

WATER DISTRIBUTION AND DRAINAGE IN APULUM*

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Abstract: This paper focus on the water distribution system of the two towns developed at Apulum, in the Roman period, *municipium Aurelium Apulense*, from the nowadays Partoș district, and *municipium Septimium Apulense*, the former *canabae legionis XIII Geminae*. Taking into consideration the archaeological discoveries and also the epigraphic evidence, the authors try to underline the specific case of water supply system of Apulum in the Roman provinces of Lower Danube context.

Cuvinte cheie: Dacia romană, Apulum, legiunea XIII Gemina, aprovizionarea cu apă, M. Statius Priscus.

Rezumat: În acest articol autorii prezintă rezultatele cercetării sistemului de aducțiune a apei din cele două orașe dezvoltate la Apulum, în epoca romană: *municipium Aurelium Apulense*, de pe teritoriul actual al cartierului Partoș, și *municipium Septimium Apulense*, fostele *canabae legionis XIII Geminae*. Ținând cont de descoperirile arheologice, precum și de evidența epigrafică, autorii încearcă să prezinte particularitățile sistemului de aducțiune a apei de la Apulum în contextul provinciilor romane de la Dunărea de Jos.

At the same time with the organization of Dacia province, on the place of the nowadays city Alba Iulia the XIII Gemina legion built its fortress. The imperial authorities decided to place the legionary fortress in this area due its strategic position, in the middle of the defensive centre of the province, on the Mureș River valley at the crossing of the main roads connecting the newly created capital *colonia Ulpia Traiana Augusta Dacica Sarmizegetusa* with other important settlements.

Furthermore, we may speak about the relatively proximity to the auriferous district from the Apuseni mountains, which had to be supervised by the military. The legionary fortress was built, even during the reign of Trajan, on a dominant plateau, more precisely on the third terrace of Mureș River (the ancient Maris), delimited in north by the Ampoi River which springs from the Apuseni Mountains, and in south by the smaller affluents of the Mureș.¹

The building of the legionary fortress favoured the development nearby of the first nucleus of civilian habitation, *canabae legionis*, inhabited by Roman citizens and people who were not Roman citizens (businessmen, merchants, artisans). This had even from the beginning the characteristics of a town. As a consequence of its development it became *municipium Septimium Apulense* during the reign of Septimius Severus.

The first Roman city developed here is *municipium Aurelium Apulense*, located under nowadays Partoș district; it reached this status during the reign of Marcus Aurelius. Subsequently, it became *colonia Aurelia Apulensis* during the reign of Commodus. Due to the geographical proximity with the gold mines of the Apuseni Mountains, the *colonia* received in the 3rd century the epithet of *chrysopolis*.²

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¹ Moga 1998, p. 44, 48. In the current phase of the research it is assumed that during emperor Hadrian the construction of the stone stage of the legionary fortress began; work finished during the following emperor, Antoninus Pius.

² It is attested by the discovery of a statue's base in IDR III/5, 432, dated 252-253 A.D. See: Diaconescu, Piso 1993, p. 67.

One of the urbanistic works which involved the soldiers of XIII Gemina legion was water catching. There was used one of the springs located in the place “Fântâna Împăratului” from the Mamut Hill. There are also noted here, among the older archaeological vestiges, brick pipes from the Roman period.³

It seems that the culvert and sewerage works towards the legionary fortress and *canabae* were ended in 158 A.D., when *M. Statius Priscus* was the governor of the Dacia Superior province.⁴ In 1968, during some archaeological excavations inside the Roman-Catholic Church, an architectural complex having a hypocaust system was discovered. This was probably legion's bathhouse (Pl. I/4) reconstructed in the first half of the 3rd century A.D., as the coins, discovered during the archaeological excavations, seem to attest (Iulia Domna, Iulia Mamae and Severus Alexander).⁵ Moreover, in 1980, in the nearby of *via sagularis*, close to *porta principalis dextra* of the legionary fortress, a tile pipe of 0.2 m diameter was discovered. It was used for the discharge of water outside that building.⁶

During the archaeological excavations organized between 1888 and 1908 in southeast of the Austrian fort, the first custodian of the Alba Iulia Museum, Adalbert Cserni, discovered several edifices, two large bathrooms and an important number of streets (Pl. I/1). Here, stamped bricks with of the XIII Gemina legion and of a *numerus singulariorum* were discovered. The bricks were used in the construction of the hypocaust, the pavement and some clay pipes.⁷ Two fragments of lead pipe of 2.5 cm diameter were also found.⁸ Others three fragments of lead pipe (A 6208/13856) coming from Apulum are in the possession of the Bruckental Museum at Sibiu. Two other fragments have not an Inv., but most likely they also came from Apulum. The exterior diameter of the three fragments mentioned above is approximately of 4-5.5 cm. Their interior diameter has different sizes. For the first fragment is of 3.7-4.8 cm and of the latter⁹ one is of 3.5 cm.

During the archaeological excavations in Alba Iulia, Munteniei Street between 1992 and 2003, Viorica Rusu-Bolindeț investigated a building, assumed to be a part of the residence of the governor of three Dacian provinces (*legatus Augusti pro praetore trium Daciarum*) (Pl. I/2).¹⁰ A *hypocaustum* and a succession of three ditches in the E room of the edifice were discovered. The ditches were probably used as a sewerage system. In the so called D room of the building, other two hypocaust systems, together with a bronze coin from Faustina Senior were also discovered. These rooms belong to the last existence phase of the edifice dated between the end of the 2nd century and the beginning of the 3rd century A.D.

During the 2000-2001 archaeological campaigns, the room C of the same building was discovered (of large dimensions: the preserved length = 10.60 m, the preserved width = 4.50-5 m).¹¹ The entrance to this room was possible by an access corridor placed in West. The room had a floor of *opus signinum*, covered with a brick pavement, from which is preserved only a small section in its south-western part. At 9.10 m east from the western wall of the D' corridor and 1.20 m south from the northern profile, on the floor of C room, at -1.32 m depth, a lime slush pit of quadrilateral shape (dimensions: 0.74 x 0.2 m) and NE-SW oriented was discovered. At 0.18 m from its southern and eastern sides and at 0.14 m from the northern and western sides, a circular area was carved, with a depth of appreciatively 0.02 m, having a diameter of 0.40 m, in the middle of which there is a central aperture with a diameter of 0.10 m. On the edges of the circular area, other five orifices slightly oblong, of 0.10 x 0.05 m, were carved, placed similarly to the petals of a flower.

³ Moga 1998, p. 58-59.

⁴ *Ibidem*, p. 58-59.

⁵ *Ibidem*, p. 68.

⁶ *Ibidem*, p. 69.

⁷ There have been discovered clay and bronze vessels, lamps, glass, tools and bronze jewels, stone reliefs, votive inscriptions and two monetary hoards (115 denarii and antoniniani issued between Septimius Severus and Gallienus; 225 denarii and antoniniani issued between Septimius Severus and Aurelianus). See: Rep. Alba 1995, p. 38.

⁸ Cserni 1891, p. 38, Băeștean 2007a, p. 101.

⁹ Information received from Professor Ioan Piso, we thank him for that.

¹⁰ We had access to this information by the goodwill of the researcher Viorica Rusu-Bolindeț from the National History Museum from Transylvania who shared with us new information concerning the archaeological excavations she carried out on Munteniei Street.

¹¹ Rusu-Bolindeț 2001.

On the *opus signinum* floor of C room, on an area of 2.70 m, the pit of implanting the sewage and the discharge culvert was discovered. The ditch under discussion has the orientation slightly deviated from the slush pit, nevertheless it was also NE-SW oriented. It is situated near the apse which borders towards SW the room C. It was preserved only by its length of 0.86 m, but continues under the *opus signinum* floor of the room C. It was made of bricks of 0.42 x 0.32 x 0.04 m at maximum 0.30 m depth. Some bricks from the bottom of the ditch were stamped with LEG XIII GEL·VF.¹² The slush pit and the corresponding drainage belong to the last level of the compound, dated in the 3rd century A.D. Of course, this compound belonged, most probably, to a civilian settlement developed around the legionary fortress, *canabae legionis XIII Geminae*.

During the 1997 rescue excavation in the location named Dealul Furcilor, south of the legionary fortress, a thermal complex was discovered (Pl. I/3). The authors named them “the small *thermae*”, to easily differentiate them of the diggings made by A. Cserni, in southeast from the Austrian fort, a century ago.¹³ We refer to a complex discovered on a surface of 8.5 x 4.6 m, built at the end of the 2nd century A.D.¹⁴

Next, we shall index the unpublished archaeological artefacts coming from the archaeological excavations of A. Cserni, the first custodian and director of the museum from Alba Iulia, in the old *glacis* of the Vauban type fortification, situated in its south-eastern part, between 1888 and 1908. We have chosen a number of 20 pieces, different by form and preserved dimensions (unfortunately we found most of them in a fragmentary state), because their number is greater¹⁵:

1. Ceramic tube, Inv. R 2785; length – 69.5 cm; the pipe socket's length - 6 cm; minimum diameter – 12.5 cm; maximum diameter - 14 cm; thickness – 1.2 cm; the pipe socket's diameter – 10.5 cm (Pl. II/1).
2. Ceramic tube, Inv. R 2786; length - 69 cm; the pipe socket's length - 5 cm; minimum diameter – 10.5 cm; maximum diameter – 11.3 cm; thickness – 1.5 cm; the pipe socket's diameter – 6.5 cm (Pl. II/2).
3. Ceramic tube, Inv. R 2787; length – 65.5 cm, the pipe socket's length - 6 cm; minimum diameter - 11,2 cm; maximum diameter – 11.4 cm; thickness – 1.5 cm; the pipe socket's diameter - 7 cm (Pl. II/3).
4. Ceramic tube, Inv. R 2788; length - 65 cm; the pipe socket's length - 6 cm; maximum diameter – 10.5 cm; thickness – 1.5 cm; the pipe socket's diameter – 6.5 cm (Pl. II/4).
5. Ceramic tube, Inv. R 2789; length – 67.5 cm; the pipe socket's length - 5 cm; maximum diameter – 11.5 cm; thickness – 1.5 cm (Pl. II/5).
6. Ceramic tube, Inv. R 2790; length - 66 cm; the pipe socket's length - 1 cm; maximum diameter – 11.3 cm; thickness – 1.5 cm.
7. Ceramic tube, Inv. R 2791; length – 63.3 cm; the pipe socket's length – 1 cm; minimum diameter – 11 cm; maximum diameter – 11.2 cm; thickness – 1.7 cm.
8. Ceramic tube, Inv. R 2792; length – 62 cm; the pipe socket's length – 1 cm; minimum diameter – 11 cm; maximum diameter – 11.7 cm; thickness – 1.8 cm.
9. Ceramic tube, Inv. R 2795; length – 36.8 cm; the pipe socket's length – 1 cm; maximum diameter – 9.8 cm; thickness – 1.3 cm; the pipe socket's diameter – 8.5 cm. At the base of the pipe socket there are seven circular perforations with a diameter of 0.5 cm. Unfortunately, we were not able to find in the bibliography analogies or reliable data on their possible functionality.
10. Ceramic tube, Inv. R 2796; length – 42 cm; the pipe socket's length – 7 cm; minimum diameter – 10.6 cm; maximum diameter – 11.5 cm; thickness – 2 cm; the pipe socket's diameter – 6.8 cm. (Pl. III/5).

¹² IDR III/6, 222. Those which are mentioned as being *in situ* were from the ditch, publishing them without asking permission of Ms. Viorica Rusu-Bolindeț, the person in charge of the excavations. According to the researcher, the stamped bricks have disappeared in 2002, together with the slush pit!

¹³ Ciobanu et alii 2000, p. 295-296; Ciobanu 2004, p. 333-335.

¹⁴ The edifice belongs to the *thermae* “in parallel axes” type, with a central corridor out of which there may be entered in the two parallel rows of rooms, on one side being *apodyterium* and *frigidarium* and on the other side, *tepidarium*, *sudatorium* and *caldarium*, heated rooms. *Thermae* of this type were discovered in the Dacia province at Bumbești and Slăveni, dating from the time of Septimius Severus. See Ciobanu et alii 2000, p. 296; Ciobanu 2004, p. 334.

¹⁵ The photographs had been taken by Ms. Lacrima Rădulescu and the drawings made by Mr. Călin Adam; we thank them for their tremendous help.

11. Ceramic tube, Inv. R 2798; length – 28 cm; maximum diameter – 10.5 cm; thickness – 2 cm.

12. Ceramic tube, Inv. R 2799; length – 25 cm; maximum diameter – 9 cm; thickness – 1.1 cm; the pipe socket's diameter – 5.2 cm (Pl. III/1).

13. Ceramic tube, Inv. R 2800; length – 65.5 cm; the pipe socket's length – 3.5 cm, maximum diameter – 9 cm; thickness – 1.2 cm.

14. Ceramic tube, Inv. R 2926; length – 42 cm; maximum diameter – 11.5 cm; thickness – 1.2 cm. There was preserved inside the tube a fragment from another, out of which only the pipe socket and a part of the body are kept. The two tubes were connected with mortar to assure waterproofing. The second tube has the following dimensions: length – 13 cm, the pipe socket's length – 6 cm, the pipe socket's diameter – 4 cm.

15. Ceramic tube, Inv. R 2928; length – 35 cm; maximum diameter – 10.5 cm; thickness – 1.5 cm. There is preserved on the inside a pipe socket from another tube: the pipe socket's length – 4 cm; the pipe socket's diameter – 4 cm.

16. Ceramic tube, Inv. R 2930; length – 34 cm; maximum diameter – 11 cm; thickness – 2 cm. There is preserved on the inside mortar from another tube and presents a perforated orifice with a (preserved) diameter of 1.5 cm. It was probably a pipe branching for another pipe or a clearing hole of the limy deposition.

17. Ceramic tubes, Inv. R 2932. We refer to two tubes connected with mortar. The first one has the following dimensions: length – 25 cm; the pipe socket's length – 4.5 cm; maximum diameter – 9.6 cm, thickness – 1.3 cm, the pipe socket's diameter – 6 cm. The second one presents the following dimensions: length – 11.8 cm, thickness – 1,1 cm, maximum diameter – 11 cm. Only the first tube has the pipe socket preserved (Pl III/2).

18. Ceramic tube, Inv. R 2933, length – 31.5 cm; the pipe socket's length – 5 cm; maximum diameter – 9.1 cm; thickness – 1 cm; the pipe socket's diameter – 6 cm (Pl. III/3).

19. Ceramic tube, Inv. R 2937; length – 26.3 cm, the pipe socket's length – 6 cm, maximum diameter – 9.7 cm, thickness – 1,3 cm.

20. Ceramic tube, Inv. R 2939, length – 24 cm, maximum diameter – 10 cm, thickness – 0.7 cm. On the inside it is preserved the pipe socket from another tube, fixed with mortar: the pipe socket's length – 5 cm; the pipe socket's diameter – 4 cm.

Most of the presented ceramic tubes are fragmentary and are part of the pipes that supplied with water the public or private buildings that belonged to the city district researched by A. Csérni a century ago. Tubes with numbers 2–5 from the index seem to be part of the same piping system (Pl. IV/1). A similar feature appears at the joining of tubes 6–8. We may therefore argue that the ceramic tubes come from two different systems. Aqueduct ceramic tubes are to be found all over Dacia province, being, as all over the Roman Empire, the most widespread way of transporting water. Good analogies for the Apulum case, and we do not refer only to technical features, are to be found in Drobeta, Potaissa and Ulpia Traiana.

In Drobeta the *thermae* were supplied through a ceramic pipe which P. Polonic identified in 1897 as supplying the fountains of the Roman city nearby the present-day high school¹⁶.

In Turda, during the archaeological excavations from 1977–1978 the Roman aqueducts were discovered. They supplied both the legionary fortress of the V Macedonica legion fort and the Roman city. The tubes of the one that supplied the fortress were 43 cm long, having a diameter of 16.5 cm. The dimensions of the tubes of the aqueduct supplying the city were 39 cm long, with a diameter of 25.5 cm.¹⁷ Although, lead pipes were not yet discovered in Potaissa, the existence of some fragments of bronze pipes,¹⁸ among which at least one might be interpreted as a *calix*, lead us to assume the possibility that they were also there in use.

A fragmentary pipe, of which 22 clay tubes were preserved, was found in *colonia Dacica Ulpia Traiana Sarmizegetusa*,¹⁹ between the buildings noted 001 and 002, during the archaeological excavations in the area of the palace belonging to the procurator of Dacia Apulensis province. Four clay tubes kept in the store house of the old museum (having the following dimensions: length – 26–28 cm; big diameter –

¹⁶ Tudor 1969, p. 319, fig. 94, 3.

¹⁷ Bărbulescu 1994, p. 68–69.

¹⁸ Bajusz 1980, p. 385–386; Tóth 1981, p. 165–166; Bărbulescu 1994, p. 69.

¹⁹ Băeștean 1998–1999, p. 254.

13 cm; small diameter – 6 cm; pipe socket – 7 cm) were also discovered in the of the palace. From Ulpia Traiana there are known 20 tubes kept in the new museum, without knowing their discovery context: length – 24–32 cm; big diameter – 12.6 – 13 cm; small diameter – 5.8–6 cm.²⁰

In Romula (Dacia Inferior province) the ceramic tubes were protected by a brick gallery, of a triangular section, filled with mortar.²¹

Important analogies are to be found in Scythia Minor also. An underground aqueduct was found in Callatis, made of ceramic tubes with a diameter of 20–22 cm, three km north of the city. Other aqueducts made of ceramic tubes were found in Troesmis, Tropaeum Traiani (two) and Casimcea.²² In Histria, an aqueduct made of clay tubes with a diameter of 18 cm and length of 62 cm was discovered, covering a distance of 4 km.²³

From the old collections of the Alba Iulia Museum come several quarry blocks used for the sewerage system (4 still unpublished) depicted as follows:

1. Sewer stone building block, unpublished, of rectangular shape, lime, Inv. R 752, dimensions: 30 X 29 X 12.5 cm. The slush pit has a carved hole (diameter – 26 cm) with three perforations in petal shape, for overflowing of the residual water (Pl. IV/3).

2. Sewer stone building block, unpublished, purchased by A. Cserni, rectangular shape, lime, Inv. R 480, dimensions: 62 X 53,5 X 15 cm. The slush pit has a carved hole (diameter – 41 cm) with six perforations in petal shape, for overflowing of the residual water.

3. Sewer stone building block, purchased by A. Cserni, rectangular shape, lime, Inv. R 458, dimensions: 91 X 64 X 19 cm. The slush pit has a carved hole (diameter – 55 cm) with a circular perforation (maximum diameter – 24 cm, minimum diameter – 15 cm) surrounded by other six perforations in petal shape, for overflowing of the residual water²⁴ (Pl. IV/2).

4. Lime block, in a fragmentary state, placed in the yard of the museum, discovered northeast of the Roman fort, in the circumstances of some urban works from the 80's of the last century, without Inv., dimensions: 204 X 60 X 45 cm. It was probably used for water catching of the spring located northeast of the Roman fort, nearby the St. Elisabeth bastion of the Austrian fortress, or, more probable for the sewerage system²⁵. In the section, it is "U" shaped and the inside aperture through which water flew, was 30 cm wide.

5. Lime block, in a fragmentary state, placed in the yard of the museum, discovered northeast of the Roman fort, in the circumstances of some urban works since the 80's of the last century, without Inv., dimensions: 236 X 60 X 42 cm.

The last blocks seem to be part of the same system if we have in mind that they have the same construction characteristics and dimensions but also for the fact that they were discovered in the same place.

A more delicate problem is to interpret their functionality. If blocks came from a ditch, this seems to have been open, because the edges of the pieces are not carrying the traces of some covering blocks. For this reason an open aqueduct seems less probable, without being able to exclude such a hypothesis; a pipe functioning like this could not transport drinking water. The sealing of such a ditch presumed important works. But mortar traces are missing in their joining area.

In Dacia province, blocks of the drainage ditches were reused as construction material in the steeple of the mediaeval church from Densuș, on its eastern and western side. A similar case is in the Peșteana church, where such a piece is fixed in wall of the church. Their provenance cannot be other than *colonia Dacica Sarmizegetusa*. Close analogies by shape are known in the Empire in Aquincum and Side.²⁶

In the north-western side of the city, traces of Roman water supply system were identified, like a Roman pipe carrying the water from "Fântâna Împăratului", in fact from the springs at Dealul Mamut.²⁷ It is not recorded the type of material this was built from, but probably there are ceramic tubes.

²⁰ *Ibidem*, p. 254-255, fig. II, a, b, c.

²¹ Tudor 1969, p.180.

²² Canarache 1954, p. 357.

²³ *Ibidem*, p. 359.

²⁴ Băeștean 2007a, p. 101-102, Fig. 109; 2007b, p. 395, pl. IV, fig. 21.

²⁵ We received the information by the goodwill of the Professor Gh. Anghel, we thank him for help.

²⁶ Băeștean 2007a, p. 395.

²⁷ Tudor 1968, p. 148.

The epigraphic sources confirm the existence of systems of water distribution in Apulum. Clearly the presence of *thermae*, or the public fountains also assumes the necessary technical means to assure a constant outflow of water, obtained not only by natural resources (springs, rain water, etc). Unfortunately a connection between the epigraphic and archaeological data is difficult to make in Apulum.

The inscription attesting the existence of an aqueduct in Apulum, today gone, was fixed in the wall of a house around the beginning of the 16th century and dates at the end of 158 A.D.:²⁸

*Io(ui) o(ptimo)·m(aximo) et·consessui deorum·dearumque pro·salute·imperii Romani·et·uirtute
leg(ionis)·XIII·G(eminae)·sub·M(arco)·Statio Prisco·consule·designato·demonstr(andibus)
ipsis·aquas·aperiendas·per·L(ucium)·Aurelium Trophimum·ponente[m]
signum·Iouis·et·aram·p(ecunia)·s(ua)·f(ecit).*

Translation: “To Jupiter the worthy and great and to the gathering of gods and goddesses to save the Roman power and for the victory of the XIII Gemina legion under the rule of Marcus Statius Priscus, appointed consul (the gods) themselves indicating (through signs) that must be dug (to find) the source through Lucius Aurelius Trophimus, who erected the statue of Jupiter and the altar. He set up this monument at his expense”. We do not know which the chosen technical feature to transport water was.

On the base of a marble statue discovered between Dealul Furcilor and the residual water ditch of the nowadays Alba Iulia city, a fountain is attested:²⁹

*Ex iussu dei Apollinis·fontem Aeterni·Ulp(ius) Proculinus speculator leg(ionis) XIII·G(eminae) Gordianae·a
solo restituit.*

Translation “Under the protection of god Apollo, Ulpius Proculinus, *speculator* of the XIII Gemina Gordiana legion, remade Deus Aeternus’ fountain.” It dates from the reign of Gordian III (238–244 A.D.).³⁰

The bathhouses are attested by two inscriptions. The first one is a votive inscription, today disappeared, seen by M. Opitz in 1622 on the bank of the Mureș; it probably comes from the territory of *colonia Aurelia Apulensis*, with the following text:³¹

*Fortunae·Aug(ustae)·sacrum P(ublius)·Aelius·Geme(l)lus·uir·clarissimus perfecto·a·solo·balneo
consacrauit.*

Translation: “Dedicated to Fortuna Augusta, Publius Aelius Gemellus, a very illustrious man (member of the senatorial order), erected (this monument), during the time when the baths from the foundations were constructed.” It dates from the end of the 2nd century or from the 3rd century A.D., based on the *uir clarissimus* title, which becomes quite frequent during this period.

The second inscription was discovered in Partoș district of the nowadays Alba Iulia city, in the area of the forum of the *colonia Aurelia Apulensis*. It is a fragmented base of a statue, with the following text:³²

*[Ob] cuius [sta]tuae dedi[cat]ionem Lu[ci]a·Iulia·uxor [C]erunoni(i) per omnes·balne[as] populo·publice
oleum posuit l(oco) d(ato) d(ecurionum)·d(ecreto).*

Translation: “On the occasion of dedicating her statue, Lucia Iulia, wife of Cervonius, offered free oil to people at the baths, the place (of erecting the statue) was given by the decurions’ decree”. It dates from the reign of Marcus Aurelius.³³

²⁸ CIL III, 1061; IDR III/5, no. 185.

²⁹ CIL III, 1061; IDR III/5, 31.

³⁰ IDR III/5, 27.

³¹ CIL III, 1006; IDR III/5, 72.

³² IDR III/5, 446.

³³ CIL III, 7805; IDR III/5, 347.

Unfortunately, unlike *colonia Dacica Ulpia Traiana Sarmizegetusa* (today superposed only by small village), the Roman settlements of Apulum had successive urban super positions in time. This comparison is important, because the obtained results in the case of biggest urban centres of the Province are so different. In the first case, the publication and dissemination of the archaeological material has enriched provincial history with data comparable with the rest of the Empire.³⁴ In the second case, even to attribute a discovered item to one of the attested settlements represents a great problem. Obviously, the archaeological feature is also different. In Sarmizegetusa, only one Roman city existed, nowadays covered merely on the western half (between the walls) of the actual village, in the eastern half without any construction. In Apulum, three centres are attested, superposed almost entirely by the ulterior settlements. The archaeological material is quite rich, compared to other Roman cities from Dacia, but it is difficult to identify the exact place of origin.

Under these circumstances a conclusion referring to the separate situation of water distribution in the two cities and of the legionary fortress cannot be drawn, at least not in this moment.

Nevertheless, in this moment is possible a comparison with the cities such as Potaissa or Drobeta. Maybe, only as a simple coincidence, is worth noticing that the archaeological discoveries related to the water distribution system, in their great majority, come from the area of the *thermae*.

From an epigraphic point of view the settlements from Apulum join Sarmizegetusa³⁵ and, eventually, Ampelum³⁶ through the written attestation of a water distribution system.

The ceramic tubes are pretty numerous, but it is quite difficult to form an idea as far as they are concerned, because only few were entirely preserved. As shape, dimension and feature their great variety does not help too much, because the differences in the case of ceramic tubes may be from several centimetres, in the case of diameters, to tens of centimetres in the case of the tubes length.³⁷ Worth noticing is the ceramic tube no. 9 with incised traces at the base of the pipe socket, which are a little bit deepened. There are not helping analogies and it is not clear whether they had a functional role (eventually for a better binding), an ornamental one or maybe it represented „a signature” of the producer. But the presence of other several similar fragments may indicate the fact that they come from one pipe only. From this point of view there may be identified at least two types of different systems. The items seem to be part of systems of water distribution. In this moment and under the given circumstances neither of the items can be identified as component of a building's arch.³⁸

The number of *fistulae plumbea* is small and certainly insignificant. Reusing lead during the subsequent ages, as well as spreading of the material towards other locations³⁹ (sometimes being lost the initial discovery place) may offer a partial answer of the actual state of research. Maybe the future archaeological excavations will throw more light on this case, because at least in the situation of the cities (if we have in mind their fame and wealth) the lead pipes must have been used in a larger number.

The drainage blocks of the sewerage system, next to those that might come from another ditch, only strengthen the certitude in the existence of water distribution system very well developed, but extremely little known. It is not feasible to exclude the possibility that the drainage ditches could have belonged to the settlements from the *territoria* of the two cities of Apulum, or maybe even from the *territorium* of the *colonia Dacica Ulpia Traiana Sarmizegetusa*. As far as the settlements from *territoria* of cities are concerned the water distribution system used is that of the aqueduct made of ceramic tubes. Nevertheless, in the rural areas wooden pipes were also used, from which at least the metallic junctions should have been preserved. In the Northern provinces, such as Britannia⁴⁰, Gemanian Inferior and Germania Superior,⁴¹ the wooden pipes were frequently used, especially in Romano-British civilian settlements. Situation from Dacia, which has many similarities with the three cited examples, cannot be different.

³⁴ Băeştean 2007a, *passim*.

³⁵ CIL III, 1446 = IDR III/2, 8.

³⁶ CIL III, 1293 = IDR III/3, 282.

³⁷ Băeştean 1998-1999, p. 255.

³⁸ *Ibidem*, p. 256-257.

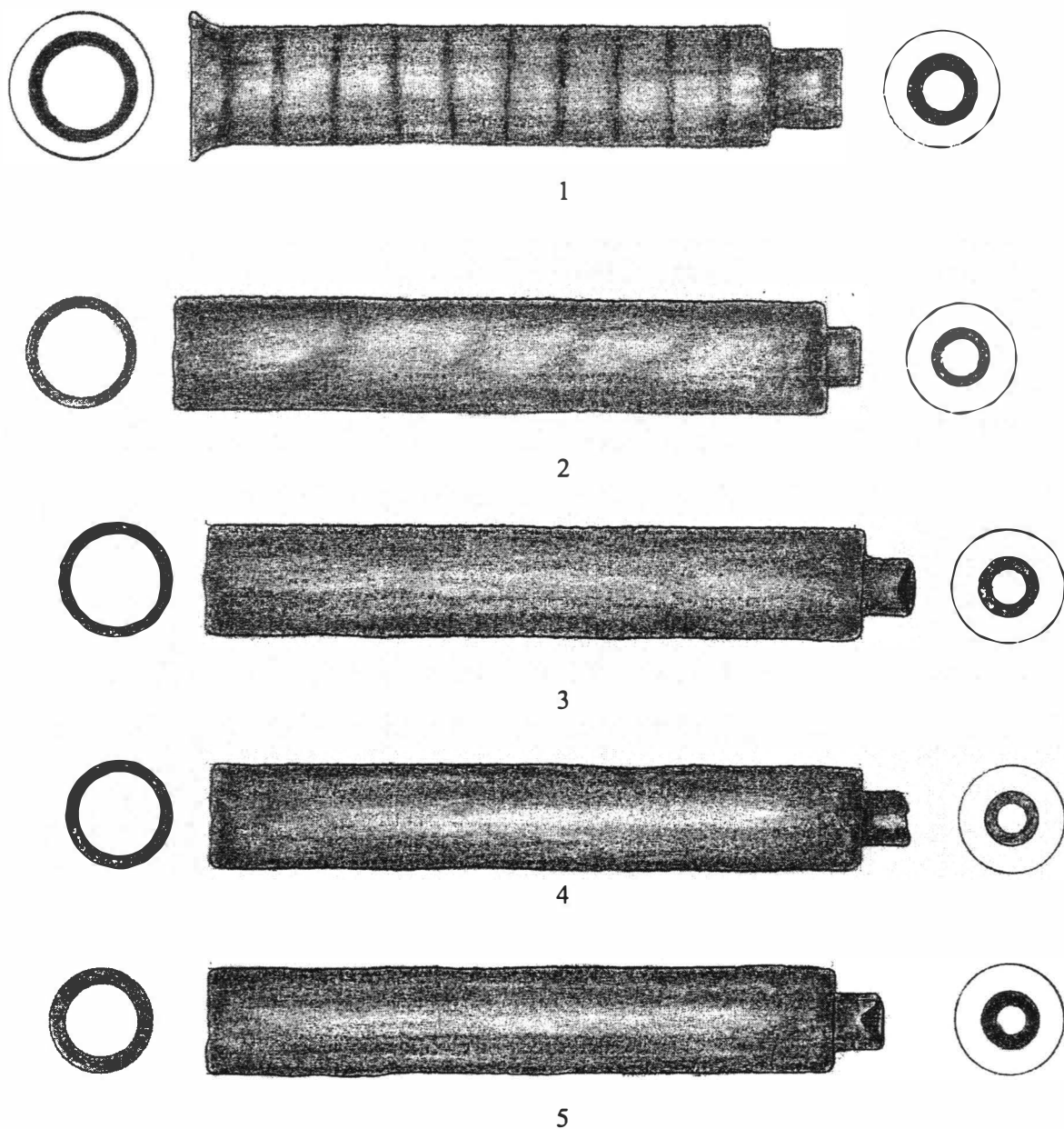
³⁹ A ceramic tube proceeded from Partoş district (written *Portus* in the inventory register), we found it again in the MNIT warehouses Cluj-Napoca, without any other data.

⁴⁰ Stephens 1985, p. 197-207.

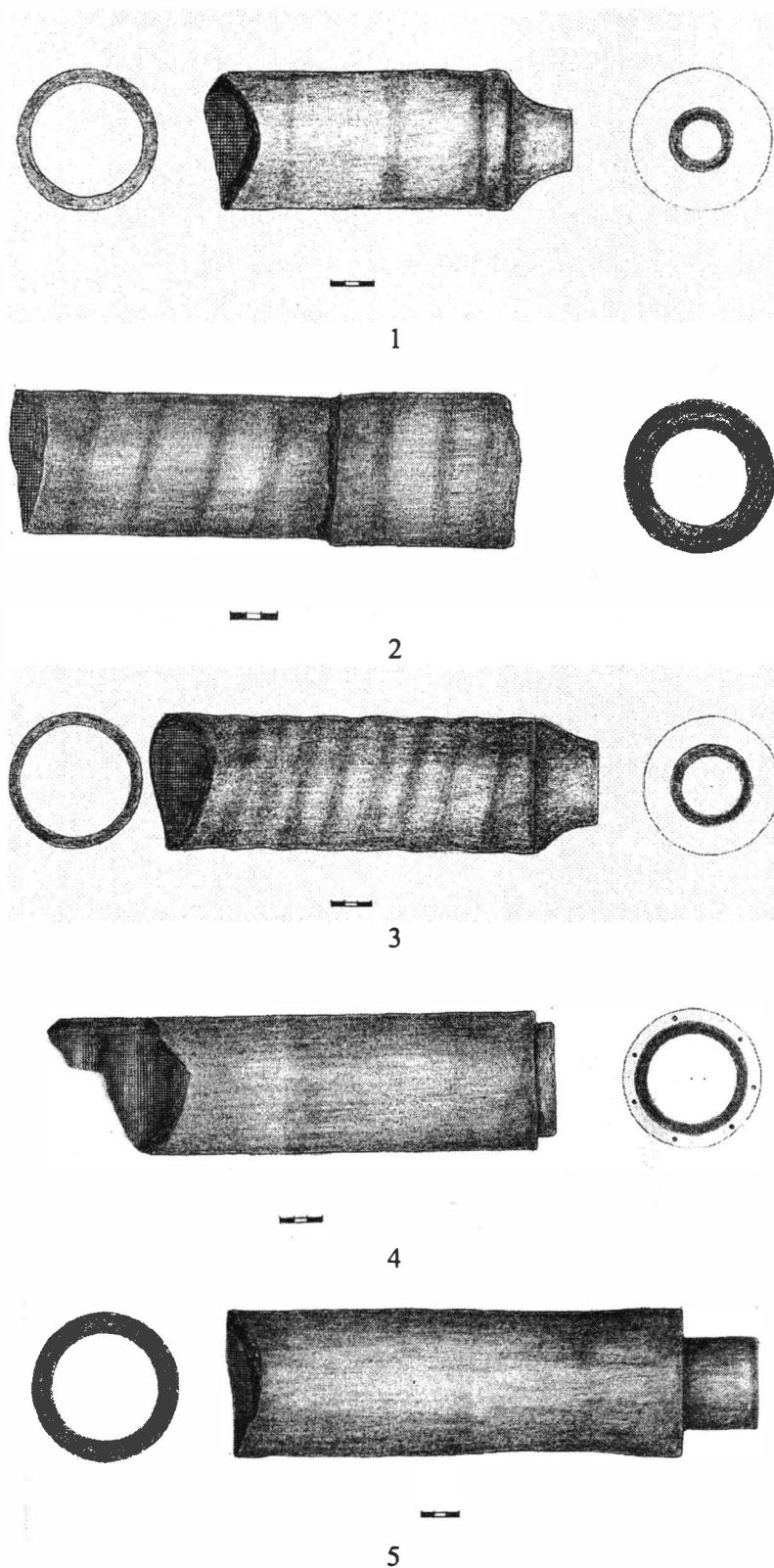
⁴¹ Trevor Hodge 1995, p. 110.



Pl. I: 1. Roman bath researched by Adalbert Cserni; 2. the governor office researched by Viorica Rusu-Bolindeț;
3. the small Roman bath researched by Radu Ciobanu; 4. legionary bath researched by Radu Heitel.



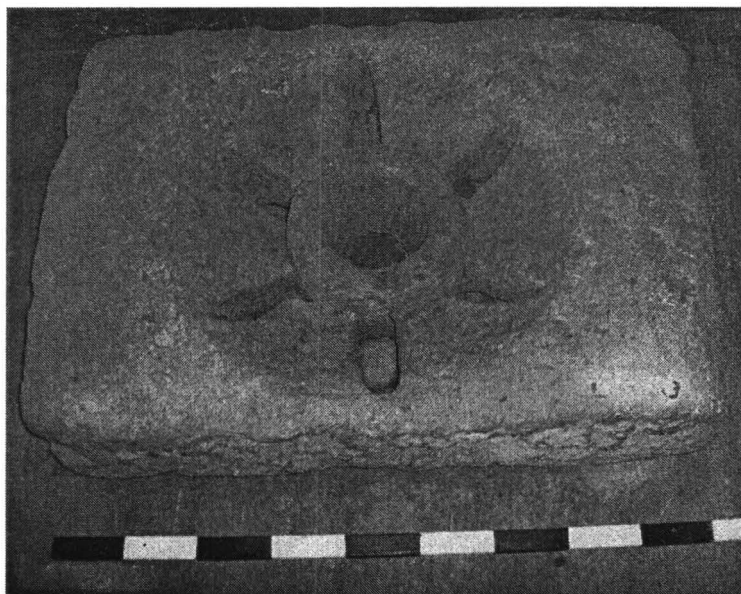
Pl. II. Ceramic tubes 1-5, scale 1:5.



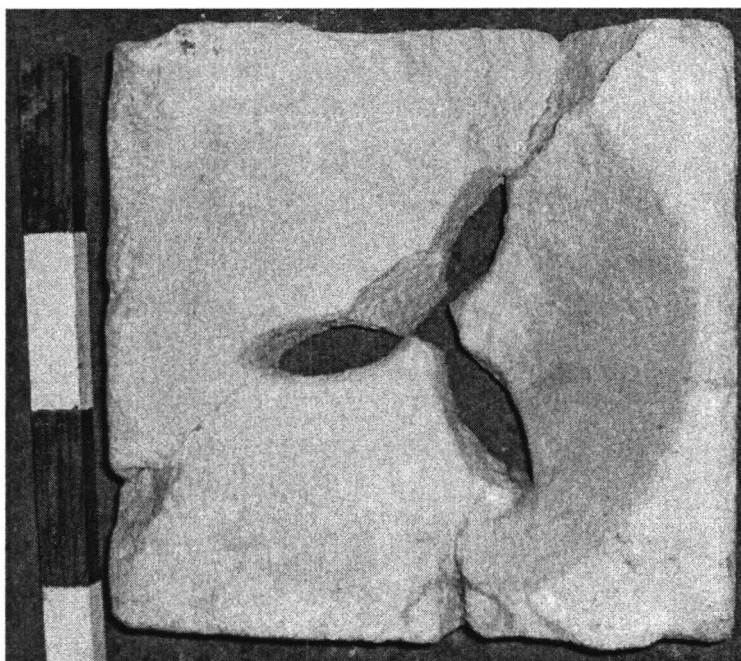
Pl. III. Ceramic tubes 1-5, scale 1:5.



1



2



3

Pl. IV. 1. Ceramic tubes of the same piping system; 2-3. Sewer stone building blocks.

Many of the archaeologically discovered items, used in the water distribution system from Dacia, come from the territory of the today Alba and Hunedoara counties. This could be only the state of the archaeological research, or probably this is to be related to the important development level of the provincial rural settlements from these areas. We should keep in mind that the two most important urban centres of the Dacia province, Sarmizegetusa and Apulum, were located in the area. The two cities benefited by immense *territoria* in which rural settlements flourished. Leaving aside the archaeological discoveries from the *territorium* of Ulpia Traiana, we should mention that in the *territoria* of the two attested cities from Apulum numerous items related to the water distribution system were also discovered.

As a guide mark, we shall refer briefly to the territory of the first urban centre, *municipium Aurelium Apulense*, which subsequently became *colonia*, because it is the first settlement that received the municipal status. I. Piso and Al. Diaconescu concluded that the territory of the *colonia* included towards southwest all the settlements till Germisara, towards northwest till Şard, not being excluded to be till Ampelum (until it became *municipium*), towards southeast, the all the settlements from the lower reach of the Târnave, and towards north, south from Brucla.⁴² At the same time with the development of *municipium Septimium Apulense* and *municipium Ampelensium*, *colonia Aurelia Apulensis* must have lost a part from its territory.⁴³

On the territory of Berghin commune (Alba County), placed east of Apulum, on the terrace „Nimul de Jos”, one kilometre northeast of the village, there were discovered pipe tubes made of clay, all belonging to a possible Roman rural settlement.⁴⁴ In Cut village, Călnic commune (Alba County), placed SSE from Apulum, in the spot named „Fântâna Dărgului” was discovered a pipe made from burnt clay.⁴⁵ In Drâmbăr, village that belongs to Ciugud commune (Alba County), placed east of Apulum, a rural Roman settlement, probably a *villa rustica*, was identified, where ceramic aqueduct tubes were found.⁴⁶ South of Apulum, in Gârbova commune (Alba County), ceramic tubes of an aqueduct were discovered which supplied a small rural Roman settlement. These are preserved in the museum from Sibiu.⁴⁷ East of Apulum, in Hăpria village (Alba County), in the „Gura Zăpozi” place, an aqueduct stamped brick of XIII Gemina legion was discovered.⁴⁸ It is worth to remember that here existed at least one Roman settlement which needed water supply. North of Apulum, in Meşcreac village, Rădeşti commune (Alba County), three aqueduct ceramic tubes were discovered, during the archaeological excavations made in 1968 by V. Lazăr in the Roman settlement.⁴⁹

Northwest of Apulum, in Miceşti district of Alba Iulia city the traces of a pipe made of big stamped bricks of the XIII Gemina legion were discovered. It was probably part of the water distribution system which supplied one of the settlements in Apulum using the water from the river Ampoi.⁵⁰ The remains of ceramic water pipes were discovered south of Apulum, in Pianu de Sus village (Alba County), next to a golden fibula, bricks, spear heads, axes and ceramic vessels.⁵¹ In Răhău commune (Alba County), placed south of Apulum, two ceramic tubes were discovered, evidently part of Roman pipeline.⁵² In 1909, near Sebeş (Alba County), placed south of Apulum, a shaft with the margins made from Roman bricks was discovered. This was situated southeast of the so called “Râpa Roşie”. A pipe made of ceramic tubes started from here being covered with tiles; it crossed the Secaş flood plain, being attested on a length of 80 metres. Unfortunately this was destroyed by the local people in 1951.⁵³ In Sâncrai, near Aiud (Alba County), placed north of Apulum, a Roman pipe is documented, without topographical notes.⁵⁴ In 1888,

⁴² Diaconescu, Piso 1993, p. 70-71; Ardevan 1998, p. 81.

⁴³ Ardevan 1998, p. 82.

⁴⁴ Rep. Alba 1995, p. 55.

⁴⁵ Rep. Alba 1995, p. 89.

⁴⁶ Tudor 1968, p. 170; Mitrofan 1974, p. 44; Rep. Alba 1995, p. 92.

⁴⁷ Tudor 1968, p. 140; Rep. Alba 1995, p. 102.

⁴⁸ Tudor 1968, p. 140; Rep. Alba 1995, p. 105.

⁴⁹ Lazăr 1974, p. 119; Rep. Alba 1995, p. 125.

⁵⁰ Tudor 1968, p. 176; Rep. Alba 1995, p. 127.

⁵¹ Rep. Alba 1995, p. 146.

⁵² *Ibidem*, p. 151.

⁵³ Tudor 1968, p. 142; Rep. Alba 1995, p. 170.

⁵⁴ Rep. Alba 1995, p. 175.

northwest of Apulum, in Tibru village, Cricău commune (Alba County), among the ruins of a building belonging to a Roman fort or *villa rustica* the sewerage pipes, next to a votive altar, a relief and other objects of Roman origin were discovered. In the same location, there were also found stamped bricks of the XIII Gemina legion.⁵⁵

Worth noticing is the fact that in the native Dacian settlements, of the Roman period, although they adopted many items of the Roman material culture (fine and coarse pottery, iron tools, bronzes, coins, etc.) there are no discoveries related to a possible water distribution systems. A possible using of wooden pipes, more difficult to detect on the field, is not be excluded. Nevertheless, it is difficult to believe, as also before the Roman period the attested example of wooden pipes from Sarmizegetusa Regia remains singular.

The little epigraphic or archaeological information attests a strong development stage of the Roman settlements from Apulum. The existence of a least one aqueduct, public or private fountains and *thermae* show that also in this part of the Empire a series of elements, perceptions and values of the Roman civilization may have been implemented in a relatively short term. Unfortunately, only a small number of artifacts related to the water distribution system were discovered during the archaeological excavations. The majority come from old collections of the Alba Iulia Museum. Probably future archaeological excavations in the territory of the actual city will uncover buildings with *hypocaust*, *thermae*, public fountains or aqueducts to confirm the high development standard of the urban centres from Apulum.

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⁵⁵ *Ibidem*, p. 191.