Roman frontier crossing Mocanului Valley

EUGEN S. TEODOR
CONSTANTIN HAITĂ
DAN ȘTEFAN

Abstract:

Several years ago, within *Limes Transalutanus* Project (2014-2017), we dealt with several segments of the Roman limes in Teleorman County. Briefly, that meant aerial and terrestrial survey, geologic sampling and geophysics, in most of the cases. The old renditions of the frontier line, as being a rampart without a ditch, were intriguing and unusual, thus they had to be checked in the field, including by test digging.

One spot chosen for a complex investigation was located several kilometres south of Roşiorii de Vede, along Mocanului Valley, where the most common traits of a Roman border (a tower, the frontier palisade and segments of the road) were present and relatively well preserved.

The test excavation confirmed the fact that the frontier obstacle was made by a large palisade and the defensive ditch was missing. The Roman road has been also sectioned, having the expected width and bulgy shape, being made, however, entirely of clay, as the stone is absent in the plain. The watchtower is rather large, relatively far from the palisade, and had been strongly burned, as well as the palisade.

Such objectives, located in a close range, illustrate the typical parts of a late frontier setup.

Rezumat: Frontiera romană la Valea Mocanului

Cu câțiva ani în urmă, în cadrul proiectului *Limes Transalutanus* (2014-2017), am studiat câteva sectoare ale frontierei romane de pe teritoriul județului Teleorman. Pe scurt, studiul a presupus cercetare aeriană și terestră, efectuarea de sonde geologice și de proceduri geofizice. Mai vechile descrieri ale obstacolului de frontieră drept o palisadă fără șanț de apărare, neobișnuite în restul imperiului, trebuiau verificate în teren, inclusiv prin săpătură de sondaj.

Unul dintre locurile alese pentru o investigație complexă se află la câțiva kilometri sud de Roșiorii de Vede, în dreptul Văii Mocanului, unde se găsesc cele mai tipice componente ale unei frontiere romane (un turn de supraveghere, palisada și segmente de drum) sunt prezente și relativ bine păstrate.

Săpătura de sondaj a confirmat că obstacolul care marca frontiera era realizat dintr-o palisadă masivă, fără un șanț de apărare în față (cum ne-am fi așteptat). A fost cercetat prin săpătură și drumul roman, care este de mărime și formă normală (cu secțiune bombată), dar este făcut exclusiv din argilă, deoarece piatra lipsește din câmpie. Turnul de supraveghere este destul de mare, poziționat relativ departe de palisadă, și a fost puternic ars, ca și palisada, de altfel.

Astfel de obiective, aflate într-un perimetru geografic restrâns, ilustrează bine elementele constitutive ale unei frontiere romane târzii, de sec. III.

Key Words: limes, geologic samples, geophysics, aerial survey, test excavations

Cuvinte cheie: frontiera romană, carotă geologică, geofizică, cercetare aeriană, sondaj arheologic

Problems at stake

The tentative list for UNESCO World Heritage, concerning Roman Dacia, is approaching its final shape. The difficulty in making it is not given by telling where the Roman frontier was, or its corporal objects (forts, towers, the linear buildings), but from the need to establish which one fulfils the requirement to preserve most of its original features. For instance, a large and important Roman fort as Flămânda, on the Danube, cannot be nominated as it was almost fully dismantled[1].

[1] Harbour at the Danube's northern bank, the fort was originally about 7 hectares large, but it was sacrificed in 1960s, in order

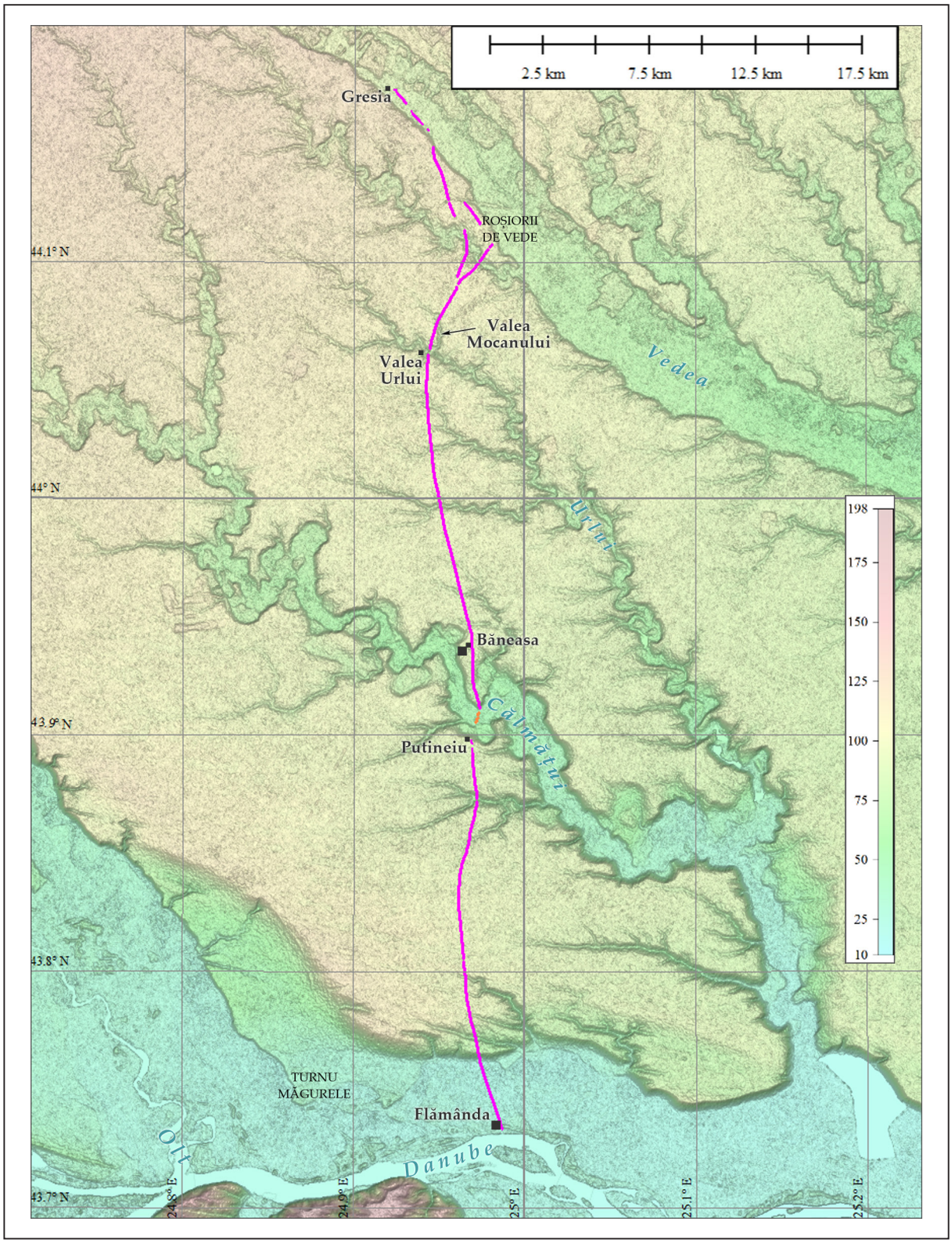

Fig. 1. The Roman frontier between the Danube and Vedea Valley. Support SRTM 30, 2018. Projection Stereo70, geographical coordinates. The map depicts the forts, the continuous border embankment, and modern cities (all caps).

A second difficulty in providing such a list is the exceptional length of the Roman frontiers in Dacia, summing more than 1500 km.[2] Only the frontier about which we are going to bring some insights, *Limes Transalutanus*, is

to make a dam (Bogdan Cătăniciu 1997, 42).

[2] Depending on what is summed. The Danube's bank takes alone over 1000 km. The land borders of Dacia were measured

about 300 km,[3] connecting the Danube and the inner side of the Carpathian Mountains, over Bran Pass. This is a *limes* made in the early third century,[4] east of Olt River, pushing forward the older border *Limes Alutanus*,[5] and lasted for only four decades, till AD 245.

Limes Transalutanus is not only a late frontier in Dacia, but also an intriguing one. The forts watching the line are rather small – except Flămânda – and located relatively far one of another, except when crossing over Călmățui Valley, tightly controlled on both sides. In the public knowledge it was also known as deprived of civilian settlements, but this was recently proved wrong.[6]

The way in which the frontier itself is marked on the field is uneven. The single sector where a continuous embankment was done is the one between the Danube and Vedea Valley, for about 55 km, between the forts from Flămânda and Gresia (Fig. 1). Nothing like this can be seen on the next 40 km northward, where Vedea and Cotmeana valleys were used as a *ripa*, due to the high banks of the western side (about 20 m in height). Other frontier *valla* could be seen, here and there, along the sector from Cotmeana Valley to Argeș Valley, but the general rule is that a border marking, with observable remains, is missing south of Pitești City.[7] North of Pitești there is a corridor driving into the mountains, and despite older allegations,[8] the frontier is not physically marked anywhere, all the way to Râșnov fort (*Cumidava*).[9]

Another unusual fact is that this is the only frontier built in an environment where the stone is missing;[10] still worse, south of the fort at Urlui Valley the wood was also a rare commodity, and that was really disturbing, as large quantity of it was necessary to mark the frontier, as we are going to see.

The list of weird facts is not over. One of the most bizarre issues is the way the frontier *vallum* was done. Older reports said that the embankment is not doubled by a ditch and this is truly difficult to cope[11]. The aim of this paper is to make it clear for everybody.

The route of the frontier embankment, as rendered in Fig. 1, was known before any research in field, as it is revealed by old maps, orthophotos, and descriptions.[12] The area of interest for this paper is located immediately north of the fort at Urlui Valley, which came into attention early, before the official start of the research project (known also as Limes Transalutanus),[13] as it was one of the most visible sectors, adding the ease of access. To be more precise,

to 1685 km (Teodor 2015 a, 374-375).

3 Depending again on who made the calculation, or where someone would consider *Limes Transalutanus* to end. From Danube to the fort at Râșnov (*Cumidava*) there are 267 km, but from there to Brețcu (*Angustia*) there are another 90 km. Is that the distance from *Cumidava* to *Angustia* on the Transalutan frontier? Yes, because we are there inside the same province, *Dacia Inferior*; no, because the length Râșnov-Brețcu is not a new frontier, but a second century one. Older works mention some distances, as between Râșnov and Turnu-Măgurele, for which 235 km is the 'standard' one, as being consecrated by G. Tocilescu (1900, 123), taken as granted by D. Tudor (1978, 253), C.C. Petolescu (2021, 46), but many others.

4 Following yet a road made in the early second century, used in Trajan's time. The date of the earlier days of *Limes Transalutanus* (as a frontier) are still at debate, as some say that will be in Hadrian time (Bogdan Cătăniciu 1997, in several places), but others pushed the event in Caligula's time (Petolescu 2021, 51-53). As an early date, like Hadrian's rule, has to be excluded, a chronology 'in the early third century' is much more likely.

5 The newest report for that frontier in Țentea, Popescu and Călina 2021.

6 Teodor 2016 for the settlements next to a fort; Teodor 2017, 897-898 (only for the settlements along the frontier, but missing a military fort).

7 The influence of the natural conditions in the design of this new frontier made the object of the study in Teodor 2018 b. Some facts, as the absence of the construction stone, imposed some unexpected solutions.

8 Tudor 1955, 94, following an unpublished manuscript of Grigore Tocilescu from 1896. The issue was tackled in Teodor, Dumitrescu and Chivoci 2016.

9 A strange episode is related to a so-called *vallum* discovered by an amateur archaeologist, in 1904, westward of the Rucăr fort. That embankment was reported 'containing red soil', read later as 'burned'. There are here some obviously weird facts here: the pretended burned palisade would be located on the opposite part as expected (*barbaricum* was towards east!); the fort near Rucăr was operational only till 117 AD, as latter archaeologically proved (Bogdan Cătăniciu 1997, 45-47), when the area was not next to a frontier (the frontier laid 200 km eastward, those days); there is no risk of invasion in Rucăr, as the area is protected by rugged mountains for dozens of km, the place being next to Dâmbovița Gorges, impossible to cross except well trained climbers. The weirdest of all is that the 'discovery' was credited by Dumitru Tudor (1955, 93; 1978, 255). What we have here to say is that the forest soil is reddish by nature, although it is not burned.

10 Except pebbles, but not easy to reach and not everywhere.

11 As rendered by our own works before digging the thing. See, for instance, Teodor 2015 b, 22 with Fig. 5 (the 'explanations' given there are fully wrong), 110 with Fig. 46, 112 with Fig. 47. The difficulty of accepting such a situation is given by its unicity (Napoli 1997, 12).

12 Summarily at Tocilescu 1900, more detailed in the – until recently unpublished – notes made by Pamfil Polonic (see Teodor 2015, 215-221), other descriptions and sketches in Bogdan Cătăniciu 1997, 79-89.

13 See http://limes-transalutanus.ro/.

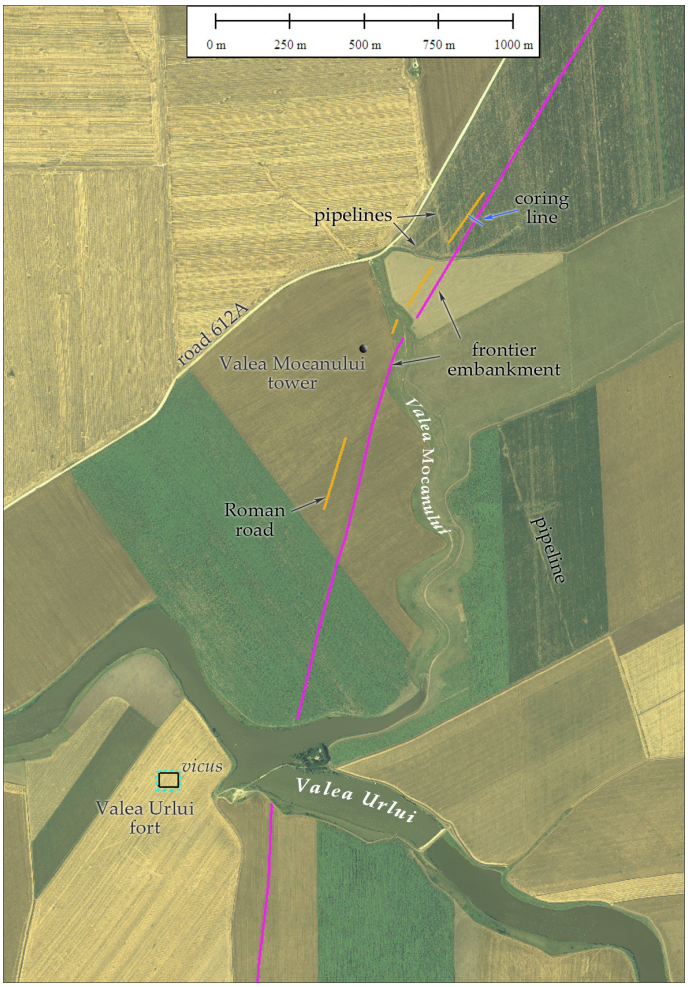

Fig. 2. Roman archaeological sites near Urlui Valley and Mocanului Valley. Orthophoto 2012 and vectors. Note that all illustrations without an explicit orientation are heading north.

the northern segment from Fig. 2, located northeast of Mocanului Valley, was visited several times, testing first documented building techniques without digging.[14]

Corring the *vallum*

As soon as the project begun, in the fall of 2014, we went back at the place, in order to make a coring test. Taking samples at regular intervals was a substitute of digging, aiming to provide a first glimpse of the stratigraphy across the burned embankment. We were using a manual coring tool able to work down to 4 meters below the surface. The central axis of the embankment was established, but not as rendered by the topographical survey, but following the trail of burned remains. Once the zero point (named Core Zero) was fixed, a perpendicular line was drawn, crossing the embankment from west (the upper place) to east (the lower place, see Fig. 3). The pace of coring was established at 4 m distance. Wouldn't be that too far? It could be, but with good reasons. The manual procedure is slow and difficult, and our main interest was to intersect the ditch, if one would be there; therefore, the coring line should be long enough to avoid missing the ditch, but no ditch could be smaller that 4 m in width. The cores towards west were named regressively, from C-1 to C-6, and the cores east of the embankment axis were named the similar, but positively, from C1 to C6. The full result of drilling is published in detail,[15] therefore we will depict here only the resulted stratigraphy along those 48 m (Fig. 4).

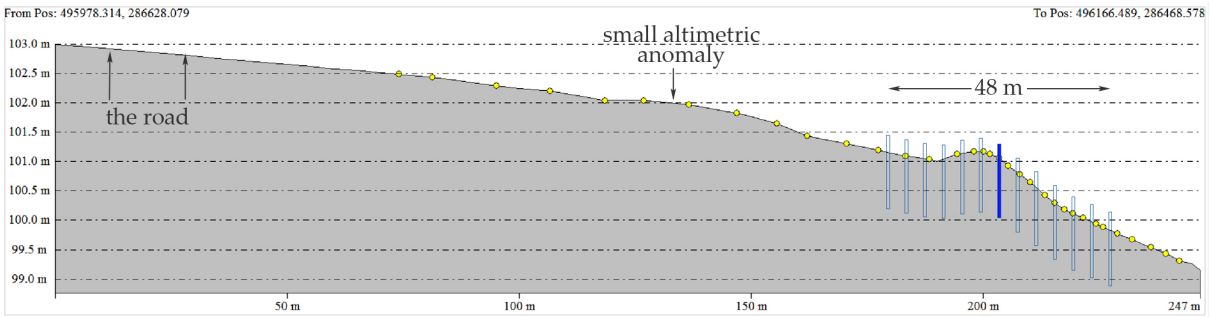

Fig. 3. Altimetric section north of Mocanului Valley, with location of the coring line (blue bars, see also Fig. 2). Coordinates for Stereo70.

[14] That research project was aiming a frontier line measuring 160 km, from Danube to Argeș River. As everybody knows, digging is slow and expensive, and we tried first other methods to document the frontier.

[15] Haită and Teodor, 2016, in Romanian.

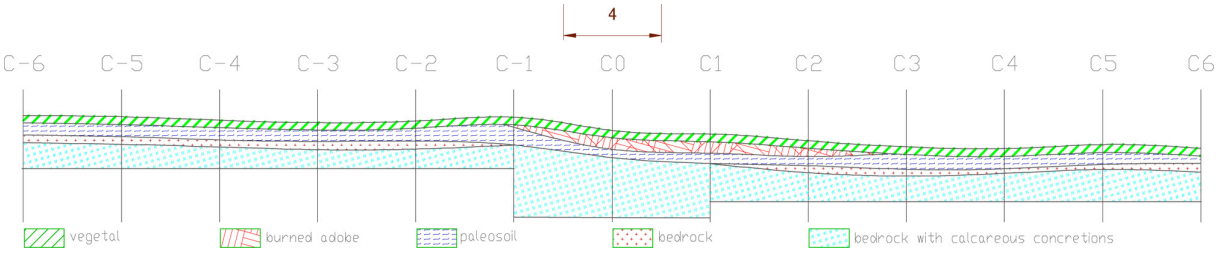

Fig. 4. Stratigraphy resulted following coring (blue bars at the Fig. 3).

The most interesting fact within the picture at the Fig. 4 is that the embankment looks different on altimetry and stratigraphy. Following the altimetric figures, the *vallum* has only 8 meters (from C-2 to C0), but looking at the layer containing burned matters, it is far longer, and slipped between C-1 to C3 (or close), being thus about 17 m in width. It was impossible to tell, then, how was that possible, but later experiences made that clear. A second observation was that the upper bedrock is pinched between C-1 and C1, an obvious sign that the builders dug below the line were burned matters lay, although that intervention is not obvious. The paleo-soil was nowhere untouched, small bits of burned adobe being scattered through cracks; therefore, the paleo-soil looked the same all over. As for the bedrock containing concretions, later diggings, in the same geographical area, showed us that it is to be found everywhere, the size and amount of those concretions growing progressively with the depth, showing an undisturbed layer.

A certain fact was that no ditch is to be found there, and the claims of the former reports were right. What we still did not know, after coring, was how the embankment was born, what was its inner structure, or if any entrenched structure existed.

Fig. 5. Drone oblique image at Mocanului Valley, April 2015, heading north.

Views from above and beneath

The next event connected with this area was a drone flight from the Roman fort at Valea Urlui, in April 2015. That mission was meant to follow the route of the frontier embankment towards north, in order to have a detailed orthophoto and a digital terrain elevation. At the end of that route, the camera was switched to oblique position, taken some shots around. One of those shots is displayed in Fig. 5. Looking at it has suggested that we just discovered a burned tower, in the rear area of the embankment.[16] The rest of the image was not very useful – at the time – because the *vallum* was almost invisible in the foreground, with a weak visibility in the distance. In the middle distance one can also see short segments of the Roman road and of the embankment. Well… We saw that much later…

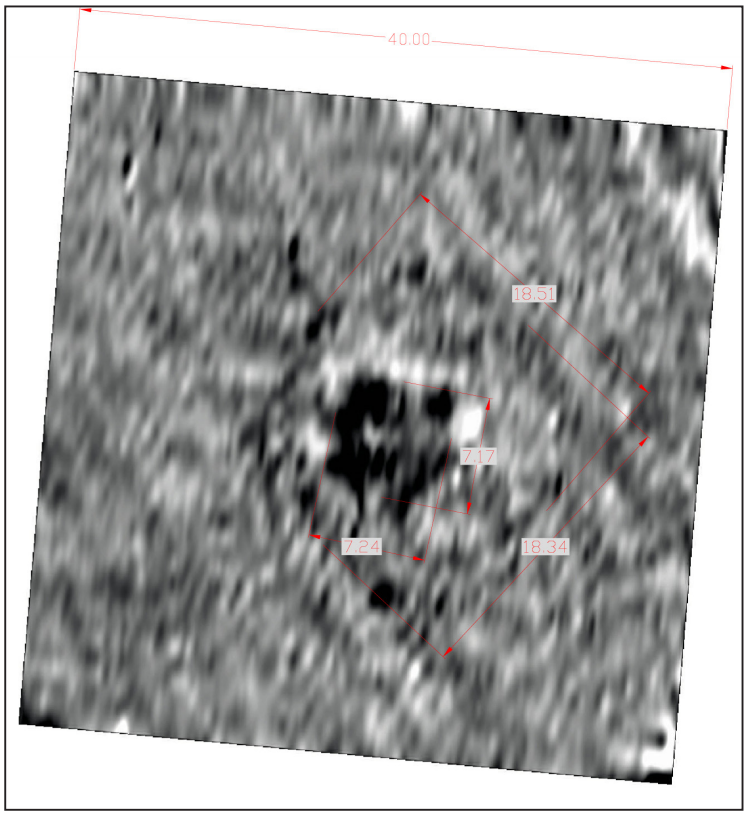

Fig. 6. Magnetometry at the Roman tower south of Mocanului Valley.

In the same spring the area was investigated by the means of geophysics. The magnetometry shows a square plan of a burned tower, measuring around 7.2 m along side, and a sub-rectangular ditch measuring about 18.4 m at the outer limit of the defensive ditch (Fig. 6), which is a rather large tower, very likely a tall one.

We made the decision to make a mechanical trench throughout the embankment, in order to see the stratigraphy, but it took a while to find a landowner to allow us to do so. In the spring 2016 the one working on the triangular field from the right side of the Fig. 5 granted us the permission. The place was good, close to the city, easy to bring a backhoe, and with a good access way. One day before the digging, we performed at the established place of the excavation an electrometric procedure, the results being provided here at the Fig. 7 (oriented approx. west-east). The main interest was to guess the bottom of the future archaeological trench, or, simpler – was there any ditch which would require a deeper excavation? Looking at that picture, the short answer is no. Some average-low resistivity values are to be seen below the meter 10, but as no burned matters existed towards the bottom, most likely it was no ditch. Speaking of burned stuff, suggested by the high values of resistivity, one can see that they are spread near the surface on a still larger distance than previously seen, on the coring section. The middle of the burned area is located on the top of the terrain, but the high vales are extended 9 m towards west and 10 m towards east of the theoretical ax of the embankment. The burned area is descending between the meters 16 and 17 down to about one metre in depth, suggesting a sort of infrastructure.

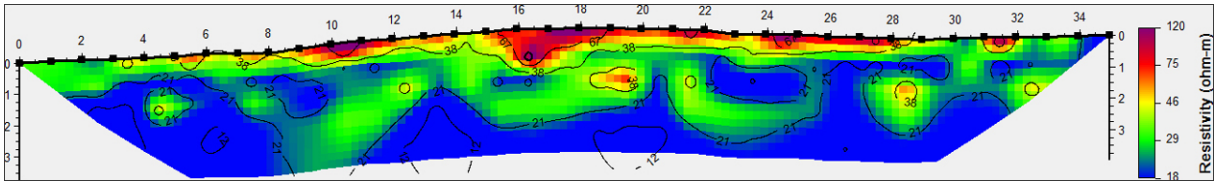

Fig. 7. Resistivity application north of Mocanului Valley (at the place where later was made the Trench 1, see further, Fig. 11).

[16] The distance is pretty large – almost 100 m – and seems to be too large, but distances 70-100 m between the embankment and the towers are normal on this frontier. Details in Teodor 2018 a, 337-339 with the Fig. 7.

Fig. 8. Photo taken at Trench 1, at the top of the embankment, northern side.

The excavations

The excavation took place the next day, 22nd of May 2016, resulting a section 34.7 m long, 2.2 m wide, and an average depth of 1.85 m.[17] The excavation itself was far more difficult than anticipated, due to the toughness of the clay; although the digging was done with a mechanical device, the sections had to be straightened up manually, and the speed in which the ground was drying up was amazing.[18] A second kind of difficulty is due to the fact that the area was not factual inhabited, after the construction was finished, therefore no obvious stratigraphy was to be seen, in comparison, for instance, to a Roman fort. It was a really interesting – but painful – exercise to spot tiny relevant things (Fig. 8).

The most obvious conclusion is that there is no defensive ditch (Fig. 9). The main structure is a trench with variable geometry (0.6 m in width on the northern side, but 1 m on the southern side), descending from 1.1 to 1.4 m below the antique surface, very likely used to bury large logs in vertical position. Nothing is preserved from the former

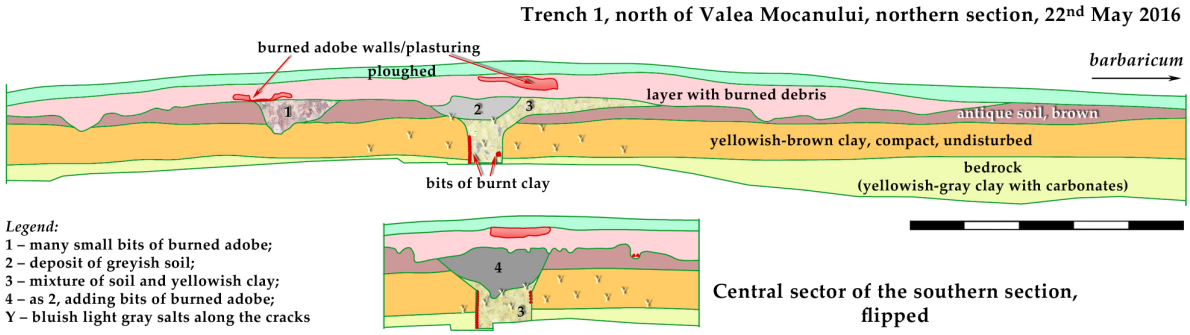

Fig. 9. Drawing depicting the central area of Trench 1, May 2016.

[17] The mechanical excavations at Mocanului Valley were briefly published (in Romanian) in Mirea et al. 2017, 241-242.

[18] We had a hand of help from our colleague from the National Museum, Mihai Florea, and from a volunteer from Turnu Măgurele, Gigi Teican.

palisade,[19] aside indirect clues, as bits of burned soil rolled down between the logs and edge of the trench, visible on the both sides of the archaeological section. Large chunks of burned soil were located near the palisade, but also in an area located 5 m towards west, nevertheless the entire layer below the surface appeared full of burned stuff of smaller sizes, containing dispersed matter of the burned palisade. Those debris were not undisturbed, as the track of the former palisade had been used, in the Middle Ages (and later) as a road[20] and any road needs maintenance from time to time.

Looking now at the antique brown soil layer, one can see that it had been strongly modified, on the entire length of the archaeological trench, or, to be more specific, on the entire drawn length (21 m at the Fig. 9). A large hole (post-hole?) was located 4.5 m west of the palisade, and a smaller hole is located another 3.5 m westward. Those contexts were missing from the southern side of the archaeological trench and could be taken as built structures behind the palisade, standing on posts. For a guard road the building was too large; we presume it was rather an open (?) shelter meant to protect the guards of rain or sun light.[21] Of course, the real thing cannot be known without a more developed digging.

Interesting enough, interventions into the brown paleo-soil layer could be seen also about 5-6 m in front of the palisade. We do not have now the means to address this, but the issue popped up again, in the subsequent excavation, as presented further.

Another thing for which there is no straight forward explanation is referring to the bluish light gray salts (noted Y into the Fig. 9). They are surely related to the vertical cracks into the soil, developed from the surface and descending to the bottom of the excavation. They should very likely be connected with recent fertilizers, although they were visible along the cracks only below one meter, probably because they were descending in moist state and drying along the cracks, looking as a sort of salts. The only problem is that we couldn't see them everywhere, but only around the palisade. From other experiences in the area, we think that this is just coincidence, irrelevant for archaeological purposes.[22]

Fig. 10. A frame from a UAV recorded video at the Mocanului Valley, looking south, May 2016.

[19] Within the soil and climatic conditions from southern Romania the wood is not preserved above 2 m. In our experience, that could happen below 4 m.

[20] Teodor and Ștefan, 2019, 204-206.

[21] It is worth noting that the southern Romania has frequently Sahara kind of summer, but a Russian kind of winter. Shelters would be necessary in both cases.

[22] We saw such white-greyish salts in our six excavation campaigns at the Roman fort at Băneasa, just some kms southward. The things happened alike, the salts being present always below the layers of archaeological relevance, but not everywhere. We made efforts to understand the issue and finally concluded that there is no connection between those salts and the archaeological evidence.

Fig. 11. Mocanului Valley, orthophoto over model-terrain, with the location of the archaeological trenches. July 2016.

Within the preparations for this digging we made also a second drone coverage of the area. The video recorded on that occasion showed us, beyond doubt, that on the opposite side of the Mocanului Valley there were two features of interest (Fig. 10). A visit payed at the place confirmed the intuition. On a slanted land, between the bottom of the valley and the terrace above, therefore on a stripe of land unfitted for ploughing, a small section of the embankment, and something else, maybe a road, survived along centuries. Although not planned, we started preparing ourselves for another excavation.

The action took place in July 2016. Vegetation was cut on the entire area, in order to have a good terrain-model (Fig. 11) but also to favour reliable results on magnetometry. The geophysics offered the same picture as the terrain-model, showing not one, but two embankments on the southern feature, where Trench 2 was going to be made (Fig. 12). That was turning interesting…

The next two trenches (T.2 and T.3) were made mechanically in the same day (July 16, 2016), this time with supplementary work force for tiding them up,[23] giving the dimensions: 31 x 2.6 m for T.2 and 19.3 x 2.7 m for T.3.

Looking now at the Fig. 13 (Trench 2) one can see that the layer containing debris is smaller and, in fact, it is containing less burned matters as we have seen on the Trench 1. That hampered the observation of the palisade trench, almost 'invisible', yet suggested by a small trace of red bits of burned soil, present in front of the trench, also of similar bits found on the bottom of the trench. This time the feature was less deep (about 0.65 m) and probably narrower (0.6 m); just 'probably', as the western side of the pit could not be established.

On the sides of the palisade the layer of the burned debris was washed out (the surface is slanted!), as well as the next layer, of the antique paleo-soil, especially in the western side; missing those parts, one cannot perform anymore a direct comparison with facts behind the palisade as seen in Trench 1. On the opposite side, towards the outer part, the similitude is outstanding: 7 m in front of the palisade the antique soil was excavated, in a shallow manner, on a length of about 2.5 m, on the bottom of that feature being found burned woods and heated adobe. Now it is obvious that 5 to 7 m in front of the palisade there was something more, presuming a shallow feature, filled with something (wooden boxes, spikes, bushes?), an additional obstacle, burned down with the same occasion.

On the same southern profile of Trench 3, one can see a carriageable way 4 m wide, flanked by two drains, located 6 m one of another (distance measured between the centres). The western drain has been deeper, which is normal, being the side receiving much of the flowing waters. If we look now to the larger picture (Fig. 14) we can see that a secondary drain was made towards west,[24] retaining some of the water flowing to the road.

There is not a single pebble in that road, although the shape of the feature is typical.

There are two stratigraphic issues to be addressed here. As one can see (Fig. 13, down), the western half of the road was just shaped into the antique soil; in the other half, the builder made a relatively large hole, filling it with a different composition, a mixture of light brown clays, brought there from nearby. Below it, there is a composition very similar with the bedrock from the west side, yet the frequency of the carbonated marks is lower. This filling is ending eastwards into another geological undisturbed sequence. The need in doing so is yet not so clear. We suppose that the builders had to fill a gap in the field, something as a small ravine.

[23] Two strong workers hired specially for that job and two volunteers (Gigi Teican and Mihai Micu).

[24] This is not unusual (Tilburg 2007, 16), especially for roads made on a slope (as here), although rarely seen in a digging.

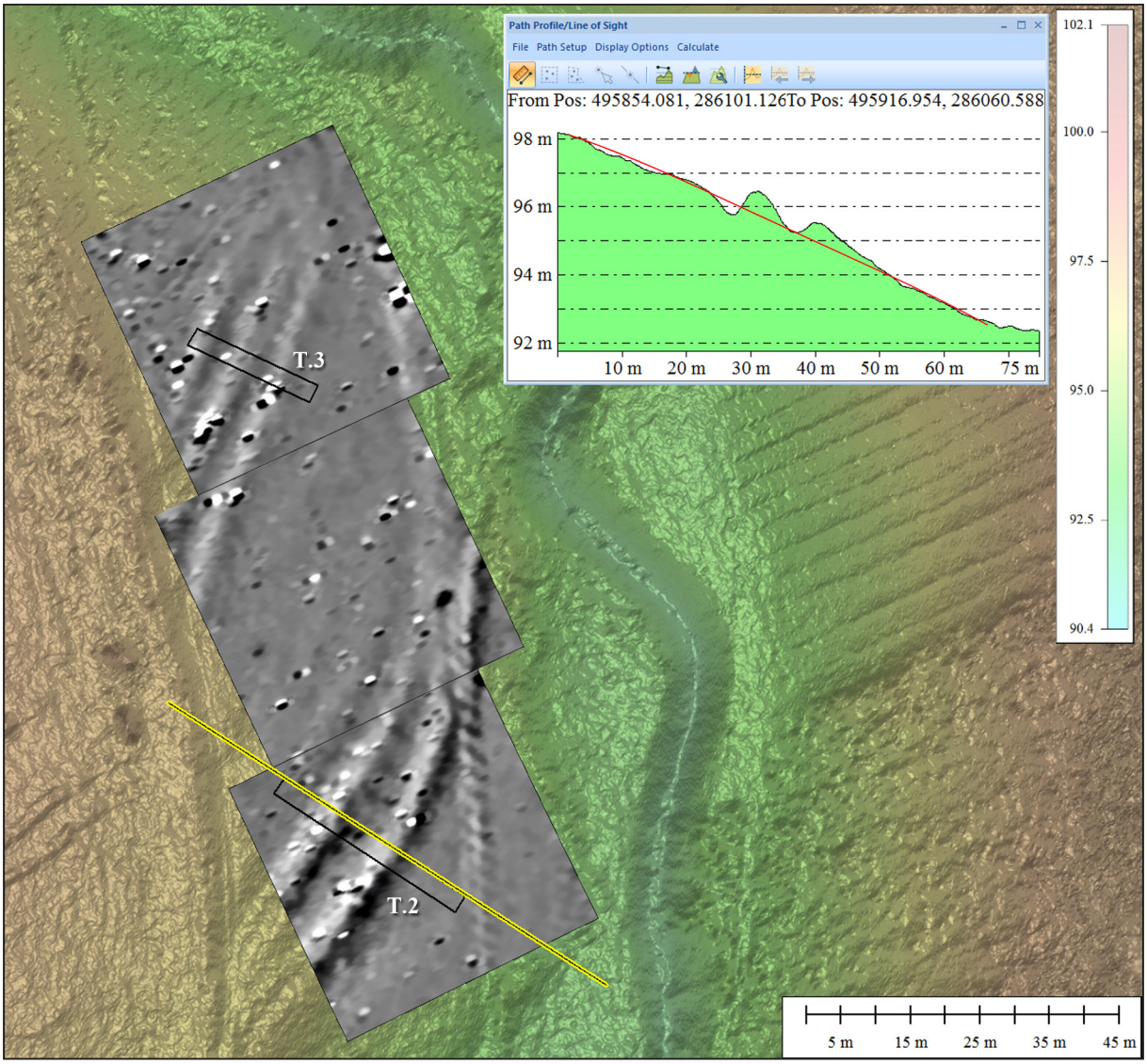

Fig. 12. Mocanului Valley, magnetometry over the terrain-model, and altimetric cross-section along Trench 2 (Stereo 70 coordinates). Red line for the natural slope.

A question comes out: how can an archaeologist find a Roman road in such an environment, in arable land? He cannot, obviously. The profile of the road is levelled by ploughing, and only a lucky excavation could find the

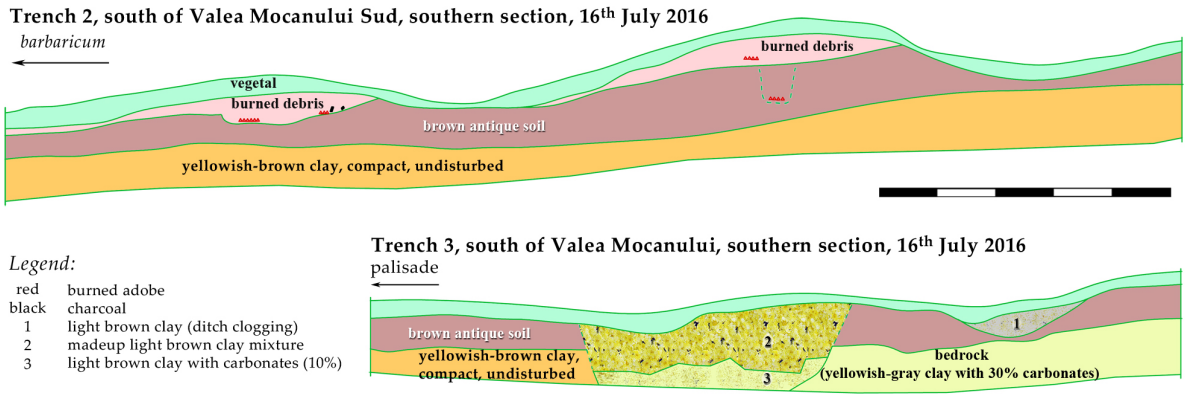

Fig. 13. Southern sections of Trenches 2 and 3, south of Mocanului Valley.

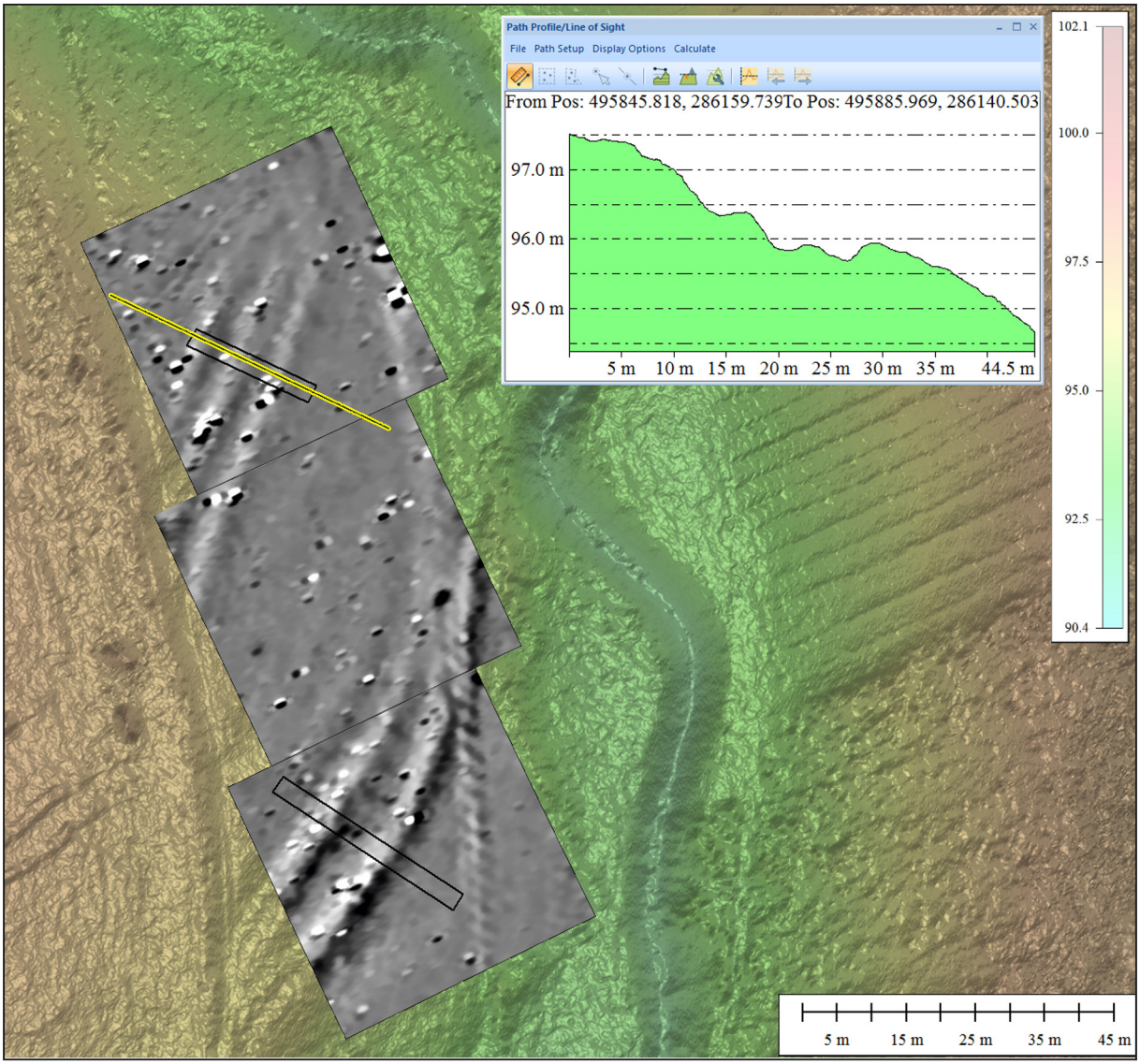

Fig. 14. Mocanului Valley, magnetometry over the terrain-model, and altimetric cross-section along the Trench 3 (Stereo 70 coordinates).

drains. In fact, there are instances in which, on some aerial snapshots, a small line is paralleling the embankment. Nevertheless, digging in the middle of the field is not a wise thing.

Topographical evidence of the roads

This is why we only know short sequences of presumably Roman roads, here and there, mainly outside the plough land. In order to keep this evidence for future field research, we made a table with some essential data (see below, Table 1).

*

Outcomes in short

Defining the Roman World is not a simple task, as many commonplaces are floating around the concept, for example the stone roads. What could be more 'Roman' than Via Appia, popping up everywhere on social media with its large and well fitted cobblestones? Nevertheless, parts of it were covered by gravel for centuries, before c. 100 AD. More than that, gravel roads were common in Roman provinces.[25]

[25] Tilburg 2007, 5-6.

Table 1. Segments of likely Roman roads, between Danube and Vedea Valley

coordinates (geographic, WGS84)	length	description
43.8759245704,24.9696416306 43.8752673284,24.9697526374 43.8747743743,24.9697528928	128 m	On the northern slope of Totița Valley (2.4 km south of Putineiu fort), 32 m west of the palisade (the central line of the embankment); no profile, just artefacts scattered along a line.
43.9073017240,24.9709623624 43.9069972282,24.9707486277 43.9067362498,24.9706351317 43.9063834331,24.9704347928 43.9062087390,24.9703306056 43.9058590371,24.9701894974 43.9052091613,24.9698390341 43.9073017237,24.9709623703 43.9069972279,24.9707486356 43.9067362495,24.9706351396 43.9063834328,24.9704348007 43.9062087387,24.9703306136 43.9058590368,24.9701895054 43.9052091610,24.9698390420	250 m	On the southern side of Călmățui River meadow, in marshy land, visible (with interruptions) as a small linear rampart, with a low profile. Its location, 120 m afar of a large tower, also in flooded land, located east of the rampart, is suggesting that this is not anymore a frontier palisade, but a road crossing the meadow, very likely with a wooden infrastructure. The old folks from Putineiu village know it as the 'brick road',[26] but into the local language 'brick' means any burned adobe. We were not able to find at the surface any bricks or burned adobe. Note that the road is not as straight as expected, mainly because it was reused (therefore also repaired many times) along Middle Ages and Modern times, being rendered on older maps (as Specht Map, 1791, or Szathmári Map, 1864).
43.9081625846,24.9711247801 43.9091298889,24.9712703993 43.9081625843,24.9711247881 43.9091298885,24.9712704072	108 m	A continuation of the above mentioned construction, on the same southern bank of the Călmățui River. Not explored, but suggested by some orthophotos. Although closer to the river, this area is arable land, therefore the archaeological structures are disturbed.
44.0414687643,24.9404819680 44.0407133459,24.9405250530	84 m	Located at Epureasca Valley, 54 m west of the palisade (measured from the axis) and 34 m east of the tower. The road is suggested by the topographical survey (high resolution DEM), as a slightly raised line on the plough land.
44.0695262600,24.9438698671 44.0716964187,24.9447805840	252 m	Located between Urlui Valley (700 m towards south) and the tower at Mocanului Valley (300 m towards north), at a distance of 82 m west of the frontier palisade. It is suggested by high definition orthophotos.
44.0748404743,24.9467264521 44.0752516793,24.9469065916	48 m	On the southern edge of Mocanului Valley. This is the road excavated and reported in this paper.
44.0756855507,24.9473667501 44.0768590108,24.9483764791	153 m	The continuation of the above, on the northern bank of Mocanului Valley, 48 m west of the frontier palisade. Not sure, just impressions from some photos.
44.0775787772,24.9490885815 44.0791005683,24.9505399074	205 m	Continuation of the above, beyond a small depression, 33 m west of the frontier palisade. Suggested by aerial snapshots but not certain.
44.1090863393,24.9633291596 44.1085840513,24.9631438667 44.1090863377,24.9633291522 44.1085840497,24.9631438593	58 m	Between the edge of the terrace and the bottom of the Bratcov Valley, on a strong slope, west of Roșiorii de Vede. Not being ploughed, the profile is still well preserved, but possibly still narrower than the one excavated at Mocanului Valley.
44.1130200006,24.9625904989 44.1131481884,24.9624984996	16 m	North of Bratcov Valley, in the context of a settlement with burned buildings, located on the sides of a road, as suggested by field survey and geophysics.

[26] Mentioned by Schuchhard 1885, 228-229.

Roads made on pebbles have been discovered also on *Limes Transalutanus*, including on its southern section, south of Argeș Valley, but only in some excavated forts, as Putineiu,[27] Băneasa,[28] Urlueni,[29] possibly Săpăta.[30]

As concerns the roads between the forts, what we certainly know are just a few fragments and only one excavation. The cut through the road from Valea Mocanului Sud did not show any pebbles. Surface surveys in all the other cases did not show pebbles either. Given the fact that some of those segments are arable lands, if any gravel had been used for making a road it should be visible on the surface; but it is not. The only instance we have seen pebbles on the surface is west and northwest of the railway station Troianul (between Băneasa and Valea Urlui fort), for some hundred meters in length, yet that one shows not an antique road, but the ruins of the palisade, turned in a road in Middle Ages; it is therefore a late improvement of the mud road.

Bibliography

Bogdan Cătăniciu, I., 1997. *Muntenia în sistemul defensive al Imperiului roman, sec. I-III p.Chr.*, Alexandria: Muzeul Județean de Istorie.

Haită, C., E.S., Teodor, 2016. Sondaje sedimentologice şi geologice la Valea Mocanului, in E.S. Teodor (ed.), *Arheologia peisajului şi frontiera romană*: 57-66. Târgoviște: Cetatea de Scaun.

Mirea, P., Teodor, E.S., Ștefan D., Ştefan, M., Haită, C., Florea, M. şi Ţeican, G., 2017 – Raport 136, *Cronica Cercetărilor Arheologice din România, campania 2016*: 238-242.

Napoli, J., 1997. *Recherches sur les fortifications linéaires romaines*, Rome: École Française de Rome.

Petolescu, C.C., 2021. *Armata romană în Dacia*, București: Editura Academiei.

Schuchhardt, C., 1885. Wälle und Chausseen im südlichen und östlichen Dacien, *Archaeologisch-Epigraphische Mittheilungen aus Oesterreich-Ungarn*, 9: 202-232.

Teodor, E.S., 2015a. A Romanian World Heritage linear site? Unsolved issues, in S. Cociş et al. (eds.), *Ad finem Imperii Romani*: 373-390. Cluj-Napoca: Mega:.

Teodor, E.S., 2015b. *The Invisible Giant: Limes Transalutanus. An overview south of Argeş River*, Târgoviște: Cetatea de Scaun.

Teodor, E.S., 2016. Stadiul identificării așezărilor civile pe frontiera transaluană, in E.S. Teodor (ed.), *Arheologia peisajului și frontierele romane*: 97-122. Târgoviște: Cetatea de Scaun:.

Teodor, E.S., 2017. Historical outcomes at the end of an archaeological project: Limes Transalutanus, in S. Forțiu et al. (eds.), *Arheovest V, in honorem Doinea Benea*: 885-907. Szeged: JATEPress Kiadó.

Teodor, E.S., 2018 a. Watching and Warning along the Limes Transalutanus. The Search for Watchtowers along its Southern Sector, in Sommer, C.S., Matešić, S., (eds.), *Limes XXIII. Proceedings of the 23rd International Congress of Roman Frontier Studies, Ingolstadt 2015*: 331-340. Mainz: Kommission: Nünnerich-Asmus Verlag.

Teodor E.S., 2018 b. Environmental impact in building a new frontier, *Angvstia* 22: 167-194.

Teodor, E.S., Dumitrașcu, E., 2019. Excavations at the Eastern Gate of the Băneasa Roman Fort, *Cercetări Arheologice* 26: 103-124, DOI: https://doi.org/10.46535/ca.26.03.

Teodor, E.S., Dumitrescu, I., Chivoci, F., 2016. Segmente ale drumului roman între Câmpulung și Dragoslavele, in E.S. Teodor (ed.), *Arheologia peisajului și frontierele romane*: 123-140. Târgoviște: Cetatea de Scaun.

[27] Bogdan Cătăniciu 1997, 105, for the second phase of *via sagularis*. For the first phase the author was speaking about limestone (Rom. *piatră calcaroasă*), without relative dimensions, although the limestone is absent everywhere north of the Danube, as well on the surface of the fort (surveyed in detail in 2015-2016, in our research project). We suppose she meant calcareous concretions, available in subsoil on loess-like deposits, about 2-3 m below the surface, provided probably when the ditches (two of them) where dug.

[28] In our own excavations, along *via praetoria*, in both positions tried, at the eastern gate of the first phase (Teodor and Dumitrașcu 2019, 114), and the eastern gate of the second phase (diggings 2021, not published in detail).

[29] Note yet that in the first phase the inner roads of the two forts were made of sand, but within the second phase pebble roads have been noted here and there (Bogdan Cătăniciu 1997, 96-101). Such a road, made with sand, have been noticed also for *via principalis* of the fort in Răcari (Dolj County, on Jiu River, in central Oltenia), for the first phase, dated in the early second century AD (Teodor, Nicolae and Alexandrescu 2011). In southern Romania, where the stone is difficult to find, Romans obviously have looked for substitutes, as pebbles or sand (or anything not turning in mud).

[30] Bogdan Cătăniciu 1997, 95.

Teodor, E.S., Nicolae, C., Alexandrescu, C.G., 2011. 54. Răcarii de Jos, com. Brădești, jud. Dolj, *Cronica cercetărilor arheologice din România, Campania 2010*: 112-113.

Teodor, E.S., Ștefan, D., 2019. Trajan's Road: A Timeless Sign of the Romanian Plain, in Döhl, R., van Rensburg, J.J. (eds.), *Signs of Place. A Visual Interpretation of Landscape*: 201-214. Berlin: Topoi.

Tilburg, C.R. van, 2007. *Trafic and congestion in the Roman Empire*. New York: Routledge.

Tocilescu, G., 1900. *Fouilles et recherches archéologigues en Roumanie*, Bucarest: Imprimerie du Corps Didactique.

Tudor, D., 1955. Considerații asupra unor cercetări arheologice făcute pe Limes Transalutanus, *Studii și Cercetări de Istorie Veche* 6, 1-2: 87-97.

Tudor, D., 1978. *Oltenia romană*, fourth edition, București: Editura Academiei.

Țentea, O., Matei-Popescu, F. și Călina, V., 2021. Frontiera romană din Dacia Inferior. O trecere în revistă şi o actualizare. 1, *Cercetări Arheologice*, 28, 1, 9-90, DOI: https://doi.org/10.46535/ca.28.1.01.

Lista ilustrațiilor

Fig. 1. Frontiera romană între Dunăre și Valea Vedea. Suport cartografic SRTM 30, 2018. Sunt reprezentate castrele, obstacolul de frontieră și orașele de astăzi (acestea cu litere capitale). Proiecție Stereo70, coordonate geografice.

Fig. 2. Situri arheologice în zona văilor Urlui și Mocanului. Ortofotografie (2012) și vectori adăugați (portocaliu – drumuri; axa probelor geologice – albastru; poziția turnului – cenușiu; castrul – contur negru).

Fig. 3. Secțiune altimetrică la nord de Valea Mocanului, cu localizarea axei probelor geologice (pentru poziția planimetrică vezi Fig. 2). Coordonate Stereo 70.

Fig. 4. Stratigrafia rezultată din analiza probelor geologice.

Fig. 5. Vedere oblică din dronă la Valea Mocanului, orientare nord, aprilie 2015.

Fig. 6. Magnetometrie la turnul roman aflat la sud de Valea Mocanului.

Fig. 7. Aplicația de rezistivitate la nord de Valea Mocanului, pe poziția unde ulterior s-a realizat Secțiunea 1. Pentru localizare vezi Fig. 11.

Fig. 8. Fotografie din S.1, la partea superioară a valului, profilul nordic.

Fig. 9. Desen al părții centrale a S.1, mai 2016.

Fig. 10. Cadru dintr-un film făcut din dronă la Valea Mocanului, vedere spre sud, mai 2016.

Fig. 11. Valea Mocanului, ortofotografie suprapusă modelului-teren, cu localizarea secțiunilor arheologice. Iulie 2016.

Fig. 12. Valea Mocanului. Magnetometrie suprapusă modelului-teren, cu secțiune altimetrică în lungul S.2. Linia roșie sugerează panta naturală.

Fig. 13. Profilele sudice ale secțiunilor 2 și 3, la sud de Valea Mocanului.

Fig. 14. Valea Mocanului. Magnetometrie suprapusă modelului-teren, cu secțiune altimetrică în lungul S.3.

EUGEN S. TEODOR
Muzeul Naţional de Istorie a României
esteo60@yahoo.co.uk

CONSTANTIN HAITĂ
Muzeul Naţional de Istorie a României
costel_haita@yahoo.com

DAN ȘTEFAN
Muzeul Naţional al Carpaţilor Răsăriteni
danstefan00@gmail.com