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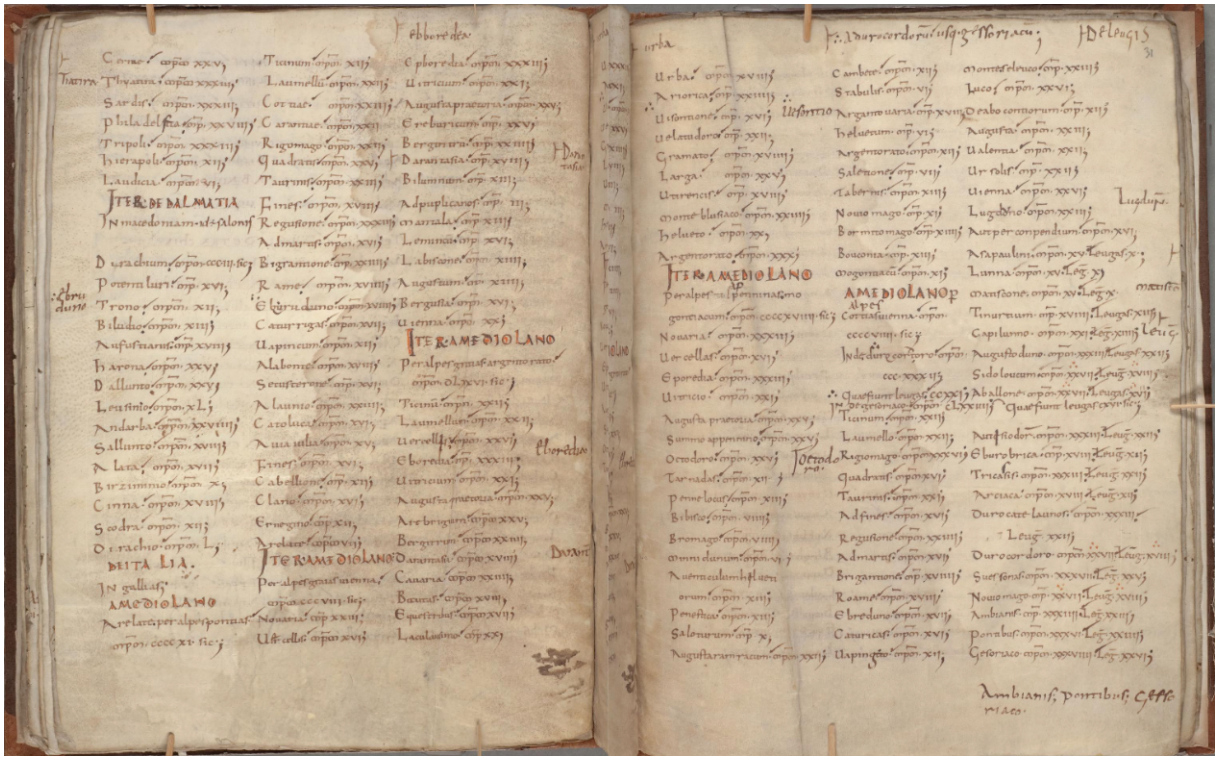
The accuracy of road distances in the Antonine itinerary



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Abstract

The Antonine itinerary was compiled in the early fourth century CE and is a key source to our knowledge about ancient geography and the Roman road system. However, the major research work dates more than 100 years back in time and few studies have been focussed on its overall reliability. The aim of the present work is to assess the accuracy of the distance figures in the itinerary by internal validation, by comparisons with other ancient sources and with the modern map. Geographic and numerical patterns in the data are also analysed. The evaluation of internal consistency and numerical patterns indicates that the distance figures are to a certain degree imprecise and likely to have been derived by estimation rather than by actual measurement. Although the overall accuracy is good, there is a geographic variation and gross deviations occur as well. Using the itinerary should therefore take these aspects into account, and the imprecision makes it less meaningful to use the distance figures to scrutinise individual road stretches. However, if this imprecision is recognized then the itinerary gives a good description of the Roman road system. The comparable relative proportions of deviations for repeated road stretches and for the mile sums cannot be explained by errors in transmission. The authenticity of the itinerary is further confirmed by the specific numerical patterns occurring, which can also be seen from other ancient sources. It therefore seems likely that errors in transmission play much less role than previously assumed. This also means that the reconstructed archetype is likely to be close to the original compilation, and thus gives us a glimpse of the nature and quality of geographic information available in antiquity.

Introduction

Primary geographic information from antiquity is scarce and fragmented, but through surviving manuscripts we have two sources that provide us with an overview of the whole of the Roman Empire. These two are the Antonine itinerary (*Itinerarium provinciarum Antonini Augusti*) and the Peutinger map (*Tabula Peutingeriana*).[1] The Antonine itinerary is the focus of this work, and it describes a major part of the Roman road system;[2] through lists of more than 2,000 places names and the distance between these places, in total more than 70,000 km. Such geographic information is of key importance for our knowledge and understanding of ancient history and archaeology. The itinerary, together with the Peutinger map, provides the foundation for major descriptive works such as *Itineraria Romana* and the Barrington Atlas.[3] But surprisingly, the research on the Antonine itinerary itself is rather limited, and the accuracy in distance figures has been systematically evaluated only for the British part.[4] Despite this ignorance of the overall accuracy, information from the itinerary is used and referenced in thousands of scholarly texts.[5]

The aim of this work is to evaluate the accuracy of the road distances reported in the Antonine itinerary, through an internal validation of its consistency and through a comparison with external sources. A further aim is to evaluate the possible sources of errors or deviations and their relative importance. Specific research issues that will be addressed are:

1. The internal consistency, by comparing distance figures for repeated road stretches, and by comparing stated mile sums for routes with sums of the individual road stretches.
2. The accuracy (trueness and precision),[6] also by comparing selected distance figures from the itinerary with the Peutinger map and the modern map.[7]
3. Possible sources of errors and deviations, by studying the patterns of deviations and distances, both geographically and numerically.

[1] *It. Ant.*; *Tab. Peut.*
[2] The Antonine itinerary also contains a minor maritime part, that is not relevant for this work.
[3] Miller 1916; Talbert *et al.* 2000.
[4] Rivet & Jackson 1970.
[5] Estimate from literature searches with *Google Scholar* and *JSTOR*.
[6] Trueness is a metrological term used to define the absence of bias (systematic errors). Precision refers to the repeatability. Trueness and precision together define accuracy, the agreement between a measured quantity and a its true value.
[7] The distances selected for comparison are the same repeated road stretches as in the itinerary.

Material

The Antonine itinerary

The Antonine itinerary, "the itinerary" hereafter, has reached us through a number of manuscripts from the Carolingian revival and onwards. It may be that the itinerary has survived only through the copies of a single fourth century manuscript.[8] However, the number of manuscripts following is substantial. Löhberg identifies 25 manuscripts and discusses 18 in his dissertation.[9] The eight oldest surviving manuscripts are from the 7th to 10th century.

The first printed versions were published already in the 16th century, *e.g.*, the version by Vincent published in Lyon in 1560 (*Fig. 1*).[10]

Fig. 1: Two pages from Vincent's edition printed in Lyon around 1560.

The first scholarly edition was published by Wesseling in Amsterdam in 1735 and accompanied by an extensive apparatus of comments.[11] Wesseling's page and line numbering is used still today to identify the routes, places and distance figures in the itinerary.

[8] Kubitschek 1891, 178, 189; Wheeler 1920, 377.
[9] Löhberg 2010, 7-48.
[10] Vincent *It. Ant.*
[11] Wess. *It. Ant.*

The first modern version, with an attempt to textual criticism, was published in 1848 by the German scholars Parthey and Pinder.[12] They used twenty manuscripts, from the Carolingian revival up until the Renaissance, for their edition and lists several more. These manuscripts and their seemingly eclectic approach are presented in an extensive preface.[13] But they did not in detail analyse the relationships between the manuscripts nor scrutinize the key manuscripts.[14]

The perceived shortcomings in Parthey and Pinder's version led Kubitschek and Cuntz to use a more rigorous approach of textual criticism, based on stemmatics, in dealing with the manuscripts.[15] In their work, aiming to reconstruct an archetype, Kubitschek and Cuntz focused on the oldest surviving manuscripts.[16] In the finally developed stemma, six of the oldest manuscripts were included together with one from the Renaissance.[17] The Renaissance manuscript was primarily used to correct corrupted parts of a closely resembling 9th century manuscript.[18] The manuscripts are as follows.[19]

P Escorialensis R II 18 is a parchment manuscript from the 7th century, measuring 19.5 x 29 cm. It contains on folios 67-82 the routes 1,1-373,2 of the itinerary.[20]

D Parsinius Regius 7230A is a parchment manuscript from the 10th century, measuring 25 x 28.5 cm. It contains on folios 87-97 parts of the itinerary, routes 163,3-435,5.[21]

L Vidobonensis 181 is a parchment manuscript from the 8th century, measuring 17 x 24 cm. It contains on folios 26-60 the complete itinerary. It has been corrected in many places by two scribes in the ninth century (2L and 3L) and is therefore difficult to read.[22]

B Parisinus Regius 4807 is a parchment manuscript from the 9th century, measuring 17 x 24 cm. It contains the itinerary on folios 23-64. A folio that is missing (routes 452-

[12] P&P *It. Ant.*
[13] Parthey & Pinder 1848, viii-xxxiv.
[14] Cuntz 1929, iv.
[15] Stemma is a scheme used in textual criticism to show the interrelationships between manuscripts in relation to a hypothesised single archetype. For more details, see Maas 1960 and West 1973.
[16] Kubitschek 1891; Cuntz 1893.
[17] Cuntz 1929, v.
[18] Cuntz 1929, v-vi.
[19] The manuscripts are as usual in textual scholarship labelled with single letters (*sigla*). The numbering of routes and road stretches in the itinerary is based on the page and line numbers in Wesseling's printed edition (1735), see Wess. *It. Ant.*
[20] Parthey & Pinder 1848, xx-xxii; Cuntz 1893, 260-273; Cuntz 1929, iv; Löhberg 2010, 7-11.
[21] Parthey & Pinder 1848, xiv; Cuntz 1893, 273-285; Cuntz 1929, iv; Löhberg 2010, 21-22.
[22] Parthey & Pinder 1848, xvi; Kubitschek 1891, 193-194; Cuntz 1929, iv; Löhberg 2010, 12-13.

462) in Paris, is kept by the British Museum. A copy of this folio was given to Parthey and also used by Kubitschek and Cuntz.[23]

β Vindobonensis 12825 (formerly sup. 14) is a parchment manuscript from the 15th century, measuring 12 x 20 cm. It contains the complete itinerary on folios 25-76.[24]

R Florentinus Laurentianus 89 sup. 67 is a parchment manuscript from the 10th century, measuring 25 x 17.5 cm. It contains the complete itinerary on folios 13-32.[25]

C Parisinus 4808 is a parchment manuscript from the 12th century, measuring 19.4 x 27.5 cm. It contains the complete itinerary.[26]

The final stemma by Cuntz (*Fig. 2*), forms the basis for the current text critical edition of the itinerary.[27]

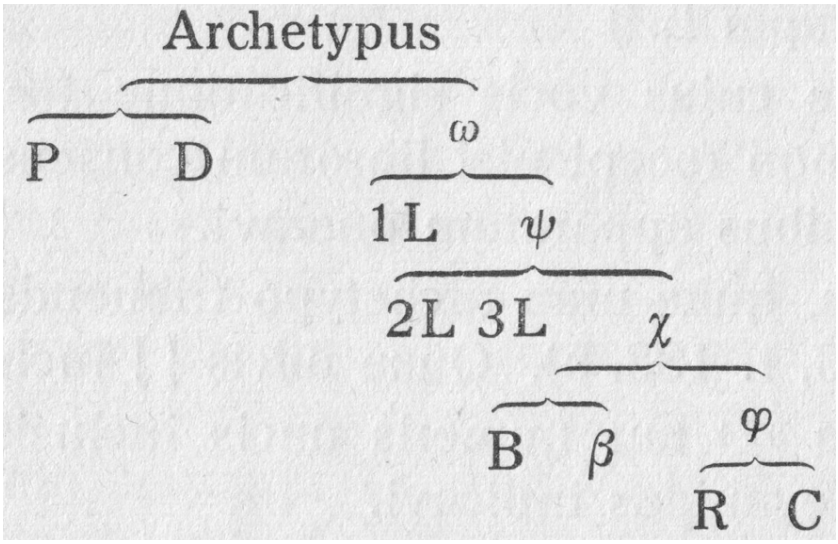


Fig. 2: Cuntz' stemma for the key manuscripts of the itinerary.

It can be noted that one 9th century manuscript seems to have been unknown to both Parthey and Pinder as well as Cuntz and Kubitschek, and that is the Ghent manuscript listed as *Cosmographia æthici : Va1* in the collection of Kungliga Biblioteket in Stockholm.[28] The title is a bit misleading since it refers only to the first of the five sections of the manuscript. The

[23] Parthey & Pinder 1848, xiii; Cuntz 1929, iv-v; Löhberg 2010, 21. A second folio also kept by the British Museum covers the maritime part of the itinerary.
[24] Parthey & Pinder 1848, xxviii; Cuntz 1929, v; Löhberg 2010, 27.
[25] Parthey & Pinder 1848, xxii; Cuntz 1929, v; Löhberg 2010, 13-14.
[26] Parthey & Pinder 1848, xiii-xiv; Cuntz 1929, v; Löhberg 2010, 23-24.
[27] Cuntz 1929, v.
[28] A copy of this manuscript was, however, known to both Parthey and Pinder, and Cuntz and Kubitschek as the Torini manuscript. See Parthey & Pinder 1848, xv-xvii; Kubitschek 1891, 179.

second section contains the complete itinerary, with only two minor gaps. It should also be noted that this manuscript is the outcome of a writing exercise, but the text seems to be meticulously checked so that the reliability may still be good.[29]

Although Cuntz and Kubitschek had worked together on the manuscripts, the new text critical edition, which was published by Teubner in 1929, had Cuntz as its sole editor.[30] This edition is also accompanied by an index by Cuntz and a map by Kiepert. Kiepert's map outlines the road system described in the itinerary (*Fig. 3*). The preface is brief and likewise the footnotes, but Cuntz transparently shows the sometimes-difficult decisions in assigning the spelling of names and selecting the distance figures to include.

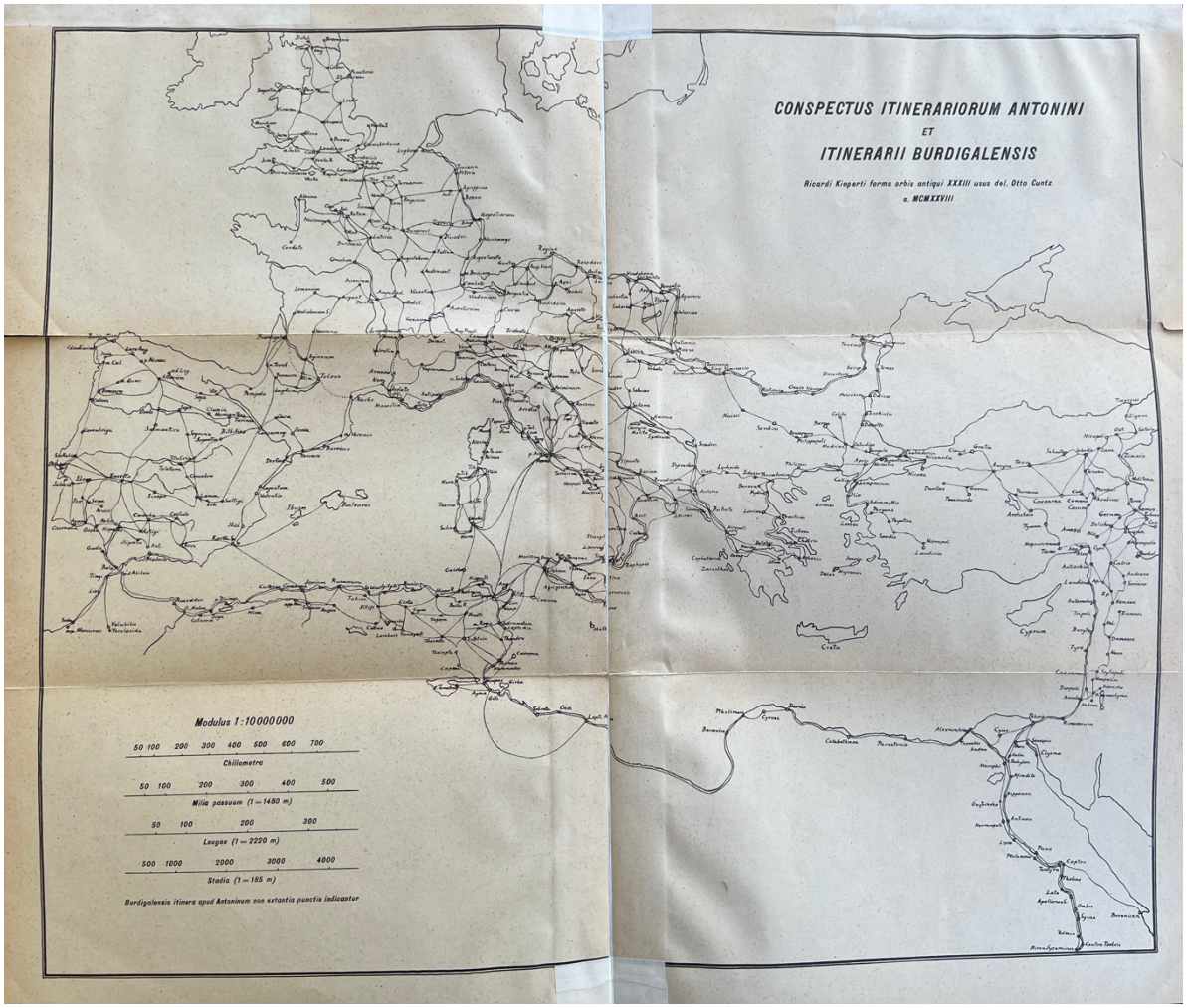
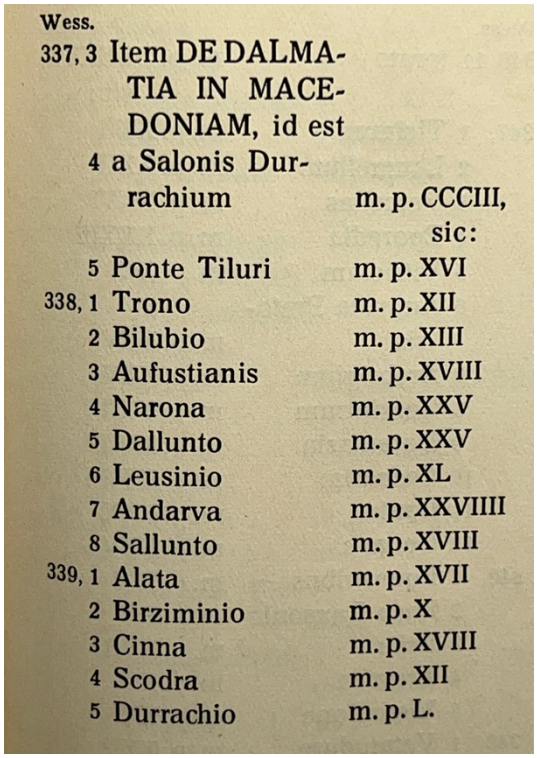


Fig. 3: A map of the Roman road system described by the itinerary.

[29] Löhberg 2010, 18-20.
[30] *It. Ant.* Re-printed in 1990 (eBook 2012).

The basic organization and structure of the itinerary follows a territorial principle.[31] Each route (*iter*) is headed by start and end points and a total distance. The stages in between are listed with place-names and distances, usually in Roman miles but in Gaul also often in leagues.[32] The itinerary is organized by main routes, 17 *Hauptlinien* according to Kubitschek, and minor connecting routes.[33] As an example, a route in *Dalmatia* is shown below (*Fig. 4*), with 15 place-names, 14 distance figures for road stretches and one mile sum for the whole route.



Wess.

337, 3	Item DE DALMA-TIA IN MACE-DONIAM, id est	
4	a Salonis Dur-rachium	m. p. CCCIII, sic:
5	Ponte Tiluri	m. p. XVI
338, 1	Trono	m. p. XII
2	Bilubio	m. p. XIII
3	Aufustianis	m. p. XVIII
4	Narona	m. p. XXV
5	Dallunto	m. p. XXV
6	Leusinio	m. p. XL
7	Andarva	m. p. XXVIIII
8	Sallunto	m. p. XVIII
339, 1	Alata	m. p. XVII
2	Birziminio	m. p. X
3	Cinna	m. p. XVIII
4	Scodra	m. p. XII
5	Durrachio	m. p. L.

Fig. 4: The route from Salona (Solin) to Dyrrhachium (Durrës) as described in the itinerary.

The routes, 249 in total, are presented in a circular mode starting in Mauretania and anti-clockwise encircling the Mediterranean with similarities to Pomponius Mela's

[31] Burian 2006.
[32] In this work a Roman mile is taken to equal 1480 m and a Gallic league to equal 1.5 times the mile. A Roman mile (*milia passuum*, abbreviated *m.p.*) specify a distance of 1000 double steps (*passus*) or 5000 feet (*pedes*). From standards recovered of the Roman foot, five varies in the interval 29.44-29.46 cm, nine in the interval 29.5-29.7 cm and two additional were shorter (29.145 and 29.25 cm). If the two shorter are removed, then the interval of variation for Roman mile would be 1472-1485 m. Considering also two milestones at the *Via Appia*, which were found at an in-between distance of 1471 m, the interval can be extended to 1471-1485 m. Schrier 2006, 507.
[33] Kubitschek 1916, 2323-2326.

Chorographia.[34] But this overall structure is not maintained consistently,[35] and another way to structure the itinerary is to divide it into ten separate sub-collections.[36]

No further edition of the itinerary has been published, although some have suggested the need for a revision or re-structuring.[37] Reed has even proposed a revision of the stemma provided by Cuntz, suggesting that P and 1L share a common ancestor not shared by D.[38] It is, however, unclear what impact such a revised stemma would have on the re-constructed text itself.

The Peutinger map

The Peutinger map (*Tabula Peutingeriana*), "the map" hereafter, is the only surviving map from antiquity.[39] The map was probably originally compiled around 300 CE.[40] The surviving copy was on a parchment roll, 6.75 m long and 0.35 m high, but is now split onto 11 segments.[41] This copy of the map dates to around 1200 CE,[42] and was discovered by the German renaissance humanist Conrad Celtis around the year 1500. It was left by his will in 1508 to another renaissance humanist Konrad Peutinger, hence the name. It is kept in Vienna since the 18th century and is now in the manuscript collection of the Austrian national library (Österreichische Nationalbibliothek) as *Codex Vindobonensis* 324.[43] The map is also available as high-resolution images on the Internet and in a recent facsimile edition published by *wbg Philipp von Zabern*.[44] Sheet 7 of the map (*Fig. 5*), shows the centre of the Italian peninsula with Rome at the right side, above is *Mare Hadriaticum* and the *Dioecesis Pannoniarum*, below is *Mare Tyrrhenum* and the *Diocesis Africa*.[45]

[34] Salway 2007, 184-185.
[35] Talbert 2007, 261.
[36] Salway 2001, 41; Salway 2007, 187
[37] Talbert 2007, 260; Rathmann 2008, 3.
[38] Reed 1978, 252-254.
[39] *Tab. Peut.*
[40] Talbert 2010a, 135-136.
[41] Talbert 2010a, 74-76
[42] Talbert 2010a, 83-84.
[43] Talbert 2010a, 10-29.
[44] *Tab. Peut.*
[45] The *diocesis* was an administrative unit in the late Roman Empire above the level of *provincia*.

Fig. 5: Sheet 7 of the Peutinger map, exhibited by Österreichische Nationalbibliothek in Vienna.

The map contains a wealth of topographical information (lakes, rivers, mountains, seas, *etc*.). It is not made to scale, but compressed in the north-south direction. An important key feature of the map is the detailed description of the Roman road system, approx. 100,000 km, with more than 3,000 place-names and distances between these places.[46] It can therefore also be viewed as an illustrated itinerary (*itinerarium pictum*) described by Vegetius,[47] as it contains both place-names and distances like the Antonine itinerary.

Epigraphy

The Vicarello cups, "the cups" hereafter, are four engraved silver goblets found together with a large silver treasure in the remains of a Roman bath near Lake Bracciano north of Rome in 1852. The four engraved cups have four almost identical itineraries, with 106 place-names and distances, for the route from *Gades* (Cadiz) in the province Hispania to Rome.[48] The cups are now in Museo Nazionale in Rome and is the only itinerary that has reached us from antiquity in original condition (*Fig. 6*). The cups are probably copies of the same archetype.[49] A

[46] Dilke 1987, 238; Talbert 2010a, 86-122.
[47] Veg. *Mil.* 3.6.11-19; Milner 2001, 73; Talbert 2010a, 142.
[48] *CIL* XI, 3281-3284.
[49] Schmidt 2011, 75-77.

consensus view held until recently was that cups were replicas of a milestone in *Gades*, like the golden milestone in Rome (*Milliarium Aureum*). The cups would then have been bought as souvenirs by a traveller and used as votive offerings. This interpretation has been discarded, but other explanations seem equally uncertain.[50] The dating is not entirely settled, but based on the evidence discussed by Schmidt it seems likely that the cups originate from the late 3rd or early 4th century CE.[51]

Fig. 6: The Vicarello cups in Museo Nazionale in Rome.

The major source of epigraphic information on distances can be found in the inscriptions on Roman milestones. A milestone from imperial time typically contains information about the ruling emperor and the building of the road and the distance to an administrative capital or nearby city (usually at the end of the inscription).[52] The number of currently known milestones are about 7,000–8,000, most of them from the imperial period and late antiquity.[53]

Latin inscriptions, including milestones, have since the 19th century been collected in the *Corpus Inscriptionum Latinarum* (*CIL*). More recently, the thematic volume XVII was

[50] Schmidt 2011, 77-80.
[51] Schmidt 2011, 80-82.
[52] Kolb 2004, 144-152; Kolb 2014, 654-660.
[53] Kolb 2004, 137-139.

begun to specifically cover the milestones.[54] However, concerns have been raised about the pace of publication of Roman milestones and the format, calling for the development of a digital Empire-wide collection of Roman milestones.[55]

The Epigraphic Database Heidelberg (EDH) is part of an initiative to make epigraphic information available in digital form and provides an exhaustive record for Latin inscriptions with the exception of the Italic regions and the Hispanic provinces.[56] The Italic regions and Hispanic provinces are covered by two other databases within the EAGLE initiative.[57]

The EDH dataset in 2021 counted over 81,000 inscriptions, and a search of the database today shows that 1747 of these inscriptions are classified as belonging to milestones.[58]

One particular milestone in the EDH dataset is the large fragment of a third century octagonal column from Atuatuca Tungrorum (modern Tongeren, Belgium), containing a publicly displayed itinerary list of places and distances (*tabellaria*),[59] (*Fig. 7*). Salway shows rather convincingly that the itinerary lists on this monument and another one at Autun, where only smaller fragments remain, must have mapped out a whole network of routes across central and northern Gaul.[60]

An additional surviving *tabellaria* of particular importance, and a witness of how extensive epigraphic itinerary lists can be, is the *stadiasmos provinciae Lyciae* at Patara.[61] This monument, which was erected in 45 or 46 CE at Patara in Lycia, was sensationally found in 1993.[62] Besides dedications to the emperor Claudius, it maps out the road system of the whole province; the Greek inscriptions lists 65 separate road stretches linking 20 places in 30 itineraries.[63]

[54] Kolb 2004, 136.
[55] Talbert 2019, 29-33.
[56] Heřmánková *et al.* 2021.
[57] Elliot 2014, 80-82.
[58] EDH 2023. Accessed 06/04/2023.
[59] *CIL* XVII, 675; Salway 2012, 205-206.
[60] Salway 2007, 192-194.
[61] *SEG* XLIV, 1205.
[62] Şahin 1994, 130-133.
[63] Salway 2012, 207.

Fig. 7: The column from Tongeren.

Previous research

The work in decoding the surviving manuscripts of the Antonine itinerary and the text critical analysis has already been discussed.

The factual information relating to the Roman road system has been of fundamental interest and importance for research in ancient history and archaeology since the 19th century and onwards. Konrad Miller in his seminal *Itineraria Romana*, describing the road system based on the Peutinger map, relied heavily on the itinerary.[64] Miller's work therefore almost provides a commented version of the itinerary. Since then, there are hundreds if not thousands of citations or mentioning of the itinerary in the literature. In most cases these are references to the factual geographic information, particularly distances, in relation to some particular road stretch or place. Research on the itinerary itself is much more limited.

Some of the fundamental research questions relate to its origins, time of compilation, use and reliability. The manuscript is also important when we discuss the Roman view of the world and ancient geography.

In the late 1930s van Berchem published a study suggesting that the itinerary is a compilation of actual journeys, made by or planned for the emperor Caracalla.[65] The longest route of the itinerary, from Rome to Egypt (123,8-162,4), would then refer to his travel in the East 214-215 CE. However, as Rivet shows, the place-names in the itinerary indicate a dating of the final compilation to the time of emperor Diocletian (284-305 CE).[66] Reed came to the same conclusion about the dating after a similar comparison of place-names and he also tried to date individual routes.[67] Talbert concludes,[68] also citing Arnaud and Calzolari,[69] that the itinerary was compiled around 300 CE, that it is a assembly of individual itineraries and there are no clear links to travels by the emperors. The source/s could instead be compilations of publicly displayed lists (*tabellaria*) and other disparate collections of itineraries. Data collected from such lists could also explain the local clustering of routes.[70]

Trying to establish the purpose of the itinerary, Rivet notes that it is easier to say what the itinerary is not, then what it is.[71] The official nature of the document has been debated, but

[64] Miller 1916.
[65] van Berchem 1937, 166-181, Rivet & Jackson 1970, 36.
[66] Rivet & Jackson 1970, 37.
[67] Reed 1978, 230, 232-240.
[68] Talbert 2007, 257.
[69] Arnaud 1993; Calzolari 1996.
[70] Salway 2001, 58-60.
[71] Rivet & Jackson 1970, 36.

without reaching consensus. The chaotic organization of routes and errors have been taken both as an argument against it being and official document, and the opposite.[72]

The repetitions and errors relating to road distances have been the focus for much attention and debate.[73] The repetitions can be seen both in close connection to each other or far apart in the itinerary, causing confusion.[74] In some repetitions, when the route is taken in the opposite direction, places are taken in the reverse order but not the distances.[75] Some examples of these errors are given by Reed,[76] but they seem to occur only on a few occasions in the itinerary. It is possible to further elaborate multi-step explanations in how scribal errors occur,[77] but these seem quite speculative.

Rivet identifies two kinds of errors, "errors in the original and errors of transmission".[78] It is, however, not so easy to identify an error since we seldom know the exact road stretch for the whole distance between two places in antiquity. Similarly, the identification of places can be unclear, the point of measurement from these places (cities) may also be unclear. That said, errors of transmission (scribal errors) could occur by simply misreading or misplacing a number. Wheeler highlights the confusion of V with II and V with X, and superfluous X, in the British section of the itinerary.[79]

A particular error of transmission is the editing of the total distances (mile sums) given in the headings for each route, to get the total distance to agree with the sum of the individual road stretches.[80] Cuntz spent considerable effort in trying to remove this later editing in his text critical edition.[81] The opposite, adjustment of individual stretches to the total, could also have occurred.[82]

As noted by Rivet, and later also by Rodwell, there seems to be a systematic bias in the reported distances in the itinerary,[83] being too short if the distances were measured from the city centres. A plausible explanation could be that the distance instead was measured from the city boundaries. This explanation may hold for the British section of the itinerary, but it cannot entirely explain systematic biases along Roman roads in other parts of the Empire. This

[72] Reed 1978, 250-251; Talbert 2007, 263-270.
[73] Kubitschek 1891, 178-179; Reed 1978, 230-231; Talbert 2007, 260-265.
[74] Talbert 2007, 260.
[75] Reed 1978, 241.
[76] Reed 1978, 241-242, 250.
[77] Reed 1978, 242.
[78] Rivet & Jackson 1970, 37.
[79] Wheeler 1920, 379, 381; Wheeler 1932, 625; Rivet & Jackson 1970, 39.
[80] Wheeler 1920, 377, 380-381.
[81] Cuntz 1893, 286-298; Cuntz 1929, v-vi.
[82] Wheeler 1920, 380.
[83] Rivet & Jackson 1970, 37-39; Rodwell 1975, 76-79.

author in his bachelor's thesis therefore pointed to the additional explanation of straighter road stretches in antiquity compare with today.[84]

Löhberg's doctoral thesis is the only major research effort about the itinerary after Kubitschek, Cuntz and Miller.[85] Löhberg has, as already mentioned, looked at the manuscripts, but his work rests entirely on Cuntz' text-critical edition of the itinerary. The major part is focused on the road stretches, the place-names and the distances, accompanied by some comments. The thesis is also supported by a separate map section based on the Barrington Atlas. Löhberg's compilation and maps have been helpful for the present work.

Löhberg states that it is not possible to compare the itinerary with the Peutinger map, due to lack of overlap (although he makes some comparisons).[86] However, this was no major problem for Talbert making precisely this comparison in his recent and ground-breaking study of the Peutinger map.[87] This author did a similar comparison in his bachelor's thesis,[88] and a comparative approach is also advocated by Chevallier.[89]

It can be noted that Löhberg counts the road stretches that are repeated to a total of 15,016 Roman miles, but here he seems to have added together both the first and all subsequent repetitions of each stretch. If each stretch is counted only once the total will be around 6,500 miles.

The current research status can be summarized as follows: The text-critical edition from 1929 has not been challenged or revised.[90] The origin, sources and use of the itinerary has been debated and based on analyses of place-names there seems to be consensus that the compilation dates to around 300 CE. There is also agreement that the itinerary is a compilation of different itineraries with different origin. Distance figures and place-names have been used in different contexts, *e.g.*, modelling of transport networks,[91] but the accuracy of these numbers has not been evaluated systematically for the itinerary as a whole. Although the term "error" is used frequently in previous research it is better to use the term "deviation" especially when it comes to distances, since the true value is seldom known.

[84] Öberg 2020, 29-32.
[85] Löhberg 2010.
[86] Löhberg 2010, 358-362.
[87] Talbert 2010a, 139-140, 158-161.
[88] Öberg 2020.
[89] Chevallier 1976, 34.
[90] The need for a revision was raised by Rathmann 2008, 3.
[91] Scheidel 2014; Peralta 2015.

Theory

Morely in the opening statement of his guide to theory writes: "The place of 'theory' in ancient history remains controversial".[92] During the review of the previous research for this thesis, discussions on theoretical approaches remain absent in the cited works. One should also be aware that applying modern theory on ancient history is in a way anachronistic. This said, all scientific work is founded in practices, traditions, and approaches, that can be presented as theory.

This study is influenced by several theoretical approaches, as are the works that it is based on. The traditional text critical stemmatic approach applied to the manuscripts has already been mentioned,[93] but it should be noted that other critical approaches have been introduced later,[94] and this study will discuss numerical patterns as an additional piece of evidence for text critique.

The basic theoretical underpinning is, however, critical rationalism as introduced by Popper and the principle of falsifiability.[95] If a statement, interpretation or conclusion, is not possible to falsify (at least in theory) then it is not scientific. Conclusions can then not simply be based on observation and interpretation, but also need to be challenged. The interplay between observations, hypotheses and consequences can then be described with a hypothetico-deductive model (*Fig. 8*).

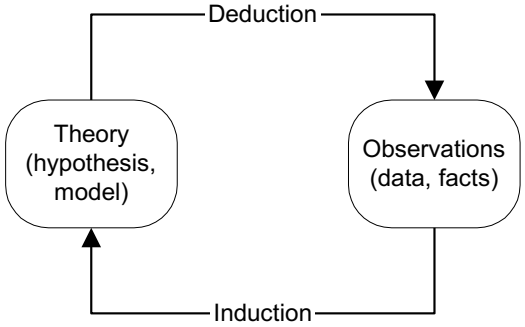


Fig. 8. The scientific learning process.

To study the accuracy of the itinerary with a comparative approach, also contains the hypothesis that it is possible to accomplish this and come to meaningful conclusions. However, the

[92] Morley 2004, 1.
[93] Maas 1960.
[94] West 1973.
[95] Popper 1959.

comparative method is already well established as a tool in ancient history as eloquently argued by Momigliano.[96]

This work is to large portion based on different comparisons within and between ancient and modern sources, and each of these comparisons can be seen as a test of the hypothesis that accuracy can be evaluated this way. Accuracy is then defined using metrological terms, which is also a choice of theoretical approach.

A second line of inquiry is the study of patterns to find possible sources of errors and deviations. The study of geographical patterns follows a traditional comparative approach, while the use of numerical patterns is novel. The sequential study of the numerical patterns of distances precented in ancient sources here follows the logic of the hypotetico-deductive model and can even be seen as involving prediction.

The theoretical approach described here is close to the practice in the natural sciences, but rare in the social sciences and the humanities.[97] The object of study and the focus on numerical data is obviously part of the explanation for the choice of this approach here. However, from such an approach follows implicitly also a reluctance against interpretation and generalisations that are not solidly founded or goes beyond the empirical evidence.

Finally, a very basic and old scientific principle that can also be seen as part of the theoretical approach here is the Occam's razor: *pluralitas non est ponenda sine necessitate*, *i.e.*, the simpler explanation is to be preferred.[98]

[96] Momigliano 2016, 39-45.
[97] "Processual archaeology" is one such exception.
[98] Transl. "plurality should not be posited without necessity." Duigan 2023.

Method

The redundancy of distance figures and place-names in the itinerary through repetition has been noted as an issue for concern, but these characteristics could also serve as a basis to evaluate consistency, and indirectly accuracy, and separate sources of errors (deviations). The comparison of the mile sums, available for 237 of the 249 routes, with the summation of road stretches could serve a similar purpose. Further possible comparisons are with other ancient sources, like the Peutinger map,[99] and with the modern map.

The basic hypothesis for this study is that such quantitative comparisons, focused mainly on the distance figures, can provide valuable quantitative and qualitative information as to the reliability of the itinerary as source of information about ancient geography. A further hypothesis is that these quantitative comparisons also can provide information about the manuscript history, tracing when errors or inconsistencies entered into the text. Finally, based on previous observations, an additional hypothesis is that the deviations between repeated road stretches are not evenly distributed across the Empire.

The distance figures for the present study of the itinerary were compiled from Cuntz' text-critical edition, but some cross-comparisons were also made to two previously printed editions.[100] The repeated road stretches were localized by searching for repeated place-names in the indexes by Cuntz and Löhberg,[101] and then iteratively evaluating the routes in the itinerary. Place-names and road stretches were searched and validated with the Barrington Atlas,[102] and geographical positions (coordinates) were localized using the web service Pleiades.[103] Distances on the Peutinger map were identified using Talbert's concordance table,[104] and distances on the modern map were established by taking the shortest road distance, by foot or vehicle, in Google Maps.[105]

The route distances (mile sums) were taken similarly from Cuntz' text-critical edition and compared with the individual road stretches added manually, but also cross-checked with the added sums (*numeri collecti*) given by Cuntz in his footnotes.

[99] *Tab. Peut.*
[100] Wess. *It. Ant.*; P&P *It. Ant.*; *It. Ant.*
[101] Cuntz 1929, 107-139; Löhberg 2010, B1-B29.
[102] Talbert 2000; Talbert 2013.
[103] Talbert *et al.* 2015.
[104] Talbert 2010b.
[105] Google 2023.

All distance figures in the itinerary were extracted for further numerical analysis from an Italian digital version of Cuntz' edition.[106] Distance figures from the Peutinger map, which had previously been extracted from Talbert's database,[107] were kindly shared by Dr. Gianluca Bosi and used for the same purpose. Distance figures from the third Vicarello cup, deemed most accurate by Miller,[108] were manually copied from the entry in *CIL*.[109]

Distance figures from milestones from the time period 28 BCE to 305 CE, *i.e.*, the principate until the end of the reign of Diocletian, were collected from the EDH database.[110] This time period was selected to match the itinerary. The distance figures were recorded manually from the transcribed text of the 731 milestones, and identified from the labelling with a unit (*m.p.* or *leug.*) or the placement on a separate line at the end of the inscription.

All data collected were continuously recorded in Excel data sheets to facilitate sorting and analysis. All road stretches were identified with Wesseling's notations and assigned to one of four *praefectura* based on the administrative division of the Roman Empire in the 4th century,[111] (*Fig. 9*).

[106] Rugnone 2016.
[107] Bosi 2019.
[108] Miller 1916, lxxi.
[109] *CIL* XI, 3283.
[110] EDH 2023.
[111] Myers 1889, 333; Wittke *et al.* 2012, 224-225. The four *praefectura* were: *Galliae*, *Italia*, *Illyricum* and *Oriens*.

Fig. 9: The Roman Empire divided into four praefectura.

The methods of analysis employed are simple arithmetic, sorting and some standard statistical measures and tools for data visualisation.

The deviations between repeated road stretches were described and evaluated both as absolute deviations and as relative standard deviations (RSD). RSD provides a scale free measure of the deviation, and is calculated as the standard deviation divided by the arithmetic mean and expressed in percent (%).[112]

The arithmetic mean of the repeated distance figures was used when comparing with the Peutinger map and the modern map.[113] The correlation in distance figures with the modern map was displayed and analysed with a scatter plot and the Pearson correlation coefficient

[112] The relative standard deviation (RSD) is also called the coefficient of variation (CV).
[113] The arithmetic mean provides an unbiased estimate for the length of a road stretch that is repeated.

(r).[114] The bias in the deviations to the modern map was also evaluated graphically with a histogram of the deviations in order of size.

Numerical patterns that were detected during the compilation of repeated road stretches, were further analysed for the whole itinerary, the Peutinger map, the Vicarello cups, and a large sample of milestones by frequency histograms.

[114] The Pearson correlation coefficient (r) provides a measure of the linear relationship between two variables, *i.e.*, a normalized measure of covariance. The correlation coefficient, *r*, can take values between −1 and +1. The square of the correlation coefficient, r^2 or coefficient of determination, represents the proportion of the variance for a dependent variable that is explained by an independent variable. R^2 is used together with regression lines in scatter plots to show how strong the linear relationship is between two variables.

Results and discussion

The evaluation of data is done in three parts; internal consistency checks, external validation and analysis of numerical patterns. On the basis of these comparisons, it will then be possible to discuss and assess the origins of errors/deviations and the overall accuracy of the itinerary.

Internal consistency of distances

Repeated place-names are a starting point for identifying repeated road stretches, that can subsequently be used for an internal consistency check. 553 repeated place-names were identified by cross-comparing the indexes of Cuntz and Löhberg,[115] and cross-checking against Barrington Atlas and Pleiades.[116] This number is less than the 791 reported by Löhberg,[117] but it is unclear if he also adds subsequent repetitions to this sum.[118] The repeated place-names, their Wesseling's notations, and their coordinates (latitude and longitude) are reported in an appendix (Appendix 1).

The repeated place-names were used to manually search the itinerary for repeated road stretches and 298 were identified, with distances between 5 and 50 Roman miles. Distances given in Gallic leagues have been recalculated to Roman miles. Similarly, as for the place-names, the repeated road stretches were identified by Wesseling's notations, and with distances given in miles (Appendix 2).

Initially the distances of all repeated road stretches were compared to each other. For 177 (59%) of the repeated road stretches there is no deviation at all in the reported distances, for 213 (71%) the deviation is one Roman mile or less, and for 236 (79%) the deviation is two miles or less. The importance and magnitude of the deviation is obviously related to the total distance, and a scale free measure like the relative standard deviation (RSD) is then the preferred alternative. If the RSD is calculated for the reported distances for these 298 repeated road stretches, then it is less than 10% for 239 (80%) stretches.

Looking at this sample from the itinerary, the road stretches with repetition, the consistency seems high taking into account that the itinerary itself is a compilation from many different sources and that the compiler did not edit it much. The deviations between repeated road stretches are, however, not evenly distributed across the Empire.

[115] Cuntz 1929, 107-139; Löhberg 2010, B1-B29.
[116] Talbert 2000; Talbert *et al.* 2015.
[117] Löhberg 2010, 396.
[118] 94 stretches were repeated more than once; 72 stretches occurred three times, 12 four times, four five times, and one six times.

The repeated road stretches for the four *praefectura* are: 82 in *Galliae*, 125 in *Italia*, 23 in *Illyricum*, and 68 in *Oriens*. If we compare the deviations with the same cut-off in RSD, then those in agreement (≤ 10%) are: 71 (87%) for *Galliae*, 106 (85%) for *Italia*, 19 (83%) for *Illyricum*, and 43 (63%) for *Oriens*, here illustrated in a histogram (*Fig. 10*). The deviations between repeated road stretches are thus more pronounced in the eastern part of the Empire, and could indicate that the itinerary is less reliable for that part. However, this does not necessarily mean that the road stretches were measured and documented with less accuracy in the East, it could also be that the compiler of the itinerary simply did not have access to reliable data from that part. A more detailed study of available milestones could possibly clarify this issue.

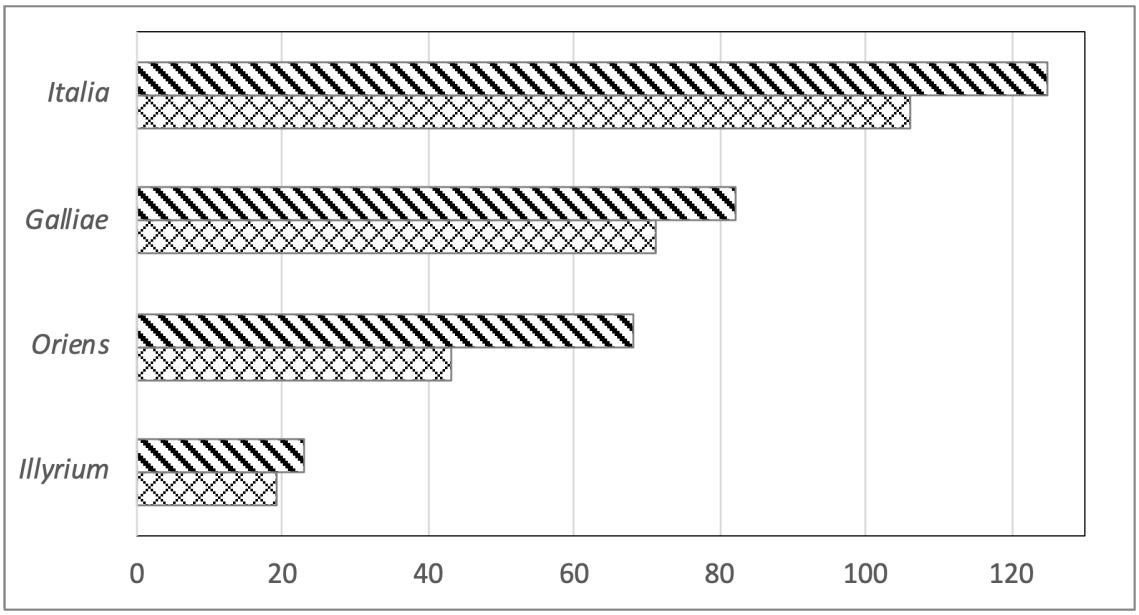


Fig. 10: Number of repeated road stretches in each praefectura and those in agreement (RSD ≤ 10%).

An additional comparison of individual road stretches between the different printed versions of the itinerary was undertaken. For the editions by Parthey and Pinder and Wesseling,[119] this comparison was between the distances reported for the first instance of the 298 repeated stretches (Appendix 3). In Parthey and Pinder, 284 stretches agreed completely and only six stretches deviated more than two Roman miles. In Wesseling, 279 stretches agreed completely and also here only six stretches deviated more than two miles. From this limited

[119] Wess. *It. Ant.*; P&P *It. Ant.*

comparison it seems evident that the distances for individual road stretches reported in the two old scholarly editions agree almost completely with Cuntz' text-critical edition, the manuscript text therefore seems stable in this respect.

The route distances (mile sums) are reported in an appendix (Appendix 4). These mile sums were subsequently compared to the manually added distances for the individual road stretches. There was complete agreement or deviation less than or equal to one Roman mile (or Gallic league) for 190 (80%) of these mile sums, which is even better than the agreement between the repeated road stretches. Nevertheless, for about 10% of the mile sums, the deviations were substantial. The five largest deviations occurred where several mile sums are stacked together in the manuscript text, at the beginning of a major route, thus enhancing the risk of scribal errors and confusion.

External validation of distances

To continue with an external validation, the itinerary was first compared to another antique source, the Peutinger map. About one third or 106 of the 298 repeated road stretches in the Antonine itinerary can also be found on this map (Appendix 5). One half, or 56, of these deviates not more than one mile from the mean value in the itinerary. However, the remaining 50 distances deviate more than that and provided that the deviations did not come from copying errors, this indicates that the itinerary and the map are based on different sources. This is then contrary to Kubitschek's postulation that the itinerary and the map have a common ancestor ("Erdkarte a").[120] However, it does not invalidate any assumptions that both the itinerary and the map partly share information from common sources.

The distances in the itinerary were also compared to the modern map (Appendix 5). Here two aspects can be assumed to inflate the deviations; in several cases the places (place-names) are not firmly localized, secondly the road stretches in antiquity are not always known with confidence. Still, such a comparison may give an additional piece of evidence in evaluating the accuracy of the information given in the itinerary.

The geographic positions of the place-names were identified for 282 of the repeated road stretches, by Pleiades or in a few cases by Löhberg.[121] The deviation between the shortest road distance given by Google Maps, irrespective of the means of transportation, and the mean value from the itinerary was calculated. The absolute value of this deviation (difference)

[120] Kubitscheck 1916, 2336.
[121] Löhberg 2010; Talbert *et al.* 2015.

was then divided by the mean value from the itinerary, to get a scale free measure in percent similar to the previous comparisons. For 188 values, two thirds, this value was below 20%,[122] but for 29 outlying cases the deviations were 50% or more. These gross deviations for 10% of the road stretches are troublesome and without simple explanations.[123] When these gross deviations are removed, the length of the modern road stretch correlates rather well with what is reported in the itinerary, as illustrated in the scatter plot (*Fig. 11*), with 81% of the variance explained.[124]

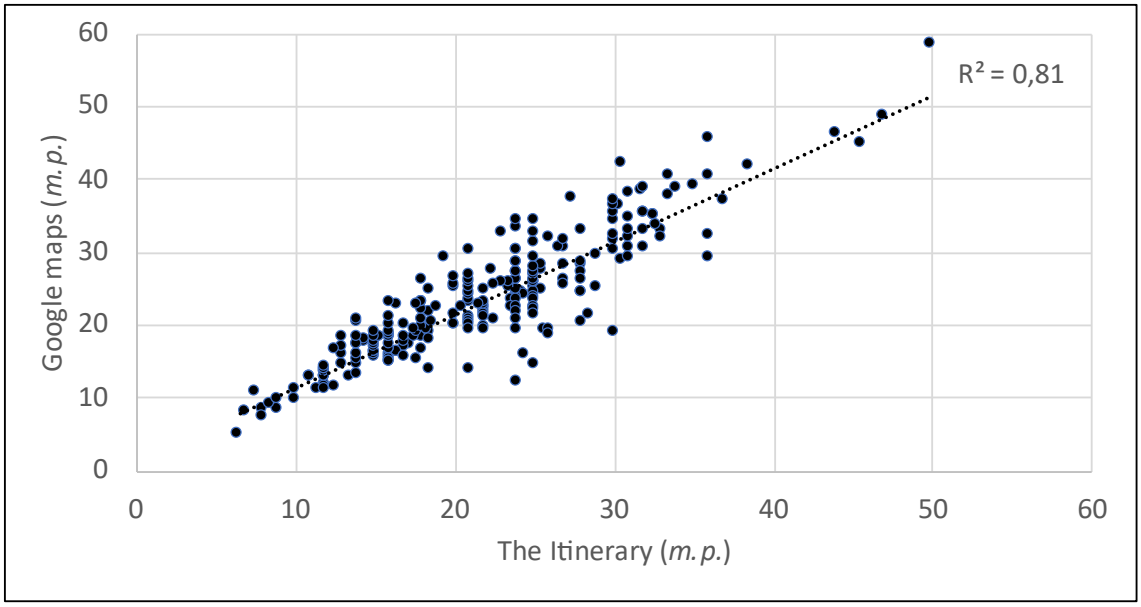


Fig. 11: Scatter plot of estimated distances (m.p.) for repeated road stretches from the itinerary and from the modern map (outliers removed).

There is also here a bias towards reporting shorter distances in the itinerary as already discussed. The removed gross deviations show an even stronger bias towards underreporting the actual distance (*Fig. 12*). Almost half of these gross deviations originate from the eastern part of the Empire.

[122] The higher cut-off used in this comparison is motivated by the underlying uncertainties mentioned.
[123] A few uncertain place-names are indicated in Barrington Atlas and in some cases the modern road stretch seems to be a detour.
[124] For some routes there is an almost perfect match between the distances given in the itinerary and the modern map, *e.g.* for *Via Aemilia* (the road between *Placentia* and *Ariminum*). See footnote 114 for a discussion of explained variance.

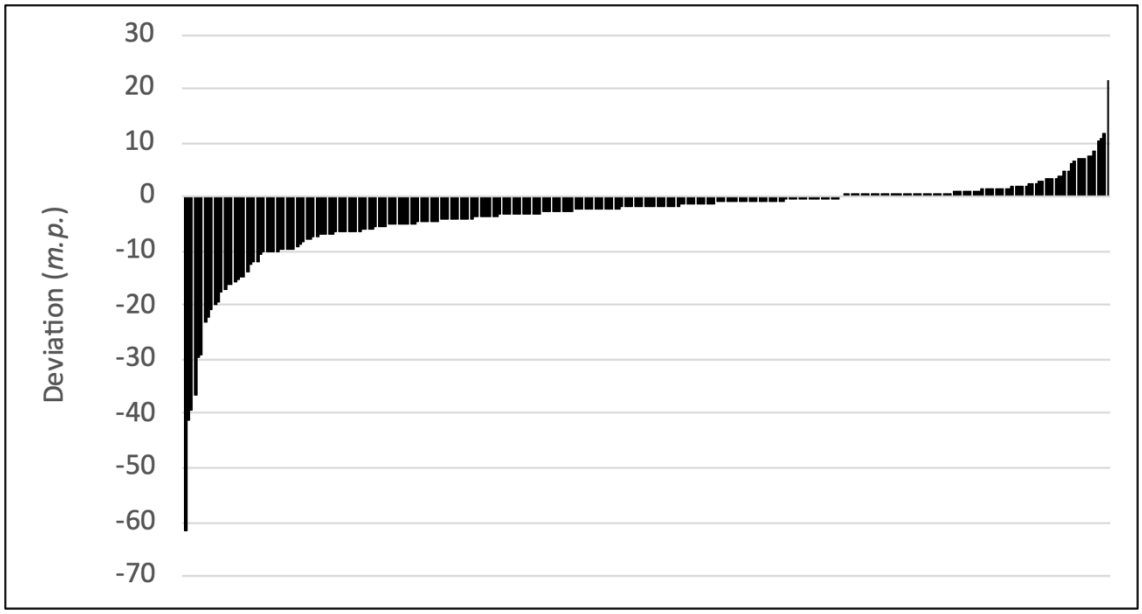


Fig. 12: Histogram showing the deviations in distance (m.p.) for 282 repeated road stretches, between the itinerary and Google Maps.

Structure and distribution of numbers

When compiling the database for repeated road stretches, a non-random distribution of distances was observed. To further investigate this phenomenon, the frequency distribution of all distance measures in the itinerary was analysed. In a frequency diagram of distance figures between 2 and 35 (*Fig. 13*),[125] we can clearly see that even numbers and multiples of 5 and 10 are favoured compared to odd numbers.[126]

[125] The smallest mile sum is 38, so the frequency distribution evaluated does only apply to the individual road stretches.
[126] The numbers 12, 15, 16, 18, 20, 24, 25 and 30 represent 57% of all distance figures between 2-35; and if we simply separate even and odd numbers, then the proportions are 69% to 31%.

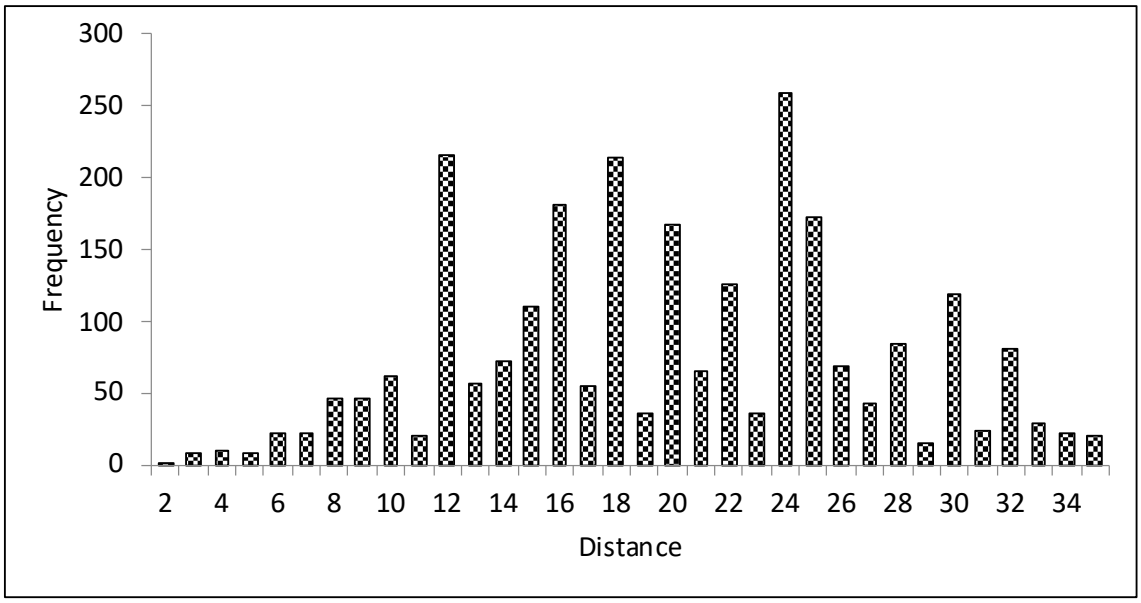


Fig. 13: Frequency distribution for 2534 distances (m.p. and leug.) of road stretches in the itinerary.

It seems highly unlikely that the actual distances between Roman cities, villages and road stations were distributed in such a manner.[127] Instead, it indicates that the distances were estimated rather than directly measured, with a preference for even numbers, or less likely, that distance measures were post-edited after the compilation with a similar preference.

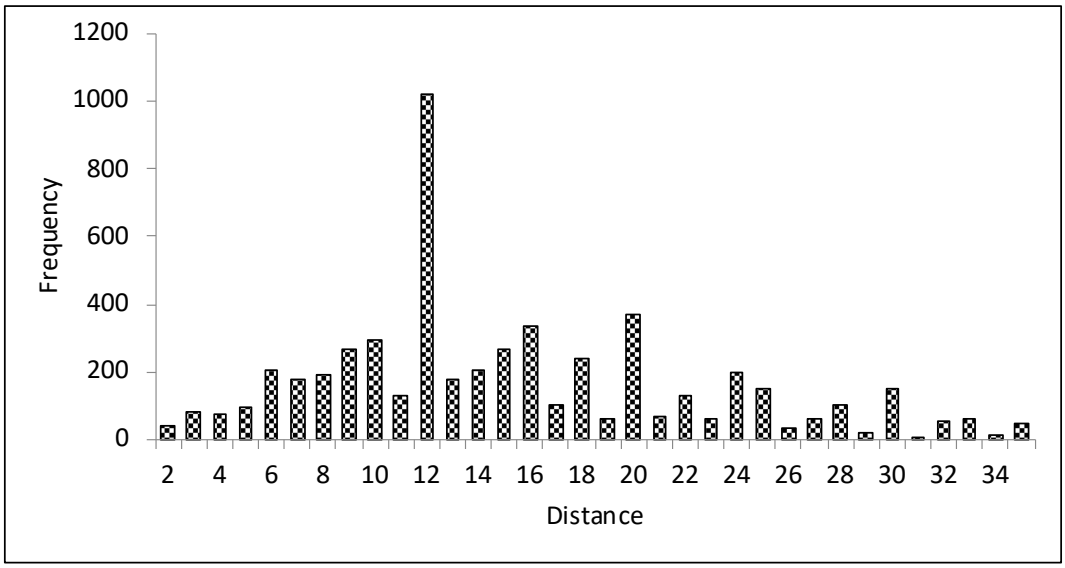
The phenomenon of data-heaping, spikes in the frequency distribution of numbers collected, is known from social surveys and population censuses. Typically, it results from rounding to multiples of the base-unit and terminal digit preference or avoidance.[128] The classic statistical paper on this subject was written by Yule in 1927,[129] later discussed also by Preece.[130] Mitchell summarised additional studies showing the tendency to select even numbers.[131] The same phenomenon seems likely to have affected the itinerary, and would then support a background of the distances from estimation rather than measurement.

The preference for certain round and even numbers could also have been influenced by the computing practices. In many respects the Romans had a base ten number system, but twelve was a fundamental fraction in measuring weight and land (1/12 = *uncia*). The

[127] Formal statistical tests can be used, but then one must also assume the underlying distribution. The non-random pattern is so obvious that this does not seem necessary or more informative.
[128] Crockett *et al.* 2001, 161-164.
[129] Yule 1927, 570-587.
[130] Preece 1981, 31-60.
[131] Mitchell 2001, 408-409.

duodecimal system was also applied for time (hours of the day, months of the year) and coinage.[132] It has been hypnotised that twelve was indeed the base for a fraction system used for computation,[133] and Turner reminds us of a verse by Horace on a schoolroom drill with duodecimal fractions:[134] *"Dicat filius Albani: si de quincunce remota est uncia, quid superat? poteras dixisse." "Triens." "Eu! Rem poteris servare tuam. Redit uncia, quid fit?" "Semis."*

To further study the phenomenon, the frequency distributions of distances reported on the Peutinger map, the Vicarello cups and a sample of milestones were analysed consecutively. The frequency distribution of distances from the map is even more unique, showing a very strong preference for the number 12,[135] and also here a strong overrepresentation of even numbers (*Fig. 14*).[136] The same pattern repeats itself on the cups, with a preference for even numbers and multiples of 5 and 10 compared to odd numbers (*Fig. 15*).[137] There is an almost equal bias towards even numbers for the milestone sample, here we compare only those in the same distance interval as before (2-35), representing 72% of the whole sample (*Fig. 16*).[138]



[132] A duodecimal system is a base-12 numeral system.
[133] Maher & Makowski 2001, 376-399.
[134] Hor. *Ars Poet.*, 326-330; Turner 1951, 64. Translated by Turner: "Let Albinus' son tell us: 'If one-twelfth (*uncia*) is taken from five-twelfths (*quincunx*), what is left?' You could have said, 'One-third (*triens*).' 'Good, you will be able to preserve your estate; add a twelfth; what have you?' 'One-half (*semis*).'"
[135] Bosi 2019, 9.
[136] The number 12 represents 19% of all distance figures between 2-35; and if we separate even and odd numbers, then the proportions are 66% to 34%.
[137] The numbers 12, 15, 16, 18, 20, 24, 25 and 30 represent 63% of all distance figures (6-34); and if we simply separate even and odd numbers, then the proportions are 63% to 37%.
[138] The numbers 4, 8, 10, 12 and 22 represent 33% of all distance figures between 2-35); and if we simply separate even and odd numbers, then the proportions are 61% to 39%.

Fig. 14: Frequency distribution for 5506 distances (m.p. and leug.) of road stretches from the Peutinger map.

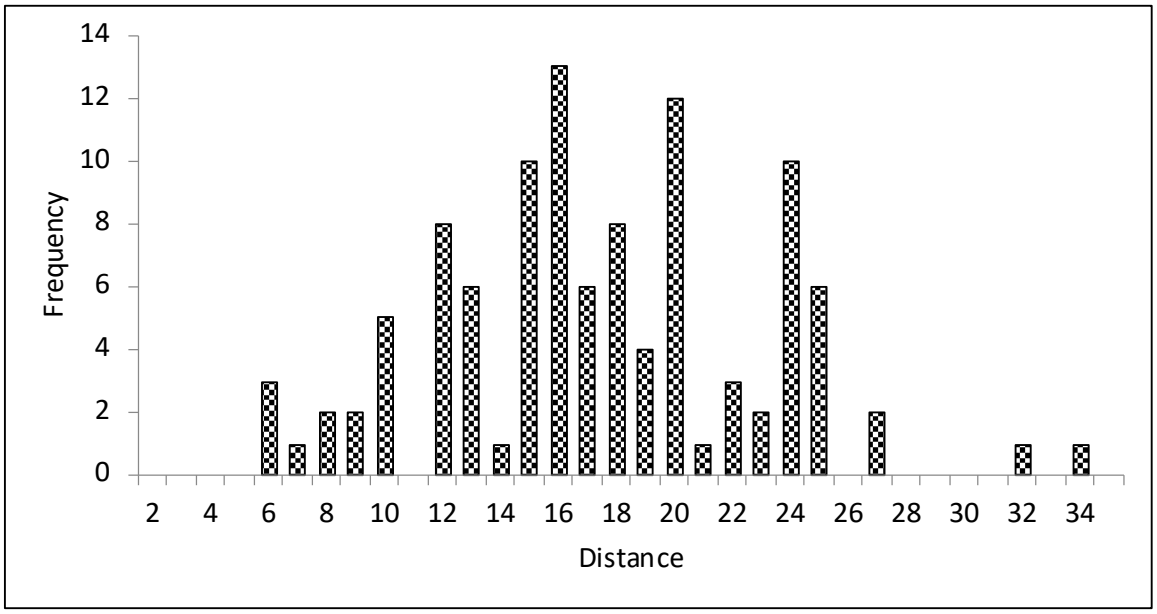


Fig. 15: Frequency distribution for 107 distances (m.p.) of road stretches from the third Vicarello cup.

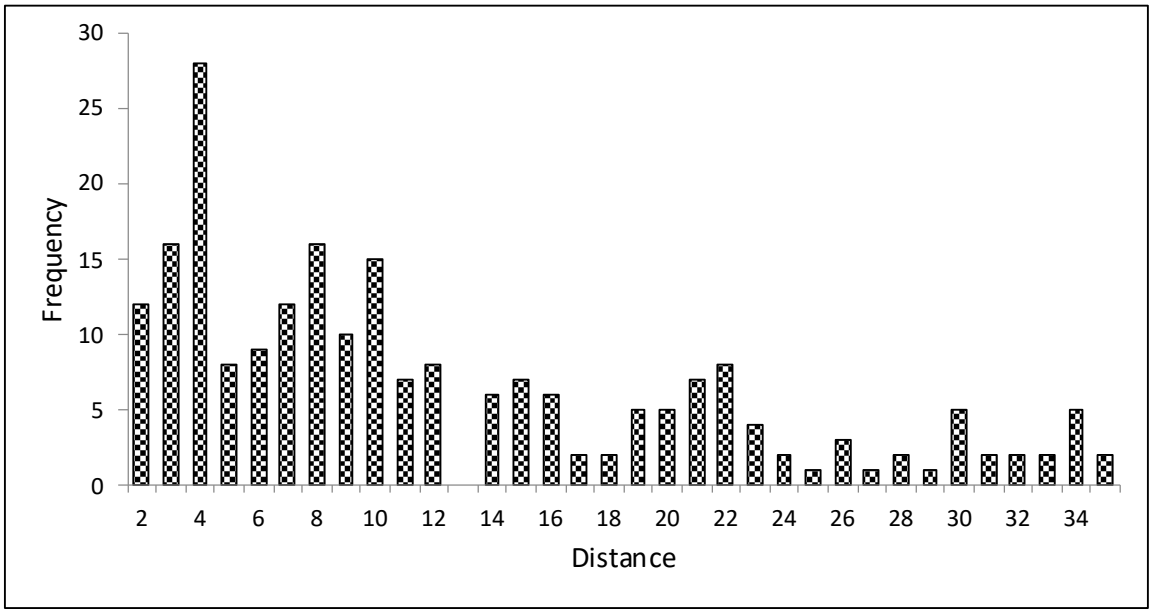


Fig. 16: Frequency distribution for 221 distances (m.p. and leug.) collected from a sample of 731 milestones.

The data set of mile stones contains the *tabellaria* from Tongeren,[139] and also from this inscription we find the same bias among the distances towards even numbers, 63% *vs*. 37%, Tab. 1.

Tab. 1: Occurrence of distances on the tabellaria from Tongeren.

Distance (*leug.*)	Occurrence
VIII	6
VIIII	3
XI	2
XII	4
XIIII	1
XV	2
XVI	1

Here it should also be noted that the more extensive road lists on the Claudian monument at Patara, also a *tabellaria*, almost exclusively use even numbers for the distance figures in Greek stades.[140] Only five out of 38 distance figures in the Patara inscription are odd.[141] Salway observes this deviation from a "natural distribution" and interprets it as evidence that the distances were first measured in Roman miles and then converted into stades.[142] The argumentation is based on the observation that 77% of the values that can be read in full are multiples of eight.[143] Salway continues by assuming rounding and underlying measurements also in half-miles, which is rather uncommon in the other itineraries, and finally explains the remaining disagreements by actual measurement in stades for a few road stretches. In addition, seemingly corrupt figures are explained as misreading Roman numerals. This chain of reasoning and explanation does not seem plausible; it is too complex and it rests on the assumption that the distance figures are obtained from precise field measurements, which does not seem likely from the other evidence assembled here.

That comparable data-heaping occurs in the itinerary, the Peutinger map, the Vicarello cups, the milestone sample and the *tabellaria* suggests that estimated distances is a rule rather

[139] *CIL* XVII, 675.
[140] A Greek stade (*stadion*) equals approx. 162-210 m. The stade use by geographical writers seems to equal a length of 185 m, giving a conversion ratio of 8:1 to a Roman mile. See Schulzki 2006 and Pothecary 1995, 67.
[141] Salway 2007, 194-201; Kolb 2013, 206-214.
[142] Salway 2007, 201-202.
[143] 71% if all values are considered.

than exception for individual road stretches from all the investigated sources. However, the stated mile sums for routes in the itinerary are in contrast almost equally distributed between even (52%) and odd (48%) numbers.[144]

Errors in the original and in transmission

The importance of errors in transmission seems to be an underlying assumption in previous work, although not clearly spelled out. Individual cases are then discussed in detail and deviations in distances are explained as copying errors of Roman numerals and as misplacing numbers in the copy process.[145] But if such errors played a significant role overall, then the mile sums ought to deviate more.

The evaluation of internal consistency in the itinerary indicates that about 80% of the distances for repeated individual road stretches are in fairly good agreement or identical. The reported mile sums for route distances and the sum of the repeated individual road stretches are in an equally good agreement or even better. From Cuntz work we know that mile sums seem to have been corrected in the copying process,[146] but also that these edits have to the extent possible been removed in the text critical edition.[147] If deviations in individual road stretches originated mainly from errors in transmission (scribal errors), then the proportion (frequency) of deviations should consequently be much higher for the mile sums.[148]

Similarly, if errors in transmission were significant, no geographic pattern ought to occur. It seems very improbable that scribal errors would show a specific geographic distribution. The logical conclusion thus seems to be that the deviations and departures in internal consistency were there already when the itinerary was first compiled.

The cross-comparison with the Peutinger map shows larger deviations than the evaluation of internal consistency. This would then indicate that these deviations are not due to errors in transmission of the manuscripts, rather that the information in them is not always identical.

However, the perhaps most compelling argument that errors in transmission only play a minor role is the observed frequency pattern in the itinerary, and similar patterns in the

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[144] The added sums of the individual road stretches still show a bias towards even numbers, 60% *vs*. 40%. This bias is, as expected, weakened by the addition operation. The bias towards even numbers for the individual road stretches was 69% *vs*. 31%.
[145] Wheeler 1920, 379, 381; Wheeler 1932, 625; Rivet & Jackson 1970, 39.
[146] Cuntz 1893, 286-298.
[147] Cuntz 1929, v-vi.
[148] The mile sums are based on the individual road stretches, so any deviations in these will necessarily propagate into the mile sums.

distances from the Peutinger map, the Vicarello cups, milestones and *tabellaria*. The frequency pattern and data-heaping around even numbers and multiples of five cannot easily be explained to be the result of errors in transmission. That the same pattern can be seen also in inscriptions as on the map and in the itinerary makes this argument even stronger. Deviations and lack of consistency in the itinerary must therefore be assigned mainly to its original compilation and the sources of information it relied upon.

The use of a numerical data pattern to show the closeness of a text critical reconstruction of an archetype to a presumed original, which is no longer available, seems to be a completely new idea and approach. It is probably only applicable to a very limited collection of manuscripts related to itineraries, but the general insight it gives into copying accuracy is also new and important. There has recently been a trend criticising the established philological approach to strive for an ideal fixed text,[149] by establishing the interrelationships between manuscripts depicted by a stemma originating from a postulated archetype. This may be well motivated in areas where the texts are still fluid, but the Antonine itinerary seem to belong to a more stable textual tradition where this is less relevant. The stable numerical patterns of distances that are traceable back to epigraphic data clearly supports this assumption. This said it could still have been of interest to study and compare each surviving manuscript separately.

Accuracy of the distance measures in the itinerary

The evaluation of internal consistency and comparison to the modern map can assist us in determining the accuracy of the itinerary as a source for geographic information from antiquity. Likewise, the data patterns discovered shed more light on the background of the distance figures reported.

It seems that the itinerary is quite accurate overall, but that the distances are imprecise, *i.e.*, low in precision. The distances for individual road stretches seem to be estimated rather than measured, and therefore it can be questioned how meaningful it is to discuss and elaborate on deviations that are just a few miles. However, if this imprecision is recognized then the itinerary gives a good description of the Roman road network.

A measurement device, the odometer, is described in the ancient literature.[150] It is unknown to what extent such an instrument or some other measurement devices, like cords or

[149] The term "new philology" was coined by Nichols 1990, 1-10.
[150] Vitr. *De arch.* 10.9.1-4; Sleeswyk 1981, 188-201; Lewis 2001, 134-139.

rods, were used to determine the road stretches.[151] It could also be that they normally were measured by counting the number of paces required, *i.e.*, 1000 double steps per mile. For the itinerary it seems that the estimation was even further removed from actual measurement, as already discussed.

Comparing with the modern map, gross errors (deviations) are also noticed. These errors could be the result of incorrect assignment of place-names and hence coordinates onto the modern map or substantial deviations in the road stretches in antiquity compared to the modern road network. However, it is also likely that gross errors were present already in the original compilation. What is surprising is the seemingly systematic bias towards underestimation in the itinerary also for the larger deviations (*Fig. 12*).[152] Maybe this could be the result of the compiler assigning a distance when some in-between road stations were missing and when the actual distance was unknown.

[151] Lewis 2001, 138.
[152] The deviations are shown in the histogram; 4 are > +10 and 29 < −10 *m.p.*

Conclusions and outlook

This study shows that it is possible to apply a macro perspective in analysing an ancient itinerary. The evaluation of internal consistency and numerical patterns indicates that the distance figures in the Antonine itinerary are to a certain degree imprecise and likely to have been derived by estimation rather than by actual measurement. Although the overall accuracy is good, there is a geographic variation and gross deviations occur as well. Using the itinerary should therefore take these aspects into account, and the imprecision makes it less meaningful to use the distance figures to scrutinise individual road stretches. For complete routes or other large portions of the itinerary this imprecision is of less importance, and the itinerary gives good and fairly reliable insight into the ancient road system and geography.

The comparable relative proportions of deviations for repeated road stretches and for the mile sums cannot be explained by errors in transmission, because then the mile sums ought to be more frequently affected. The authenticity of the itinerary is further confirmed by the specific numerical patterns occurring, which can also be seen from other ancient sources. It therefore seems likely that errors in transmission play less role than previously assumed. This also means that the reconstructed archetype is likely to be close to the original compilation, and thus gives us a glimpse of the nature and quality of geographic information available in antiquity.

The reported numerical pattern in distance figures is a novel finding and motivates further research. Firstly, it would be of interest to evaluate how wide-spread this phenomenon is, and if it occurs also for a more complete sample of milestones. Secondly, further work is motivated to more conclusively deduce the likely cause/s for such a pattern, and look for its presence in other ancient sources. Thirdly, it would be of interest to investigate if this observation could contribute to textual criticism in other realms than itineraries.

Further research is also motivated to validate the localisation of place-names mentioned in the itinerary. There is one ancient source rich in toponyms, the Ravenna Cosmography,[153] that could assist in this work together with the digital resources such as epigraphic databases.

[153] *Rav. Cosm.*

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Appendix 1

Places with duplicate entries in the itinerary. Place-names mainly from Löhberg's *Index Nominum* (2010), identified from the itinerary by Wesseling's notations. Positions (latitude, longitude) from Pleiades (https://pleiades.stoa.org/).

Name	**Wess.**	**Position**
Abila	198,5; 199,6	33.627108, 36.1159485
Acci	402,1; 404,6	37.300309, -3.134636
Acontisma	321,2; 331,3	40.968007, 24.538414
Ad Aquas Larodes	88,7; 89,4	37.504887, 13.091992
Ad Aquas Tacapitanas	74,1; 78,2	33.883611, 9.794514
Ad Columnam	106,4; 111,5	38.191434, 15.651754
Ad Dracones/Dracontes	183,3; 207,7	Unlocated
Ad Equum Tuticum	103,2; 112,2; 115,7	41.152484, 15.087531
Ad Fines/Finibus	238,1; 251,4	47.5950575, 8.9574465
Ad fluvium Sabutum	105,5; 110,8	39.1080911868, 16.2593265031
Ad lacum Comacinum	278,7; 277,9	45.81192, 9.085784
Ad Mallias	106,3; 111,4	38.310645, 15.829655
Ad Martis (Alp. Cott.)	341,4; 357,2	45.03323, 6.833543
Ad Mercurios	8,3; 24,4	35.508424, -5.839493
Ad Pictas	304,8; 305,10	41.750203, 12.860163
Ad Pirineum/Summo Pyremeo	390,2; 397,7	42.4646429, 2.8629997
Ad Septem Aras	419,3; 420,5	39.030986, -7.161004
Ad Turres (Brutt.)	105,6; 111,1	38.928249, 16.269759
Ad Turres (Etrur.)	290,2; 301,2	41.936088, 12.1553995
Adrumeto	52,6; 55,10; 56,4; 58,5	35.825866, 10.63878
Aere	196,4; 198,7	33.071101, 36.185274
Agma sive Fulgurita villa	59,7; 75,1	33.658705, 10.344649
Agrantomago/Agantomago	460,2; 462,3	46.594036, 1.51722
Agrigentum	88,4; 89,5; 95,1; 96,5	37.290594, 13.585475
Alabonte/Alamonte	342,4; 388,1	44.385921, 5.943974
Alaunio	343,1; 388,3	43.946069, 5.870795
Alexandria (Aeg.)	57,9; 70,1; 154,5	31.201435, 29.909773
Alicano/Halicano	261,9; 262,4	46.525105, 16.361983
Alifas	122,1; 304,2	41.328486, 14.330592
Alisincum	366,7; 460,7	Unlocated
Alpe Summa	296,3/4	43.7445795, 7.4019021

Altinum	126,6/7; 128,4; 281,4	45.5571337333, 12.3907663333
Ambre	236,4; 257,4; 258,10	48.140949, 11.202691
Ambrussum	389,1; 396,6	43.715607, 4.1496005
Amphipoli	320,4; 331,1	40.8258114808, 23.8415794323
Ancira/Ancyra	143,1; 201,2; 201,7; 203,2; 205,7	39.9437925, 32.859333
Ancona	312,6; 316,5	43.6189926667, 13.5160726667
Andro	154,1; 155,3	30.778076, 30.626467
Antianis	232,7; 243,7; 267,4	45.804539, 18.665075
Antunnaco	254,1; 371,1	50.439196, 7.406147
Apamia	187,5; 195,7	35.422241, 36.402509
Apollonia	320,3; 330,8	40.623703, 23.469685
Apris/Arnis	175,9; 332,4; 333,6	40.9269409, 27.1073556
Apta Iulia	343,3; 388,4	43.876571, 5.393684
Aqua viva	130,1; 265,12	46.343945, 16.233016
Aquae Bilbitanorum	437,2; 438,14	41.296294, -1.894044
Aquileia	126,9; 128,6; 270,1; 272,8; 276,1; 279,2; 281,2	45.768945, 13.3677735
Aquinquo leg. II Adiutrix/Acinquo	245,7; 263,9; 264,9	47.564075, 19.049522
Aquis Celenis	423,8; 430,3	42.605502, -8.643331
Aquis Regis	47,3; 53,2; 54,2; 55,2; 55,8; 56,2	35.58292, 9.718677
Aquis Terebellicis	455,10; 457,3	43.709216, -1.0525105
Arabisso/Arabalisso	181,7; 188,4; 210,11; 213,12; 214,13; 215,2	38.246013, 36.911673
Arabona	246,6; 263,1; 267,10	47.5, 17.5
Araura sive Cesserone	389,4; 396,9	43.3945615, 3.420181
Arauracos	208,1; 216,1	40.10699, 39.094444
Arbore Felice	237,5; 251,3	47.515071, 9.436868
Arcas	178,1; 211,3; 215,5	38.33454, 37.9711315
Arcobriga	437,1; 438,13	41.2959278328, -2.13807695147
Arebrigium	345,4; 347,7	45.764042, 6.984632
Arelate	299,4; 344,2; 388,6; 396,1;	43.677616, 4.630799
Arethusa	188,2; 194,5	34.960169, 36.735111
Argentorato	239,2; 252,5; 350,3; 354,5; 372,2; 374,8	48.582416, 7.747407

Arialbino	238,3; 252,1	47.567426205249646, 7.543907337910503
Ariarathia	181,2; 212,9; 213,8	38.723507, 36.392334
Ariminum civitas	100,4; 126,4; 286,7	44.0589565, 12.5631945
Arlape	234,3; 248,5	48.212163, 15.2104235
Armaxa	179,3; 206,10; 214,8	39.18618, 36.0663835
Arriaca	436,3; 438,10	40.650874, -3.196797
Artaxata/Arasaxa	180,1; 210,6; 211,6	38.6239795, 35.87671
Ascalona	151,1; 200,3	31.6659785, 34.545947
Asclo	307,6; 317,1	42.855397, 13.574951
Aspona	143,4; 206,2	39.302241, 33.307757
Assuras	47,6; 49,4; 51,4	35.9926205, 9.0223555
Astigi	413,3; 414,4	37.540932, -5.079949
Asturica	423,5; 425,5; 429,4; 431,3; 425,5;448,2; 453,5	42.458776, -6.063532
Aterno vicus/Aeterni	101,5; 313,6	42.4648345, 14.214037
Augusta Praetoria	345,3; 347,6; 351,3	45.737444, 7.3161705
Augusta Vindelicum	236,5; 250,5; 258,11; 274,8	48.365463, 10.894765
Augustobona	361,3; 383,6	48.297473, 4.074806
Augustodunum	360,2; 366,5; 460,8	46.94724, 4.2991775
Aulona	323,10; 329,2	40.484898, 19.473197
Bagacum	377,1; 378,1; 380,7	50.2977855, 3.792415
Balsione/Bellisone	443,4; 451,1	41.900517, -1.418493
Bannaventa/Isannavantia	470,5; 477,1; 479,5	52.49445, -1.301384
Barcenone	390,5; 398,4	41.387911, 2.169911
Bathenas Meri (Osrhoëne)	190,4; 192,2; 192,5	36.9763845, 38.424374
Belgido/Bergido	429,2; 431,1; 425,4	42.599819, -6.725657
Bemmaris	185,2; 190,3	Unlocated
Benearnum	453,3; 457,5	43.332678, -0.434655
Benevento	112,1; 120,1; 122,3; 304,4; 302,2; 305,5	41.130437, 14.781161
Bergintrum	345,5; 347,8	45.615918, 6.766804
Bergule	137,6; 230,5; 323,2	41.4017405, 27.352699
Beroa/Borea	193,4; 194,11	36.1994074125, 37.1628351411
Betaro	150,2; 199,2	32.238479, 34.955489
Beterras	389,5; 397,1	43.3416765, 3.217941
Bidaio	236,1; 257,1; 258,7	47.934824, 12.477721

Bilbili	437,3; 439,1	41.38201, -1.603219
Bingio/Vineo/Vingio	253,4; 371,3; 374,4	49.96790555, 7.89377555
Bizantino, qui et Constantinopoli	138,5; 230,11; 323,8; 332,9	41.005902, 28.9738815
Bolodoro/Boiodurum	249,5; 259,6	48.5723053, 13.463311
Bonna	254,3; 370,7	50.732632, 7.096251
Bononia civitas (Ital.)	99,5; 127,2; 282,2; 282,7; 283,7; 287,5	44.4945737, 11.3455467
Borbitomago	355,3; 374,6	49.630359, 8.3588465
Bragara	422,1; 427,4; 429,5	41.550875, -8.424973
Bregetione	246,4; 263,2; 265,3	47.735239, 18.169507
Brendice/Brizice	322,1; 331,8	Unlocated
Briceco/Brigaco	439,8; 440,1	42.002779, -5.674123
Brigantia	237,4; 251,2; 259,2; 277,4; 278,3	47.503041, 9.747061
Brigantione (Alp. Cott.)	341,5; 357,3	44.896886, 6.633951
Brige	483,3; 286,12	Unlocated
Brundisium	118,2; 315,6	40.638663, 17.9429115
Burdigalam	456,5; 457,2; 458,5; 461,2	44.837205, -0.576533
Burdipta	137,2; 231,6	41.76656091407039, 26.20245141346843
Burginacio	256,2; 370,1	51.7268395, 6.3059345
Burrio	484,5; 485,1	51.703886, -2.902543
Burtudizo	137,5; 230,4; 323,1	41.427933, 27.092423
Cabellione/Cavellione	343,5; 388,5	43.829885, 5.034166
Caesada	436,4; 438,11	40.90396, -3.073496
Caesaraugusta	392,1; 438,1; 439,4; 439,13/14; 443,2; 444,2; 446,2/3; 448,1; 451,2	41.6541855, -0.8772685
Caesarea (Cappad.)	179,5; 202,5; 206,7; 210,5; 211,5; 214,10	38.728033, 35.484989
Caesarea (Syr.)	150,1; 199,1	32.5018359, 34.8964316
Caesaromago/Cesaromago	474,3; 480,6	51.735893, 0.469629
Calcida (Syr.)	194,1; 195,1; 195,5	36.007956, 37.009719
Cale vicus/Ad Calem	125,7; 316,1	43.546796, 12.648528
Callecoma	191,6; 195,4	36.217791, 37.193425
Calleva	478,3; 485,7; 486,7	51.3572048631, -1.08239136468
Calone	255,4; 370,4	51.569108, 6.582542

Calvisiana	89,6; 95,7	37.043562, 14.293643
Camaracum	377,9; 379,3	50.175165, 3.234282
Cambete	354,1; 386,5	47.690543, 7.503772
Camisa	207,2; 213,5	39.845769, 37.401155
Campoduno/Camboduno (Raet.)	237,2; 250,8; 258,13	47.727498, 10.326578
Cannaba	189,3; 191,3	37.126213, 38.186464
Capitoliada	196,6; 198,9	32.5986015, 35.8582935
Capitonianibus	88,1; 94,4	37.388048, 14.692681
Caprasis	105,3; 110,6	39.621778, 16.27126
Capua	109,1; 111,6	41.0860925, 14.250207
Caralis	80,7; 81,4; 82,7	39.214886, 9.109522
Carnunto Leg. XIV. Gemina Germanica	247,4; 262,8; 267,12	48.113346, 16.867891
Carsagis	208,2; 215,4	39.898965, 38.9485065
Cartagine	6,2; 22,5; 25,2; 44,3; 46,1; 50,5; 52,1; 57,7; 58,1	36.8500325, 10.318
Castello	376,5; 377,2; 377,6	50.799218, 2.486896
Castello Firmano	101,2; 313,2	43.183742, 13.794334
Castro Novo (Etrur.)	291,1; 301,4	42.0333333, 11.8333333
Castro Novo (Piceni.)	101,4; 308,2; 313,4	42.752395, 13.962266
Castulone	396,4; 402,5; 403,3; 404,1	38.036873, -3.6240175
Catabathmon	69,4; 71,7/8	31.552706, 25.152644
Cataractoni	465,2; 468,2; 476,2	54.3871953968, -1.65471014672
Catina	87,4; 90,2; 94,1; 94,2	37.502959, 15.088142
Caturrigas	342,2; 357,6	44.545037, 6.278222
Cellis (Maced.)	319,2; 330,4	40.7564735, 21.679636
Cellis Picentinis	50,3; 59,5	34.252313, 10.066097
Cenofrurio	138,3; 230,9; 323,6; 332,7	41.2322499, 28.1955952
Centum Cellis	291,2; 301,5	42.091179, 11.79681
Cesarea colonia	5,1; 15,2; 25,1; 31,5	36.607058, 2.1918495
Cesena civitas/Cesena	100,3; 126,10; 286,8	44.1360174, 12.24117485
Cetio	234,2; 248,4	48.20473, 15.622695
Chereu	154,4; 155,1	31.13965, 30.192032
Cibalas civitas/Civalis	131,2; 232,5; 261,1; 267,2; 268,4	45.291016, 18.801056
Cilio	54,5; 54,11	35.167856, 8.798446

Cirta	24,6; 28,2; 35,1; 41,2; 42,4	36.3681146667, 6.61330266667
Cirtisa	260,9; 268,5	45.285247, 18.433879
Clipeis	57,1; 57,6	36.838512, 11.115794
Clodiana	318,1; 329,7	41.041466, 19.796367
Cocuso	178,5; 180,5; 181,6; 211,10; 213,1; 214,11	38.031581, 36.4983445
Coduzalaba/Doduzalaba	180,2; 181,3; 210,7; 211,7; 212,10; 213,9	38.484719, 36.504406
Colonia Agrippina	254,4; 370,6; 373,5; 376,1; 378,8	50.940662, 6.9599065
Colonia Camoloduno (Brit.)	474,4; 480,4	51.8900740264, 0.901087762674
Comagenis	234,1; 248,3	48.3310275, 16.052051
Comana	180,3; 181,4; 210,8; 211,8; 212,11; 213,10	38.3313252358, 36.3239848355
Como	278,1; 279,1	45.81192, 9.085784
Concordia (Ital.)	126,8; 128,5; 281,3	45.7582850005, 12.8427680218
Condate (Brit.)	469,1; 482,3	53.259423, -2.517363
Condate (Gall. Lugd.)	383,3; 385,4	48.384734, 2.956193
Conplutum	436,2; 438,9	40.4739, -3.3842
Copton	165,6; 171,5	25.99629845, 32.81596555
Corbeunca/Gorbeus	143,2; 205,9	39.69484, 32.87447
Corduba	402,6; 403,4; 412,6; 413,5; 415,3	37.884683, -4.779171
Coreba	26,1; 49,2; 51,2	36.508717, 9.4691485
Coriovallum	375,7; 378,6	50.883046, 5.980935
Cosam	292,1; 300,5	42.4114104481, 11.2883770391
Cosentia	105,4; 110,7	39.295395, 16.253611
Crococalana	477,8; 478,11	53.11871, -0.7472505
Crumero	246,2; 266,8/9	47.7583058, 18.5374485
Cumis	122,7; 123,5	40.8476741, 14.0562815333
Curia	277,6; 278,4	46.8485485, 9.533107
Curubi	56,7; 57,5	36.575649, 10.862461
Cyrene	68,1; 70,6	32.820348545, 21.8565546881
Cyrro	189,6; 193,2; 194,9	36.7396705, 36.952677
Dagalasso	182,6; 207,4; 213,3	40.196836, 37.980042
Damasco	196,3; 198,6; 199,5	33.511612, 36.309102
Dandaxina	178,2; 211,2; 215,4	Unlocated
Dano	475,5; 478,8	53.5254159814, -1.13510287779

Darantasia	346,1; 347,9	45.484001, 6.532142
Darnis	68,3; 70,9	32.7660775, 22.6404775
Decetia/Deccidae	367,1; 460,6	46.8282482222, 3.46142494445
Deobrigula/Teobrigula	449,6; 454,3	42.349723, -3.81438533333
Dertona	288,6; 294,6	44.897171, 8.865452
Deva leg. XX Vici (Vict.)	469,2; 482,8	53.1914685, -2.8939425
Diana Veteranorum	34,3; 35,4	35.7798225608, 6.07746431754
Dimis	322,5; 333,4	40.939631, 26.271198
Diospoli (Syr.)	150,3; 199,4	31.9582535, 34.892378
Divodoro	240,3; 364,6; 365,6; 371,6	49.1181355, 6.1741555
Dolica	184,4; 189,1; 191,1; 194,7	37.153671, 37.359985
Drepanis	91,1; 98,1	38.017128, 12.51782
Drizipara/Drusiparo	137,7; 230,6; 323,3	41.300089, 27.543955
Durnonovaria	483,6; 486,15	50.7092845, -2.437165
Durobrovis/Dubobrius	472,3; 473,3; 473,8	51.3896486672, 0.502597173879
Durocasis	384,5; 385,5	48.737951, 1.361087
Durocobrivis	471,2; 476,9; 479,7	51.883025, -0.528644
Durocortoro	362,1; 363,4; 364,7; 365,7; 379,8; 381,6	49.2539525, 4.0332025
Duroruerno/Durarueno	472,5; 473,4; 473,9	51.279876, 1.08386
Durrachio	339,5; 317,6	41.3163425, 19.447355
Ebora	418,1; 426,5	38.5717285, -7.9084865
Eburacum leg. VI Victrix	466,1; 468,4; 475,7; 478,6	53.957672, -1.082304
Eburoduno/Ebreduno	342,1; 357,5	44.5639875, 6.4957095
Edessa (Maced.)	319,3; 330,5	40.799718, 22.053972
Edissa	185,3; 187,1; 189,5; 190,5; 191,5; 192,3	37.1625575, 38.781432
Egnatiae/Gnathiae	117,4; 315,4	40.888326, 17.391887
Eleuteropoli	199,4; 200,2	31.614254, 34.8910485
Emerita	415,2; 416,3; 418,5; 419,6; 420,7; 432,8; 433,1; 438,2; 444,3	38.9178151543, -6.33901360476
Epamantuduro	349,2; 386,4	47.4503869667, 6.8001402
Epitania	188,1; 194,4	35.1485665, 36.752969
Eporedia	345,1; 347,4; 351,1	45.466604, 7.875942
Esuri	425,6; 431,4	37.21845, -7.441717

Eulepa	179,4; 206,9; 214,9	39.02792, 35.870839
Faventia civitas	100,2; 126,11; 283,8; 287,2	44.286236, 11.883507
Ferentino	302,6; 305,2	41.692693, 13.253364
Fiarasi/Siara	205,5; 214,4	39.864116, 36.594603
Fidentiola vicus	99,1; 127,6; 288,1	44.865109, 10.061732
Fines (Ital. - Alp. Cott.)	341,2; 356,13	45.0957849, 7.4208953
Flexo	247,2; 267,11	47.87441, 17.26939
Florentia	284,2; 285,2	43.768755, 11.256929
Floriana	263,8; 265,2	47.39333, 18.460507
Fonte Timavi	270,3; 273,1	45.78862, 13.590851
Formis/Furmis	108,2; 121,10	41.2560395, 13.6035325
Foro Corneli civitas (Transpad.)	100,1; 127,1; 287,3	44.353995, 11.707535
Foro Domiti	389,3; 396,8	43.515715, 3.692307
Fregellano	303,2; 305,4	41.5461, 13.513236
Frusinone	303,1; 305,3	41.64016, 13.351922
Fundis	108,1; 121,9	41.357429, 13.427922
Gabilunnum/Cavilunno	360,1; 363,3	46.783372, 4.8560145
Gadara	197,1; 198,10	32.655922, 35.6781455
Gadis	408,4; 409,1	36.5292776667, -6.29312066667
Gela sive Filosofianis	88,2; 94,5	37.3190798213, 14.2954461465
Gemellas	32,7; 34,5	Unlocated
Germa	201,4; 202,8	39.511421, 31.616172
Germanicia	184,1; 186,1; 188,7	37.586682, 36.925326
Gesoriaco	363,2; 463,4	50.7256746667, 1.61483166667
Gorsio sive/Hercule	264,4; 265,1	47.0899955584, 18.4205453087
Hadriae	308,3; 310,4; 313,5	42.5802, 13.981081
Hadrianopoli	137,3; 175,6; 231,7; 322,8	41.676459, 26.562891
Harenatio	256,3; 369,5	51.812301, 6.125456
Haza/Haia	183,4; 207,8	39.983333, 39.333333
Heliupoli	198,4; 199,7	34.0063794317, 36.2038547331
Helius	163,4; 169,3	30.1294036, 31.3074812
Helueto	252,4; 350,2; 354,4	48.372887, 7.616824
Helvillo vicus	125,6; 315,7	43.296882, 12.759704
Hemesa	188,3; 194,6; 198,1; 199,10	34.7376565, 36.719319
Hennoma civitas/Hemona	129,2; 259,11	46.051425, 14.505963
Heraclea (Maced.)	319,1; 330,3	41.024885, 21.338242

Heraclia (Thrac.)/Perintho	138,2; 175,7; 176,2; 230,8; 323,5; 332,6	40.971013, 27.952973
Hermupoli (Aeg. Delta)	154,3; 155,2	31.033655, 30.4707825
Hierapoli (Syr.)	191,8; 193,1	36.526222, 37.9555335
Hippon	68,4; 71,1	32.599189, 22.936949
Hippone Regio	6,1; 20,3; 42,7; 44,4	36.882478, 7.751272
Hispali	410,3; 413,1; 414,1	37.382668, -5.996293
Horrea Caelia	52,5; 56,5; 58,4	36.030099, 10.507908
Hyccara	91,4; 97,3; 97,7	38.131616, 13.180922
Ierabrica	419,9; 421,1	39.066877, -9.062142
Igilgili colonia	18,3; 40,5	36.8212995, 5.766168
Ilerda	391,2; 452,2	41.6159535, 0.625938
In Medio (Cappad.)	212,8; 213,7	38.9383575, 36.674519
In Medio (Osrhoëne)	189,4; 191,4	37.152848, 38.399985
Incero	260,5; 265,8	45.377474, 17.735551
Insiniscra	236,3; 257,3; 258,9	47.920814, 11.76939
Interamnio (Hisp. Tarr.)	448,5; 453,7	42.5, -5.5
Intereraconio Flavio/Interamnio	429,3; 431,2	42.6175246, -6.5201227
Interpromium vicus/Interbromio	102,1; 310,2	42.244249, 13.934227
Inuca/Unuca	25,2; 45,5; 50,7	36.728132, 10.012412
Iovavi	235,4; 256,7; 258,6	47.7991735, 13.0455165
Iscae leg. II Augusta	484,4; 484,10; 485,8	51.610420624, -2.95544971545
Isurium/Isubrigantum	465,3; 468,3; 476,1	54.0906269505, -1.38333650603
Italica	413,6; 432,3	37.540932, -5.079949
Iuliaco	375,8; 378,7	50.921007, 6.361194
Iuliobona	382,1; 384,13; 385,1	49.5196055, 0.53567465
Iuncaria	390,3; 397,8	42.2748, 2.96815
Izirallo/Tzirallo/Thirallo	138,1; 230,7; 323,4	41.1666897906, 27.7953932947
Laciaco	235,3; 256,6; 258,5	47.985451, 13.419395
Lacobriga	395,1; 449,3; 454,1	42.338959, -4.601768
Lacotina	210,2; 215,9	37.989649, 38.613281
Lactodoro	470,6; 476,11	52.131483, -0.9887305
Lambese	34,2; 40,6	35.4899361155, 6.25480952551
Larissa (Syr.)	187,6; 195,8	35.422241, 36.402509
Lasamices	67,6; 70,5	32.590008, 21.712327
Laude civitas	98,6; 127,8; 283,2	45.303456, 9.418776
Laudicia	198,2; 199,9	34.5571498714, 36.5193557285
Laumello	282,9; 340,2; 347,2; 356,9	45.122041, 8.79735

Lauriaco	235,1; 249,1; 256,4; 258,5; 277,3	48.2186795, 14.470479
Lavatris/Levatris	468,1; 476,3	54.514656, -2.012394
Legeolio/Lagecio	475,6; 478,7	53.725863, -1.356271
Lepti Magna	57,8; 63,2; 77,3	32.6379575, 14.291378
Libissa/Lybissa	140,1; 231,2	40.769562, 29.539812
Licnido/Lignito	318,4; 329,10	41.114136, 20.7964495
Lilybeum	89,2; 90,6; 97,6	37.80113425, 12.4308155
Limniade	68,2; 70,8	32.779834, 22.155779
Lindo	475,3; 477,9; 478,10	53.2348205, -0.538442
Loco Felicis	234,4; 248,6	48.096382, 14.799821
Londinio/Lundinio	471,5; 473,1; 474,1; 476,7; 478,5; 479,9; 480,8	51.513335, -0.088949
Luca/Laca	284,4; 284,5; 289,1/2	43.84184, 10.50703
Luco Augusti	430,8; 424,7	43.0106145, -7.5570105
Lugdunum (Gall. Narb.)	358,5; 359,1	45.758866, 4.8194815
Lugudunum (Aquit.)	457,8; 463,2	43.0270135, 0.5722425
Luguvallo	467,2; 476,6	54.896035, -2.9376685
Lune	289,2; 293,4	44.064253, 10.016856
Luticia	368,2; 383,1; 384,7; 384,12	48.8544055, 2.346168
Macomadibus (Afr.)	48,7; 59,4	34.525858, 10.497324
Madasuma	48,4; 49,9	Unlocated
Magiovinto	471,1; 476,10; 479,6	51.998623, -0.716167
Malandara/Marandara/Maiandara	179,2; 206,11; 214,7	39.3502785, 36.4101085
Mamucio/Mamcunio	468,7; 482,2	53.4753159454, -2.25412713
Marazania	47,4; 55,7	36.02994, 9.222872
Margiduno	477,6; 479,1	52.9739905, -0.9639585
Masclianis	53,3; 54,3; 55,1; 56,1	35.396463, 9.544378
Maxula Prates	57,3; 58,1	36.768841, 10.271569
Medialano (Brit.)	469,4; 482,4	52.967, -2.681
Mediolano Aulercorum (Gall. Lugd.)	384,4; 384,13	49.024342, 1.151012
Mediolanum civitas (Ital.)	98,5; 127,9; 278,2; 339,7; 344,3; 346,10; 350,4; 356,1; 387,5	45.463746, 9.18806
Melantiada	138,4; 230,10; 323,7; 332,8	41.028946, 28.764683

Meletena	177,5; 209,5; 211,4; 215,6	38.4417033923, 37.6846822258
Mellissurgin	320,2; 328,6	40.612681, 23.3457935
Memphi	156,2; 163,5	29.849491, 31.255061
Menegere	54,6; 54,10	35.368472, 8.470741
Mercurios	3,2; 6,4	Unlocated
Messana	86,4; 90,4	38.192251, 15.556634
Miasena/Nesena	210,1; 215,8	38.146215, 38.687646
Michera sive Elene	69,1; 71,4	32.128016, 23.668112
Minariacum	377,4; 377,7	50.644574, 2.721531
Minnicam	193,3; 194,10	36.520874, 37.081608
Minturnis	108,3; 121,11	41.242193, 13.768467
Mogetiana	233,4; 263,5	47.118283, 17.314149
Mogontiacum	355,5; 374,5	49.998912, 8.273869
Monte Brisiaco	239,1; 252,3; 350,1	48.0286545, 7.581259
Muriduno/Moriduno |Devon]	483,7; 486,16	50.7713632414, -2.9967275191
Mursa civitas	131,1; 232,6; 243,5; 265,10; 267,3	45.560018, 18.675749
Musti	26,2; 41,3; 45,2; 49,3; 51,3	36.336066, 9.143109
Muteno	233,7; 266,6	47.936365, 16.481762
Mutina civitas	99,4; 127,3; 282,1; 282,6; 283,6; 287,6	44.647057, 10.925223
Nara	48,3; 49,8	35.089578, 9.328907
Naraggara	41,5; 44,7	36.223438, 8.356079
Narbone	389,6; 397,2	43.1836165, 3.004203
Narnia civitas	125,2; 311,2	42.5187636, 12.51568345
Neapoli	123,2; 123,3	40.839995, 14.25287
Neapoli (Syr.)	197,4; 199,11	32.218685, 35.262911
Nemausum	388,7; 396,5	43.8431497874, 4.3541755708
Nemetacum	377,8; 378,10; 379,2; 379,9	50.2927655, 2.778586
Nertobriga	437,4; 439,2	41.500549, -1.396549
Nerulo	105,1; 110,4	39.953733, 16.039995
Neve	196,5; 198,8	32.889163, 36.0422425
Nevensio/Novesiae	255,2; 370,5	51.183889, 6.721944
Nicia/Castra	318,5; 330,2	41.05699, 21.177949
Nicomedia	140,2; 231,3	40.7651905, 29.919887

Nicopoli (Cappad.)	183,1; 207,5; 213,2; 215,12	40.1485567, 38.14353355
Nicotera	106,2; 111,3	38.55563, 15.937498
Novaria	344,5; 350,6	45.445082, 8.618661
Noviomago (Germ. Sup.)	253,3; 355,2; 374,7	49.3172545, 8.436718
Nuceria	109,3; 123,3	40.743128, 14.673929
Nura	85,2; 85,3	38.9848181, 9.01528185
Obucula	413,2; 414,3	37.462227, -5.348392
Ocelo Duri	434,6; 439,10	41.503336, -5.746286
Olisippo	416,4; 418,7; 419,7; 420,8	38.707166, -9.135507
Olotoaelariza	183,2; 207,6; 215,13	40.07737, 38.594684
Osca	391,5; 451,5	42.1394475, -0.407326
Osdara/Asdara	178,3; 211,1; 215,3	38.240638, 37.328382
Ossonoba	418,6; 426,2	37.01535, -7.935108
Ostudizo	137,4; 230,3; 322,9	41.549918371918324, 26.821660382818514
Othoca	82,5; 84,3	39.879418, 8.611448
Otricoli civitas/Ocricoli	125,1; 311,1	42.412746, 12.466611
Ovilavis	235,2; 249,2; 256,5; 258,4; 277,2	48.156643, 14.024611
Pace Iulia	427,3; 431,7	38.015604, -7.865225
Palantia	449,1; 453,8	42.47473, -5.297387
Panormo	91,5; 97,2	38.11127, 13.3534422
Panticio	139,3; 231,1	40.88067720820398, 29.258135648161534
Papyra	201,6; 203,1	39.772272, 32.458677
Parme civitas	99,2; 127,5; 287,9	44.801507, 10.327967
Parnaso	144,1; 206,3	38.9918185, 33.570111
Parthano	257,6; 375,2	47.49237, 11.086258
Parthenico	91,3; 97,9	38.044987, 13.12095
Patavis civitas	128,3; 281,5	45.409561, 11.876975
Pella/Diocletianopolis	319,4; 330,6	40.757294, 22.5220635
Pelusio	152,4; 162,5; 171,4	31.0427587, 32.5473404
Perdices	29,3; 36,1	35.931999, 5.390069
Perre	210,3; 215,10	37.778243, 38.2865415
Petromantalum	382,5; 384,10	49.120178, 1.771454
Philippis	320,5; 331,2	41.013317, 24.2836083333
Pisauro civitas	100,5; 126,3	43.912081, 12.91577

Pisis	289,1; 293,2	44.897171, 8.865452
Pistoris	284,3; 285,1	43.932766, 10.9182435
Placentia civitas	98,7; 127,7; 288,3	45.0525855, 9.6976645
Plagiaria	419,5; 420,6	38.922609, -6.901471
Plotinopolim	175,7; 322,7	41.358625, 26.499702
Ponte Aeni	236,2; 257,2; 258,8; 259.3	47.856079, 12.124016
Ponte Neviae	430,10; 425,2	42.853402, -7.162148
Ponte Sociorum/Ponte Mansuetiana	264,2; 267,6	Unlocated
Porsulis/Inipara/Pyrsoali	321,5; 331,6/7	41.132896, 25.3293005
Potentia civitas/Castro Truentino	101,1; 313,1	43.4198358, 13.66733325
Ptandari/Tandari	178,4; 180,4; 181,5; 210,10; 212,12; 213,11; 214,12; 215,1	38.422166, 36.913591
Ptholemais	67,4; 70,2	32.708807, 20.9507545
Pupput	52,4; 56,6; 58,3	36.392998, 10.562216
Pyrgos/Pirgos	290,3; 301,3	42.0153455, 11.963217
Quadratis (Ital.)	340,6; 356,11	45.191112, 7.969391
Quadrato (Pann.)	260,1; 274,5	Unlocated
Rame	341,6; 357,4	44.747573, 6.57861
Rapidi	30,7; 38,9	36.1368445, 3.4229785
Ratas/Ratis	477,4; 479,3	52.634738, -1.13538
Ratomago	382,3; 384,1	49.440841, 1.096451
Rauracis/Augusta Rauracis	251,7; 353,3	47.533241, 7.722118
Regio civitas (Gall. Caspad.)	99,3; 127,4; 283,5; 287,7	44.698137, 10.630721
Resisto/Risisto	176,1; 332,5	40.978415, 27.508023
Rigomago	340,5; 356,10	45.193171, 8.297388
Ritupis in portu Brittaniarum	463,5; 472,6	51.293746, 1.3325535
Rosolatiaco/Orsologiaco	143,3; 206,1	39.588876, 32.896893
Rostro Nemaviae	237,1; 258,12	48.061146, 10.63995
Rusadder	4,2; 11,4	35.2922015, -2.938778
Rusiccade	5,3; 19,2	36.8814425, 6.9055805
Rusuccuro colonia	16,4; 39,1/2	36.9128545, 3.9096445
Sabaria	233,5; 261,7; 262,6; 263,3; 266,4	47.235142, 16.62192
Salacia	417,4; 418,6; 426,4	38.371152, -8.519503
Saldis	5,2; 17,3; 32,3; 39,6/7	36.740851, 5.057965
Salonas	269,7; 272,7; 337,4	43.539561, 16.483426

Samarobriva	362,4; 380,1	49.8936075, 2.297948
Samosata leg. VII	186,6; 210,4; 215,11	37.525756, 38.530357
Sara/Zara	182,5; 207,3; 213,4	39.89671, 37.755439
Satalam leg. XV Apollinans	183,5; 207,9/10; 216,3; 217,4	40.027787, 39.597934
Sca Dumnonniorum/Isca D.	483,8; 486,17	50.725562, -3.5269108
Scaenas Veteranorum	163,3; 169,4	30.301404990740004, 31.297088924732385
Scallabin	420,1; 421,2	39.2335206, -8.6774238
Scampis	318,2; 329,8	41.116775, 20.092646
Scanatu	179,1; 206,12; 214,6	Unlocated
Scarabantia	233,6; 261,6; 262,7; 266,5	47.684893, 16.583036
Scytopoli	197,2; 198,11	32.5033615, 35.502981
Sebastia	176,3; 178,6; 180,6; 204,6; 205,6; 207,1; 212,5; 213,6; 214,5	39.7490195, 37.016607
Sebastopoli	205,3; 214,1	40.0012844667, 36.0854952
Secontia/Segontia	437,5; 439,3	41.63349, -1.191459
Segeloci/Ageloco	475,4; 478,9	53.33623255, -0.7646715
Segesamone/Legisamone	394,5; 449,5; 454,2	42.417842, -4.043492
Segontia	436,5; 438,12	41.069585, -2.642246
Segusione	341,3; 357,1	45.138348, 7.048364
Segusterone	342,5; 388,2	44.197042, 5.94352
Semeros	67,5; 70,4	32.533293, 21.449973
Senagallia civitas	100,6; 316,3	43.714978, 13.21799
Septempeda	312,3; 316,6	43.229281, 13.181319
Septiminicia	48,5; 50,1	Unlocated
Seriane	195,3; 197,5	35.387685, 37.800064
Sextatione	389,2; 396,7	43.64232, 3.896373
Sicca Veneria	41,4; 45,1	36.18057, 8.712204
Sicilibra	25,3; 45,4	36.68588, 9.873597
Sicos Basilisses	184,3; 188,8	37.411526, 37.330858
Sigus	28,1; 34,8; 42,2	36.122312, 6.78528
Sinuessa	108,4; 122,5	41.15229, 13.84483
Siricis	210,9; 211,9	38.204189, 36.458778
Sirmi civitas	131,4; 231,11; 261,3; 266,14; 267,13	44.966447, 19.610106

Siscia	260,2; 265,5; 266,3; 274,7	45.483168, 16.371388
Sitifi	24,7; 29,2; 31,6; 33,1; 34,6; 36,2; 40,1	36.1930925, 5.4108155
Sorvioduni/Sorbiodoni	483,4; 486,13	51.09327383, -1.80477879645
Speluncas	118,1; 315,5	40.756409, 17.700432
Spinis	485,6; 486,6	51.411962, -1.343928
Sub Anagniae/Compitum	302,5; 305,1; 306,1/2	41.742213, 13.158962
Suessonas/Augusta Suessonum	362,2; 379,6; 380,6	49.380839, 3.3258515
Sufasar	31,3; 38,5	36.19245, 2.51327
Sufetula	46,6; 48,2; 49,7; 51,7; 53,4; 54,4; 54,12; 55,11	35.240165, 9.119793
Sufibus	47,5; 48,1; 49,6; 51,6; 55,6	35.5433595, 9.073196
Suisa/Soissa	207,12; 216,2	Unlocated
Summurano	105,2; 110,5	39.842839, 16.13737
Suppianis/Sopianis	232,8; 264,1; 267,5	46.07335, 18.228059
Syracella/Syrascele	332,3; 333,5	40.884037, 26.926366
Syracusis	90,1; 96,4	37.0687655418, 15.284171651
Tabalta	48,6; 50,2	32.930463, 10.453562
Tacapis	50,4; 59,6; 74,1; 78,3	33.88643, 10.109445
Tadutti	32,5; 35,3	35.711899, 6.374227
Tamugadi	34,1; 35,2; 40,7	35.4852165, 6.4682225
Tarracina	107,5; 121,8; 122,4	41.291169, 13.24885
Tarracone/Terracone	391,1; 399,1; 452,5	41.116892, 1.2583375
Tarvenna	376,4; 378,9; 379,1	50.635487, 2.256822
Taurinis	341,1; 356,12	45.0717795, 7.685998
Tauromenio	87,2; 90,3	37.852391, 15.292123
Tauruno classis/Laurinum	131,6; 241,3; 242,1	44.835966, 20.411502
Tavia	201,8; 203,8/9; 204,7	39.873826, 34.47186325
Telesia	122,2; 304,3	41.2234541313, 14.5041752135
Theano	121,12; 304,1	41.2502785, 14.0700745
Thebeste colonia	27,1; 33,2; 47,2; 54,7; 54,8	35.404174, 8.1223145
Thenis	46,2; 48,8; 57,7; 59,3	34.6553465, 10.670659
Thermis Himeraies	92,1; 93,2	37.9851965, 13.6962535
Thessalonice	320,1; 328,5; 330,7	40.628342, 22.952885
Thilaticomum	192,1; 192,6	Unlocated
Thou	163,2; 170,1	Unlocated

Ticino	283,1; 340,1; 347,1; 356,8	45.185899, 9.156562
Timalino	425,1; 430,9	42.891567, -7.260016
Tindaride	90,5; 93,1	38.14272495, 15.0445609
Tingi	4,1; 8,4; 9,1; 24,5	35.787546, -5.8102335
Titulciam	436,1; 438,8; 439,11/12; 446,1	40.136593, -3.570531
Toletum	438,7; 446,7	39.85668, -4.024491
Tonosa	181,1; 182,1; 212,7	39.283695, 36.75576
Topiro/Otopiso	321,3; 331,4	41.079556, 24.773105
Traianopoli	175,8; 322,4; 332,1; 333,4	36.258509, 32.282734
Tres Tabernas/Tribus Tabernis	318,3; 329,9	41.5, 20.5
Tridento	275,7; 281,1	46.0667685, 11.119135
Tritium	450,1; 454,4	42.459336, -3.484908
Triveros/Treveros	240,5; 363,3; 366,4; 371,5; 372,3; 374,1	49.7523211725, 6.64163827339
Troento civitas	101,3; 308,1; 313,3; 317,2	42.9137095, 13.904355
Tubusuptus (Maur. Caes.)	32,2; 39,5	36.667565, 4.8462225
Tucca Terebentina	47,7; 49,5; 51,5	35.829469, 9.014215
Tullum	365,4; 385,10	48.679364, 5.8947805
Turnacum	376,7; 377,5; 378,11	50.605679, 3.3882855
Tusdro/Thusdro	53,5; 55,5; 59,1	35.2960575, 10.707584
Ulbia/Olbia	79,4; 80,8; 82,9	40.923, 9.500426
Ulmos vicus	131,3; 232,4; 261,2; 267,1; 268,3	45.16406, 19.151556
Urioconio/Viriconio	469,6; 484,9	52.6744875916, -2.64381110604
Uruncis/Virincis	252,2; 349,5	47.7813285, 7.3470445
Uttaris	425,3; 430,11	42.649464, -6.882122
Vallata	448,4; 453,6	42.517505, -5.766403
Vallis	25,4; 49,1; 51,1	36.75, 9.75
Vapincum	342,3; 357,7; 387,5	44.559876, 6.075897
Varia/Barium	117,2; 315,2	41.129222, 16.870331
Varianis (Pann.)	260,3; 265,6	45.479229, 16.776469
Veldidena	258,1; 259,10; 275,3; 280,4	47.253961, 11.399902
Vemania	237,3; 251,1; 259,1	47.6981400839, 10.0672795429
Venonis/Vennonis	470,4; 477,3; 479,4	52.49445, -1.301384

Venta Belgarum	478,2; 483,2; 486,11	51.063, -1.317
Venusium civitas	104,1; 113,1; 121,2	40.968880391, 15.8274579533
Vercellas	282,8; 344,6; 347,3; 350,7	45.321094, 8.426374
Verisa	205,4; 214,3	40.102781, 36.484083
Verolamio	471,3; 476,8; 479,8	51.7520276421, -0.358468171293
Verometo/Vernemeto	477,5; 479,2	52.821583, -1.0559
Verona civitas	128,1; 275,9; 282,3	45.4421295463, 10.9957360051
Verteris	467,5; 476,4	54.5214081466, -2.32367380505
Veteris/Traiana [Xanten]	256,1; 370,2	51.6679345, 6.4481775
Veteris/Veteribus [Birten]	255,5; 370,3	51.646389, 6.469989
Vico Augusti	53,1; 54,1; 55,9; 56,3	35.676112, 10.308148
Vienna	346,9; 358,4	45.5245105, 4.875982
Viminacio (Hisp. Tarr.)	449,2; 453,9	42.329158, -4.803655
Viminacium (Moes.)	133,3; 217,5	44.7266235, 21.1913635
Vina	52,3; 58,2	36.510508, 10.550673
Vinda	201,5; 202,9	39.6503052703, 31.9784831233
Vindogladia/Vinocladia	483,5; 486,14	50.826394, -2.05251
Vindomi	483,1; 486,10	Unlocated
Vindomona	233,8; 261,4; 266,7	48.211345, 16.373946
Vindonissa	238,2; 251,6	47.478494, 8.220204
Vipiteno	275,4; 280,3	46.89921, 11.431153
Virovenna	394,4; 450,2; 454,5	42.550298, -3.32337
Visontione/Vasentione	348,5; 386,3	47.2372405, 6.027924
Vitricium	345,2; 347,5; 351,2	45.668586, 7.690596
Zeuma	185,1; 189,2; 190,2; 191,2	37.058156, 37.86983

Appendix 2

Repeated road stretches in the itinerary identified by Wesseling's notations and distances in Roman miles (*m.p.*).

Repeated road stretches	**Distances**
24,4-24,5/8,3-8,4	18/18
25,2-25,2/46,1-45,5/50,5-50,7	22/21/22
25,2-25,3/45,5-45,4	7/8
25,4-26,1/49,1-49,2/51,1-51,2	20/20/20
26,1-26,2/49,2-49,3/51,2-51,3	28/26/26
28,1-28,2/42,2-42,3/34,8-35,1	25/25/25
29,2-29,3/36,2-36,1	25/25
32,2-32,3/39,5-39,6	18/18
34,1-34,2/40,7-40,6	14/14
41,3-41,4/45,2-45,1	32/34
41,4-41,5/45,1-44,7	30/32
47,3-47,4/55,8-55,7	15/20
47,4-47,5/55,7-55,6	28/28
47,6-47,7/49,4-49,5/51,4-51,5	15/12/12
47,7-48,1/49,5-49,6/51,5-51,6	25/25/25
48,1-48,2/49,6-49,7/51,6-51,7	25/25/25
48,2-48,3/49,7-49,8	15/15
48,3-48,4/49,8-49,9	25/32
48,4-48,5/49,9-50,1	25/25
48,5-48,6/50,1-50,2	20/20
49,3-49,4/51,3-51,4	30/20
50,3-50,4/59,5-59,6	30/30
52,1-52,3/58,1-58,2	33/28
52,3-52,4/58,2-58,3	10/12
52,4-52,5/56,6-56,5/58,3-58,4	33/30/30
52,5-52,6/56,5-56,4/58,4-58,5	10/18/18
52,6-53,1/56,4-56,3/55,10-55,9	25/25/25
53,1-53,2/56,3-56,2/54,1-54,2/55,9-55,8	25/32/35/35
53,2-53,3/56,2-56,1/54,2-54,3	18/17/18
54,5-54,6/54,11-54,10	25/25
54,6-54,7/54,10-54,8	25/25

67,4-67,5/70,2-70,4	32/32
67,5-67,6/70,4-70,5	26/26
67,6-68,1/70,5-70,6	25/25
68,1-68,2/70,6-70,8	21/21
68,2-68,3/70,8-70,9	24/24
68,3-68,4/70,9-71,1	28/28
87,4-88,1/94,2-94,4	24/24
88,1-88,2/94,4-94,5	21/21
91,3-91,4/97,9-97,7	8/12
91,4-91,5/97,3-97,2	16/18
98,6-98,6/127,9-127,8	16/16
98,6-98,7/127,8-127,7	24/24
98,7-99,1/127,7-127,6/288,3-288,1	24/24/25
99,1-99,2/127,6-127,5/288,1-287,9	15/15/15
99,2-99,3/127,5-127,4/287,9-287,7	18/18/18
99,3-99,4/127,4-127,3/287,7-287,6/283,5-283,6	17/17/18/17
99,4-99,5/127,3-127,2/282,6-282,7/287,6-287,5/283,6-283,7	25/25/25/25/25
99,5-100,1/127,2-127,1/287,5-287,3	24/24/23
100,1-100,2/127,1--126,11/287,3-287,2	10/10/10
100,2-100,3/126,11-126,10/287,2-286,8	24/24/23
100,4-100,5/126,4-126,3	24/24
101,1-101,2/313,1-313,2	20/22
101,2-101,3/313,2-313,3	26/24
101,3-101,4/308,1-308,2/313,3-313,4	12/12/12
105,1-105,2/110,4-110,5	16/13
105,2-105,3/110,5-110,6	21/21
105,3-105,4/110,6-110,7	28/26
105,4-105,5/110,7-110,8	18/18
105,5-105,6/110,8-111,1	18/18
105,6-106,2/111,1-111,3	38/39
106,2-106,3/111,3-111,4	24/24
106,3-106,4/111,4-111,5	14/14
107,5-108,1/121,8-121,9	14/13
108,1-108,2/121,9-121,10	13/13
108,2-108,3/121,10-121,11	9/9
117,2-117,4/315,2-315,4	37/37
117,4-118,1/315,4-315,5	20/21
118,1-118,2/315,5-315,6	19/18
121,12-122,1/304,1-304,2	17/17

122,1-122,2/304,2-304,3	25/25
122,2-122,3/304,3-304,4	18/18
125,1-125,2/311,1-311,2	12/12
125,6-125,7/315,7-316,1	23/14
126,6/7-126,8/128,4-128,5/281,4-281,3	31/31/31
126,8-126,9/128,5-128,6/281,3-281,2	31/31/31
128,3-128,4/281,5-281,4	33/32
131,1-131,2/232,6-232,5/267,3-267,2	23/22/22
131,2-131,3/232,5-232,4/261,1-261,2/267,2-267,1/268,4-268,3	22/23/22/24/22
131,3-131,4/232,4-231,11/261,2-261,3/267,1-266,14	26/26/26/26
137,2-137,3/231,6-231,7	24/32
137,4-137,5/230,3-230,4/322,9-323,1	18/18/19
137,5-137,6/230,4-230,5/323,1-323,2	18/18/17
137,6-137,7/230,5-230,6/323,2-323,3	14/14/14
137,7-138,1/230,6-230,7/323,3-323,4	16/16/16
138,1-138,2/230,7-230,8/323,4-323,5	17/18/18
138,2-138,3/230,8-230,9/323,5-323,6/332,6-332,7	18/18/18/24
138,3-138,4/230,9-230,10/323,6-323,7/332,7-332,8	28/27/27/27
138,4-138,5/230,10-230,11/323,7-323,8/332,8-332,9	18/18/19/19
139,3-140,1/231,1-231,2	24/24
140,1-140,2/231,2-231,3	22/22
143,1-143,2/205,7-205,9	20/24
143,2-143,3/205,9-206,1	12/18
143,3-143,4/206,1-206,2	31/20
143,4-144,1/206,2-206,3	24/22
150,1-150,2/199,1-199,2	18/31
150,2-150,3/199,2-199,3	22/28
154,3-154,4/155,2-155,1	24/20
154,4-154,5/155,1-154,5	20/24
163,3-163,4/169,4-169,3	14/18
175,9-176,1/332,4-332,5	22/26
176,1-176,2/332,5-332,6	25/26
177,5-178,1/211,4-211,3/215,6-215,5	26/28/28
178,1-178,2/211,3-211,2/215,5-215,4	24/22/22
178,2-178,3/211,2 - 211,1/215,4-215,3	24/24/24
178,4-178,5/180,4-180,5/181,5-181,6/212,12-213,1/214,12-214,11	38/38/38/38/28
179,1-179,2/206,10-206,11/214,6-214,7	30/39/39
179,2-179,3/206,11-206,10/214,7-214,8	28/28/28
179,3-179,4/206,10-206,9/214,8-214,9	24/24/24

179,4-179,5/206,9-206,7/214,9-214,10	16/16/26
180,1-180,2/210,6-210,7/211,6-211,7	19/24/24
180,2-180,3/181,3-181,4/210,7-210,8/211,7-211,8/212,10-212,11/213,9-213,10	24/20/26/26/24/24
181,1-181,2/212,7-212,9	50/50
182,5-182,6/207,3-207,4/213,4-213,3	20/20/20
182,6-183,1/207,4-207,5/213,3-213,2	24/24/24
183,1-183,2/207,5-207,6/215,12-215,13	24/24/24
183,2-183,3/207,6-207,7	26/26
183,3-183,4/207,7-207,8	24/26
183,4-183,5/207,8-207,9/10	26/26
184,1-184,3/188,7-188,8	20/15
184,3-184,4/188,8-189,1	10/15
184,4-185,1/189,1-189,2/191,1-191,2	12/14/24
185,1-185,2/190,2-190,3	20/13
185,2-185,3/190,3-190,5	25/27
187,5-187,6/195,7-195,8	16/16
188,1-188,2/194,4-194,5	16/16
188,2-188,3/194,5-194,6	16/16
189,2-189,3/191,2-191,3	13/25
189,3-189,4/191,3-191,4	12/22
189,4-189,5/191,4-191,5	15/18
191,8-192,1/193,1-192,6	10/31
193,2-193,3/194,9-194,10	20/24
193,3-193,4/194,10-194,11	22/20
193,4-194,1/194,11-195,1	18/15
196,3-196,4/198,6 - 198,7	32/32
196,4-196,5/198,7-198,8	30/30
196,5-196,6/198,8-198,9	36/36
196,6-197,1/198,9-198,10	16/16
197,1-197,2/198,10-198,11	16/16
198,4-198,5/199,7-199,6	38/32
198,5-198,6/199,5-199,6	18/38
201,4-201,5/202,8-202,9	24/32
201,5-201,6/202,9-203,1	32/32
201,6-201,7/203,1-203,2	27/27
205,3-205,4/214,1-214,3	24/24
205,4-205,5/214,3-214,4	12/12
205,5-205,6/214,4-214,5	36/36
209,5-210,1/215,7-215,8	12/12

210,1-210,2/215,8-215,9	28/28
210,2-210,3/215,9-215,10	26/26
210,3-210,4/215,10-215,11	24/24
212,9-212,10/213,8-213,9	20/20
232,6-232,7/267,3-267,5	24/24
232,7-232,8/267,4-267,5	30/30
233,5-233,6/261,7-261,6/262,6-262,7	34/34/34
233,6-233,7/266,5-266,6	12/18
233,7-233,8/266,6-266,7	22/36
233,8-234,1/248,2-248,3	24/20
234,1-234,2/248,3-248,4	24/30
234,2-234,3/248,4-248,5	22/20
234,3-234,4/248,5-248,6	26/25
234,4-235,1/248,6-249,1	20/20
235,1-235,2/249,1-249,2/258,2-258,4/277,3-277,2	26/16/26/26
235,2-235,3/256,5-256,6/258,4-258,5	32/27/32
235,3-235,4/256,6-256,7/258,5-258,6	28/28/28
235,4-236,1/256,7-257,1/258,6-258,7	33/33/32
236,1-236,2/257,1-257,2/258,7 - 258,8	18/18/18
236,2-236,3/257,2-257,3/258,8-258,9	20/20/20
236,3-236,4/257,3-257,4/258,9-258,10	32/32/32
236,4-236,5/258,10-258,11	27/27
236,5-237,1/258,11-258,12	25/25
237,1-237,2/258,12-258,13	32/32
237,2-237,3/250,8-251,1/258,13-259,1	15/15/15
237,3-237,4/251,1-251,2/259,1-259,2	24/24/24
237,4-237,5/251,2-251,3	20/20
237,5-238,1/251,3-251,4	20/20
238,1-238,2/251,4-251,6	45/46
246,4-246,6/263,2-263,1	30/30
247,2-247,4/267,11-267,12	30/30
252,2-252,3/349,5-350,1	23/24
252,3-252,4/350,1-350,2	28/20
252,4-252,5/350,2-350,3/354,4-354,5	29/30/18
255,4-255,5/370,4-370,3	32/27
256,1-256,2/370,2-370,1	9/8
256,2-256,3/370,1-369,5	15/9
260,2-260,3/265,5-265,6	23/23
282,8-282,9/347,3-347,2	25/26

282,9-283,1/340,2-340,1/347,2-347,1/356,9-356,8	22/22/22/22
284,2-284,3/285,2-285,1	25/25
284,3-284,4/285,1-284,5	25/25
290,2-290,3/301,2-301,3	12/12
290,3-291,1/301,3-301,4	8/8
291,1-291,2/301,4-301,5	5/8
302,5-302,6/305,1-305,2	8/8
302,6-303,1/305,2-305,3	7/7
303,1-303,2/305,3-305,4	14/14
308,2-308,3/313,4-313,5	15/15
318,1-318,2/329,7-329,8	20/22
318,2-318,3/329,8-329,9	28/30
318,3-318,4/329,9-329,10	27/27
318,4-318,5/329,10-330,2	34/33
318,5-319,1/330,2 - 330,3	11/12
319,1-319,2/330,3 - 330,4	34/33
319,2-319,3/330,4-330,5	28/33
319,3-319,4/330,5-330,6	28/30
320,1-320,2/328,5-328,6	20/20
320,3-320,4/330,8-331,1	30/32
320,4-320,5/331,1-331,2	33/32
320,5-321,2/331,2-331,3	21/21
321,2-321,3/331,3-331,4	17/18
340,1-339,7/347,1-346,10/356,8-356,1	22/22/22
340,5-340,6/356,10-356,11	13/16
340,6-341,1/356,11-356,12	23/21
341,1-341,2/356,12-356,13	18/16
341,2-341,3/356,13-357,1	33/24
341,3-341,4/357,1-357,2	16/16
341,4-341,5/357,2-357,3	18/19
341,5-341,6/357,3-357,4	19/18
341,6-342,1/357,4-357,5	18/17
342,1-342,2/357,5-357,6	17/16
342,2-342,3/357,6-357,7	12/12
342,4-342,5/388,1-388,2	16/16
342,5-343,1/388,2-388,3	24/24
343,1-343,3/388,3-388,4	28/28
343,3-343,5/388,4-388,5	22/22
344,5-344,6/350,6-350,7	16/16

344,6-345,1/347,3-347,4/350,7-351,1	33/33/33
345,1-345,2/347,4-347,5/351,1-351,2	21/21/21
345,2-345,3/347,5-347,6/351,2-351,3	25/25/25
345,3-345,4/347,6-347,7	25/25
345,4-345,5/347,7-347,8	24/24
345,5-346,1/347,8-347,9	19/19
366,7-367,1/460,7-460,6	36/14
375,7-375,8/378,6-378,7	18/27
375,8-376,1/378,7-378,8	27/27
377,8-377,9/379,2-379,3	21/21
388,7-389,1/396,5-396,6	15/15
389,1-389,2/396,6-396,7	15/15
389,2-389,3/396,7-396,8	15/15
389,3-389,4/396,8-396,9	18/18
389,4-389,5/396,9-397,1	12/12
389,5-389,6/397,1-397,2	16/12
390,2-390,3/397,7-397,8	16/16
394,4-394,5/454,5-454,2	47/47
394,5-395,1/449,5-449,3/454,2 - 454,1	30/30/15
417,4-418,1/426,4-426,5	44/44
419,3-419,5/420,5-420,6	20/20
419,5-419,6/420,6-420,7	30/30
419,7-419,9/420,8-421,1	30/30
419,9-420,1/421,1-421,2	32/32
429,2-429,3/431,1-431,2	20/29
429,3-429,4/431,2-431,3	30/30
436,1-436,2/438,8-438,9	30/30
436,2-436,3/438,9-438,10	22/22
436,3-436,4/438,10-438,11	24/24
436,4-436,5/438,11-438,12	23/23
436,5-437,1/438,12-438,13	23/23
437,1-437,2/438,13-438,14	16/16
437,2-437,3/438,14-439,1	24/24
437,3-437,4/439,1-439,2	21/21
437,4-437,5/439,2-439,3	14/14
437,5-438,1/439,3-439,4	16/16
448,2-448,4/453,5-453,6	16/16
448,4-448,5/453,6-453,7	13/13
448,5-449,1/453,7-453,8	14/14

449,1-449,2/453,8-453,9	31/31
449,2-449,3/453,9-454,1	10/15
449,5-449,6/454,2-454,3	15/15
449,6-450,1/454,3-454,4	21/21
450,1-450,2/454,4-454,5	11/11
465,2-465,3/468,2-468,3/476,2-476,1	24/24/24
465,3-466,1/468,3-468,4/476,1-475,7	17/17/17
467,5-468,1/476,4-476,3	14/14
468,7-469,1/482,2-482,3	18/18
470,4-470,5/477,3-477,1/479,4-479,5	17/20/19
470,5-470,6/477,1-476,11	12/12
470,6-471,1/476,11-476,10	17/16
471,1-471,2/476,10-476,9/479,6-479,7	12/12/12
471,2-471,3/476,9-476,8/479,7-479,8	12/12/12
471,3-471,5/476,8-476,7/479,8-479,9	21/21/21
472,3-472,5/473,3 --473,4/473,8 --473,9	25/25/25
474,3-474,4/480,6 --480,4	24/21
475,3-475,4/478,10-478,9	14/14
475,4-475,5/478,9-478,8	21/21
475,5-475,6/478,8-478,7	16/16
477,3-477,4/479,4-479,3	12/12
477,4-477,5/479,3-479,2	13/12
477,5-477,6/479,2-479,1	12/12
477,6-477,8/479,1-478,11	14/14
477,8-477,9/478,11-478,10	12/14
483,1-483,2/486,10-486,11	21/21
483,2-483,3/486,11-486,12	11/11
483,3-483,4/486,12-486,13	8/8
483,4-483,5/486,13-486,14	12/12
483,5-483,6/486,14-486,15	8/8
483,6-483,7/486,15-486,16	36/36
483,7-483,8/486,16-486,17	15/15
484,4-484,5/484,10-485,1	9/9

Appendix 3

For comparison, the first instance of distances reported for 298 repeated road stretches in the printed editions by Wesseling, Parthey & Pinder and Cuntz.

Road stretches	Wesseling 1735	Parthey & Pinder 1848	Cuntz 1929
24,4-24,5	18	18	18
25,2-25,2	22	22	22
25,2-25,3	7	7	7
25,4-26,1	20	20	20
26,1-26,2	28	28	28
28,1-28,2	25	25	25
29,2-29,3	25	25	25
32,2-32,3	18	18	18
34,1-34,2	14	14	14
41,3-41,4	32	32	32
41,4-41,5	30	30	30
47,3-47,4	15	15	15
47,4-47,5	28	28	28
47,6-47,7	15	15	15
47,7-48,1	25	25	25
48,1-48,2	25	25	25
48,2-48,3	15	15	15
48,3-48,4	25	25	25
48,4-48,5	25	25	25
48,5-48,6	20	20	20
49,3-49,4	30	30	30
50,3-50,4	30	30	30
52,1-52,3	33	33	33
52,3-52,4	10	10	10
52,4-52,5	32	33	33
52,5-52,6	10	10	10
52,6-53,1	25	25	25
53,1-53,2	25	25	25
53,2-53,3	18	18	18
54,5-54,6	25	25	25
54,6-54,7	25	25	25

67,4-67,5	32	32	32
67,5-67,6	25	26	26
67,6-68,1	25	25	25
68,1-68,2	21	21	21
68,2-68,3	24	24	24
68,3-68,4	28	29	28
87,4-88,1	24	24	24
88,1-88,2	21	21	21
91,3-91,4	8	8	8
91,4-91,5	16	16	16
98,6-98,6	16	16	16
98,6-98,7	24	24	24
98,7-99,1	24	24	24
99,1-99,2	15	15	15
99,2-99,3	18	18	18
99,3-99,4	17	17	17
99,4-99,5	25	25	25
99,5-100,1	24	24	24
100,1-100,2	10	10	10
100,2-100,3	24	24	24
100,4-100,5	24	24	24
101,1-101,2	20	20	20
101,2-101,3	26	26	26
101,3-101,4	12	12	12
105,1-105,2	16	16	16
105,2-105,3	21	21	21
105,3-105,4	28	28	28
105,4-105,5	18	18	18
105,5-105,6	18	18	18
105,6-106,2	38	38	38
106,2-106,3	24	24	24
106,3-106,4	14	14	14
107,5-108,1	16	16	14
108,1-108,2	13	13	13
108,2-108,3	9	9	9
117,2-117,4	37	37	37
117,4-118,1	20	20	20
118,1-118,2	19	19	19
121,12-122,1	17		17

122,1-122,2	25		25
122,2-122,3	18		18
125,1-125,2	12	12	12
125,6-125,7	23	23	23
126,6/7-126,8	31	31	31
126,8-126,9	31	31	31
128,3-128,4	33	33	33
131,1-131,2	24	23	23
131,2-131,3	24	22	22
131,3-131,4	26	26	26
137,2-137,3	24	24	24
137,4-137,5	18	18	18
137,5-137,6	18	18	18
137,6-137,7	14	14	14
137,7-138,1	16	16	16
138,1-138,2	18	18	17
138,2-138,3	18	18	18
138,3-138,4	28	28	28
138,4-138,5	18	18	18
139,3-140,1	24	24	24
140,1-140,2	22	22	22
143,1-143,2	20	20	20
143,2-143,3	12	12	12
143,3-143,4	31	33	31
143,4-144,1	24	24	24
150,1-150,2	18	18	18
150,2-150,3	22	22	22
154,3-154,4	24	24	24
154,4-154,5	20	20	20
163,3-163,4	14	24	14
175,9-176,1	22	22	22
176,1-176,2	25	25	25
177,5-178,1	26	26	26
178,1-178,2	24	24	24
178,2-178,3	24	24	24
178,4-178,5	38	38	38
179,1-179,2	30	30	30
179,2-179,3	28	28	28
179,3-179,4	24	24	24

179,4-179,5	16	16	16
180,1-180,2	18	19	19
180,2-180,3	24	24	24
181,1-181,2	50	50	50
182,5-182,6	20	20	20
182,6-183,1	24	24	24
183,1-183,2	24	24	24
183,2-183,3	26	26	26
183,3-183,4	24	24	24
183,4-183,5	26	26	26
184,1-184,3	20	20	20
184,3-184,4	10	10	10
184,4-185,1	12	12	12
185,1-185,2	20	20	20
185,2-185,3	25	25	25
187,5-187,6	16	16	16
188,1-188,2	16	16	16
188,2-188,3	16	16	16
189,2-189,3	13	13	13
189,3-189,4	12	12	12
189,4-189,5	15	15	15
191,8-192,1	10	10	10
193,2-193,3	20	20	20
193,3-193,4	22	22	22
193,4-194,1	18	18	18
196,3-196,4	32	32	32
196,4-196,5	30	30	30
196,5-196,6	36	36	36
196,6-197,1	16	16	16
197,1-197,2	16	16	16
198,4-198,5	38	38	38
198,5-198,6	18	18	18
201,4-201,5	24	24	24
201,5-201,6	32	32	32
201,6-201,7	27	27	27
205,3-205,4	24	24	24
205,4-205,5	12	12	12
205,5-205,6	36	36	36
209,5-210,1	12	12	12

210,1-210,2	28	28	28
210,2-210,3	26	26	26
210,3-210,4	24	24	24
212,9-212,10	20	20	20
232,6-232,7	24	24	24
232,7-232,8	30	30	30
233,5-233,6	34	34	34
233,6-233,7	12	12	12
233,7-233,8	22	22	22
233,8-234,1	24	24	24
234,1-234,2	24	24	24
234,2-234,3	22	22	22
234,3-234,4	26	26	26
234,4-235,1	20	20	20
235,1-235,2	26	26	26
235,2-235,3	32	32	32
235,3-235,4	29	28	28
235,4-236,1	33	33	33
236,1-236,2	18	18	18
236,2-236,3	20	20	20
236,3-236,4	32	32	32
236,4-236,5	27	27	27
236,5-237,1	25	25	25
237,1-237,2	35	32	32
237,2-237,3	15	15	15
237,3-237,4	24	24	24
237,4-237,5	20	20	20
237,5-238,1	20	20	20
238,1-238,2	45	45	45
246,4-246,6	30	30	30
247,2-247,4	30	30	30
252,2-252,3	22	23	23
252,3-252,4	28	28	28
252,4-252,5	29	28	29
255,4-255,5	10	10	32
256,1-256,2	9	9	9
256,2-256,3	15	15	15
260,2-260,3	23	23	23
282,8-282,9	25	25	25

282,9-283,1	22	22	22
284,2-284,3	25	25	25
284,3-284,4	25	25	25
290,2-290,3	12	12	12
290,3-291,1	8	8	8
291,1-291,2	5	8	5
302,5-302,6	8	8	8
302,6-303,1	7	7	7
303,1-303,2	14	14	14
308,2-308,3	15	15	15
318,1-318,2	20	20	20
318,2-318,3	28	28	28
318,3-318,4	27	27	27
318,4-318,5	34	32	34
318,5-319,1	11	11	11
319,1-319,2	34	34	34
319,2-319,3	28	28	28
319,3-319,4	28	28	28
320,1-320,2	20	20	20
320,3-320,4	30	30	30
320,4-320,5	33	33	33
320,5-321,2	21	21	21
321,2-321,3	17	17	17
340,1-339,7	22	22	22
340,5-340,6	15	15	13
340,6-341,1	23	23	23
341,1-341,2	18	18	18
341,2-341,3	33	33	33
341,3-341,4	16	16	16
341,4-341,5	18	18	18
341,5-341,6	19	18	19
341,6-342,1	18	18	18
342,1-342,2	17	17	17
342,2-342,3	12	12	12
342,4-342,5	16	16	16
342,5-343,1	24	24	24
343,1-343,3	31	28	28
343,3-343,5	28	22	22
344,5-344,6	16	16	16

344,6-345,1	33	33	33
345,1-345,2	21	21	21
345,2-345,3	25	25	25
345,3-345,4	25	25	25
345,4-345,5	24	24	24
345,5-346,1	19	19	19
366,7-367,1	36	36	36
375,7-375,8	18	18	18
375,8-376,1	27	27	27
377,8-377,9	21	21	21
388,7-389,1	15	15	15
389,1-389,2	15	15	15
389,2-389,3	15	15	15
389,3-389,4	18	18	18
389,4-389,5	12	12	12
389,5-389,6	16	16	16
390,2-390,3	16	16	16
394,4-394,5	47	47	47
394,5-395,1	30	30	30
417,4-418,1	44	44	44
419,3-419,5	24	20	20
419,5-419,6	30	30	30
419,7-419,9	30	30	30
419,9-420,1	32	32	32
429,2-429,3	20	20	20
429,3-429,4	30	30	30
436,1-436,2	30	30	30
436,2-436,3	22	22	22
436,3-436,4	24	24	24
436,4-436,5	26	23	23
436,5-437,1	23	23	23
437,1-437,2	16	16	16
437,2-437,3	24	24	24
437,3-437,4	21	21	21
437,4-437,5	14	14	14
437,5-438,1	16	16	16
448,2-448,4	16	16	16
448,4-448,5	13	13	13
448,5-449,1	14	14	14

449,1-449,2	31	31	31
449,2-449,3	15	10	10
449,5-449,6	15	15	15
449,6-450,1	21	21	21
450,1-450,2	11	11	11
465,2-465,3	24	24	24
465,3-466,1	17	17	17
467,5-468,1	14	14	14
468,7-469,1	18	18	18
470,4-470,5	17	17	17
470,5-470,6	12	12	12
470,6-471,1	17	17	17
471,1-471,2	12	12	12
471,2-471,3	12	12	12
471,3-471,5	21	21	21
472,3-472,5	25	25	25
474,3-474,4	24	24	24
475,3-475,4	14	14	14
475,4-475,5	21	21	21
475,5-475,6	16	16	16
477,3-477,4	12	12	12
477,4-477,5	13	13	13
477,5-477,6	13	12	12
477,6-477,8	14	14	14
477,8-477,9	12	12	12
483,1-483,2	21	21	21
483,2-483,3	11	11	11
483,3-483,4	9	8	8
483,4-483,5	12	12	12
483,5-483,6	8	8	8
483,6-483,7	36	36	36
483,7-483,8	15	15	15
484,4-484,5	9	9	9

Appendix 4

The route distances (mile sums) as reported in the itinerary and the distances added from the individual road stretches. Most distances are in Roman miles (*m.p.*), but some are in Gallic leagues (*leug.*) as noted in the comment field.

Route	Distance reported	Distance added	Comment
6,4-8,4	174	174	
4,2/9,2-11,4	318	318	
5,1/11,4-15,2	423	453	
2,2/15,2-17,3	218	217	
5,3/17,3-19,2	218	228	
6,1/19,2-20,3	115	115	
6,2/20,3-22,5	193	194	
23,1/23,1-24,5	148	148	
24,6/24,6-28,2	321	332	
31,6/31,6-32,3	79.5	79	
32,4/32,4-33,1	102.5	102.5	
33,2-3/33,3 - 34,6	212	212	
34,7/34,7 - 35,1	40	40	
35,2/35,2 - 35,5	62	62	
35,6/35,6-36,2	62	62	
36,3/36,3-39,1	394	394	
39,2/39,2-39,6	97	97	
39,7/39,7-40,5	159	159	
40,6/40,6-41,2	83.5	84	
42,4/42,4-42,7	94	94	
42,8-9/42,9-44,3	218	218	
44,4-5/44,5-46,1	228	230	
46,2/46,2-47,2	175	175	
47,3/47,3-47,5	43	43	
47,6/47,6-48,8	192	182	
48,9-10/48,10-50,4	308	308	
50,5-6/50,6-51,7	172	172	
52,1-2/52,2-53,4	210	190	
53,5/53,5-54,7	195	195	
55,6/55,6-55,10	108	108	

55,11/55,11-57,1	216	216	
57,2/57,2-57,6	85	85	
57,7/57,7-59,3	217	217	
57,8/59,3-63,2	422	422	
57,9/63,2-70,1	902	905	
70,2 - 73,3	missing		
73,5-6/73,6-77,3	605	604	
77,4/77,4-78,3	152	152	
78,5/78,5-80,7	246	245	
80,8/80,8-81,4	172	172	
81,5/81,5-82,7	213	213	
83,1/83,1 - 84,6	260	260	
84,7/84,7-85,3	69	69	
85,5/85,5-86,1	126	125	
86,3/86,3-89,2	257	257	
89,3/89,3-90,4	336	300	
90,6/90,6-93,1	208	218	
93,2/93,2-94,1	91	91	
94,2-3/94,3-95,1	92	91	
95,2-3/95,3-96,4	137	137	
96,5/96,5 - 97,6	175	175	
98,3-5/98,5-106,4	900.5	912	Calc. by Cuntz
106,5/107,1 - 111,5	455	462	
112,3-4/112,4-115,6	478	474	
115,7-8/115,7-118,4	235	235	
120,1/120,1 - 121,7	157	158	
121,8/121,8-122,3	113	113	
122,4/122,4-123,2	87	87	
123,8-9/124,8 - 127,9	433	433	
123,9/124,1/124,8-128,6	260	265	
124,2/128,6-131,4	401	401	
124,3/131,4-140,2	782	782-784	Calc. by Cuntz
124,4/140,2-147,1	755	690	
124,5/147,1-154,5	802	792	
124,6-7/154,5-162,4	763	760	
162,5/162,5-163,5	123	112	
170,5/170,5-171,4	60	60	
171,5/171,5-173,4	258	258	
175,2/175,2-175,6	79	79	

176,3-4/176,4-178,5	293.5	294	
178,6-7/178,7-180,5	258	258	
180,6/180,7-181,6	206	206	
181,7-8/181,8-183,5	223	268	
184,1-184,2/184,2-185,3	87	87	
186,1-2/186,2-187,1	90	70	
187,2/187,2-188,3	134	134	
188,4/188,4-188,6	48	48	
188,7/188,7-189,5	89	84	
189,6/189,6-190,5	92	102	
190,6/190,6-191,5	137	137	
191,6/191,6-192,3	85	85	
192,4/192,4-193,1	83	83	
193,2/193,2-194,6	151	151	
194,7/194,7-195,3	128	128	
195,4/195,4-195,8	79	79	
195,9/195,9-197,4	227	227	
197,5/197,5-198,11	318	318	
199,1/199,1-199,4	77	77	
199,5/199,5-199,10	152	152	
199,11/199,11-200,3	74	74	
200,4/200,4-201,2	134	134	
201,3/201,3-201,7	99	99	
201,8/201,8-202,5	109	108	
202,6/202,6-203,2	141	141	
203,3/203,3-203,8	116	116	
203,9/203,9-204,6	161	161	
204,7-8/204,8-205,6	166	166	
205,7-8/205,8-206,7	198	198	
206,8/206,8-207,9	320	326	
207,10-11/207,11-210,4	341	341	
210,5/210,5-211,4	228	228	
211,5/211,5-212,4	211	211	
212,5/212,5-213,1	206	206	
213,2/213,2-213,12	226	226	
214,1/214,2-214,10	207	217	
214,11/214,11-214,13	52	52	
214,14/213,14-215,6	142	142	
215,7/215,7-215,11	91	90	

215,12/215,12-216,3	122	122	
216,4/216,4-217,4	130	125	
217,5-6-231,3	missing		
231,4/231,4-231,7	87	87	
231,11/XX-235,1	437	437	
232,1/235,1-236,5	216	216	
232,2/236,5-238,1	136	136	
232,3/238,1-240,5	221	221	*leug.*
241,3/XX-249,1	587	725	
241,4/249,1-250,5	40	223	
241,5/250,5-252,5	38	323	
252,5-256,1	missing		
256,4-258,1	missing		
258,2-3/258,3-259,2	311	311	
259,3/259,3-259,6	150	150	
259,7-259,10	missing		
259,11-12/259,12-261,3	311	335	
261,4/261,4-262,2	184	184	
262,3/262,3-262,8	164	164	
262,9/262,9-263,2	102	102	
263,3/263,3-263,9	169	169	
264,1/264,1-264,6	135	135	
264,7/264,7-265,3	110.5	100	
265,5/265,5-265,10	134	132	
265,11/265,11-266,3	100	100	
266,4/266,4-266,7	88	88	
266,8-9/266,9-266,13	42	42	
266,14/266,14-267,12	311	311	
267,13/267,13-269,7	284	274	
270,1-2/270,2-272,7	199	199	
172,8-9/272,9-274,7	213	213	
274,8-9/274,9-275,9	272	272	
276,1/276,1-277,3	272	272	
277,4-5/277,5-278,2	138	138	
278,3/278,3-279,1	195	195	
279,2-3/279,3-280,4	215	215	
280,5/280,5-281,1	110	110	
281,2/281,2-282,2	missing		
282,3/282,3-282,7	105	105	

282,8/282,8-283,2	70	70	
283,3-283,7	missing		
283,8/283,8-284,4	120	120	
284,7-8/284,8-286,5	238	239	
286,7/286,7-288,6	228	228	
289,4-5/289,5-299,4	796	759	
300,1/300,1-300,5	61	61	
300,6-7/300,7-301,5	69	69	
302,2/302,2-304,4	188	188	
304,6/304,6-305,6	170	170	
306,4/306,4-308,3	156	156	
308,5/308,5-310,4	148	148	
310,6-7/310,7-315,6	627	627	
315,7/315,7-316,5	50	50	
316,6/316,6-317,2	73	74	
317,7/317,7-323,8	754	754	
324,1-330,6	missing		
333,2-3/333,3-333,8	129	130	
333,9 - 337,2	missing		
337,4/337,4-339,5	303	303	
339,7-8/339,8-344,2	411	411	
344,3-4/344,4-346,9	308	308	
346,10-11/346,11-350,3	577	546	
350,4-5/350,5-355,5	419	419	*m..p.. & leug.*
356,1-2/356,2-358,4	409	409	
356,3/358,5-362,1	332	331	
356,5/362,1-363,2	174	173	
363,4-5/363,5-364,6	74	62	*leug.*
364,7/364,7-365,6	87	86	*leug.*
365,7-366,4	missing		
366,5-6/366,6-368,2	187	187	*leug.*
368,4-372,2	missing		
372,3/372,3-373,5	67	78	*leug.*
374,1/374,1-374,8	128	128	*leug.*
375,1-2/375,2-376,1	71	71	*leug.*
376,2-3/376,3-377,1	83	83	*leug.*
377,2-3/377,3-377,5	38	38	*leug.*
377,6/377,6-378,8	172	172	*leug.*
378,9/378,9-378,11	49	49	*leug.*

379,1/379,1-379,8	103	104	*leug.*
380,1/380,1-380,6	89	69	*leug.*
380,7-8/380,8-381,6	53	53	*leug.*
381,7/381,7-383,6	153	153	*leug.*
384,1-2/384,2-384,7	77	77	*leug.*
384,8-9/384,9-384,12	46	46	*leug.*
385,1/385,1-385,5	78	68	*leug.*
385,6-7/385,7-385,10	43	43	*leug.*
386,1-2/386,2-386,5	102	102	*leug.*
386,6/386,6-387,3	77	77	*leug.*
387,7-8/387,8-395,4	975	1004	
396,1/396,X-397,2	101	101	
396,2/397,2-399,1	234	234	
396,3/399,1-401,5	360	360	
396,4/401,5-402,5	303	203	
402,6/402,6-403,3	99	99	
404,2/404,2-405,6	276	291	
405,7/405,7-408,4	155	155	
409,1/409,1-412,6	295	294	
413,1/413,1-413,5	93	93	
414,1/414,1-415,2	162	162	
415,3/415,3-416,3	144	144	
416,4/416,4-418,5	161	161	
418,7/418,7-419,6	154	200	
419,7-8/419,8-420,7	220	220	
420,8-9/420,9-422,1	244	244	
422,2/422,2-423,5	247	247	
427,4-5/427,5-429,5	215	218	
429,5/429,5-431,3	299	299	
423,6-7/423,7-425,5	sea and land		
425,6/425,6-427,3	267	267	
431,4-5/431,5-431,7	76	76	
431,8-9/431,9-432,8	313	313	
433,1-2/433,2-438,1	632	632	
438,2-3/438,3-439,4	348	348	
439,5-6/439,6-439,14	497	497	
439,15-16/439,16-443,2	301	301	
443,3/443,3-444,2	56	56	
444,3-4/444,4-446,3	458	458	

446,4/446,4-446,7	95	95	
446,8-9/446,9-448,1	249	249	
448,2/448,2 --452,6	482	482	
452,6/452,6-453,3	112	112	
453,5/453,5-456,5	421	422	*m.p. & leug.*
456,6-7/456,7-457,2	64	64	*leug.*
457,3-4/457,4-458,3	130	130	*m.p. & leug.*
458,5-6/458,6-460,8	274	279	*leug.*
461,2-3/461,3-462,3	197	196	*leug.*
462,4/462,4-463,2	65	65	*leug.*
464,1-2/464,2-466,4	156	156	
466,5-6/467,2-472,6	481	478	
473,6-7/473,7-473,10	68	68	
474,1-2/474,2-476,6	442	442	
476,7/476,7-477,9	156	156	
477,10/477,10-478,5	96	96	
478,6/478,6-479,9	227	228	
479,10-11/479,11-480,8	128	127	
481,1-2/481,2-482,4	150	150	
482,5/482,5-482,8	74	74	
482,9-10/483,8-484,9	186	166	
484,10/484,10-485,7	109	90	
485,8/485,8-486,7	103	103	
486,8-9/486,9-486,17	136	126	

Appendix 5

Average distance in Roman miles (*m.p.*) for the repeated road stretches from the itinerary, from the Peutinger map and from the modern map (Google Maps).

Road stretches	**Average distance - itinerary**	**Distance - Peutinger map**	**Distance - Google**
24,4-24,5/8,3-8,4	18		26
25,2-25,2/46,1-45,5/50,5-50,7	22		23
25,2-25,3/45,5-45,4	8	13	11
25,4-26,1/49,1-49,2/51,1-51,2	20	20	30
26,1-26,2/49,2-49,3/51,2-51,3	27		31
28,1-28,2/42,2-42,3/34,8-35,1	25		26
29,2-29,3/36,2-36,1	25		86
32,2-32,3/39,5-39,6	18		16
34,1-34,2/40,7-40,6	14	23	17
41,3-41,4/45,2-45,1	33	51	32
41,4-41,5/45,1-44,7	31	12+	29
47,3-47,4/55,8-55,7	18		59
47,4-47,5/55,7-55,6	28		47
47,6-47,7/49,4-49,5/51,4-51,5	13		17
47,7-48,1/49,5-49,6/51,5-51,6	25		24
48,1-48,2/49,6-49,7/51,6-51,7	25		26
48,2-48,3/49,7-49,8	15		19
48,3-48,4/49,8-49,9	29		
48,4-48,5/49,9-50,1	25		
48,5-48,6/50,1-50,2	20		
49,3-49,4/51,3-51,4	25		33
50,3-50,4/59,5-59,6	30		34
52,1-52,3/58,1-58,2	31		42
52,3-52,4/58,2-58,3	11		13
52,4-52,5/56,6-56,5/58,3-58,4	31		38
52,5-52,6/56,5-56,4/58,4-58,5	15		18
52,6-53,1/56,4-56,3/55,10-55,9	25		25
53,1-53,2/56,3-56,2/54,1-54,2/55,9-55,8	32		38
53,2-53,3/56,2-56,1/54,2-54,3	18		23
54,5-54,6/54,11-54,10	25		27

54,6-54,7/54,10-54,8	25		31
67,4-67,5/70,2-70,4	32		55
67,5-67,6/70,4-70,5	26		19
67,6-68,1/70,5-70,6	25		26
68,1-68,2/70,6-70,8	21		21
68,2-68,3/70,8-70,9	24		34
68,3-68,4/70,9-71,1	28		28
87,4-88,1/94,2-94,4	24		28
88,1-88,2/94,4-94,5	21		30
91,3-91,4/97,9-97,7	10		10
91,4-91,5/97,3-97,2	17		17
98,6-98,6/127,9-127,8	16	16	18
98,6-98,7/127,8-127,7	24	20	28
98,7-99,1/127,7-127,6/288,3-288,1	24		25
99,1-99,2/127,6-127,5/288,1-287,9	15	15	16
99,2-99,3/127,5-127,4/287,9-287,7	18		18
99,3-99,4/127,4-127,3/287,7-287,6/283,5-283,6	17	17	17
99,4-99,5/127,3-127,2/282,6-282,7/287,6-287,5/283,6-283,7	25		26
99,5-100,1/127,2-127,1/287,5-287,3	24		22
100,1-100,2/127,1-126,11/287,3-287,2	10	9	11
100,2-100,3/126,11-126,10/287,2-286,8	24		23
100,4-100,5/126,4-126,3	24	23	24
101,1-101,2/313,1-313,2	21	8+	20
101,2-101,3/313,2-313,3	25	24	22
101,3-101,4/308,1-308,2/313,3-313,4	12	-	14
105,1-105,2/110,4-110,5	15		18
105,2-105,3/110,5-110,6	21		23
105,3-105,4/110,6-110,7	27	44	28
105,4-105,5/110,7-110,8	18		23
105,5-105,6/110,8-111,1	18		23
105,6-106,2/111,1-111,3	39		42
106,2-106,3/111,3-111,4	24		25
106,3-106,4/111,4-111,5	14		20
107,5-108,1/121,8-121,9	14	13	13
108,1-108,2/121,9-121,10	13	13	15
108,2-108,3/121,10-121,11	9	9	10
117,2-117,4/315,2-315,4	37	38	37
117,4-118,1/315,4-315,5	21	21	22

118,1-118,2/315,5-315,6	19	28	18
121,12-122,1/304,1-304,2	17	18	20
122,1-122,2/304,2-304,3	25	18	15
122,2-122,3/304,3-304,4	18		22
125,1-125,2/311,1-311,2	12		11
125,6-125,7/315,7-316,1	19	17	25
126,6/7-126,8/128,4-128,5/281,4-281,3	31	30	33
126,8-126,9/128,5-128,6/281,3-281,2	31	30	35
128,3-128,4/281,5-281,4	33	30	35
131,1-131,2/232,6-232,5/267,3-267,2	22		27
131,2-131,3/232,5-232,4/261,1-261,2/267,2-267,1/268,4-268,3	23		
131,3-131,4/232,4-231,11/261,2-261,3/267,1-266,14	26		
137,2-137,3/231,6-231,7	28	20	24
137,4-137,5/230,3-230,4/322,9-323,1	18	18	19
137,5-137,6/230,4-230,5/323,1-323,2	18	18	15
137,6-137,7/230,5-230,6/323,2-323,3	14	12	14
137,7-138,1/230,6-230,7/323,3-323,4	16	12	19
138,1-138,2/230,7-230,8/323,4-323,5	18	10	19
138,2-138,3/230,8-230,9/323,5-323,6/332,6-332,7	20	29	29
138,3-138,4/230,9-230,10/323,6-323,7/332,7-332,8	27	19+	45
138,4-138,5/230,10-230,11/323,7-323,8/332,8-332,9	19	-	19
139,3-140,1/231,1-231,2	24		23
140,1-140,2/231,2-231,3	22	23	25
143,1-143,2/205,7-205,9	22		22
143,2-143,3/205,9-206,1	15		16
143,3-143,4/206,1-206,2	26		40
143,4-144,1/206,2-206,3	23		36
150,1-150,2/199,1-199,2	25		24
150,2-150,3/199,2-199,3	25		23
154,3-154,4/155,2-155,1	22		22
154,4-154,5/155,1-154,5	22		21
163,3-163,4/169,4-169,3	16		16
175,9-176,1/332,4-332,5	24		26
176,1-176,2/332,5-332,6	26		27

177,5-178,1/211,4-211,3/215,6-215,5	27		38
178,1-178,2/211,3-211,2/215,5-215,4	23		
178,2-178,3/211,2-211,1/215,4-215,3	24		
178,4-178,5/180,4-180,5/181,5-181,6/212,12-213,1/214,12-214,11	36		46
179,1-179,2/206,10-206,11/214,6-214,7	36		
179,2-179,3/206,11-206,10/214,7-214,8	28		25
179,3-179,4/206,10-206,9/214,8-214,9	24		21
179,4-179,5/206,9-206,7/214,9-214,10	19		35
180,1-180,2/210,6-210,7/211,6-211,7	22		51
180,2-180,3/181,3-181,4/210,7-210,8/211,7-211,8/212,10-212,11/213,9-213,10	24		19
181,1-181,2/212,7-212,9	50		59
182,5-182,6/207,3-207,4/213,4-213,3	20		41
182,6-183,1/207,4-207,5/213,3-213,2	24	39	12
183,1-183,2/207,5-207,6/215,12-215,13	24	21	30
183,2-183,3/207,6-207,7	26	21+	
183,3-183,4/207,7-207,8	25	23	
183,4-183,5/207,8-207,9/10	26	25	19
184,1-184,3/188,7-188,8	18		33
184,3-184,4/188,8-189,1	13		24
184,4-185,1/189,1-189,2/191,1-191,2	17		39
185,1-185,2/190,2-190,3	17		
185,2-185,3/190,3-190,5	26		
187,5-187,6/195,7-195,8	16	16	18
188,1-188,2/194,4-194,5	16	20	15
188,2-188,3/194,5-194,6	16	16	19
189,2-189,3/191,2-191,3	19		29
189,3-189,4/191,3-191,4	17		18
189,4-189,5/191,4-191,5	17		30
191,8-192,1/193,1-192,6	21		
193,2-193,3/194,9-194,10	22		21
193,3-193,4/194,10-194,11	21		26
193,4-194,1/194,11-195,1	17	21	23
196,3-196,4/198,6-198,7	32		35
196,4-196,5/198,7-198,8	30		19
196,5-196,6/198,8-198,9	36		40
196,6-197,1/198,9-198,10	16	16	15
197,1-197,2/198,10-198,11	16		23

198,4-198,5/199,7-199,6	35	32	39
198,5-198,6/199,5-199,6	28	18	20
201,4-201,5/202,8-202,9	28		27
201,5-201,6/202,9-203,1	32		35
201,6-201,7/203,1-203,2	27		31
205,3-205,4/214,1-214,3	24		26
205,4-205,5/214,3-214,4	12		22
205,5-205,6/214,4-214,5	36		32
209,5-210,1/215,7-215,8	12		41
210,1-210,2/215,8-215,9	28		26
210,2-210,3/215,9-215,10	26		32
210,3-210,4/215,10-215,11	24		33
212,9-212,10/213,8-213,9	20		25
232,6-232,7/267,3-267,5	24		24
232,7-232,8/267,4-267,5	30		37
233,5-233,6/261,7-261,6/262,6-262,7	34	33	39
233,6-233,7/266,5-266,6	15		23
233,7-233,8/266,6-266,7	29		25
233,8-234,1/248,2-248,3	22	13	23
234,1-234,2/248,3-248,4	27		26
234,2-234,3/248,4-248,5	21		23
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