Salaria via usque ad lapidem XVIII

a reconstruction of the ancient road line between

Porta Collina and the 18th milestone of the road

University of Oulu
Faculty of Humanities
Master's thesis in Archaeology
Panu Hyppönen
Supervisor: Eero Jarva
April 2014
INTRODUCTION

Research problems and research history ................................................................. 1
Methods of study and the structure of this thesis .................................................... 3

1 BUILDING AND MEASURING ROMAN ROADS. THE HISTORY OF VIA SALARIA. .... 5

1.1 Historical and theoretical aspects of Roman road building ................................ 5
   1.1.1 Ex oriente via? ........................................................................................................ 5
   1.1.2 Planning Roman roads ......................................................................................... 6
   1.1.3 The canonical structure of a Roman road ............................................................ 7

1.2 Notions on the metrology related to road building ................................................ 9
   1.2.1 “Man is the measure of all things.” .................................................................... 9
   1.2.2 Regulations and reality: on the width of Roman roads ......................................... 11

1.3 Brief account of the origins and the development of the road line ......................... 17

2 THE ARCHAEOLOGICAL AND CARTOGRAPHICAL EVIDENCE ON THE ANCIENT ROAD
LINE OF VIA SALARIA ................................................................................................. 23

2.1 From Porta Collina past the Aniene ........................................................................ 23
   2.1.1 The first mile ........................................................................................................ 23
   2.1.2 The second mile .................................................................................................. 29
   2.1.3 The third mile ..................................................................................................... 31
   2.1.4 Via Salaria Vetus and Via Salaria Nova ............................................................... 35

2.2 From Aniene to Crustumerium ............................................................................... 37
2.2.1 The fourth and fifth mile ................................................................. 37
2.2.2 The sixth mile ............................................................................. 41
2.2.3 The seventh mile ....................................................................... 43
2.2.4 The eight mile .......................................................................... 45
2.2.5 The ninth mile .......................................................................... 47

2.3 From Crustumerium to the 18th milestone ........................................ 48
  2.3.1 The 10th mile ........................................................................... 48
  2.3.2 The 11th mile .......................................................................... 51
  2.3.3 The 12th mile .......................................................................... 56
  2.3.4 The 13th, 14th and 15th mile ..................................................... 59
  2.3.5 The 16th and 17th mile ............................................................. 62
  2.3.6 The 18th mile .......................................................................... 63

CONCLUSIONS ................................................................................................. 72

BIBLIOGRAPHY ............................................................................................ 77

APPENDIX 1: MAPS

APPENDIX 2: PROFILES

In the cover: The ancient road line of Via Salaria between Porta Collina and 18th milestone. The image is from Google Earth (https://maps.google.fi/?mid=1365625611), and it's oriented north-up.
INTRODUCTION

The subject of this thesis is to reconstruct the ancient road line of Via Salaria between Porta Collina, the starting point of the road, and its 18th milestone. Chronologically the aim is to focus to the road line as it was in the Imperial Period. Earlier phases can naturally not be left unnoticed. The reason for choosing just this particular section of the road line for the object of study lies both in the need to stay within the requirements set for a Master’s thesis\(^1\) and in the fact that the absolute location of both Porta Collina and the road’s 18th milestone are known since they both have been found in situ. In this way I will get a firm beginning and end for the reconstruction. The 18th mile is also the last complete mile of the road at the proximity of the Tiber as on the 19th mile the close tie between the road and the river ends. At the same time on the 19th mile the road enters definitively the ancient Sabine territory as it reaches the settlement of Eretum.\(^2\)

Research problems and research history

This being a thesis in Archaeology it is clear that the main evidence for the reconstruction of the road line is archaeological, namely the traces of the ancient road still visible in the field and the ones found during archaeological excavations. Other archaeological record is naturally not to be forgotten, but will be referred to only when necessary for locating the road line. Milestones - especially those found in situ make important points of reference in the work of reconstruction. After all, as much as this thesis is about the archaeological evidence of the ancient road, it is about measuring the road line, and in this procedure the milestones in situ give concrete\(^3\) points to rely on.

Via Salaria is among the oldest roads of the Roman Empire and due to this it also has had a remarkable share of archaeological research. There is plenty of archaeological evidence related to the road, for example the ancient Latial centres of Antemnae, Fidenae and Crustumerium were located by the route of Via Salaria. Also the road line itself has been studied several times. To my knowledge the first to treat the road line has been A. Nibby in his Viaggio antiquario ne’ contorni di Roma in 1819. Other early studies

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\(^1\) Originally the 31st milestone of the road was chosen as the terminus of this thesis, but the ancient soil turned out so fertile that the new terminus was set to the 18th milestone. The Augustan 31st milestone of Via Salaria had an important role in my Bachelor’s thesis on the assumed 10th milestone of the road and at the same it led me to choose the object of study for this Master’s thesis.

\(^2\) See for example Strab. 5, 3, 1 (note 106), where Eretum is referred to as a Sabine village.

\(^3\) Even though in this case perhaps the metaphor “limestone” would be more appropriate.
of the road line include F. Gori’s *Dal ponte Salario di Roma a Fidene, Crustumerio ed Erèto* and N. Persichetti’s comprehensive *La Via Salaria nei circondari di Roma e Rieti* as well as T. Ashby’s *The Classical Topography of the Roman Campagna*. The ancient road line has also been studied by E. Martinori (*Via Salaria*, published in 1931). The posthumously published *La campagna romana antica, medioevale e moderna* by G. & F. Tomassetti must also be mentioned together with the early studies. More recent studies include S. Quilici Gigli’s *La Via Salaria da Roma a Passo Corese*, L. Quilici’s *La Via Salaria da Roma all’Alto Velino: la tecnica struttiva dei manufatti stradali*, and M. Cifarelli’s & F. di Gennaro’s *La via Salaria dall’Aniene all’Allia*, which covers the ancient road line between km 6 and km 15. Nonetheless, the extensive focus on these settlements has turned the interest a bit away from Via Salaria itself, as Cifarelli & di Gennaro state in their afore mentioned article.

This is visible also in the journal *Bullettino della Commissione Archeologica Comunale di Roma*, where new findings of the road line are mainly to be sought: nearly every new volume contains information e.g. on the roads Via Flaminia and Via Nomentana, but Via Salaria gets a mention less frequently.

There being such a vast amount of available research one could question the sense of doing one more study on such a thoroughly studied subject. This brings us to the problems this thesis is trying to solve, of which the first and the most important is naturally:

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4 See Gori 1863.
5 See Persichetti 1908.
6 See Ashby 1906.
7 See Martinori 1931.
8 See Chiumenti & Bilancia 1977.
9 See Quilici Gigli 1977.
10 See Quilici 1993. Quilici’s excellent study even contains a map projection of the ancient road line although in a small scale.
What is the whole body of archaeological record related to the section of road line under study we have at the moment?
The main task of this study is to try to collect and list every piece of knowledge concerning the ancient road line with its milestones and other archaeological record (when necessary) related to the road context.

What is the alignment of the ancient road?
The archaeological record will be used to reconstruct the alignment of the ancient road - what other means are there to get a clearer picture of the alignment? How precisely can it be defined?

How wide is the road line of the ancient Via Salaria?
Romans seem to have had certain standards concerning the width of their roads. Does the width of Via Salaria conform to these standards?

How were Roman roads planned and measured?
For example, the ancient Via Salaria is 139 Roman miles long and its milestones are presumably located exactly on every mile. How was Roman road construction planned? What kind of measuring equipment was needed for this?

How steep is the reconstructed road line?
The ancient wheeled traffic couldn’t handle slopes too steep. What is our knowledge concerning the gradients of Roman roads in general? How steep are the known sections of Via Salaria? Does my reconstruction fit in the frames of the maximal possible steepness?

Methods of study and the structure of this thesis
The first task for me in the work of reconstruction is to relate the ancient Via Salaria to general knowledge on Roman road building and the metrological aspects related to it. This is done by getting familiar with publications on the history of the ancient road networks, the regulations ruling Roman roads, the practicalities the road builders had to face and the studies on Roman metrology. Chapter one will concentrate on providing
this information. The question of the history of construction of Via Salaria will also be dealt with in chapter one.

The most important part of this study is to search for the archaeological evidence related to the ancient road line. This is to be found in the literature, since my personal exposure to Via Salaria’s ancient road line consists only of a short section of pavement visible near the two remaining 31st milestones of the road. Another important instrument in the work are aerial photographs, especially the collection of satellite images found in Google Earth. Aerial photographs have been used in studying the ancient Via Salaria already in the 1970s by Quilici & Quilici Gigli and more recently by di Gennaro.\textsuperscript{14} The arsenal of satellite images available in Google Earth provides a much wider spectrum of images to be used even by the general public. At the same time this thesis is a methodological experiment on whether such an easily accessible software as Google Earth can be used for the purposes of academic study. The ancient road line is presented in chapter two with the help of maps and elevation profiles created in the platform offered by Google Earth. All the maps and profiles in this thesis have been created with the tools available in Google Earth. As regards the elevation profiles it must however be noticed that they are based on the modern ground figures, not in ancient ones. Their weight as evidence is thus not absolute.

When referring to scientific journals and publications I try to avoid abbreviations in order to make the references easier to find for the reader. However, this doesn’t apply to classical authors, with which I will use the standard abbreviations found in the indexes of \textit{Thesaurus Linguae Latinae} and Liddell & Scott’s Greek-English Lexicon (1940). Also the data concerning the \textit{floruit} of the classical authors cited is taken from these indexes without further references to them in the text below. The terms \textit{foot} and \textit{mile} in this thesis refer to Roman foot and mile, not to the foot and mile still in use in the Anglo-American world.\textsuperscript{15}

\textsuperscript{14} See Quilici & Quilici Gigli 1980 and di Gennaro 2013.
\textsuperscript{15} See chapter 1.2.1 for discussion on the metric equivalents of Roman foot and mile.
1 BUILDING AND MEASURING ROMAN ROADS. THE HISTORY OF VIA SALARIA.

1.1 Historical and theoretical aspects of Roman road building

1.1.1 Ex oriente via?

The paved road is not a Roman invention. Already in the Bronze Age Egypt and in the Minoan Crete there were paved roads that connected cities, sanctuaries and necropoleis. Even in Italy there were well-defined routes of travel long before the Roman rule. In Greece, the creation of the ancient Greek road network can be dated back to the 7th century BC at the latest. There is evidence that suggests that the road construction knowledge spread westwards from Persia with Ionia acting as the stepping stone. In Arcadia the *terminus post quem* for the road network can be set more precisely to the mid-7th century BC, when the Second Messenian War had ended.

The focus on improving the road network in Rome is not an isolated phenomenon, but connected with the larger interest in development of road infrastructure attested throughout Italy from Magna Graecia to Northern Etruria. It is often held, that the Romans started a systematical construction of their road network in the end of the 4th century BC, when the first sections of Via Appia were paved. It is obvious that the Roman colonization in Italy and the restructuration of the Roman road network through the peninsula in the 4th - 3rd centuries are interconnected. It is probable that the first phase of construction of the whole Via Salaria by the Romans dates also to this period (see chapter 1.3).

There were anyhow roads connecting the centers of the Latial culture already at the early phase of its development, for example the oldest parts of “Via Lavinatis” at Laurentino in Rome date back to the 8th century BC and the terracing of Via Salaria near the site of Antemnae in Villa Savoia in Rome is from the Archaic period. At Tor de’ Cenci, SE from Rome, a succession of roads beginning in the end of the 8th century BC has been witnessed. Also the Crustumerium road trench in northern Latium dates back to

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16 Forbes 1934: 50-55; Quilici 2008: 552.
17 Pikoulas 1999: 308.
18 Cifani 2008: 308.
19 See Coarelli 1988a, especially p. 35.
21 See Bedini 1990.
before mid-7th century B.C.\textsuperscript{22} In Rome itself the building of paved areas and roads had begun in the end of the 8th century BC at latest,\textsuperscript{23} but the first significant changes are seen in the end of the 7th century BC: already in the second half of the century there is a gravel road in the Valley of the Colosseum and from the end of the century there is evidence from the Forum Romanum of two paved roads suitable for at least light carriages. The carriageway is 2.45 m wide, added with 0.74 m of footpath.\textsuperscript{24} In addition, the regulations of the Law of the Twelve Tables\textsuperscript{25} prove that in the 5th century BC there was already a Roman legislation concerning the paving of roads.\textsuperscript{26}

1.1.2 Planning Roman roads

The canonical Roman road is straight as an arrow.\textsuperscript{27} The aim of Roman road-planning was to reach the final, long-distance destination as quickly as possible by keeping the route as short as possible with little concern put to any technical difficulties imposed by this approach. The roads served naturally also as conduits of Roman culture, surmounting not only natural but also cultural obstacles: non-Roman ways of life. Even important cities were bypassed by the road line and accessed only through branch roads.\textsuperscript{28} The first section of Via Appia from Rome for example is a straight line of almost 90 km.\textsuperscript{29} The Roman engineers’ search for the most simple and economic solution that was as close as possible to the ideal of straight line meant cutting the road line through rock, where necessary. If it was possible the rock was cut only from one side. In this case the roads were provided with retaining walls. Often, when the bedrock was soft, the solution was a road trench.\textsuperscript{30} The last option was to dig a tunnel for the road. The most famous of these is probably the crypto Neapolitana, a 750 meters long, 5 meters high and

\begin{itemize}
\item \textsuperscript{22}Tuppi \& al. 2014: 19.
\item \textsuperscript{23}Cifani 2008: 245.
\item \textsuperscript{24}Cifani 2008: 305-306.
\item \textsuperscript{25}The Law of the Twelve Tables was drawn up in 451-450 BC on tablets of bronze or wood and published in the Forum – the original tablets perished, when Gauls sacked Rome in 390 BC, and the surviving fragments are known only through quotations and references in ancient literature. (Berger \& Nicholas 1970: 1100.)
\item \textsuperscript{26}Cifani 1994: 192-194.
\item \textsuperscript{27}See for example the discussion in Ward Perkins 1957: 139-143.
\item \textsuperscript{28}The ideological meaning of bypassing cities, especially in the conquered areas, could also be discussed. If the road line seems to deliberately deviate from some cities/locations (\textit{id est} with no explanation offered by the physical reality), also this aspect has to be taken in consideration. For phenomenological approach to Roman road building, see for example Witcher 1998.
\item \textsuperscript{29}Quilici 2008: 553-555.
\item \textsuperscript{30}Adam 1984: 304-306.
\end{itemize}
4 meters wide gallery from the Augustan period, connecting Napoli and Pozzuoli through the Vomero hill. Waterways were naturally crossed with bridges and valleys were sometimes traversed with viaducts. Varro (in 37 BC) speaks also about trenches and banks of soil built along rivers and public roads to help with problems caused by flooding. He mentions in particular the ager Crustuminus along Via Salaria as a zone equipped with these kind of constructions to prevent the river from damaging the fields. Together with the creation of the road network grew also travellers’ needs which had to be tended: first by tabernae, which after the creation of the mail service, cursus publicus, by Augustus, were followed by official rest stops, mansiones, and mutationes to change horses. The environmental conditions led Roman engineers to choose the sunny side of mountains and hills for the alignment of the roads in order to reduce the problems caused by snowfall and to ensure a quicker thawing of the road. For reasons of drainage also damp or swampy soil was avoided and summits or slopes of hills preferred.

1.1.3 The canonical structure of a Roman road

The cross-section of a canonical via publica consists of four layers (fig.1). First the limits of the road line are set and the earth between them excavated until reaching a firm base. Then a statumen, a foundation made of rocks and at least 30 cm (~ one ft) thick, is laid. Next a rudus, a layer of rough gravel as thick as the statumen, is prepared. Over the rudus an equally thick layer of finer gravel is added and in this nucleus the pavement, pavimentum, made of gravel or polygonal blocks of basalt, tuff or limestone is seated. The pavement had a camber to make the rainwater flow to the curbs on either side. The curbs were made of upright slabs and the pavimentum was framed with sidewalks (crepidines) of packed gravel, which were from 1.1 to 3 meters wide depending on the anticipated traffic. To prevent wheeled vehicles from riding up on the sidewalks and to

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31 Adam 1984: 307-309
32 Varro rust. 1, 14, 2-3: Hoc genus saepes fieri secundum vias publicas solent et secundum amnes. Ad viam Salariaim in agro Crustumino videre licet locis aliquot coniunctos aggeres cum fossis, ne flumen agris noceat.
33 Suet. Aug. 49.
34 Adam 1984: 311.
36 Quilici 2008: 556; Radke 1973: 1439-1440. Their accounts are influenced by Vitruvius’s description of how to build a pavement as well as Statius’s poem on the building of Via Domitiana. (Stat. silv. 4, 3; Vitr. 7, 1.)
assist travelers in mounting their pack animals, upright blocks were built into the curb every 3 to 5 meters.37

![Figure 1: The cross-section of a via publica (figure from Radke 1973: 1439-1440).](image)

Notwithstanding the importance of the road network for the Romans, we don’t have any technical literature on the subject from antiquity and even among the other literary genres only one description of the building of a road, namely a poem of Statius, a contemporary of the emperor Domitian, has survived.38 In addition to the image Statius’s account gives of how the paving of a road eased the pains of traveling – no more vehicles stuck in the mud or draft animals moaning under heavy burdens39 – it offers a testimony of the stages of the actual Roman road building: first, ditches were made and the road line was cut clear. Then, the soil was dug deep.40 The trenches just formed were refilled with new material to prepare a firm base for the pavement in order to prevent the soil from slipping and to make sure that the base of the road was not unsound under the pressure of the upper stones.41 The layers were kept together by forcing curbstones to both sides of the structure and fortified with wedge-shaped stones anchored on frequent intervals (fig. 2).42 After an excursion to visions on how the terrain is cleared from obstacles before the road line43 Statius states that the structure was finished by covering it with baked dust44 and dark tuff.45

38 Radke 1973: 1439.
39 Also the travel time shortened considerably according to Statius: a trek, which before had taken the whole day could now be done in two hours. (Stat. silv. 4, 3, 27-37.)
41 Stat. silv. 4, 3, 43-46: mox haustas aliter replere fossas /et summo gremium parare dorso /ne nutent sola ne maligna sedes /det pressis dubium cubile saxis.
44 i. e. pozzolana.
45 Stat. silv. 52-53: illi saxa ligant opusque texunt/ cocto pulvere sordidoque tofo. ‘Dark tuff’, tofus sordidus, could also be interpreted as basalt, commonly witnessed as paving material on Roman roads.
However, not all roads are built as described above by Statius and Radke & Quilici – the scheme was varied according to local conditions and construction materials available and the type of construction was adapted to the type of anticipated traffic. Not all roads were paved; some were left only with the gravel surface.

1.2 Notions on the metrology related to road building

1.2.1 “Man is the measure of all things.”

The pre-Roman measuring system in Italy was based on the basic unit of Oscan/Osco-Italic foot. The length of an Oscan foot according to H. Nissen’s studies in Pompeii is 27.5 cm. It was in use in Pompeii until the Italic war after which the Roman foot became the standard. The exact measure of Oscan foot however is not standardized – for example L. Quilici proposes a value of 25.7 cm based on the width of Via Valeria in its original

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46 E.g. the roads in the western Tiber Valley tend to be paved with volcanic basalt, while those in the eastern side with other material, such as the limestone pavement found on Via Salaria. (Laurence 2004: 286; Quilici 1994: 91-95.)

47 Forbes 1965: 152.


49 Ὅ ἄνθρωπος τὸ μέτρον πάντων χρημάτων (Pl. Tht. 152).

50 Hultsch 1862: 671; Nissen 1877: 74, 86, 96. Nissen calls the Oscan foot “the national measure of Southern Italy”. (Nissen 1877, 92.) For examples of the use of multiples of the 27.5 cm Oscan foot in Rome, see Cifani 1994: 199. In Cifani 2008 an Oscan foot of 27.2 cm is employed with examples dating from the beginning of 6th century BC (the structures under the Equus Domitiani in the Forum Romanum) to 272 BC (tufa blocks in the aqueduct of Anio vetus). (Cifani 2008: 239-240.)
ascent of the hill of Arsoli.\textsuperscript{51} In this study the value of 27.5 cm is used, but the study by J. Tuppi shows that the value proposed by Quilici should not be left unnoticed.\textsuperscript{52}

The introduction of the Roman foot as the basic unit is also a subject that divides scholars. According to some, the introduction of the new foot first happened with the construction of the parts of the Servian wall by Syracusans in 378 BC. It is also held that the official abolition of the system based on the Osco-Italic foot and the introduction of the new Attic-Roman foot happened together with the monetary reform of 268 BC. The new unit became known as \textit{pes monetalis}, because the new standard measure was kept at the temple of Juno Moneta on the Capitoline, the location of the mint.\textsuperscript{53}

Many Roman foot measures have been preserved, their length varying between 29.06 and 29.73 cm. The miles of the roads are also said to be measured so accurately by the Romans that the milestones found \textit{in situ} can be used in defining the length of the Roman foot. The same applies to the other public constructions: knowing the approximate of a Roman foot facilitates the calculation of its exact value: since the foot was the basic unit, the dimensions of Roman public buildings are in multiples of one foot.\textsuperscript{54} For example the columns of Trajan and Marcus Aurelius both measure \textasciitilde{}100 ft in height without their bases.\textsuperscript{55}

The standardized Roman foot (\textit{pes monetalis}) used by Roman engineers is approximately 29.6 cm.\textsuperscript{56} The foot was subdivided into sixteen \textit{digiti} (1 \textit{digitus} = 1.85 cm) or twelve \textit{unciae} (1 \textit{uncia} \textasciitilde{} 2.47 cm). \textit{Uncia} on its behalf was subdivided e.g. into \textit{semuncia} and \textit{sicilicus}, 1/24 and 1/48 of a foot, respectively.\textsuperscript{57} For longer distances they

\begin{itemize}
  \item \textsuperscript{51} Quilici 2008: 562.
  \item \textsuperscript{52} Lugli 1957: 189-193; Tuppi 2010: 280-284. See chapter 1.2.2 for discussion on the subject.
  \item \textsuperscript{53} Liv. 6, 20. See the discussion on the subject in Lugli 1957: 191-192 and Säflund 1932: 232-233. Cifani (2008: 240) gathers some of the main examples of the use of the 29.6 cm foot, beginning already with the temple of Capitoline Jupiter from 509 BC. On the other hand Varro makes a reference to a Punic war as divider in the use of old and new measuring sytems. (Varro \textit{rust.} 1, 10, 2.)
  \item \textsuperscript{54} Hultsch 1882: 89-94.
  \item \textsuperscript{55} The column of Trajan measures 29.78 m and the column of Marcus Aurelius 29.60 m. (Coarelli 2001: 143, 358.) Also the distance between the towers of the Aurelian wall is 100 ft (29.57m). (Lanciani 1888: 10.)
  \item \textsuperscript{56} As with the case of Osco-Italic foot, metrologists have come to differing conclusions concerning the exact length of the Roman foot, but the currently accepted modern equivalent is 29.6 cm. (Holsch 2011: 206.) However, when longer distances are concerned, it is better to use the non-rounded value of 29.57 cm: the 0.03 cm difference might not seem a lot, but already on one mile it is multiplied 5000 times. (Lugli 1957: 189.)
  \item \textsuperscript{57} Wikander 2008: 767; Lugli 1957: 189-190. For the names of different multiples and submultiples of the foot see Lugli 1957: 190.
\end{itemize}
used passus as a basic unit, one passus being equal with the distance covered by one foot's complete movement at walking pace. Romans standardized one passus as five feet. One mile then was 1000 passus, which with a simple calculation gives the metrical value of 1478.5m for a Roman mile, if the 29.57 cm foot is used as the basic unit. These metrical values for foot and miles are the ones used in this thesis.

In order to measure long distances Romans used probably a hodometer, a device described by Roman engineer and architect Vitruvius around 25 BC. It could well be that the miles of Via Salaria were measured with an apparatus functioning as the one described by Vitruvius, because the first reliably datable milestones of the road are from 16 BC.

1.2.2 Regulations and reality: on the width of Roman roads

It is widely accepted that the Law of the Twelve Tables regulated the width of Roman roads to 16 feet in curves and 8 feet on straight paths. However, Festus states that this concerns only the viae privatae.

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58 Hultsch 1882: 79-81. Among Classical authors e.g. Vitruvius: *pedum milia quinque, id est passus mille* (Vitr. 10, 9, 4.) The common abbreviation *mp* in milestones stands for *milia passuum*, which at the same naturally also reveals the etymological and practical origins of the word *mile*.

59 Ancient Greek ὁδός = 'path, road, journey,...' (Liddell & Scott 1997, s.v. ὁδός).

60 Wikander 2008: 766-767. Although some scholars, such as Lewis (2001: 134-139) argue that the hodometer was perhaps not that widely used. Also a pertica/decempeda ('ten-feet') was used to make linear measurements, but its use on longer distances is not probable. (Stone 1928: 218.) To measure distances Romans used also a groma, an instrument, which made it possible to plot straight lines and 90-degree angles of established lines - a kind of an ancient total station, which allowed remarkable accuracy. (Wikander 2008, 767-768; Lewis 2001: 120, 124-33.) It is however unlikely that the groma was used to measure the exact mileage of a road, because it doesn't take into account the topography of the route accurately enough.

61 *CIL* 9: 5943, 5950. However, Vitruvius’s description is problematic, because a hodometer built with Vitruvian parameters is prone to provide a mile that is c. 26.5 ft too long. This could be related to a conception (see Capanna 2006) that on certain Roman roads (Via Salaria being one of them) the mile measures differ not only from the standard value (1478.5m) but also between each other. For detailed discussion see Hyppönen, forthcoming.

62 Varro *russt.* 7, 2, 15: *leges iubent in directo pedum VIII esse <viam>, in anfracto XVI, id est in flexu; Gaius dig. 8, 3, 8: *Viae latitudo ex lege XII tabularum in porrectum octo pedes habet, in anfractum, id est ubi flexum est, sedecim.* The surviving fragments of the law are known only through quotations and references in ancient literature. (Berger & Nicholas 1970: 1100.) The most commonly cited by scholars seem to be Varro (116-27 BC) and Gaius. (Gaius was a Roman jurist of the 2nd century AD. (Kübler 1910: 489.))

63 As noted already by Radke 1973: 1438.

64 Fest. 508, 20-25: *Viae sunt et publicae, per ..........e omnibus licet, et privatae, quibus neminem uti praetereorum quorum sunt. Et ita privatae VIII pedes in latitudine iure et lege, publicae quantum ratio utilitatis permittit. Lex iubet XVI <in anfracto fle> xuque pedes esse vias...
"There are public roads, by ........ is allowed to everyone, and private roads, that are to be used only by those, who own them. Thus private roads are to be eight feet wide by justice and law, the public roads as wide as is appropriate. The law rules the roads to be 16 feet in curves..."

Albeit somewhat later, Isidore (6th/7th century AD) gives the practical translation of Festus’s inexact quantum ratio utilitas permittit:

"A via is something on which a vehicle can go, and thus called because of the movement of vehicles on it. It consists of two cart tracks for the meeting of vehicles that go in opposite directions. All that is road is either public or private. Public is that, what is on public land...Private is that, what is given to the local authorities."

As well in the Late Antiquity, Procopius (6th century AD) tells the same thing, when speaking about Via Appia:

"The width of this road is such that two carriages going in opposite directions can pass each other."  

Also Pausanias (2nd century AD) tells the same thing about a road in the Isthmus of Corinth broadened by Hadrian:

"Hadrian the emperor restored it so that it was spacious enough for passing chariots going in opposite directions."

The evidence of the regulations on the width of Roman roads preserved by Classical authors underlines the aspect that the viae publicae were constructed as wide as was needed for two-way traffic. Regarding this the regulations of the Law of the Twelve Tables can be deduced to concern only the viae privatae, just as Festus remarks. This is also obvious: the state authorities responsible for the construction of viae publicae weren’t in need of guidance for the appropriate measures. Bearing in mind the fact that the roads were sometimes built on top of aggeres, the wish for appropriateness expressed in the citations above seems also highly logical – if the road wasn’t wide enough for two vehicles to pass each other the worst-case scenario would be the other or both of the vehicles swerving off the road in order to avoid collision. Accordingly, J.-P. Adam sees that the width of the pavement of the road varies according to the

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65 Isid. orig. 15, 16, 4-5: Via est qua potest ire vehiculum; et via dicta a vehiculorum incursu. Nam duos actus capit propter euntium et venientium vehiculorum occurrsum. Omnis autem via aut publica est aut privata. Publica est quae in solo publico est,...Privata est quae vicino municipio data est.

66 Procop. Goth. 1, 14, 7: εὖρος δέ ἐστι τῆς ὁδοῦ ταύτης ὅσον ἄμαξας δύο ἀλλήλαις ἐναντίας ἰέναι.

67 Paus. 1, 44, 6: Αδριανὸς δὲ ὁ Βασιλεὺς καὶ οὗτος ὡς καὶ ἄρματα ἑναντία ἔλαυνεσθαι κατέστησεν εὐροχωρή τε καὶ ἐπιστηδείαν εἶναι.
importance of the road and the nature of the surrounding terrain. It is not possible to individuate standards corresponding with official regulations. The examples of the widths of viae publicae gathered by J.-P. Adam show a variation of width between 2.8 and 7.5 meters.\textsuperscript{68}

On the other hand, the pre-Roman and archaic road cuttings studied by J.-P. Tuppi show that the widths of 2 and 4 meters stand out from the data conforming to the regulations of the Law of the Twelve Tables, if the Osco-Italic foot is used as the measure unit.\textsuperscript{69} However, this can’t be generalized to concern the viae publicae built by the Romans as is shown in this chapter. Some examples of the widths of roads from the Roman era gathered in Table 1 show that there is no exact generalizable numerical standard measure for the width of a via publica.

\textsuperscript{68} Adam 1984: 303.
\textsuperscript{69} Tuppi 2010: 279-280. See above chapter 1.2.1 for metrology. Also conforming to the results in Tuppi’s study is the pavement found in the valley of the Forum Romanum from the last decades of the 7th century BC. The road, probably identifiable as the Via Sacra, was originally wide 1.71 m with a footpath of 0.74 m. After rebuilding in the end of the 6th century BC the overall width of the road was narrowed to 2 m, but there was no footpath. As well in Rome, also the width of a road identifiable probably as the ancient Via Lavinatis and datable to the second half of the 6th century BC was 2m, widened later to 4m. (Quilici 2000: 73-75.)
The road widths gathered in Table 1 show no clear pattern conforming to some standard width. Neither the use of either Oscan or Roman foot seems to be consistent, since the majority of cases differ too much from a full multiple of either one of them. Nonetheless, it seems reasonable to presume that a full multiple of a foot was used, when constructing a road. In the examples above only the width of Via Salaria at Strambo del Paladino, although the measure is the total width of the road, i.e. with *crepidines*, seems to coincide with a full multiple of a Roman foot (21.98 – the error of 0.02 feet is only ~6 mm, comprehensible on the behalf of both a Roman engineer and a

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Table 1: Some examples of Roman road widths. Measures within 0.1 ft of a full multiple of foot in **bold**.

<table>
<thead>
<tr>
<th>Road</th>
<th>Location</th>
<th>Width in: meters</th>
<th>Roman feet</th>
<th>Oscan feet</th>
<th>Quilici70</th>
</tr>
</thead>
<tbody>
<tr>
<td>Via Flaminia</td>
<td>Ponte Sanguinario</td>
<td>4.571</td>
<td>15.22</td>
<td>16.36</td>
<td>17.51</td>
</tr>
<tr>
<td>Via Flaminia</td>
<td>Via Carlo Emery (Rome)</td>
<td>4.473</td>
<td>14.88</td>
<td><strong>16</strong></td>
<td>14.12</td>
</tr>
<tr>
<td>Via Ostiensis</td>
<td>km 13.5 of Via Ostiense</td>
<td>4.874</td>
<td>16.23</td>
<td>17.45</td>
<td>18.68</td>
</tr>
<tr>
<td>Via Praenestina</td>
<td>Ponte Amato</td>
<td>5.6575</td>
<td>19.11</td>
<td>20.55</td>
<td><strong>21.98</strong></td>
</tr>
<tr>
<td>Via Salaria</td>
<td>Ponte di Cecco</td>
<td>6.3276</td>
<td>21.37</td>
<td><strong>22.98</strong></td>
<td>24.6</td>
</tr>
<tr>
<td>Via Salaria</td>
<td>Ponte di Quintodecimo</td>
<td>3.877</td>
<td>12.85</td>
<td>13.82</td>
<td>14.79</td>
</tr>
<tr>
<td>Via Salaria</td>
<td>Strambo del Paladino</td>
<td>6.5764</td>
<td><strong>21.98</strong></td>
<td>23.64</td>
<td>25.29</td>
</tr>
<tr>
<td>Via Salaria</td>
<td>Valle Inferno</td>
<td>5.5763</td>
<td>18.6</td>
<td><strong>20</strong></td>
<td>21.4</td>
</tr>
<tr>
<td>Via Salaria</td>
<td>Posta</td>
<td>7.580</td>
<td>25.36</td>
<td>27.27</td>
<td>29.18</td>
</tr>
<tr>
<td>Via Salaria</td>
<td>Ponte Sambuco</td>
<td>5.1481</td>
<td>17.38</td>
<td>18.69</td>
<td><strong>20</strong></td>
</tr>
<tr>
<td>Via Salaria</td>
<td>Rieti</td>
<td>5.1582</td>
<td>17.42</td>
<td>18.73</td>
<td><strong>20.04</strong></td>
</tr>
<tr>
<td>Via Salaria</td>
<td>near Porta Collina</td>
<td>5.283</td>
<td>17.59</td>
<td><strong>18.91</strong></td>
<td>20.23</td>
</tr>
<tr>
<td>Via Salaria</td>
<td>near Porta Salaria</td>
<td>5.584</td>
<td>18.6</td>
<td><strong>20</strong></td>
<td>21.4</td>
</tr>
<tr>
<td>Via Tiburtina</td>
<td>Bivio di Guidonia</td>
<td>4.685</td>
<td>15.56</td>
<td>16.73</td>
<td><strong>17.9</strong></td>
</tr>
<tr>
<td>Via Tiburtina</td>
<td>Acque Albione</td>
<td>3.786</td>
<td>12.51</td>
<td>13.45</td>
<td>14.4</td>
</tr>
</tbody>
</table>

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70 The 25.7 cm Oscan foot, proposed by Quilici (see chapter 1.2.1 above and Quilici 2008: 562.).
71 Persichetti 1898: 216. With *crepidines* the measures are 5/16.9/18.18/19.46.
72 Ashby & Fell 1921: 169.
73 Giustini 2006: 363.
74 Ghislazoni 1913: 9.
76 Gazzola 1963: 66.
78 The measure includes the *crepidines*. Quilici 1994: 142.
79 The measure includes the *crepidines*. Quilici 1994: 142.
80 The measure includes the *crepidines*. Quilici 1994: 142.
81 Giummara 2010: 129-132. The total width of the bridge is 6.4m. However Quilici (1994: 118-120) tells that only 4.5 m of the width is left for the carriageway, the balustrades being 95 cm wide each. The measures offered by Persichetti (1909: 214) on the other hand are 6.2m for the bridge and 4.2m for the carriageway.
82 Quilici 1994: 121.
83 Lanciani 1893-1901: plate 3. With *crepidines* the measures are 7/23.67/25.45/27.24. It should be noted that this width, as well as the next one, is measured from a map of 1:1000.
84 Lanciani 1893-1901: plate 10. With *crepidines* the measures are 7.5/25.36/27.27/29.18.
modern archaeologist). If the Oscan foot is used as the basic unit, this is valid also for the width of Via Flaminia at Via Carlo Emery in Rome (exactly 16 ft), the width of Via Salaria at Valle Inferno (exactly 20 ft), Porta Salaria (20), and Ponte di Cecco (22.98). If the 25.7 cm foot proposed by Quilici is used, the bridge of Via Salaria in Rieti (20.04 ft) and Ponte Sambuco (20 ft), as well as Ponte Amato on Via Praenestina (22.98 ft) conform to a full multiple of the unit. On the other hand one could ask how far the error margin can be stretched – 0.1 feet for example equals only 2.57-2.96 cm depending on the feet used. With an error of 0.1 feet also the total width of Via Caecilia at Ponte Nascosto (16.9) would fall near a full multiple of a Roman foot and when it comes to Oscan feet, this would cause also the width of Via Praenestina at Ponte Amato to near a full multiple of foot (24.9 (with *crepidines*)/Quilici: 21.98), as well as the width of Via Salaria at Porta Collina (18.91) and the afore mentioned road’s total width at Strambo del Paladino (24.07).

All in all it seems that the only certain notion to be made from the examples in the table above is that there were no regulating Tables involved in the building of the Roman *viae publicae*. The five examples from Via Salaria – Valle Inferno, Porta Salaria, Ponte di Cecco, Strambo del Paladino and Porta Collina – suggest, that the Oscan foot was perhaps used as the measure, when building the road. Also the 25.7 cm foot proposed by Quilici gets strong support from the examples Ponte Sambuco and the bridge at Rieti. This also brings up the question of when the paving of Via Salaria was originally laid, if the official abolition of the Oscan foot happened together with the monetary reform of 268 BC as discussed above in chapter 1.2.1 The question will be dealt in more detail in the chapters 1.3 and 2.1-2.3, where the history and archaeological record of Via Salaria’s ancient road line is studied. At this point it is anyhow to be said that on behalf of the metrological evidence it seems that Via Salaria saw its first phases of construction long before the Imperial era.

87 It is strange that the widths above differ so largely from the full multiples of foot. The width of Via Salaria at Ponte Cecco is the only measure in the table that seems exact, i. e. not rounded. Could it be that the archaeologists responsible for the numbers have rounded them to closest 5 or 10 cm? The inaccuracy causes significant problems for study, since the measure of 4.1 m pronounced sometimes as a canonical width of *viae publicae* differs from the nearest full multiple of the 25.7 cm Oscan foot with only 1 cm (16 ft = 4.11 m), from the 27.5 cm Oscan foot with 2.5 cm (15 ft = 4.125 m) and also from the 29.57 cm pes *monetalis* only with 4 cm (14 ft = 4.14 m).

88 All of the measures anyhow exceed the 8-ft requirement expressed in the Law of the Twelve Tables.
The wheel ruts visible in the pavement of ancient roads can also be used to deduce the minimum width needed for a road – a logical continuum for example of the definition of a road expressed above by Isidore of Seville. The average gauge documented from Roman roads is 1.3-1.4 m. To this must be added the length of wheel hubs, which may vary between 14 and 65 cm. This gives 1.44-2.05 m as the minimum road width required by a vehicle. With Isidore’s as well as Procopius’s words in mind the road width needed is thus 2.88-4.1 m. Noteworthy in the latter width is, that it goes along with the consistent width of the basalt pavement on Via Appia. When converted to Roman feet this revolves around 14 feet, alternatively in Oscan feet around 15 feet or, as Tuppi notices, around 16 feet, if Quilici’s proposition is used. This brings again to mind the regulations expressed in the Law of the Twelve Tables, but it must be kept in mind that the width 4.1-4.2 meters is consistent – not varying between straight paths and curves. Once again the width can be explained by an intention to build a road wide enough for two vehicles to pass each other.

Regarding a standard width for the viae publicae, Quilici makes an interesting notice: the consistent width of Via Appia (4.1-4.2 m, i.e. ~14 Roman ft) seems to recur often also with other major roads constructed from 3rd century BC onwards. With roads of Archaic origin there seems to be likewise a width that recurs often: 3.8-3.9m, which again is ~14 ft, if we use Oscan foot as the unit. Does this point out to a standard of 14 ft instead of the 16 expressed in the Law of the Twelve Tables?

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89 See note 65.
90 Tuppi 2010: 273-277. The hubs of ancient vehicles could make a significant part of the total length of a vehicle’s axis. See for example Feruglio & Emiliozzi 2000: 211, where the outer parts of the hubs make approximately 2/5 of the axis’ total length.
91 If pedestrians falling from the crepidines aren’t a concern. If also the outer hubs need to be fitted within the carriageway, these measures go up to 3.16-5.4 m.
92 The width of Via Appia is consistently 4.1-4.2 m. (Quilici 2008: 555.)
93 2010: 288.
94 At the time of construction of the first sections of Via Appia the Oscan foot could still have been in use (See chapter 1.2.1. above and the discussion in Säflund 1932: 232-233.).
95 This on the other hand brings up the question, whether the intention of the regulations in the Law of the Twelve Tables was that on viae privatae two vehicles could pass each other only in curves.
1.3 Brief account of the origins and the development of the road line

The name Via Salaria refers to the road leading northeast from Rome through the Apennines to the Adriatic coast at Castrum Truentinum (modern municipality of Martinsicuro (TE)).

The name *Via Salaria* derives from the Latin word *sal*, ‘salt’. The explanation for the name, provided among others by Pliny the Elder (AD 23-79) is that the Sabines inhabiting the inland areas used the route to trade salt from the estuary of the Tiber. First there was only a track consisting of beaten paths reaching from inland to the salt fields at the estuary. The road line followed the left bank of the Tiber crossing the river at the Tiber Island. In fact the rise and expansion of Rome divided the road in two and only the northern half got the name Via Salaria.

The origins of Via Salaria as a salt trading route reveal also that it wasn’t “established” by Romans, but by the Sabines and other tribes that needed the connection.

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97 Seeck 1920: 1845.
98 SS4 = Strada Statale 4, the modern Via Salaria. On a small scale the route of modern Via Salaria serves to demonstrate the lineage of the ancient road, albeit not coinciding with it exactly.
99 *OLD*, s.v. *sal*.
100 Ceci & Costantini 2008: 391; Plin. *nat.* 31, 89: *sicut apparent ex nomine Salariae viæ, quoniam illa salam in Sabinos portari convenerat*. See also Fest. 437, 4-5. The term *convenire* refers here to an agreement (*OLD* s.v. *convenio* 7b).
101 Ceci & Costantini 2008: 391. Also the track from the Sabine area west to the Adriatic coast is of ancient origin.
102 Quilici Gigli 1977: 5. The southern half is covered by Via Ostiensis.
to the coast. Literary evidence supports a view that Roman occupation of the roads in the area is connected with the victories gained over the Sabines, first by Appius Claudius Caecus and then by Manius Curius Dentatus in 290 BC. A date worth of noting is also the foundation of the colony Castrum Novum in the Adriatic coast in 284 BC.¹⁰³

A proof of the pre-Roman origins of the road can also be seen in its adaptation to environmental circumstances. The road line of Via Salaria isn’t exactly the prime example of the canonical Roman road straight as an arrow. This is visible for example in the figure 4 below: it is easy to see, how the road line follows the course of the river in the Tiber valley avoiding the slopes staying anyhow as far from the river as possible. J.-P. Adams on the other hand sees the sinuosity of the track of Via Salaria as a remembrance of the progression of Roman occupation in Latium¹⁰⁴.

Figure 4. The ancient road line of Via Salaria between miles 5 and 12 in c. 390 BC according to J. Kromayer and G. Veith (figure from Kromayer & Veith 1922: plate 1).

¹⁰³ Aur. Vict. 34; Liv. *perioch.* 11; Vell. 1, 14, 7; Cornell 1995: 362; Philipp 1970: 1579. The ancient Via Salaria bifurcated in Interocrium (mod. Antrodoco (RI)), one branch leading to Castrum Novum and the other to Castrum Truentinum. It is uncertain, whether the branches were built contemporaneously. (Persichetti 1908: 277.) The question of the date of foundation of Castrum Novum has also been debated (see the discussion in Barbetta 2000: 55 (note 43)). Pliny speaks in *nat.* 3, 110 of Castrum Novum, but doesn’t mention Castrum Truentinum: he calls the latter only Truentum mentioning the tribe of Liburni as its settlers.

¹⁰⁴ Adam 1984: 299.
Some scholars hold that until the reign of Augustus Via Salaria ended in Reate (modern Rieti) from where Augustus prolonged the road to the Adriatic coast. The passage from Strabo (c. 63 BC - AD 21) is often offered for proof, in which it is told that Via Salaria starts from Porta Collina and runs through the area inhabited by the Sabines, but isn’t long. The 31st, 69th, 99th and 123rd milestone of the road, erected between 16 and 11 BC give archeological proof of the construction works ordered by Augustus. However it seems that the road line was extended also beyond Reate already before Augustus. For example the retaining wall of the road at Strambo del Paladino, demolished in 1899, but seen by Persichetti, is constructed in opus incertum, which was in use in the 2nd and 1st centuries BC.

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106 Strab. 5, 3, 1: ἔστρωται δὲ δι’ αὐτῶν ἢ τε Σαλαρία ὁδὸς οὐ πολλή ὁδὸς, εἰς ἣν καὶ ἡ Νωμεντανὴ συμπίπτει κατὰ Ὑρητόν, τῆς Σαβίνης κώμην ὑπὲρ τοῦ Τιβέρεως κειμένην, ἀπὸ τῆς αὐτῆς πύλης ἀρχομένη τῆς Κολλίνης.
107 CIL 9: 5943; Persichetti 1891: 41; CIL 9: 5950, 5954. There is also the probable 64th milestone of the road with an inscription (badly eroded) possibly referring to emperor Augustus. The milestone was last seen in the roadside 1974 (Donati 1974: 171-172). Another possible Augustan milestone of Via Salaria stands at the locality Colonnetta (RI) along Via Salaria Vecchia. The inscription is eroded, but by its form it resembles the other Augustan milestones of Via Salaria. Also in Mompeo (RI), c. 6 km to the west from the route of Via Salaria, there is an Augustan milestone with a mile marking 35, belonging probably to the milestones of Via Salaria (Sterpos 1971: 116). Strabo’s words “not long” (οὐ πολλῇ οὖσα) are thus a bit weird if connected with the length of the road line, because in the 123rd milestone (not to mention the 53rd one) we have a proof that the road was extended well beyond Reate, when those words were written.
108 In fact Persichetti reports several different construction techniques, which were still discernible in the beginning of the 20th century along the road line. In several locations he saw retaining walls in the Archaic opus poligonale, as well as in afore mentioned opus incertum. Opus pseudoisodomum and opus quadratum isodomum, the first a construction technique in use in the Republican period and the latter in the Augustan period also abound along the road line. Persichetti sees that a major part of Via Salaria’s route over the Apennines was constructed before the Roman domination. (Persichetti 1908: 277-281.) In Rieti there’s a milestone with a number LIII (53), walled in a bulding at Via Roma 97. It is possibly from Via Salaria, as the road passed through Rieti. The stone is from the first half of the 1st century BC. (Spadoni 2000: 95-97.) If it is from Via Salaria, this makes it thus the oldest surviving milestone of the road. Originally it would have stood a couple of miles west from Rieti, because for example Itinerarium Antonini Augusti has 48 miles as the distance between Rieti and Rome. This is also a proof for the existence of a Roman road beyond Rieti already before Augustan era.
The view is supported also by metrology: the width of the road line of Via Salaria beyond Rieti seems to coincide better with the full multiple of an Oscan foot than that of a Roman one. For example, the carriageway at bridges Ponte di Cecco and Ponte di Porta Cappuccina,\textsuperscript{109} both in Ascoli Piceno, measures 6.32m (22.98 Oscan ft) and 5.5m (20 Oscan ft) respectively. Also Ponte della Scutella in Ascoli Piceno conforms better to Oscan than Roman feet: its carriageway is 4.65m wide (16.91 Oscan vs. 15.73 Roman ft). This is valid also with Ponte del Gran Caso near Ascoli Piceno on Via Salaria, where the carriageway is 3.3m (= 12 Oscan ft) wide.\textsuperscript{110} Also worth mentioning are the measures 5.14m (Ponte Sambuco) and 5.15m (a bridge in Rieti), pointing to the use of the 25.7 cm foot (see table 1). In the light of these measures it seems likely that Via Salaria was extended beyond Reate already long before Augustus, as the abolition of the system based on the Osco-Italic foot happened in the 3\textsuperscript{rd} century BC.\textsuperscript{111}

\textsuperscript{109} Ponte di Porta Cappuccina is actually a bridge of a side road of Via Salaria in Ascoli Piceno.
\textsuperscript{110} Gazzola 1963: 65-68.
\textsuperscript{111} Lugli 1957: 191-192; Säflund 1932: 232-233. See also chapter 1.2.1.
The surviving milestones with the mileage 18, 31, 42, 66, 67, and 108 then, are proof of maintenance works of the road ordered by different emperors after Augustus. The 18th milestone is from AD 97, with emperor Nerva’s name inscribed in it (see chapter 2.3.6 for more detailed examination). Chronologically the next one is the 66th milestone from the reign of emperor Trajan. The next milestone, 67th, goes up in chronology as much as to the beginning of the 4th century, bearing the name of the emperor Maxentius. This is followed by the 108th milestone, erected by emperor Magnentius, the 31st milestone, erected by emperor Julian and the 42nd and 108th milestones erected by emperors Valentinian, Valens and Gratian, all of which date already to the second half of the 4th century.¹¹²

Problematic is the milestone bearing the mile marking CXIX (119). It was found as incorporated to a burial in Sant’Oméro (TE).¹¹³ The site isn’t located in the vicinity of the assumed road line of the ancient Via Salaria,¹¹⁴ but polygonal blocks of volcanic basalt, used in the paving of Roman roads were found nearby.¹¹⁵ In addition to the mile marking the inscription in the stone bears the name of its erector, Lucius Caecilius Metellus (Diadematus), who was a consul in 117 BC. The date is significant, when related to the road construction projects of Gaius Gracchus in the second half of the 2nd century BC.¹¹⁶

It is possible that the stone is a milestone of Via Caecilia, a road that is known only from an inscription found at the proximity of the location of Porta Collina. The inscription records the maintenance works realized on the road,¹¹⁷ which naturally prove that before the date there already had been a road line that then had to be repaired. Following this reasoning it seems improbable that L. Caecilius Metellus Diadematus would have been the constructor of the road. As T. Wiseman notes, it is reasonable to assume that the road was constructed shortly after the final subjection of the Sabines in the beginning of the 3rd century BC.¹¹⁸ In 284 BC, the probable year of foundation of Castrum Novum, the name of the consul in Rome was Lucius Caecilius

¹¹² Radke 1973: 1654-1657; CIL 9, pp. 582-584.
¹¹⁴ Ashby 1912: 227.
¹¹⁵ Fiorelli 1878: 127.
¹¹⁶ CIL 9: 5953; Hülsen 1897: 1173-1174; Plut. C. Gracchus 7.
¹¹⁷ CIL 12: 2202; Hülsen 1897: 1173-1174.
Metellus Denter, which makes one assume that Via Caecilia got its name from Denter, not from Diadematus.\footnote{Barbetta 2000: 55-56. However, the milestone of Sant’Oméro can’t be from such an early date. A comparison with early milestones, such as \textit{CIL} 6: 31585 from Via Ostiensis (mid-3\textsuperscript{rd} century BC) reveals that the language and the script in it are from a more recent date.}

In addition to the 119\textsuperscript{th} milestone there are three other possible milestones of Via Caecilia (104\textsuperscript{th}, 125\textsuperscript{th} and 133\textsuperscript{rd})\footnote{104\textsuperscript{th} = \textit{CIL} 9: 5957, 133\textsuperscript{rd} = \textit{CIL} 9: 5958. The 125\textsuperscript{th} stone is lost, but treated by F. Bernabei in F. Bernabei 1888: ‘Di alcune iscrizioni del territorio di Hadria nel Piceno.’ \textit{Mitteilungen des Deutschen Archäologischen Instituts Römische Abteilung} 3, Rome 1888, 3-13.}, which M. Guidobaldi has used to reconstruct its road line.\footnote{Guidobaldi 2000: 278.} The questions concerning Via Caecilia are much debated and cannot be treated with more detail in this thesis. It is anyhow necessary to point out that such a road, beginning from the same gate as Via Salaria and constructed possibly already in the beginning of the 3\textsuperscript{rd} century BC, existed.\footnote{For discussion on the subject see Persichetti 1898, Barbetta 2000 and Guidobaldi 2000.}
2 THE ARCHAEOLOGICAL AND CARTOGRAPHICAL EVIDENCE ON THE ANCIENT ROAD LINE OF VIA SALARIA

2.1 From Porta Collina past the Aniene

2.1.1 The first mile

The mileage of the roads beginning from Rome was calculated using the relevant gates of the “Servian” wall as the zero point. For Via Salaria this gate was Porta Collina. The “golden milestone”, milliārum aureorum, erected by Augustus in 20 BC to the Forum Romanum, was the starting point of viae publicae only in theoretic and propagandistic sense.

The so-called Servian wall existed already before the first Gallic invasion of Rome. A cappellaccio wall with a perimeter of c. 11 km was constructed between the second half of the 6th century and the 4th century BC. Strabo mentions that just as Via Salaria, also Via Nomentana began from the same gate of the wall, Porta Collina. The remains of the gate have been found in situ at the intersection of the modern Via Venti Settembre and Via Goito (see fig. 6 and maps 1 & 18). The gate belongs to the archaic phase of the wall and from Livy’s testimony it can be deduced that the gate existed already at the end of 6th century BC.

In figures 6 and 7 it is visible that Via Salaria doesn’t seem to depart from Porta Collina itself, but rather from Via Nomentana, which in its turn departs from the gate in question. One could assume that at the time of the construction of the wall the road line of Via Salaria passed somewhere else (i.e. because there isn’t a separate gate for the road

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123 Strabo (5, 3, 7) credits the building of an agger and a fortified wall to Servius Tullius, i.e. to the middle of the 6th century BC.
124 Viedebantt 1924: 499; Radke 1973: 1454; Strab. 5, 3, 1.
125 Platner & Ashby 1929: 342; Dig. 50, 16, 154: mille passus non a miliario urbis sed a continentibus aedificis numerandi sunt. (“Mileage is not to be calculated from the milestone of Rome, but from the surrounding walls.”) In addition to the meaning ‘a building’, the word aedificium has a meaning ‘wall’. (ThLL I: IV, s.v. aedificium, p. 920, line 25.) It must be noted that the expression continentia aedificia may also include in its meaning the suburbs outside the walls. (OLD s.v. continens 3b.)

126 See the discussion in Cifani 1998, particularly 377-381.
127 Strab. 5, 3, 1: Ἐστρωται δὲ δι’ αὐτῶν ἢ τε Σαλαρία ὄδὸς οὐ πολλῆ ὀδύσα, εἰς ἣν καὶ ἡ Νομεντανή συμπίπτει κατὰ Τηρητόν, τῆς Σαβίνης κόμην ὑπὲρ τοῦ Τιβέρεως κειμένην, ἀπὸ τῆς αὐτῆς πόλης ἄρχουμένη τῆς Κολλίνης.
128 Cifani 1998: 370. The gate itself and the parts of the wall between the gate and Largo di Santa Susanna, c. 475 m southwest from the gate, belong to the earliest phases of the wall (6th-5th centuries BC). (Cifani 2012: 83.)
129 Liv. 2, 11, 7-10. See also Strab. 5, 3, 7.
in the wall). At the same time it can be deduced that at the time of Strabo, i.e. the Augustan period, this had already changed. This could be connected with the terms *Via Salaria Vetus* (~old Via Salaria) and *Via Salaria Nova* (~new Via Salaria) often used in research. The question will be treated in chapter 2.1.4.

Figure 6. The location of Porta Collina (figure from Barbera & Magnani Cianetti 2008: plate 3).

Figure 7. Porta Collina and the moat surrounding the wall with Via Nomentana and Salaria crossing it by a wooden bridge (figure from Cifani 2012: plate 4).
Starting our journey, the first traces of the pavement of the ancient Via Salaria have been witnessed c. 60m north from the location of the gate, on Via XX Settembre, where basalt slabs were found in 1877 (see map 1). Circa 150 m from the gate, in front of the modern street numbers 10 and 12 of Via Piave, more remnants of pavement in basalt were found in June 1882 (see map 1). Again, 60 m further at 20m from the intersection of Via Piave with Via Belisario, a short stretch of basalt pavement was found at 0.6 m below the street level in 1915. However, G. Mancini points out that it is not certain whether the pavement is from Roman or Medieval context. On the other hand, the stretch aligns with other findings on Via Piave and as will be seen, the depth 0.6m below the modern level is not rare for the traces of the ancient Via Salaria. Circa 100 m north from here, still on modern Via Piave, an 8-meter long stretch of pavement in basalt was found in 1911 one meter below the street level (see map 1).

It is evident that the road line of Via Piave follows the one used by the ancient Via Salaria. *Forma Urbis Romae*, compiled by R. Lanciani at the end of the 19th century, shows that the traces of the ancient pavement continue in a consistent line between Porta Collina and Porta Salaria. According to his map the width of the road varies from c. 5.2 m (with crepidines c. 7m) to c. 5.5 m (with crepidines c. 7.5m). It is anyhow not certain on which findings the different sections of the road sketched in Lanciani’s map are based.

All the remnants of the road seen so far lead to the location of Porta Salaria, the gate through which the ancient Via Salaria passed the Aurelian wall (see map 1). The gate was from the time of emperor Aurelian (reigned AD 270-275), restored by emperor Honorius (reigned AD 395-423) and damaged in the bombardments of the 20th of September 1870 preceding the unification of Italy. After the demolition the remains of the gate were removed. The gate had two semi-circular towers that had been built upon graves. Among them was the famous epitaph of the young poet Q. Sulpicius from the end

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131 Selce in Italian.
132 *Carta archeologica di Roma* 3: 106; Fiorelli 1877: 268. When referring directly to the pages of *Carta archeologica*, the knowledge is of secondhand. The reason for this procedure is that to access the firsthand knowledge a visit to Rome, e.g. to the *Archivio Centrale dello Stato*, would be required which, for the purposes of a Master’s thesis, doesn’t seem reasonable.
133 *Carta archeologica di Roma* 3: 88; Fiorelli 1882: 301.
134 *Carta archeologica di Roma* 3: 73; Mancini 1915: 64.
135 *Carta archeologica di Roma* 3: 60.
of the 1st century AD.\textsuperscript{137} The opening of the gate was 4.2m wide,\textsuperscript{138} in accordance thus with the consistent width of Via Appia, proposed sometimes also as the canonical width of \emph{viae publicae}.\textsuperscript{139}

Leaving the intramural Rome, the first remnants of the ancient road line were encountered in Piazza Fiume at the proximity of the western tower of Porta Salaria, where in 1964 a section of a gravel road (dating back to the earliest phases of road paving, 6th – 4th centuries BC) and a tufa block of its \emph{crepido} was found at c. 1.25 m below the modern level (see map 1).\textsuperscript{140} As well in Piazza Fiume, several stretches of the retaining wall of the ancient road were found at 0.65-1.16 m below the modern level. In the same context some blocks of the ancient road pavement were found, though not \emph{in situ}. Part of the retaining wall is conserved now in the tunnel below the piazza. Also a sewer (1.8mx0.7m, the top at 1 m below street level) that ran under the ancient road has

\begin{itemize}
  \item \textsuperscript{137} Ashby 1927: 59; CIL 6: 33976; \textit{Carta archeologica di Roma} 3: 26-27.
  \item \textsuperscript{138} \textit{Carta archeologica di Roma} 3: 26.
  \item \textsuperscript{139} See Quilici 1992: 89-92; Quilici 2008: 555. The measure translates as 14.2 feet, differing from the nearest full multiple (14) of the 29.57 cm foot with 6 cm. See also chapter 1.2.2 for a discussion on Roman road widths.
  \item \textsuperscript{140} \textit{Carta archeologica di Roma} 3: 28.
\end{itemize}
been found in the piazza. At the intersection of Via Salaria and Via Viterbo, c. 60 m from Porta Salaria, more remnants of the tufaceous retaining wall of Via Salaria in opus quadratum were found at c. 1 m below street level (see map 1).

After Porta Salaria the road passed in a straight line the hill of Villa Albani. On this section the ancient pavement has been seen in two locations. The first one is at 220 m from the gate under the modern Via Salaria, at the intersection with Via Isonzo. The basalt pavement of the ancient road line was uncovered for a length of 45 m at 0.45 m (on average) depth under the modern street level. The pavement dates back to 3rd/2nd centuries BC – 1st century AD (see map 1). 25 m further, also under the modern Via Salaria and parallel to it, in front of Via di Villa Albani, basalt pavement from 3rd/2nd centuries BC – 1st century AD was seen for the length of 20 m during the construction of a tram line in 1925. It was 0.5 m below the modern street level and the width of the pavement was 2.5 m (the width is only a part of the total width of the ancient pavement, because the excavation was performed only for the part left under the tram line). The pavement was in good condition and wheel ruts were visible in it (see map 1). These findings show that on this section the modern Via Salaria uses the road line of its ancient precursor.

Circa 160 m further on the same line there is the mausoleum of the military tribune Lucilius Paetus (as can be read in the inscription facing Via Salaria) from the end of the 1st century BC (see map1). The diameter of the mausoleum is 34.91 m and its foundations lie 6.6 m under the modern street level and c. 30 m from the line of modern Via Salaria. A wall made of tufa blocks is visible at 15 m from the mausoleum towards the road. Its function was possibly to fence the grave area from the road. In the 2nd century AD the mausoleum was partly buried and several graves were built upon it (one columbary, for example, had its foundation c. 2 m above the level of the mausoleum).

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141 Carta archeologica di Roma 3: 24-25.
142 Carta archeologica di Roma 3: 20.
143 Quilici & Quilici Gigli 1978: 141.
144 Cupitò 2007: 42; Gatti 1894: 169.
146 = c. 118 ft, which makes one assume an error in measuring or a foot of 29.09 cm, which would give 120 ft for the diameter.
147 ~100 ft.
After the mausoleum, a catacomb, a quarry of pozzolana and other archeological material from the 1st - 6th centuries at the intersection of Via Simeto and Via Salaria prove for the route of the road line (see map 2).\textsuperscript{149} Between the mausoleum of Lucilius Paetus and the catacomb there aren’t anyhow any recorded fixed archaeological findings.\textsuperscript{150} The line of the modern Via Salaria makes a 30° angle at c. 210 m from the mausoleum (see map 2). If a straight line was drawn from the mausoleum to the catacomb, the road line would measure c. 10 m less. Other studies on the subject make the line of the ancient Via Salaria coincide with that of the modern road,\textsuperscript{151} which seems a reasonable presumption based on the consistency of the modern and the ancient road line already seen.

Going further on the line of modern Via Salaria, a 6 m-long section of basalt pavement was found in 1910, located by C. Cupitò to the intersection of Via L. Boccherini and Via Salaria (see map 2). A. Pasqui, who appears to be the only source of information contemporary to the finding, doesn’t anyhow give this specification.\textsuperscript{152} There’s some uncertainty with the exact alignment of the road at the location, because in 1912 Pasqui notes that a tomb with a hexagonal form was found in the area, at 55 m from the modern and c. 10 m from the ancient Via Salaria\textsuperscript{153} - meaning that the modern road line would not use the same line as the old one, which is by all means possible. However, a sketch made by G. Gatti during the excavations doesn’t contain any notice of such a deviation.\textsuperscript{154} There is thus something wrong with the facts and the most logical solution seems to be that Pasqui has made an error when marking the distance of the tomb from the ancient road line. In addition, c. 65 m further, at the intersection of Viale Liegi and Via Salaria, a short section of a gravel-paved road was found in 1920. It had the characteristics of a typical \textit{via glareata}, dating thus to the earliest phases of road paving in Rome.\textsuperscript{155} The gravel pavement coincides exactly with the line used by modern Via Salaria, which again makes Pasqui’s observation controversial (see map 2).

\begin{footnotesize}
\begin{itemize}
\item[150] See Cupitò 2007; Fusco 2009.
\item[151] e.g. Cupitò 2007.
\item[152] Pasqui 1910b: 167; Cupitò 2007: 41-42.
\item[153] Pasqui 1912: 199-202. In fact a large number of graves dating to 3rd century BC - 4th century AD have been found in the area. (Cupitò 2007: 41-45.) See map 2.
\item[154] See the figure in Cupitò 2007: 44.
\item[155] 6th - 4th centuries BC. (Cupitò 2007: 41-42.)
\end{itemize}
\end{footnotesize}
At the opposite intersection of Viale Liegi and Via Salaria, at 1.35 m below street level, a section of basalt paving was found in 1920 (see map 2).\textsuperscript{156} Yet the paving hasn’t been interpreted as belonging to the ancient Via Salaria. This could be due to the fact that it deviates a bit from the line of the modern road, which coincides with the ancient line, as seen, only 30 m earlier. It could be that the paving belongs to the ancient precursor of Viale Liegi,\textsuperscript{157} which intersects with Via Salaria at 90° angle at the proximity of the location, where the first milestone of Via Salaria once stood (see map 2). An alternative solution would be to align the road taking Pasqui’s notice as valid and treating the basalt paving as belonging to Via Salaria and the gravel paving as belonging to Viale Liegi’s precursor. The result would be a road line that is 38 m longer, i.e. the first milestone would fall 38 meters earlier, quite exactly to the middle of modern Viale Liegi (see map 3). Also nearby, five columns (diameter 4.8m) that were set at 5.1m apart from each other\textsuperscript{158} were found at 1.75m below street level in 1912 at the intersection of Viale Regina Margherita and Via Salaria\textsuperscript{159}.

2.1.2 The second mile

A 42.5 m long wall (1\textsuperscript{st} century BC - 1\textsuperscript{st} century AD) made of three layers of tufa blocks (of size 1.32x0.6x0.55m) was found in 1920 on the left side of the road, immediately after the estimated position of the first milestone. The wall was parallel to Via Salaria and it was first interpreted as the left crepido of the road, but its dimensions changed the hypothese: it is thought to be a wall that fenced the burial area on the left side of Via Salaria.\textsuperscript{160} Circa 310 m further from the first milestone and c. 45 m\textsuperscript{161} to the left from the road line there are the columbarium and catacomb referred to as the catacomb of Villa Amici (1\textsuperscript{st} - 4\textsuperscript{th} centuries AD) (see map 4).\textsuperscript{162} Advancing further away from Rome, circa 170 m from this at the intersection of the road with Via Chiana, two graves, possibly from the Imperial period, were found at 2.20 below modern level (see map 4).\textsuperscript{163} The

\textsuperscript{156} Cupitò 2007: 45-46.
\textsuperscript{157} As seen for example in Dinuzzi & Cupitò 2009: plate 3.
\textsuperscript{158} In total this makes 44.4 m, c. 150 ft.
\textsuperscript{159} Though the function of the columns is not known. (Fusco 2009: 136.) See map 2.
\textsuperscript{160} Cupitò 2007: 45-46. See map 4. The graves marked in the map at the proximity of the wall date to 1\textsuperscript{st} - 3\textsuperscript{rd} centuries AD (Cupitò 2007: 45-46).
\textsuperscript{161} ~150 ft.
\textsuperscript{162} Cupitò 2007: 47-49.
\textsuperscript{163} Fusco 2009: 145.
Coemeterium Iordanorum (c. AD 250 - 6th century) and the cemetery of Trasone (second half of the 3rd century) are located on the eastern side of the road c. 130 m further, both at the proximity of the road line of modern Via Salaria (see map 4).\textsuperscript{164} The catacombs of Sant’Illaria from the second half of the 2nd century are close to these, on the right side of the road (see map 4).\textsuperscript{165} On this section there aren’t any findings of the road pavement itself, but the numerous graves and catacombs found along the line of modern Via Salaria suggest that the modern road is laid upon the ancient one.

Circa 300 m further the catacomb of Via Anapo (3rd - 4th century AD), although not exactly along Via Salaria, owes its location to the road. It is c. 30 m (~100 ft) southeast from the road line (see map 5).\textsuperscript{166} C. 235 m from the catacomb, at the intersection of Via Salaria and Via Filomarino, two graves were found in 1831, possibly from the 1st – 2nd century. The graves are possibly the same that were encountered later during rescue excavations in 1997 (see map 5).\textsuperscript{167} In the same rescue excavations c. 180 m further from these graves from 1st century BC - 1st century AD were found. The location of the graves makes C. Pavolini suggest that the line of the ancient Via Salaria ran a few meters to the west from the modern one (see map 5),\textsuperscript{168} which anyhow doesn’t affect the assumption that the modern road is laid upon the ancient one. The width of the modern carriageway is 11 m, so there is some clearance for an ancient road line with an approximate width of 4.2 m. In addition, tufa blocks of the crepido of the ancient road were seen on the northwestern side of the modern road at the proximity of the catacombs of Priscilla still at the beginning of the 20th century\textsuperscript{169}. The catacomb of Novella from the beginning of the 4th century is also nearby (see map 5)\textsuperscript{170}.

At the proximity of the catacomb of Novella there are the galleries belonging to the catacombs of Priscilla (end of the 2nd century - c. 450), one of the vastest and most important catacombs in Rome. The catacombs extended also over to the area now covered by Villa Ada, and the basilica of Saint Sylvester (from the 3rd century) belonged to the complex (see map 5).\textsuperscript{171} Also the aqueduct Aqua Virgo ran through the area.\textsuperscript{172} It is

\begin{itemize}
\item \textsuperscript{164} Cupitò 2007: 49-51.
\item \textsuperscript{165} Fusco 2009: 143-145.
\item \textsuperscript{166} Fusco 2009: 147-148.
\item \textsuperscript{167} Fusco 2009: 162-164; Pavolini 1998: 322-325.
\item \textsuperscript{168} Fusco 2009: 164-166; Rinaldoni & Ferrazzoli 1998: 325-327.
\item \textsuperscript{169} Ashby 1906: 13.
\item \textsuperscript{170} Fusco 2009: 164-166.
\item \textsuperscript{171} Fusco 2009: 164-166; Cupitò 2007: 52-53; Marucchi 1905: 416-421.
\end{itemize}
worth noticing that the aqueduct cut the road line only c. 30 m (~ 100 ft) before the spot of the estimated position of the 2nd milestone of the road (see map 5). If Pasqui’s notice about the alignment of the road line just before the estimated position of the first milestone was to be considered as valid (see chapter 2.1.1) the aqueduct would have cut the ancient road line quite close to the location of road’s second milestone (c. 8 m after it). As seen, the “Pasquian” road line has similar causes regarding the position of the first milestone: the ancient Via Salaria and the precursor of Viale Liegi would have intersected exactly at the first milestone of Via Salaria. It is intriguing to assume that Pasqui was right and the road line originally made the curve sketched in map 3 becoming thus c. 38 m longer. I haven’t anyhow used this assumption when drawing the map and measuring the positions for the milestones.

2.1.3 The third mile

So far there haven’t been any drastic changes in the gradient of the road (see profile 3). On the third mile things change, because right after the 2nd milestone the road starts its ascend towards the river Aniene. While the location of the 2nd milestone is at 58 m above sea level, the 3rd milestone stood c. 42 meters lower, at 16 m a.s.l. Here, the gradient of the road might also have had a consequence for the alignment of the ancient road line.

The steepness of a road was a matter of concern for the Roman road builders, because the ancient wheeled traffic couldn’t handle slopes that were too steep. The gradients were tried to be kept as low as possible even in mountaineous regions, for example in Valle d’Aosta, the gradient of the Roman road through the Alps was kept at a maximum of 10%173. However, on some narrow mountain passages gradients of even over 15% are encountered, but it is probable that they were meant only for the passage of pack animals, not for wheeled traffic174. On Via Salaria, at the 42nd mile, the carriageway on the bridge Ponte Sambuco (also known as Ponte del Diavolo) from the 2nd century BC shows a gradient of 8-9%.175 Closer to Rome and related to the context of

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173 The roads in Valle d’Aosta also have deep, regular, parallel ruts cut to the bedrock with a gauge of 1.3 and 1.6 meters as well as regular corrugations to provide traction to the animal hooves and to prevent them from slipping. (Mollo Mezzana 1992: 62.)
Via Salaria, the Crustumerium road trench revealed by the excavations of the University of Oulu shows a gentle gradient of c. 5%.\textsuperscript{176}

On the third mile of the ancient Via Salaria there are two possibilities for the route of the ancient road. One has a maximum gradient of 9.5 % and the other 16.3%. For the first 260 m both of the options use the line of the modern Via Salaria, thus the mark for ruins on the eastern side of the line of the road little after the catacombs of Priscilla in Lanciani’s 	extit{Carta archeologica del suburbio} (1894 - c. 1906), interpreted as a grave due to the proximity with the road by U. Fusco, is along the line of both of them (see map 6).\textsuperscript{177}

In a map from the end of the 19\textsuperscript{th} century drawn by Lanciani there is a marking for three tombs to the eastern side of the line now used by the modern Via di Ponte Salario. Lanciani has also sketched the road line of the ancient road as coinciding with the beginning of Via di Ponte Salario. Between the tombs and the crossing of the river Anio the ancient road appears as a straight line (see fig. 9). U. Fusco on the other hand, locates the aforementioned tombs to the intersection of modern Via Salaria and Viale Somalia (see map 6). The number of separate graves found varies from two to six in the sources of the end of the 19\textsuperscript{th} - early 20\textsuperscript{th} century and the graves date back to the first half of the first century AD.\textsuperscript{178} C. 95 m north from this Fusco locates also the finding place of various graves and sepulchral inscriptions, but in reality the exact finding spot is uncertain.\textsuperscript{179} When it comes to the line of the ancient road, Quilici and Quilici Gigli follow Lanciani, Fusco the modern Via Salaria.\textsuperscript{180} I have ended up following Lanciani - I have found no reason to reject his map.\textsuperscript{181} It should be noted that following the line sketched in Lanciani’s map takes better into account the topographical situation (visible also in figure 9), where the road line runs through a natural valley\textsuperscript{182}. In addition Lanciani’s line, coinciding partly with the modern Via di Ponte Salario has a maximum gradient of 9.5 % (see profile 1), where as in the case of the line coinciding with the modern Via

\textsuperscript{176} Tuppi & al. 2014: 21.
\textsuperscript{177} Fusco 2009: 108, 172-173.
\textsuperscript{178} Fusco 2009: 173.
\textsuperscript{180} Quilici & Quilici Gigli 1978: plate 56.
\textsuperscript{181} See the discussion in Fusco 2009: 173.
\textsuperscript{182} Or a road cutting? (a remark made by E. Jarva.)
Salaria the maximum gradient goes up to 16.3% (see profile 2). The difference might have had an effect for the choice of the route made by its ancient planners. Either way, for the mileage of the ancient road this doesn’t have a vast effect: if instead the line of the modern Via Salaria was chosen, the result would fall only 4 m shorter.

Figure 9. Three tombs and the ancient road line in Lancellotti’s map (from Lancellotti 1897: 112).

As visible in figure 9, Antemnae was once in the vicinity of the road. Its *raison d’être* was its location at the confluence of the Tiber and Aniene (Lat. Anio) on the top of a hill, guarding the passage of Via Salaria over Aniene. Via Salaria makes the passage by Ponte Salario. The ancient bridge was devastated many times throughout its history. An inscription for example mentions a restoration under Justinian in AD 565. The last demolition was in 1867 and the modern bridge that stands in the place is considerably larger than the ancient one. The old bridge can be seen in many paintings of the 18th-19th century (see figure 10 for one version). As well as the bridge, also the name is modern, because for example Livy calls it *pons Anienis*, “the bridge of Anio”.

183 However it must be noticed that the elevation is calculated on figures based on the modern topographical features.
184 Quilici & Quilici Gigli 1978: 140-141.
186 Liv. 7, 9: *C. Sulpiicius et C. Licinius Calvus consules... (= 364 BC) Galli ad tertium lapidem Salaria via trans pontem Anienis castra habuere*. In Livy’s time the 3rd milestone was thus at the vicinity of the bridge.
remaining parts of the bridge are dated back to the end of the 2nd century BC - the first half of the 1st century BC. The original length of the bridge is supposed to be over 72 m and the width 6.52 m.\textsuperscript{187}

Figure 10. The Ponte Salario by Hubert Robert (c. 1775) (the figure is from \texttt{http://www.nga.gov/collection/gallery/gg55/gg55-41665.html} (26.2.2013)).

After crossing the river the first thing to draw attention to is the so called mausoleum of Marius with a medieval tower standing on top.\textsuperscript{188} The mausoleum, although not necessarily of Marius, dates back to the 1st century BC.\textsuperscript{189} Circa 150 m from the mausoleum and 10 m to the right from the modern road a rectangular grave (3.25m x 3.87m, made of peperino and travertine) and other similar structures were found and devastated (see map 6).\textsuperscript{190}

Already on the fourth mile, but not far from the estimated position of the third milestone another mausoleum was found at c. 4 m below modern level on the eastern side of the modern road. Cifarelli & di Gennaro propose that the placement of the mausoleum points out to the fact that the line of the ancient Via Salaria was aligned more to the east from the modern road line. They also remark that to the west from the mausoleum there is a depression, which is probably the ancient road line.\textsuperscript{191} This might

\textsuperscript{187} Fusco 2009: 179. The nearest multiples of foot for the width are 22 Roman feet and 24 Oscan feet.
\textsuperscript{188} Cifarelli & di Gennaro 2000: 125.
\textsuperscript{189} Messineo 1984: 132.
\textsuperscript{190} Quilici & Quilici Gigli 1986: 180.
\textsuperscript{191} Cifarelli & di Gennaro 2000: 123-125; Nini: 139. The map represented by Cifarelli & di Gennaro is of such a small scale that the exact location of the mausoleum can’t be precised with it. (Cifarelli & di Gennaro 2000: 122.) The additional information given by M. Nini in the appendix of same article anyhow helps to define the location with sufficient accuracy. (See Nini 2000: 139.)
be connected with the depression visible in an aerial photo taken in 1934,\textsuperscript{192} when the area was still free from modern building activity. I have combined these two pieces of information for my version of the alignment of the ancient road line (see map 6).

The first three miles have contained an abundance of archaeological data (see map 7), which has made the progression of the work quite slow on the one hand and easy on the other hand. Now that Rome is left further away with every step, the pace becomes faster, but on the same time less accurate. First I must anyhow turn back and still face the problem of the two \textit{viae} Salaria, as promised in chapter 2.1.1.

### 2.1.4 Via Salaria Vetus and Via Salaria Nova

The question, as the one concerning Via Caecilia, is one that has divided scholars for over a century. Many, e.g. Quilici & Quilici Gigli hold that Via Salaria Vetus was, as its name suggests, the older route of Via Salaria. They argue that it was the route used by the ancient salt road dating thus back to prehistoric times. The route presumably ascended to Rome from north by Via di Porta Pinciana and passed through Campus Martius, without going anyhow through the city that was inside the Servian wall, crossed the river at the Tiber Island and ended at the salt fields at the mouth of the Tiber.\textsuperscript{193} It is also possible the the original destination of the road was Forum Boarium and more precisely the \textit{Salinae} at the foot of the Aventine.\textsuperscript{194}

Others, such as C. Cupitò and S. Dinuzzi propose that despite its name Via Salaria Vetus is not necessarily an older route of Via Salaria. The name appears first in Late Antiquity, and as seen in chapter 2.1.1, neither does Via Salaria Nova necessarily carry its name with justification, because the oldest remaining parts of the road date back to the 6\textsuperscript{th} – 4\textsuperscript{th} centuries BC. It is argued that Via Salaria Vetus was probably only an alternative route of the road in the northern suburbs of Rome.\textsuperscript{195}

The most recent scholars to treat the question of the route of Via Salaria Vetus outside the Aurelian wall have been Dinuzzi and Cupitò. They suggest that from Porta

\textsuperscript{192} See Quilici & Quilici Gigli 1986: plate 63.
\textsuperscript{193} Quilici & Quilici Gigli 1980: 141-144; Patterson 1999: 144-145; Ceci & Costantini 2008: 391. For the most recent study on the possible route of the road in Rome between the Aurelian wall and the crossing point of the Tiber see Coarelli 2014: 56-61.
\textsuperscript{194} Coarelli 1988b: 110-112; Liv. 24, 47; Solin. 1, 11; Frontin. 1, 5. Consider also the expression used by Pliny (nat. 31, 89): \textit{convenerat} – “it had been agreed” (see note 100).
\textsuperscript{195} Dinuzzi & Cupitò 2009: 79.
Pinciana the road line reached the Tiber following the modern Via Pinciana, Via G. Paisiello, Via A. Bertoloni and Via F. Denza, the last section between Via Denza and the Tiber being highly hypothetic (see map 8 for the road line in question). As for the route between Porta Pinciana and Via Denza, it is based on several findings of a gravel-paved road, dated back to the 6th-4th centuries BC, and basalt paved road, dated back to 2nd century BC - 1st century AD.

Also the road that Lanciani defines in *Forma Urbis Romae* as *diverticulum a Via Salaria Vetere ad Portam Collinam*, i.e. a side road that connected Via Salaria Vetus to Porta Collina, belongs to the early phases of Roman road building. Quite close to Porta Collina, at the intersection of Via Piave and Via Flavia, remains of this road, namely a cambered gravel road were found in 1885 on the western side of the line of the ancient Via Salaria. At 3.5m below the street level there was a 0.4 m thick layer of gravel. Below this at 4.8m from the modern level was found a gravel layer. It was 0.35 m thick and 3.75 m wide and bordered on both sides by *cappellaccio* walls that were 1.77 m high and 1.18 m wide. Moving further, in 1745 slabs of pavement in basalt were found near the Aurelian wall, close to the intersection of modern Via Lucania and Via Campania. The direction of the section is SE-NW and aligned with the remains of the gravel road found at the intersection of Via Piave and Via Flavia (see map 8).

North from the Aurelian wall, to the west from Via Salaria Nova, between modern Via Salaria, Corso d'Italia and Via Pinciana there was a vast burial area (referred to as *Sepolcreto Salario* or *Necropoli di Via Salaria*). The graves have been oriented with the sideroads between Via Salaria Vetus and Nova. *Sepolcreto Salario* consists of 120 columbaries, 51 graves, two mausoleums, 43 sarcophags, 15 tombs *a cappuccina* and several independent burials. The oldest graves date back to the 8th – 7th centuries

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199 i.e. the modern road that uses the road line of the ancient Via Salaria between Porta Collina and Porta Aureliana.
200 *Carta archeologica di Roma* 3: 92; Fiorelli 1885: 155-156. The measures of the wall conform to a 29.5 cm foot, being 6 and 4 ft respectively.
201 *Carta archeologica di Roma* 2: 72; Lanciani 1888:9.
203 Cupitò 2001: 47.
BC.\textsuperscript{204} Also the roads that go through the area are of an early origin: the oldest road pavements here date back to the 6th – 4th centuries BC.\textsuperscript{205} The burial area and the roads passing through it were in use until the Late Empire, for example basalt pavement was found in various occasions during excavations in 1896,\textsuperscript{206} and underneath one of the sections a leaded water pipe with an inscription referring to the Late Empire was found.\textsuperscript{207} The use of the \textit{diverticulum} mentioned above was anyhow no more possible after the construction of the Aurelian wall, because the wall cut the road in two and there was no gate for it. Despite this it is evident that both Via Salaria Vetus and Via Salaria Nova and the roads connecting them through the Sepolcreto Salario were in use from the earliest phases of Roman road building until the Late Empire.

2.2 From Aniene to Crustumerium

2.2.1 The fourth and the fifth mile

As mentioned before at the end of the chapter 2.1.3, the amount of archaeological data drops, when leaving the urban area. On the fourth and fifth miles, after the mausoleum discussed already in the end of chapter 2.1.3, there is hardly any archaeological material relevant for the reconstruction of the ancient road line. The reconstructed route is thus less reliable than that seen this far and must be drawn up with the help of other guiding principles. As regards material evidence, there are two points of reference, though. From the fourth mile there is a generic mention from the 1960s of an encounter with ancient road pavement in an underpass c. 1300 m from Ponte Salario between the modern road and the railway yard\textsuperscript{208}. On the basis of Google Earth’s satellite images the only suitable underpass is the one at c. km 7.690 of the modern road (see map 9). This piece of information can be used in reconstructing the route of the road on the fourth mile. On the fifth mile, then, the location and the NE-SW-orientation\textsuperscript{209} of the medieval Torre

\textsuperscript{204} Cupitò 2007: 60-63.
\textsuperscript{205} Cupitò 2007: 150-151.
\textsuperscript{206} Carta archeologica di Roma 2: 56; Gatti 1896: 328-330, 370, 392.
\textsuperscript{207} Gatti 1896: 392.
\textsuperscript{208} Quilici & Quilici Gigli 1986: 176, 181.
\textsuperscript{209} See Quilici & Quilici Gigli 1986: plates 20&21. Quilici & Quilici Gigli note however that this kind of an orientation was a common feature in medieval towers planned to make the building less exposed to winds blowing from the north. (Quilici & Quilici Gigli 1986: 192.)
Serpentara may be used in defining the course of the road (see map 9).\textsuperscript{210} 130 m to the east from the Torre Serpentara there were graves from the Imperial period, which were demolished when constructing the railway in 1938 (see map 9).\textsuperscript{211} The ancient road must have run between Torre Serpentara and these graves.

Quilici & Quilici Gigli have drawn the fourth and fifth miles as an arrow-straight line reaching from the mausoleum of Marius to the hill of Villa Spada (see map 9). The hypothesis seems acceptable, because also further away (e.g. on the 10\textsuperscript{th} mile), as will be seen, the road was constructed using exactly this procedure. Notwithstanding the proof offered by analogy, on the fourth and fifth mile this is anyhow quite risky, because the line proposed by Quilici & Quilici Gigli runs extremely close to the river. This is significant, because the Tiber is a river prone to severe flooding. Even in modern era floods can cause problems for the traffic in the area.\textsuperscript{212} The line proposed by Quilici & Quilici Gigli is at the closest only one meter higher and c. 60 m from the areas object to erosion caused by the flooding river, which can clearly be seen in satellite images, e.g. the one from June 2013 (see fig. 11).

\textsuperscript{210} Torre Serpentara dates up to 10\textsuperscript{th} century. It was demolished during the World War II. (Quilici & Quilici Gigli 1986: 191-192.)
\textsuperscript{211} Although the exact location of the graves is insecure. (Quilici & Quilici Gigli 1986: 181-184, plate 21.)
\textsuperscript{212} Quilici & Quilici Gigli 1986: 172. A recent example is from autumn 2012, when Ponte Milvio had to be closed due to the flooding Tiber. F. Gori (1863: 8-9) gives a vivid account of a flood in the mid-19\textsuperscript{th} century. Archaeological proof of floods in antiquity then is offered e.g. by the aforementioned mausoleum (see note 191) on the ruins of which a thick layer of clay (probably caused by the floods) was found. See also note 32 for the observation by Varro regarding the situation further along the road in \textit{ager Crustuminus}. Another example of the obstacles caused by the proximity of the river are the various ditches running into the Tiber that nowadays are drained, but can be seen in some historical maps such as the \textit{Topografia Geometrica dell'Agro Romano} (see \url{http://www.igmi.org/ancient/immagine.php?cod=6655}). It must anyhow be admitted that there is no certainty on the hydrographic conditions in antiquity and the modern situation can’t be taken as a proof of them (see Quilici & Quilici Gigli 1980: 161, 168.).
Figure 11. The line of the ancient road proposed by Quilici & Quilici Gigli at the proximity of the river bank. The eroded areas closest to the road line are at 19 m a.s.l, whereas the road line is at 20 m a.s.l. The image is from Google Earth (https://maps.google.fi/?mid=1365625611), and it's oriented north-up.

This is why I propose an alternative road line. The ancient road must have been tried to be kept at a distance from the flood-prone river. At the same time the gradient of the road must have been taken into account. I have used these two principles when determining the alignment of the road (see map 9). The maximum gradient on the fourth mile is kept at 3.9% and on the fifth at 2.8% (see profile 4). The depression visible in the aerial photo from 1934 used for the reconstruction of the route at the estimated position of the third milestone continues also on the first part of the fourth mile and is used as a help. As for the route of the road at the proximity of the estimated position of the fifth milestone, the orientation of basalt pavement found in 1984 (see next chapter) is used as a point of reference.

It is anyhow to be noticed that several historical maps,\textsuperscript{213} as the one by Eufrosino della Volpaia from 1547 (see fig. 12) or the one by G. Cingolani from 1692 (see fig. 13) show the road passing between Torre Serpentara and the river.\textsuperscript{214}

\textsuperscript{213} Even though the medieval or later route of the road can't be taken as a proof of the ancient route. See for example di Gennaro & Vitti 2004: 143-144.
\textsuperscript{214} There are anyhow as well maps that show the road passing from the other side of the tower (see for example Il Lazio con le sue piu cospicue strade antiche e moderne di esso by G. Ameti from 1693.
Figure 12. A detail from the map of Eufrosino della Volpaia (from Frutaz 1962: plate 26.).

Figure 13. A detail from the map of G. Cingolani (from Frutaz 1962: plate 161.). Torre Serpentara is the building besides the number 398.
It has also to be admitted that further (see next chapter) the ancient road verifiably ran extremely close to the riverbank. It is thus possible that the road line proposed by Quilici & Quilici Gigli is closer to the ancient one than the alternative line I have proposed in the map 9. The maximum gradient on the Quilici & Quilici Gigli line is 5.2% (see profile 5). The two lines meet 152 m after the estimated position of the 5th milestone of my road line (see map 9) and the Quilici & Quilici Gigli line is 64 m shorter. Thus, if the line proposed by Quilici & Quilici Gigli was used, the milestones further afield would fall 64 m before the positions proposed in this thesis.

Nevertheless, the ever-changing nature of the Tiber river channel can not be left unconsidered: the changes in the course of the river can take place rapidly and have vast effects on the lateral placement of the river channel. The route proposed by Quilici & Quilici Gigli doesn’t take this into account and in this light the assumption that the road was built further from the river is more plausible.

2.2.2 The sixth mile

In 1984 a short section of the ancient road pavement came to light at c. 10 km of the modern Via Salaria at c. 30 m east from the modern road at c. 2 m below the modern level. The width of the pavement was c. 4 m and it was bordered from the eastern side by a crepido and a complex consisting of a tufa wall, a portico and a mausoleum. In the complex there are at least four distinguishable successive phases of construction datable between Late Republic and the 4th century. The pavement is at c. 180 m from the estimated position of the 5th milestone and it’s oriented NNW-SSE (see map 10).

Not far from this the basalt pavement of the ancient road has been seen on two occasions. During the construction of the railway in 1889 a section of it was found at 1.3 m below the level of the railway track on the eastern side of the rail. Due to the inclination of the hill of Fidenae the finding spot must fall close to the spot, where the pavement in 1984 was found - the information given by R. Lanciani & L. Borsari is somewhat disordered, but the reference given by them to km 12.01 of the railway

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216 The modern level is at 23 m a.s.l.
217 Messineo & Staffa 1984: 146; Quilici & Quilici Gigli 1986: plate 23. The measure given by Messineo & Staffa, c. 4 m, is again not exact. 400 cm translates as 13.53 Roman and 14.55 Oscan feet.
together with the direction of the basalt pavement found in 1984 can be combined to determine the finding spot of the basalt slabs in question (see map 10).

After this, a 19 m long section of the ancient road pavement was seen on the eastern side of the modern road in 1906. The pavement was possibly only 30 cm below the modern level. The exact location of the finding place is not certain, but Quilici & Quilici Gigli deduce it to be at c. km 10.380 of the modern road (see map 10). At c. 200 m further the grave of T. Apronius Apollonius from the end of the 2nd – the beginning of the 3rd century was documented in various occasions in the late 19th - early 20th centuries with variating details given for its exact location. I have no reason to argue against the research Quilici & Quilici Gigli have done on the subject locating the grave at c. km 10.600 of the modern Via Salaria (see map 10). On the eastern side of the road there is a steep hill, the site of ancient Fidenae (see map 10). The road line uses the extremely narrow passage left between the hill and the river.

Proceeding c. 600 m further, a retaining wall of the ancient road was found at c. km 11.200 of the modern Via Salaria between the modern road and the river in 1959 (see map 10). The finding place of the wall is only 65 meters from the river (see fig. 13) at 19 m a.s.l. - the river here is at 16 m a.s.l. As can be seen in fig. 14, the area is subject to severe erosion caused by the flooding river, which naturally offers a functional explanation for the retaining wall at this point of the road. It also confirms that the modern road on this section uses approximately the same route as the ancient one. In addition several rock-cut tombs have been witnessed here on the slopes of the hill on the eastern side of the road. Halfway between the retaining wall and the grave of T. Apronius Apollonius a road passing through Fidenae to the river bank once crossed the ancient Via Salaria. The location was used for crossing the river and from the west bank the road continued up to Veii and Etruria.

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219 Quilici & Quilici Gigli 1986: 82, 90, plate 20.
221 Dionysius of Halicarnassus (in the end of the 1st century BC) writes in several occasions (2, 53; 3, 27; 10, 22) that the distance between Rome and Fidenae was 40 stades, i.e. c. 5 miles.
222 Quilici & Quilici Gigli 1986: 197, plate 82.
223 The wall was found at 2.3 m below the modern level. (Quilici & Quilici Gigli 1986: 197.)
Figure 14. Retaining wall of the ancient road at the proximity of the river at c. km 11.200 of the modern Via Salaria. The image is from Google Earth [https://maps.google.fi/?mid=1365625611] and it’s oriented north-up.

2.2.3 The seventh mile

In 1891 the remains of a 2nd century bathhouse were found circa 280 m north from the estimated position of the sixth milestone (see map 11). Close to this, on the southern slope of the hill of Castel Giubileo, are the remains of the Basilica of the archangel Michael ad Septimum (~‘on the seventh mile’) from the end of the 4th century (see map 11). The site was occupied by a villa already in the Republican period. On the eastern slope of the hill an archaic necropolis (terminus ante quem the middle of the 6th century BC) has been found at c. km 12 of modern Via Salaria (see map 11).


227 The expression has been, as well as the mile markings seen in ancient itineraries (e.g. Tabula Peutingeriana), a subject of continuous speculation (see for example Bianchini & al. 2007: 636-637). The preposition ad in Latin doesn’t necessarily denote accuracy (e.g. OLD s.v. ad 13a: ‘at, near, beside’; OLD s.v. ad 13b: ‘situated at, occurring near’; OLD s.v. ad 20a: ‘round about, approaching, approximately’). When referring to miles the itineraries as well as ancient authors are speaking in rounded values. We don’t for example see any mentions of 16.3 miles or so – the only number provided is that of the mile. We can’t thus take the distances found in ancient literature as referring to precise mile markings. Radke (1973:1447) makes a similar remark on Velleius’s account on the distances in Germania (Vell. 2, 106, 6: ad quadringentesimum miliarium a Rheno usque ad flumen Albim) - Velleius refers to the 400th milestone/mile from the Rhein towards Elbe, even though there weren't any milestones there. As regards the basilica in question, from Hieronymian martyrology we have also a mention that it’s at the sixth mile/milestone (Saxer 1990: 247).

228 Bianchini & al. 2007: 626-627.

Due to questions concerning the steepness of the road, on the first part of the seventh mile the obvious route must have been the valley between the hill of Castel Giubileo and the Colle Salario. This finds support from historical maps, for example from the one drawn by Eufrosino della Volpaia in 1547 (see fig. 12). The route of the road as seen in map 11 is based on the principle of “lowest gradient on a line as straight as possible” witnessed elsewhere on Roman roads. Notwithstanding, the gradient of the road goes up to 9.5% c. 310 m after the 6th milestone, just after having passed the site of the Basilica of archangel Michael (see profile 7).

Proceeding through the valley, the pavement of the ancient road was encountered during the construction of a junction from Via Salaria to the G.R.A. (the ring road of Rome) at km 12.400 of the modern road (see map 11). However, archaeologists weren’t called to witness the operation and the information is only based on a later oral account of a representative of the company.

The ancient road continued on the bank of the river for the final part of the seventh mile. The confirmation for the route this close to the river is the location of the bridge of Malpasso in the beginning of the eighth mile (see next chapter).

The area to the north from the estimated position of the seventh milestone is called Settebagni, due to the remains of a Roman villa on the hill c. 250 m east of the ancient road line (see map 11). The name was in use at least already in the 13th century, and the name itself is a testimony of one of the most grandiose villas of the Late Republic-Imperial periods in the vicinity of Rome. It was considered by early scholars even as the remains of Crustumerium and presumed more recently by Quilici and Quilici Gigli to have been of imperial possession, as the Praetorium Fidenatium.

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230 The map is, as all the maps in this thesis, anyhow based on the topography as seen in modern maps, which means that road cuttings happened after antiquity might have escaped the attention of the author.
231 For example H. Ynnilä’s studies on the Roman roads in Jordania show that the roads tend to prefer a gradient as low as possible on a line as straight as possible. (Ynnilä 2007: 8.)
233 From Latin *septem balnea*, ‘seven baths’.
234 See for example the map of Cingolani (fig. 13).
2.2.4 The eighth mile

C. 200 m from the estimated position of the seventh milestone the road passes a ditch, Fosso della Bufalotta, joined by another ditch, Fosso di Malpasso, just a few meters before the bridge (see map 11). The ancient bridge of Malpasso was still seen in the beginning of the 19th century, before the construction of a new one in 1832. The bridge itself was a testimony of the strong subsidence in the valley of Tiber: it consisted of three different phases constructed on top of each other (see fig. 15). The first phase of construction recognized by A. Nibby, visible also in the fig. 15, in \textit{opus quadratum} of tufa, is dated by Nibby back to the Republican period. On top of these is the arch in \textit{opus latericium}. From its bricks were found stamps\textsuperscript{236} referring to the years 126 - 129 AD. The second arch was constructed on top of this Hadrianic arch in more recent times.\textsuperscript{237}

The location of the bridge has been subject to some discrepancies.\textsuperscript{238} This might be due to changes in the hydrographic conditions in the Tiber valley.\textsuperscript{239} For example in the map of Eufrosino (from 1547) there is a stream and a bridge crossing it with the description \textit{Mal passaggio}\textsuperscript{240} (see fig. 12) before the hill of Settebagni and not far from the site where modern Via Salaria passes under the G.R.A., but in the map of Cingolani (from 1692, fig. 13) the situation is already different, resembling more the modern one. With the information available it seems anyhow reasonable to assume that the old bridge (fig. 15) was at the location of the new one. Just before the bridge, c. 100 m from where Fosso della Bufalotta runs into the Tiber, a dredger found an Imperial-period

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\textsuperscript{236} \textit{CIL} 15: 506b, 507b, 702.
\textsuperscript{237} Nibby 1837: 134.
\textsuperscript{238} Persichetti (1908: 315) writes that the new bridge is 100m closer to the river than the old one. Ashby (1906: 23) tells that the road passed both Fosso della Bufalotta and Fosso di Malpasso by the bridge. In Quilici & Quilici Gigli 1986 the bridge is told to have been at modern km 12.850 (p. 198), but in their map (1986: plate 187) the bridge is anyhow drawn at c. km 12.400. Cifarelli & di Gennaro (2001: 122, 128) locate the bridge at c. km 13.150, thus to the location of the new bridge. This is also the view represented by Quilici & Quilici Gigli (1980: plate 123).
\textsuperscript{239} See the discussion concerning the area of Ponte di Malpasso in Quilici & Quilici Gigli 1980: 172-173. These changes, together with the bridge seen in Eufrosino map (fig. 12), also lead Quilici & Quilici Gigli to suggest that in addition to the bridge of Malpasso (fig. 15) in antiquity there was perhaps another bridge (the one in Eufrosino’s map) closer to Castel Giubileo. It is also likely that this bridge was originally the one with the name \textit{Malpasso} (Passigl 2004: 139.). An interesting detail is that the stream in Eufrosino’s map might well be river Tutia, mentioned by Livy as being at six miles from Rome (Liv. 26, 11). More recent evidence from the incessant changes in the hydrographic conditions in the Tiber valley are the ponds northwest from Castel Giubileo (see map 11 and compare with fig. 12, where there’s an isola tiberina at the same place).
\textsuperscript{240} ~'bad passage' - hence also the modern name \textit{Malpasso}.
tombstone that had sunk in to the river probably due to erosion (see map 11).\textsuperscript{241} Considering the meandering nature of the Tiber,\textsuperscript{242} this makes one also think whether the river channel was here this close to the road in antiquity. It could well have been situated more to the west on the vast plain on the western bank of the river (see map 11).

\begin{center}
\includegraphics[width=\textwidth]{bridge.png}
\end{center}

Figure 15. Bridge of Malpasso (Ponte di Malpasso) in a sketch from the beginning of the 19\textsuperscript{th} century (from Guattani 1827: 43.).

C. 820 m NNE from the bridge Quilici & Quilici Gigli locate the remains of a 1\textsuperscript{st}-2\textsuperscript{nd} century sepulchral altar, whose exact finding place however is uncertain.\textsuperscript{243} Halfway between the bridge and the altar, c. 330 m east from the suggested road line at Tenuta Malpasso there is a tunnel, orientated N-S and c. 5.7 m wide, c. 2.8 m high and c. 60 m long (see map 11). F. Fraioli proposes that it belonged to the improvement works of the road network during the reign of Augustus and that it was part of the alternative route of Via Salaria, safe from the floods of the Tiber.\textsuperscript{244} Accordingly, Cifarelli & di Gennaro propose that the tunnel is connected with a change in the route of the road more towards the hills, away from the problems caused by the proximity of the river.\textsuperscript{245} The tunnel could also have belonged to the road that left Via Salaria inland to Crustumerium.

\begin{footnotesize}
\textsuperscript{242} See for example the discussion in Kuusela & al. 7-19.
\textsuperscript{243} Quilici & Quilici Gigli 1980: 176-177.
\textsuperscript{244} Fraioli 1998: 299-301.
\textsuperscript{245} Cifarelli & di Gennaro 2001: 129.
\end{footnotesize}
and Montelibretti right after Fosso di Malpasso.\textsuperscript{246} Be that as it may, building a tunnel is a major undertaking that was not engaged in easily: in Italy there are only around twenty tunnels datable to the Roman era.\textsuperscript{247} This speaks on behalf of the importance of the route for which the tunnel was built.

The main road line must anyhow have remained the principal route and the one used, when the mileage of the road was measured. If the miles however were measured using the alternative road, the road line would be c. 390 m longer and each milestone coming after this point would thus have to be sought c. 390 m earlier than mapped in this thesis. This is anyhow not the case, as will be seen in chapter 2.3.6.

Returning to the suggested principal road line, the estimated position of the 8\textsuperscript{th} milestone is c. 420 m from the sepulchral altar (see map 11). The remains of a necropolis found at the beginning of the ninth mile (see next chapter) are used to determinate the course of the road.

2.2.5 The ninth mile

A small necropolis from the Imperial period, consisting of a funerary monument and eight burials, was found in 1991 at the corner of Via Salaria and Via della Stazione di Settebagni (see map 12). Besides the monument also a track of an ancient road, probably Via Salaria, was seen.\textsuperscript{248}

C. 400 m northeast from here there is a hollow on the northern side of Salita della Marcigliana, the road that leads from Via Salaria to Casale della Marcigliana (see map 12), where basalt slabs have been witnessed. The hollow leads to a mouth of a tunnel that goes through the hill.\textsuperscript{249} The tunnel is c. 110 m long, 3.5 m high and 5.5 m wide. Connected to the route of the tunnel also sepulchral chambers were possibly cut into the hill.\textsuperscript{250} The tunnel was lit by two circular holes dug into its ceiling at 55 m and 90 m from the southern entrance. It was built possibly in the Augustan era to defend the road from

\textsuperscript{247} Coralini 1992: 85. In the beginning of the 1990s the number was 18, to which the tunnel identified by Fraioli adds one. It is noteworthy that two of these are connected with Via Salaria in the vicinity of Rome.
\textsuperscript{248} Alvino 2003: 40; Cifarelli & di Gennaro 2001: 129-130, 141.
\textsuperscript{249} The entrances of the tunnel are discernible also from the satellite images in Google Earth.
\textsuperscript{250} Quilici & Quilici Gigli 1980: 185-187.
the floods of the river at a point where the passage between the river and the hill was extremely narrow.\footnote{Busana & Basso 1997: 113.}

As regards the principal road line, it must have used a route as close as possible to the hill with a gradient as low as possible. The tunnel gives a short cut of only c. 70m, which gives further support for the view that the main reason for building the tunnel was in fact the Tiber (see map 12 for the tunnel and the probable principal road line). The maximum gradient of the road remains gentle on the ninth mile except when the road climbs (7.1\%) and descends (6.7\%) the side of the hill of Casale della Marcigliana (see profile 8). However, this remains within the limits witnessed elsewhere on Roman roads.\footnote{See for example Mollo Mezzana 1992.}

2.3 From Crustumerium to the 18th milestone

2.3.1 The tenth mile

On the tenth mile Via Salaria passed the site of ancient Crustumerium (see map 13). There probably was a crossing point of the Tiber somewhere near Crustumerium as the settlement was situated along a route that connected southern Etruria (especially Veii) with southern Latium & Campania passing through Gabii and Praeneste.\footnote{Tuppi 2008: 8; di Gennaro 2006: 222; di Gennaro 1988: 113-114; Quilici & Quilici Gigli 1980: plate 123.}

On 10th - 18th miles the route of the ancient road line can be reconstructed quite accurately with the help of several satellite images available in Google Earth. In the images the road appears as a straight line, either lighter or darker from the surrounding field depending on the season. The road seems to have been constructed between the Tiber and the hills to the east from the river as a long, nearly straight line (see fig. 16). It is not far-fetched to assume that the sections between the tracks visible in satellite images repeat the same scheme. In fact, I have found part of the tracks presented in following pages by drawing a straight line between the already known sections of the road and following the hypothetical line closely with the help of various satellite images. Google Earth with its collection of satellite images proves thus to be a practical tool for the search of ancient road lines.\footnote{Taking SETI as example a world wide SARI programme could be launched in order to harness personal computers and amateur archaeologists around the world to a Search for Ancient Road Intelligence.}
Figure 16. The ghost of the ancient road line between on the 10th - 19th miles as observed in Google Earth's satellite images. The sections visible in satellite images are marked with red, the approximate finding place of the probable 10th milestone with a yellow pin “km 17.7” and the finding place of the 18th milestone with a yellow pin “mp 18”. The image is from Google Earth (https://maps.google.fi/?mid=1365625611), and it’s oriented north-up.

The first one of these “ghosts” of the ancient Via Salaria was perceived already by Quilici & Quilici Gigli in 1970s. It covers a distance of over 2.5 km on the tenth and eleventh mile of the ancient road. The section visible in figure 17 measures c. 1480 m. Also visible in fig. 17 is a side road leaving at c. km 17.7 of the modern road southeast towards Crustumerium. On the tenth mile the track visible in fig. 17 is the only proof of the ancient road line making the estimated position of the 10th milestone to fall at the level of c. km 17.45 of modern Via Salaria (see map 13). It is also noteworthy how Fosso

255 The ghost seems also to possess a skeleton, because the local farmers tell that in the area, (coinciding with the line) there is some kind of a sunken canal consisting of non-local stone hidden in the fields (Quilici & Quilici Gigli 1980: 179; di Gennaro 2013: 14).
Maestro, identified as the ancient river Allia runs parallel to the line of the ancient Via Salaria at a range of c. 90 m (~300 ft) (see map 13).\textsuperscript{257} Varro’s mention of trenches and banks of soil built to defend fields from the river (see note 32) in \textit{ager Crustuminus} relates probably to the canalization of the area between the road and the Tiber (see map 13), plausibly demonstrated by Quilici & Quilici Gigli as an undertaking happened already in antiquity.\textsuperscript{258}

\textsuperscript{257} Quilici & Quilici Gigli 1980: 163.
\textsuperscript{258} Quilici & Quilici Gigli 1980: 163-164 and plates 60-61.
2.3.2 The 11th mile

A stone with a cylindrical form (see fig. 18), commonly accepted as the 10th milestone of the ancient Via Salaria, was found in 1977 during ploughing the field belonging to Tenuta della Marcigliana at c. 70 cm below modern level at c. km 17.7 of the modern road.\textsuperscript{259} The stone’s characterization as a milestone is however not certain.\textsuperscript{260} Together with the stone, also basalt slabs have possibly been found at the location.\textsuperscript{261}

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{figure18}
\caption{The presumed 10th milestone of the ancient Via Salaria (from Quilici & Quilici Gigli 1980: plate 63).}
\end{figure}

\textsuperscript{259} Quilici & Quilici Gigli 1980: 179.
\textsuperscript{260} The stone was the subject of my Bachelor’s thesis in Archaeology (2011) and the biggest problem with the stone is that it contains no inscription: according to Quilici & Quilici Gigli (1980: 179) the stone is broken from the middle and the remaining part is the lower one, while the inscription would presumably have been cut in to the upper part. Notwithstanding, Quilici & Quilici Gigli (1980: 179) retain clear that the stone is the 10th milestone of the road firstly due to its resemblance in form, measures and material with the known Augustan milestones of the road, (although according to my own studies the stone’s dimensions are a bit smaller from the Augustan average) and secondly, because the finding place of the stone fits in with their calculations of the positions of the milestones of the road (yet in their calculations it is actually the 11th, not the 10th milestone that should be sought at km 17.7 of the modern road (see Quilici & Quilici Gigli 1980: plates 119, 120, 123)). The exact finding place of the stone remains also unclear, because the place was shown to scholars by the farmer only afterwards (Cifarelli & di Gennaro 2001: 132). Further examination is hindered by the fact that it is uncertain where the stone is deposited at the moment. It ought to be at Casale della Marcigliana (Quilici & Quilici Gigli 1980: 179), but the residents of the plot claim that there is no archaeological material deposited there. They also threaten those who ask with calling the police.
\textsuperscript{261} Quilici & Quilici Gigli 1980: 179.
At the proximity there also seems to have been a circular structure, discernible in a satellite image (see fig. 19). It is at c. 18 m (~60 ft) distance from the road line and its diameter is approximately 6.5 m (~22 ft).

Figure 19. A circular shape in the field at the proximity of the tenth milestone. The image (11.9.2009) is from Google Earth (https://maps.google.fi/?mid=1365625611), and it’s oriented north-up.

Circa 90 m further, exactly at km 17.7 of the modern road in another satellite image a shape of a square structure of c. 42x22m is visible (see fig. 20). It is probably the one hypothesized by A. Amoroso as a statio\textsuperscript{262} due to its vicinity to the 10\textsuperscript{th} milestone although he treats the ancient road line as coinciding with the modern road, not with the lines visible in satellite images. The function of the structure is anyhow not clear. A considerable amount of material related to a building (e.g. marmor plates and pieces of mosaic) has been found in its vicinity.\textsuperscript{263} Moreover, at the proximity there’s a side road connecting Via Salaria with Crustumerium,\textsuperscript{264} visible also in satellite images (see fig. 17). The concentration of all this material at the vicinity of km 17.7 gives support also to the original location of the 10\textsuperscript{th} milestone at the vicinity making thus my road line 150-250

\textsuperscript{262} Also known as mansio (see chapter 1.1.2).
\textsuperscript{263} Amoroso 2000: 273-275.
\textsuperscript{264} See for example Amoroso 2000: 264.
m too long (see map 13, where it is shown that according to my calculation the location of the 10th milestone is at c. km 17.45 of modern Via Salaria). This is anyhow to be tested only at the 18th milestone that has been found in situ and whose status as a milestone is certain (see chapter 2.3.6).

Figure 20. Remains of a square structure in the field at the proximity of km 17.7 of modern Via Salaria. The image (17.6.2013) is from Google Earth (https://maps.google.fi/?mid=1365625611), and it's oriented north-up.

After the section visible in fig. 17 the road is again discernible continuing on the same line at c. 75 m further for c. 170 m in a satellite image of 27.7.2005 (see fig. 21).
Figure 21. The continuation of the track of the ancient Via Salaria in a satellite image (27.7.2005). The blue arrows are drawn to help in the perception of the track. The track visible in the lower left corner of the image is the final part of the track in fig. 17. The image is from Google Earth (https://maps.google.fi/?mid=1365625611), and it’s oriented north-up.

At c. km 18.35 of the modern road there is a chapel, in front of which there is a modern pavement made of reused basalt slabs of the ancient road (see map 13). Circa 310 further from the track in fig. 21 the road line is again discernible in a satellite image for c. 90 m, but the orientation of the road changes with a few degrees, probably due to the crossing of Fosso Maestro (i.e. ancient Allia) right after the chapel (see fig. 22 and map 13).

265 Quilici & Quilici Gigli 1980: 171.
Figure 22. The continuation of the track of the ancient Via Salaria in a satellite image (1.9.2005). The blue arrow is to help in the perception of the track. The track visible in the lower left corner of the image and marked with red is the final part of the track in fig. 21. The image is from Google Earth (https://maps.google.fi/?mid=1365625611), and it’s oriented north-up.

The road is again discernible for c. 485 m in a satellite image taken 30.9.2010 only c. 100 m further, when continuing on the same line (see fig. 23). The estimated position of the 11th milestone falls also on this section (see map 13).²⁶⁶

²⁶⁶ According to several ancient authors the ancient battlefield of Allia is also to be sought nearby - e.g. Liv. 5, 37: “the confrontation took place at the eleventh milestone, where the river Allia, flowing down from the mountains of Crustumerium in a peculiarly deep channel, mixes with the Tiber not far below the road” (ad undecimum lapidem occursum est, qua flumen Allia, Crustuminis montibus praebito defluens alveo, haud multum infra viam Tiberino amni miscetur). It must anyhow be noticed that at the time of the battle (beginning of 4th century BC) there most likely weren’t any milestones and that Livy is telling a story that has happened c. 400 years earlier. Quilici & Quilici Gigli also point out that the course of Allia may well have been different at the time of the battle (Quilici & Quilici Gigli 1980: 298).
Figure 23. The continuation of the track of the ancient Via Salaria in a satellite image (30.9.2010). The track visible in the lower left corner of the image and marked with red is the final part of the track in fig. 22. The image is from Google Earth (https://maps.google.fi/?mid=1365625611), and it’s oriented north-up.

2.3.3 The 12th mile

The 12th mile can nearly all be covered with the help of satellite images. The first part is seen in fig. 23 and after this the line visible in satellite images is interrupted with c. 215 m. The continuing part is not as evident as those before, but anyhow discernible. It measures 190 m, but it would be longer without the furrows coinciding with the road line just before and after it (see fig. 24). In 1906 a circular mausoleum (diam. ~34 m) from Late Republican - Early Imperial period, in opus quadratum of travertine, was found halfway between these sections (see map 13). The mausoleum is one proof of the strong subsidence in the Tiber valley, as it was found at 5 m below modern level.267

Based on archaeological findings the average sediment deposition in the Tiber valley at the proximity of Crustumerium is 5-8 m. However, the possible 10th milestone of the road was found at the depth of only c. 70 cm (see page 51). The finding place of the mausoleum is still recognizable in a satellite image of 22.9.2006, where it shows as a dark, round shape in the field.

Figure 24. The continuation of the track of the ancient Via Salaria on the twelfth mile in a satellite image (11.9.2009). The blue arrows are drawn to help in the perception of the track. The track visible in the lower left corner of the image and marked with red is the final part of the track in fig. 23. The image is from Google Earth (https://maps.google.fi/?mid=1365625611), and it’s oriented north-up.

The next section of the road appears in a satellite image even paler than that in figure 24. It is anyhow discernible, and since it continues the line seen before (e.g. fig. 24) and attaches to a section in the beginning of the thirteenth mile (fig. 26), it can be taken as another ghost of the ancient road. It starts at c. 280 m from the line seen in fig. 24 and continues for c. 115 m, being interrupted then by c. 180 m and continuing again for c. 160 m (see fig. 25). These tracks belong to those I’ve found by drawing a straight line between the already known sections of the road and examining thoroughly the line with satellite images. They are so pale and similar to other lines appearing in the field that otherwise they would easily have been left unnoticed.

Figure 25. The continuation of the track of the ancient Via Salaria at the end of the twelfth mile in a satellite image (29.3.2012). The blue arrows are drawn to help in the perception of the track. The track in the lower left corner of the image and marked with red is the final part of the track in fig. 24 and the track in the upper right corner is the one shown in fig. 26. The image is from Google Earth (https://maps.google.fi/?mid=1365625611), and it’s oriented north-up.

The estimated location of the 12th milestone is at c. 165 m from here (see map 13). The gradient of the road line between the 9th and 12th milestones remains gentle, at a maximum of 3.5% (see profile 9), which is naturally quite logical, because for the whole section the road stays on the plain of the Tiber valley without having to climb any hills.
2.3.4 The 13th, 14th and 15th mile

At the beginning of the 13th mile, continuing on the line observed before, at c. 160 m from the estimated position of the 12th milestone, there is a c. 85 m long section of the road, clearly visible in a satellite image (see fig. 26).

![Figure 26. The continuation of the track of the ancient Via Salaria c. 160 m NE from the estimated position of the twelfth milestone in a satellite image (11.9.2009). The image is from Google Earth (https://maps.google.fi/?mid=1365625611), and it's oriented north-up.](image1)

The next section is somewhat uncertain and it could also be a result of more recent activity. It is approximately on the same line c. 590 m further (see fig. 27), although the orientation of the line deviates with a few degrees, which is possibly connected with a change in the course of the road to avoid excessive proximity to a meander of the Tiber at the height of the estimated position of the 14th milestone (see map 14). With no other information available on the road line in the area the section can be supposed to prove for the course of the ancient road until proven contrary. The estimated position of the 13th milestone is at the level of km 22 of modern Via Salaria and c. 505 m further NE, when continuing on the same line (see map 14).

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269 In map 14 one can also discern an oxbow lake caused by the meandering of the river. Of course it must also be remembered that 2000 years ago the course of the river may well have been different.
On the fourteenth mile I have found no trace of the ancient road line. Neither is there any archaeological data related to the road.\textsuperscript{270} The road line has to be drawn by taking as a point of reference a mention of F. Gori from the middle of the 19\textsuperscript{th} century. According to him polygonal limestone blocks related to the pavement and crepidines of the ancient road were seen at the height of km 23.5 of the modern Via Salaria at a point, where a road turns from it towards Monterotondo. It is noteworthy that up to this point all the paving material has been of basalt whereas from this point forwards it is of limestone.\textsuperscript{271} The junction is also the location for the estimated position of the 14\textsuperscript{th} milestone. A

\textsuperscript{270} C. Pala (1976: 154) mentions that slabs of volcanic basalt have been witnessed east from km 22.75 of the modern road, but not \textit{in situ}. In addition in an image (7/2008) in Google Street View there seems to be a single lump of limestone of unknown origin lying on the field in Via Val Pusteria at Monterotondo c. 8 m NW from the hypothetical road line and c. 270 m from the estimated position of the 13th milestone (see map 14).

\textsuperscript{271} Gori 1863: 31; Quilici 1994: 91.
further argument for a route of the ancient road closer to the modern one on this section could be that since the ancient road line can’t be perceived in satellite images, it could well be hidden under and destroyed by the building activity in the area (see map 14).

After reaching the crossroads to Monterotondo and passing the meander of the river, the road turns more to the north. The exact route on the 15th mile is anyhow again highly hypothetical, because the only piece of information proper to the 15th mile is a short (c. 27 m) line in the field at the height of km 24 of the modern road heading towards the finding place of the 18th milestone (see fig. 28). The estimated position of the 15th milestone is, as the route here, extremely hypothetical (see map 14). The gradient of the road between the 12th and 15th milestones remains gentle except for the proximity of the 14th milestone, where it reaches a high figure of 10.1 % (see profile 10), when the road climbs towards the intersection of modern Via Salaria and the road to Monterotondo. This could also be an argument against drawing the road line based on the imprecise mention by Gori, and on the other hand on behalf of a route closer to the river, but with no better information available there is no reason to reject the proposed route, because the gradient of 10.1% remains still within the limits witnessed elsewhere on Roman roads.

Figure 28. A possible remainder of the track of the ancient Via Salaria on the 14th mile in a satellite image (11.9.2009). The image is from Google Earth (https://maps.google.fi/?mid=13656256111), and it’s oriented north-up.
2.3.5 The 16th and 17th mile

As on the 15th mile, on the 16th and 17th miles the ancient road line is to be reconstructed based on very scarce evidence. Close to km 26.2 of the modern road (see map 15) there are two short lines heading towards the finding place of the 18th milestone (see fig. 29). The first is c. 20 m and the second c. 16 m long. Although it is hard to use satellite images in giving accurate measures, their width seems to be between 4-5 m, conforming thus with the canonical width witnessed elsewhere on Roman roads (see chapter 1.2.2). It must be admitted that as the two short, pale lines have the same orientation as the furrows in the field, they are somewhat questionable and no firm evidence on the road line. Nonetheless, they fall approximately on the same line and have the same orientation as the next section of the road (at the end of the 17th mile), which appears, although pale, somewhat firmer. The estimated position of the 16th milestone is just before the first one of these two short lines (see map 15).

![Figure 29. Two possible remainders of the track of the ancient Via Salaria on the 17th mile in a satellite image (17.6.2013). The image is from Google Earth (https://maps.google.fi/?mid=1365625611), and it's oriented north-up.](image)

272 This is also the case with the other sections of the road seen in satellite images, when measurable.
The beginning and the end of this section at the end of the 17th mile can’t be clearly defined, but its approximate length is 240 m (see fig. 30). It is on the same line as the next section on the 18th mile, found by L. Quilici in the 1980s (see next chapter). The estimated position of the 17th milestone is c. 280 m from here (see map 15). The gradient of the road line remains gentle throughout the 16th and 17th mile with a maximum at 3.5% (see prof. 11).

Figure 30. Continuation of the track of the ancient Via Salaria on the 17th mile in a satellite image (13.4.2003). The image is from Google Earth (https://maps.google.fi/?mid=1365625611), and it’s oriented north-up.

2.3.6 The 18th mile

A clear, c. 340 m-long section of the ancient road line is visible in a satellite image from July 2012 at the proximity of the finding place of the 18th milestone (see fig. 31). It is the same one noticed already by L. Quilici in an aerial photo from 1985. Quilici also remarks that on the field, corresponding with the line, pieces of limestone and basalt abound. Based on this Quilici proposes a rectilinear route for the ancient road from between c. km 26.5 and km 30.47 of the modern road. He suggests that the line continued straight
through the river\textsuperscript{273}, which doesn't anyhow exactly match with the information there is on the finding place of the 18\textsuperscript{th} milestone.

Figure 31. The track of the ancient Via Salaria on the 18\textsuperscript{th} mile in a satellite image (20.7.2012). The image is from Google Earth (https://maps.google.fi/?mid=1365625611), and it’s oriented north-up.

\textsuperscript{273}Quilici 1994: 91-93.
The 18th milestone (fig. 32) was found in 1910, when the floods had made a part of the left bank of the Tiber collapse at the riverbend at c. 300 m from the road workers’ house (casa cantoniera) Casa Cotta in Montelibretti (see fig. 34). Together with the milestone a section of the ancient road was found at 2 m below the ground. The pavement was of limestone and bordered by travertine crepidines. The travertine milestone, 2.1 m high and with a diameter of 0.68-0.7 m, was on the right side of the ancient road, on a base made of two blocks of travertine. It bears an inscription of emperor Nerva, referring to AD 97.274

Regarding the finding place Ashby states (referring to personal information from Pasqui) that the milestone was found 250 m NE from the old Osteria Pedocchi.\textsuperscript{275} The problem for the reviewal of the finding place is that there no longer is Osteria Pedocchi. According to Martinori, Osteria Pedocchi was at the river bank at 29.1 km, called also Osteria Creta and precisely at the turning point to Montelibretti.\textsuperscript{276} However, the crossroads to which Martinori refers is nowadays exactly at km 29.3. The crossroads is probably a more reliable point of reference: if the modern kilometer posts don’t conform to those in the 1930s, the turning point is anyhow at the same place, as can be deduced from a map of the early 20\textsuperscript{th} century (see fig. 33) and modern satellite images. As Ashby, also Martinori mentions that the milestone was found at c. 250m NE from Osteria Pedocchi.\textsuperscript{277}

In the 1980s Quilici witnessed a layer consisting of pieces of basalt, limestone, tufa blocks and bricks beginning at 3-3.5 m below modern level at the riverbank 75 m from the turning point to Montelibretti (see fig. 34). Due to a landslide (which is still visible in Google Earth’s satellite images) the layer continued to the river. It is probable that Osteria Pedocchi was constructed on the riverbank using the ancient Via Salaria as a foundation; both now subsided to the river due to the meandering river channel.\textsuperscript{278} The osteria in question is probably the one appearing almost in the middle of the river in the map used by T. Ashby (see fig. 33). This place matches also with the information given by Quilici.

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\textsuperscript{275} Ashby 1912: 222-223; Ogilvie 1965: 71.
\textsuperscript{276} Martinori 1931: 45.
\textsuperscript{277} Martinori 1931: 46.
\textsuperscript{278} Quilici 1994: 92.
Figure 33. A detail from the map used by T. Ashby (from Ashby 1906: map 1). The probable Osteria Pedocchi is circled with red.

Since the data is not more specified I have outlined the area, where the exact finding place must have been (see fig. 34). The westernmost limits of the area are at c. 250 m from the level of the crossroads and the easternmost limits c. 250m from the landslide, where Osteria Pedocchi most likely was before crashing to the river. It is not certain how exact the description “NE” is to be taken, but according to Pasqui the milestone was found from the riverbank. Comparing the map used by Ashby (see fig. 33) with the modern situation (for example fig. 34) it is safe to say that the course of the river hasn’t changed too much in 100 years to be able to assume that the modern river bank is approximately at the same place as it was in 1910. The finding place, then, is probably the river bank at the curve of the river NE from Osteria Pedocchi (see fig. 34). This is also where the river is at its closest to the casa cantoniera, although at its closest the house is at c. 390m (and not c. 300m as Pasqui wrote in 1910) from the river bank.
Figure 34. The area around the finding place of the 18\textsuperscript{th} milestone. The milestone was found within the area bordered with white. The image (17.6.2013) is from Google Earth (https://maps.google.fi/?mid=1365625611), and it’s oriented north-up.

On the 19\textsuperscript{th} mile, c. 240 m NW from the casa cantoniera, there is a short (c. 30 m), pale line (4-5 m wide) visible in a satellite image (see fig. 35) that can be used in defining the course of the road at the end of the 18\textsuperscript{th} and at the beginning of the 19\textsuperscript{th} mile, as well as the estimated position of the 18\textsuperscript{th} milestone (see map 16). The accuracy is remarkable. The road line as proposed in this thesis brings the estimated position of the 18\textsuperscript{th} milestone to the riverbank almost exactly in the middle of the area, where the milestone was found in 1910.
Figure 35. A possible section of the ancient Via Salaria on the 19th mile in a satellite image (21.3.2012). The image is from Google Earth (https://maps.google.fi/?mid=1365625611), and it's oriented north-up.

Considering the meandering nature of the Tiber, in antiquity the road might not have passed as close to river as it does now (see map 16). At the 18th milestone the road was anyhow quite close to the river, and taking the “ghost” of the road in figure 35 as valid, it is possible to deduce that the 30° change in the direction of the road just before the 18th milestone (see map 16) is probably due to the river. Why was the road brought this close to the river? A possible explanation could be found on the other bank, at c. 3.6 km NW from the point where the road makes the 30° turn towards the 18th milestone. There was a connection across the Tiber between Eretum and Lucus Feroniae (see map 16), an important place of worship of the goddess Feronia and later also a colony for the veterans of Caesar. Can this location on the ancient Via Salaria have acted as the

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279 The distance between Roma and Eretum varies in ancient itineraries: Tabula Peutingeriana shows Eretum at 14 (XIII) miles from Fidenae, which, taking into account the distance of 5 miles between Rome and Fidenae, proposed also in this thesis, makes 19 miles; Itinerarium Antoninianum shows Eretum at 18 miles from Rome (CIL 9, p. 204). Also ancient authors have preserved information on the location of Eretum: Strabo writes (5, 3, 1 – see note 127) that Via Nomentana joins to Via Salaria at Eretum, which he describes as a Sabine city by the Tiber. Dionysius of Halicarnassus (11, 3) mentions that Eretum was 140 stades (~17.5 miles) from Rome. From Dionysius we also learn that the area surrounding Eretum saw many fierce battles fought between the Romans and the Sabines, one of them at 160 stades (~20 miles) from Rome (D.H. Ant. Rom. 3, 32; 3, 59; 4, 3; 4, 51; 5, 45). The site of Eretum has been located by archaeologists to the hills NE from the 18th milestone (see map 16 and Ogilvie 1965).

280 Cornell 1995: 310; Ogilvie 1965: 72. Livy writes that Hannibal turned to Lucus Feroniae at Eretum on his way from Reate to Rome (Liv. 26, 11). It is evident that the road used by Hannibal was Via Salaria.

crossing point to Lucus Feroniae? With the help of satellite images I have been able to discern two possible sections of a road connecting the suggested crossing point with Lucus Feroniae (see figures 36 & 37 and map 16).

Figure 36. A possible section of the road connecting the ancient Via Salaria with Lucus Feroniae. The image (30.9.2010) is from Google Earth (https://maps.google.fi/?mid=1365625611), and it’s oriented north-up.

The point is actually also one of the points where the line of Via Salaria is at its closest to Lucus Feroniae. The road line gets c. 200 m closer to Lucus Feroniae on the 19th mile, but at least the modern situation reveals that the plain NNW from the 18th milestone is vulnerable to floods (see for example map 16). After this, on the 19th mile, the road turns away from the Tiber and heads inland. Considering Quilici’s observation of how the layer of archaeological material continues to the river: could it even be that there has been a stone bridge at the site? A recently founded Roman colony on the other side of the river (i.e. Colonia Iulia Felix Lucoferensis) would at least have offered a logical reason for building a more permanent bridge here.
As regards the gradient of the road, on the 18th mile it remains gentle, at a maximum of 3.2% (see profile 12).
CONCLUSIONS

The main aim of this thesis was to reconstruct the road line of the ancient Via Salaria with the help of archaeological and cartographical evidence. The starting point was set at Porta Collina and the final point at the 18th milestone of the road, both found in situ. In the proximity of Rome archaeological data abounds, but in the countryside the actual archaeological evidence becomes scantier. On this part of the road the satellite images turned out to be invaluable help for the progress of the work. Even sections never noticed before were perceived. This helped to define the alignment of the ancient road line more precisely than done before. The accuracy is confirmed by the congruence of the finding place of the 18th milestone with the stone’s estimated position produced by the road line reconstructed in this thesis.

On the section under study there is only scarce archeological data on the width of the ancient road. It is not certain if the width of 5.2-5.5m (equaling 19-20 Oscan ft) sketched in Lanciani’s Forma Urbis at the proximity of Porta Collina and Porta Salaria is based on actual archaeological evidence. The width of Porta Salaria itself seems to coincide with the “canonical” width encountered on other ancient Roman public roads, 4.2 m (=c. 14 Roman ft). The pavement found on the sixth mile in 1984 is c. 4 m (= c. 13.5 Roman ft) wide, but unfortunately we don’t have an exact figure. Other sections of the road line studied in this thesis have only been preserved or excavated partly and cannot thus be used in generalizations concerning the width of the road. The proof offered by findings beyond the 18th milestone seems anyhow to point out to the use of the 25.7 cm and the 27.5 cm foot as the basic unit, when the road was constructed. These sections seem thus to have been constructed before the pes monetalis became a standard and the width of the road seems to have been designed to around 20 ft, not 8 or 16 as asserted in the Law of the Twelve Tables (albeit to be precise for private roads).

The canonical Roman road is straight as an arrow and planned to reach its final destination with a line as short as possible conquering all the natural and cultural obstacles on its way. Via Salaria both does and doesn’t follow this scheme. On the section under study in this thesis the road clearly takes into account the topographical and natural conditions, of which the flood-prone river Tiber is the most challenging one, but strives at the same time to fulfill the principle of “the lowest gradient on a line as straight as possible”. When considering the feats in engineering, it is remarkable that
two of the known tunnels from Roman era on Italian soil are situated at the section studied in this thesis. This tells about the importance Via Salaria had for the Romans.

Roman roads were probably measured with the help of a hodometer and a milestone was erected exactly on every mile. The reconstruction of the ancient road line proposed in this thesis suggests that the mile measure on the ancient Via Salaria nears the standard value of 1478.5 m. To get a more precise result, the finding place of the 18th milestone would be needed to be defined more accurately than it is possible with the information available.

The gradient of the road line was a question to consider for the Roman road planner. The steepness of the ancient Via Salaria fits in with the gradients measured on other Roman roads, the maximum gradient on the section under study being 10.1%. It must anyhow be noticed again that the figures in this thesis are based on modern topographical situation, not the ancient one.

As regards to how deep beneath the modern level the ancient road is to be sought, in Rome the findings of the pavement have occurred between 0.45 m and 1.16 m, whereas the 1st century BC mausoleum of Lucilius Paetus was buried under later graves already in antiquity and is nowadays at the depth of 6.6 m. It seems thus that the road itself is not buried as deep as the structures bordering it. The remains of the side road that connected Via Salaria Vetus and Via Salaria Nova were found at 3.5 - 4.8 m below the modern level, which is probably due to the fact that the road was left out of service already in the later half of the 3rd century, when the Aurelian wall cut it in two. Further away from the historic center of Rome, the mausoleum at the proximity of the 3rd milestone was found at 4 m below the modern level. On the sixth mile the road pavement has been found at 2 m, 1.3 m and only 0.3 m below the modern level, all the three findings being located at a short distance between each other. In the Tiber valley the average sediment deposition is generally 5 - 8 m, testified for example by the mausoleum at the proximity of the 12th milestone, found at 5 m below the modern level. The stone commonly accepted as the 10th milestone of the road makes an anomaly though, as it was found at only 0.7m below the modern level. The findings of the road

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282 It is also noteworthy that the widths of the road encountered in this thesis seem to coincide better with the Oscan foot, whereas the length of the road seems to have been measured using the Roman foot as a basic unit. This was certainly the case at the time of Augustus – the existing road was thus probably not systemically widened in the Late Republican – Imperial periods.
pavement itself in the Tiber valley are scarce, but the pavement found together with the 18th milestone was at 2 m below the modern level. The findings indicate thus that the ancient road pavement is at 0.3 - 2 m below the modern level.

Via Salaria appears to have been paved for the whole section studied in this thesis: up till the 14th milestone with basalt and from there on with limestone. Earlier layers of gravel pavement have also been found which proves for an early date of the first construction of the road. These have been found both on the route of the Via Salaria Vetus and Via Salaria Nova, which proves that contrary to the name, the former wasn’t necessarily an earlier version of the road than the latter.

The road itself is of a proto- or even prehistoric origin, but the first phase of its building by Romans possibly dates back to the beginning of the 3rd century BC, when the areas inhabited by the Sabines had been conquered. This happened thus long before the reign of Augustus, when the first accurately datable (on the basis of the remaining milestones bearing his name) phase of building of Via Salaria by the Romans took place.

The archaeological record shows that in Rome up till Ponte Salario the ancient Via Salaria used the route now covered by the roads Via Piave, Via Salaria and Via di Ponte Salario. There is a discrepancy at the proximity of the first milestone, but it is probably due to an error in marking made by A. Pasqui – nonetheless, if the road line was drawn taking it into account, the estimated position of the 18th milestone would still remain within the area, where the milestone actually was found. This would also bring the intersection of Aqua Virgo with Via Salaria quite exactly to the spot, where the second milestone would have stood, which seems like a potential methodical option. However, this is left in this thesis at the level of mere speculation.

From the so called mausoleum of Marius at the proximity of Ponte Salario up till the hill of Fidenae the ancient road ran on the eastern side of the modern one, escaping thus the extreme proximity to the river on the fifth mile. This is anyhow based on very scarce archaeological data. Quilici & Quilici Gigli propose a different line, closer to the river. Choosing this option would need the estimated positions of the milestones to be moved 64 m closer to Rome than proposed in this thesis. As regards the 18th milestone, the shift of 64 m would move its position to the edge of the area framed as the stone’s finding place. This is only c. 150 m from the probable location of the Osteria Pedocchi.
This seems unlikely, although still possible regarding the ambiguity in the exact location of the former osteria, now presumably sunken in the river.

On the sixth mile the archaeological record on the ancient road line is abundant, contributing thus for a more accurate reconstruction of the ancient route than on the fourth and fifth miles. There are three separate findings of the paving of the road as well as a retaining wall proving that on this section the ancient road ran extremely close to the river. On the seventh and eighth miles the most important points of reference are the section of the ancient road pavement found at the junction from modern Via Salaria to G.R.A. and the bridge of Malpasso, constructed at the same place, where an ancient bridge was still seen in the beginning of the 19th century. Apart from these, the archaeological evidence remains scarce up till the hill of Casale della Marcigliana on the ninth mile, where there is a tunnel dating back presumably to the Augustan era.

Although on the remaining nine miles the archaeological evidence becomes even scarcer, a succession of straight lines visible in several satellite images, starting at c. 880 m NE from the northern entrance of the tunnel gives firm proof for the route of the ancient road line on the 10th - 18th miles. The ancient road is visible in twelve separate sections between the Tiber and the modern Via Salaria. When combined, the sections form a straight line with only a small deviation for example in locations extremely close to the river. Some sections perceived in the satellite images appear somewhat doubtful, but the congruence of the road line produced with their help with the finding place of the 18th milestone proves on behalf of their validity.

It also proves correct the hypotheses represented earlier concerning the route of the road line: on the fifth mile the road probably didn’t follow the route proposed by Quilici & Quilici Gigli (chapter 2.2.1.), but ran further from the river (map 9). As regards the tunnels built on the 8th and 9th miles (maps 11 & 12) probably in the Augustan era, the principal road line remained as the one used, when measuring the road and placing the milestones. As regards the place, where the possible 10th milestone of the road was found, the road line reconstructed in this thesis supports the view that the 10th milestone of the road should have originally stood at c. km 17.45 of the modern road, not at km 17.7. The few sections of the road on 15th - 17th miles that were found uncertain in the text above (chapters 2.3.4 & 2.3.5) also gain validity from the result. It is as well

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283 The other option would be to treat this as only fool’s luck and pure serendipity: all the hypotheses are mismatched in a proportion to bring forth the right results.
evident that even though the only point of reference for the road line on the 14th mile is an imprecise mention made by F. Gori in the mid-19th century (chapter 2.3.4), also scarce and imprecise information can help in arriving at a correct result, when used with consideration.

As regards the exact place, where the 18th milestone was found in 1910, the precise location cannot be defined with the information available, but sufficient accuracy can be reached by combining the data as presented in this thesis. Apparently one-meter-sharp accuracy can’t even be reached, but on a ten meter scale the place in question is exactly at the curve the river makes at the estimated position of the 18th milestone.

The remarkably accurate congruence of the estimated position of the 18th milestone with the actual finding place of the stone proves for the validity of the road line as presented in this thesis. Google Earth with its collection of satellite images has proven as an applicable tool for the search of ancient road lines in general. Over eight miles of the ancient Via Salaria could be reconstructed with the help of 13 satellite images. The accuracy gained by using them is astonishing. The best way to prove the certainty of the reconstructed route would naturally be archaeological excavation (e.g. test pits) on selected sections of the road. The proposed site for the crossing to Lucus Feroniae needs also further examination. Can the hypothesis presented in this thesis be proved archaeologically?

The congruence of the estimated position of the 18th milestone with the finding place of the stone also means that the road line presented in this thesis can be used as a cogent point of reference in later studies on the ancient road line of Via Salaria. The congruence also bashes the presumption according to which the miles on Via Salaria would differ from the standard value of 1478.5 m. This brings usable aid for further studies on Roman road building and especially for the studies on the practical application of the devices used in measuring them (e.g. the Vitruvian hodometer).
BIBLIOGRAPHY

Ashby, T. 1927. The Roman Campagna in Classical Times. London. [online] http://babel.hathitrust.org/cgi/pt?id=mdp.39015046383348;page=root;view=1up;size=100;seq=7;orient=0;num=3 (29.10.2012)
Bedini, A. 1990. ‘Un compitum di origine protostorica a Tor de Cenci.’ in Archeologia Laziale 10, Roma, 121-133.
Carta archeologica di Roma 2 = Carta archeologica di Roma, tavola II, a cura della commissione per la carta archeologica d’Italia con la


Ghislanzoni, E. 1913. 'Via Ostiense.' in Notizie degli Scavi di Antichità 1/1913, Roma, 8-9.


Kuusela, J., Ikäheimo, J. & Jarva, E. Submitted. 'The Allia Battlefield. A Study of a Battle of the Early Roman Republic.' (Submitted for publication.)


Laurence, R. 2004. 'The economic exploitation of geological resources in the Tiber valley: road building.' in H. Patterson (ed.) Bridging the Tiber: Approaches to regional archaeology in the Middle Tiber Valley.


Nibby, A. 1837. *Analisi storico-topografico-antiquaria della carta de’ dintorni di Roma*, 1, Roma. [online]  
http://books.google.fi/books?id=eUUPAAAAQAAJ&printsec=frontcover &hl=fi&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false  
(14.1.2014)


[online]  
http://archive.org/stream/pompeianischestu00nissiala#page/n9/mod e/2up (22.11.2012)


Palma, N. 1833. ‘Di una iscrizione relativa ad una strada del Pretuzio.’ in *Bullettino dell’Instituto di corrispondenza archeologica per l’anno 1833*, Roma, 100-102. [online]  
http://www.archive.org/stream/bullettinodellin1833inst#page/100/ mode/2up (2.5.2010)


http://archive.org/stream/notiziedegliscav07realrich#page/166/mod e/2up (25.8.2013)

http://archive.org/stream/notiziedegliscav09realrich#page/198/mod e/2up (25.8.2013)


Seeck, O. 1920. ‘Salaria via.’ in Paulys Realencyclopaedie der Klassischen Altertumswissenschaft, 1A:2, Stuttgart, 1845-1846.


Wiseman, T. 1970. 'Roman Republican Road Building.' in *Papers of the British School at Rome* 38, 122-152.


Map 1. The road line of Via Salaria between Porta Collina and the mausoleum of Lucilius Paetus. The road is marked as a red line and the separate archaeological finds connected with it with yellow pins. The map is from Google Earth (https://maps.google.fi/?mid=1365625611), and it's oriented north-up.
Map 2. The road line between the mausoleum of Lucilius Paetus and the estimated position of the first milestone. The road is marked as a red line and the archaeological finds connected with it with yellow pins. The small red pins indicate separate graves and the hexagon the grave located by A. Pasqui to 10 m distance from the road line. The estimated position of the 1st milestone is marked with a white arrow. The map is from Google Earth (https://maps.google.fi/?mid=1365625611) and it’s oriented north-up.
Map 3. The alternative route of the road at c. 1 mile. The road is marked as a red line, the alternative route as a blue line and the archaeological finds connected with the road with yellow pins. The small red pins indicate separate graves and the hexagon the grave located by A. Pasqui to 10 m distance from the road line. The estimated position of the 1st milestone is marked with a white arrow. The map is from Google Earth (https://maps.google.fi/?mid=1365625611) and it's oriented north-up.
Map 4. The road line between the first milestone and the catacombs of Sant'Illaria. The road is marked as a red line and the separate archaeological finds connected with it with yellow pins. The small red pins indicate separate graves. The estimated position of the 1st milestone is marked with a white arrow. The map is from Google Earth (https://maps.google.fi/?mid=1365625611), and it's oriented north-up.
Map 5. The road line between the catacombs of Sant’Ilaria and the estimated position of the second milestone. The road is marked as a red line and the separate archaeological finds connected with it with yellow pins. The yellow dot indicates the place where the lines of the ancient road and the aqueduct Aqua Virgo met. The estimated position of the 2nd milestone is marked with a white arrow. The map is from Google Earth (https://maps.google.fi/?mid=1365625611), and it’s oriented north-up.
Map 6. The road line on the third mile. The road line is marked with red, the road line proposed by Fusco in blue and the separate archaeological finds connected with them with yellow pins. The area covered by the site of ancient Antemnae is marked with yellow. The estimated positions of the milestones are marked with a white arrow. The map is from Google Earth (https://maps.google.fi/?mid=1365625611), and it’s oriented north-up.
Map 7. The first three miles of ancient Via Salaria with the archaeological finds related to it. The map is from Google Earth (https://maps.google.fi/?mid=1365625611), and it's oriented north-up.
Map 8. Via Salaria Vetus (in yellow) and Via Salaria Nova (in red). The discontinuous yellow line indicates the separate findings of the side road that connected the Vetus and the Nova by passing through the burial area of Sepolcreto Salario, which was located between the two roads and bordered from south by the Aurelian wall and reaching in north up to the area of the mausoleum of Lucilius Paetus. The map is from Google Earth (https://maps.google.fi/?mid=1365625611), and it's oriented north-up.
Map 9. The fourth and fifth mile of ancient Via Salaria. The estimated positions of the milestones are marked with white arrows. The road is marked as a red line and the separate archaeological finds connected with it with yellow pins. The alignment of Torre Seprpentara is marked with a yellow square. The alignment of the road proposed by Quilici and Quilici Gigli is marked as a purple line and the estimated positions of the milestones on it with the letter Q. The map is from Google Earth (https://maps.google.fi/?mid=1365625611), and it’s oriented north-up.
Map 10. The sixth mile of ancient Via Salaria. The estimated positions of the milestones are marked with white arrows. The road is marked as a red line and the separate archaeological finds connected with it with yellow pins. The boundaries of Fidenae (in yellow) as presented in di Gennaro & al. 2001: 199. The map is from Google Earth (https://maps.google.fi/?mid=1365625611), and it's oriented north-up.
Map 11. The seventh and eighth mile of ancient Via Salaria. The estimated positions of the milestones are marked with white arrows. The road is marked as a red line and the separate archaeological finds connected with it with yellow pins. The ditches Fosso della Bufalotta and Fosso di Malpasso are marked with dark and light blue, respectively. The map is from Google Earth (https://maps.google.fi/?mid=1365625611), and it's oriented north-up.
Map 12. The ninth mile of ancient Via Salaria. The estimated positions of the milestones are marked with white arrows. The road is marked as a red line and the separate archaeological finds connected with it with yellow pins. In addition to the principal road line also the tunnel under the Casale della Marcigliana and the hollow leading to it are marked with red. The map is from Google Earth (https://maps.google.fi/?mid=1365625611), and it’s oriented north-up.
Map 13. The 10th, 11th and 12th mile of ancient Via Salaria. The estimated positions of the milestones are marked with white arrows. The road is marked as a red line (thicker, where it is discernible in satellite images) and the separate archaeological finds connected with it with yellow pins. The site of ancient Crustumerium (the yellow line) as presented in di Gennaro 1999: 27. The course of Fosso Maestro parallel to the ancient road is marked as a blue line. The map is from Google Earth (https://maps.google.fi/?mid=1365625611), and it's oriented north-up.
Map 14. The 13\textsuperscript{th}, 14\textsuperscript{th} and 15\textsuperscript{th} mile of the ancient Via Salaria. The estimated positions of the milestones are marked with white arrows. The road is marked as a red line (thicker, where it is discernible in satellite images) and the locations referred to in text with yellow pins. The map is from Google Earth (https://maps.google.fi/?mid=1365625611), and it’s oriented north-up.
Map 15. The 16th and 17th mile of the ancient Via Salaria. The estimated positions of the milestones are marked with white arrows. The road is marked as a red line (thicker, where it is discernible in satellite images) and the locations referred to in text with yellow pins. The map is from Google Earth (https://maps.google.fi/?mid=1365625611), and it’s oriented north-up.
Map 16. The 18th mile of the ancient Via Salaria. The estimated positions of the milestones are marked with white arrows. The road is marked as a red line (thicker, where it is discernible in satellite images) and the locations referred to in text with yellow pins. Eretum as in Ogilvie 1965: plate 38. The possible road line from Via Salaria to Lucus Feroniae is marked with blue (thicker, when discernible in satellite images). The finding place of the 18th milestone is within the area bordered with white. The map is from Google Earth (https://maps.google.fi/?mid=1365625611), and it’s oriented north-up.
Map 17. The road line of the ancient Via Salaria from Porta Collina to the 18th milestone. The thicker sections are those visible in satellite images. The map is from Google Earth (https://maps.google.fi/?mid=1365625611), and it's oriented north-up.
Map 18. The location of Porta Collina in Rome. The map is from Google Earth (https://maps.google.fi/?mid=1365625611), and it's oriented north-up.
Profile 1. The gradient of the road line on the third mile. The profile is from Google Earth.
Profile 2. The gradient of the road line proposed by U. Fusco (2009) on the third mile. The profile is from Google Earth.
Profile 3. The gradient of the road line on the first three miles. The profile is from Google Earth (https://maps.google.fi/?mid=1365625611).
Profile 4. The gradient of the road line on the fourth-fifth mile. The profile is from Google Earth (https://maps.google.fi/?mid=1365625611).
Profile 5. The gradient of the road as proposed by Quilici & Quilici Gigli between the mausoleum of Marius and Fidenae. The profile is from Google Earth (https://maps.google.fi/?mid=13552551).
Profile 6. The gradient of the road line on the sixth mile. The profile is from Google Earth.

[Profile Image]

[Google Earth Profile Link](https://maps.google.fi/?mid=1365625611)
Profile 7. The gradient of the road line on the 7th and 8th miles. The profile is from Google Earth (https://maps.google.fi/?mid=13656256111).
The gradient of the road line on the 9th mile. The profile is from Google Earth.
Profile 9. The gradient of the road line on the 10th, 11th, and 12th mile. The profile is from Google Earth (https://maps.google.fi/?mid=1365623511).
Profile 10. The gradient of the road line on the 13th, 14th and 15th mile. The profile is from Google Earth.

[Profile link: https://maps.google.fi/?mid=13656256111]
The gradient of the road line on the 16th and 17th mile. The profile is from Google Earth (https://maps.google.fi/?mid=13656256111).
Profile 12. The gradient of the road line on the 18th mile. The profile is from Google Earth.

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