# MAPPING ARCHAEOLOGICAL SITES USING DIGITAL CARTOGRAPHY.
# ROMAN SETTLEMENTS FROM POTAISSA TO NAPOCA

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**Abstract: - Mapping archeological sites using digital cartography. Roman settlements from potaissa to Napoca.** *We aim to analyze and correct several archaeological and historical data regarding some settlements included in an official document, issued by the Ministry of Culture from Romania, entitled the List of Historical Monuments (Lista Monumentelor Istorice / LMI). We focused our attention on the Roman road from Potaissa to Napoca, the main imperial road of Dacia. We described the route of the Roman road and corrected the old information in the list of historical monuments regarding the discoveries within the territory of the village of Aiton. Methodologically, we used data from the old literature, the modern Austro-Hungarian maps from the XVIIIth and the XIXth centuries, information from regional gazetteers and different journals. We aimed to offer new insights regarding the accurate location of these settlements and to debate upon the spatial relations of these settlements and their position within the landscape of Dacia. At the beginning of the study, we presented the present situation concerning the databases in Romania covering archaeological sites. The second part of our study discusses how the archaeological sites are recorded in the list of historical monuments. Then we offered several case studies This type of methodological approach will be applied in the future for other areas, in order to reconstruct the former landscape of the province of Dacia, as accurately as possible, using digital tools and modern maps. Our contribution also improved the quality of the data sets used for the topographical descriptions of archaeological sites in Romania.*

**Key-Words:** the list of historical monuments, digital cartography, Roman rural settlements, Roman road, archaeological patrimony.

## 1 Premises. The old lists of historical monuments in Transylvania

The online databases presenting the archaeological sites of Romania record 14062 sites – http://ran.cimec.ro/.). Of these, 2597 sites belong to the Roman period. Of all sites, about 90 per cent of reported sites, included in this online database, and in the regional gazetteers (archaeological repertories) are indicated by artifacts (mainly ceramic fragments) or building materials identified on the ground surface.

Nowadays, we are dealing with a terrible situation concerning these sites: 1. a lack of a real, comprehensive, cartographic digital database, where all the archaeological sites should be mapped; 2. a lack regarding the use of aerial archaeology to reconstruct the elements of the landscape of Roman Dacia; 3. A lack of detailed field investigation, supported by detailed cartographic analyses concerning archaeological sites. The Romanian archaeologists and historians made great efforts,

in time, to know the topography of Roman Dacia. Until recently, they used classical methods, i.e. fieldwalking and excavations, in a period of 'romantic archaeology', when there were no economic pressures, no 'deadlines', no preventive archaeology. But nowadays, when large infrastructure projects (highways, commercial or residential centers) began all over the country, preventive archaeology is the only solution to protect, save and capitalize the archaeological heritage. So, massive infrastructure projects, combined with the law regarding planning, have requested maximum efforts from archaeologists, but unfortunately the documentation concerning archaeological sites remains largely at the level of the 1970's. This represents, in my opinion, an important lack in the Romanian scientific community. We are dealing with a terrible situation. The European Convention for the protection of the archaeological patrimony in La Valetta[1] (adopted at La Valetta on the 16th of January 1992 and ratified by Romania by Law no. 150 of 24 July 1997) asks, at the beginning, the following: "…it is important to institute, where they do not yet exist, appropriate administrative and scientific supervision procedures…". In 2000, the government adopted the Decree 43/2000 concerning the protection of the archaeological repository[2]. But in applying these legislative measures, the sites needed to be properly known and mapped.

During the 1950's, a project started in Romania, focusing on the creation of the National Archaeological Repertory. Soon after this moment, due to the lack of cooperation between specialists, the project was partially abandoned. After the 1990's, this situation changed, but very slowly. The first archaeological repertory published was the one for Cluj County.[3] This work established a pattern for the future publications of this kind. The modern settlements were alphabetically described, started with the earliest discoveries (prehistory) and continuing chronologically, to

Roman times and post Roman discoveries. The topographic indications and the maps are, in many cases, almost useless. The indications in text, in many cases, are formulated like this: "…in that part of the village…", "…on the territory of the settlement X…" or "…. South, North, East or West of this point/road/terrace/river etc." The maps published in these repertories are extremely general, sometimes with no scale, difficult to read.

So far, several archaeological repertories were published, for the following regions/counties: Cluj, Mureş,[4] Alba,[5] Braşov,[6] Covasna,[7] Arad,[8] Harghita,[9] Sibiu,[10] Caraş-Severin,[11] Hunedoara,[12] Sălaj.[13]

In 2000, the biggest and most comprehensive Atlas concerning the Roman world was published (Talbert 2000). In the *Map-by-map* directory (a list of all settlements mapped), those from Dacia are described using old documentation, i.e. *Tabula Imperii Romani* (L-34, Budapest and L-35, Bucharest), published in 1968-1969. After more than 40 years, this information must be updated. We identified three main issues: 1. despite general efforts during the twentieth century, archaeological investigation in Romania focused on military and urban sites; 2. We have a paradox: a large number of the sites recorded and briefly described in the online databases and regional gazetteers are not Roman fortresses or urban sites (*municipia, colonia*), but settlements in the rural areas; 3. modern methods and tools for the investigation of the sites are rarely used. For decades, because of legal difficulties during the Communist years, using aerial photographs to identify, describe and map archaeological

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[1] http://conventions.coe.int/Treaty/en/Treaties/Html/143.htm.
[2] http://www.cimec.ro/Legislatie/Og43-2000-Republicare-2007-04-25.pdf.
[3] Crişan, Bărbulescu, Chirilă, Vasiliev, Winkler 1992.

[4] Lazăr 1995.
[5] Moga, Ciugudean, 1995.
[6] Costea 1996.
[7] Cavruc 1998.
[8] Hügel 1999.
[9] Cavruc 2000.
[10] Luca, Pinter, Georgescu 2003.
[11] Luca, 2004.
[12] http://arheologie.ulbsibiu.ro/ publicatii/bibliotheca/xvi/repertoriu%20arheologic%20hunedoara%20mic.pdf.
[13] http://www.brukenthalmuseum.ro/pdf/Biblioteca Brukenthal/XLV/BBXLV.pdf.

sites was forbidden. After the '90s, few aerial reconnaissance programmes started in Romania, even if this method is largely used in countries like Great Britain, France, Germany, Austria etc. Only an exception can be recorded. W. S. Hanson and Ioana Oltean started and implemented a project concerning aerial reconnaissance in Western Transylvania (1998-2004). As a result, a book was published (Oltean 2007).

## 2 Current statistics of archaeological structures mentioned in LMI (the List of Historical Monuments)

Many sites survived on the territory of the former province Roman Dacia, but the exact location of a large number of archaeological sites is still unknown. A project implemented between 2006 and 2010 focused on the discovery of new archaeological sites within the territory of Timiş County (western Romania, region which was not included in the former Roman Dacia). After two years of terrain investigations, about 300 new archaeological sites were discovered.[1] Another example is suggestive as well. In Hungary, or Romania, large infrastructure projects (motorways, railways, commercial centers) dramatically changed the number of potential unknown sites. Every 1 - 1,5 kilometer along a motorway (70-100 meter wide), a site was discovered. In Romania, all the archaeological sites are listed and shortly described in an official document, issued by the Ministry of Culture, entitled the List of Historical Monuments (Lista Monumentelor Istorice / LMI).[2] The list was updated in 2010. Unfortunately, because a unified digital database recording all the archaeological sites in the country was not developed, errors and other problems are contained within this list. How are these sites recorded?

Each site is recorded with an individual code (random example: CJ-I-m-A-07180.01).

CJ represents the acronym of the county (in this case Cluj). The next item is a Roman numeral, which indicates the monuments by categories: I is for archaeological monuments, II for architectural monuments, III for public monuments and IV for memorial and funerary monuments. Then it follows a small letter, indicating: *m* for monument, *a* for ensemble and *s* for archaeological site. This is followed by a capital letter (A or B), which represents: A. monument of national interest; B. monument of local interest. The final part of the code indicates a unique serial number across the country (e.g. 00001.01).

In many cases, due to the lack of information, archaeological structures found at the ground surface, mainly consisting of ceramic fragments, are categorized and registered as sites belonging to the category A (sites of national importance). This classification is based on the law 422 of 18 July 2001 regarding the protection of historical monuments, and the government decrees no. 2682/2003 (regarding the approval of methodological regulations for the classification and registration of historical monuments, and of the List of historical monuments) and 562/2003 (issued by the Ministry of Transports, regarding the technical regulations focused on the regional plans). In order to update and maintain an accurate database, continuous field investigations must be made, because otherwise sites which no longer exist (destroyed by agricultural works, for example) are registered in the lists. So, from a socio-economic or cultural point of view, as well as from a scientific perspective, this project will improve the level of knowledge concerning the archeological sites.

## 3 The Roman road from Potaissa to Napoca

In 106 A.D. Dacia became Roman province. Before the conquest, during the two military campaigns in 101-102 A.D. and 105-106 A.D., the Roman engineers, leaded by Balbus, succeeded to project and to start the construction of the first Dacian 'highway': the road starting from the Danube, towards the

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[1] http://www.banaterra.eu/romana/colectiv-arheogis-baza-de-date-patrimoniului-arheologic-cuprins-lista-monumentelor-istorice.

[2] http://arhiva.cultura.ro/Files/GenericFiles/LMI-2010.pdf.

Banat region, including two branches - the Western road, from Lederata to Tibiscum, and the Eastern road, from Dierna to Tibiscum.

In fact, these two branches were the two lines used by the Roman army to penetrate the Dacian territory. Connecting together at Tibiscum, the road continued along the valley of the river Bistra, in the narrow corridor also known with the name 'the Iron Gates of Transylvania', until it reached the future capital of Dacia, Ulpia Traiana Sarmizegetusa. From here, the road continued to North, towards Apulum, Potaissa, Napoca, ending at Porolissum, the northernmost point of the Dacian province. From south to north, the road has a total length of circa 450 kilometers. The construction started in 101-102 A.D. and probably ended around 110 A.D. We know this from an interesting discovery of the 18th century. In 1758, at Aiton (Cluj County) a Roman milestone was discovered, with an inscription informing that this road was constructed during Trajan. According to the inscription, the road was built in 108 A.D. Probably soon, in the next two years, the Romans succeeded to finalize the construction of the most important road in Dacia.

Between Potaissa and Napoca this road was extensively identified in the terrain and mapped with accuracy. The total length in this sector is 36 kilometers, i.e. 24 Roman miles. The slope is small. The general direction is from south-east to north-west. In several points, close to the area of the current village Ceanu Mic, the road was recently the object of some preventive archaeological researches. What is more important is the position of the legionary fortress from Potaissa[1] (Turda, Cluj County), in relation to this road and the other one from south, heading towards Războieni-Cetate. Choosing the location for one big legionary fortress as the one from Potaissa (23,37 ha) was not an easy task. The only one big plateau in this area was/is the hill called 'Cetate' (altitude 375 m), positioned west of the current city. This place was also close to a stone quarry (from here up to north, to the quarry from Sănduleşti,

the distance, in straight line, is circa 5,5 kilometers). Another important aspect was related to the water source for the camp and the ancient city. This source was identified and used by the Romans close to the stone quarry. The plateau provides a slight slope: towards north-west, where *porta decumana* was built, the terrain is a little higher comparing to the east. From the north-eastern corner of the fortress one could easily visually observe the Roman road up to the top of the hill called 'Dealul Dăbăgăului'. Our shed analysis demonstrates that towards north, there was visibility up to Aiton, and in south, all the valley of Arieş was visible, almost to the point when this river flows into the Mureş River. Once again, using digital data, combined, obviously, with archaeological information, we can demonstrate the powerful preoccupation of the Roman engineers to carefully occupy the geographical space, and to create strategic and economic advantages using this space.

*Potaissa* was the most important military settlement from the Northern part of Dacia. With an estimated population of 20.000 inhabitants, Potaissa was the headquarters of the *legio V Macedonica*. Its fortress (573 x 408 m) was positioned on the Cetate Hill, in the Western part of the city.

From Potaissa to Napoca the Peutinger map mentions XXIIII miles (35,484 km). The whole sector between those two settlements was identified in the terrain, surveyed and mapped.[2] In this particular sector, the Roman engineers proved again their amazing skills and knowledge in finding the perfect route for the road. They understood perfectly the geomorphology of the terrain and, therefore, the Roman road does not climb the big Feleac Hill, but avoids it. The engineers preferred to choose the simple, better route from Potaissa through the villages of Ceanu Mic, Aiton and Gheorghieni, until the road reached Napoca. It this way, the Roman road is with 4 kilometers longer than the current road, but avoiding the hill to the East, it presented a better, simple route.

[1] Bărbulescu 1987; Bărbulescu 1994; Bărbulescu 1997.

[2] Winkler, Blăjan, Cerghi 1980, 63-73; Winkler 1982, 587-589.

Along the main imperial road, at Aiton (Cluj County), exactly 10 miles (14,785 km) North of *Potaissa*, a Roman milestone was erected in 108 A.D., during Trajan. The monument was found in 1758. Now, unfortunately, is lost. The text is:[1]

IMP(erator) / CAESAR NERVA / TRAIANVS AVG(ustus) / GERM(anicus) DACICVS / PONTIF(ex) MAXIM(us) / (tribunicia) POT(estate) XII CO(n)S(ul) V (sic) / IMP(erator) VI P(ater) P(atriae) FECIT / PER COH(ortem) I FL(avia) VLP(ia) / HISP(anorum) MIL(liaria) C(ivium) R(omanorum) EQ(uitata) / A POTAISSA NAPOCAE / M(illia) P(assuum) X.

This piece of evidence has a triple importance: 1. In the formula *a Potaissa Napocae* we find the first epigraphic evidence of *Potaissa* and *Napoca*; 2. This road sector was built by *cohors I Flavia Ulpia Hispanorum milliaria civium Romanorum equitata*. This troop is mentioned among the military forces used by Trajan in the war against the Dacians. After fulfilling its mission, it was garrisoned at Orheiul Bistriței, along the northeastern frontier.[2] Because it was *equitata*, I suspect the use of this cavalry unit for the recognition of the landscape of northern Dacia; 3. This particular case can be added to the list of the military units, which built roads, even if Michael Rathmann proved that little evidence could be found to demonstrate the individual existence of the term *via militaris* in Roman times.[3] At Aiton, a sector of road was excavated. Nowadays it is preserved in the courtyard of the village school, together with a copy of the milestone. In 2005, a sector of this road was found close to the village of Ceanu Mic. Within the territory of the village Aiton, in several points (private gardens of the inhabitants), there were recorded and excavated wall substructures, coins, ceramic fragments, all of them proving the existence of a stopping point along the road, possible a *mansio*.[4]
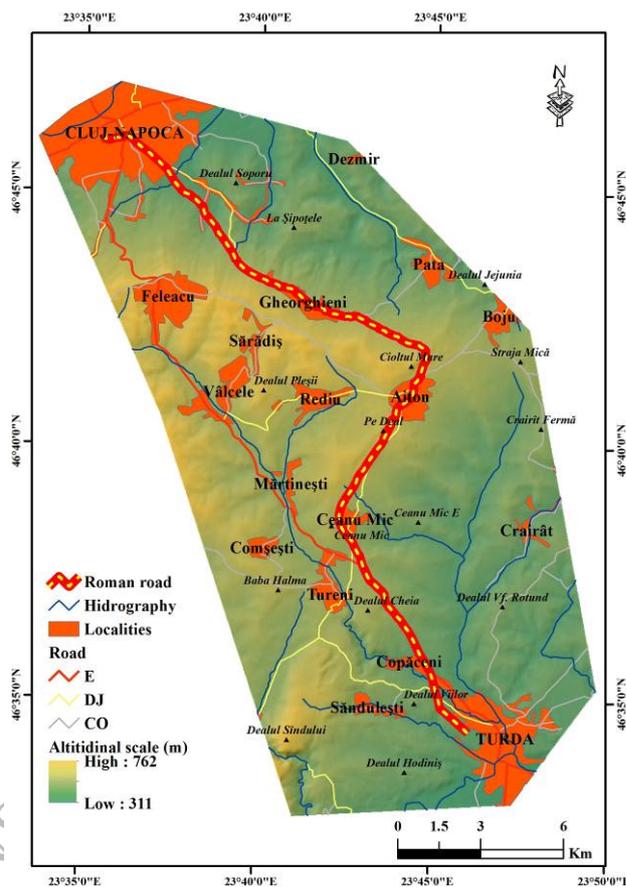
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[1] CIL III 1627.
[2] Protase 2008.
[3] Rathmann 2003, 40.
[4] Blăjan, Cerghi 1978, 21-27; Fodorean 2006, 133.



**Fig.1.** *Roman Road*

This road is very important. It is, after all, a section of the first road built in Dacia. To establish the exact topography of the Roman road, we created a cross section of the road and we read the parameters [Fig. 1]. The engineers used at maximum the geomorphology of the terrain and they chose the best route for this road. These parameters are:

1. Start position: 392463.625, 586288.289
2. Start height: 352.16 m
3. End position: 405504.407, 564440.419
4. End height: 378.407 m
5. Straight-line distance: 25.447 km
6. 3D distance on surface: 31.724 km
7. Vertical difference (start to finish): 26.2 m
8. Total Climbing: 571.6 m
9. Total descending: 545.4 m
10. Minimum elevation on path: 347.361 m
11. Maximum elevation on path: 653.386 m
12. Azimuth: 148° 09' 5.3"
13. Slope/Tilt: 0.06°
14. Max path slope: 11.13° [29.39 km along path]

## 4. Mapping the archaeological discoveries in Aiton

Aiton is the name of the most important Roman settlement along this road. Archaeological investigations in the area of this village were carried out mostly in the last century, but most are accidental discoveries.

During the Roman period, Aiton was probably an important rural settlement within the territory of Potaissa, and we must suppose that a *mansio* was set up here. Why? First, because of the distance from Potaissa: 10 Roman miles. Second, because of the discoveries within the territory of the village. We mapped all these important discoveries [Fig. 2]:
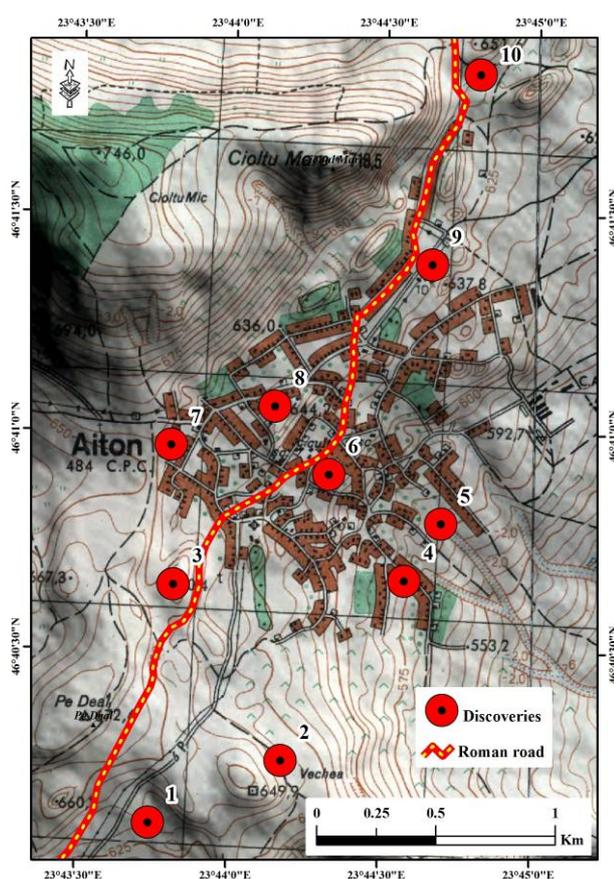


***Fig.2.** Important discoveries*

1. Close to the rivulet Togu, there is a small terrace, 1 km south of the entrance in the village. Ceramic fragments belonging to the Roman period were discovered here;

2. In the south-eastern part of the village, in a point indicated by the toponym "La Cânepi",

numerous archaeological remains were discovered: stones, tiles, ceramic fragments. On a surface of circa 40 x 50 m, several sections were excavated. The foundations of a building of 17,6 x 14 m were discovered. The foundations were constructed of stone with clay. The building had several rooms. The walls were made of wood. Below the Roman level fragments of prehistoric ceramics were also found. The archaeological investigations remained unpublished. These data are recorded in the archaeological repertory of Cluj County, at Aiton, no. 10, page 23;

3. On a small terrace, positioned close to the southern entrance in the village, traces of several former walls were observed, scattered at the surface of the ground;

4. In the garden of the house no. 130, archaeological excavations lead to the discovery of a channel, on a length of 11,60 m. Close to it Roman ceramic fragments were discovered. Below this level, prehistoric fragments of ceramic were found. Above the channel two fragments of Roman monuments were identified, one of them dedicated to IOM;

5. Agricultural workings lead to the discovery of Roman materials in the gardens of the houses no. 83, 84, 116, 121, 126, 160 and 316;

6. In the garden of the Orthodox Church a terracotta Roman statuette was discovered, representing a female;

7. The western part of the village is entitled "Podul de Piatră" ("the stone bridge"). In this area, several important discoveries are recorded: traces of Roman buildings (walls, stones, bricks and tiles), ceramic fragments and an amphora fragment with an inscription. A building with 5 rooms was discovered. The walls were built in *opus incertum*, with a pavement of *cementicium*. This building was first discovered in 1903;

8. In the garden of the house no. 135 fragments of Roman ceramics were discovered. Archaeological excavations were carried out here. Four sections were excavated, revealing a corner from a building;

9. In the garden of the house no. 436 other remains from a Roman settlement were found, together with a large quantity of Roman ceramic fragments;

10. Within an area delimited by the toponyms "La Izvoare" and "Butură", in the north-western part of the village, Roman ceramic fragments were found.[1]

The list of the historical monuments of Cluj County records a total of 12 points with archaeological discoveries in Aiton. Of these, only two record archaeological discoveries belonging to the Roman period. More, of these two points, one records the presence of the Roman road. So, actually, only one point mentions the existence of Roman discoveries, in a place called "Deasupra Morii" (no. 43, CJ-I-m-A-06938.02). Aiton is not mentioned as Roman settlement in other databases.[2]

In 1991 I. Moțu tried to map several points with archaeological discoveries within the territory of Aiton.[3] In the center of the village he indicated (fig. 2 in his article) the existence of remains of former Roman buildings. Unfortunately, the sketch published in the article has no scale, and the location of the points mapped there seems difficult using modern ortophotographs. What can we establish is that several buildings can be located in the northern part of the village, close to the route of the Roman road. One building was excavated in 1913 by M. Roska. A sector of another building was excavated by I. Moțu.

## 5. Conclusions

What can we establish using all data available? These are the main information:

1. The position of the milestone discovered in 1758 in Aiton must be located south of the village. This way, the distance from Potaissa to Aiton is exactly 10 Roman miles, as indicated in the text of the inscription;

2. The discoveries within the territory of the village Aiton indicate that this settlement was an important point along the main imperial Roman road. The archaeological excavations and the other data indicate the presence of several buildings in the northern part of the current village. Also, traces of a channel were

discovered. The artifacts are also interesting. In numerous cases, the archaeologists discovered large quantities of ceramic fragments;

3. Based on what we know so far, we can distinguish two areas with Roman discoveries: the points no. 1, 2, 3, 4, 5, 6 are grouped in the southern part of the village. The points no. 9 and 10 are positioned north of the village. The points 7 and 8 are positioned between these two areas, in the western part of the village.

All in all, these data allow us to affirm that Aiton represented, during Roman times, an important settlement between Potaissa and Napoca.

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