The Fortlets on the Frontier of Dacia Porolissensis: Structures, Landscape, Functionality

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Abstract: The frontier of Dacia Porolissensis was developed within a tripartite scheme or form of organization. In the first line there were the auxiliary forts, in the second one the *burgus*-type structures and in the third and most remote one, the watchtowers, all these military features being connected by roads and reinforced in the most important areas by linear fortifications. The present study will deal with the second line of *burgus*-type structures, trying to establish as much as possible their role within the mechanism of the frontier of Dacia Porolissensis. This kind of military border installations has never been studied separately; such being the case, this article aims to quantify all the available information and to bring, as much as possible, a better understanding of how these middle fortifications are actually in charge of *intra* and *extra provinciam* traffic and commerce and also, most probably, to intercept small hit-and-run bands or reduced scale brigandage.

Keywords: Roman frontier, Dacia Porolissensis, *burgi*, middle fortifications, functionality.

Rezumat: Fortificațiile mediane de pe frontiera Daciei Porolissensis: structuri, peisaj, funcționalitate. Frontiera Daciei Porolissensis a fost organizată într-o schemă sau formă tripartită de funcționare. În prima linie erau castrele auxiliare, în a doua structurile de tip *burgus* (fortificații mediane) iar în a treia și cea mai îndepărtată, turnurile de supraveghere, toate aceste elemente militare fiind conectate între ele prin drumuri și întărite în cele mai importante zone cu fortificații liniare. Prezentul studiu tratează a doua linie de structuri de tip *burgus*, încercând să stabilească pe cât posibil rolul lor în cadrul mecanismului frontierei Daciei Porolissensis. Acest tip de instalații militare limitrofe nu a mai fost studiat separat, din acest motiv, acest articol își propune să cuantifice informația disponibilă și să aducă, pe cât posibil, o mai bună înțelegere asupra rolului acestor fortificații mediane în traficului *intra* și *extra* provinciam, a comerțului cât și a rolului, cel mai probabil, în interceptarea micilor raiduri ori a brigandajului la scară redusă.

Cuvinte-cheie: Frontiera romană, Dacia Porolissensis, *burgi*, fortificații mediane, funcționalitate.

SUBB – Historia, Volume 63, Number 1, June 2018
doi:10.24193/subbhist.2018.1.03

During the field surveys and archaeological excavations of the physical elements which form the visible heritage of the frontier of Dacia Porolissensis[1], there were identified, except for surveillance towers, several fortifications interposed between the auxiliary forts and the chain line of watchtowers. These structures are generally called in the Romanian studies *burgi*[2] or *castella*[3]. As I tried to demonstrate in another study[4], there is a slight difference between a watchtower[5], which is a small-sized fortification, and a medium-sized one, known generally in several sources as *burgi*[6], both in physical layout and in functionality. Based on the fact that there are currently unfinished discussions about the proper use of the ancient term, we will henceforth employ the usual term *fortlet*, to name these medium structures[7].

However, in this study we will not discuss again the terminology or the difference between certain frontier fortifications, but we will try to underscore the role of these *burgi*-type structures in the frontier mechanism of Dacia Porolissensis, together with an up-to-date archaeological information about them. Besides, in order to understand better their preserved features and their functionality in the frontier landscape, we used a series of topographical surveys and geostatistic analyses such as Cumulative Viewshed Analysis, (CVA), Line of Sight (LoS) and Least Cost Analyses (LCA). But before we start the discussion about their role, we must review the available information about their structures and internal planning.

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[1] See especially Torma 1863; Torma 1880, Buday 1912, 103-118; Buday 1914, 95-105; Marțian 1921; Daicoviciu 1935, 240-256; Ferenczi 1941, 189-214; Rádnoti 1945, 137-138; Ferenczi 1967, 143-162; Ferenczi 1972, 37-46; Ferenczi 1973, 79-105; Ferenczi 1976, 107-133; Ferenczi 1988, 251-289; Gudea 1985, 143-218; Gudea 1989, 10-1178; Matei 1996, 63-73; Gudea 1997; Matei 2007, 250-269; Marcu/Cupcea 2013, 569-589; Opreanu/Lăzărescu 2016; Zăgreanu *et al.* 2017, 25-45.

[2] See especially Gudea 1986, 189-193.

[3] The discussion in Ferenczi 1968, 75-98 and Ferenczi 1971, 599-625.

[4] Cociș 2017, 43-51, with previous bibliography.

[5] For example CIL VIII 20816: *Imp(erator) Caesar M(arcus) Aurel(ius) Commodus / Antoninus Aug(ustus) P(ius) Germanicus Sarmaticus Britannicus / Maximus securitati provincialium suorum c(o)nsulens / turres novas instituit et veteres refecit oper(a) militum / suorum curante / Cl(audio) Perpetuo proc(uratori) suo.*

[6] For example, AÉ 1910, 145 = AÉ 1952, 15 = RIU 1135 = PIR² C 1359: *Imp(erator) Caes(ar) M(arcus) Aur(elius) [[C[ommod]us]] / Antoninus Aug(ustus) Pius Sarm(aticus) Germ(anicus) Britt(anicus) / pont(ifex) max(imus) trib(unicia) pot(estate) VI imp(erator) IIII co(n)s(ul) IIII p(ater) p(atriae) / ripam omnem burgis a solo ex/tructis item praesidi(i)s per loca / opportuna ad clandestinos latrun/culorum transitus oppositis mu/nivit per [[L(ucium) Cornelium Felicem]] / [[Plotianum leg(atum) pr(o) pr(aetore)]].*

[7] See in this direction mainly Marcu 2009, 11-12; Symonds 2018, 5-12.

A. The structures

At this moment there are clearly known 13 (2 of them with question mark) frontier fortlets within the province of Dacia Porolissensis, the majority being identified and excavated in the north-western part of the frontier, three of them on the northern sector of the frontier and one in the north-east. The discussion will start with examples from the Meseș Mountains area.

1. The fortlet of Poieni (Poieni commune, Cluj county)/Plate I.1.

The first medium frontier structure known in the north-western area of the *limes Porolissensis* is the fortlet of Poieni. It was first discovered and described by the Hungarian scholar Torma K. at the end of the 19th century[8]. Since then, his description was repeatedly reproduced in a series of studies concerning the north-western frontier[9]; some authors had denied its existence[10]. As described by Torma, the structure is situated on a promontory at the confluence of a creek (Vărădeștilor Valley) with the Criș river[11]. Its dimensions were 50 x 47 m[12]. A wall was connected to this structure, already destroyed by the creek in the 19th century, intermingled with a *clausura*[13] that ran almost 300 m west on the neighbouring hill, blocking the access to the valley[14]. Unfortunately, the structure and the wall are completely destroyed nowadays, the only visible element is the *clausura-vallum* system[15]. There is no information regarding its internal layout.

2. The fortlet of Negreni-Cetatea lui Cimpoca (Negreni commune, Cluj county)/Plate XIII.1.

Located 15 km west of Poieni, the structure lies on a promontory above the riverside of the Criș. The given dimensions of the first square enclosure are about 44.50 x 46 m and of the second 55.55 x 55.50 m[16]. However, after a topographical survey, the real dimensions of the outer enclosure seem to be 70 x 55.5 m. The discontinuance seen by N. Gudea[17] is

[8] Torma 1880, 53-55.
[9] Téglás 1907 573-574; Daicoviciu 1935, 254; Ferenczi 1959, 344-345; Ferenczi 1967, 151; Gudea 1985; Gudea 1997, 37.
[10] Daicoviciu 1935, 254.
[11] Torma 1880, 54.
[12] Gudea 1997, 37.
[13] Torma 1880, 54.
[14] Torma 1880, 54-57; Buday 1912, 104-107; Ferenczi 1959, 342-344; Ferenczi 1968, 82-83; Gudea 1985, 161; Gudea 1997, 38; the archaeological profile of S III / 1972 at 105, fig. 13; Daicoviciu 1935, 254 considered that the *vallum* is not an anthropic structure.
[15] Cociș 2016, 74.
[16] Gudea 1997, 36.
[17] Gudea 1997, 36.

located on the eastern side of the structure. There is as yet no archaeological research available for this structure. However, in the first account concerning it, Finály G. describes a 6 m wide and 4.50 m deep ditch, bricks, some worked stones and also an *aureus* from Nero[18]. The structure is partially covered by a modern household. Excavations are the only way to confirm or disprove the hypotheses. What is worth mentioning is that if the structure is indeed a Roman fortlet and its chronology is in connection with the one of Poieni and the frontier system, then it might be possible to have a *Vorlimes* controlling point on the Criș river. Situations of advance fortlets are known for example in Germany, their role being that of an improved control network in highly important areas[19].

3. The possible fortlet from Hodișu-Dosul Turcului or Cetate (Poieni commune, Cluj county)/Plate I.

The structure was initially described by Buday A.[20] and afterwards by N. Gudea[21]. It is located on a high gorge situated between Greben and Sonului hills[22], where there are also two signalling towers[23]. The dimensions of this structure are 40 x 30 m[24]. Unfortunately, the building was not excavated. Only the towers were archaeologically investigated[25].

4. The possible fortlet of Vânători-Dealul Cocinilor (Ciucea commune, Cluj county)/Plate I.

As in the previous case, neither this structure has been archaeologically investigated. All we know about it is that it is located on a promontory[26], probably near a valley access and in connection with the two towers (Cornul Vlașinului 1 and 2[27]). The possible dimensions are 36 x 36 m[28].

5. The fortlet of Ponița-Poic, La arie (Horoatul Crasnei commune, Sălaj county)/Plate II.3.

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[18] Finály 1864, 8-9.

[19] Breeze 2012, *passim*. See also the cases of the *Pannonian* watchtowers across the Danube (Visy 2011, 33-48).

[20] Buday 1912, 108-109.

[21] Gudea 1985, 164.

[22] Buday 1912, 108-109, Gudea 1985, 164, Gudea 1997, 44.

[23] Torma 1880 60-61, no. 6-7; Téglás 1907, 574-576, Buday 1912, 107-109; Ferenczi 1959, 347; TIR L34, 119; Ferenczi 1967, 147, 151; Gudea 1971, 517-519; Gudea 1985, 163-164, Gudea 1997, 43-45.

[24] Gudea 1997, 44

[25] Gudea 1997, 43-44, 110 fig.18, 111 fig.19.

[26] Buday 1912, 108-109; Ferenczi 1967, 150-151; Gudea 1985, 164; Gudea 1997, 45.

[27] Torma 1880, 61; Buday 1912, 107-109; TIR L34, 119; Gudea 1971, 519; Gudea 1985, 165-166; Gudea 1997, 45-46, 111 fig.19.

[28] Ferenczi 1967, 150.

Its topographical emplacement follows the same logic: about 300 m from a creek, on an elevated ground, keeping in sight Poicului Valley[29], which constitutes one of the main access ways into the province. The structure has a double square earth enclosure. The first one measures 17 x 22 m and the second 25 x 25 m, with 3.50 m between them. Also, a 2 m wide and 0.50 m deep ditch was observed. In 1984, N. Gudea excavated part of this structure; he found Roman mortar and potsherds[30]. The fortlet is in visual and acoustic connection with 4 towers[31].

6. The fortlet of Stârciu – Dealul Secuiului (Horoatul Crasnei commune, Sălaj county)/Plate II.4.

The structure is roughly located on the northern slope of the hill[32]. From this position, the structure could easily have observed Ragului Valley[33]. In 1968, N. Gudea excavated (by a 10 x 1.50 m trench) the western side of the structure. Its dimensions are 47 x 55 m. In front of it lies an earth mound, 6 m wide at its lowest point and 1.50 m tall, made of well-trodden yellowish soil with a 3-3.50 m wide and 1-1.30 m deep ditch[34]. The structure has line of sight with 10 towers[35]. Behind this fortlet runs a 500 m long *clausura* that blocks Ragului Valley[36] and connects the same 10 towers. It is possible, however, that this fortlet structure be assigned to an earlier phase of the frontier, because of its relation to the *clausura*; a fortlet is generally located behind or in connection with a wall or an earth *clausura*, not in front of it, especially not 1 km in front of it, as in this case. However, as D. Breeze stated, the Roman frontiers must be considered within a chronological time span, they did not appear completely formed, they developed[37].

7. The fortlet of Ortelec – La Strâmtură, Fântâna Șușigului (Zalău, Sălaj county)/Plate III.3, Plate IV.

The structure was identified in 1976 by Alexandru V. Matei[38], even though, the wall that connects the tower of Măgurice Hill[39] with the

[29] Gudea 1997, 47.
[30] Gudea 1997, 47.
[31] Gudea 1997, 47.
[32] Torma 1880, 75; Buday 1912, 113; TIR L34, 106; Gudea 1985, 167-168; Gudea 1997, 53.
[33] Gudea 1997, 53.
[34] Gudea 1997, 53.
[35] Gudea 1997, 53.
[36] Gudea 1985, 168; Gudea 1997; 54.
[37] Breeze 2011, 5.
[38] Marțian 1921, 6-8, 10 mentions the ruins in passing; Matei 1979, 129; Gudea 1985, 102-103; Gudea 1985a, 177-178; Matei 1996, 63-73; Matei 1997, 93-101; Gudea 1997, 74-75; Matei 2007, 250-269.
[39] Ferenczi 1941, 209; Ferenczi 1967, 146; Radnóti 1945, 146; Gudea 1985, 176; Gudea 1997, 72-73.

medium-sized structure was discovered much earlier[40]. The location of the site follows the same pattern, on a plateau, only this time it is located at the narrowest point of the valley[41]. The first archaeological excavations took place in 1976. With a single trench of 10 x 1.5 m placed on the southern side of the structure, N. Gudea and A. V. Matei determined that the fortlet measured 50 x 55 m, with 1.25 m thick walls built in the *opus incertum* technique. In front of the wall there is a 5 m wide and 2 m deep ditch. Inside the structure, an *agger* made of yellowish soil was identified, 8-10 m wide at the lowest point and 1-1.50 m high. There was also a smaller wooden phase identified[42]. The archaeological material was composed of common pottery, stamped pottery, bricks, tiles, iron and bronze objects[43].

There was again an excavation in 2010, unfortunately the process was stopped due to several difficulties. With two archaeological trenches (S1/2010 of 18 x 1.5 m and S2/2010 of 8 x 1.5 m[44]), new important aspects were highlighted. The interior layout of the fortlet consists in a corner watchtower and most probably one (or more?) barrack(s)[45]. Also, an open fireplace was discovered. The archaeological material was quite rich, being represented by *tegulae*, common grey pottery, animal bones and a spearhead[46].

8. The fortlet of Brebi – Brebi I, Roata Dungii (Creaca commune, Sălaj county)/Plate III/1, Plate V.

It was initially discovered by Torma K.[47], being drawn by Buday A.[48]. Further research was carried out by C. Daicoviciu who excavated the structure for the first time, discovering burnt clay, wooden rods and a few potsherds[49]; in his opinion the structure dates to the first decades of the 2nd century[50]. I. Ferenczi was the next one who saw and described the ruins of the fortlet, in 1941[51]. Systematic archaeological research was carried out by M. Macrea and his team, in 1959[52]; three trenches (S1/1959 of 84 x 1 m,

[40] See for this the history of research in Cociș 2016a, 41-76.
[41] Matei 1979, 129; Gudea 1997, 74.
[42] Gudea 1985, 102; Gudea 1997, 75.
[43] Gudea 1985, 102.
[44] Pop, Csók 2010, 250.
[45] Pop, Csók 2010, 251.
[46] Pop, Csók 2010, 251.
[47] Torma 1864, 35.
[48] Gudea 1989, 96. The structure was seen also by I. Marțian (Marțian 1921, 55, fig. 4).
[49] Daicoviciu 1935, 255.
[50] Daicoviciu 1935, 255; for the debate regarding the chronology of the Brebi I fortlet see Gudea 1989, 99.
[51] Ferenczi 1941, 193.
[52] Macrea *et al.* 1962, 493.

S2/1959 of 53 x 1 m and S3/1959 of 5 x 1 m) and an open surface (7 x 7 m) were carried out[53]. The dimensions established after the excavations are 61 x 62.50 x 58.50 x 64 m[54]. The earth enclosure of the fortlet is about 80 cm high, with a defensive ditch surrounding the structure. Unfortunately, there is an almost complete lack of useful information after this excavation. What we know (but not for sure) is that there are two possible layers of habitation and traces of a wooden barrack with a roof made of *imbrices*, the archaeological material being composed of reddish pottery, bronze and iron objects and an (undetermined) coin[55].

9. The fortlet (fortified gateway?) of Brebi-Brebi II (Creaca commune, Sălaj county)/Plate III.2, Plate VI.

The second fortlet of Brebi II is located 600 m north from Brebi I, being also integrated in the linear *clausura* that is barring the Orteleculuі Valley[56]. It was also discovered by Torma K.[57] and drawn by Buday A.[58]. C. Daicoviciu excavated inside the fortification for the first time but the data published by him are very precarious[59]. A more detailed description is made by I. Ferenczi, who contested Buday's plan[60]. The interesting fact is that in Ferenczi's drawing we can observe two small barracks inside the earth enclosure[61]. The real dimensions of this structure, calculated on the Digital Surface Model, are 33.56 x 30.95 m. It was excavated by M. Macrea and his team in the same archaeological campaign of 1959, using only a single trench: S1/1959 of 56 x 1 m[62]. They identified also a defensive ditch of 2.25 x 0.25 m[63]. On the western side, Macrea observed that the earth enclosure has a gap of 3.5 m[64], confirmed by us in the field. This particular aspect makes me believe that this structure could be a fortified gateway[65], not a fortlet structure, from an earlier phase of the frontier[66]. Obviously,

[53] The unpublished excavation journal of I. Mitrofan, after Gudea 1989, 97.
[54] Gudea 1989, 97 citing I. Mitrofan's archaeological journal. For stratigraphy, archaeological material and technical discussions see mainly Gudea 1989, 97-99.
[55] Gudea 1989, 98-99.
[56] Gudea 1989, 100.
[57] Torma 1880, 81.
[58] Buday 1914, 103.
[59] Daicoviciu 1935, 255.
[60] Ferenczi 1941, 197.
[61] Ferenczi 1941, 198, fig. 7.
[62] Macrea *et al.* 1962, 492; Gudea 1989, 101.
[63] Gudea 1989, 101.
[64] Gudea 1989, 101.
[65] See especially Manning/Scott 1979, 19-60; Breeze/Dobson 2000, 40; Hodgson 2005, 183-188. For the case of Dacia Porolissensis see Matei 1996, 63-76; Matei 2007, 250-269.
[66] A particular characteristic of this segment of the north-western frontier of Dacia Porolissensis is the existence of a quasi-linear frontier system. In this case, the fortlet of La

this is only a theoretical statement which must be archaeologically confirmed or denied.

10. The possible fortlet of Podișu (Ileanda commune, Sălaj county)/Plate I.

A possible structure could be situated at Podișu. The site is located on a terrace above the Someș meadow[67]. On the surface one can observe brick fragments, *tegulae* and potsherds[68]. When the owner of the field where the site is located dug 2 m deep in order to build a series of groundworks, a stone wall was found along with a large number of bricks[69]. The structure is basically located halfway between the auxiliary forts of Tihău and Cășeiu-*Samum*, where the main frontier watchtower line crosses the Someș River. Nearby this structure there is a watchtower[70], Podișu being anyway in the line of sight of several towers on both sides of the river. Only further non-intrusive research and archaeological excavations could determine the nature of this structure.

11. The fortlet of Negrilești – Cetatea lui Negru Vodă (Negrilești commune, Bistrița-Năsăud county)/Plate VII.1.

The structure and the site itself were the subject of an ongoing debate since the beginning of the the 20th century[71]. Its relative dimensions are approximately 35 x 30 m[72] and it is located near a watershed, on a low

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Strâmtură, which actually is the Meseş Gate pass (Matei 2007, 2007), is connected to a 3.5 km wall that obstructs this narrow pass into the province. However, A. V. Matei identified and excavated two entry gates in the architecture of the wall. Excavating, he found that in a second phase of the wall the gate entry (which was 2.60 m wide) was blocked by a wall and in a third phase a round tower was built over the blocked gate (7 meters in diameter). Behind the wall, several new towers were found in connection with the quasi-linear system. These minor gate entries with their short existence could be compared with the minor passages in the German *Pfahlgräben*, known only in a single phase of the frontier. Probably their purpose in the first phase (as in many cases of linear frontiers) was to control the movement over the frontier (even M. Macrea mentioned that he found a Roman *fibula* in the excavations, but there are no further data about it; Gudea 1989, 101).

[67] Ferenczi 1988, 269; Bajusz/Tamba 1988, 92; Luca/Gudea 2010, 86.

[68] Bajusz/Tamba 1988, 92.

[69] Ferenczi 1988, 269-270; Bajusz/Tamba 1988, 92.

[70] The Roman watchtower of Rogna-Bontauă, located on the left bank of the river Someș; for further details see Ferenczi 1988, 267, fig. 29.

[71] The structure was mentioned for the first time by J. Kádár in 1901 (Kádár 1901, 222), who believed that the site was actually a stronghold belonging to the voivode Radu Negru. In 1920 I. Marțian (Marțian 1920, 28, no. 459) took the idea of Kádár up again. One year later, the same author (Marțian 1921, 23-24) considered that the structure was actually a Dacian fortress located there to defend the valley. After detalied fieldwalking, I. Ferenczi concluded that the structure is actually a Roman *burgus*, due to the type of construction, its location and Roman potsherds, plus two inscriptions already found on the site (Ferenczi 1973, 95).

[72] Cociș 2016, 55.

plateau near a narrow pass, being in visual and acoustic connection with at least two towers[73]. But what is most important is that from the surface of the fortlet come two inscriptions. The first one is an altar dedicated by P. Aelius Atilianus, *decurio ex singulari consularis* to Silvanus and Diana[74]. As G. Cupcea already argued, Atilianus could have been detached by the governor on the Dacian frontier with a special mission[75]. The other possibility is that a *decurio* was in charge of the troops stationed in a fortlet[76]. The second inscription is a fragment, discovered and read by I. Ferenczi: *...E (?) SATVR.../...MILI...*[77]. However, his lecture was not correct and a new one was proposed: *[---e]t? Saur(-ius?; -io?;-nus?;-us?) [---] / [---] mile[s]*[78].

12. The fortlet of Salva – Cetățea (Salva commune, Bistrița-Năsăud county)/Plate VII.2.

The last but one element of our study is located on a high plateau near the Someş river. It was recently identified by the author by means of a written account dating back to 1864[79]. On the surface one can see potsherds, stones and mortar. On the field, only the western side of the structure, with the length of 31 m, can be observed. Unfortunately, it is heavily damaged by the intensive agriculture, an ongoing process. This fortlet is visually and acoustically interconnected with three watchtowers[80].

13. The fortlet of Lunca – Coasta Rotundului (Șieuț commune, Bistrița-Năsăud county)/Plate VIII.1-2[81].

The last structure discussed in the present study was recently discovered using aerial photography[82]. It is located on the path of a ridge road, a main accessway on the eastern frontier, behind the watchtower of

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[73] Ferenczi 1973, 94-98; for CVA (Cumulative Viewshed Analyses) see Cociș 2016, 65.

[74] Nemzeti Társalkodó1831, no. 18; Finály 1911, 433-436; AÉ 1913, 54; Daicoviciu 1940, 332; Radnóti 1945, 139; TIR L34, 52-53; Bărbulescu 1972, 221; Ferenczi 1973, 95, n.17; ILD 795; Cupcea 2010, 390: *Dian(a)e et / Silvano / sacrum / P(ublius) Ael(ius) Atili/anus dec(urio) ex si/ng(ulari) co(n)s(ularis) / fecit.*

[75] Cupcea 2010, 390; Cupcea 2014, 55.

[76] An approach in this direction in Symonds 2018, 16-21. Based on a batch of *ostraca* from the Eastern Desert, in the top of the hierarchy of soldiers dispatched in a fortlet there was a *curator* (See especially Reddé 2006, 248 for the interior planning of the Maximianon fortlet and Symonds 2018, 20 for the general discussion).

[77] Ferenczi 1973, 94-98.

[78] Cociș 2016, 58, 67.

[79] Retegan 2002, 163. The location itself was originally identified by L. Vaida (Vaida *et al.* 2009, 80).

[80] Ferenczi 1973, 184-185; Cociș 2015, 46-51.

[81] Even though its proximity to the auxiliary fort of Brâncovenești could indidicate that the fortlet is located in *Dacia Superior/Apulensis*, its features are important for our discussion.

[82] Pánczél/Szabó 2015, 94.

Vătava (4.5 km north west). It is heavily affected by modern exploitation roads. However, the dimensions measured on the field are approximately 30 x 30 m[83]. No excavations of the structure or information regarding its elements or interior layout are known. As we can observe in the DTM and in the aerial photo, on all sides there is a double defensive system, with 2 *valla* and 3 ditches on the eastern side. The preserved elevation of the structure varies here and there between 1-2 m[84].

[83] Many thanks to my colleague Pánczél Szilamér for indicating the location of the structure *via* WGS coordinates and also for providing his latest research on the subject.
[84] See further Szabó *et al.* 2017, 116-119.

Nr.	Fortlet	Excava-tions	Dimensions	Layout	Internal planning	Archaeological material
1	Poieni	-	50 x 47 m 0.235 ha	Stone structure	-	-
2	Cetatea lui Cimpoca		70 x 55.5 m 0.385 ha	Stone structure(?)with defensive ditch		Bricks, bones, worked stones, coin
3	*Dosul Turcului*	-	40 x 30 m 0.120 ha	Earth enclosure	-	-
4	*Dealul Cocinilor*	-	36 x 36 m 0.129 ha	Earth enclosure	-	-
5	Poic	1984	1: 17 x 22 m 2: 25 x 25 m 0.062 ha	Double earth enclosures and defensive ditch	-	Mortar and pottery
6	Dealul Secuiului	1968	47 x 55 m 0.278 ha	Earth enclosure and a palisade-ditch system	-	-
7	La Strâmtură	1976 2010	50 x 55 m 0.275 ha	Stone structure with defensive ditch. Smaller wooden phase	Corner watchtower and barrack(s)	*Tegulae*, pottery, stamped pottery, animal bones, spearhead.
8	Brebi I	1933 1959	61 x 62.50 x 58.50 x 64 m 0.374 ha	Earth enclosure and defensive ditch	Barrack(s)	*Tegulae*, pottery, iron objects, bronze objects, coin
9	Brebi II	1933 1959	33.56 x 30. 95 m 0.103 ha	Earth enclosure, defensive ditch a possible gateway	Two possible barracks	Pottery, burnt clay and a *fibula*

10	*Podișu*	-	-	Stone structure(?) -	*Tegulae*, bricks, pottery
11	Cetatea lui Negru Vodă	-	35 x 30 m 0.105 ha	Stone structure -	Burnt clay, pottery, inscriptions
12	Cetățea	-	31 x - 30 x 30 m	Stone structure (?) -	Pottery, hand-made pottery, burnt clay
13	Coasta Rotundului	-	0.090 ha	Earth enclosure with traces of double ditch -	-

Table 1. Synoptic table with the dimensions of the fortlets on the frontier of Dacia Porolissensis (based on their total surface).

Even if there is a visible lack of research and excavations carried out on this type of peripheral military fortifications, one can draw some preliminary conclusions about the structures and their interior layout. First of all, the enclosures of the sites are made of (timber and) earth or stone, with a defensive or in some cases multiple defensive ditches. After all the observations made by previous researchers, it is possible that the earth enclosures be earlier that the stone ones in the frontier development, based mostly on the case of La Strâmtură. Again, without a systematic program, this statement is just theoretical.

In the second place, we can observe that were the archaeological excavations are more extensive, there are mentioned barracks inside the enclosure, one or two, where the soldiers were accommodated. In the case of La Strâmtură, is mentioned a corner watchtower. This particular case has a direct analogy on the eastern frontier, where the fortlet of Cetatea Hășmaș[85] (Ocland commune, Harghita county), recently reinvestigated[86], has a corner watchtower and a possible barrack. The presence of the barracks within these installations is a must, due to the fact that the soldiers are drawn from the auxiliary forts and outposted within these neighbouring fortlets, on a variable time span[87]. As for the first acoustic and inter-visibility studies, the applied methodology involved fire torches and yelling, all data being systematized in a visibility network scheme[88].

The dimensions of the structures vary from case to case, for Dacia Porolissensis the smallest structure being 25 x 25 m (Poic) and the biggest one, the Vorlimes-*burgus* of Negreni, measuring 70 x 55.5 m.

B. The Landscape

In order to postulate viable interpretations about the various levels of functionality, one must understand the landscape where these structures are located and their position within the physical layout of the frontier. The so-called mountain frontier concept (or type) of D. Breeze[89] cannot be automatically applied on the entire frontier discussed here, even if the frontier of Dacia Porolissensis is organized on a tripartite functionality

[85] See Ferenczi/Ferenczi 1982, 279-286 with previous bibliography. Another appropriate analogy is the *burgus*-type structure of Eremitu – Dealu Tompa, which has a 8 x 8 m corner watchtower (see especially Höpken *et al.* 2016, 241, fig. 3/3, 247).

[86] Fereczi/Ferenczi 1982, 279-286.The newest results were presented by Pánczél Szilamér and Sidó Katalin at the Symposium *Limes Forum* VI, held at Cluj, November 28-29, 2017.

[87] Breeze 1977, 4; Cuvigny 2006, 311-312; Symonds 2018, 25.

[88] Gudea 1979, 63-87.

[89] See Breeze 2012, 133-145. See also Breeze 2011 for the importance of the landscape settings within the frontier location.

scheme[90]. In Breeze's opinion, this type of frontiers is focused on the routes and on the valley access ways[91], therefore the position of the physical elements on the terrain is mainly generated by the topographical layer[92], a defining structural element.

The position of the frontier's physical elements on the north-western side of the Province, mainly from Bologa to Porolissum, is roughly following the Meseș Mountains alignment[93]. This alignment separates two major relief units: the Transylvanian Plateau in the east and the Pannonian Plain in the west[94]. The Meseș line suffered in time major fragmentations which, combined with the alignment of springs, produced from place to place discontinuities[95]. These discontinuities (valleys) were used as access ways or corridor ways into the Province (like the Poic valley or the Ragului valley, for example).

Being a tripartite system and using on a large scale the topography on behalf of the tactical element[96], the layout of the fortlets on the north-western frontier appears to be following two patterns of distribution: they are located either on plateaus above narrow valleys that are representing entries to the Province (Poieni[97], Dealul Cocinilor[98] and Poic[99]) or on the ridge roads that connect two or more watchtowers (Dosul Turcului[100] and Dealul Secuiului[101]). Even if the fortlet of Negreni is not geographically included in the line of the Meseș Mountains, its placing follows the same rule: on an elevated plateau above a moderately narrow valley[102].

In the Porolissum area the situation is basically the same. The Meseș Mountains end at Orteleculuі valley or *Porta Mesesina*, where the fortlet of La Strâmtură is located, like in the other cases, on a high plateau, keeping in sight the path through the valley, a main route towards the Province.

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90 Zăgreanu *et al.* 2017, 26: "a tripartite functioning scheme composed of: *castra* (as major military structures of the frontier) – *burgi (fortlets)* (as middle structures) – *turres* (the smallest structures)".
91 Breeze 2012, 172.
92 This type of frontiers is included by D. J. Woolliscroft in the terrain-following system type (see Woolliscroft 2001, 53-57).
93 Gudea 1979, 63-87; Gudea 1985, 143-218; Gudea 1997, 20-21.
94 Gudea 1997, 20.
95 Clichici 1968, 53-70.
96 See Baatz 1997, 1-20; Fields/Spedaliere 2003, 12-21.
97 Torma 1880, 54.
98 Buday 1912, 108-109.
99 Gudea 1997, 47.
100 Buday 1912, 108-109.
101 Torma 1880, 75.
102 Gudea 1997, 36.

Because of its highly strategic, military and economic role[103], *Porolissum*, the keystone of Dacia Porolissensis[104], has a highly complex frontier organization with multiple phases of development[105], relying on its unique geographical features[106], the physical features of the frontier being composed of two auxiliary forts, several watchtowers, linear fortifications and the fortlets mentioned above. The next two examples in the *Porolissum* area, the fortlet of Brebi I and the fortlet/fortified gateway of Brebi II, are again located in such a way as to supervise a valley pass.

The northern segment of the frontier has quite different geomorphologic characteristics, but the distribution pattern of the physical elements of the frontier follows basically the same logic. The geographical landscape of northern Dacia Porolissensis is characterized by a system of ridges aligned south-north, between Culmea Brezei in the north and the Someșul Mare river valley in the south[107]. The hydrographic network created in time a monocline relief[108]; these aspects had a defining influence over the distribution pattern of the watchtowers and of the *burgi*-type structures[109]. Starting with the watchtowers of the Ileanda area (Sălaj county) in the west, up to Livezile (Bistrița-Năsăud county) in the east, the chain line is located on the northern dominant peaks of the ridges and the fortlets are located within the valleys that are also the main access routes to this area. The *burgi* of Cetatea lui Negru Vodă[110] and Cetățea[111] are perfect examples. Even if there are currently only two cases known, the future field research in the area could identify another structure(s), especially since there are more valleys in the area, even bigger and important than those abovementioned.

The last case, the one located on the eastern frontier, appears to follow the ridge road pattern. The area is included in the eastern part of the Transylvanian Plain, characterized by high and elongated hills[112]. The structure is located on the south-western side of such a hill, being also

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[103] See in this direction especially Matei 1996, 63-67; Gudea 1989; Gudea 1997; Opreanu 1998, 47-139; Marcu 2009, 86-89; Opreanu/Lăzărescu 2015; Opreanu/Lăzărescu 2016.
[104] Gudea 1988, 125-214.
[105] See Cociș 2016a, 41-76.
[106] A recent study about the geographic landscape of Porolissum in connection with its archaeological features in Petrea *et al.* 2016, 31-42.
[107] Ferenczi 1973, 84. See also Cociș 2017a, 156-158.
[108] Ferenczi 1973, 85.
[109] Bîcă/Zăgreanu 2015, 58-64.
[110] Ferenczi 1973, 94-98.
[111] Cociș 2015, 46-57.
[112] For the geographical description of the eastern frontier see especially Ferenczi/Petică 1982, 557-584 and Ferenczi 1994, 139-153.

placed on a road that connects the Province with eastern *Barbaricum*, near the watchtower of Vătava.[113]

Nr.	*Burgus*	Location
1	Poieni	Elevated plateau above a valley pass
2	Cetatea lui Cimpoca	Elevated plateau above a valley pass
3	Dosul Turcului	Ridge road on a high plateau
4	Dealul Cocinilor	Elevated plateau above a valley pass
5	Poic	Elevated plateau above a valley pass
6	Dealul Secuiului	Ridge road on a high plateau
7	La Strâmtură	Elevated plateau above a valley pass – *Porta Mesesina*
8	Brebi I	Elevated plateau above a valley pass
9	Brebi II	Elevated plateau above a valley pass
10	Podișu	Second terrace of Someș River
11	Cetatea lui Negru Vodă	Elevated plateau above a valley pass
12	Cetățea	Elevated plateau above a valley pass
13	Coasta Rotundului	Ridge road on a high plateau

Table II. Synoptic table showing the location pattern of the fortlets of Dacia Porolissensis.

In conclusion, we see how these medium installations are located in the frontier areas using the same two patterns, in order to fulfill a series of duties. The role and the duties of the *burgus*-type structures will be highlighted, as much as the available data allow us. The structure of Podișu, except for the fact that we know its relative position, cannot be included in this discussion due to the fact that we do not have any further info about it.

C. The Functionality

What would we know about the limes if we had to rely on literary sources alone[114]? This rhetorical question of B. H. Warmington can be extrapolated in my opinion within the context of the structures discussed in these pages. There are several studies concerning the reflection of the

[113] Szabó *et al.* 2017, 116-119.
[114] Warmington 1972, 291.

burgus-type structures in the ancient sources[115], but the discussion of their functionality relied mainly on literary and epigraphic evidence[116]. The functionality of the frontier *burgi* of Dacia Porolissensis could be intuited by using both the ancient sources and the modern GIS analyses.

There are several cases of inscriptions which describes the functionality and the role of a frontier fortlet, quite succinctly though. The first two examples are coming from the frontier area of Numidia, more precisely from Ksar Sidi El Hadj[117] and Loth Bordj[118], both in the El Kantara region. The structures are called *burgum Commodianum speculatorium* in the first case and *burgum speculator(i)um Anto(ninianum)* in the second one. The *burgi* are located in the El Kantara defile[119] in such a way as to control the frontier crossing point, being supervised by *speculatores*, with a military background[120].

But the most relevant epigraphic sources related to the purpose and the functionality of the fortlets are coming from Pannonia Inferior, where a batch of similar inscriptions reveals the fact that these structures (and the *praesidia*) are located in such a way in the frontier area, *per loca oportuna*, as to stop the clandestine crossing of the *latrunculi*: *ripamomnem burgis a solo ex/tructis item praesidi(i)s per loca / opportuna ad clandestinos latrun/culorum transitus oppositis mu/nivit*[121]. The *latrunculi* of these inscriptions are considered to be the Sarmatian riders[122]. It is quite clear that these middle-

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115 See mainly Labrousse 1939, 151-167; Alföldy 1941, 40-59; Pennick 1945, 5-21; Mihajlov 1961, 42-56; Gichon 1974, 513-544; Cohen 1981, 230-238; Bagnall 1982, 125 128; Grünewald 2004, *passim*; Bagnall 2006, 325-333; Kovács 2008, 125-138; Visy 2009, 989-996; Băjenaru 2010, 44-53; Fuhrmann 2011.

116 In Cociș 2017, 43-51 we tried to demonstrate, based on the epigraphic sources dated between the 1st- 3rd century AD, that there is a quite visible difference between a tower and a *burgus*-type structure both in the terminology-functionality areas and in the topographical layer.

117 CIL VIII 2495 = AÉ 1909, no. 73: *Imp(eratori) Caes(ari) M(arco) Aurelio / Commodo Antoni/no Pio Felice Aug(usto) Germ(anico) / Sarm(atico) Britannico p(ater) p(atriae) / trib(unicia) pote(state) XIII co(n)s(uli) V /* ***burgum Commodi/anum speculato/rium*** *inter duas vi/as ad salutem comme/antum nova tute/la constitui iussit Ti(berius) / Claudius Gordianus v(ir) c(larissimus) leg(atus) Aug(usti) pr(o) pr(aetore) / cura agente [[…]].*

118 CIL VII 2494 = ILS 2636: *Imp(eratore) Case(are) M(arco) Aurelio / Severo Antonino Aug(usto)* ***bur/gum speculator(i)um Anto(ninianum)*** */ Marcus Val(erius) Senecio leg(atus) eius pr(o) / pr(aetore) c(larissimus) v(ir) fieri iussit c(uram) a(gente) C(aio) Iulio Ae / lurione [[(centurione) leg(ionis) III]] Aug(ustae) Anto(ninianae) prae(posito) n(umeri) H(emesenorum) Ant(oniniani) // Ti(tulum) bis posuit Caletamera in te(m)pore suo.*

119 Baradez 1949, 235-242; Pringle 2001, 78-79, 280-281.

120 Sheldon 2004, 167.

121 RIU 1135; see also RIU 1136; RIU 1127; RIU 1128; RIU 1129; RIU 1130; RIU 1131; AÉ1998, 1057; PIR² C 1359; AE 2001, 1685b; *Tit. Aq.* 0935.

122 Alföldi 1941, 40-59; Grünewald 2004, 21-22; Kovács 2008, 128.

sized fortifications[123] had a preponderant role in guarding, controlling and in some cases stopping the passage in the frontier area. In my opinion we can extrapolate the situations of the *burgi* of the *Ripa Pannonica* to the Dacian examples. They are also located *per loca oportuna* in an observable pattern and the pregnant military presence most certainly had a role in controlling the main routes towards the province.

By using GIS analyses such as Cumulative Viewshed Analyses[124] to observe the regular pattern of visibility and inter-visibility of the fortlets with the landscape and other frontier elements (mainly watchtowers), and Least Cost Path Analyses[125] to see their location in relations with the most accessible ways into the Province, we can observe again these distribution patterns and the functionality: the fortlets are placed in such a way as to control (and observe) the main valley routes, being in visual and acoustic connection with the watchtowers, whose purpose is to survey and to send data about the movements of people in the frontier area[126] (see Plates X-XII). For this type of analyses was used, in both cases, a SRTM 3D background with a resolution of 1 arc/sec=30 m. The LCPA analyses were made using only the elevation data, with no friction layers added.

The purpose of the Roman frontier is not to block the access[127], but to form a purely theoretical demarcation line[128]. In my opinion this interpretation of C. R. Whittaker allows us to postulate a functionality of the frontier in general and of the fortlets in particular, focused on the dynamism of the *limites*, the frontier itself being an amplified spatial unit[129], characterized by powerful social and economic relations.

By using epigraphic sources and GIS analyses, we can underscore several duties of the medium sized fortlets of Dacia Porolissensis: inter-visibility with the signaling towers, acoustic interconnectivity with them, providing them with personnel using strategic routes, supply bases, the main task of guarding the valleys and the easiest routes to enter the province and a permanent link with the auxiliary forts behind them, altogether providing a 24-hour security for the frontiers. As for the troops which are garrisoned in these medium sized installations, we do not have direct information. We can only bring into discussion the possibility that

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123 Kovács 2008, 130-131. For the latest interpretations of the sources see Mráv 2016, 35-60.
124 See Kvame 1999, 153-201. Parameters: transmitter elevation (Te)=6 m, receiver elevation (Re)=4 m, Radius (R)=10 km. Different radius colors were used for different objectives.
125 See Lee/Stucki 1998, 891-905.
126 Woolliscroft 2001, *passim*.
127 See in this direction Fabricius 1926, 572-582 or Forni 1959, 1074.
128 Whittaker 1994, 91, 121. See also Hedeager 1987, 127.
129 Soja 1996, 10-11; Boozer 2013, 278.

the troops are drawn from the closest auxiliary forts. The number of men drawn from the auxiliary forts to these fortlets could only be estimated, due to the lack of direct information or rigorous archaeological research. For the *fossatum Africae*, J. Baradez estimated a maximum number of 50 men (*burgarii*) per *burgus*[130]. If we consider that every tower contains a team of 4-5 men[131] and a *burgus* is in charge of approximately 10 towers, then we have 40-50 men per *burgus*, a situation almost equivalent with the text of the inscription of Serdica dated between 151-152 AD: nine towers to a *burgus*[132]. It is clear that some of these structures are not big enough to sustain such a number and the deployment pattern is not regular either. A last observation is that in some cases, in close proximity to the fortlet, we can observe potsherds, burnt clay and mortar extended on a large surface. These are, as C. Băjenaru already observed, structures that appear in connection with the daily activities of the soldiers stationed in these installations[133]. Two edifying cases are the *burgi* of Negrilești[134] and Salva[135].

Even if it is a typical and classical linear frontier system[136] and a terrain-crossing system by definition[137], the milecastles of Hadrian's Wall could represent a direct analogy for the *burgus*-type structures of Dacia Porolissensis, not in terms of geographical distribution, but in functionality. Through systematic research carried out on Hadrian's Wall[138], 80 milecastles were identified, with three distinct plans, based on their axis, and four gateway types: long and short axis plans, and a typical turf wall plan[139]. The four types of gateways are: type I – short-axis milecastles built by the *legio* II Augusta; type II – short-axis milecastles built by the *legio* XX Valeria Victrix; and type III – long-axis milecastles built by the *legio* VI Victrix[140].

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130 Baradez 1949, 39.

131 For further details see Southern 1990, 233-242.

132 AÉ 1957, 279 = AÉ 2000, 1291 = ILB 211 = PIR² G50: *Imp(erator) Caes(ar) T(itus) Ael(ius) Hadrian(us) / Antoninus Aug(ustus) Pius p(ater) p(atriae) trib(unicia) / potestate XV co(n)s(ul) IIII pr(a)esidia / et burgos ob tutelam provinci(ae) / Thraciae fecit curante C(aio) Gallonio / Frontone Q(uinto) Marcio Turbone leg(ato) / Aug(usti) pr(o) pr(aetore) per fines civitatis / Serd(ic)ensium regione Dyptens(ium) /* ***praesidia n(umero) IIII burgi n(umero) XII phruri // n(umero) CIX.*** As C. Băjenaru remarked, for every *praesidium* there are three *burgi* and for every *burgus* nine *phruri* (Băjenaru 2010, 56).

133 Băjenaru 2010, 161-168.

134 Cociș 2016, 61.

135 Cociș 2015, 46-47, 55, fig. 5.

136 See especially Breeze 2011, 55-92.

137 Woolliscroft 2001, 58-101.

138 Wilmott 2013, 137-143.

139 Johnson 2004, 31-32.

140 Wilmott 2013, 137-138.

The milecastles are guarding the gateways through the wall, with a garrison (estimated by the general dimensions) of 20-30 soldiers housed in two barracks; on both sides of the milecastles there were two watchtowers, which acted also as supply base. Their main role seems to be the passage of people and goods, but they probably also functioned as custom houses, taxing people[141]. The functionality and the internal layout (based on the available info) of the *burgi* are very similar to these milecastles. As for the architecture, functionality and interior layout, the only building that follows a certain long-axis milecastle plan, obviously with particular adaptations, is the so-called *Zollstation* or customs house of Porolissum[142]. On the same basis, we must not neglect the possibility that Brebi I and II were constructed following the short-axis milecastle type (see Plate XIII.2).

At the end of these pages we must underline two important aspects regarding the possibility of obtaining further information about these structures. First of all, an archaeological investigation of as many fortlets as possible is stringently needed if we want to understand more about the internal layout of these medium sized fortifications, more about their phases and chronology. Also, daily routine and the intimacy of soldier's life in these peripheral areas of Dacia Porolissensis are little known. Secondly, we must consider and analyze these peripheral structures within the larger frame of the north-western frontier of Dacia Porolissensis as component parts of a wider mechanism. Therefore, any information regarding these structures must be connected with the wider frame of *limes Dacicus* involving both the tripartite scheme previously mentioned, the human factor (on both sides of the frontier) and the landscape factor, which are key elements in the frontier movement.

[141] Breeze 2011, 64-65. For the economical role of the frontiers see especially Whittaker 1994, 98-131. See also Symonds 2018, 5-12 for a functional definition of the frontier fortlets. Similar conclusions for the eastern frontier of Dacia Porolissensis/Apulensis in Futó *et al.* 2014, 124-127.

[142] See the plan in Gudea 1996, 142, fig. 4; Gudea 1988, 175-189; Piso *et al.* 2016, 544-548.

Illustrations

Pl. I. General distribution of the frontier's physical installations.

Pl. II. Redrawn plans of Poieni fortlet – Fig. 1 (redrawn after Torma 1880, 55, fig. 1), Negreni – Fig. 2 (redrawn after Gudea 1997, 104, fig. 12), Poic – Fig. 3 (redrawn after Gudea 1997, 112, fig. 120) and Dealul Secuiului – Fig. 4 (redrawn after Gudea 1997, 117, fig. 25).

Pl. III. Redrawn plans of the Brebi I fortlet– Fig 1, after the original drawings of Buday A. (up) and after I. Mitrofan (down) (after Gudea 1989, 376, fig. 30 1-2), Brebi II – Fig. 2, after the original drawings of Buday A. (up) and after I. Mitrofan (down) (after Gudea 1989, 380, fig. 34 1-2) and La Strâmtură (after Gudea 1997, 125, fig. 33).

Pl. IV. General plan of the La Strâmtură fortlet with the excavations from 2010. Reproduced with the permission of Csók Zsolt, Phd, National History Museum of Transylvania.

Pl. V. Digital Surface Model of the Brebi I fortlet I (Fig. 1) and the overlaid excavations of M. Macrea and his team, as seen in the field (Fig. 2).

Pl. VI. Digital Surface Model of the Brebi II fortlet/gateway (Fig. 1) and the overlaid excavations of M. Macrea and his team (orange) and C. Daicoviciu (possible area, in green) as seen in the field.

Pl. VII. Digital Surface Models of the Cetatea lui Negru Vodă fortlet (Fig. 1) and Cetățea fortlet (Fig. 2).

Pl. VIII. Digital Surface Model of the Coasta Rotundului fortlet – Fig. 1 (after Szabó *et al.* 2017, 116) and the aerial photo – Fig 2. (after Pánczél, Máté 2015, 94).

Pl. IX. Altimetric profiles of the fortlets from Cetatea lui Cimpoca – a, La Strâmtură – b, Brebi I – c, Brebi II – d, Cetatea lui Negru Vodă – e, Cetățea – f.

Pl. X. CVA, LoS and LCP analyses of the fortlets from Poieni – Fig. 1 and of Cetatea lui Cimpoca – Fig. 2.

Pl. XI. CVA, LoS and LCP analyses of the fortlets from Dealul Cocinilor, Poic and Dealul Secuiului – Fig. 1 and of La Strâmtură, Brebi I and Brebi II – Fig. 2.

Pl. XII. 3D SRTM intervisibility visualisation of the fortlets from Cetatea lui Negru Vodă – Fig. 1 and Cetățea – Fig. 2.

Pl. XIII. Digital Surface Model of Negreni fortlet - Fig 1; comparison between a short-axis milecastle 79 – a (after Wilmott 2013, 195, fig. 300) and Brebi II – b (redrawn after Ferenczi 1941, 198, fig. 7).

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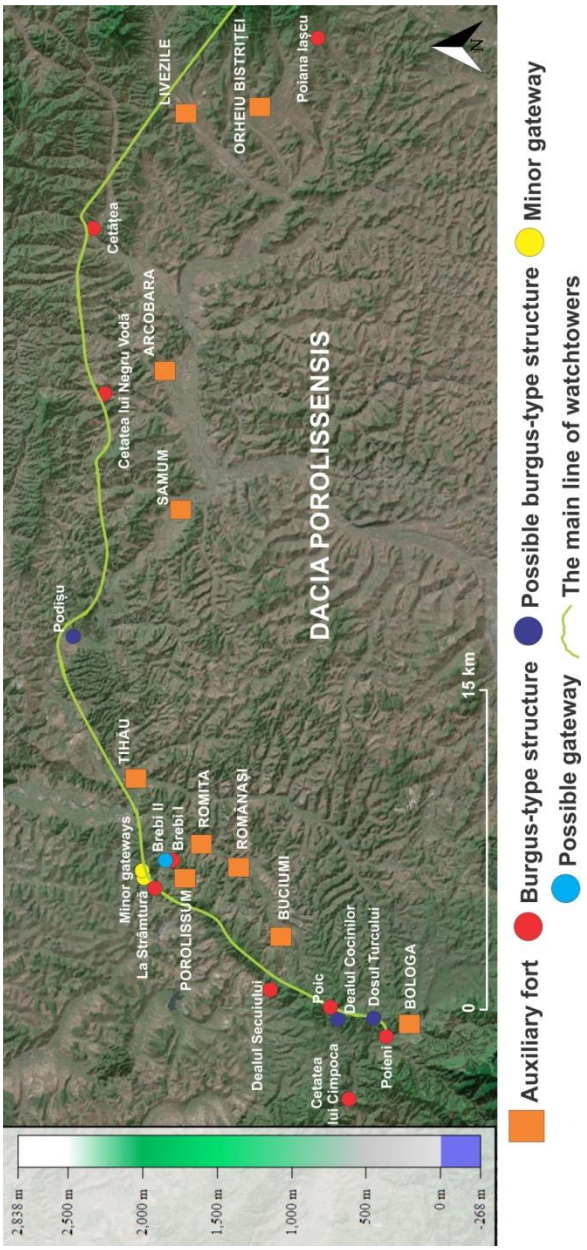

DACIA POROLISSENSIS
Auxiliary fort
Burgus-type structure
Possible burgus-type structure
Minor gateway
Possible gateway
The main line of watchtowers
Minor gateways
La Strâmtură
Brebi II
Brebi I
TIHĂU
ROMITA
ROMANAȘI
BUCIUMI
POROLISSVM
Podișu
Cetatea lui Negru Vodă
ARCOBARA
SAMUM
Cetățea
LIVEZILE
ORHEIU BISTRIȚEI
Poiana Iașcu
Dealul Secuiului
Poic
Dealul Cocinilor
Dosul Turcului
BOLOGA
Cetatea lui Cimpoca
Poieni
0
15 km
2,838 m
2,500 m
2,000 m
1,500 m
1,000 m
500 m
0 m
-268 m

Pl. I.

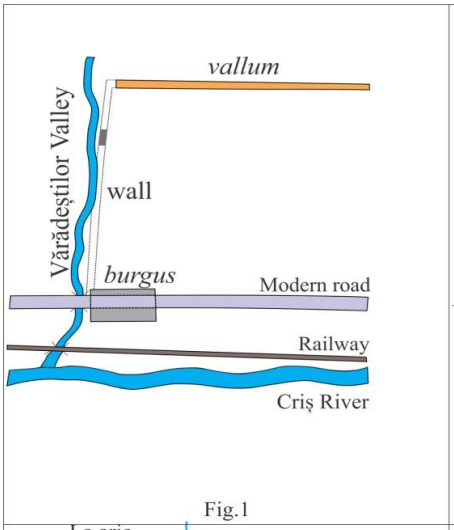


Fig.1

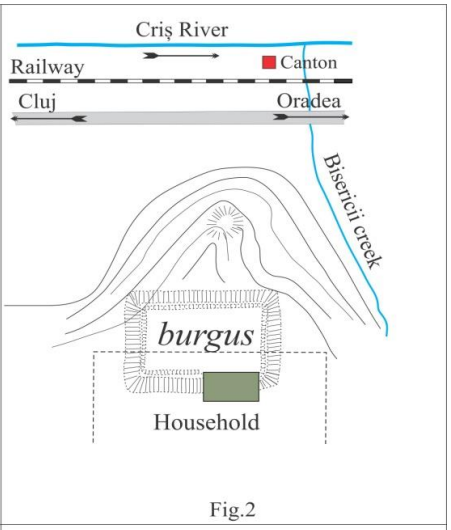


Fig.2

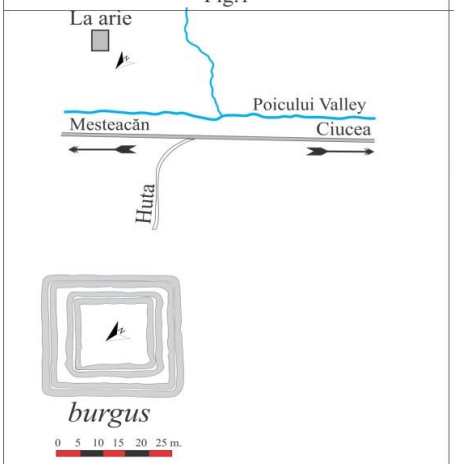


Fig.3

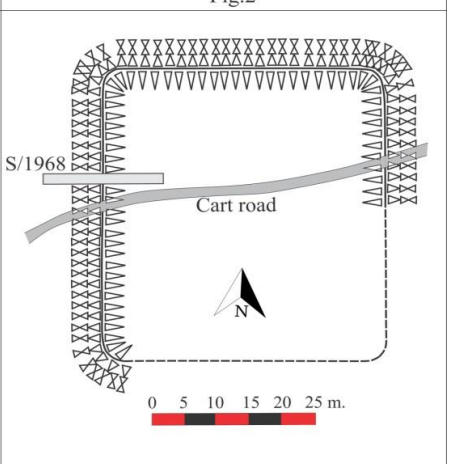


Fig.4

Pl. II

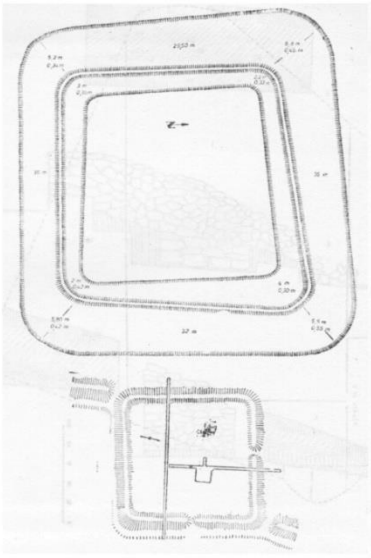


Fig.1

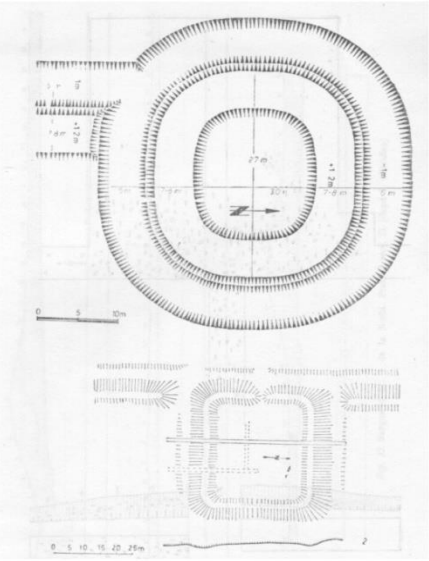


Fig.2

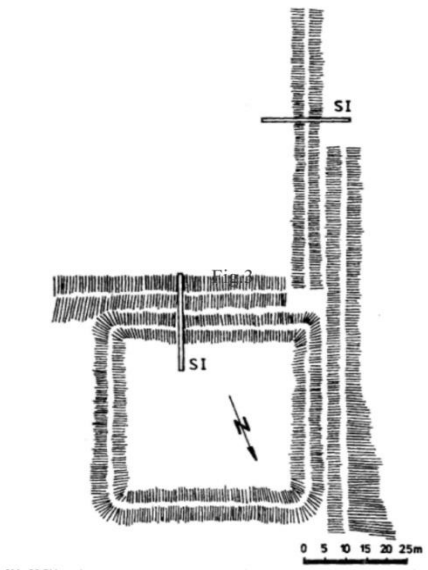
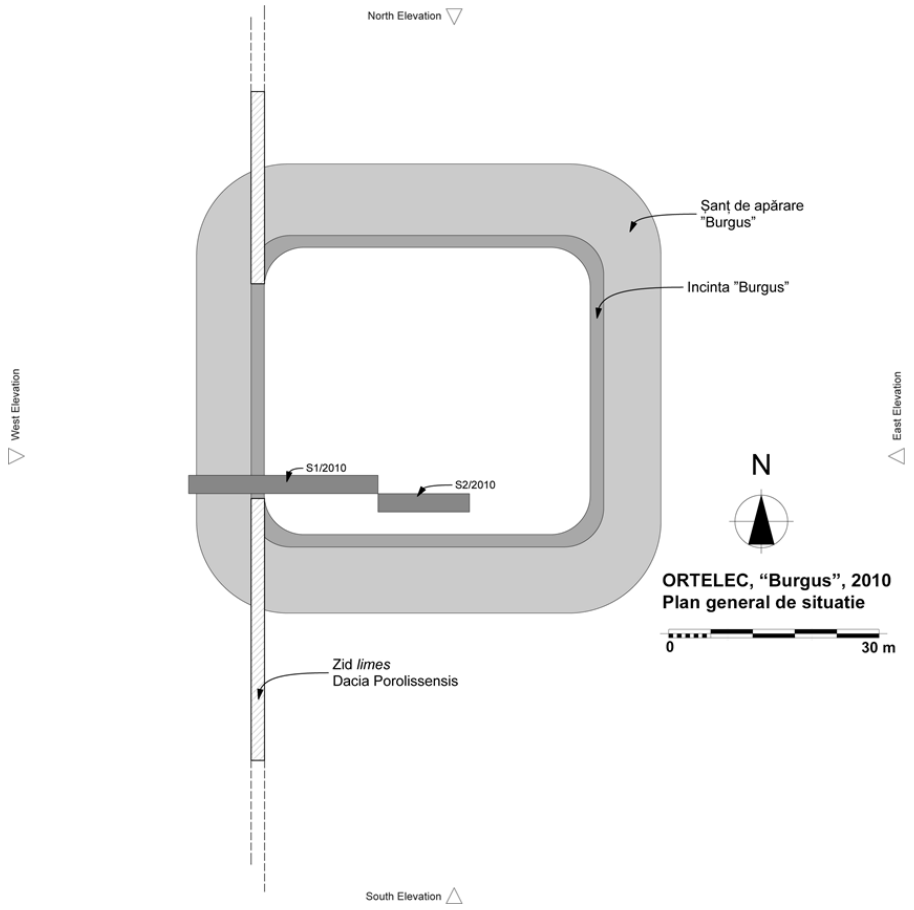


Fig.3

Pl. III.


North Elevation
West Elevation
East Elevation
South Elevation
Șanț de apărare
"Burgus"
Incinta "Burgus"
S1/2010
S2/2010
Zid *limes*
Dacia Porolissensis
N
ORTELEC, "Burgus", 2010
Plan general de situatie
0
30 m

Pl. IV.

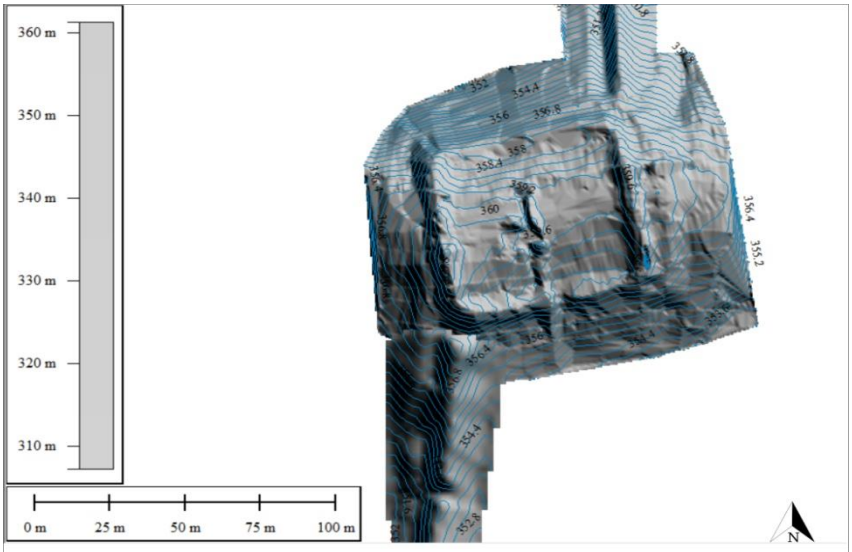


Fig. 1

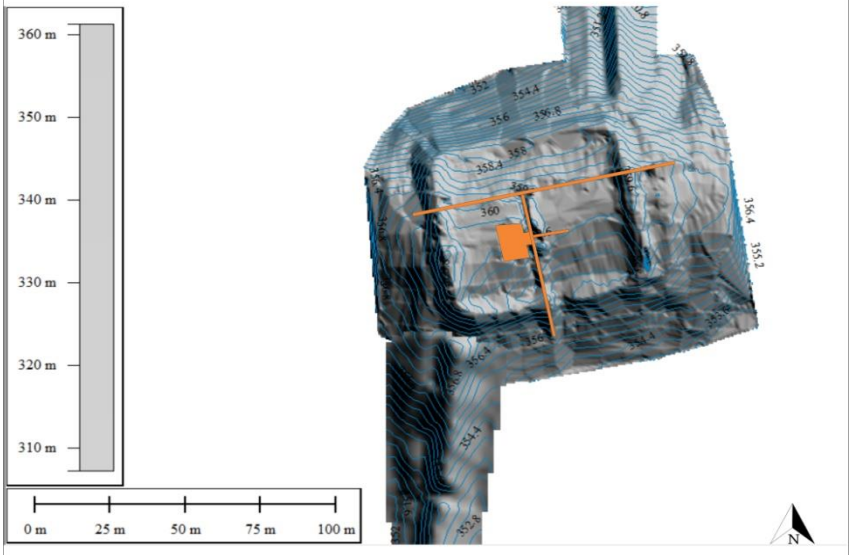


Fig. 2

Pl. V.

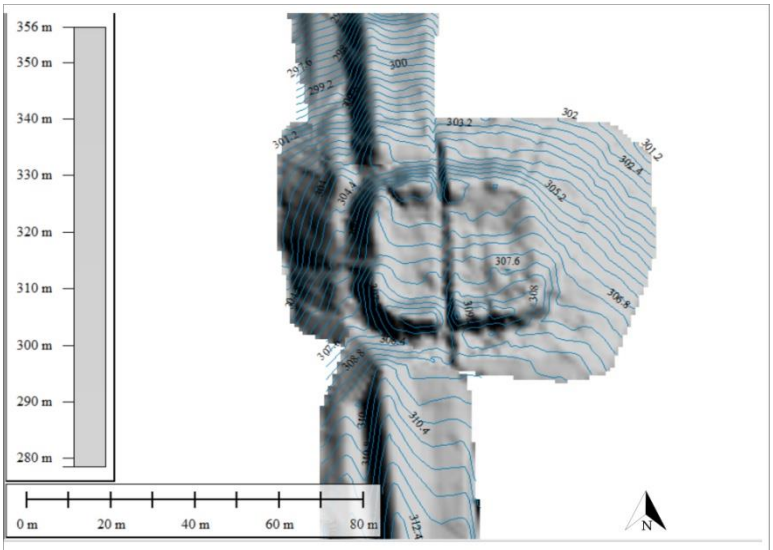


Fig. 1

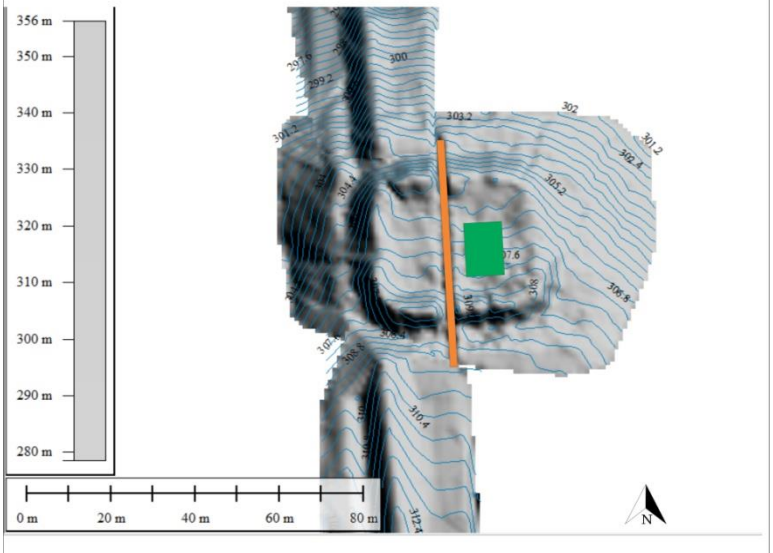


Fig. 2

Pl. VI.

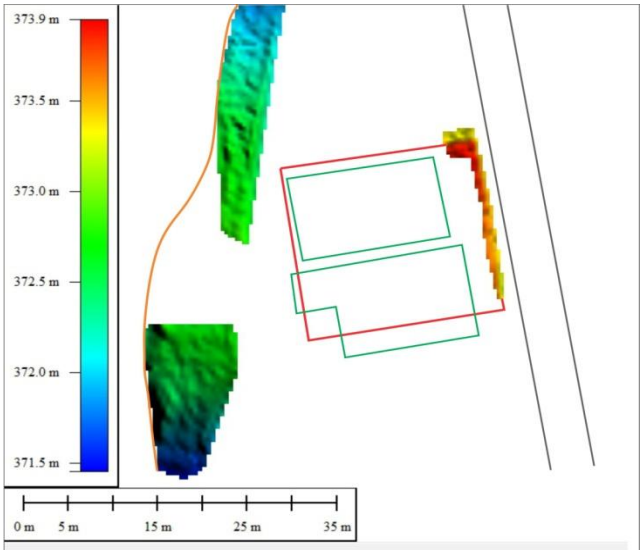


Fig. 1

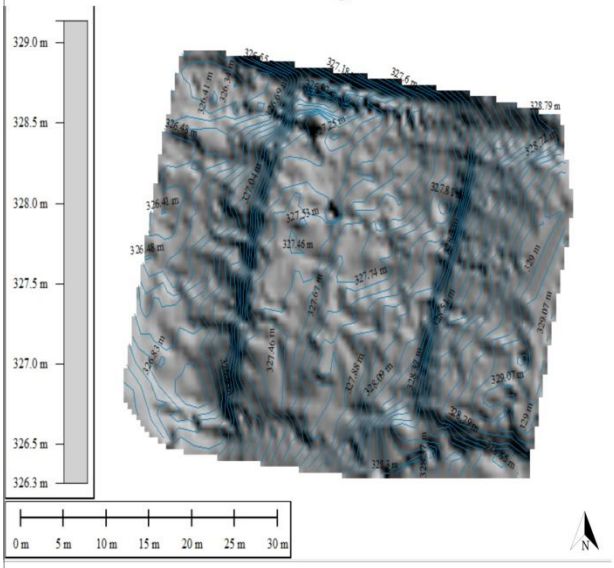


Fig. 2

Pl. VII.

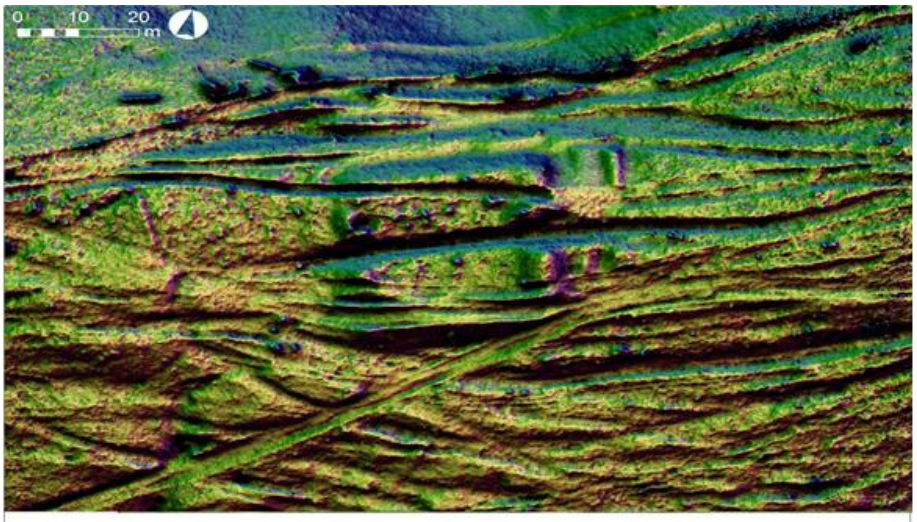


Fig. 1

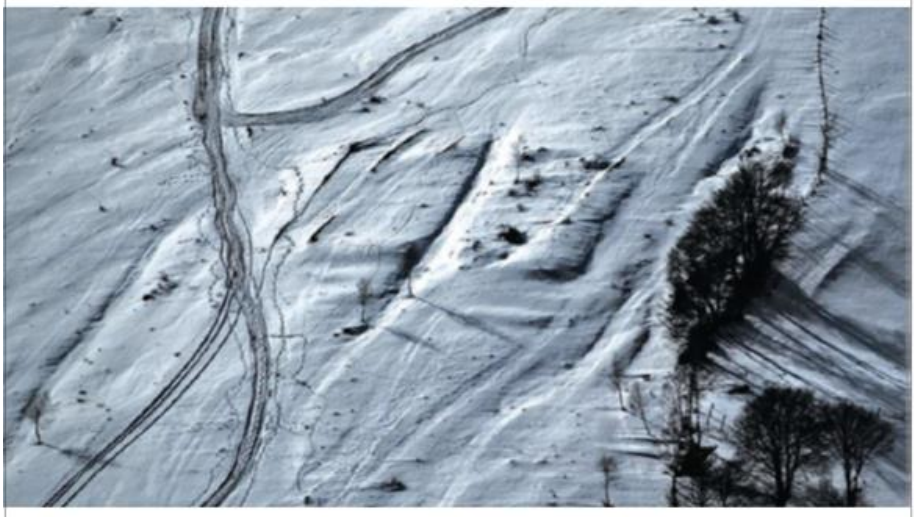
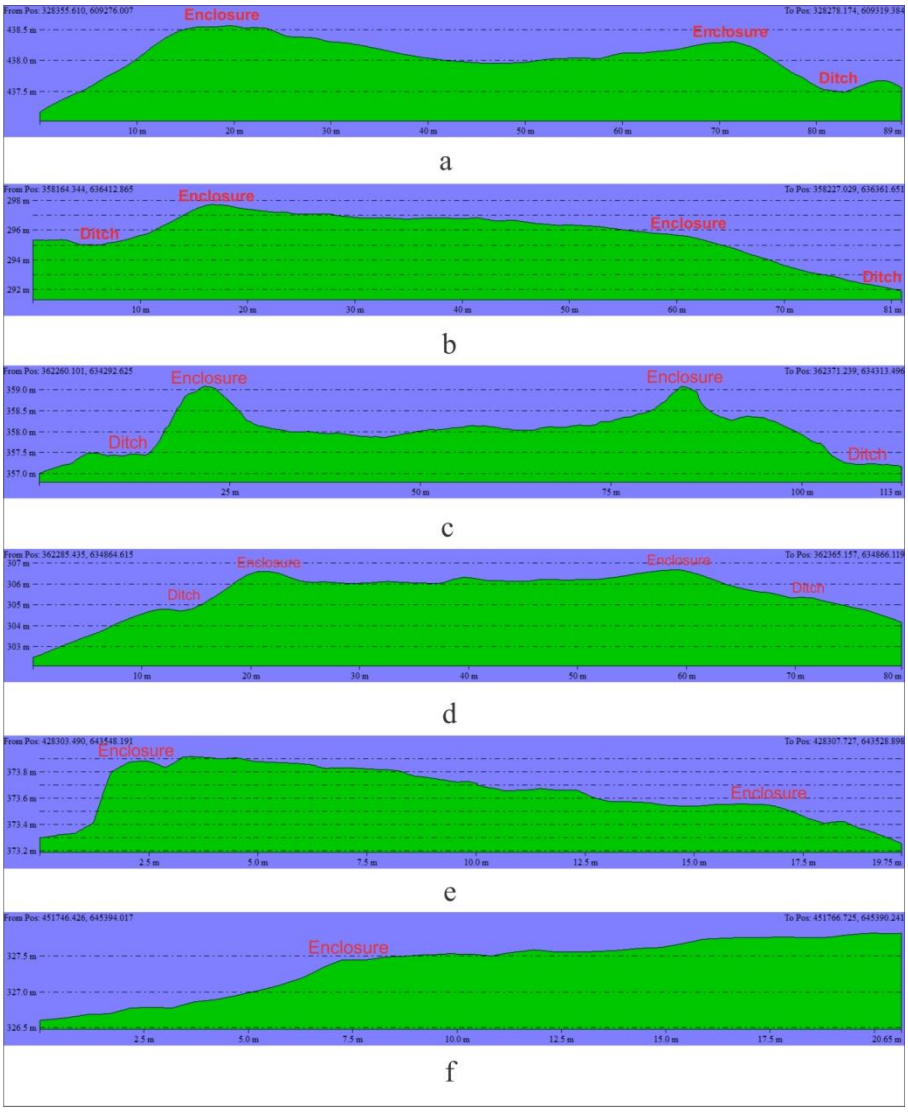


Fig. 2

Pl. VIII.


Enclosure
Enclosure
Ditch
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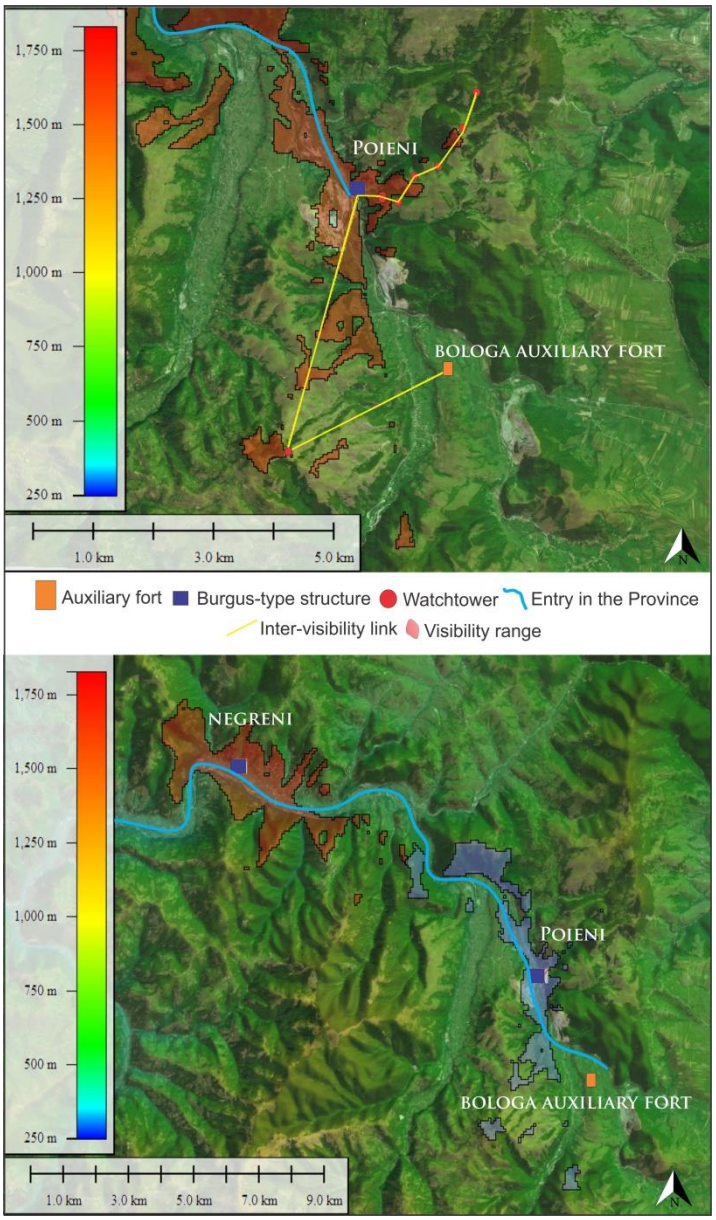
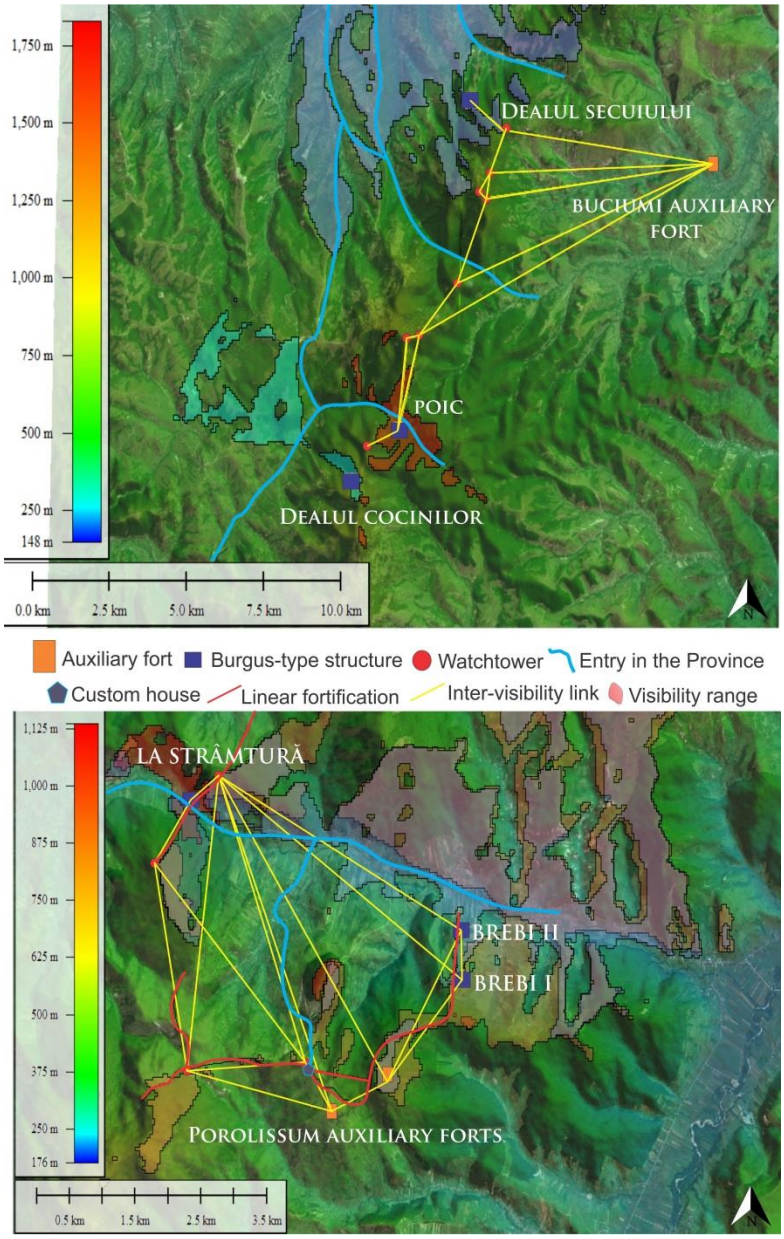
Pl. IX.


1,750 m
1,500 m
1,250 m
1,000 m
750 m
500 m
250 m
POIENI
BOLOGA AUXILIARY FORT
1.0 km
3.0 km
5.0 km
Auxiliary fort
Burgus-type structure
Watchtower
Entry in the Province
Inter-visibility link
Visibility range
NEGRENI
POIENI
BOLOGA AUXILIARY FORT
7.0 km
9.0 km

Pl. X.


1,750 m
1,500 m
1,250 m
1,000 m
750 m
500 m
250 m
148 m
0.0 km
2.5 km
5.0 km
7.5 km
10.0 km
DEALUL SECUIULUI
BUCIUMI AUXILIARY FORT
POIC
DEALUL COCINILOR
Auxiliary fort
Burgus-type structure
Watchtower
Entry in the Province
Custom house
Linear fortification
Inter-visibility link
Visibility range
1,125 m
1,000 m
875 m
750 m
625 m
500 m
375 m
250 m
176 m
0.5 km
1.5 km
2.5 km
3.5 km
LA STRÂMTURĂ
BREBI II
BREBI I
POROLISSUM AUXILIARY FORTS

Pl. XI.

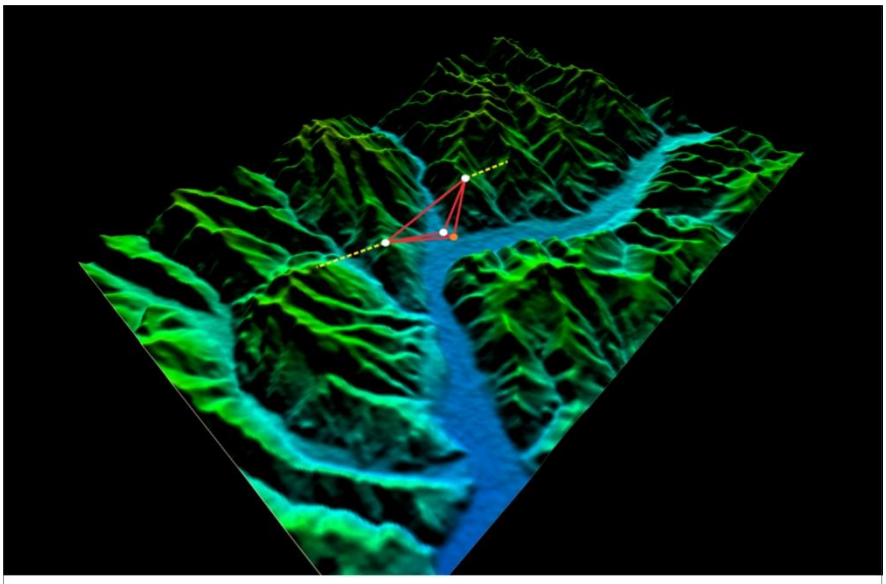


Fig. 1

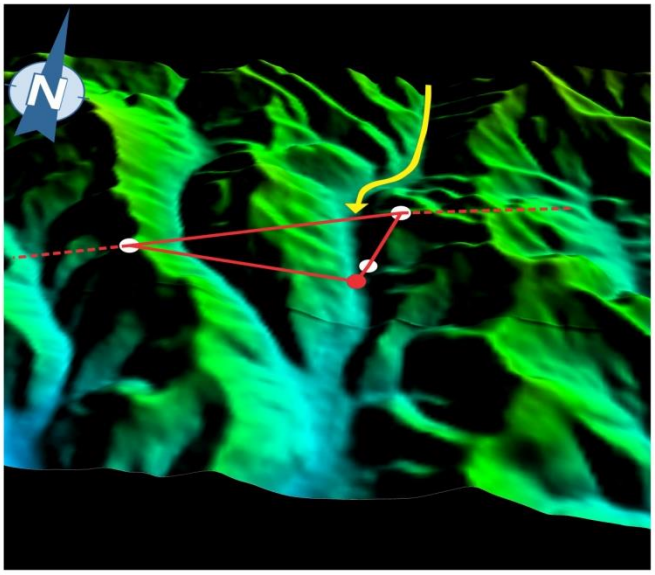


Fig. 2

Pl. XII.

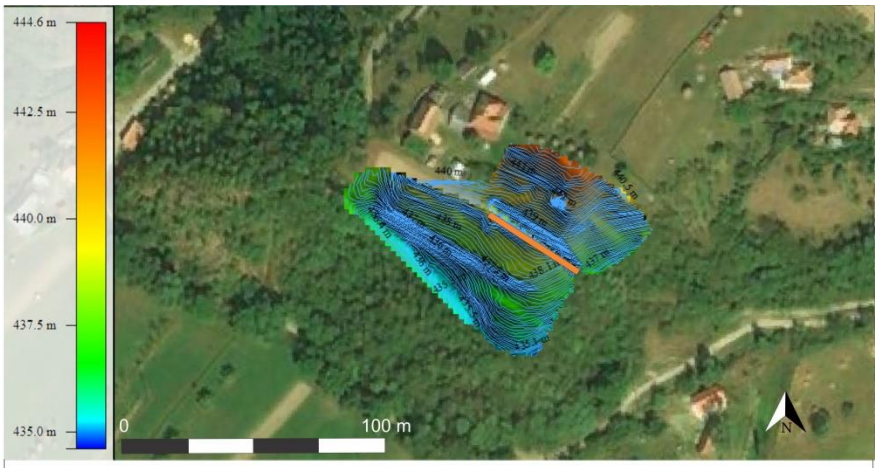


Fig. 1

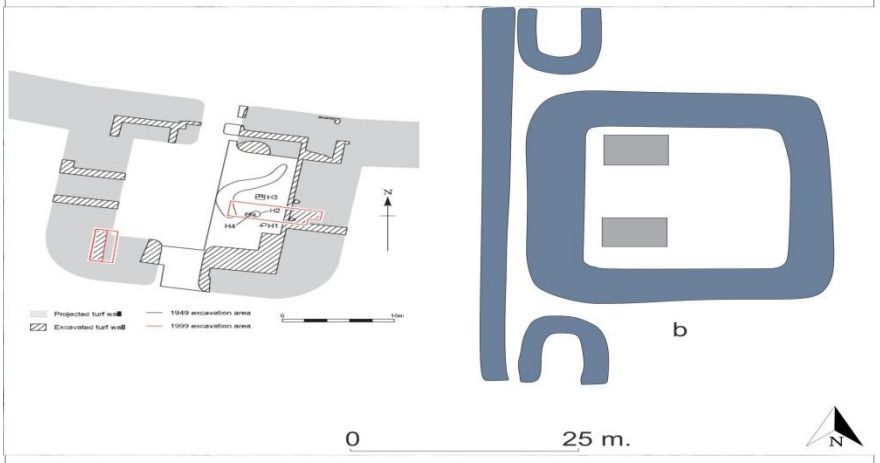


Fig. 2

Pl. XIII.