

AQUEDUCTS FOR THE *URBIS CLARISSIMUS LOCUS*: THE PALATINE'S WATER SUPPLY FROM REPUBLICAN TO IMPERIAL TIMES

Dr. Andrea Schmölder-Veit, University of Augsburg
andrea-sv@web.de

The Palatine hill, where Rome began, was already an important center of power long before Imperial palaces were built there. As early as the Republican period, elite residents had constructed monumental architecture on this hill above the Roman Forum that publicly advertised their claims to leadership. Also at this time, the greatness of the *res publica* was demonstrated through monumental building projects, which correlated with the *gloria* of families who dedicated temples in Rome's honor.¹ As nothing is known about the *domus* of this period, it can only be assumed that the Palatine was a residential area populated by elite Romans in the fourth and third century BC. For example, Livy (8: 19. 4) tells us that Vitruvius Vaccus, a very rich Fundanian, had a property on the Palatine before 330 BC. Evidence for the *domus* on this "most splendid place in the city" (*urbis clarissimus locus*) exists from the second century BC onwards. Cicero, for example, informs us that a *domus* on the Palatine was a requirement for ambitious citizens who aspired to the most powerful position in the *res publica*.²

Unfortunately, the only archaeological evidence that confirms habitation during this time, are underground cisterns that were cut into the bedrock to capture rainwater.³ Most of the cisterns can be dated to the late sixth or early fifth century through their revetment with cappellaccio. It seems possible that some of them were built to serve residences.⁴ Residential water management on the Palatine underwent significant changes once the Aqua Marcia brought water to the hill in 140 BC, a fact, which we know from Frontinus (7:1-8).⁵ In this article that evidence is compared with the archaeological remains of pipes and fountains along with evidence concerning the purposes for which water was brought to the hill. While the main arguments deal with the aqueducts that delivered water to the Imperial palaces, the article also offers a more general view of the hydraulic situation on the hill.

With Augustus and his son-in-law Agrippa, Rome's water management underwent a radical change: two new aqueducts brought fresh water to the Urbs; the organization and supervision of the aqueducts was improved with the appointment of a *curator aquarum*; and water was made available not only for the daily needs of the inhabitants, but also for luxury purposes such as the Stagnum and the Euripus.⁶ Augustus began his own palace on the Palatine after his victory at Naulochus in 36 BC and Agrippa's residence was also situated on the hill. It isn't surprising then that the Palatine, which was designated *regio X* in the Augustan subdivision of the Urbs, was supplied by one of the new conduits—the Aqua Iulia. But the greatest change

to the Palatine's water supply occurred under Nero, who built the first unified palace building (not a collection of several independent *domus* as Augustus had done).⁷ For this he needed more water; therefore, he sponsored a completely new branch that extended the Arcus Neroniani (Arcus Caelimontani) on the Caelian to the Palatine. This higher-level line could deliver water to every level of the hill, even to nymphaea in the highest courts and gardens.

The first conduit for the Palatine in Republican times

The Marcia was the only aqueduct to supply the Palatine hill during the Republican period. The Aqua Appia (312 BC) arrived at only about 15 masl (meters above sea level) in the city.⁸ This was too low, even for the houses at the bottom of the Palatine slope near the Via Sacra.⁹ Why Rome's second aqueduct, the Aqua Anio Vetus completed in 272 BC, did not supply higher areas, like the Caelian, Aventine, and Palatine, is unclear. Its *specus* lay at 46.45 masl near Porta Maggiore, so the line could have reached about 35-40 masl inside the Urbs.¹⁰ This lack of service to even the lower parts of these hills may have been due to technical difficulties or lack of expertise in this early period of Roman water engineering. Finally, the Aqua Tepula (125 BC) served the Capitoline (Frontin. 8: 1), but even in later times it never arrived at the Palatine (Frontin. 82: 2).

Another reason for the restricted fresh-water distribution on the lower areas of the Palatine in Republican times is suggested by Frontinus (94: 3) who reports that at first, water was brought into the city for public use only. What that meant exactly in the fourth and third century BC is not clear. In Late-Republican times this term signifies among other things that public fountains fed by running water were set up regularly in the streets. Such a system is well preserved in Pompeii, with nearly forty public street fountains.¹¹ In the fourth and third century BC there could have been several other purposes as well, such as the supply of large *piscinae* like the one we know from Livy (23: 32, 3 f.) at the end of the Aqua Appia, and the irrigation of *horti*.¹² But too little is known, both from archaeological and literary evidence about the fourth and third century BC to reconstruct the needs for and the use of fresh-water. Only one thing seems certain: there was no priority of private water use and in some cases it was even forbidden to supply houses with a conduit.¹³ As the Palatine's building environment consisted primarily of sanctuaries and *domus*, an investment like an aqueduct was not required. The residents and cult members must have taken their water from cisterns. As we know quite well, in Pompeii there were private as well as public wells and

cisterns situated in the streets and houses to supply residents and foreigners with water.¹⁴

It wasn't for another one hundred and thirty years that the Aqua Marcia (144-140 BC) brought aqueduct water to the Palatine.¹⁵ Traces of the conduit have survived *extra urbem*, and near the Porta Maggiore where the *specus* is preserved at 55.7 masl (fig. 1).¹⁶ Inside the Urbs the line is nearly completely lost. But it can be assumed that the aqueduct lost as much as 10 meters of elevation as it flowed through the city. Nonetheless, the water still could have reached 45 masl—definitely high enough to serve most *domus* on the Palatine. That it reached the Palatine, with its important residential neighborhood cannot be questioned.¹⁷ But like the main *specus* of the Marcia, its exact course is unknown. Two different lines can be imagined: one crossing the Caelian and reaching the Palatine on the east side, the other running up the Capitoline and ending at the west slope facing the Velabrum (fig. 2).

We can, first of all, exclude any suggestion that if the line crossed the Caelian to the Palatine that it was the Rivus Herculaneus, which Frontinus (19: 7-9) notes was too low to supply the Caelian and ended above Porta Capena.¹⁸ When the channel was partly excavated, some levels of the bottom were measured for example at 36.47 masl near the west end of the section found in the Villa Wolkonsky.¹⁹ Obviously here the Marcia lost about 20 meters in a very short distance, which means that it could have reached only about 35 masl at the Palatine—definitely too low for the upper stories of any *domus* situated on top of the hill. It might even have been insufficient for the lower floors as well, some of which lie at approximately 36-37 masl.²⁰

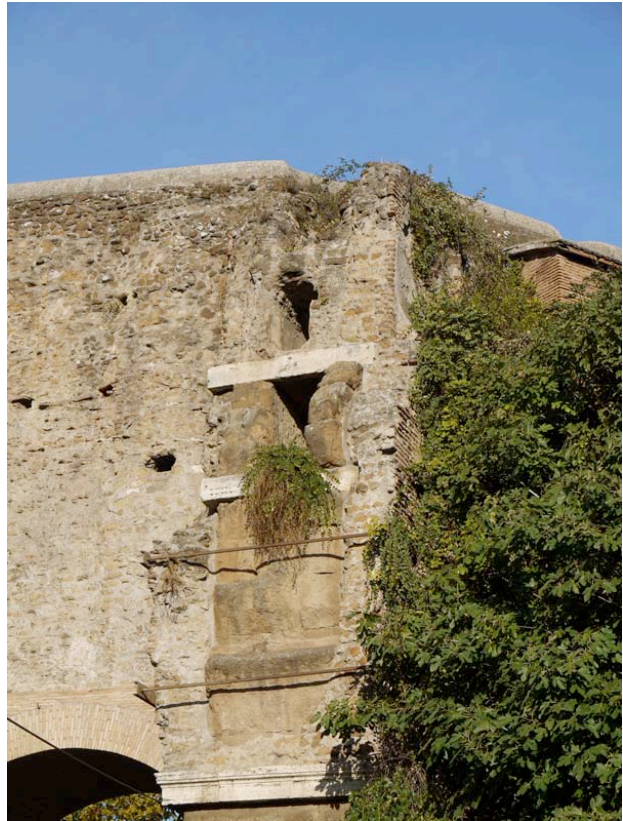


Fig. 1. Porta Maggiore: *specus* of the Aqua Iulia on top (partially destroyed), the Aqua Tepula in the middle and the Aqua Marcia below.

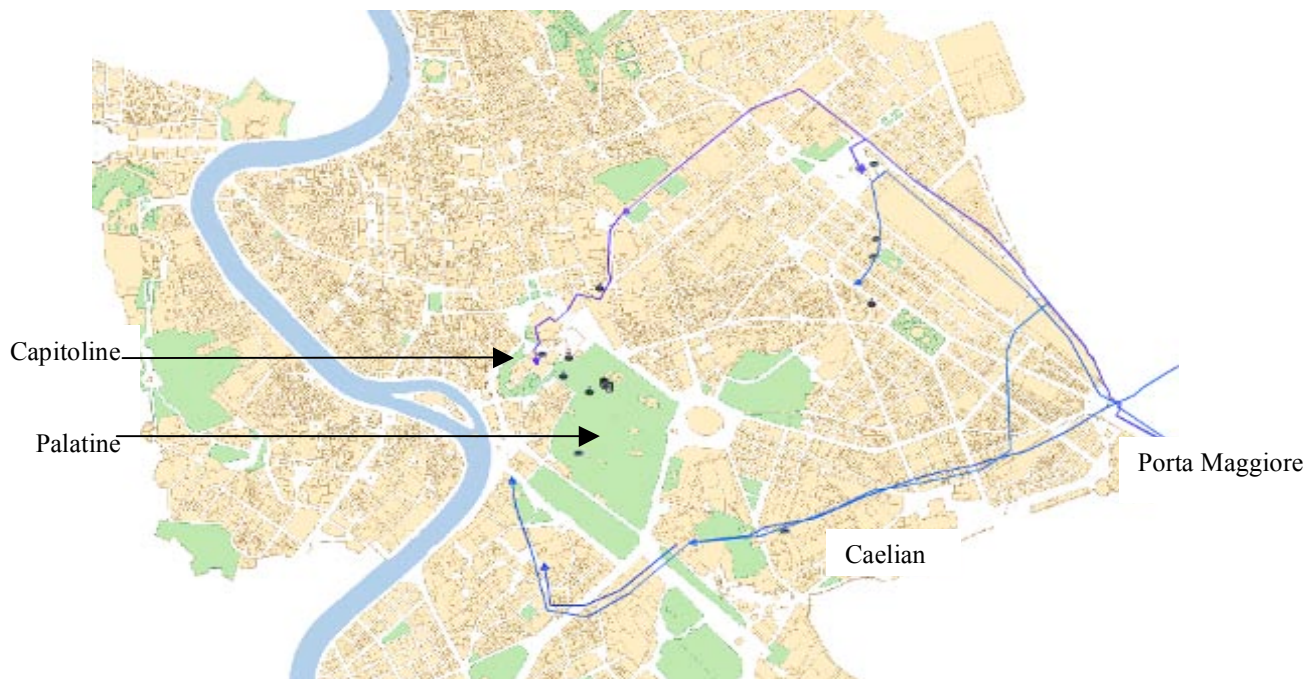


Fig. 2. The course of the republican aqueducts in Rome. (K. Rinne, <http://www3.iath.virginia.edu/waters/timeline/>).

But apart from the Rivus Herculaneus, Frontinus (76: 4-7) describes another branch of the Marcia running over the Caelian, supplying this hill and the Aventine. According to Pier Luigi Tucci, this extension can be identified with a conduit made of stone pressure pipes.²¹ A considerable number of them have been found north of the route of the Arcus Caelimontani. Like the Imperial aqueduct this line seems to have begun at the Porta Maggiore and ended at the Temple of the Deified Claudius. But we have no idea if the branch had reached a sufficient height to supply the Palatine, or when this conduit was built—whether in Republican or Imperial times. Furthermore Antonio Colini remembers a Severan monumental inscription of white marble, excavated in the Villa Massimo.²² It appears to record the repair of a branch of the Marcia in AD 196 and is perhaps to be connected with a monumental arch carrying the Marcia's conduit over today's Via Merulana or Via Tuscolana. It seems very unlikely that both findings—the stone pipes and the inscription—belong to the same branch, but a third branch of the Marcia over the Caelian is not known. So we assume that from the second century BC until the Neronian period the branch consisted of an inverted siphon, whereas after the re-implementation of the Marcia under Trajan (Frontin. 87: 3-4) it was carried on arches over the Caelian.²³

Another possibility for the Palatine's aqueduct should be taken into consideration: the branch of the Marcia over the Capitoline hill.²⁴ Lacking archaeological evidence, it is controversial whether this branch was brought first onto the Quirinal and then onto the Capitoline, or whether two lines supplied both hills.²⁵ Although several ancient authors noted *fistulae* (Roman lead pipes) on the Capitoline, the main supply line might not have consisted of an inverted siphon, but was instead an aqueduct on arches.²⁶ That this line ended near to the temple of Iupiter Optimus Maximus and the statue of Marcius Rex might be suggested from Republican coins.²⁷ And it is here where the conduit presumably would have crossed the Velabrum valley to deliver water to the Palatine. But, as this area was transformed many times in antiquity, no traces of such an extension have been found.

If we take into account all archaeological and literary evidence we must admit that a decision in favor of one of the two possible courses cannot be made. Harry B. Evans prefers the line to the Palatine crossing the Caelian, because it easily could have branched off at Porta Maggiore, taking the much shorter route to the Palatine.²⁸ This would imply that both branches of the Marcia over the Caelian and the one to the Capitoline were contemporaneous. But, setting aside the unknown dating of all these lines, we first have to ask why two different extensions of the Marcia would run over the Caelian, when the higher level branch might have sufficed entirely. We should take into consideration the possibility of a subsequent extension of the *intra urbem* branches of the Marcia. First the aqueduct might have had at least two

extensions: one to the Caelian at a very low level, the Rivus Herculaneus, and one or two higher ones in the direction of the Capitoline, also serving the Viminal and Quirinal. If we consider the Marcia's first Caelian branch to have been at a lower level, the one to the Capitoline would have supplied the Palatine first.²⁹ When later—perhaps at the end of the second century BC with the erection of the Aqua Tepula—the higher extension on the Caelian might have taken over the supply for the Palatine.

Whatever the course of the Palatine conduit, there can be no doubt that a branch of the Aqua Marcia delivered water to it. Unfortunately, the only archaeological evidence of the water supply from that time is a public fountain located in front of the Temple of Cybele (fig. 3).³⁰ The fountain has a rectangular basin that resembles those from the Late Republican period. Because of this there can be no doubt that the fountain was fed with fresh water from a conduit.³¹ According to Patrizio Pensabene the fountain is situated alongside a *platea*, dating to the beginning of the second century BC that was destroyed by a fire in 111 BC. Although this does not give an exact date for the fountain, it is likely to have been erected with the introduction of the Marcia. The water-spout was at about 42 masl, which fits well with the known heights of the Marcia. Although it is the only public fountain excavated so far on the Palatine, we can be quite sure that from this time on several streets fountains would have provided the residents with fresh water, just as in the lower elevation areas.



Fig. 3. Republican fountain near the temple of Cybele. P. Pensabene, "Scavi nell'area del tempio della Vittoria e del santuario della Magna Mater sul Palatino," *ArchLaz* 9, 1988, fig. 6.

Other uses for Marcia's water cannot be proven through archaeological findings, as most second and first century BC houses have not been preserved. But ancient authors give us an idea of the *domus* and the inhabitants. As has often been stressed, there was intense competition over the richest, largest, and most representative *domus* in *regio X*.³² In 165 BC Cnaeus Octavius was elected Consul because he had a luxurious house on the Palatine (Cic. *off.* 1: 138). Again in 125 and 92 BC we can read about rich Romans—the famous Aemilius Scaurus and Licinius Crassus—who invested much of their wealth in their Palatine *domus*.³³ Especially in the first century BC the

homines novi, men who were the first in their families serving the Roman Senate, competed with each other for prime locations and the biggest estate.³⁴ These houses were all furnished with “masses of marble and paintings; expenses befitting a king”—*marmorum molem, opera pictorum, impendia regalia* (Pliny *Nat. Hist.* 36: 110).

Cicero mentions how important a water conduit was for two of his houses outside Rome.³⁵ As we know from inscriptions, private conduits had always been a status symbol and were installed during the Republican period only for special merit.³⁶ Therefore it seems likely that the wealthy houses on the Palatine were provided with a private water supply. But it must be stressed that it wasn't easy to receive a concession, because there wasn't enough water for everyone. As a result many private conduits were installed illegally. Cato Maior in 184 BC (Livy 39: 44, 4; Plut. *Cato maior* 19), as well as Marcus Rex in 144 BC (Frontin. 7:1-2) rigorously cut off all pipes laid out without concession and redirected the water to public fountains. Although the Marcia added 1472 *quinaria* to the city's supply this abuse did not end (Frontin. 81:2), but continued into Republican and Imperial times.³⁷ As private conduits had long been a status symbol, we can conclude that the *domus*' supply would have been elegantly presented—especially to impress visitors. In the noble quarter of the Palatine the Marcia branch enabled, for the first time, the embellishment of *domus* with nymphaea. This might have initiated a change in furnishing of Roman houses, so that now, nymphaea constituted basic equipment. Additionally the new water supply might have given rise to gardens with many flowers and plants.³⁸

The connection between wealthy houses and increased water demand leads us to a second thesis. Since Rome's water supply (especially in this area) expanded again in 125 BC with construction of the Aqua Tepula, we might also conclude that there was a housing “boom” for the wealthy on the Palatine. As Harry B. Evans has pointed out, it was unusual that only nineteen years after construction of the Marcia, that a new line had to be built in order to supply the Capitoline (Frontin. 8:1-2), towards which the water of the Marcia was already led.³⁹ There can be no doubt that the Marcia's branch was not sufficient and that there was an urgent need for more water in that area. It isn't clear why the Capitoline needed more water at the end of the second century BC, so we must conclude that the adjacent Palatine branch no longer sufficed. New elaborate houses provided with a great deal more running water may be the reason. In any case, the Tepula, which ended on the Capitoline, had low quality water unlike the Marcia, which provided excellent water (Frontin. 13:4. 92; Pliny *Nat. Hist.* 31:42; Mart. 6:42). Therefore, its extension—carrying the Palatine's share of water plus the amount formerly dedicated to the Capitoline—provided the hill and its luxuriant *domus* adequately.

Water for the first Roman emperor

With the Augustan era many fundamental changes took place, both concerning housing on the Palatine as well as Rome's water supply. As we know, already in 36 BC Augustus bought several *domus* there and transformed them into his new residence.⁴⁰ Nearly contemporaneously, Agrippa introduced in 33 BC a new aqueduct, the Aqua Iulia, which also supplied the Palatine.⁴¹ The question of whether this was a coincidence or whether the water was urgently needed for the new residence calls for a study of the Aqua Iulia.⁴²

Once more our knowledge about this aqueduct and the distribution of its water in the Urbs is based almost entirely on Frontinus. He tells us that the Iulia was one of the smaller lines—bringing only 597 *quinaria* to the city (83: 2). The water supplied seven different *regiones* of the city, among them the Esquiline, Capitoline, Caelian, and Palatine. According to Evans, the Iulia seems to have increased the delivery for the eastern *regiones* and for some hills, but had not been built to supply a particular area or building project like the Aqua Virgo, which was built to serve the Campus Martius with the Baths of Agrippa, the Stagnum, and the Euripus.⁴³ Frontinus records that the Iulia delivered only 18 *quinaria* for the emperor's use and 383 *quinaria* for public use. Again these numbers reflect the distribution at the end of the first century AD, but might more or less be relevant for the Augustan period.⁴⁴

Unfortunately, Frontinus does not mention how much water was distributed to the Palatine. But taking the known figures into consideration we can be quite sure that the Palatine received only a small additional amount of water, maybe about 85 *quinaria*, which accounts for a seventh of the total amount. It isn't clear whether the entire amount was distributed to the new *domus* of the emperor, or that it might also have served other houses on the Palatine, like that of Agrippa.⁴⁵ Nevertheless it is obvious from these figures that with the new aqueduct the Palatine's water supply increased only minimally. Augustus, however, might have had a considerable amount of water supplying his residence, using in addition the concessions for those houses he had bought before. Although a private concession for a conduit could not have been inherited or sold, Augustus' position might have allowed him to take over the former ones.⁴⁶

In addition to Frontinus' comments about water quantity, archaeological records also provide us with technical information. The Aqua Iulia began in the Alban Hills and ran on the substructures of the Marcia and the Tepula from Capannelle to Rome.⁴⁷ The bottom of its *specus* lies near Porta Maggiore at 59.37 masl, that is, 4 meters higher than the Aqua Marcia (fig. 1). As has been suggested, it is probable that once inside the city, the Iulia's branch to the Palatine continued on top of the Marcia, although we have no evidence of it.⁴⁸ So, it is likely that water reached the Palatine at the same height as in

Republican times, since the line should have ended at the same distribution tank as the Marcia.

In contrast to the Republican period, surviving archaeological evidence from the Augustan period allows us to ascertain the elevation of the highest known water tap. In the Casa di Augusto the lowest nymphaeum is situated at approximately 38.5 masl, and there should have been no problem to deliver water to it. The nymphaeum was excavated in a room northeast of the peristyle on the ground level, which was measured at the base of the ramp.⁴⁹ Two lead pipes in an Augustan *domus* under the Vigna Barberini laying at about 41 masl were recently published.⁵⁰ Another pipe with the stamp of Iulia Augusta was found in a *cryptoporticus* under the Area Palatina connecting the Domus Flavia and the Domus of Iulia.⁵¹ The floors of the *domus* lay at 41 masl and a *cryptoporticus* north of the *domus* at 44 masl.⁵² Thus, we might consider an elevation of about 42 masl for the lead pipe. This is the highest point, attested by the findings, where water could have been delivered in the Augustan period.⁵³ As mentioned earlier, the same elevation has been reconstructed for the Republican supply of the Palatine. So the remains from both Augustan and Republican periods suggest that the water reached 42 masl from 140 BC to the beginning of the first century AD and further sustains the theory that the Iulia's branch was carried on top of the Marcia.

Given our knowledge of the Augustan period—with Augustus' new residence and Agrippa's revolutionary reorganization of the water management of Rome—one might expect a new development of the Palatine's water management. But according to Frontinus and the archaeological findings, the heights and the suggested route of the aqueducts indicate no change in the distribution lines and techniques. And, what might be even more important, only slightly more water was distributed to the Palatine. Therefore, it seems clear that an enormous supply of water was not needed for new extravagant purposes. Additionally, two nymphaea of the Augustan residence have been excavated and they indicate no exaggerated decoration or form: one is a long basin in the western peristyle and the other a fountain in a small niche decorated with seashells and pumice stones (fig. 4).⁵⁴ Certainly most of the fountains still remain unknown, but we can formulate an idea of the private use of water in Augustan times. Conspicuous consumption in the form of monumental basins and exalted nymphaea—like those in the Domus Aurea with the *stagnum* and the so-called Bagni di Livia⁵⁵—cannot be traced back so far. Yet it has been mentioned that it is not exaggerated dimensions, but instead many details in the decoration of the *domus* that demonstrate the claim to leadership of the first emperor.⁵⁶ The design of the fountains supports this consideration. As neither the water supply nor the private use of water on the Palatine changed substantially, we might consider that a

revolution concerning the water supply as well as the use of fresh water was not intended.



Fig. 4. Nymphaeum in the Casa di Augusto

Whether Augustus' direct successors inherited his conception, we do not know. But we might assume increasing demands in the emperor's residence as it is in this period when the two latest cisterns were erected on the hill. One of them, a well-preserved rainwater reservoir under the so-called Basilica of the Domus Flavia has a semicircular form and is twenty-five meters wide. It could have contained an enormous quantity of water, which might have been necessary to complete the water supply. The cistern belonged to the garden of the so-called palazetto (little palace), an imperial *domus* built between the reigns of Tiberius and Nero. A dating in the reign of Claudius is most probable because of the alignment of the building. Later on, perhaps in Neronian times, it was converted into a fishpond and decommissioned under Domitian, when the so-called Basilica was built.⁵⁷ On the one hand the cistern was incorporated in the base of the villa, above which the garden was built on the main level (approx. 48 masl). On the other hand it provided the hill with more rainwater, which could have been used for watering the plants.⁵⁸ Another huge, two story cistern from this time is preserved in the House of Caligula near the Clivus Victoriae. On top of it (at 46.5 masl) a thick waterproof pavement covers the reservoir and served perhaps for collecting rainwater from the adjacent roofs.⁵⁹ These two enormous storage basins might give a hint to an increasing demand for water in the first half of the first century AD. But until Nero's great achievement, no change in the Palatine's fresh water supply is documented.

Extending the Aqua Claudia to the Palatine

It is well known that under Caligula in AD 38 the work for two new aqueducts began: the Aqua Claudia and the Aqua Anio Novus. Both lines were completed under Claudius in AD 52.⁶⁰ Although an extension over the Caelius might have been part of Claudius' or even Caligula's plan from the very beginning, it is not until Nero that the so-called Arcus Neroniani, or Arcus Caelimontani, were built.⁶¹ In a relatively lengthy passage (compared with other branches in the city, which are briefly or nowhere described) Frontinus (20: 2-4) refers to this branch delivering water to the Caelian, the Aventine, the Palatine, and Transtiberim.⁶² Already in his time at the end of the first century AD this might have been a remarkable construction and a very important line for the city's water supply. Due to its good state of preservation the aqueduct acted as a landmark throughout the centuries and was pictured in many illustrations of Rome (fig. 5).⁶³ The route of the aqueduct can still be followed over the Caelian (fig. 6), from the Porta Maggiore (fig. 7) with the *specus* at 63.85 masl, to the convent of PP. Passionisti.⁶⁴ In ancient times the line ended here at the Temple of the Deified Claudius. Today the last section of the *specus* is preserved near the Arco di Dolabella at 62.39 masl.⁶⁵ The majority of the arches are Neronian and only some of them were completely rebuilt under the Flavians.⁶⁶ Antonio Colini published the course with all remains in detail and dated the original arches as well as the repairs.⁶⁷ The very last section next to the ancient temple is shown on a fragment of the Severan Forma Urbis.⁶⁸

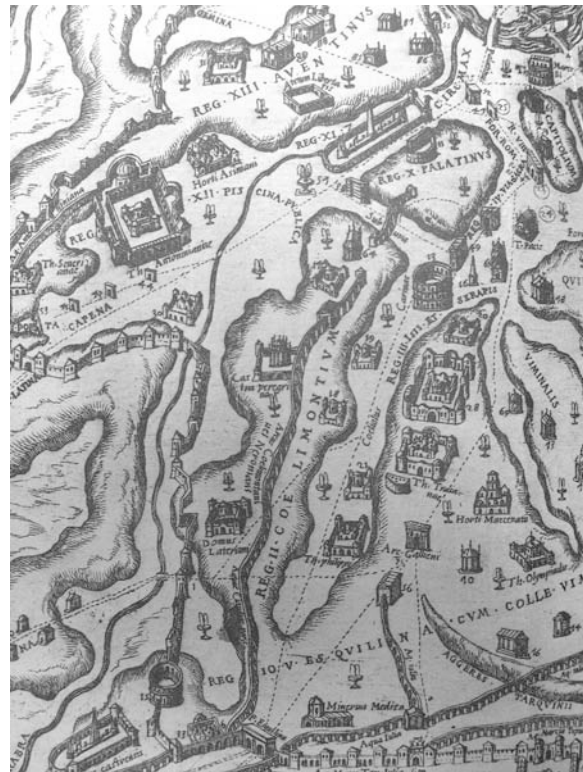


Fig. 5. Caelius with remaining arches. Onofrio Panvinio, 1565. Frutaz (1962) pl. 35.

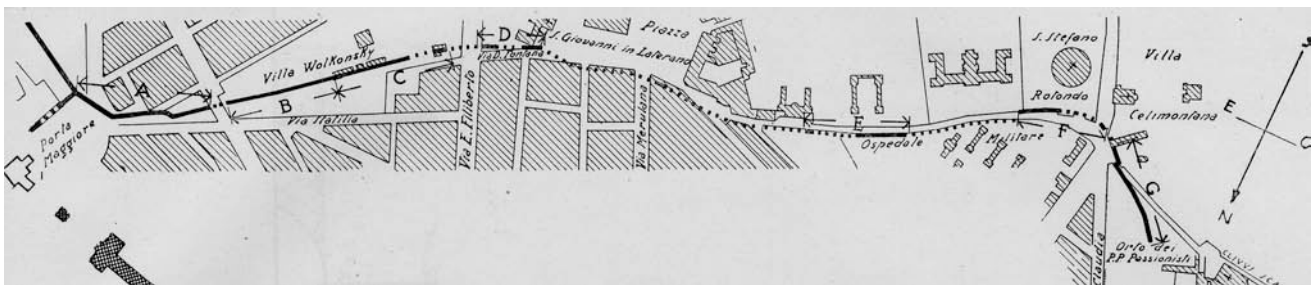


Fig. 6. The course of the Arcus Caelimontani or Arcus Neroniani. Colini (1944) pl. 2.

In contrast to this well-known section, the extension from the Temple of the Deified Claudius to the Palatine is almost completely lost. It must have begun at the east side of the temple and run down the Caelian. The arches on this slope survived the Middle Ages, but were destroyed entirely in 1596. We know about them only from some sixteenth century illustrations (figs. 5, 8, & 16).⁶⁹ By that time the bridge over Via Triumphalis (today's Via di S. Gregorio) had vanished completely. At the bottom of the Palatine some arches are still preserved next to the Via Triumphalis. But higher up the hill and especially on top of it, where the final *castellum aquae* should have delivered water throughout the palace, nearly every trace of the water supply is lost.⁷⁰ Apart from the problematic reconstruction

of the course, which will be discussed below, the construction of the aqueduct is today without controversy. It must have consisted of a four-story monumental arcade carrying the *specus* on top of it.⁷¹ As shown in the plaster model of Rome by Italo Gismondi, the bridge over the valley between the Caelian and the Palatine must have been an impressive sight in ancient times (fig. 9). Such an ambitious monument seen at such a prominent location had enormous symbolical significance as it reflected the Romans' important achievements in engineering and architecture, their sophisticated water management, and also the importance and grandeur of the Imperial residence.



Fig. 7. Porta Maggiore with the specus of the Aquae Claudia and the Anio Novus.

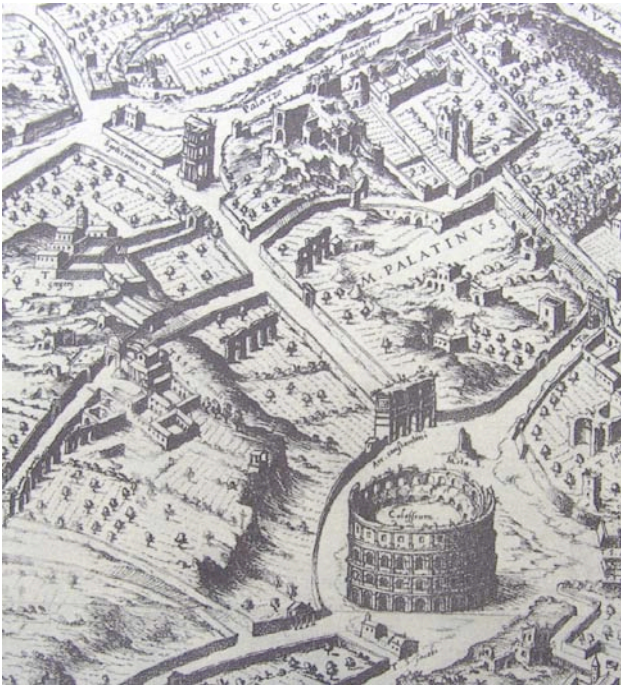


Fig. 8. Remaining arches on the slope of Caelian and Palatine. Du Pérac, 1577. Frutaz (1962) fig. 249.

This aqueduct played a key role in the water supply of the palace from the middle of the first century AD onwards. Although Frontinus (20: 2-5) says that the Arcus Neroniani were built under Nero and delivered water to the Palatine, a dating of the extension to the Palatine under Nero was never taken for granted. Since Thomas Ashby in the 1930s studied the masonry of the remaining arches and compared them with the brickwork of the Flavian palace, the overwhelming majority of scholars consider the extension to have been built under Domitian.⁷² At the same time as Ashby, Esther van Deman, studied the Roman aqueducts and published her manuscript in 1934. In contrast to Ashby, she distinguishes a Neronian core (constituting the original piers and arches from a restored phase), based on a detailed analysis of the masonry.⁷³ But her observations are rarely cited in literature.⁷⁴ Nonetheless some scholars suggest a Neronian date of the Claudia's extension to the Palatine based on general historical reasons, and consider the line to be an inverted siphon, which was replaced by the arched aqueduct in the late Flavian period.⁷⁵

Lastly, Lanciani's interpretation that the arches were built in Severan times should be mentioned, although his dating was never accepted.⁷⁶ He proposed that the first imperial branch—an inverted siphon—was erected under Domitian. A stamped lead pipe from Domitianic times was found in the area of the Temple of the Deified Claudius and according to Lanciani belonged to the line for the Ceasars' residence.⁷⁷ But, first, the direction of the pipe is not at all definite and could have also delivered water to the Meta Sudans. Second, its diameter of 30 cm is much too small for supplying the whole palace, when it is compared with the Domitianic lead pipe with a diameter of 14 cm providing water only for the Stadium.⁷⁸ Therefore, his suggestions can be ignored.

Our approach will start at the same place that Ashby and van Deman began their investigations: with the preserved arches (figs. 10-12 and 19). Nearly eighty years have passed since their observations and the masonry has undergone serious damage during this period. It may no longer be possible to obtain incontestable results by examining the brickwork. Instead a different method, which has never been taken into consideration, will bring us closer to a solution for the dating problem: a comparison between the Arcus Neroniani on the Caelian and the Palatine's arches. First we will carefully examine the extension between the Porta Maggiore and the Temple of the Deified Claudius. As mentioned before, portions of this belong to the original Neronian construction phase. But a small section now located in the Villa Wolkonsky was completely rebuilt in the Flavian period and has been thoroughly studied (fig. 13).⁷⁹ To get an idea of the different substructures it is necessary to compare the Flavian to the Neronian arches.⁸⁰



Fig. 9. The Palatine aqueduct bridges the Via Triumphalis. Reconstruction by Italo Gismondi, "Il Plastico di Roma," Museo della Civiltà Romana, Rome.

Neronian Arcus Caelimontani (on the Caelian in general)	Flavian Arcus Caelimontani (in Villa Wolkonsky)
---	---

width of piers: max. 2,3 m.

width of arches: about 8 m.

some arches: single ring of *bipedales*; other arches with double ring of bricks: *bipedales* (below) and *sesquipedales* (above).

width of piers: approx. 4,5 m.

width of arches: approx. 5 m.

all arches: double ring of *bipedales*.

The Neronian arches are very wide with slender piers, and must have seemed an elegant and fragile substructure when first built.⁸¹ In contrast, the Flavian section in the Villa Wolkonsky consists of thicker piers and narrow arches (fig. 13). Contemporaneous renovations were undertaken at all parts of the line by inserting a secondary arch within the original one (fig. 14).⁸² The repair made the whole line look less elegant and more massive, but, provided greater support. As we can distinguish very clearly the main characteristics of the two construction periods, we will now look more closely at the core of the arches on the Palatine (figs. 10. 12):

- Width of piers: 2.6-3.05 m.
- Width of arches: 6.45-7 m.⁸³

- lower arches with two rings of tiles: *bipedales* (below) and *sesquipedales* (above); upper arches with two rings of *bipedales*⁸⁴

While the Palatine and Caelian measurements are not exactly the same, it is obvious that the Palatine's arches are very near to those of the Neronian ones. They differ only in slightly larger piers and the arches are one meter smaller, whereas the difference from the Flavian section is much larger. Deviations in the width of the piers and the arches may be traced back to the fact that most arches on the Caelian ran more or less at the same level, whereas the ones on the Palatine were built into the hillside. Even in Neronian times the slender piers might have been considered too unstable to ascend the steep hill.⁸⁵

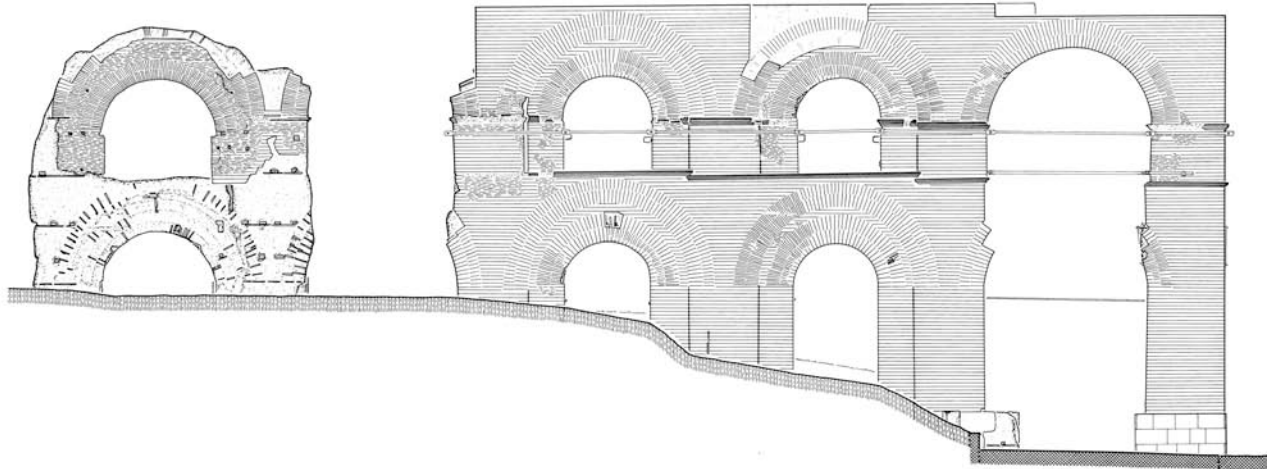


Fig. 10. The arches on the eastern slope of the Palatine. *Architekturreferat*, DAI.



Fig. 11. Three of the remaining and heavily restored arches at the Via Triumphalis (view from the north).

What is most striking is the construction of the arches. Everywhere on the Caelian the arches of the different stories are made of the same bricks, whereas on the Palatine we note *bipedales* and *sesquipedales* in the lower story and only *bipedales* in the upper one. The most

convincing solution is to propose two phases: in the lower arches there is still preserved an original, Neronian core, whereas the upper ones were completely rebuilt in the late Flavian period.⁸⁶ Although this would fit well with the comparison of the measurements, one problem remains:

why were the new arches not diminished as in other Flavian sections, but built as wide as the Neronian ones? They might belong to an earlier repair of the line. This part could have been one of the first sections to need maintenance because of the situation on the hillside. So it could be assumed that it was rebuilt contemporaneously with the initiation of the construction of the emperor's new palace already under Vespasian.⁸⁷

Nevertheless there can no longer be any doubt that Nero completed an Aqua Claudia extension, for which two dates have been proposed. On the one hand, Evans suggests that the aqueduct was built after the fire of AD 64, which destroyed most parts of the Caelian.⁸⁸ He argues that if the branch had been introduced before, the fire would have damaged the aqueduct so much that a complete rebuilding would have been inevitable. As we do not know anything about a reconstruction, Evans thinks that the branch was part of the urban renewal program of Nero after AD 64.⁸⁹ On the other hand, an inscription at the Porta Maggiore records the (partial) collapse—*intermissas dilapsasque*—of the Aqua Claudia and especially of its sources in AD 62 and its repair under Vespasian nine years later (CIL VI 1257). So if the Aqua Claudia malfunctioned in the second half of Nero's reign, it would not have been reasonable to extend the line.



Fig. 12. The upper arch on the eastern slope of the Palatine (view from the south).



Fig. 13. The Flavian section of the Arcus Caemontani in the Villa Wolkonsky.



Fig. 14. Neronian arch with a Domitianic reinforcement in the Via Statilia



Fig. 15. The opening for the specus in the northern wall of the reservoir.

Robert Coates-Stephens brings light to the discussion by suggesting that it was the Arcus Neroniani that interrupted the flow of the Aqua Claudia.⁹⁰ He proposes that most water of the Claudia was at that time drained off by the Arcus Neroniani to supply not only the higher hills, but also Nero's first residence, the Domus Transitoria, built before the fire of AD 64. As a consequence the Esquiline branch of the Claudia nearly ran dry and in this part of the city less water was available. When the Flavians returned the land and treasures of the Domus Aurea partly to the people, they also gave back the water of the Aqua Claudia to the western *regiones*. Another consideration, already suggested by Evans, supports this theory: because the Aqua

Claudia and Anio Novus were built to supply the higher *regiones* of Rome, it is hardly conceivable that their extension was not planned from the beginning and not achieved as soon as possible. If we accept Coates-Stephens' assumption as the most likely solution to the problem under discussion, we gain further information. Not only the interruption dates back to AD 62, but also the erection of the Arcus Neroniani.

Despite the fact that the Aqua Claudia must have supplied the Domus Transitoria, only the Neronian nymphaea belonging to the Domus Aurea's wing of the Palatine have been preserved on a high level. One is an enormous square basin (the side walls are more than 40 meters long) with a round structure in the middle directly under the Coenatio Iovis, a large banquet hall of the Domus Flavia.⁹¹ The floor-level of the basin was recorded at an elevation of 47.79 masl. West of this monumental construction (nearly at the same level) another basin was excavated, of which only a small part of the southern rim remains. It resembles the basin in the upper story of the Esquiline wing of the Domus Aurea and lay at approximately 47 masl, which is 5 meters higher than water could reach during the Republican and Augustan periods.⁹² But with Nero's new supply, it would have been possible to deliver water to even higher levels. This is confirmed by archaeological evidence where the *specus* is still preserved on the Palatine in a post-Severan *castellum* in the area of the Domus Severiana (figs. 15. 22-24), where the aqueduct entered the north wall of the reservoir at 53.3 masl.⁹³ This fits well with the *specus* atop the four-story aqueduct over the Via Triumphalis (about 55 masl), as reconstructed by Colini and Gismondi (fig. 9).⁹⁴

The remaining arches on the eastern slope of the Palatine are important for reconstructing the course of the aqueduct between the Temple of the Deified Claudius and the top of the Palatine. The aqueduct arches at the temple are not preserved; therefore we cannot refer to archaeological evidence for the first half of the supply line, but must rely on illustrations and maps.⁹⁵ As we have mentioned before, the arches on the slope of the Caelian were already destroyed in 1596, but fortunately, Giovanni Antonio Dosio illustrated them around 1562 (fig. 16).⁹⁶ These images do not allow a detailed reconstruction, nonetheless it is clear that the arches didn't follow the same orientation as the ones at the Palatine (fig. 5). Rodolfo Lanciani refers to Du Pérac's engraving, but he has not taken this element into consideration in the *Forma Urbis Romae* where he has drawn the arches in a line with the remaining part on the Palatine (fig. 17).⁹⁷ But since 1970, when Emilio Rodriguez-Almeida published further fragments of the Severan *Forma Urbis*, we can be sure about the different orientation of the aqueduct on the Caelian.⁹⁸ In contrast to the Clivus Scauri, which intersects the Via Triumphalis at a right angle, the aqueduct line depicted on the Severan marble plan has a different orientation (fig. 18).

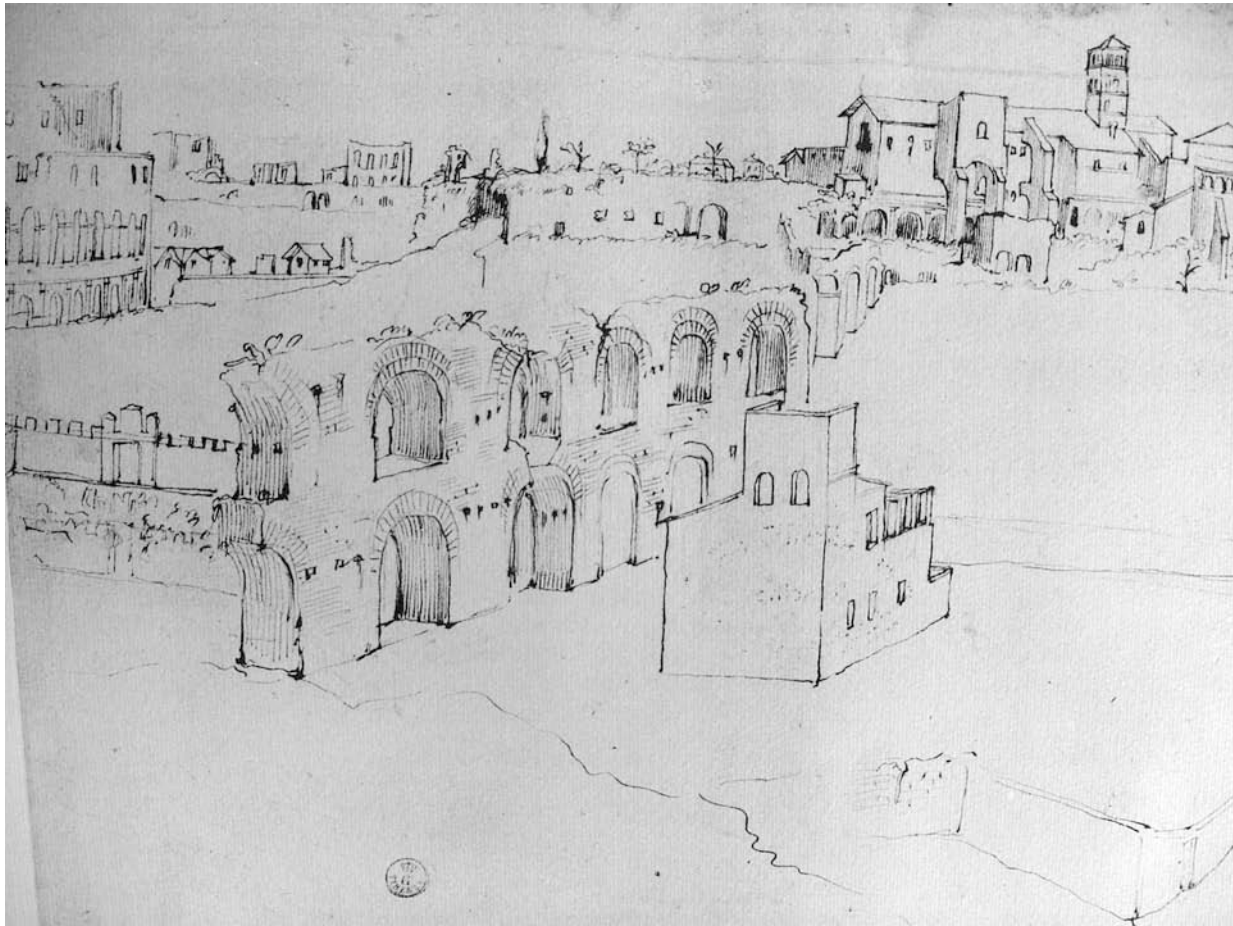


Fig. 16. Arches on the Palatine and in the background those on the Caelian. Giovanni Dosio, around 1562. A. Bartoli, *I monumenti antichi di Roma dei disegni degli Uffizi di Firenze VI* (Rome 1922) fig. 777.

The bridge over the Via Triumphalis presents a major problem. Lanciani suggests in his *Forma Urbis Romae* that the arches crossed the street, then turned at a right angle to the south running parallel to the Via Triumphalis.⁹⁹ After a short section the line again made a right angle turn and took the known direction up the hill. The reconstruction is certainly based on his observations of the remains. Even today one can see that in the last preserved pylon near the street where two arches, one above the other, begin to spring at a right angle to the existing arcade (fig. 19). There can be no doubt that those two arches carried a *specus* on top. Most scholars have followed Lanciani's reconstruction (fig. 9).¹⁰⁰ This, in spite of the fact, that no other example of this type of aqueduct junction exists and that it was extremely vulnerable to damage. Even Ashby doubted whether the aqueducts on the Caelian and the Palatine were linked with a section consisting of two right angles.¹⁰¹

Nineteenth century photographs make clear that the pylon near the Via Triumphalis was badly damaged.¹⁰² But we can gain some idea of its earlier appearance from careful examination of one of Giovanni Battista Piranesi's

engravings of the Acqua Claudia at the Palatine hill (fig. 20). In this image, the last pylon is obviously depicted in the same way as the better preserved ones: the lower parts of the pier consist of roughly illustrated brickwork with layers of *bipedales*, but in the uppermost part a different masonry is shown. The depiction resembles the well-preserved arches, where the hatching represents the bottom side of the arches with rings of upright bricks (fig. 20: between A and C). In consequence there must have been the beginning of another arch that bridged Via Triumphalis in the same direction as the remaining aqueduct. Du Pérac's illustration, which shows brickwork coming out of the pylon and following the same alignment as the rest of the arches, confirms this (fig. 8), as does a drawing by Francis Towne from 1781.¹⁰³

Still, the problem with the arch at the right angle to the north remains. And as Piranesi's engraving illustrates, he saw another arch springing to the south—but only in the second story of the aqueduct (fig. 20: A). Construction of this type is too unstable to carry a water-channel, so we might consider here a kind of portico running parallel to the

Via Triumphalis to the south.¹⁰⁴ So we have an aqueduct supplying the Palatine in a direct line and one extension branching off at a right angle and following the Via Triumphalis to the north. How the water was divided into different channels at this junction without a reservoir is not clear. As a probable solution to this technical problem, water gates or sluices might have channeled the water and controlled the quantity for the different branches. Because scholars agree that it formed part of the main aqueduct to the Palatine, other supply lines for the northern line have never been considered. For a reconstruction of this branch we have first to examine the reservoirs on top of the hill.

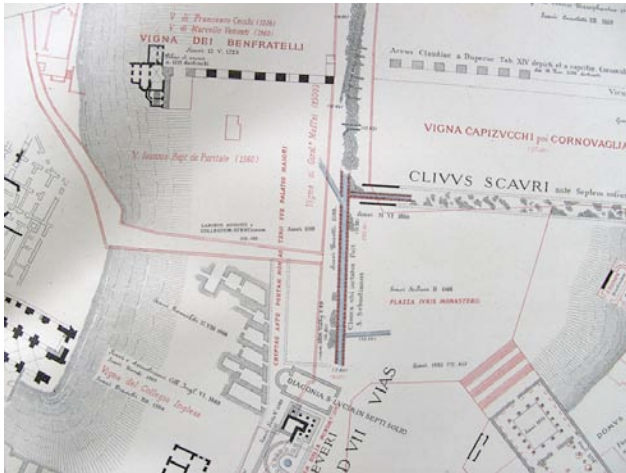


Fig. 17. Lanciani's reconstruction of the aqueduct course over the Via Triumphalis. Lanciani, *FUR*, pl. 35

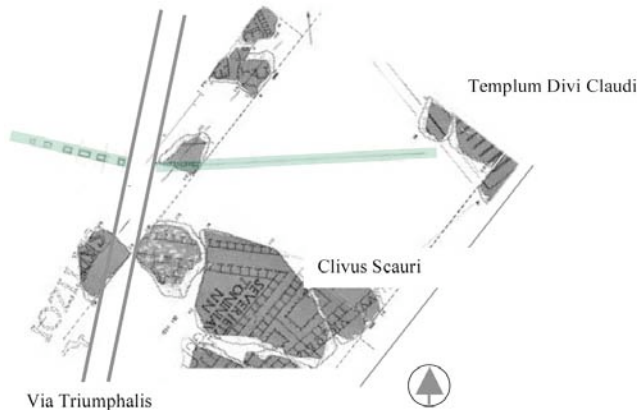


Fig. 18. Reconstruction of the aqueduct's course based on the Severan marble plan. E. Rodriguez-Almeida, *Forma Urbis Marmorea*. (Rome, 1981). A. Schmölder-Veit, additions.

The final castella on the Palatine

The evidence suggests that at least two different distribution reservoirs can be assumed on top of the eastern slope of the Palatine. For the earliest branches of the Aqua Marcia and Aqua Iulia we know neither exactly where the single common line ran, nor where it ended. For the

Neronian aqueduct we can propose two final reservoirs for the original phase. One of them must have been built at the end of the remaining row of arches at the summit of the great exedra at the Stadium (fig. 21). The alignment of this branch is puzzling. Since the exedra and the Stadium were erected under Domitian, all earlier buildings have been superseded; and no *castellum* is preserved in the surrounding structures. Still, it may be that the Neronian branch originally ended in the middle above the depression, which is now the Stadium. Since this branch was not abandoned in Flavian nor in later times, we might also consider a Flavian reservoir in this area. The only convincing suggestion for a location is east of the exedra, where all edifices have disappeared. It has been suggested that the exedra was a nymphaeum or that some sort of water game was hosted there.¹⁰⁵ In spite of the fact that the other well-preserved walls do not contain any fountain remains and that the summit of the exedra is destroyed down to the level of the *specus*, a fountain located in the middle indicating the aqueduct's terminus still remains a possible suggestion (fig. 22).

The only documented change to this branch dates from the Late-Severan or Post-Severan period. Unpublished until now, it consists of a new two-chamber reservoir—one chamber is 5.82 meters long and 4 meters wide, the other 5.77 meters long and 3.8 meters wide—that originates in an open hall behind the exedra (figs. 15, 21-23). The bottom of the *specus* lies 3.1 meters above the floor of the reservoir, which had a maximum capacity of 140 cubic meters. During the Severan period the niches and openings of the original room were sealed with masonry.¹⁰⁶ So the closure must be contemporaneous with the great changes and extensions of this palace wing, usually called the Domus Severiana. It is unknown which function the new structure fulfilled. The transformation might have been planned as a reservoir from the beginning, but there was no opening in the Severan wall provided for the *specus* (figs. 15, 23).¹⁰⁷ Only later an aperture was broken into the walls for the afflux. Furthermore, the interior wall, which divided the reservoir in two chambers with an opening in the middle for the water circulation, was added later. It is obvious that the elements of the reservoir postdate the Severan closure of the hall. However, we cannot exclude changes to the plan having been made during the Severan construction phase, including the erection of the reservoir. So it will remain unclear whether the reservoir served the new structures of the Severan extension in this area or later modifications like the Baths of Maxentius.¹⁰⁸ The point at which the line to the reservoir branched off the main aqueduct is also hypothetical (fig. 21).

While these two *castella* have never been discussed in literature, a third *castellum* located between the Vigna Barberini and the Stadium, on the highest point of the Palatine, has been assumed for the final and main reservoir of the Palatine as seen in Pirro Ligorio's sketches, in Pietro Santi Bartoli's description, and elsewhere (fig. 24).¹⁰⁹ The

high elevation provides a good reason to build the final castellum here, as was customary in Roman times. Also, this area sits between two palace-wings—the Stadium and the Vigna Barberini—with different alignments, forming a hinge, where a massive service structure like a *castellum aquae* could be placed without interrupting the representative ensemble of the residence.

In 1552, when the area was excavated, Pirro Ligorio sketched a floor plan in which he noted “*piscinae adinasiae*” following the same alignment as the Stadium (fig. 25).¹¹⁰ In another plan, he drew a reservoir next to the remains of the so-called Vigna Barberini (fig. 26: D). The reservoir is depicted as a rectangular hall with sixteen massive piers. Due to the identical partition of the walls and the similar positioning of the two structures, it might be that Ligorio referred to the same reservoir in both plans.



Fig. 19. A view of the pylon near the Via Triumphalis that shows the beginning of two arches on top of each other.

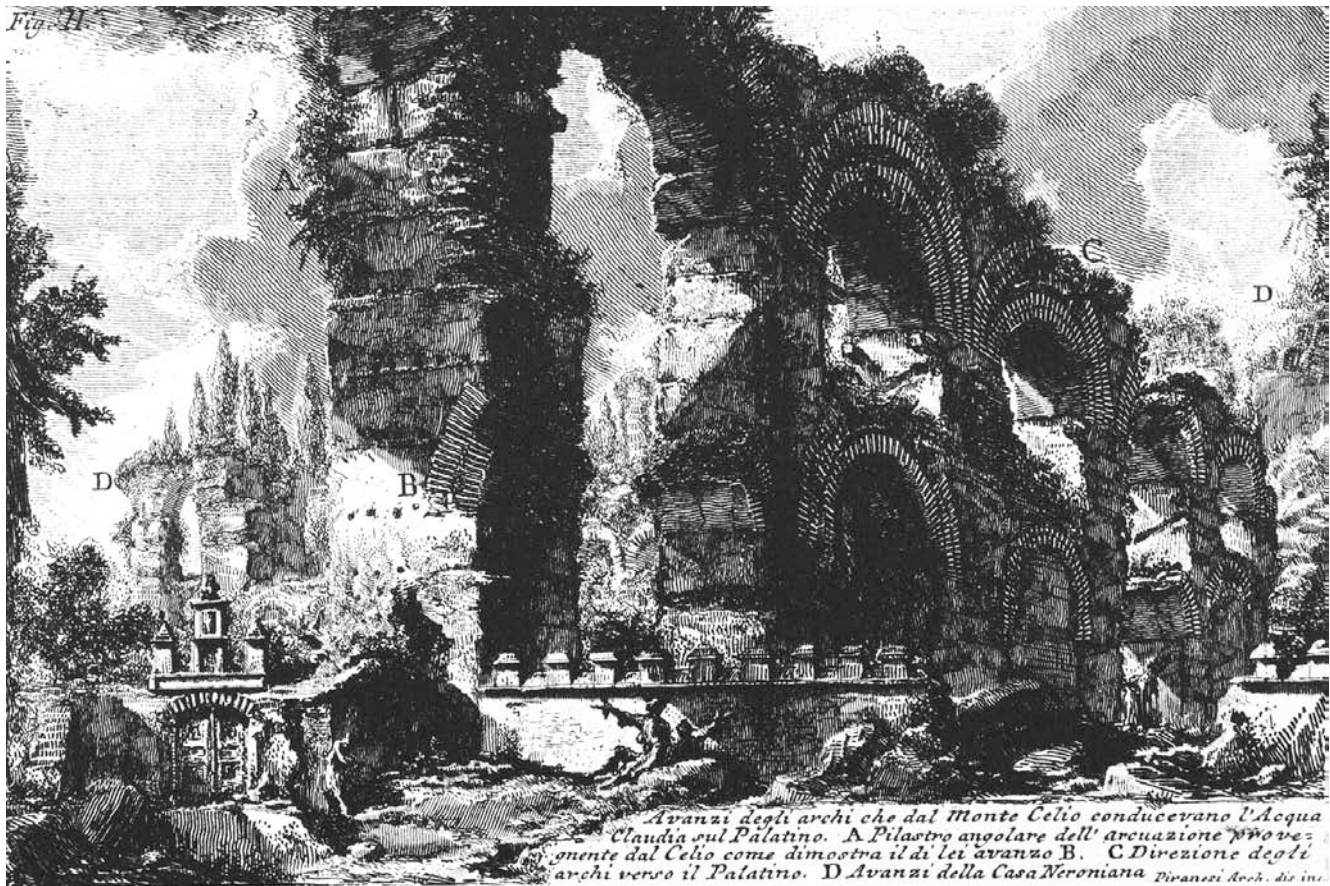


Fig. 20. The Palatine's aqueduct. G. B. Piranesi, *Le antichità romane* vol. I (Rome 1784, reprint) pl. xxxiv fig. ii.

In 1625 this area was almost completely destroyed when the Convent of San Bonaventura was built. In his memoirs, Pietro Santi Bartoli described some water devices that he saw during construction: "For the most part, these monuments were believed to be water tanks, one of which

serves now as a Refectory; there was found part of a lead pipe; a metal key (to open the lines) weighing 90 pounds under the gardens of these Religious."¹¹¹ Although we cannot trust Ligorio's drawings and descriptions in every detail, other scholars have noted reservoirs in this place;

specifically four chambers northeast of the fountain apsis used for habitation. Henri Deglane has seen the typical rounded form of waterproof mortar in all chambers, which is found in roman cisterns and reservoirs. As the floor-level of the chambers is unknown, it is impossible to say whether these provided water to the main level of the palace or only the edifices situated on the lower slope.¹¹²

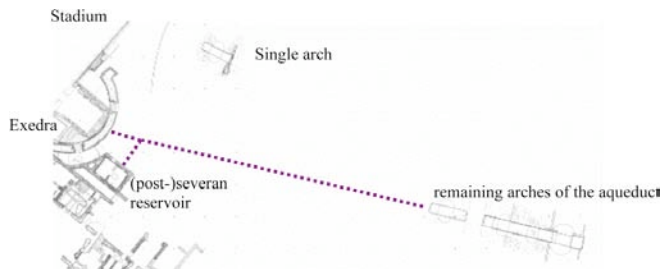


Fig. 21. Reconstruction of the southern branch on the Palatine. *Architekturreferat*, DAI. A. Schmölder-Veit, additions.



Fig. 22. Reservoir with coffered ceiling and the summit of the Stadium exedra in the background. Classical Archaeological Institute, Ludwig-Maximilians-Universität, Munich.

Several evidential threads lead almost directly to the conclusion that this is where we should find a *castellum aquae*. But nothing presently remains to give us a clear idea about how and where the water was collected and delivered to the palace. The area north of the fountain apsis, indicated by Ligorio as one side of the reservoir, does not show any of the characteristics he specified. Perhaps Ligorio did not depict the remains of the reservoir in the correct place, as a comparison of his two sketches suggests: the *castellum* cannot follow the alignment of the Stadium as well as of the Vigna Barberini and form at the same time a rectangular building (fig. 24-26). So, what did Ligorio really see and which parts of his plan did he reconstruct? Perhaps he only saw the margins of the reservoir in the north and some pillars and then

reconstructed the other parts based on this evidence. So the *castellum* might be located directly on the site of the Convent of San Bonaventura, where everything was destroyed in the sixteenth century. The floor plan of the refectory, mentioned by Bartoli, determined the following reconstruction. The chamber was identified by Bartoli as part of a reservoir, but shows a completely different layout from Ligorio's sketch. Its form is trapezoidal, because one side follows the alignment of the Vigna Barberini, whereas the other has the same direction as the Stadium. So, we might assume a reservoir consisting of a trapezoidal chamber and several rectangular halls (fig. 24). This would perfectly integrate the alignments of the surrounding palace wings and would resolve the space between them.

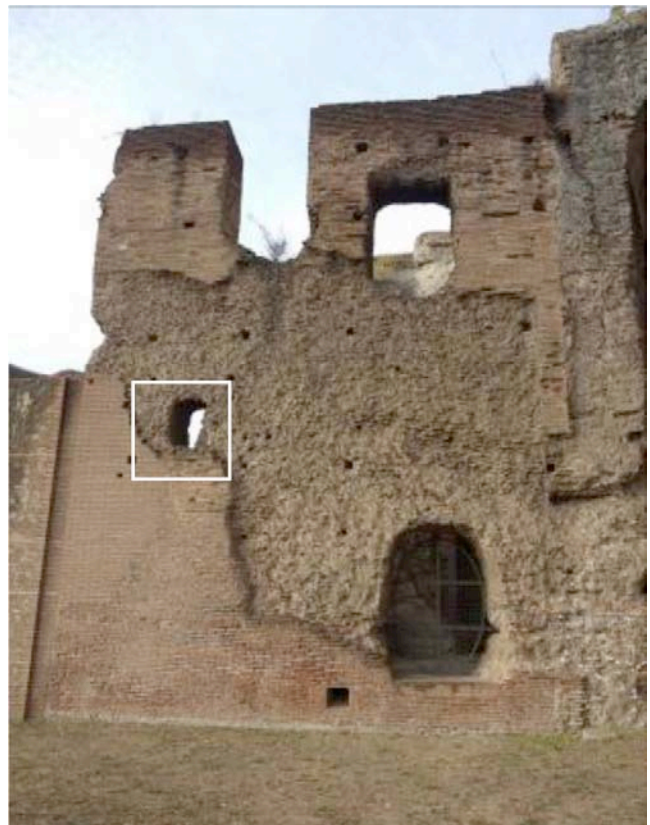


Fig. 23. Northern wall of the reservoir with a hole for the specus (marked).

Although there are only a few indications from earlier centuries and no direct evidence, a strong argument in favor of a final *castellum* in this area is indicated, especially when we consider the course of the aqueduct serving this reservoir.¹¹³ On his plan Ligorio notes two pylons described as “Aquadotto Aquae Mar. Claudiae” (fig. 25). Both have disappeared completely and we cannot verify their location. But a position some meters to the north or south does not matter for our reconstruction. What is important is that these pylons can easily be incorporated in an aqueduct line branching off the remaining arches at

the Via Triumphalis to the north running up the slope of the Palatine and ending north of the Stadium (fig. 24). Other traces of this line between the beginning and the Stadium are not preserved so that the proposed course remains hypothetical. We can be sure that the single arch at the slope of the Palatine (fig. 21), which has often been suggested to be part of the aqueduct, was not incorporated within this branch.¹¹⁴ Actually it is doubtful if this arch was part of any aqueduct for the Palatine. Its masonry and architecture differ in nearly every point from the well-known construction of the remaining arches.

This reconstruction suggests two branches: one in direct alignment with the bridge over the Via Triumphalis

to the middle of the Stadium, and the other branching off the line directly behind the bridge to the north and ending between the Stadium and today's Vigna Barberini (fig. 24). Both ended on the eastern slope of the Palatine and their *castella* are reconstructed not far away from each other. Thus, we might assume the line to the exedra continued further along and piped water to a *castellum* in a different palace wing. But this problem cannot be solved without further excavations of the Neronian structures. Due to the dating of the arches it seems likely that the final *castella* of both lines are part of the original water supply of Nero's reign.¹¹⁵



Fig. 24. The Palatine's eastern slope: nymphaea (dark blue); known and literary attested reservoirs (light blue); hypothetical reservoir in the north (dotted in light blue); and the aqueduct's course reconstructed (dotted in black). Miriam Knechtel.

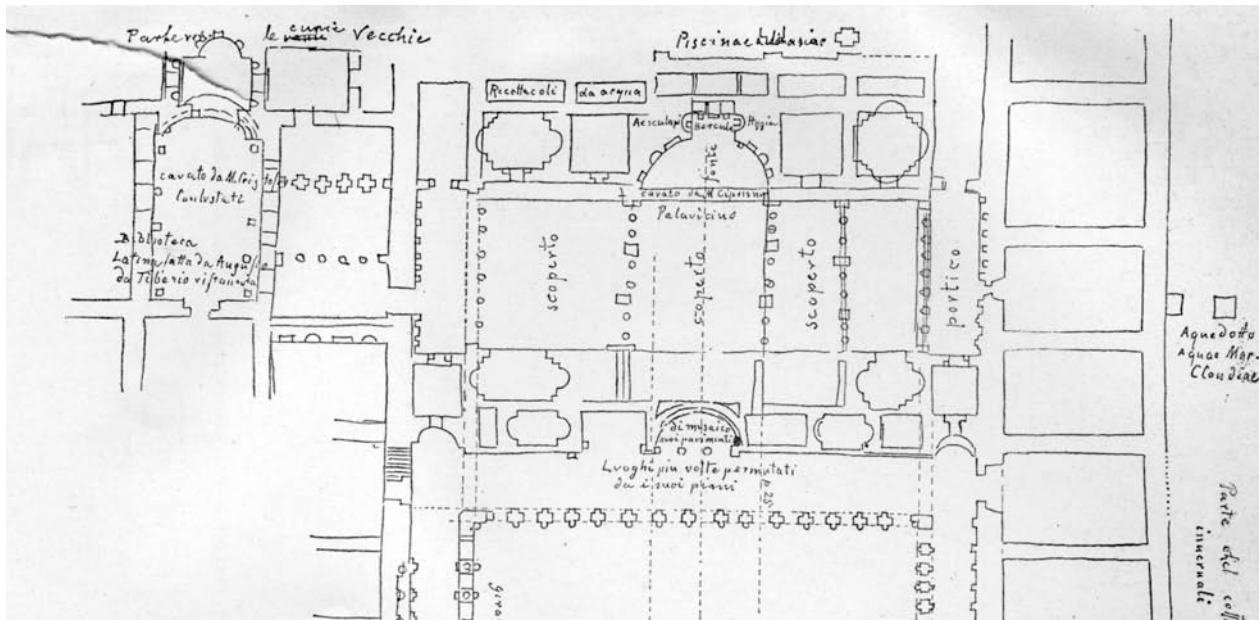


Fig. 25. Floor plan. Pirro Ligorio, 1552. Detail from: Hülsen (1895) pl. VIII.

Repairs and changes

As previously noted, the first repair of the aqueduct was undertaken perhaps in early Flavian times, when Vespasian began to build the Flavian residence. It probably consisted of new arcades above the first row of arches. Since then the aqueduct has undergone several repairs. Secondary arches reinforced all the original arches, but their brickwork is very different, and so we might assume at least two different restoration phases. For this we must distinguish between the upper arch and the three arches next to the Via Triumphalis, which have been restored in modern times (figs. 10-12). The modern interventions make it difficult to form a clear idea of the ancient masonry. Nonetheless, it seems reasonable to propose a Domitianic dating for these reinforcements for two reasons: the double row of *bipedalis* (well preserved in some parts) consists of good brickwork with very thin layers of mortar in between; and the arch rests on a cornice of bricks typical for Neronian and Flavian arches (figs. 14, and 27). In addition, the joint that attached the Domitianic pier to the original one is still preserved.

The appearance of this part of the line also changed—from a very light, fragile, and elegant sub-structure to a more massive and solid one. If Coates-Stephens' suggestion mentioned above is correct, we have to consider one further and quite profound change during that time. According to him the disruption of the Aqua Claudia mentioned in the inscription at the Porta Maggiore (CIL VI 1257) was a consequence of the building of the Arcus Neroniani. Nine years later, when the Flavians returned parts of the land of the Domus Aurea to public use, they also returned Aqua Claudia water to the inhabitants of the western quarters of the Urbs. This might have resulted in a reduced water supply for the Caelian, Aventine, and

Transtiberim and perhaps for the Imperial palace as well. This deficit was redressed under Trajan when a line for the Aquae Marcia and Iulia, which had ceased to deliver water to the Caelian hill under Nero (Frontin. 76: 4-7), was renewed about AD 100 and might have been part of a new system of Rome's water supply invented under Nerva (Frontin. 64: 1. 87-88). The Iulia delivered water to the Caelian and also to the Palatine (Frontin. 83: 2), while the Marcia's water flowed only to the Palatine and the Aventine (Frontin. 81: 2).¹¹⁶ In fact, the Arcus Neroniani were too high for these supply lines, so we must assume a second aqueduct on the Caelian and the eastern slope of the Palatine although the course and the ending of these lines are unknown.¹¹⁷

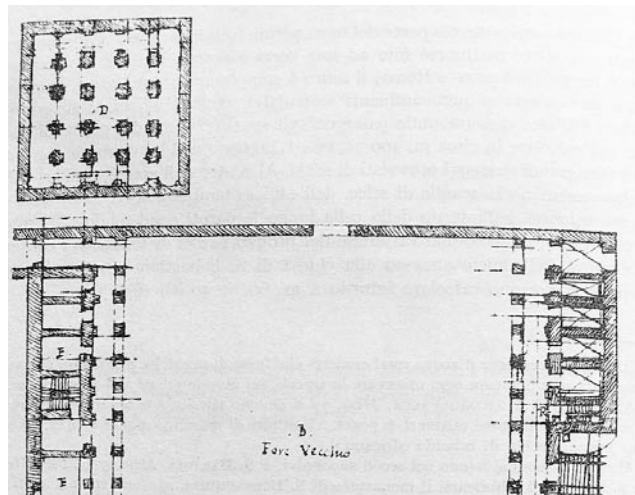


Fig. 26. Castellum with ancient remains of the Vigna Barberini (Foro Vecchio). Pirro Ligorio. F. Castagnoli, *Topografia antica. Un metodo di studio I. Roma* (Rome 1993) 316, fig. 2.



Fig. 27. Detail of the upper remaining arch on the Palatine.

Whether the practice of supplying the Palatine by all three lines—the Marcia, the Iulia, and the Claudia—was followed by Trajan’s successors is unknown. Under Septimius Severus the entire Arcus Neroniani, or Caelimontani, as they were called under his reign, were repaired (CIL VI 1259).¹¹⁸ This must have been part of his building program of the Palatine, especially the Domus Severiana and the Septizodium, a monumental nymphaeum at the bottom of the hill.¹¹⁹ Archaeological remains of this restoration may have been preserved in the second story of the upper arch on the Palatine (figs. 12 and 27), where the two rings are made of thin *bipedales* characteristic of the Severan period, and show layers of mortar that exhibit nearly the same thickness as the bricks themselves. The masonry can be compared with several other Severan repairs of the Arcus Caelimontani.¹²⁰ The lack of a joint between the reinforcement and the Vespasianic arch and the absence of a cornice below the springing of the arch are uncommon. Nevertheless this agrees with the dating of the Severan repair as has often been proposed.¹²¹

It is possible that Septimius Severus not only restored the water supply of the palace, but also reorganized water management of the whole area along with the adjacent quarters. Susann Lusnia suggests that in AD 201 a building program was completed concerning not only the extension of the Palatine and the erection of the Septizodium, but also the Severan baths in *regio I*.¹²² She considers that it was for this purpose that both the Arcus Caelimontani and the branch of the Aqua Marcia on the Caelian were restored in AD 201. This might have included a new allocation of the water. The Marcia, now not only repaired but also enlarged, could have served the Severan baths. As is known from other Imperial baths, like the *Thermae Antonianae*, those constructions required an increased water flow. The Marcia’s branch might have been appropriated entirely for the needs of the Severan baths and in consequence ceased to supply the Palatine. A brief notice in the *Historia Augusta* confirms such a realignment of the aqueducts. As is recorded, Alexander Severus

preferred to drink the cool water of the Claudian line (SHA Alex. 30: 4). One might wonder why he drank the water of the Claudia and not the even better water of the Marcia if this aqueduct still supplied the Palatine. As a result the Claudia was perhaps the only line during that period to deliver water to the palaces.

The lower arcade of the upper arch on the Palatine was repaired once more and the poor quality brickwork used to reinforce the arch is still preserved (fig. 28). The repair has damaged the earlier arch and consists of three rings of very fragmentary bricks and marble pieces. It is nearly impossible to date this masonry more precisely than to the third or fourth century AD.¹²³ So it may be part of the building activity of Maxentius and a supporting procedure for his new baths in the Domus Severiana. In all probability the aqueduct continued in use well into the fifth century.¹²⁴

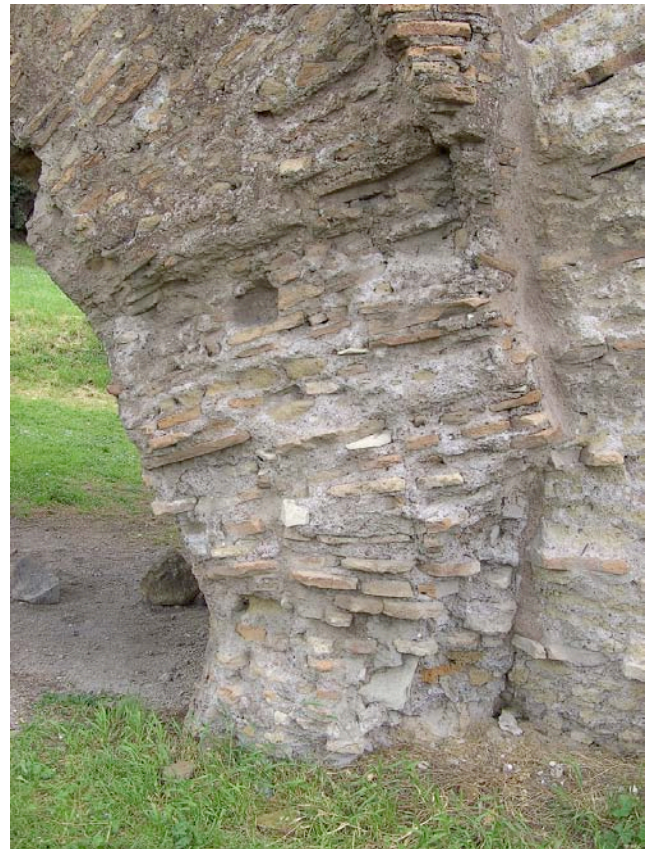


Fig. 28. Late-antique repair of the upper remaining arch on the Palatine.

Conclusions

Water management of the Palatine underwent two radical changes in ancient times: in 140 BC the hill was provided for the first time with fresh water from the Aqua Marcia; and in Neronian times the emperor’s residence acquired a completely new supply that was able to deliver water to the uppermost level as well the lower level. The Aqua Marcia’s extension of 140 BC meant that it was now possible to obtain water from public fountains like the one preserved

near the Temple of Cybele in addition to the rainwater collected in the many cisterns. It can also be assumed that in this elite quarter of the Urbs many private residences were provided with dedicated conduits. For the first time the upper classes on the Palatine could furnish their *domus* with water games and nymphaea, as was the rule in other parts of town. Thus, more and more elaborate houses could be built and provided with private fountains, which increased water consumption. Nineteen years later with the construction of the Aqua Tepula, more water was made available to the Palatine, to help satisfy the increasing demands of the residents on this *urbis clarissimus locus*.

Similar effects were achieved by extending the Aqua Iulia to the Palatine in the Augustan period. But the Iulia, a small aqueduct, delivered only a small additional amount of water to the hill. Carried on top of the Marcia, even this new line did not reach the higher levels. It might seem surprising that the new Augustan policy of providing a better water supply for Rome did not include a considerable improvement to his own residential area. But it is important to remember that as far as we know Augustus did not build his residence with conspicuous nymphaea, but with the customary fountains such as are observed in senatorial houses. Also, the extensions of Rome's water supply completed during this time were intended to serve the monumental buildings in the Campus Martius and to increase the quantity of water for all quarters of the Urbs.

It was only under Nero, who extended the Aqua Claudia to the Palatine, that the desired improvements to the hill's water supply were achieved. As we have demonstrated here through a detailed analysis of the

remaining structures, the Arcus Neroniani supplied the Palatine as early as the Neronian period. In antiquity this aqueduct was considered completely sufficient for the needs of the palace so that the Aquae Marcia and Iulia ceased to deliver to the hill. From then on—in all likelihood before the fire of AD 64—the water also reached to the highest level of the residence, which constituted the main floor in many wings of the later Domitianic palace. In addition to reconsidering the construction date of the aqueduct, we have also re-examined the aqueduct's course from the slope of the Caelian up the eastern hillside near the Stadium. A new and convincing solution for the bridge over the Via Triumphalis can be proposed, as well as two extensions up the hill. The line further north ended between the Stadium and today's Vigna Barberini, where we can most likely trace the site of the main reservoir for the emperor's palace. The other line ran directly to the summit of the great exedra at the Stadium. Whether it ended here in a reservoir or took its course further on is not clear. In Severan (or perhaps later) times a new reservoir was built behind the exedra in order to deliver water to the enlarged and completely rebuilt Domus Severiana. This wing and the modification to the water supply—visible in the repairs of the arches—were part of an enormous building program, which included the Septizodium and the Thermae Severianae nearby. One final effort at renovation was perhaps undertaken in connection with the new Baths of Maxentius. Although the Palatine was much less attractive and lacked the attention of the emperors after the seat of power was shifted to Constantinople and other imperial residences, the aqueducts and the pipe network might have been in use until the fifth century AD.¹²⁵

Acknowledgements

This essay presents, in part, results of the fruitful project "Water on the Palatine" supported by a grant from the Deutsches Archäologisches Institut. I wish to thank this institution, especially the members of the department in Rome, Henner von Hesberg, Heinz Beste, and Richard Neudecker for encouraging me to study the water management of the Caesar's palaces. I am also most grateful to the Soprintendenza Speciale per i Beni Archeologici di Roma, and to Maria Antonietta Tomei, Director of the Palatine, who generously authorized the analysis. I warmly thank the friars from the convent San Bonaventura for showing me the refectory and the cellars as well as Allegra Serrao and Terry Share who enabled a visit to the gardens of the Villa Wolkonsky. Particular thanks are due to Ulrike Wulf-Rheidt, Evelyne Buckowiecki, Alexandra Riedel, Natascha Sojc, Robert Coates-Stephens, Henning Fahlbusch, and Christer Bruun for discussion of various aspects and useful feedback. I also extend thanks to my anonymous readers who provided me with useful comments. Elizabeth Thill, Beatrix Schmölder, and Monika Trümper-Ritter kindly revised the English version.

Unless otherwise noted, all photographs are by A. Schmölder-Veit.

Bibliography

- Aicher 1995 P. J. Aicher, *Guide to the Aqueducts of Ancient Rome* (Wauconda 1995)
 Baillie Reynolds – Bailey 1966 P. K. Baillie Reynolds, T. A. Bailey, "The Aqueduct in the Grounds of the British Embassy in Rome," *Archaeologia* 100, 1966, 81-104
 Blake 1959 M. E. Blake, *Roman construction in Italy from Tiberius through the Flavians* (Washington 1959)
 Bruun 1991 C. Bruun, *Water Supply of Ancient Rome. A Study of Roman Imperial Administration* (Helsinki 1991)

- Carandini – Papi 1999 A. Carandini, E. Papi (ed.), "Palatium e sacra via II. L'età tardo-repubblicana e la prima età Imperiale (fine III secolo a. C. – 64 d. C.)," *BA* 59-60 (Rome 1999)
- Carandini 1995 A. Carandini, "Palatium e sacra via I. Prima delle mura, l'età delle mura e l'età case arcaiche," *BA* 34 (Rome 1995)
- Carettoni 1967 G. Carettoni, "Scavo nella zona sud-ovest della casa di Livia. Prima relazione: la casa repubblicana," *NSc* 21, 1967, 287-319
- Carettoni 1987 G. Carettoni, "La X Regione: Palatium," C. Pietri (ed.), *L'Urbs. Espace urbain et histoire (Ier siècle av. J.-C. – IIIe siècle ap. J.-C.)*, Actes du colloque international organisé par le Centre national de la recherche scientifique et l'École française de Rome (Rome, 8–12 May 1985) (Rome 1987)
- Cecamore 2002 C. Cecamore, "Palatium. Topografia storica del Palatino tra III. sec. a. C. e I. sec. d. C.," *Bulletino della commissione archeologica comunale di Roma* Supplementi 9 (Rome 2002)
- Coates-Stephens 2004 R. Coates-Stephens, *Porta Maggiore: monument and landscape. Archeology and topography of the southern Esquiline from the Late Republican period to the Present*, *BCom* Suppl. 12 (Rome 2004)
- Colini 1944 A. M. Colini, *Storia e topografia del Celio nell'antichità*. MemPontAc 7 (Vatican 1944)
- Demant 1934 E. B. van Demant, *The Building of the Roman Aqueducts* (Washington 1934)
- Eck 1987 W. Eck, "Die Wasserversorgung im römischen Reich. Sozio-politische Bedingungen, Recht und Administration," in: Frontinus-Gesellschaft e. V., *Die Wasserversorgung antiker Städte* (Mainz 1987) 49-101
- Evans 1982 H. B. Evans, "Agrippa's Water Plan," *AJA* 86, 1982, 401-411
- Evans 1983 H. B. Evans, "Nero's Arcus Caelimontani," *AJA* 87, 1983, 392-399
- Evans 1994 H. B. Evans, *Water Distribution in Ancient Rome. The Evidence of Frontinus* (1994)
- Frontin. Frontinus, *de Aquae ductu urbis Romae*
- Frutaz 1962 A. P. Frutaz, *Le piante di Roma*, 3 vols. (Rome 1962)
- Hoffmann – Wulf 2004 A. Hoffmann, U. Wulf (ed.), *Die Kaiserpaläste auf dem Palatin in Rom. Das Zentrum der römischen Welt und seine Bauten* (Mainz 2004)
- Iacopi – Tedone 2005/2006 I. Iacopi, G. Tedone, "Bibliotheca e Porticus ad Apollinis," *RM* 112, 2005/2006, 351-378
- Iacopi – Tomei 1988 I. Iacopi, M. A. Tomei, "Indagini al complesso severiano sul Palatino," *ArchLaz* 9, 1988, 69-76
- Iacopi 1990 I. Iacopi, "Il versante orientale," *BA* 3, 1990, 83-89
- Lanciani 1881 R. Lanciani, *Le acque e gli acquedotti di Roma antica. [I comentarii di Frontino intorno le acque e gli acquedotti]* (1881, reprint Rome 1975)
- Lanciani 1985 R. Lanciani, *Rovine e scavi di Roma antica* (Rome 1985 translation by E. R. Almeida of: *The ruins & excavations of ancient Rome*, London 1897)
- Lanciani FUR R. Lanciani, *Forma Urbis Romae* (Milan 1893-1901)
- Lugli 1946 G. Lugli, *Roma antica. Il centro monumentale* (Rome 1946)
- Lusnia 2004 S. S. Lusnia, "Urban planning and sculptural display in Severan Rome. Reconstructing the Septizodium and its role in dynastic politics," *AJA* 108, 2004, 517-544
- Manderscheid 2004 H. Manderscheid, "Was nach den „ruchlosen Räubereien“ übrigblieb – zu Gestalt und Funktion der sogenannten Bagni di Livia in der Domus Transitoria," Hoffmann – Wulf 2004, 75-85
- Mar 2005 R. Mar, *El palatí. La formació dels palaus imperials a Roma* (Tarragona 2005)
- Mucci 1986 A. Mucci, Arcus Caelimontani Aquae Claudiae, *Il trionfo dell'acqua: Acque e acquedotti a Roma, iv sec. a. c. – xx sec.* Mostra organizzata in occasione del 16 congresso ed esposizione internazionale degli acquedotti, 1986-1987 (Rome 1986) 95-99
- Noreña 2006 C. F. Noreña, "Water Distribution and Augustan Rome's residential topography," L. Haselberger – J. Humphrey (ed.), *Imaging Ancient Rome. Documentation-Visualization-Imagination*. *JRA* Suppl. 61 (Portsmouth 2006) 91-105
- Pasquali 1986 S. Pasquali, "Acquedotto Claudio-Neroniano in Via di S. Gregorio," *BCom* 91, 2, 1986, 502-507
- Pensabene 2004 P. Pensabene, "Das Heiligtum der Kybele und die Untergeschossbauten im Südwesten des Palatin," Hoffmann – Wulf 2004, 18-31
- Rodgers 2004 R. H. Rodgers, *Frontinus de Aquaeductu urbis Romae*. Edited with introduction and commentary (Cambridge 2004)
- Schmölder-Veit 2009 A. Schmölder-Veit, "Brunnen in den Städten des westlichen Römischen Reiches." *Palilia* 19 (Wiesbaden 2009)
- Schmölder-Veit, in print A. Schmölder-Veit, "Die Wasserversorgung von Rom und römischen Städten: Innovation und Tradition in augusteischer Zeit," R. Eichmann, H. Fahlbusch, F. Klimscha, Ch. Schuler (Hrsg.), *Der Umgang mit Wasser in prähistorischen und antiken Gesellschaften, Sammelband des Cluster 2 des DAL*.
- Sojc 2009 N. Sojc, "Domus principum. Ursprung und Entwicklung der Kaiserpaläste auf dem Palatin in der Zeit von Augustus bis Hadrian," (in print for *Palilia*)

- Taylor 2000R. Taylor, *Public needs and private pleasures. Water distribution, the Tiber river and the urban development of ancient Rome* (Rome 2000)
- Tedeschi Grisanti 1992 G. Tedeschi Grisanti, "Primo contributo ad una livellazione urbana sistematica degli antichi acquedotti di Roma," G. Pisani Sartorio (ed.), *Il trionfo dell'acqua. Gli antichi acquedotti di Roma: problemi di conoscenza, conservazione e tutela*. Atti del convegno 1987 (Rome 1992) 59-72
- Tomei 1992 M. A. Tomei, "Nota sui giardini antichi del Palatino," *MEFRA* 104, 2, 1992, 917-951
- Tomei 1999 M. A. Tomei, *Scavi francesi sul Palatino. Le indagini di Pietro Rosa per Napoleone III (1861-1870)* (Rome 1999)
- Tomei 2000 M. A. Tomei, "Le case di Augusto sul Palatino," *RM* 107, 2000, 7-36
- Tucci 2006 P. L. Tucci, "Ideology and technology in Rome's water supply," *JRA* 19, 2006, 94-120
- Volpe 1996 R. Volpe (ed.), *Aqua Marcia. Lo scavo di un tratto urbano* (Florence 1996)

Abbreviations

Archaeologia: *Archaeologia or Miscellaneous Tracts Relating to Antiquity Published by the Society of Antiquaries of London*

BA: *Bollettino di archeologia*

NSc: *Notizie degli scavi di antichità*

MemPontAc: *Atti della Pontificia accademia romana di archeologia. Memorie*

AJA: *American Journal of Archaeology*

RM: *Mitteilungen des Deutschen Archäologischen Instituts, Römische Abteilung*

ArchLaz: *Archeologia laziale. Incontro di studio del comitato per l'archeologia laziale*

JRA Suppl.: *Journal of Roman Archaeology Supplement*

BCom: *Bollettino della Commissione archeologica comunale di Roma*

MEFRA: *Mélanges de l'Ecole française de Rome. Antiquité*

Footnotes

¹ Cecamore (2002) 145-54; Sojc (2009) 44-48.

² For *urbis clarissimus locus*, Cicero, *de Domo sua*, 132; Cicero, *de Off.*, 1: 138: "Cn. Octavius—the first of that family to be elected consul—distinguished himself by building upon the palatine an attractive and imposing house."

³ For cisterns in general, see Carettoni (1987) 773. Also, Manderscheid (2004) 83 notes that no groundwater has been verified for the Palatine hill.

⁴ For example the well-known ogive cisterns under the Area Palatina (Pensabene (2004) 19-20 fig. 28; Tomei (1999) 160 fig. 100), a cistern reveted with cappellaccio under the Vigna Barberini (M. Rossi, "Vigna Barberini: Settori A 1-7: Strutture arcaiche e vera di pozzo repubblicana," *BA* 23-24, 1993, 148-150) and cisterns near the via sacra (Carandini (1995) 50 pl. 48; Carandini – Papi (1999) figs. 14-16). For dating, see J. A. Becker, "The Villa del Grotte at Grottarossa and the prehistory of Roman villas," *JRA* 19, 1, 2006, 213-220 esp. 216; for residences, see Pensabene (2004) 19.

⁵ His comments along with other literary evidence for the bringing water to Palatine have been discussed in detail. For example, Evans (1994), Rodgers (2004), and Tucci (2006).

⁶ For the Augustan period in general, see Noreña (2006) 91-105; for luxury purposes, see Schmölder-Veit, in print.

⁷ For Augustus (whose individual *domus* were connected through galleries and *cryptoporticus*, see Tomei (2007) 7-36; for Nero, see Sojc (2009) 147-150.

⁸ Ashby (1935) 54. In his time the altitude could only be estimated. But the sources of the Aqua Appia lay not higher than 38 masl (Ashby (1935) 51)—still too low to serve Rome's hills. For the urban remains of the channel, see Deman (1934) 27-8, and Ashby (1935) 51-4.

⁹ A nymphaeum in one of these houses lay at 23-24 masl, (Carandini – Papi (1999) 119. 121 figs. 86-90 pl. LXVIII-LXXV).

¹⁰ For the Anio Vetus in general, see *LTUR* I (1993) 44-45 s. v. Anio Vetus (Z. Mari); for elevations, see Deman 1934, 31; and Ashby 1935, 84, who notes that "levels have so completely changed since 1861 that accurate calculation is now impossible."

¹¹ Schmölder-Veit (2009) 34-35. This is accepted for Rome as well, see Taylor (2000) 46-48 and Noreña (2006).

¹² See also *LTUR* (1999) 93-94 s. v. piscina publica (F. Coarelli). For an aqueduct erected for the irrigation of *horti* in the second century BC, see: N. Purcell, "The horti of Rome and the Landscape of Property," A. Leone et al. (ed.), *Res bene gestae. Ricerche di storia urbana su Roma antica in onore di Eva Margareta Steinby*, *LTUR* Suppl. IV (Rome 2007) 363.

- ¹³ Frontin. 94: 3.
- ¹⁴ Schmölder-Veit (2009) 116-120. For Rome we might also take this into consideration, although our knowledge of the wells and cisterns is limited, see Taylor (2000) 39-43.
- ¹⁵ *LTUR* I (1993) 67-69 s. v. Aqua Marcia (D. Cattalini). For dating and building period between 144 and 140 BC see Rodgers (2004) 166 and Frontinus (20: 5. 81: 1-2). Changing technical as well as social preconditions might be associated with the conquest of Greece and contacts with Pergamon; on this item see M. Lewis, "Vitruvius and Greek Aqueducts," *BSR* 67, 1999, 145-172.
- ¹⁶ Deman (1934) 67-139; Ashby (1935) 88-142. I rely on the levels published by Tedeschi Grisanti (1992) 64 fig. 3.
- ¹⁷ See also Evans (1983) 395.
- ¹⁸ Rodgers (2004) 200-01. For the Rivus in general see also Deman (1934) 139-141 and 402; Ashby (1935) 154-5; Evans (1983) 394; and Tucci (2006) 97.
- ¹⁹ For the measured levels of the conduit see Ashby (1935) 154.
- ²⁰ The floor elevations of some Late Republican houses about 100 BC in the area of the *Domus Augustana* are known: the highest ones lay at approximately 45.4 masl (measured by author in spring 2008) and lower ones at approximately 36-37 masl; approximately 2 meters below than the lower story of the Imperial palace at about 38.9 masl. For these *domus*, see also M. L. Morricone Martini, *Mosaici antichi in Italia. Regione prima. Roma. Regione X. Palatium* (Rome 1967) 10-13: no. 1 and 16: no. III.
- ²¹ Tucci (2006) 96-97.
- ²² CIL VI 1247: [...] PO III [...] AQUAM M[arciam ...]. Colini (1944) 85. 87; Evans (1983) 394; Lusnia (2004) 538 with n. 101.
- ²³ Deman (1934) 143.
- ²⁴ Frontin. 7: 5; Livy, *Epit. Oxyrh.* 188-190. Deman (1934) 139 considers it to be the first branch of the Marcia *intra urbem*. See also Ashby (1935) 152.
- ²⁵ For the sequence, see E. Tortorici, "La 'Terrazza domiziana', l'acqua Marcia e il taglio della sella tra Campidoglio e Quirinale," *BCom* 95, 2, 1993, 21; for different lines, see Deman (1934) 69; Evans (1994) 86 and more recently, P. L. Tucci, in L. Haselberger, and J. Humphrey (ed.), *Imaging Ancient Rome. Documentation. Visualization. Imagination. JRA Suppl.* 61 (Portsmouth 2006) 67-73 who tries to reconstruct the aqueduct crossing the Forum of Trajan.
- ²⁶ For discussion of a siphon, see Volpe (1996) 80 and Rodgers (2004) 166.
- ²⁷ Volpe (1996) 80. H. A. Grueber, *Coins of the Roman Republic in the British Museum* vol. I (Oxford 1970) 306 no. 2419 pl. xxxvii. 17.
- ²⁸ Evans (1983) 395.
- ²⁹ Deman (1934) 139 also suggested this to be the first line on the Caelian.
- ³⁰ P. Pensabene, "Scavi nell'area del tempio della Vittoria e del santuario della Magna Mater sul Palatino," *ArchLaz* 9, 1988, 59-60 figs. 5-7.
- ³¹ See the preserved fountains in Paestum: Schmölder-Veit (2009) 109-113.
- ³² See in general B. Tamm, *Auditorium and Palatium. A Study on Assembly-rooms in Roman Palaces during the 1st Century BC and the 1st Century AD*, (Stockholm 1963); I. Shatzman, "Senatorial Wealth and Roman Politics," *Latomus*, 142 (Brussels 1975), 288-439; T. Wiseman, "Conspicui postes tectaque digna deo. The Public Image of Aristocratic and Imperial Houses in the Late Republic and the Early Empire," C. Pietri (ed.), *L'Urbs. Espace urbain et histoire (Ier siècle av. J.-C. – IIIe siècle ap. J.-C.)*, *Actes du colloque international organisé par le Centre national de la recherche scientifique et l'École française de Rome (Rome, 8-12 May 1985)* (Rome 1987) 393-413.
- ³³ See in general R. Rilinger, "Domus und res publica," A. Winterling (ed.), *Zwischen „Haus“ und „Staat“*. *Antike Höfe im Vergleich, Beiheft HZ 23* (Munich 1997) 79-80.
- ³⁴ The most colorful example is the power struggle between Cicero and Clodius Pulcher. See R. Förtsch, *Archäologischer Kommentar zu den Villenbriefen des jüngeren Plinius* (Mainz 1993) 242-243; A. Carandini, *Schiavi in Italia. Gli strumenti pensanti dei Romani fra tarda Repubblica e medio Imperio* (Rome 1988) 365: "... e soprattutto dagli inizi del I secolo ingrandimenti di case dovute a un più accentuato differenziarsi delle ricchezze e del potere. Clodio rappresenta il caso estremo in questa direzione". "... and above all, since the beginning of the first century, the aggrandizement of houses accentuates wealth and power. Clodius is the extreme case."
- ³⁵ Cic. *ad Quint. Frat.* 3: 1, 3 f.; Cic. *Att.* 13: 6, 1.
- ³⁶ See Eck (1987) 86-87 with n. 255.
- ³⁷ Frontinus records for the first two Republican aqueducts the total amount of 2207 Quinaria *intra urbem* (Frontin. 79: 2; 80: 2). Frontin. 76: 1-3; Pliny, *Nat. Hist.* 31: 42.
- ³⁸ According to Tomei (1992) 917 in the second half of the second century BC the primitive horti were substituted with rich gardens as a consequence of the conquest of Greece.

- ³⁹ Evans (1982) 403-404.
- ⁴⁰ *LTUR* II (1995) 46 ff. s. v. *Domus: Augustus (Palatium)* (I. Iacopi); Sojc (2009) 57-8.
- ⁴¹ Evans (1982) 406. – For the discussion of the correct date see J.-M. Roddaz, *Marcus Agrippa* (Rome 1984) 148-149 with n. 59; G. de Kleijn, *The Water Supply of Ancient Rome. City Area, Water, and Population* (Amsterdam 2001) 20 with n. 49.
- ⁴² Evans (1983) 395 “The increased importance of the hill after Augustus had established his residence there no doubt dictated an augmented water supply.”
- ⁴³ In general, Evans (1982) 406-408 for Frontinus.
- ⁴⁴ Noreña (2006) 95-96.
- ⁴⁵ *LTUR* II (1995) s. v. *Domus: M. Antonius* (E. Papi) 34; Tomei (2000) 25.
- ⁴⁶ Eck (1987) 86.
- ⁴⁷ See Deman (1934) 157-164; Ashby (1935) 128-149.
- ⁴⁸ Ashby (1935) 155. This has been already suggested by Colini (1944) 88; Evans (1982) 406; Evans (1983) 395.
- ⁴⁹ Iacopi – Tedone (2005/2006) 368-69 tab. 6.
- ⁵⁰ F. Villedieu (ed.), *La vigna Barberini II: Domus, palais impérial et temples. Stratigraphie du secteur nord-est du Palatin* (Roma 2007) 75 fig. 74. 356.
- ⁵¹ CIL XV 7264. Because of this lead pipe the *domus* was identified as that of Iulia, wife of Augustus, see *LTUR* II (1995) s. v. *Domus: Livia* (I. Iacopi) 130-132; Tomei (1999) 422-423.
In general: Bruun (1991) 26 with n. 30; 33 with n. 61; Tomei (2000) 18. For the exact location see: Tomei (1999) 423 with n. 176.
- ⁵² U. Reina – V. Barbieri, Roma. “Nuove scoperte nella città e nel suburbio,” *NSc* 1904, 46 with map.
- ⁵³ This level might be confirmed by a fountain excavated in one of the Augustan *domus*, lying not much below the Flavian level, which is at approx. 48 masl. (Tomei (2000) 16).
- ⁵⁴ For the long basin, see Iacopi-Tedone (2005/6) 363-366; for the seashell fountain, see Tomei (1992) 921, and fig. 2. Another Augustan fountain is known under the Lararium and the Aula Regia, see Tomei (2000) 16 and M. Marella Vianello, “Di alcuni dati e problemi suggeriti da nuove indagini intorno alla Casa dei Grifi,” *Antichità II*, 1950, 26.
- ⁵⁵ For recent studies, see A. Tomei – R. Rea (ed.), *Nerone. Exhibition catalogue Rome* (Rome 2011), especially, M. A. Tomei, “Nerone sul Palatino,” 118-135; A. Carandini et al., “Gli altri odiosi di un re crudele,” fig. 6. 7 on p. 142; and C. Panella, “La *Domus Aurea*,” 160-169.
- ⁵⁶ Sojc (2009), 105 for the first residence of Augustus: Exaggerated dimensions and conspicuous consumption was avoided and the claim to leadership was communicated through abundant details in the decoration system (“Übertriebene Größendimensionen und auffälliger Prunk wurden vermieden und der Machtanspruch durch eine Fülle von Ausstattungsdetails vermittelt.“).
- ⁵⁷ For the cistern in general see G. Lugli, *La zona archeologica di Roma* (Rome 1924) fig. 49; Lugli (1946) 498; A. Bartoli, “Culti orientali sul Palatino,” *RenPontAc* 29, 1956/57, 17; Tomei (2000) 16. For dating, see Cecamore (2002) 222; Sojc (2009) 133.
- ⁵⁸ This is allocated by Sen. *Epist.* 86, 21 and *Iuv.* 3, 226 for example. See also Schmölder-Veit (2009) 28-29.
- ⁵⁹ E. van Deman, “The House of Caligula,” *AJA* 28, 1924, 388-391.
- ⁶⁰ In general, see Deman (1934) 187-330; Ashby (1935) 190-298; Baillie Reynolds – Bailey (1966) 82-84; *LTUR* I (1993) 42 ff. s. v. Anio Novus (Z. Mari); 63 ff. s. v. Aqua Claudia (Z. Mari – V. Jolivet); Aicher (1995) 42-44; Talyor (2000) 201-206. According to Tacitus (*ann.* 11: 13) the Aqua Claudia may have been in operation as early as AD 47, and some scholars have suggested that only the Anio Novus was completed five years later. “But given the structure of the Porta Maggiore, where provision is clearly made for a double channel, we should have complete faith in Frontinus’ account” (Coates-Stephens (2004) 35 with n. 39).
- ⁶¹ Evans (1983) 396; Evans (1994) 119-120. Frontinus (20: 3) calls them Arcus Neroniani, while a Severan inscription (CIL VI 1259) notes them as the Arcus Caelimontani.
- ⁶² Frontin. 20: 3-5: *partem tamen sui Claudia prius in arcus qui vocantur Neroniani ad Spem veterem transfert. hi directi per Caelium montem iuxta templum divi Claudii terminantur. modum quem acceperunt aut circa ipsum montem aut in Palatium Aventinumque et regionem Transtiberinam dimittunt.*
- ⁶³ See Colini (1944) fig. on p. XVI-XIX and Frutaz (1962) pl. 26. 28. 31. 32. 35. 36. 40. 44. 98. 203. 249. 671. 679.
- ⁶⁴ In general Colini (1944) 97-106; and also Deman (1934) 266-270; Ashby (1935) 244-251; Baillie Reynolds – Bailey (1966) 82-84 fig. 1; Mucci (1986) 95-99; and Pasquali (1986) 502-504.
- ⁶⁵ For the Specus above Porta Maggiore see, Tedeschi Grisanti (1992) 64 fig. 3. For the Specus near Arco di Dolabella, see Colini (1944) pl. 3.
- ⁶⁶ Baillie Reynolds – Bailey (1966) 81-103.

- ⁶⁷ Colini (1944) 93-104 with pl. II.
- ⁶⁸ For recent studies, see Tucci (2006) 94-120 and C. Bruun, "Aquaeductium e statio aquarum. La sede della cura aquarum di Roma," in: A. Leone et al. (ed.), *Res bene gestae. Ricerche di storia urbana su Roma antica in onore di Eva Margareta Steinby* LTUR Suppl. IV (Rome 2007) 1-14.
- ⁶⁹ For the route, see Tucci (2006) 94 fig. 1; for the destruction, see Lanciani *FUR* pl. 35 ("die 14. Nov. 1596 destructi"); for images, see A. Bartoli, *I monumenti antichi di Roma die disegni degli Uffizi di Firenze* VI (Rome 1922) 129. fig. 777 (Giovanni Antonio Dosio, about 1562), Iacopi (1990) fig. 9 (M. Cartaro); Frutaz (1962) pl. 249 (Stefano Du Pérac 1577).
- ⁷⁰ Lanciani *FUR* pl. 35 notes that another arch at the end of the still existing remains has been destroyed in 1712.
- ⁷¹ In general: Colini (1944) 105 with pl. III; Lanciani (1985) 169 fig. 69; Aicher (1995) 68. For the impossibility of a decision, see Deman (1934) 267 and Tucci (2006) 114. But several arguments can be mentioned in favor of an open channel on a four story arcade: the water could more easily branch off at the junction next to the Via Triumphalis, where no reservoir was found (see below, to this point see also Aicher (1995) 68); the many recorded repairs were only necessary for a higher monument (around 37 m.) and not for a small, only 15 m. high aqueduct; and lastly at this prominent site between the Palatine, Circus Maximus, Via Triumphalis and Colosseum a representative monument was surely chosen.
- ⁷² Ashby (1935) 250; Colini (1944) 105; Lugli (1946) 516; Blake (1959) 123; Baillie Reynolds – Bailey (1966) 84; Mucci (1986) 95; Iacopi – Tomei (1988) 75 f.; Bruun (1991) 151; Aicher (1995) 67-68; Manderscheid (2004) 83. For Flavian dating in general, see Pasquali (1986) 503 and A. Wilson, "Late antique water-mills on the Palatine," *BSR* 71, 2003, 104.
- ⁷³ Deman (1934) 266. 268. 417 no. 8.
- ⁷⁴ See D. Kek, *Der römische Aquädukt* (Münster 1996) 188 with n. 333 for an exception. Without citing van Deman also others favor a Neronian date: E. Rodriguez-Almeida, *Forma Urbis Marmorea. Aggiornamento generale 1980* (Rome 1981) 76; Iacopi (1990) 88; and Coates-Stephens (2004) 66.
- ⁷⁵ P. Grimal, *Frontin, les aqueducs de la ville de Rome* (1944) 75 n. 44; 55 n. 78. Evans (1983) 397; Bruun (1991) 151; *LTUR* I (1993) 100 s. v. Arcus Neroniani (Z. Mari); Evans (1994) 121; Rodgers (2004) 243; Mar (2005) 129.
- ⁷⁶ Lanciani (1985) 169.
- ⁷⁷ Lanciani (1881) 371-2; Colini (1944) 104 with n. 59. The pipe was found during work for the refectory of SS. Giovanni e Paolo (see also Lanciani, *FUR* pl. 29).
- ⁷⁸ G. Gatti, "Nuove scoperte nella città e nel suburbio," *NSc* 1894, 94; G. Gatti, "Degli oggetti scoperti negli scavi dello stadio palatino," *MonAnt* 5, 1895, 69.
- ⁷⁹ Baillie Reynolds – Bailey (1966) 90-91.
- ⁸⁰ The measurements are taken from Colini (1944) 94; Baillie Reynolds – Bailey (1966) 89-91.
- ⁸¹ In general, see Deman (1934) 268 (for the entire route to the Palatine). Baillie Reynolds – Bailey (1966) 88 suggest a "lower series of arches, now buried, to give some stability; but without excavation it is not possible to say definitely".
- ⁸² Colini (1944) 94-95; Baillie Reynolds – Bailey (1966) 89-91.
- ⁸³ Also published by Colini (1944) 105.
- ⁸⁴ The voussoir bricks curve in the first and second story. Also mentioned by Colini (1944) 105 and Blake (1959) 123.
- ⁸⁵ Baillie Reynolds – Bailey (1966) 89 have noted some repairs dating back to Neronian times, which confirms the instability of the slender piers shortly after their erection.
- ⁸⁶ This might also explain the different dating proposed by Ashby and van Deman (see above).
- ⁸⁷ For Vespasian's building activity see N. Sojc, "Festsaal und Nebenräume in der *Domus* Augustana auf dem Palatin. Ergebnisse der archäologischen Dokumentationsarbeiten 2004 und 2005," *RM* 112, 2005/2006, 339-350; and I. Iacopi – G. Tedone, "L'opera di Vespasiano sul Palatino," F. Coarelli (ed.), *Divus Vespasianus. Il Bimillenario dei Flavi, exposition Roma 2009* (Rome 2009) 240-245.
- ⁸⁸ Evans (1983) 397-8. *LTUR* I (1993) 100 f. s. v. Arcus Neroniani (Z. Mari) and Rodgers (2004) 202 follow his argumentation.
- ⁸⁹ Evans (1983) 397-8. In this point he follows J. Carcopino, *La basilique pythagoricienne de la porte majeure* (Paris 1926) 72.
- ⁹⁰ Coates-Stephens (2004) 63-68; similar Tucci (2006) 95-96.
- ⁹¹ A. Cassatella, *Antiquario Palatino*. "Fasi edilizie sotto l'ex convento della Visitazione," *BCom* 91, 1986, 535-539 fig. 254.
- ⁹² G. Carettoni, "Roma (Palatino) – Costruzioni sotto l'angolo sud-occidentale della Domus Flavia (triclinio e ninfeo occidentale)," *NSc* 1949, 61-64 figs. 14. 17. 18; and A. Carandini et al., "Gli altri odiosi di un re crudele," M. A. Tomei

- R. Rea (ed.), *Nerone. Exhibition catalogue Rome* (Rome 2011) fig. 3 on p. 139. For the Esquiline basin see L. Fabbrini, "Domus Aurea, il piano superiore," *MemPontAc* 14, 1982, 5-24 fig. III.
- ⁹³ Measurement taken by the Architekturreferat of the DAI. I gratefully thank Ulrike Wulf-Rheidt for sharing her latest investigations with me. Perhaps Lanciani (1985) fig. 69, refers to this specus—altitude of 53.28 masl—shown on his map.
- ⁹⁴ Colini (1944) pl. III.
- ⁹⁵ For a discussion whether the line was first an inverted siphon and later an open channel, see Tucci (2006) 114-120.
- ⁹⁶ Dosio: A. Bartoli, *I monumenti antichi di Roma dei disegni degli Uffizi di Firenze VI* (Rome 1922) 129 fig. 777. For reconstructions, see 1574 Stefano Du Pérac (Frutaz 1962, pl. 44); 1561 Pirro Ligorio (Frutaz 1962, pl. 671); and 1551 Leonardo Bufalini (Frutaz (1962) pl. 203). G. Blaeu drew the arches in 1663 (Iacopi (1990) fig. 10).
- ⁹⁷ Lanciani *FUR* pl. 35.
- ⁹⁸ First published by E. Rodriguez-Almeida, *BCom* 82, 1970-71, 129 fig. 13, later also E. Rodriguez-Almeida, *Forma Urbis Marmorea. Aggiornamento generale 1980* (Rome 1981) 76.
- ⁹⁹ Rodolfo Lanciani tried unsuccessfully to find traces of other tiers when the major Colosseum drain was built under the Via di S. Gregorio. No traces of the substructure were found in the ancient street (Lanciani (1881) 372). So we might assume a very high and wide bridge over the Via Triumphalis.
- ¹⁰⁰ For example: Lugli (1946) pl. 3; Hesberg (2004) fig. 89; and Mar (2005) fig. 72.
- ¹⁰¹ Ashby (1935) 250.
- ¹⁰² Pasquali (1986) fig. 212; Tomei (1999) fig. 21.
- ¹⁰³ Du Pérac: Frutaz 1962, pl. 249. Francis Towne, "The Claudian Aqueduct, near the Arch of Constantine, looking towards the Palatine," http://www.britishmuseum.org/research/search_the_collection_database/search_object_details.aspx?objectId=749061&partid=1&searchText=aqueduct+rome+towne&fromADBC=ad&toADBC=ad&numpages=10&orig=%2fresearch%2fsearch_the_collection_database.aspx¤tPage=1.
- ¹⁰⁴ Ashby (1935) 250-1, proposed that a branch began here supplying the *regio* I, as recorded by an inscription.
- ¹⁰⁵ S. Buranelli Le Pera – L. D'Elia, "Analisi archeologica delle superfici," *BCom* 91, 1986, 541; H. von Hesberg, "Eine Zierarchitektur im Palast Domitians," S. Lieb (ed.), *Form und Stil, Festschrift for Günther Binding* (Darmstadt 2001) 13.
- ¹⁰⁶ V. Massaccesi, "I restauri di Settimo Severo e Caracalla agli edifici Palatini," *BCom* 67, 1940, 133 fig. 7.
- ¹⁰⁷ The window opening in the upper part lies above the ceiling of the reservoir and has no connection with it.
- ¹⁰⁸ See in general G. Carettoni, "Terme di Settimo severo e Terme di Massenzio „in Palatio“," *ArchCl* 26, 1972, 96-104; and H. Leppin – H. Ziemssen, *Maxentius. Der letzte Kaiser in Rom* (Mainz 2007) 59-67.
- ¹⁰⁹ For the reservoir see Lugli (1946) 527; Lanciani (1985) 168; Mucci (1986) 95-99; Pasquali (1986) 505; *LTUR* I (1993) 100 s. v. Arcus Neroniani (Z. Mari). For the highest point, see Lugli (1946) 527; and C. Panella (ed.), *Meta Sudans I* (Rome 1996) fig. 152. To Ligorio see C. Häuber, *The Eastern Part of the Mons Oppius in Rome: the Sanctuaries of Isis et Serapis in Regio III, Minerva Medica and Fortuna Virgo, and the Horti of Maecenas* (forthcoming).
- ¹¹⁰ R. Lanciani, *Storia degli Scavi di Roma e notizie intorno le collezioni romane di antichità* vol. 2 (Rome 1902-1912) 45.
- ¹¹¹ "La maggior parte di questi monumenti fu creduto essere conserve d'acqua, una delle quali serve adesso di Refettorio ai Fratri; e vi fu trovato un pezzo di condotto di piombo; una chiave di metallo di peso libbre 90 sotto l'orto di questi Religiose". First cited in R. Venuti, *Accurato e succinta descrizione topografica delle antichità di roma* (Rome 1763) 28. That some kind of monument was connected directly to the reservoir is suggested by the discovery of a lead pipe and a metal key. A similar situation is preserved at Carthage: A. Wilson, "Water supply in ancient Carthage," J. T. Peña et al. (Hrsg.), *Carthage Papers. JRA Suppl.* 28 (Portsmouth 1998) 83-84; A. Wilson, "The Castra of Frontinus," A. Leone et al. (ed.), *Res bene gestae. Ricerche di storia urbana su Roma antica in onore di Eva Margareta Steinby* *LTUR Suppl.* IV (Rome 2007) 441.
- ¹¹² For Ligorio see for example C. Hülsen, "Untersuchungen zur Topographie des Palatins," *RM* 10, 1895, 276-283. For the reservoir chambers, see H. Deglane, "Le palais de Césars au mont Palatin," *Gazette archéologique* 13, 1888, 155. Today the chambers can only be seen from outside. The eastern wall is cut into the slope and has a height of around six meters.
- ¹¹³ A rainwater cistern (perhaps Roman) still exists under the convent. It might have been part of the water supply for the emperor's palace, although it is not high enough to deliver water to the main floor level.
- ¹¹⁴ Tucci (2006) 117.
- ¹¹⁵ The springing of the north arch is made of *sesquipedales* and *bipedales*, typical for the Neronian period (see above).
- ¹¹⁶ Bruun (1991) 152.
- ¹¹⁷ In general, see Tucci (2006) 111.
- ¹¹⁸ For Severan repairs on the Arcus Caelimontani see Colini (1944) 96-97; Baillie Reynolds – Bailey (1966) 92-96.

-
- ¹¹⁹ J.-L. Desnier, "*Omina et realia*, Naissance de *l'urbs sacra* sévérienne," (193-204 ap. J.-C.), *MEFRA* 105, 1993, 594-611; Lusnia (2004) 534-538.
- ¹²⁰ Colini (1944) 96-97. 102; Baillie Reynolds – Bailey (1966) 92-93.
- ¹²¹ Deman (1934) 257. 268-270. 417 with n. 8; Ashby (1935) 250; Colini (1944) 106; Blake (1959) 123.
- ¹²² Lusnia (2004) 534-538.
- ¹²³ For repairs under Diocletian or even later see Colini (1944) 97 and Baillie Reynolds – Bailey (1966) 97-97. But these examples are not similar to the late reinforcement on the Palatine.
- ¹²⁴ See Baillie Reynolds – Bailey (1966) 84: "though this inscription (CIL VI 3867) is not certainly attributable to this line."
- ¹²⁵ Baillie Reynolds – Bailey (1966) 84.