areas or sectors with archaeological potential and of explaining, through the perspective of analyzing certain recent changes, certain situations that can generate areas that are improper to habitation or to being used for temporary activities.

From the analysis of cartographic sources we have excluded certain products (for ex. general, physical, tourist, geological/karstic maps, products such as the OpenSteetMap, Google Maps, and satellite images), due to their generally small volume of data for the area under research. This analytic, in-detail study, as compared to the micro-region, of monographic character, can have a decisive impact on the elaboration of regional studies, despite the fact that rendering the formats of the cartographic documents compatible with each other and their geo-referencing were not among our short-term objectives. The advantages of employing the new technologies are immense for all those involved in this academic initiative (historians, archaeologists, cartographers, computer programmers, statisticians). Some of the data extracted from specialized databases (DEMs, digital elevation models), combined with cadastral maps, would have been useful to the present initiative, but, at the present stage of documentation, gaining access to the primary information proved difficult.

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Abbreviations

AAC	Acta Archaeologica Carpathica. Cracovia.
AARMSI	Analele Academiei Române. Memoriile Secțiunii Istorice. București.
ACSSTU	Annals. Computer Science Series Tibiscus University. Timișoara.
ActaArchHung	Acta Archaeologica Academiae Scientiarum Hungaricae. Budapest.
AÉ	Archaeologiai Értesitõ. Budapest.
AGGH	Acta Geodaetica et Geophysica Hungarica. Budapest.
AIINC	Anuarul Institutului de Istorie Națională Cluj. Cluj-Napoca.
AISC	Anuarul Institutului de Studii Clasice. Sibiu.
AJPA	American Journal of Physical Anthropology. New York.
Alba Regia	Alba Regia. Annales Musei Stephani Regis. Az István Király Múzeum Közleményei. Székesfehérvár.
AMN	Acta Musei Napocensis. Cluj-Napoca.
AMP	Acta Musei Porolissensis. Muzeul Județean de Istorie şi Artă Zalău. Zalău.
AnB S.N.	Analele Banatului, Serie nouă. Timișoara.
Analele ANTIM	Analele Asociației Naţionale ale Tinerilor Istorici din Moldova. Chișinău.
Apulum	Apulum. Alba-Iulia.
ArchKorrbl	Archäologisches Korrespondenzblatt. Urgeschichte, Römerzeit, Frühmittelalter. Mainz.
ArhMed	Arheologia Medievală. Brăila, Reşiţa, Cluj-Napoca.
AS	Acta Siculica. Sepsiszentgyörgy/Sfântu Gheorghe.
ATS	Acta Terrae Septencastrensis. Sibiu.
AUVT	Annales d'Université Valahia Targoviste, Section d'Archéologie et d'Histoire. Târgoviște.
BAM	Brvkenthal Acta Mvsei. Sibiu.
BAR International Series	British Archaeological Reports, International Series. Oxford.
Banatica	Banatica. Muzeul Banatului Montan. Reșița.
BÁMÉ	A Béri Balogh Ádám Múzeum Évkönyve. Szekszárd.
BCȘS	Buletinul Cercurilor Științifice Studențești. Istorie-Arheologie-Muzeologie. Alba Iulia.
BerRGK	Bericht der Römisch-Germanischen Komission des Deutschen Archäologischen Instituts, Frankfurt a. M .- Berlin.
BHAB	Bibliotheca Historica et Archaeologica Banatica. Timișoara.
BSNR	Buletinul Societății Numismatice Române. Societatea Numismatică Română. București.
Caietele CIVA	Caietele CIVA. Cercul de Istorie Veche și Arheologie. Alba Iulia.
CCA	Cronica cercetărilor arheologice. București.
CCDJ	Cultură şi civilizaţie la Dunărea de Jos. Muzeul Dunării de Jos. Călăraşi.
CN	Cercetări Numismatice. Muzeul Național de Istorie a României. București.
CNA	Cronica Numismatică și Arheologică, Societatea Numismatică Română. București.
Corviniana	Corviniana. Acta Musei Corvinensis. Hunedoara.
Crisia	Crisia, Muzeul Ţării Crişurilor, Oradea.
Cumania	Cumania. A Bács-Kiskun Megyei *Önkormányzat* Múzeumi Szervezetének *Évkönyve*. Kecskemét.
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DMÉ	A Debreceni Déri Múzeum Évkönyve. Debrecen.
DolgKolozsvár	Dolgozatok az Erdély Nemzeti Múzeum Érem- és Régiségtárából (Travaux de la section numismatique et archéologique du Musée National de Transylvanie). Kolozsvár/Cluj-Napoca.

DolgSzeged	Dolgozatok a Szegedi Tudományegyetem Régiségtudományi Intézetéből. Szeged.
Drobeta	Drobeta. Muzeul Regiunii Porților de Fier. Drobeta Turnu-Severin.
EME	Erdélyi Múzeum Egyesület. Cluj-Napoca.
EphNap	Ephemeris Napocensis. Cluj-Napoca.
ETF	Erdélyi Tudományos Füzetek – Erdélyi Múzeum Egyesület. Kolozsvár/Cluj-Napoca.
FdI	File de istorie, Muzeul de Istorie. Bistrița.
FolArch	Folia Archaeologica. A Magyar Nemzeti Múzeum Évkönyve. Annales Musei Nationalis Hungarici. Budapest.
Germania	Germania. Anzeiger der Römisch-Germanischen Komission des Deutschen Archäologischen Instituts. Berlin.
História	História – történelmi folyóirat. Budapest.
HK	Hadtörténelmi Közlemények. Budapest.
HOMÉ	A Herman Ottó Múzeum Évkönyve. Miskolc.
Istros	Istros. Muzeul Brăilei. Brăila.
JAHC	Journal for the Association of History and Computing. Michigan University.
JahrbRGZM	Jahrbuch des Römisch-Germanischen Zentralmuseums zu Mainz, Mainz.
JAMÉ	Janus Pannonius Múzeum Évkönyve. Pécs.
KL	Kartografické listy. Bratislava.
Korall	*Korall Társadalomtörténeti Folyóirat*. Budapest.
Közl	Közlemények az Erdélyi Nemzeti Múzeum Érem- és Régiségtárából. Kolozsvár/Cluj-Napoca.
Lucrări	Lucrări Ştiinţifice. Istorie-Ştiinţe-Pedagogie, Institutul Pedagogic. Oradea.
GT	Geographia Technica. International Journal of Technical Geography. Cluj-Napoca.
Marisia	Marisia. Marisia. Studii și materiale. Arheologie – Istorie – Etnografie. Târgu-Mureș.
MCA	Materiale și Cercetări Arheologice. București.
MEKSB	A Miskolci Egyetem Közleménye. A sorozat, Bányászat. Miskolc.
MFMÉ StudArch	A Móra Ferenc Múzeum Évkönyve. Studia Archaeologica. Szeged.
MFMÉ MonArch	A Móra Ferenc Múzeum Évkönyve. Monumenta Archeologica. Szeged.
MHB	Monumenta Historica Budapestinensia. Budapest.
MIM	Materiale de Istorie și Muzeografie, Muzeul de Istorie a Municipiului București. București.
MSW	Materialy Starozytne Wczesnosredniowieczne. Kraków.
MW	Materialy Wczesnośredniowieczne. Kraków-*Wrocław*-Warsawa.
NK	Numizmatikai Közlöny, Magyar Numizmatikai Társulat. Budapest.
NNT	Norsk Numismatisk Tidsskrift.
NZ	Numismatische Zeitschrift, herausgegeben von der numismatischen Gesellschaft in Wien. Wien.
OJA	Oxford Journal of Archaeology, Oxford.
OpHung	Opuscula Hungarica. Budapest.
PBF	Praehistorische Bronzefunde.
Potaissa	Potaissa. Studii și comunicări. Turda.
PZ	Prähistorische Zeitschrift. Berlin.
Régészeti Füzetek	Régészeti Füzetek. Magyar Nemzeti Múzeum. Budapest.
RÉSÉE	Revue des Études Sud-Est Européenes. l'Institut d'Études Sud-Est Européennes de l'Académie Roumaine. București.
RI	Revista de Istorie, Institutul de Istorie „Nicolae Iorga". București.
RM	Revista Muzeelor. Centrul pentru Formare, Educație Permanentă și Management în Domeniul Culturii. București.
RRH	Revue Roumaine d'Histoire, Academia Română. București.
Sargetia	Sargetia, Muzeul Civilizației Dacice și Romane Deva.

Savaria	Savaria – a Vas megyei múzeumok értesítője. Pars historico-naturalis. Szombathely.
SCIVA	Studii și Cercetări de Istorie Veche (și Arheologie). București.
SCN	Studii și Cercetări Numismatice. Institutul de Arheologie „Vasile Pârvan". București.
SCȘI	Studii și Cercetări Științifice. Istorie.
SIB	Studii de Istorie a Banatului. Universitatea de Vest Timișoara.
SlovArch	Slovenská Archeológia. Bratislava.
SMIM	Studii și Materiale de Istorie Medie. Institutul de Istorie „Nicolae Iorga". București.
SMK	Somogyi Múzeumok Közleményei. Kaposvár.
SSCR	*Social Science Computer Review. North Carolina State University.*
Speculum	Speculum. Cambridge Journals Online. Cambridge.
StComCaransebeș	Studii și Comunicări. Etnografie. Istorie. Caransebeș.
StComSatuMare	Studii și Comunicări. Satu Mare.
Stratum plus	Stratum plus Journal. High Anthropological School University. Cultural Anthropology & Archaeology.
Studia Caroliensia	Studia Caroliensia. A Károli Gáspár Református Egyetem szakfolyóirata. Budapesta.
Studia Comitatensia	Studia Comitatensia. Tanulmányok Pest Megye Múzeumaiból. Szentendre.
Századok	Századok. A Magyar Történelmi Társulat Folyóirata. Budapest.
Terra Sebus	Terra Sebus. Acta Musei Sabesiensis. Sebeș.
Thraco-Dacica	Thraco-Dacica. București.
Transilvanian Review	Transilvanian Review/Revue de Transylvanie. Cluj-Napoca.
TS	Történelmi Szemle. A Magyar Tudományos Akadémia Történettudományi Intézetének Értesitöje. Budapest.
UPA	Universitätsforschungen zur Prähistorische Archäologie. Bonn.
VAH	Varia Archaeologica Hungarica. Budapest.
VMMK	Veszprémi Megyei Múzeumok Közleményei. Veszprém.
World Archaeology	World Archaeology. London.
ZfA	Zeistchrift für Archäologie. Berlin.
Ziridava	Ziridava, Complexul Muzeal Arad. Arad.
ZMSW	Zeitscrift für Münz-, Siegel- und Wappenkunde. Berlin.