

# Water for the Villas: Water Distribution for Production Processes

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## Abstract

Contemporary archaeological debate frequently discusses the presence of water in Roman villas, mainly focusing on the difference between decorative and functional aims. Past research has focused on the decorative and functional value of water in a residential building, trying to study on one hand water as a luxury element, highlighted with pools and fountains or on the other hand as an enhancing economic tool. However, the point is: how can we architecturally and structurally decline the functionality of water in a villa? Furthermore, is it possible to identify technological differences in water supply in relation to the productive process? Sometimes, water supply was secured by connecting it to a central system, like a city aqueduct, supplying the villas along its way in the suburban area. However, this was not the only possible solution. In fact, there are also villa securing their own water supply through private aqueducts, built, by public concession, for the exclusive use of a villa or a group of such. These particular cases seem to conceal a meaning that goes beyond the display of wealth and glamour. A new construction of an aqueduct was a huge expense, higher than connecting to an existing public network. Therefore, could we interpret this effort as the need of particular productive processes? Finally, is the huge expense for the construction of a private aqueduct justified by the gains that it would have generated in a certain agricultural or handicraft production?

Haec utilitas haec amoenitas deficitur aqua salienti,  
sed puteos ac potius fontes habet; sunt enim in summo.  
Plin., Ep., 2, 17, 25

## Introduction

This contribution will analyse an infrastructure in which some villas were included up in Roman times: aqueducts.<sup>1</sup> We will try to define the dimensions of the phenomenon and its possible connections with production cycles. In fact, these water supplies seem to show a direct connection with the production aspects of a villa rather than with decorative ones. Initially we will try to delineate the legal and historical background of the phenomenon, proposing a comparison with the literary sources and the archaeological remarks. Finally, we will try to pull the strings of the speech, trying to propose some preliminary interpretations.<sup>2</sup>

## Water and Private Property

Roman water servitudes start from these elements: the distinction between conduction and derivation; the flow of water to be perennis.<sup>3</sup> A water servitude gave the right to run water to its own property, passing through intermediate lands, but did not allow to derive the water to the same lands. Only perennis water was subject to law, rainwater was excluded.<sup>4</sup> A landowner could not ignore these aspects and was faced with two possibilities: the connection to a running water system or the collection of rainwater. The second solution would be the most common, achievable without any authorisation. Finally, we must remember that a water servitude starts from the caput aquae.<sup>5</sup> Private selling of water servitudes from perennial sources was impossible<sup>6</sup>, but we can exclude small sources of water as streams or ponds.<sup>7</sup>

Otherwise, groups of more people could join, acquiring together the *ius aquae ducendae*. This seems to be most advantageous than a single concession, because it does not cease immediately on its expiry, but remained in place until at least one of the members remained alive<sup>8</sup>, allowing circumventing the limit of the hereditary transmission of a concession.<sup>9</sup>

An example of group concession seems to be the Aqua Crabra.<sup>10</sup> The owners of the villas located near the municipium of Tusculum, in fact, including Cicero, obtained the exclusive right to use this water supply system, which they accessed through the

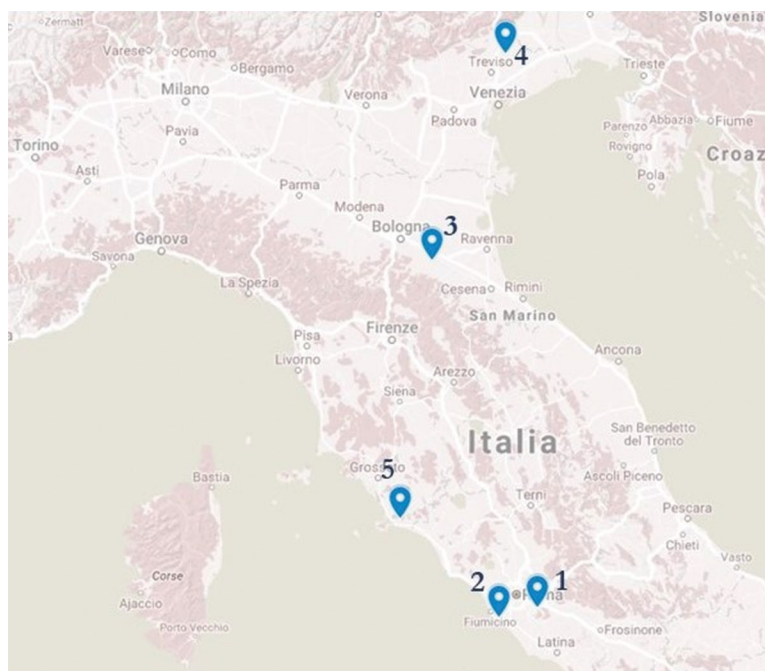


Fig. 1: Examples of water group concession: 1. Aqua Crabra, Tuscolo, 2. Ager Laurentinus, 3. the so called 'Morine' aqueduct, 4. San Polo di Piave (Treviso), 5. Gold valley, Cosa.

payment of a vectigal.<sup>11</sup> Other similar contexts are (fig. 1): the aqueduct recognised in the Ager Laurentinus<sup>12</sup>, the so-called “Morine” aqueduct near Forlì<sup>13</sup>, the water supply system recognised in San Polo di Piave (Treviso)<sup>14</sup> and the one along the Gold valley nearby Cosa.<sup>15</sup>

Frontinus depicts a new privatisation tendency of water management in its time, which, on the contrary, was originally exclusive public property. It is also interesting to note the reflection that the author proposes in this regard:

ex quo manifestum est quanto potior cura maioribus communium utilitatum quam privatarum voluptatum fuerit, cum etiam ea aqua quam privati ducebant ad usum publicum pertineret.<sup>16</sup>

These private concessions in Rome, starting from the Augustan age, were guaranteed directly by the emperor in the form of *beneficium*, rigidly respected for the amount of water that was arranged.<sup>17</sup> All works related to the water supply were carried out under the control of a water curator, in order to ensure full compliance with the concessions. Because of that the person who guaranteed a derivation, could engage the public supply system only through intermediate tanks that were placed along the aqueduct path, no direct connection was allowed to the conduit.<sup>18</sup>



Fig. 2: The so called plan of the ‘Priorato’ or of the ‘Aventine’.

The distribution of water to individuals is well clarified by some documents: the so-called “Plan of the Priorato or of the Aventine”<sup>19</sup> (fig. 2), the “Tivoli Plan”<sup>20</sup>, the tabula of Lamasba<sup>21</sup> and the famous Lex rivi Hiberiensis.<sup>22</sup> From the first plan we learn that the water distribution involved a turnover of the dealers, who then received the water alternately and with a different frequency, sometimes connected to the granted amount of water.<sup>23</sup> The same context is confirmed in the others. It is clear that private water concessions limited the amount of water along with its frequency, but individuals had also another opportunity to overcome these limitations: undertaking the construction of their own aqueduct.<sup>24</sup>

The most famous case of a private aqueduct is the Pont d’Ael bridge/aqueduct<sup>25</sup> in Valle d’Aosta. It was built in 3 BC by Caius Avillius Caimus to guarantee the water supply of the quarries installed in the area. It is probably the only known case of this kind in the Roman world:

Imp(eratore) Caesare Augusto XII co(n)s(ule) desig(nato) / C(aius) Avillius  
C(aii) f(ilius) Caimus Patavinus / Privatum<sup>26</sup>

### The Aqua Vegetiana and the Aqua Corneliania

Talking about villas, the constructive practice of a private aqueduct is well described in the context of the so-called Aqua Vegetiana near Viterbo.<sup>27</sup> It is known because an epigraphic text reports its realisation, but there is no information about the villa. Lanciani proposed a graphic reconstruction of what was to be the path of the procurement work (fig. 3).<sup>28</sup>

[Mummius Niger Val]erius Vegetus cons[ul(aris) / aquam suam Vegetianam, ex f]onte qui nascitur in fundo A[ntoniano Maiore / P(ublii) Tullii Varronis cum eo loco, in] quo is fons est emancipatu[s, du]xit per m[ilia passum ((quinque milia nongentos quinquaginta)) / in villam suam Calvisianam, quae est ad] [A]quas Passerianas suas, compar[a/tis] et ema[ncipatis sibi locis / itineribusque eius aquae a possessoribus sui cuiu/sque fundi, per quae aqua s[upra scripta, ducta est, / per latitudinem structuris pedes decem, fistulis per l]atitudinem pedes sex, per fundos Antonia[num Maiorem / et Antonian(um) Minor(em), P(ublii) Tullii Varronis et Ba]ebianum et Philianum Avilei Commo[di et Petronianum / Publii Tullii Varronis, et Volsonianum Here]nni Polibi et Fundanianum Caetenni Pr[oculi / et Cuttolonianum Cornelii Latini et Serranum l]nferiorem Quentinni Verecundi et C[apitonianum / Pistrani Celsi et crepidinem sinestrior]em viae publicae Ferentenses (!) et Scirp[ianum / Pistraniae Lepidae et per viam Cassiam in villam] Calvisianam suam, item per vias lim[itisque / publicos ex permissu] s(enatus) c(onsulto)<sup>29</sup>

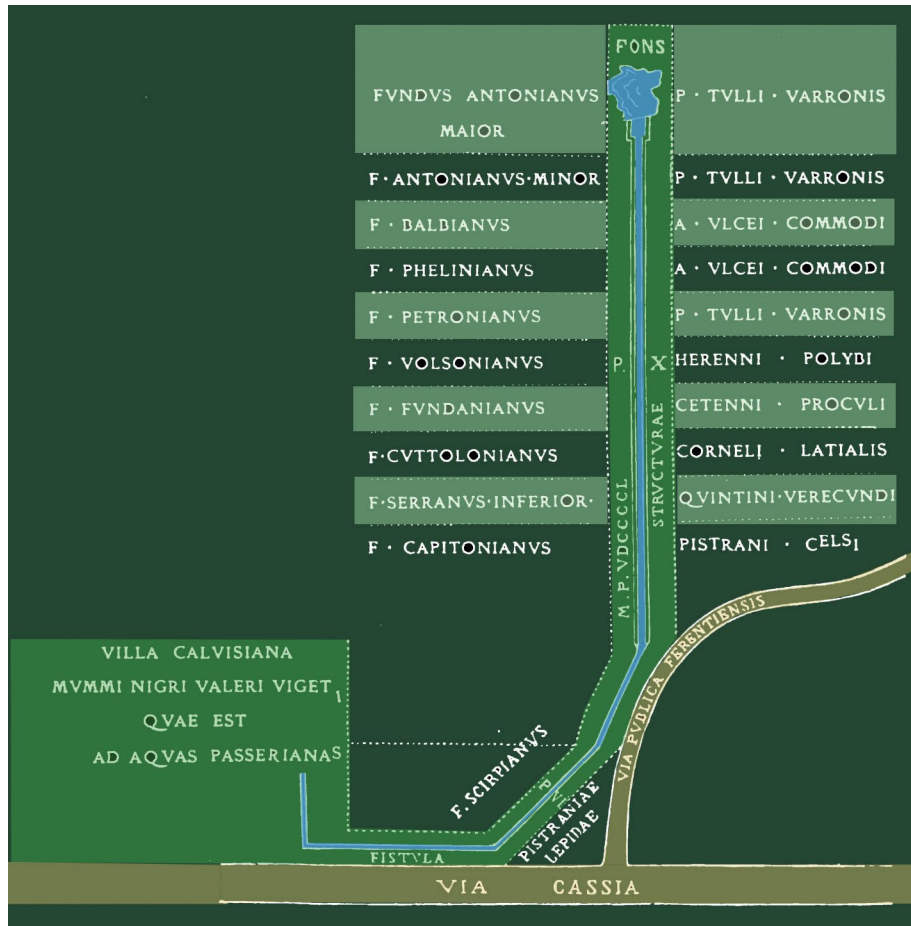


Fig. 3: Aqua Vegetiana, the graphic reconstruction of what was to be the path of the procurement work proposed by Lanciani.

The text, dated to the mid-second century AD, allows us to understand the process of building a private aqueduct, placing particular emphasis on some important elements: the acquisition of the properties of the source, water and the strip of land on which the aqueduct would have to pass.<sup>30</sup> These three steps testify the complexity of the work and above all the dimensions of the economic investment, without neglecting the costs of labour for the realisation. The text gives us the route of the aqueduct towards villa Calvisiana but does not give us elements about the reasons that led the decision of the construction of such an expensive infrastructure. After all, the text does not celebrate the work, but presents itself as a land map, probably required by the local senate to document the entire route of the aqueduct in detail.

A similar context is the one located in S. Maria in Stelle, not far from Verona.<sup>31</sup> There is an aqueduct underneath the local church, where from the 4<sup>th</sup> century AD onwards, it shared the space with an oratorium for private devotion, probably belonging to the

same gens Pomponia who had built the water supply and from which it seems we can trace the present inscription:

P(ublius) Pomponius Corne/lianus et Iulia Magia cum / Iuliano et Magiano  
filiis a solo / fecerunt<sup>32</sup>

It is currently in a reuse context, inside the conduit, but it was probably once placed outside to remember the intervention of the important local family. The inscription does not mention terms that have anything to do with water, but the wording a solo leads one to believe that it wanted to indicate the integral construction of the work: from the source. At the same, in this context it would be superfluous specifying a water term, after all the monument itself helped to clarify it. In all likelihood the work served to guarantee the water supply of the family properties located in the area. The inscription is placed in the first half of the 3<sup>rd</sup> century AD.

### Quintili Aqueduct

Another case of private aqueduct is the one at the Villa dei Quintili in Rome. This case should be interpreted as the acquisition of the right to the water servitude but not of the caput aquae by a private individual, since it is not an aqueduct specially built for the villa, but an urban one that led the waters towards Rome. It is also possible to recognise the acquisition of the caput aquae property, not coinciding with the source itself, but with the beginning of the private derivation. The aqueduct owes its name to the stamps that were found on the fistulae<sup>33</sup> connected to it and it is dated around the middle of the second century AD.<sup>34</sup> Lanciani believed that the waters of the Aqua Iulia derived from the villas, instead others propose that the aqueduct collected the waters from the Anio Novus.<sup>35</sup>

The water supply was organised around various tanks and served to irrigate the gardens of the villa and for thermal baths. The monumentality of the structure has induced to give it a representative value, typical of the monumental villas of the 2<sup>nd</sup> century, a phase probably connected to the figure of Commodus who became the owner. Before Commodus the owners of the villa were the brothers Sextus Quintilius Condianus and Sextus Quintilius Valerius Massimus, consuls in 151 AD, and it is to them that the aqueduct of the villa must be traced back.<sup>36</sup> The water interest of the two brothers should not have been new since they had obtained water servitudes in the area of Tusculum, as evidenced by a mark on a fistula aquaria found in Mondragone.<sup>37</sup> The aqueduct<sup>38</sup> (fig. 4) is partly built on round arches and partly in a blind cable conduit near the villa. To the Quintili phase also the exedra of the entrance, the median cistern (P) and a large cistern (G) fed by the first part of the aqueduct belong.<sup>39</sup> The structure does not reveal the reasons to the Quintili's choice to have a private aqueduct and a material

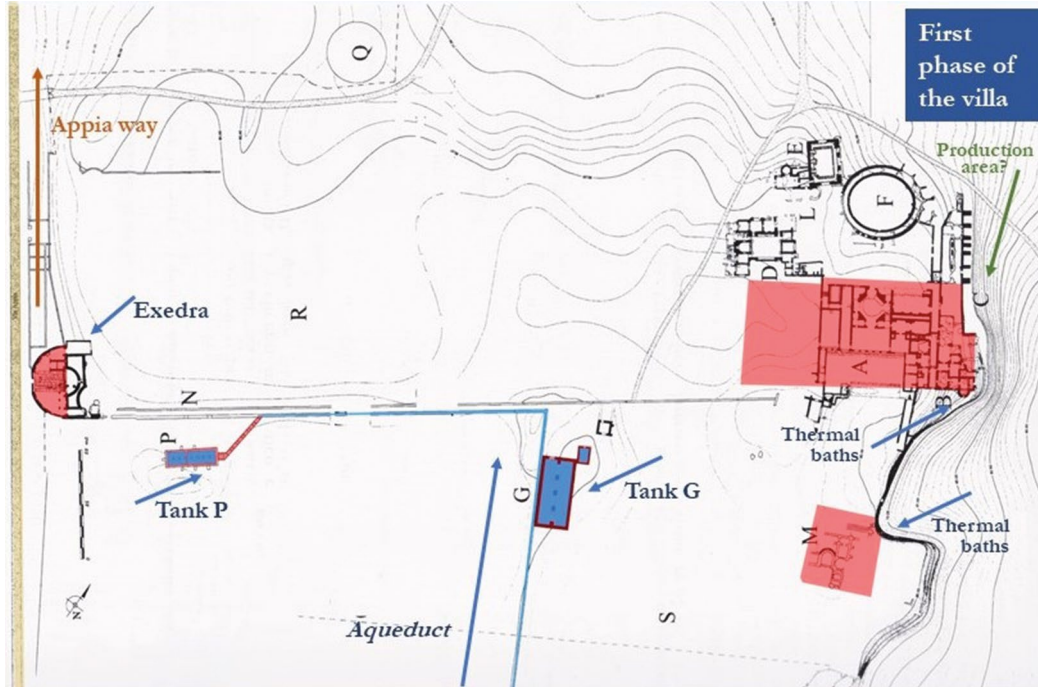


Fig. 4: The Quintili aqueduct and the first phase of the villa.

justification of such a large investment. The presence of two thermal baths, arranged by tanks for water collection, appears to be a weak justification.<sup>40</sup> At the same time it is plausible to assume that in the villa there were areas for agricultural work<sup>41</sup>, partially discovered, perhaps dismantled during the “monumentalisation” phase of the villa started with Commodus. Finally, it is also plausible, namely that the Quintili may have undertaken such an initiative perhaps as members of a consortium.<sup>42</sup> All the contexts shown lead our reflection to a further question: why did a private individual decide to undertake this investment?

### Water as an Investment

The topic of water as investment has recently been the subject of a reflection by Christer Bruun.<sup>43</sup> Starting from the case of Valerius Vegetus, the author highlights some aspects of the work created by the senator. The aqueduct was about 9 km long and was used to convey the waters of a source that was supposed to be rich and did it through eleven different properties. The work was subject to a *senatus consultum* that authorised the passage along the Via Cassia. All these elements help to understand the extension of the investment, but trying to give it a more concrete dimension, the author proposes to reconstruct its economic value, drawing comparative ideas from the construction of the Aqua Claudia and the Anio Novus

in Rome<sup>44</sup> together to the aqueduct built by Cicero's brother for his properties.<sup>45</sup> Comparing these two cases with the aqueduct made by Valerius Vegetus, we obtain a hypothetical estimate of the entire work, which oscillates between 88.880 and 985.000 sesterces.<sup>46</sup> However, these costs do not take into account the expenses incurred for the acquisition of the land, even if Bruun hypothesises that such payment could also take place in kind, giving part of the water that was being carried to the landowners. Valerius Vegetus' investment is not justified by the increase in the yields of its land, because even though cultivating them to vineyards<sup>47</sup> he would hardly be able to return the initial investment. Ultimately, the author hypothesises that "Valerius Vegetus was planning to sell the water transported by this aqueduct".<sup>48</sup>

The water supply contributed to the growth of agricultural production, but it is also true that in addition to the construction of an aqueduct, landowners faced other water collection solutions. Tanks inside villas are frequent and of considerable size. Moreover, the opportunity to derive waters that were not subject to public control such as torrents, ponds, not to mention rainwater, should not be underestimated. The construction of the aqueduct should therefore be understood as a choice based on obvious economic reasons that had to be very clear to the landowner and certainly went beyond ostentation.

### Archaeology of Water Inside Villas

Water inside a villa was poised between two fundamental aspects: decorative and functional, but always placed inside a single circle that did not allow its waste and guaranteed its constant reuse.

Zaccaria Mari<sup>49</sup> proposes a periodisation of the use of water in the villas, starting from the literary sources and comparing them with the archaeological contexts of the Ager Tiburtinus<sup>50</sup> and Sabinus. From this analysis it follows that in the so-called "Catonian Villa"<sup>51</sup> there was usually a rectangular tank, located near the atrium of the house, from which water was collected for domestic use. A larger one was placed at a higher level, at the edge of the perimeter of the villa for production activities. The size of the second tank is proportional to the extension and productivity of the bottom in which it was placed. This approach continues in the so-called "Varronian villa", with two important innovations: the use of opus signinum for the coating of tanks and the construction of large piscinae for collecting rainwater probably used for watering the animals.<sup>52</sup> In summary, the reconstruction proposed by this scholar emphasises the role of water as an aid to productivity, where collateral uses are considered subordinates. Water was mainly used to irrigate fields and to water animals.

Another similar periodisation is also proposed by De Franceschini for the villas of the Roman countryside (fig. 5).<sup>53</sup> From her point of view the first element of





Fig. 5: Villas with a private aqueduct in Rome’s suburbium: 1. Villa of Cinecittà; 2. Villa of the Sette Bassi; 3. Quintili villa; 4. Villa of the Vignacce; 5. Centroni villa; 6. Tor de Schiavi, ‘dei Gordiani’; 7. Centocelle area.

evolution consists in the passage from cuniculi to tanks; then from underground tanks to above ground ones. Next to tanks she inserts the impluvia and the private aqueducts. Finally she indicates the villas that were provided with a private water supply<sup>54</sup> and connects the presence of it in all villas with one thing: luxury.<sup>55</sup> At the end of the analysis of the water-villa relationship, the author identifies in the introduction of tanks above ground the technical leap that allowed starting from the Augustan age the construction of the first decorative waterworks, but at the same time she underlines that water surplus spent for voluptuous uses was a circumscribed phenomenon.<sup>56</sup>

### Conclusion

To conclude our paper we can underline that the archaeological remains can be divided into two categories: villas with a specific water supply system and water supply systems isolated in their context. It follows the presence of two distinct realities: private individuals connected to a water supply system and individuals who build their own one. Most cases are attributable to the first type and only two can be defined as specific private facilities. In these cases a figure emerges, or a family, in the organisation of the

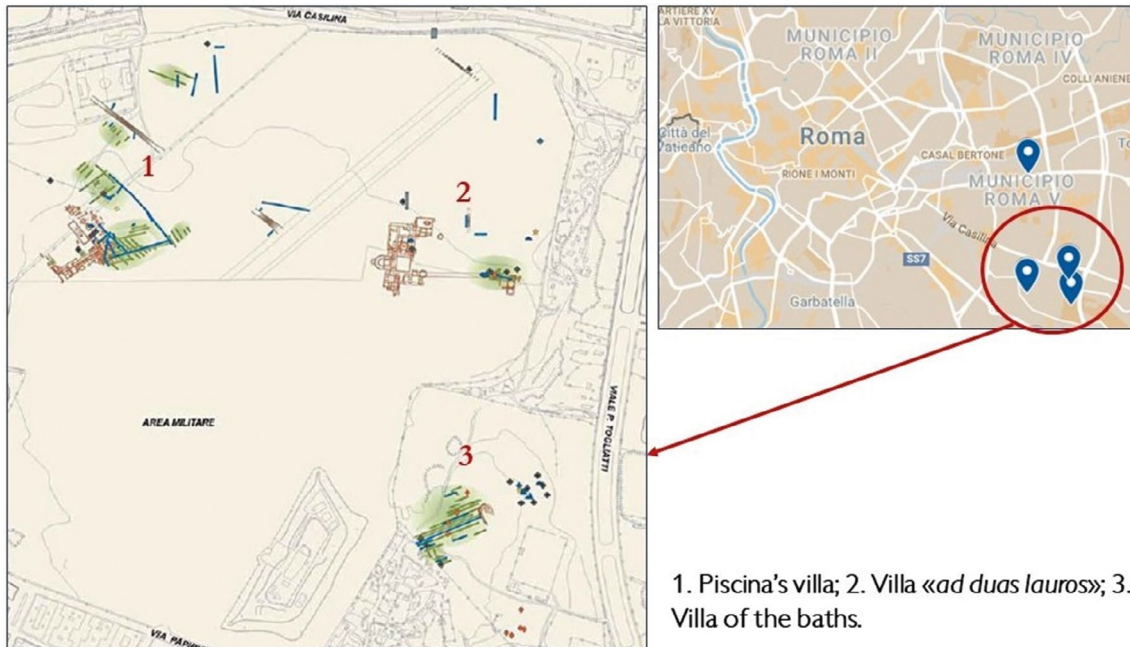


Fig. 6: The area of 'Centocelle': 1. Piscina's villa; 2. Villa 'ad duas lauros'; 3. Villa of the baths.

work that leaves therefore to intend the centrality also in the use. However, we do not have any traces attributable to the place where the water was conducted and about the primary origin that pushed private individuals towards this enterprise. The demand for a large amount of water leads us to believe that it could be necessary for the irrigation of crops in an extensive way, however this choice should be linked to economic reasons in order to justify the investment. Past studies have already shown that the presence of too large tanks could prove the presence of a water supply system, because they would not be fed only by rainwater.<sup>57</sup> This means that there could be more water supply systems than we think and identify. The known archaeological remains do not allow to recognise specific links between aqueducts-villas-type of production, even if, in a very preliminary way, it would seem appropriate to highlight the widespread presence of torcularia<sup>58</sup> for the production of oil or wine.

A good example could be the context of Centocelle<sup>59</sup> (fig. 6), in Rome, where three villas had a connection to the aqueduct, used both to power the thermal baths and irrigate the vineyards.

Another interesting case is the context of Masseria Ciccotti<sup>60</sup> (fig. 7), where starting from the second half of the 2<sup>nd</sup> century AD a villa was provided with a segment of a private aqueduct that in addition to feeding the thermal baths, served to ensure the functioning of a fullonica. In both cases the correlation between water and the aim to create an economic surplus remains clear.

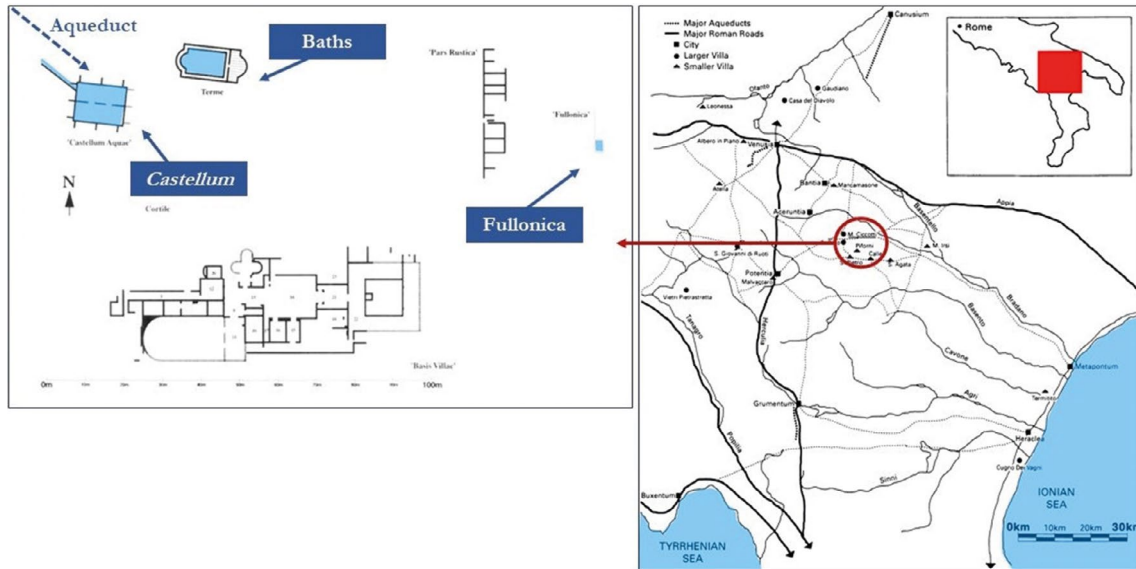


Fig. 7: The plan of the villa 'of Masseria Ciccotti'.

Attempting to outline a chronology, the 2<sup>nd</sup> century AD seems to be the period of greatest flowering of the phenomenon that probably had its beginning in the Augustan age, in the same way as attested for urban water supplies. Finally, although small, the contexts collected bear witness to a general diffusion that is not limited to Rome and central Italy, but also shows diffusion towards the Po Valley.

### Notes

- <sup>1</sup> De Franceschini 2005, 311 f.; Marzano 2007, 165–171.
- <sup>2</sup> For more information about this subject see: Thomas-Wilson 1994; De Franceschini 2005, 311 f.; Marzano 2007, 165-171; Bannon 2009; Bruun 2015; Sánchez 2015; Longfellow 2018.
- <sup>3</sup> Capogrossi Colognesi 1966, 1–13.
- <sup>4</sup> Capogrossi Colognesi 1966, 5. See also Bruun 2015, 145–149.
- <sup>5</sup> Capogrossi Colognesi 1966, 13.
- <sup>6</sup> See Bruun 2015, 147–149.
- <sup>7</sup> Capogrossi Colognesi 1966, 27–33; but see also Bruun 2015, 132–136.
- <sup>8</sup> Frontin. aqu. 10, 5. See also Bruun 2015, 142–145.
- <sup>9</sup> Frontin. aqu. 107; 108.
- <sup>10</sup> Cic. leg. agr. 3, 2, 9.
- <sup>11</sup> Marzano 2007, 167.
- <sup>12</sup> Lauro 1998.
- <sup>13</sup> Riera 1994.

- <sup>14</sup> Mingotto 2000.
- <sup>15</sup> Calastri 2007.
- <sup>16</sup> Frontin. aqu. 94.
- <sup>17</sup> Frontin. aqu. 103, 2 f.; 105. See also Del Chicca 2004, 90 f., 425–427, 425–431.
- <sup>18</sup> Frontin. aqu. 106.
- <sup>19</sup> CIL VI, 1261. See also Rodriguez Almeida 2002, 23–26.
- <sup>20</sup> CIL XIV, 3676.
- <sup>21</sup> CIL VIII, 18587 = ILS 5793. See also Bruun 2015, 142 f.; Maganzani 2012, 195–213.
- <sup>22</sup> Bruun 2015, 145; Maganzani 2012, 171–185.
- <sup>23</sup> About a similar organization in north Africa see also Plin. nat. 18, 188 f.
- <sup>24</sup> See Bruun 2015, 138–140; Capogrossi Colognesi 1966, 52. Also interesting to read the opinion of Cicero about the aqueduct made by his brother Quintus: *sumptum nusquam Melius posse poni* (Cic. ad Q. fr. 3, 1, 3).
- <sup>25</sup> Döring 2005.
- <sup>26</sup> CIL V, 6899.
- <sup>27</sup> CIL XI, 3003 = ILS 5771 = AE 2002, 471. See also Capogrossi Colognesi 1966, 91–94; Rovidotti 2002; Bianco 2007, 119, 195; Bannon 2009, 73–75; Maganzani 2012, 159–164; Bruun 2015, 136.
- <sup>28</sup> Lanciani 1880, 379.
- <sup>29</sup> CIL XI, 3003 = ILS 5771 = AE 2002, 471. See also Rovidotti 2002, 194.
- <sup>30</sup> See Capogrossi Colognesi 1966, 93; also Bruun 2015, 136.
- <sup>31</sup> Gangale Risoleo 2018.
- <sup>32</sup> CIL V, 3318.
- <sup>33</sup> CIL XV, 7518: II Quintiliorum Condiani et Maximi.
- <sup>34</sup> Lanciani 1880, 183.
- <sup>35</sup> Meogrossi 1985, 95 f.
- <sup>36</sup> See Paris et al. 2015.
- <sup>37</sup> Lanciani 1880, 184. 260 no. 350.
- <sup>38</sup> Meogrossi 1985, 95–99.
- <sup>39</sup> Paris et al. 2015, 204.
- <sup>40</sup> De Franceschini 2005, 222–236.
- <sup>41</sup> This hypothesis could be confirm thanks to the discover made in area c41, where they found some tanks lined with opus signinum and probably linked with oil and wine production; De Franceschini 2005, 223. 236.
- <sup>42</sup> Lanciani 1880, 184.
- <sup>43</sup> Bruun 2015.
- <sup>44</sup> See also Plin. nat. 36, 122.
- <sup>45</sup> See also Cic. ad Q. fr. 3, 1, 3.
- <sup>46</sup> The variation in costs depends on the presence of arches.
- <sup>47</sup> The most profitable: see Cato agr. 17.
- <sup>48</sup> Bruun 2015, 141.
- <sup>49</sup> Mari 2005, 9, 17 f.
- <sup>50</sup> Marzano 2007, 168. See also Cappa – Felici 1998 and Mari 2013.

<sup>51</sup> See also De Franceschini 2005, 329–331.

<sup>52</sup> Varr. rust. I.11.2; Col. I, 3; Vitr. VIII, 6. 14.

<sup>53</sup> De Franceschini 2005, 305–313.

<sup>54</sup> Villa “of Cinecittà”, villa “of Sette Bassi”, villa “of the Quintili”, villa “of the Vignacce”, villa “of the Centroni”, villa “Tor de’ Schiavi, of Gordiani”; De Franceschini 2005, 144–156. 163–166. 199–202. 209–214. 222–236. About water inside Rome’s suburbium: Dell’Era 2000, Bruun 2003, Vitonen-Korhonen 2014. An hypothetical private aqueduct was recently discovered along the Ardeatina way, see Fiocchi Nicolai – Vella 2017, 309–324.

<sup>55</sup> De Franceschini 2005, 312.

<sup>56</sup> De Franceschini 2005, 312 f.

<sup>57</sup> Thomas – Wilson 1994, 141.

<sup>58</sup> See villa “Tor de’ Schiavi, of the Gordiani”; De Franceschini 2005, 144–156. Villa of “Pian della Civita”; Marzano 2007, 271. Villa “of the Selvicciola”; Marzano 2007, 387. Villa “of the Cecina”; Donati 2012.

<sup>59</sup> Santangeli Valenzani – Volpe 2012.

<sup>60</sup> Flohr 2013, 27; Gualtieri 1999, 133–139. 147–151.

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Fig. 1: by the author. – Fig. 2: Rodriguez-Almeida 2002, fig. 9. – Fig. 3: Lanciani 1880, 379. – Fig. 4: De Franceschini 2005, 81.1. – Fig. 5: by the author. – Fig. 6: Santangeli Valenzani – Volpe 2012, 65, fig. 4. – Fig. 7: Gualtieri 1999, 133, fig. 87.

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