Depopulation in Germania Inferior: Following the Money, Coin Numbers Found in 5 Sites Between 100-400 AD

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Contents

Introduction

Where do we come from? It is a question that seems to be present throughout history. The mythological stories present in cultures across the world are one example of this innate desire. Another example is the recent trend to discover one's origins through DNA with web-based databases such as myheritage.[1] These questions are mainly the result of people travelling and migrating around the world.

Studies into population history, population growth and depopulation of the Roman Empire, have existed for centuries. Depopulation can occur when a certain location has more people emmigration than immigration, if the birth rate is outpaced by the death rate, or if these two factors are combined, one can speak of depopulation. Depopulation is a notoriously difficult thing to prove however. After all, something's presence can be proven by the existence of evidence. However, the absence of evidence is not evidence of absence.

The historian Elio Lo Cascio also emphasized this. He noted in the 1990s that contemporary research on ancient demographics no longer attempted to estimate the size of an ancient population. The reason he gave for this was the uncertainty of the available sources.[2] Instead, Cascio notes, researchers focused on the structure and dynamics of ancient populations. This includes normal patterns of mortality or fertility, the age at marriage for women and men or the extent of exposure and infanticide from our sources.[3] Precise estimates based on guesswork for the population size are rarely made.[4]

However Cascio defends the importance of these demographic studies because numerical evidence on these micro-demographic issues of ancient populations is, indirectly, related to the size of the population anyway. Also, knowledge of the demography of a place and period might offer ways to test the

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[1] <www.myheritage.nl/> 02-05-20.
[2] Elio Lo Cascio, 'The Size of the Roman Population: Beloch and the Meaning of the Augustan Census Figures', *The Journal of Roman Studies* 84:1 (1994) 23-40, there 40.
[3] Ibidem, 40.
[4] Walter Scheidel, 'Roman population size: the logic of the debate', *SSRN Electronic Journal* 303:1 (Version 2.0; 2007) 1-37, there 30.

reliability of many theories historians construct or of figures found in the ancient sources.[5]

Walter Scheidel underlines this and goes even further stating that: “Our ignorance of ancient population numbers is one of the biggest obstacles to our understanding of Roman history.”[6] Economic performance is directly related to absolute population numbers and relative population numbers matter greatly for conflicts between states. This goes double for preindustrial societies when human labor was needed for virtually everything. Quantity is a quality of its own. Population size is thus essential for assessing economic growth. He reasons that the problem is that we have not even a vague sense of scale.[7] A point that will be discussed further in chapter 2.

This thesis will concern itself with depopulation in the later Roman Empire. Arthur Boak states that: “Most writers at least agree that during the fourth and fifth century the population declined in the Roman Empire as a whole and this was directly linked with the fall of it.”[8] This decline likely started during the third century. Lukas de Blois notes that during the crisis of the third century between 235 and 284 there were economic problems, population decrease, a religious and moral crisis and invasions of foreign peoples in practically all border regions.[9] Stijn Heeren believes that some areas in Germania Inferior were depopulated during the third century but that given the lack of evidence for violence this may have occurred peacefully. Large scale depopulation likely followed later.[10]

However, we lack reliable statistics. Ancient authors appear to have had a habit of exaggerating numbers. A likely cause is that writings at the time were often

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[5] Lo Cascio, ‘The Size of the Roman Population’, 39-40
[6] Scheidel, ‘Roman population size’, 2.
[7] Ibidem, 2.
[8] Arthur Boak, *Manpower Shortage and the Fall of the Roman Empire in the West* (Westport 1974) 3.
[9] Lukas de Blois, ‘The Crisis of the Third Century A.D. In the Roman Empire: A Modern Myth?’, in: Ibid and J. Rich, *The Transformation of Economic Life under the Roman Empire* (Nottingham 2002) 204-217, there 204.
[10] Stijn Heeren, ‘From Germania Inferior to Germania Secunda and Beyond. A Case Study of Migration, Transformation and Decline’, in ibid, *Social dynamics in the Northwest Frontiers of the Late Roman Empire : Beyond Decline or Transformation* (Amsterdam 2017) 149-179, there 149-155.

political. Other evidence is interpretive, making estimates uncertain.[11] Evidence to make such grand statements about an area the size of the Roman Empire is not something that can be easily acquired. It would require a comprehensive insight in all the differing climates, state of the agricultural class and ideally a well functioning administration at the time to count the population for us, over an area the size of Europe.

Despite the inherent difficulty, population sizes and depopulation are thus an important question to answer in regards to decline of societies. This thesis aims to answer one such question of depopulation. I hope to prove whether Germania Inferior experienced depopulation when some historians expect it, roughly between the third to late fourth century.[12]

Germania Inferior, the red area on Figure 1, was a Roman province and comprised an area which encompassed the southern half of the Netherlands, Belgium and small parts of Germany. It was first visited by Julius Caesar in 57 BC who also fought several tribes there up until 51 BC. No garrison remained however and there was no Roman presence to justify speaking of the region as a part of the Roman empire. In 12 BC Augustus sent a new Roman army to the Rhine area, fully incorporating what would be Germania Inferior into the Roman Empire.[13]

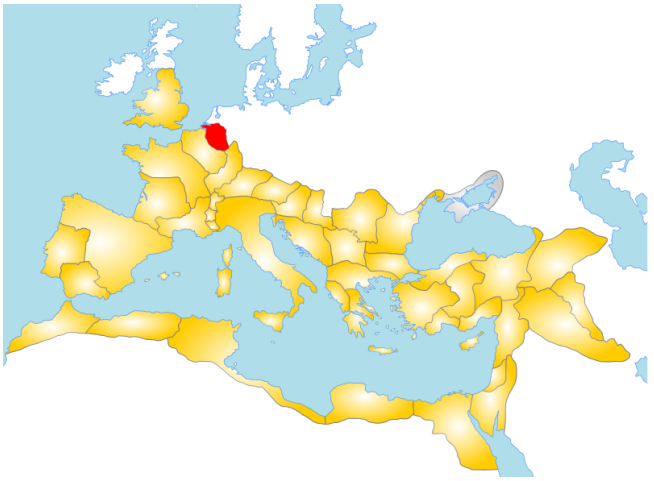

Figure 1: Map of the Roman Empire at its largest around 117 AD, Germania Inferior in red. <en.wikipedia.org/wiki/File:Roman_Empire_Germania_Inferior.svg> last accessed 30-05-21.

This research is important to answer not only questions of heritage from later inhabitants, but also helps to explain how the Limes and the northwestern border of the Roman Empire developed. As previously stated however it is difficult to give any

[11] Boak, *Manpower Shortage and the Fall of the Roman Empire in the West,* 4-7.
[12] Stijn Heeren, 'The Depopulation of the Lower Rhine Region in the 3rd Century. An Archaeological Perspective', in: N. Roymans, T. Derks and H. Hiddink, *The Roman villa of Hoogeloon and the archaeology of the periphery* (Amsterdam 2014) 271-294.
[13] Wim van Es, *De Romeinen in Nederland* (Haarlem 1981) 24-28.

exact number for the population in Germania Inferior beyond a mere guess. This thesis will contribute to the debate by making relative population estimates using coins as well as compiling previous works. To provide a population number to a well documented area in a well documented period, such as Rome's population during Augustus' time, is difficult. Let alone a border province like Germania Inferior in late antiquity, which is notorious for how little literature is available.[14]

The main research question for this thesis therefore becomes: To what extent can we speak of large scale depopulation in Germania Inferior between the third and late fourth centuries, based on coin numbers from five settlements. The time period that is taken can be considered large, spanning two centuries. The reason for this is that because the depopulation has not yet been conclusively proven, it has also not been narrowed down. To do this myself from the onset would be counterproductive to answering the main question.

The first sub-question, which will be answered in chapter 1, is: did the situation the Roman Empire was in, and Germania Inferior especially, between 200 and 400 influence depopulation or not. Are there sources of disease, warfare or civil unrest? The first chapter will thus provide context and answer this question at the same time. Most sources used here are those of other modern historians, sparingly supplemented by ancient authors. The reason is that in order to get a good picture of a large period a historian would need to study too many ancient sources, both literary and archaeological.

The next sub-question, to be answered in chapter 2, is: to what extent do ancient and modern authors speak of depopulation in Germania Inferior. This differs from the previous chapter in the sense that chapter 1 was mostly concerned with providing the general picture of the period. In this chapter the comments of ancient authors which can be related to depopulation such as the destruction of towns or mentions of refugees will be discussed. Modern authors who have done work on determining Roman population figures will also be looked at, as well as the reasons why progress in this area of research has been limited. To give some perspective,

[14] Luuk de Ligt, *Peasants, Citizens and Soldiers : Studies in the Demographic History of Roman Italy 225 BC-AD 100* (Cambridge 2012) 4.

the most popular work on Roman population was written in 1886 by Julius Beloch.[15] Most later authors who wrote on population numbers mainly tried to fine-tune Beloch's work.

Chapter 3 will include an investigation into the number of coins found at five different sites that were inhabited during the Roman period to determine whether we see a decrease in coin material in this period. Something you would expect if the number of people also declines. I have used the database of NUMIS of the Nederlandsche Bank as it is reliable and, until for instance PAN has finished developing, the most complete database on stray coin finds in the Netherlands. I will use graph bars to visualise the data. The period covered in these graphs will be from 96 AD, to the year 400 AD which is roughly the time when any actual control of the region was ceded by the Roman Empire for the last time. The reason 96 AD was taken as a starting date was to ensure that any kind of drop in population during the third century could indeed be seen as 'sudden' or 'new,' rather than an already ongoing process.

The final sub-question will concern itself with whether the data gained from the numismatic research in chapter 3, supports the image of depopulation as it is sketched by chapters 1 and 2. Whether there was general large scale depopulation, regional depopulation or no depopulation whatsoever. It will also discuss what the reasons may be for the results of this new primary data. The chapter itself is subdivided in the cities, countryside (4.1) and army (4.2). The reason for this is that the numismatic research is done in towns and is discussed first to link it with chapter 3. The countryside paragraph will explain to what extent degradation of agricultural land may be blamed for population losses in the towns. The reason this is discussed in chapter 4 rather than 2 is because the data from the numismatic research is necessary to make comprehensive statements about the subject. The army is discussed in both chapter 2 and 4 because so much has been said and written about the subject that, when discussing population it has to be included in chapter 2. However it is also included in chapter 4 because the research provides new data since the army played a pivotal role in the development of most of the sites. It is

[15] Julius Beloch, *Die Bevölkerung der griechisch-römischen Welt* (Leipzig 1886).

discussed last because it is a ‘loose factor.’ The size and impact of the empire are dependent on arbitrary decisions of the emperor, separate from developments in the province itself. It will also discuss the Roman practice of handing out agricultural land to mostly independent barbarians who served as a new local army. In chapter 5, the main points of each chapter will be briefly touched upon again to end with a conclusion on the course of population in Germania Inferior. In chapter 5, the main points of each chapter will be briefly touched upon again to end with a conclusion on the course of population in Germania Inferior.

1. Sketching the backdrop of the late Roman Empire: a period of transformation and crisis

To understand the context in which the supposed depopulation occurred it is imperative to first understand the period in which it happened and the Roman Empire at the time. I speak of 'the Roman Empire at the time' because there were large changes in the many centuries in which Rome ruled over most of Europe. To properly understand the supposed depopulation between the third and late fourth centuries this chapter will effectively discuss the second to fifth centuries, between 100 to 400 AD. This period could be called the late Roman Empire, which coincides with the time period known as 'late antiquity'.

Some further clarification is necessary however as both terms are vague and fraught with debate.[16] So what does this period actually encompass? The phrase first appeared in an English book-title in a 1945 catalogue of late antique textiles by Paul Friedlaender, which presumably borrowed the term from Wulff and Volbach's earlier catalogue of late antique textiles. The term only really gained traction however because of Peter Brown's book 'The World of Late Antiquity' in 1971.[17]

However, precise boundaries for the period are a continuing matter of debate. Brown proposes a period between the 3rd and 8th centuries AD.[18] The Oxford Centre for late antiquity defines it roughly as 250–450 AD.[19] Some authors even stretch the period as far as 800 AD.[20] James Edward states that Brown essentially created this period, with no genuine attempt to argue the case.[21] As a result there is no universally agreed on periodization.

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[16] James Edward, 'The Rise and Function of the Concept "late antiquity"', *Journal of Late Antiquity* 1:1 (2008) 20-30, there 20.
[17] Ibidem, 21.
[18] Peter Brown, *The world of late antiquity : from Marcus Aurelius to Muhammad* (London 1971).
[19] <https://www.ocla.ox.ac.uk/sect_lre.shtml> 03-05-20.
[20] Hervé Inglebert, 'Introduction: Late Antique Conceptions of late antiquity', In: Scott Johnson (ed.) *The Oxford Handbook of late antiquity* (Oxford 2005) 3-31, there 4.
[21] Edward, 'The Rise and Function of the Concept "late antiquity"', 23.

Aside from its vague periodization it is also not entirely clear how late antiquity exactly differs from the late Roman Empire. The Oxford Centre for late antiquity simply equates it with the late Roman Empire and Edward notes that Brown does the same: “In his third book, for instance, a collection of essays written mostly before The World of late antiquity, he frequently seems to use “late antique” and “late Roman” as synonyms”. If there is a distinction at all there was a tendency to use “late Roman” when he was talking about society or government, and “late antique” when referring to intellectual or religious life.[22] When I use the term late antiquity I will use it to refer to the period after 100 AD up until around 500 AD, ending around the time when the Roman Empire ceased to exist.

1.1 The transformation of the bureaucracy, society and defensive strategy in the late Roman Empire

To understand the transformation that occurred in the late Roman Empire we will first look at the transformation which occurred in the bureaucracy and society of the late Roman Empire. As has been said before the Roman Empire of late antiquity was very different from the time of Julius Caesar and Cicero

1.1.1 Changes in bureaucracy and society: linking people to the empire

One major transformation the late Roman Empire underwent was a continually expanding bureaucracy. The rule of Diocletian, who was emperor from 284 to 305, was a pinnacle point for the Roman Empire. Diocletian separated and enlarged the empire's civil and military services and reorganized the empire's provincial divisions, establishing the largest and most bureaucratic government in the history of the empire. He established new administrative centres in Nicomedia, Mediolanum, Antioch, and Trier, closer to the empire's frontiers than the traditional capital at Rome had been.[23]

However, the transformation from an empire based firmly in Rome, to one with several large administrative centres in strategic locations had started much earlier.

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[22] Edward, ‘The Rise and Function of the Concept “late antiquity”’, 23.
[23] Hans L'Orange and Knut Berg, *Art forms and civic life in the late Roman Empire* (Princeton 1972) 3.

So too had the process in which an increasingly larger part of the population could call themselves Roman citizens. For example, emperor Trajan, who ruled from 98 to 117 AD, placed imperial commissars in cities to correct disorders in local finances. Ten-man committees were also appointed by city councils to enable the central power to quickly intervene in the internal affairs of municipalities. The mostly independent cities of the early Roman Empire and its city state model were thus fundamentally altered.[24] In subsequent developments these city councils and committees were also burdened with state responsibilities, which made them appear like compulsory state service.[25]

The wealthy were not the only ones that were linked to the state. The free guilds or *collegia* were also encroached upon. It was Aurelian who eventually imposed full state control over collegia in the late 3rd century.[26] These guilds were organized in corporations or *corpora* and obliged to perform specific services to the state. Free trades were thus transformed to obligations to work for the state. Trades became hereditary *munus* and people were bound to their places of birth as a result.

It can be questioned whether these edicts were actually followed as we know that many of Diocletian's attempts at regulation had to be abandoned as they proved untenable. Miriam Groen-Vallinga notes that many laws may have been made more from a moralizing perspective than an economic one.[27] Still, the fact these laws were passed in the first place shows a changing mindset towards the position and powers of the government.

Not only in urban zones, but also in military contexts, we can see attempts to chain soldiers to their profession.[28] In the countryside similar transformations occurred as well. Connor Whately suggests that these measures in the countryside can likely be attributed to the increasingly unsafe conditions due to barbarian

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[24] James Rives, 'Animal Sacrifice and Euergetism in the Hellenistic and Roman Polis', *Religion in the Roman Empire* 5:1 (2019) 83-102, there 89.
[25] L'Orange and Berg, *Art forms and civic life,* 4.
[26] Mary Boatwright e.a., *The Romans: From Village to Empire* (New York 2012) 434.
[27] Miriam Groen-Vallinga and Laurens Tacoma, 'The Value of Labour: Diocletian's Prices Edict', in: K. Verboven and L. Christian, *Work, labour, and professions in the Roman world* (Leiden 2017) 104-132, there 105-106.
[28] <https://www.britannica.com/place/ancient-Rome/Diocletian> 28-11-20.

invasions and civil wars.[29] The results were that on the large estates, the so-called *latifundia,* and on the imperial domains a new class of small tenant farmers called *coloni* appeared. These men became scripted leaseholders under their *possessores* who owned the land.[30]

Another crucial reform which transformed and distinguished the late Roman Empire from the republican period and the early principate is the issuing of the *Constitutio Antoniniana*. This edict was issued in 212 AD and gave Roman citizenship to all inhabitants of the empire.[31] An important characteristic of the republican period and the early principate was a clear differentiation between the many different levels of citizenship. This could for example be found in the distinction of cities in *colonia*, *municipia* and *civitates peregrinae.*[32] To put it simply, the more important cities got more privileges, especially if its political and administrative culture reflected that of Rome.[33]

In this hierarchical system *coloniae* stood at the top, formed of former Roman soldiers. Below that were the *municipia*, cities in which many Roman citizens dwelled and which were often former allies of Rome. At the bottom were the *civitates peregrinae,* which were cities for the 'natives'. In part this hierarchy was also based on the level of wealth, as the Romans sometimes changed the legal state of *civitates peregrinae*. Cities without Roman citizenship could sometimes essentially buy their way to *municipia,* or even *colonia* if a fort was constructed nearby.[34]

While Cassius Dio remarks that Caracalla only wanted to increase tax income, the fact that this could be envisaged and the old system overturned by an edict shows a change of perspective from earlier centuries.[35] It was this edict that formally recognized a level of equality in the empire, a clear turning point from exploiting the provinces to a level of uniformity across the empire. There was thus a

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[29] Conor Whately, 'Strategy, Diplomacy, and Frontiers: a Bibliographic Essay', in: A. Sarantis and N. Christie, *War and Warfare in late antiquity: Current Perspectives* (Leiden 2013) 239–254 there 247.
[30] L'Orange and Berg, *Art forms and civic life,* 5.
[31] Ibidem, 4.
[32] Mod., *libro secundo, excusationum, Digesta*, 27.1.6.2.
[33] Orietta Cordovana, 'Historical Ecosystems. Roman Frontier and Economic Hinterlands in North Africa', *Historia: Zeitschrift für Alte Geschichte,* 61:4, 458-494, there 476.
[34] Ibidem, 475-476.
[35] Cassius Dio, LXXVIII 9.5.

fundamental realignment of political power. Power went away from the cities, and moved in favour of the central state.

Perhaps coincidentally, but possibly related, is that Christianity firmly manifested as the new state-religion from Constantine's reign onwards in 312. Polytheism with all its local cults was gradually abandoned.[36] This meant that from an ideological point of view the more regional character of many pagan cults was replaced with christanity in which a strict hierarchy was maintained. This may well have contributed in validating the direction in which the empire developed.

This relatively free and non-centralized system of government, which existed during earlier centuries was thus transformed, especially during Diocletian's government. Many provinces of the empire had over time become increasingly Roman. Bureaucracy was gradually increased and the wealthy were made to handle city affairs to link them closer to the empire. The city state model of mostly independent cities in which the Italian provinces taxed its empire had ended. People were increasingly linked to their parent's profession as well in an attempt to create stability.

1.1.2 The changing borders of the Late Roman Empire

The limes was a long and thin defensive area that served as a border between the Roman Empire and Germania, though the Romans themselves never saw the Limes as the limit of their empire. The term 'border' is a modern one and would be completely foreign to a Roman. According to Orietta Cordovana this is visible in classical literature because *limes* gained an administrative meaning between the first and third century AD. In every period of Roman history it was the provincial administration that determined where the actual line lay.[37] It was only in the fourth century, after hundreds of years of the limes remaining in a singular place that its meaning had slowly changed into something similar to what we think of today as a border.[38] Roman borders should be viewed not as a line but an area in which Roman

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[36] <https://www.ocla.ox.ac.uk/sect_lre.shtml> 03-05-20.
[37] Orietta Dora Cordovana, 'Historical Ecosystems. Roman Frontier and Economic Hinterlands in North Africa', *Historia: Zeitschrift für Alte Geschichte,* 61:4 (2012) 458-494, there 460-461.
[38] David Cherry, *Frontier and society in Roman North Africa* (Oxford 1998) 24-25.

influence gradually dissipated. Even in Germania where the Rhine provided a clear geographic border this was the case.

After all, border forts did not serve a purely defensive purpose as older historians typically believed.[39] It is well known that both in Germania and Pannonia the Romans crossed the rivers often to intervene in tribal conflicts or to punish particularly troublesome tribes.[40] The border did not separate the Roman Empire from the rest of the world.

Regardless of linguistic complexities, the limes functioned for centuries as a border between the empire proper and its vassals, allies and enemies in Germania beyond the Rhine. It was hard to penetrate for unprepared invaders and functioned as a highway for the Roman navy, the *classis Germania*.[41]

In the late third century this static defensive line was breached by attacks from the outside and problems were exacerbated by revolt in Gaul and repeated wars for the imperial throne. Shortly before 300 the Romans managed to mostly regain control and changed the region Germania Inferior into Germania Secunda which ran more or less along the same borders. It is in this period that the empire's defense turned into a defence-in-depth.[42]

Whether this was a good or bad decision on the Romans' part is difficult to say. On the one hand this new doctrine meant that border provinces were undoubtedly more dangerous to live in as the border garrisons were robbed of some of their strength. On the other hand the larger tribal federations and the increased strength of the Romans' enemies may have meant that the old way of defending the empire had become untenable. Large tribal confederations like the Alemanni may indeed have required an approach such as this.

The result of the troubles of the third century was that the static defenses of the early empire gradually began to be replaced by smaller outposts which housed the so-called 'limitanei.' Invaders that managed to penetrate these outer defenses

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[39] Stephen Dyson, *The creation of the Roman frontier*, (Princeton 1985).
[40] Cherry, *Frontier and society,* 24-25.
[41] Richard Thomas and Sue Stallibrass. 'Feeding the Roman Army : The Archaeology of Production and Supply in NW Europe. Oxbow Books', in: Ibidem, *Feeding the Roman army : the archaeology of production and supply in NW Europe* (Oxford 2008) 1-17.
[42] Harry van Enckevort, e.a., *Nieuw Licht op Donkere Eeuwen : De Overgang van de Laat-Romeinse Tijd naar de Vroege Middeleeuwen in Zuid-Nederland* (Amersfoort 2017) 33.

would then find themselves attacked by the more mobile cavalry units of the *'comitatenses*.'[43] The knowledge about military presence in Germania Inferior in this period unfortunately remains meagre due to a lack of research reports and overall insights. There is also little evidence for limitanei on Dutch soil.[44]

1.2 The crisis of the late Roman Empire

Late antiquity was a time of change and perhaps even innovation. However it has also traditionally been connected with the notion of decline. Nowadays this term has almost become a taboo, as it places a certain value on society, ranking some as better than others. Wolf Liebeschuetz argues that historians are reluctant to admit that anything ever became smaller, less effective or worse even when dealing with quantifiable data.[45] Erika Manders also notes that in the second half of the twentieth century, many scholars focused on which label should be attached to this period characterized by internal and external turmoil.[46] This period of unrest is also noted in the most common denomination of this period: the crisis of the third century.[47] It was this period which truly spurred on the changes of the late roman empire. The title of 'crisis' for the years 235-284 AD could be justified because of several reasons.

First, external threats pressured the emperors and their armed forces at the frontiers, as mentioned in the previous paragraph. Difficulties were the most pressing at the eastern and northern borders.[48] Strong emperors like Septimius Severus and Marcus Aurelius could keep the empire strong and healthy but in the fifteen years afterwards military coups occurred one after the other and the amount of emperors in the fifty years after Marcus Aurelius is almost half of the total amount of emperors in four hundred years.[49] To quote Herodian's history on it:

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[43] Conor Whately, '2. Making sense of the frontier armies in late antiquity: An historian's perspective', in: R. Collins, M. Symonds and M. Weber, Roman Military Architecture on the Frontiers : Armies and their Architecture in Late Antiquity (Philadelphia 2015) 6-18.
[44] van Enckevort, e.a., *nieuw licht op donkere eeuwen*, 36-37.
[45] Wolf Liebeschuetz, 'Late Antiquity and the Concept of Decline', *Nottingham Medieval Studies,* 45:1 (2001), 1–11, there 4.
[46] Manders, *Coining Images of Power,* 11.
[47] <http://www.bbc.co.uk/history/ancient/romans/thirdcenturycrisis_article_01.shtml> 04-05-20.
[48] Manders, *Coining Images of Power,* 13.
[49] van Es, *De Romeinen in Nederland,* 15.

"A comparative survey of the period of about two hundred years from Augustus to the age of Marcus would reveal no such similar succession of reigns, variety of fortunes in both civil and foreign wars, disturbances among the provincial populations, and destruction of cities in both Roman territory and many barbarian countries, There have never been such earthquakes and plagues, or tyrants and emperors with such unexpected careers, which were rarely if ever recorded before." [50]

Second, internal turmoil was rampant from 193 to 284. The rapid sequence of emperors dying due to a variety of reasons culminated into the greatest crisis Rome had ever faced. Macrianus rebelled in the east, shortly after beating back a Persian invasion in 260 AD.[51] Almost simultaneously Postumus, emperor Gallienus' military commander at the Rhine frontier, rebelled against him in 260.[52] Postumus was named emperor by his troops, and I believe might have even been more or less forced to rebel.[53] This sometimes occurred after a general was particularly successful and was usually dangerous for said general as the actual emperor could feel that his position was threatened. One example of this happening, and in which a general tried to shush his soldiers was noted by Julian I when he was still a military commander.[54]

Macrianus was beaten by Gallienus and his generals but the result of Postumus' revolt was the creation of the Gallic Empire which encompassed Gaul, Hispania and Britain. The Gallic Empire was not the only insurrection that managed to successfully split off from Rome. In the east the Palmyrene empire did much the same as queen Zenobia conquered most of the Roman east. The Roman Empire as a whole was close to collapse as a result.[55]

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[50] Herodian, 1.1.4.
[51] Lukas de Bois, *De Politiek van Keizer Gallienus* (Amsterdam 1974) 2.
[52] Manders, *Coining Images of Power*, 14.
[53] de Bois, *De Politiek van Keizer Gallienus* 5.
[54] Wright, *Letters. Epigrams. Against the Galilaeans,* XIII.
[55] Ibidem, 14.

Third, this was a decisive period regarding the development of Christianity. Christian numbers continued to rise which disturbed the *pax deorum*. In the year 249 an edict by the emperor Decius was issued. Decius ordered all inhabitants of the Empire to sacrifice to the gods of the Empire and swear an oath. Christians naturally refused to obey this edict which led to increased unrest in the empire.[56]

Fourth, the situation was made worse by a great epidemic known as the Cyprian plague which raged between 249 and 262.[57] Kyle Harper states that there are reports from all over the empire of severe depopulation. The bishop of Alexandria in particular made a precise report which Harper estimates puts the percentage of survivors at 38 percent. He admits that not all those need to have been from the plague as it is possible people fled to the countryside.[58] But a general picture of crisis and depopulation is invariable.

Some scholars have abandoned the concept 'crisis' however or apply it only to certain key phases.[59] They maintain that agriculture and urbanism came into trouble in the Rhinelands and the Middle Danube region, but not in the Balkans, let alone in regions that were not affected by warfare. At the end of the third century many cities still stood and knew periods of recovery. The senatorial order's powers were greatly decreased. Senators were replaced in the armies and in provincial government, which was taken over by military men from the ordo equester. Other scholars ascribe the myth of the third century crisis to biased stories made up by historiographers like Cassius Dio and Herodian, who believed their privileges were at risk. As de Blois rightly questions however: "Could these authors have made up stories that were simply not true. Their readers knew third century circumstances and would have rejected their works if these authors had done so."[60]

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[56] Wright, *Letters. Epigrams. Against the Galilaeans,* XIII, 22.
[57] Kyle Harper, *The Fate of Rome Climate, Disease, and the End of an Empire*, Series: The Princeton History of the Ancient World, 2 (Princeton 2018) 137-138.
[58] Ibidem, 140-141.
[59] Wolf Liebeschuetz, 'Was There a Crisis of the Third Century?', in: Ibidem, *East and West in Late Antiquity,* Impact of Empire, 20:1 (2015) 19-28, there 19.
Bryan Ward-Perkins, *The Fall of Rome : And the End of Civilization* (New York 2005) 4.
Johne Klaus-Peter, 'Einleitung', in: Ibidem, *Gesellschaft und Wirtschaft des Römischen Reiches im 3. Jahrhundert Studien zu ausgewählten Problemen* (Paris 1999) 7-16.
Lukas de Blois, 'The Crisis Of The Third Century A.D.', 205-206.
[60] Ibidem, 205-206.

Regardless of whether the term ‘crisis’ is an apt one, I argue that there are legitimate reasons to speak of general decline for a longer period. The quantifiable data available to historians speak of a decline of public order and increased unrest. Moreover, all the problems listed above meant traditional income from taxes no doubt suffered lasting damage as a result this is not even mentioning the massive inflation. The abandonment of provinces like the Agri decumates and Dacia are further signs of weakness.[61] Roman society in late antiquity was vastly different than it had been in the first century BC. It is generally assumed that many factors in the third century promoted depopulation, rather than stability and rising population numbers. Whether this was true for Germania Inferior will be looked at in the following chapters.

[61] Sylviane Estiot, ‘The Later Third Century’, In: W. Metcalf, *The Oxford Handbook of Greek and Roman Coinage* (Oxford 2012) 538-554, there 540.

2. Depopulation in texts: Antique and modern explanations

This chapter will first discuss modern authors' debate on Roman demographics and the lack of progress in the field since Karl Beloch. Afterwards, a short history and rough assumptions on the population numbers in Germania will be discussed. In this subchapter the literature on warfare in the region and how being a province on the border of the empire affected demographics. The next subchapter discusses the archaeology in the area, focusing on evidence of urbanization, abandonment and the settling of the Franks in the area. The last subchapter discusses the impact of the new army strategy during the period of 100 to 400 AD. This will put the changes in defensive strategy mentioned in chapter 1.1.2 in context for the province Germania Inferior, discussing them in greater detail.

2.1 Modern discussions on Roman demographics and the lack of material

When speaking of depopulation in classical texts it is important to remember the following: reliable evidence is almost entirely absent. This might be surprising as many ancient authors are known to describe the destruction of towns following war and raids. However the destruction of towns does not necessarily equate to a decrease of its population, let alone its total annihilation. Moreover, while there are some rare instances of ancient authors giving population numbers, these are unreliable.[62]

For example, Caesar claimed to have killed 250.000 Helvetii, even though 25.000 is more likely given what we know of the region the Helvetii resided and how large a population the area could reasonably sustain at the time. Any kind of timeline in which we can see subsequent periods of growth and decline would be impossible to make. This is the case for even the most well documented regions like Syria, Italy and Egypt. For a relatively badly documented border region like Germania Inferior

[62] Walter Scheidel, 'Roman population size', 16-17.

even more so. As such I will first attempt to give an account of population history for the Roman Empire as a whole and after that try to make some conclusions of Germania Inferior using the previous chapter which accounts for what parts of history we do know.

The debate on depopulation started with the first large investigation regarding population numbers in the empire. The author of this work, Die Bevölkerung Der Griechisch-Römischen Welt, was Karl Beloch.[63] He also used the total amount of grain supplied yearly and the number of people who received imperial donatives of grain or money.[64]

Despite the work being published in 1886 it is still regarded as authoritative. Moreover, while the work itself is more than a century old, no new primary source material has become available. By this I mean that no new classical texts have been found which touch upon the issue of population numbers in the empire. As a result, no new information could counteract its conclusions since then. Researchers interested in demography of the Roman Empire have focused mainly on tweaking Beloch's theories.[65]

This can for example be seen in Whitney Oates' work, which explains Beloch's theory regarding population numbers in the city of Rome. Oates argues that Beloch's assumption that each man received 3 modii of wheat is wrong. While the amount changed over the centuries Oates believes that 4 modii is a better average for what a grown person needs. The fact that Oates' work, published half a century later in 1934, still focuses on slightly tweaking Beloch's work should be plenty indicative of Beloch's importance. It also changes nothing about Beloch's main conclusion.[66] As Luuk de Ligt pointed out, the field of demography continued to be disregarded up until the 1990s.[67] Even as late as 2015 Peter Garnsey still made similar tweaks on Beloch's theory, raising the modii an adult received to 5.[68] This

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[63] Whitney Oates, 'The Population of Rome', *Classical Philology* 29:2 (1934) 101-116, there 102-103.
[64] Ibidem, 103-104.
[65] Ibidem, 104-105.
[66] Ibidem, 116.
[67] de Ligt, *Peasants, Citizens and Soldiers*, 5.
[68] Peter Garnsey and Jaś Elsner, *The Roman Empire : economy, society and culture* (Oakland 2015) 110.

shows that in some regards the field has ground to a halt. The lack of new ancient literature on the topic means this chapter will not bring radical new developments either.

However, this does not mean that offering new insights or viewpoints is impossible. Works like that of Elio Lo Cascio in 1994 noted that the importance and influence of Beloch's work cannot be overstated. However Lo Cascio recognizes the weaknesses in Beloch's theories as well. He notes that, as Beloch himself admitted, the strength of Beloch's work is its internal consistency. What Lo Cascio means by this is that Beloch has created an overview of the demography from a meager, unreliable set of data through a set of assumptions and demographic standards. However, Lo Cascio argues that the strength of the Bevolkerung is a bigger weakness because the whole construction rests on a simple argument from likelihood. One which he believes is incorrect after close analysis.[69] If Beloch is right, then that would mean that between 70 and 28 BC the population was decreasing.[70] This would be strange, given that Rome's territory was expanding.

We know from archaeological excavations however that there was an unprecedented urban development in the last centuries of the Republic. This means that If there was indeed a collapse of the Italian population, then it would have meant a total collapse of the population in the countryside. While the urban population of Rome's population was fed in part by the provinces, most of the other cities and towns in the Italian peninsula must have drawn their subsistence from the Italian countryside, which cannot have been emptied.[71] More recent works like Saskia Hin affirm this. She notes that the bleak view scholars had of the Roman population in the last two centuries of the republic has been overturned by revisionist scholarship. Rather than a decrease, the population was rapidly increasing, she concludes.[72]

Lo Cascio thus concludes that as the strongest argument in favour of Beloch's theory is incorrect, the theory falls apart considering that the interpretation of

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[69] Lo Cascio, 'The Size of the Roman Population', 23.
[70] Ibidem, 37
[71] Ibidem, 37-39.
[72] Saskia Hin, *The Demography of Roman Italy Population Dynamics in an Ancient Conquest Society (201 BCE-14 CE)* (Cambridge 2013) 342.

plausibility cannot be correct.[73] Seeing as how other modern works like that of Hin confirm this I agree with Lo Cascio that the value of Beloch's work stems from it being a collection of data on population sizes in which it is still unsurpassed. It does not provide plausible estimates of the size of ancient populations

This all serves to illustrate that when it comes to Roman demographics very little progress has been made. As no new primary evidence has been found we will have to make do with guesstimates using what little we do reliably know of the period and the region in question. This is the case especially for a remote province like Germania Inferior in a badly documented period like the later centuries of the Roman principate.

2.2 The population of Germania Inferior

To make a statement about the growth or reduction of a population it is useful to have an idea of the size of the population you are starting with. The first account we have of population numbers in the region of Germania Inferior comes from Julius Caesar's account of his conquest of Belgica in the *Commentarii de bello Gallico.* Here Caesar mentions which nations were in arms, how large they were and what they could do in war. Supposedly, many Belgae came from Germany, crossing the Rhine long ago to settle because the land was fertile. They drove out and mixed the Gauls who lived there previously in the process.[74]

The Atrebates were estimated by Caesar to be 15,000 strong, the Ambiani, Veliocasses, Caletes and Viromandui 10,000, the Morini 25,000, the Menapii 9,000, the Aduatuci 19,000, and the German tribes of the Condrusi, Eburones, Caerosi, and Paemani, were reckoned at 40,000.[75] This would add up to a total 'fighting' population of 128.000 men. If we add women, children and elderly you could reasonably expect a population of at least 300.000.

However Caesar's accounts are notorious for overestimating the number of enemies he faced for political prestige. He has, for example, claimed to have reduced the Nervii from 60.000 to a mere 500 in 57 BC. Yet, Cicero is besieged only

[73] Lo Cascio, 'The Size of the Roman Population', 37-39.
[74] James O'Donnell, *The War for Gaul: A New Translation* (Princeton 2019) 45.
[75] O'Donnell, *The War for Gaul,* 46.

a couple years later by the Nervii after which they supposedly lose another 60.000.[76] This shows how unreliable our data is. Many authors had certain intentions when writing their works, and were not above over- or underestimating population numbers as a result.

The best guesstimates we can make of the Roman population as a whole is during the reign of Augustus, in which we have the most data. Beloch claims the Roman Empire during Augustus' time housed between 50 and 60 million people.[77] Other authors like Ferdinand Lot claim the number was between 60 to 65 million.[78] Ernst Stein on the other hand argues it was likely about 70 million.[79] There are also lower estimates of 45.5 million, such as Bruce Frier who still accepts Beloch's reconstruction with some minor modifications.[80] This would mean that the estimates are between 45 and 70 million, which is a difference of more than 50 percent.

Most historians estimate the population of Gaul to be about 10 million, or 15 persons per square kilometre between 50 and 250 AD.[81] This would roughly mean a population of 200.000 for Germania Inferior. One might expect a lower number as the western Netherlands' soil consisted mostly of peat and only got more wet in the third century, increasing the uninhabitable area. But we know the dune area and the high sandy current ridges provided safe places to live. The location also allowed for trade and a highway straight to Britain and Germania Superior.[82] I would therefore argue that a population of 200.000 is a decent guesstimate to make for the population around 150 AD.

All modern sources agree that the population increased greatly during the first century after the conquest as landowners prospered due to new immigration. Moreover Germania Inferior gained a large new class of inhabitants with cash to

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[76] John Sadler and Rosie Serdiville, *Caesar's Greatest Victory: The Battle of Alesia, Gaul 52 BC* (Oxford 2016) 56.
[77] Walter Scheidel, 'Roman population size', 6.
[78] Ferdinand Lot, *The End Of The Ancient World And The Beginnings Of The Middle Ages,* translated by P. and M. Leon (New York 1953) 65-67.
[79] Ernst Stein, *Geschichte des spatRömischen Reiches* (Vienna 1928) I,3.
[80] Bruce Frier, 'Demography', in A. Bowman, P. Garnsey and D. Rathbone, *The Cambridge Ancient History. 2nd edition, XI: The High Empire, A.D. 70-192,* (Cambridge 2000) 787-816, there 812-814.
[81] <https://www.britannica.com/place/France/The-Roman-conquest> 12-12-20.
[82] van Es, *De Romeinen in Nederland* 20.

spend in the Rhine army. This stimulated trade and offered new opportunities to local farmers and attracted many new immigrants.[83]

That said, we need to be careful not to overstate the influx of Romans. The Romans never had a shortage of habitable land. Conquest was for the Romans more often because of military, economic or political reasons. In the northwestern part of the empire veterans were sometimes made to found new cities. These were, compared to the massive gains of the Roman conquests, relatively rare however.[84]

As previously noted, the inaccuracy of estimates for later periods is even worse as we have even fewer sources. Delbruck rates the population of the Roman Empire in 250 at 90 million.[85] Meanwhile John Bury estimated the population at 70 million in Constantine's regime between 307-337.[86] Regardless of absolute numbers it would seem that, overall, population numbers in the empire declined between 200 and 400 AD.[87]

We have some evidence of the pressure on the population of border provinces in this period and the progressive impoverishment.[88] A dedicatory inscription near Augusta Vindelicorum, present day Augsburg speaks of Postumus winning a battle against Juthungi and freeing many thousands of captives.[89] The fact that Postumus was fighting against raids of this scale as well as keeping his Gallic Empire's independence against the Romans in Italy shows just how unstable the situation was.

Additionally, the dedicatory inscription's location is not coincidental. Some modern historians state that priority was given to holding the Danube and the East. The result of this priority policy was that Roman Gaul was looted by two confederations of Germanic peoples In 260 and 276 AD. The Alemanni attacked Germania Superior while the Franks occupied Germania Inferior.[90] During this period

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[83] <https://www.britannica.com/place/France/The-Roman-conquest> 12-12-20.
[84] Boak, *Manpower Shortage*, 16.
[85] Hans Delbrück, *Geschichte der Kreigskunst im Rahmen der politischen Geschichte* (Berlin 1921) 237-238.
[86] John Bury, The invasions of Europe by the Barbarians (London 1928) 38.
[87] Boak, *Manpower Shortage*, 6.
[88] Ibidem, 18.
[89] AE 1993, 1231.
[90]<https://www.britannica.com/place/France/Gaul-under-the-late-Roman-Empire-c-250-c-400> 02-02-21.

when the imperial armies fought each other the Rhineland was plundered by successive waves of raids.[91] This likely caused an even bigger decline in rural population, both absolute and relatively. More will be said on the effects of depopulation in the rural population on population numbers overall in chapter 4.

The Roman emperor Aurelian reconquered the Gallic Empire in 274 AD.[92] Although unity was reestablished and the provinces somewhat recovered, steps needed to be taken to prevent a repeat.[93] Aurelian's successor Probus began fortificating several cities on strategic locations. He even went as far as using older buildings as material.[94] Probus' choice was thus drastic on a symbolic level. It was also unwise when considering rebellions. City fortifications do not only protect cities from foreign attacks but also from their own governments as it provides a certain position of strength and independence. It is therefore not something any ruler would do on a whim. However, it was clearly deemed necessary since the Franks continued to raid and plunder Germania Inferior under Aurelian's successors.[95] This continuous raiding likely forced many landowners and peasants off the countryside even after the Romans officially reconquered the province.[96]

The population of Germania Inferior was never properly recorded, or if it was we have no knowledge of it. As a result we have to work with guesstimates. Using Gaul as a base I came upon the number of 200.000 inhabitants for the province around 150 AD. This was a period of population growth for the empire because of the *Pax Romana.* All sources agree however that around the third century population numbers dropped for the empire as a whole as a result of a multitude of factors.[97] Exact numbers of the population decline and subsequent restoration for Germania Inferior are completely unknown. However, we do know that occasional raids continued even after the year 284. The year where we 'officially' end the crisis

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[91] Boak, Manpower Shortage, 23-24.
[92]<https://www.britannica.com/place/France/Gaul-under-the-late-Roman-Empire-c-250-c-400 > 02-02-21.
[93] van Es, *De Romeinen in Nederland,* 15.
[94]<https://www.britannica.com/place/France/Gaul-under-the-late-Roman-Empire-c-250-c-400 > 02-02-21.
[95] Historia Augusta, Volume III: Probus, 12.3.
[96]<https://www.britannica.com/place/France/Gaul-under-the-late-Roman-Empire-c-250-c-400 > 02-02-21.
[97] Kyle Harper, *The Fate of Rome* 118.

period. Possible depopulation as a result of these raids may have simply continued in some areas.

2.2.1 The influence of being a border province on the rural population

Prior to the industrial period when machinery lightened the workload for humans a single farmer could only produce food for a relatively limited number of people. Landowners thus employed large numbers of unschooled low income workers which they often paid with small amounts of money, along with meals, during the period of employment.[98]

It was this large number of low class workers that the upper classes and the empire as a whole depended on. Cities, when fortified, often had a good chance of fending off barbarian attacks as the Germans were generally unskilled in siege warfare. This meant that smaller towns were the primary target.[99]

Lukas de Blois notes that in general border provinces obviously traded with the interior. However, Transporting large amounts of goods in ancient times was considerably difficult. Doubly so if there were no navigable waterways. Therefore the border provinces themselves provided most of the cheaper goods to the army.

The problem with this state of affairs is that long periods of warfare and looting could destroy vital production in the area such as farm estates and nearby towns. As a result of these events production capability would permanently decrease as farmers and other inhabitants leave for greener pastures.[100] Based on the literary evidence seen of ancient authors in the last two chapters, as well as the conclusions of many historians of the period, I conclude that these longer periods of warfare and the threat of raids occurred during much of the third century and in parts of the fourth century.

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[98] Paul Kardulias, 'Interpreting the Past through the Present: The Ethnographic, Ethnoarchaeological, and Experimental Study of Early Agriculture', in: L. Hall and W. Caraher, *Archaeology and History in Roman, Medieval and Post-Medieval Greece: Studies on Method and Meaning in Honor of Timothy E. Gregory.* (Florence 2008) 109-126, there 118-119.

[99] Boak, Manpower Shortage, 25.

[100] Lukas de Blois, 'Monetary policies, the soldiers' pay and the onset of crisis in the first half of the third century ad' in: P. Erdkamp, *The Roman Army and the Economy* (Amsterdam 2002) 90-107, there 93.

This would eventually result in a lack of food and the depopulation of cities. Once the province had reached this stage recovery was often a lengthy process which could take decades. The sentiment is echoed by Paul Erdkamp. He states that short raids never caused migration on a significant scale as people could lend from their neighbours and change agricultural practices. It would entail the cultivation of only fast-growing crops so not much financial loss is incurred if they were lost.[101] Longer periods of war could cause large-scale emigration however. Boak notes that in the third century this happened numerous times.[102]

Italy was hounded by brigands who came from the frontier and in Gaul deserters, known as Bagaudae, terrorized the countryside and caused problems even for larger cities.[103] These groups were large enough to warrant mention by ancient authors and required military action by emperors illustrates just how many people left the countryside on the frontier. The border region of Germania Inferior must have faced similar challenges. The fact that a large number of Franks could be settled along the Rhine also suggests there was a rural labour shortage.[104] While the Romans may have always settled populations in uncultivated areas, in the past it was mostly reserved as a gift for veterans, those who had provided long term service to the state, not something to just hand out to barbarians.

However Boak suggests that there may have been mostly a shortage of personnel in certain sectors rather than a decline in population. He states this was caused mostly by the increased size of the army. Large armies consist mostly of low class citizens or inhabitants. This meant that apart from officers, it tended to be drawn mostly from low class workers like agricultural laborers. The losses incurred during the third century combined with the already shrinking rural population meant so many were drafted into service that there was a shortage of rural workers.[105] As a result agricultural production fell. This is especially true for border provinces as they typically raised most recruits. When the border provinces became truly pressured, as

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[101] Paul Erdkamp, *Hunger and the sword : warfare and food supply in Roman republican wars (264-30 B.C.)* (Amsterdam 1998) 208-269.
[102] Boak, *Manpower Shortage,* 27-28.
[103] Eutropius, *Breviarium ab urbe condita,* 9.20
[104]<https://www.britannica.com/place/France/Gaul-under-the-late-Roman-Empire-c-250-c-400> 02-02-21.
[105] Boak, *Manpower Shortage,* 25-33.

was the case in the third century, new armies had to be raised in the interior. This took far more effort.[106]

In addition to this, the countryside population had problems restoring its numbers. In the late Roman Empire there was no favorable system for small time farmers to set up in the imperial fiscal system or general agricultural operations. As noted in chapter 1, we instead see a rise of large latifundia or estates which were the property of rich landowners. These landowners squeezed out their resident farmers.

The Christian author Lactantius, who lived from 250 to 320 AD, claimed in 307 that the high land tax demanded of small farmers caused them to desert their farms. [107] Lactantius was generally very negative about Diocletian however and is therefore rather dubious as a source. Themistius, a more neutral author who lived from 317 to 390 AD, sketched a similar picture however. He states that the taxes had doubled in the forty years preceding the accession of Valens in 364.[108] In order to raise taxes and, probably to prevent tax evasion, the government forcefully allocated land to neighbouring farmers or towns. They might have hoped that this would incite farmers to be more productive. However the result was that some deserted their land as these farmers could not find enough laborers and produce enough to offset taxation. [109]

Arthur Boak also mentions an event in which Constantine I checked on the effects in Gaul in the city of Autun he deducted the taxes by more than one-fifth. In the middle of the fourth century the situation in Gaul had declined further as bands of brigands had grown to truly worrying proportions. All this suggests that abandonment of land was a serious issue in this period in the northern part of the Roman Empire. [110]

As mentioned in chapter 1, people were bound to their place of birth and to their jobs. It is likely this was intended to maintain stability and to prevent refugee waves. However, tenant farmers lacked funds to eventually start their own farms and

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[106] de Blois, 'Monetary policies', 94.
[107] Lactantius, *De mortibus persecutorum,* 7. 2.
[108] Ian Hughes, *Imperial Brothers: Valentinian, Valens and the Disaster at Adrianople* (Havertown 2013) 65-80.
[109] Arthur Boak, *Manpower Shortage,* 34-35.
[110] Ibidem, 40-41.

the lack of people to start new large scale latifundia meant the policies of the late Roman Empire obstructed the process of recovery even more. This meant the state promoted a stable situation at best and a downward spiral at worst. Very little in the way of growth could occur without a free trade system.[111] It is unlikely the state had the power to prevent people from leaving but they did have the power to prevent people from building a farm or a business. This further declined food production and potential population growth as a result.

While, again, hard numbers are difficult to give, Lactantius and Themistius' comments, as well as the episode of Constantine I, seem to suggest that depopulation occurred in the countryside due to civil unrest or government policy. Modern authors too stress that long term unrest was hard for farmers to recover from and linking people to their jobs created a rigid inflexible system that did not allow for quick recovery. This was likely the case for the northwestern Roman Empire as a whole, but especially so for the population of Germania Inferior. The long-term peace and stability of the first two centuries AD was broken. Though the extent of this depopulation remains unclear.

2.2.2 The archaeology of Germania Inferior

In the book '*Nieuw licht op donkere eeuwen*,' written by Harry van Enckevort, Joep Hendriks and Martijn Nicasie almost 150 archaeological reports are recorded from the Netherlands. These excavations are about late antiquity and the Early Medieval period between the fourth to sixth century.[112] In essence, all archaeological excavations in the Dutch part of Germania Inferior done between 1992 and 2016 from the relevant period were collected in this work.

Using this compilation of data, Enckevort, Hendriks and Nicasie see a clear reduction in the number of settlements in the eastern half of current-day Netherlands, they claim as much as 25 percent. They base themselves mostly on Willem Willems' 1984 thesis who simply speaks of a clear reduction. Willems wrote a large analysis of material from the eastern part of the Dutch river area during the

[111] Arthur Boak, *Manpower Shortage,* 33.
[112] Harry van Enckevort, Joep Hendriks and Martijn Nicasie, *Nieuw licht op donkere eeuwen de overgang van de laat-Romeinse tijd naar de vroege middeleeuwen in Zuid-Nederland* (Amersfoort 2017).

Roman Period, focusing on the landscape, the associated flora and fauna and the potential for human exploitation. Willems in turn bases himself on hundreds of archaeological sites and finds and the conclusions made in those archaeological reports.[113] They also use the book of van Es et al. *'Romeinen, Friezen en Franken in het hart van Nederland'* in which many different excavations as well as a chronological telling of the region's history are discussed.[114]

In Brabant the depopulation seems to be as severe as in the western Netherlands and it may have been completely abandoned even. The most prominent exception being the river area.[115] I will explain this phenomenon in the next paragraph as it might seem strange from a military viewpoint that the border remained populated while the interior was abandoned. One would expect that the interior is further away from hostile invaders after all.

The authors note that habitation in large parts of the western half of the Netherlands ceased altogether during the second half of the third century. They base this conclusion on a compilation of archaeological excavations in the Netherlands on sites from late antiquity. They wondered if there was truly depopulation or whether the remains of habitation are somehow 'outside the archaeological field of view.'[116] However from this data alone, the archaeological evidence seems to back up the idea of depopulation.

This study hypothesizes that the idea of habitation outside the archaeological view is likely as we do have evidence of the Franks moving into the area and it seems likely that they were ordered to create their own settlements, away from already established ones.[117] The Franks occupied the northern part of present-day Netherlands for a longer time. After the fall of the limes in the third century a part of

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[113] Willem Willems, 'Romans and Batavians. A Regional Study in the Dutch Eastern River Area', *Berichten van de Rijksdienst voor het Oudheidkundig Bodemonderzoek* (34)1, 42-341, there 210-211.
[114] Wim van Es et al., *Romeinen, Friezen en Franken in het hart van Nederland Van Traiectum tot Dorestad 50 v.C-900 n.C* (Utrecht 1994).
[115] van Enckevort, *Nieuw licht op donkere eeuwen* 33-35.
[116] Ibidem, 34.
[117] Amm. Marc. 7.8.3.

this community seems to have migrated to Roman-controlled territory and taken possession of uncultivated land.[118]

The Roman settlements may have declined in this period due to the already mentioned unrest, which motivated many to settle further in the interior. Meanwhile the Frankish settlements, made from wood and other perishable materials as they were used to, grew in new locations. The locations and choice in materials would hide them more easily from our view.

It would also conform with the conventional development of the province. The creation of more coloniae and municipia in the Roman northwest always remained a slow process compared with other marginal parts of the empire such as Mauretania. Instead, the development of a civitas system was promoted.[119] Tribes retained a measure of independence and old rivalries continued. Competition was no longer violent but measured by their standing in Roman society.[120] Romanization and urbanization processes gradually worked their way up from south to north in the Lower German military zone and in Gallia Belgica.[121] The population was thus essentially split up into Romans and various levels of romanized non-Romans. At the time the Franks getting their own land inside the province may have been seen as a continuation of the previous situation. That as far as we know the Romans were easily able to settle the Franks without protests from the local population indicates this.

Boak suggests this may have meant that the Frankish migrants were only enough to partially restore the population of Roman settlements in the area. However Boak was ignorant of the archaeological situation, as he wrote his book before Enckevort, That said, he rightly notes that the settling of Germanic tribes and their use as foederati was a direct counter to a lack of manpower.[122] More will be said on this in the next paragraph.

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[118] van Enckevort, *Nieuw licht op donkere eeuwen,* 36-37
[119] Christoph Rüger, '15 - Roman Germany', In: A. Bowman, P. Garnsey and D. Rathbone, *The Cambridge Ancient History Volume 11: The High Empire, AD 70–192, 2nd edition* (Cambridge 2000) 517-534, there 530.
[120] <https://www.britannica.com/place/France/The-Roman-conquest> 12-12-20.
[121] Rüger, '15 - Roman Germany', 530.
[122] Boak, *Manpower Shortage,* 27-28.

Enckevort, Hendriks and Nicasie note that between 250 and 450 archaeological evidence for habitation is scarce. Exceptions being Katwijk aan Zee, Leiderdorp and Forum Hadriani. The state of Forum Hadriani is unclear but it was still put on maps so it is assumed to remain a place of some significance.[123]

The archaeological data of the Netherlands thus supports the image of depopulation, but it does not seem to be a clear-cut event. Certain areas were never depopulated and 'merely' suffered population reductions of 20 to 25 percent while other areas like the western half of the Netherlands and Brabant were almost completely abandoned. The state of some towns is unclear although maps may provide some hints based on whether they were still mentioned. However there are indications that these populations were replaced by Franks who may be hidden from our archaeological view.

2.2.3 The impact of depopulation on the army

There are many indications that depopulation, or rather a shortage of manpower, was an issue for the Roman army. Many recruits of the late Roman army were barbarian. This was a practice established long before the end of the crisis of the third century. Already before Diocletian's reign about one quarter was non-Roman.[124] The Romans have had a long history of using non-Roman units like *auxilia* and ethnic groups that specialized in one function, like the famed Numidian light cavalry. [125] However it seems that at some point soldiering became increasingly an occupation for foreigners.[126] It was this policy which also seemed to be used by the Romans in Germania Inferior in the form of the Franks.

No nation could feel comfortable using these troops for their armies as their original power structures were not broken up the same way the Roman Empire did in previous centuries.[127] Indeed, it was often leaders of distinct groups like Franks who served as former Roman generals who became Rome's most dangerous enemies.[128]

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[123] van Enckevort, *Nieuw licht op donkere eeuwen,* 34.
[124] Boak, *Manpower Shortage,* 92.
[125] Caesar, *Alexandrian War. African War. Spanish War,* 3.70.IIII.
[126] Ward-Perkins, The Fall of Rome, 38-39.
[127] Amm. Marc., XXX.10.1
[128] Jeroen Wijnendaele, 'Sarus the Goth: from imperial commander to warlord', *Early Medieval Europe,* 27:4 (2019) 469-493.

It is evident from this that the empire had trouble finding enough recruits. At least for the amount in which they were willing to pay them.

Another way the empire tried to solve this problem was by conscription. According to this system plots of land called *capitula* each had to supply one man every year. Landholders who owned several *capitula* thus had to supply as many men as they owned *capitula*. They could choose to pay money instead so the state could find other recruits but poor landholders had no alternatives.[129]

Another sign of how dire the situation was can be seen from a law decreed by Diocletian which obligated the sons of soldiers to enlist themselves.[130] To be fair, it may simply be a desire to have state control over the population similar to the law governing hereditary trades. However when you combine the law with the effort it took to raise new legions as mentioned in 2.2.1 it paints a damning picture.

Ian Haynes states that a lack of recruits was a long standing issue for the Romans. They needed rural provinces like Pannonia to recruit amongst tribes, farmers, shepherds and hunters.[131] A lack of these recruits during times of turmoil or even complete lack of access to these areas could cause serious manpower shortages. The Romans experienced these circumstances with increasing frequency during later centuries. More widespread recruitment did happen but was more of a response than pre-emptive strategy during the early empire.[132]

There are some ancient authors who take note of this as well, such as Vegetius in his '*Epitoma rei militaris.'* He explains in his first book how soldiers ought to be selected, from which places, what kinds of men and from what professions. He also notes that there is a shortage of these men and that if necessary barbarian northerners need to be used to temporarily fill gaps.[133]

Admittedly, Vegetius lived in the late 4th century, not to mention that Vegetius cannot be called impartial as the work is clearly trying a plea for army reform. However, as I stated before, the practice of foreign recruitment was widespread even

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[129] Boak, *Manpower Shortage*, 94-95.
[130] https://www.britannica.com/place/ancient-Rome/Diocletian <28-11-20>.
[131] Ian Haynes, *Blood of the Provinces: The Roman Auxilia and the Making of Provincial Society from Augustus to the Severans* (Oxford 2013) 128.
[132] Ibidem, 124.
[133] Vegetius, *Epitoma rei militaris*, I.II.101-I.VIII.263.

before Diocletian's reign at the start of the fourth century. I also see no reason to doubt the truthfulness of Vegetius' claim that there was a lack of recruits as this would have probably been common knowledge at the time. Considering that the Roman Empire in the decades before or during Diocletian's reign had suffered through successive disasters in the form of plagues and civil wars the situation was likely no better.

One counterargument to depopulation affecting the army is that the Roman army did continuously grow in size. There were around 350.000 auxilia in 235.[134] After the crisis of the third century the army likely grew to 400.000.[135] Under Diocletian and Constantine I the army was divided in palatini en comitatenses and the limitanei. After that it becomes unclear and the amount is estimated to be between 400.000 and 650.000. The notitia dignitatum is also used as a source for army numbers but its data is incomplete. It is clear however that this data, especially from the notitia dignitatum, shows legions at ideal, full strength. It does not reflect the reality of casualties and the fact that we know that in the fourth century the legions were not maintained at full size.[136]

Another example of being careful, yet not dismissing army size numbers given by Latin authors come from Lactantius. Lactantius claimed that Diocletian quadrupled the number of men under his command.[137] As Lactantius is a contemporary, such a gross miscalculation seems strange. However, because Diocletian created the tetrarchy with two *augusta* and two *caesars* he likely meant that each emperor and sub-emperor had as many units as a single previous emperor which means that units became more specialized and smaller. The absolute number within those units naturally lowered.[138] The army increases on paper are thus not as indicative of successful large scale recruitment as one might think.

To conclude, any statements about absolute army numbers are extremely problematic. Both for Germania inferior and in general. Estimations can differ by

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[134] Ramsay MacMullen, 'How Big was the Roman Imperial Army?', *Klio,* 62:1 (Leipzig 1980) 451-460, there 454.
[135] Boak, *Manpower Shortage,* 86-87.
[136] Ibidem*,* 87-91.
[137] Lactantius, *De Mortibus Persecutorum*, 7.2.
[138] MacMullen, 'How Big was the Roman Imperial Army?' 454-456.

more than 50 percent, however some general deductions can be made about depopulation in the army. First it is clear that the Romans had a general tendency to increase army size. Second it becomes clear that the established ways of recruitment became increasingly untenable. Original areas of recruitment like rural Illyria were no longer capable of supplying enough recruits and the Romans eventually went as far as a form of conscription for the general population and sons of soldiers especially. Third, Roman units became consistently smaller throughout time and were likely not kept up to full strength either. While I would not go so far as to say the army was a paper tiger, I would suggest caution using literary sources to calculate army numbers. Overall the picture does not quite seem to be one of depopulation, but definitely a strain to find soldiers and especially ‘native Romans’ to supply the army with. Apparently resulting in Germania Inferior in foreigners being brought into the area.

3. Depopulation in coins

In addition to looking at textual evidence I have also done a material inquiry into possible depopulation between 250 and 400 AD. This has been done by looking at large amounts of coins found in several Roman sites. By doing so I in essence performed a simple quantitative analysis by using the basic principle: more people means more material remains.

I would like to note that originally I was not planning to use coins to look for depopulation. Stijn Heeren was kind enough to advise me and suggested using three fibulae types to measure depopulation. These were the *'Eenvoudige meerdelige voetboogfibula'*, *'Meerdelige voetboogfibula met uitgewerkte voet'* and the *'Voetloze fibula met hoge naaldhouder'.* The reason these were chosen is because they roughly correlate with the period in which the depopulation occurred and also because no proper attempt has been made to properly date these three types using a large database of existing excavations. If several dozen of these fibulae found in the same stratigraphic level as Roman coins could be found a *terminus post quem* could be provided. The master thesis could thus solve uncertain dating of several fibulae types on top of its main research question of measuring a decrease in material culture.

This goal was achieved by using several methods. As stated before, *'Nieuw licht op donkere eeuwen'* of Harry van Enckevort compiled all archaeological excavations in the Dutch part of Germania Inferior between 1992 and 2016. For the years 2016 to 2020 there were essentially two options. Either go to the RCE, the *Rijksdienst voor het Cultureel Erfgoed*, in Amersfoort and look for physical copies of archaeological excavation reports or go online to easy.dans.knaw.nl/, a site where these reports are stored for usage by researchers or interested laymen.[139] Here relevant reports of armbrust fibula can be found online. Unfortunately, due to the corona crisis the RCE was closed. Reports before 2011 were normally in the library from RCE but those were in the coming period not available.

[139] <https://easy.dans.knaw.nl/ui/> 02-05-20.

Of the 149 *voetboogfibulafibula* or ‘footbowfibula’ found online all were unfortunately part of a private collection with no other information available. That meant they were found as individual finds by amateur metal detector owners. This also meant no context was available and they were thus unusable for any kind of dating research.[140]

I also attempted to find more armbrust fibulae online through PAN, or portable-antiquities.nl, however archaeological objects in this site are listed independently from any research excavation they are found in and are thus again separated from any kind of context which can be used to date them. All of these factors combined forced me to abandon my original research method and led me to the current coinage dating.

3.1 Roman coinage and dating

Roman coins are easily dated, perhaps even the easiest material group available to historians and archaeologists. Roman coins, in theory at least, derived their value from the material from which they were made. They were primarily a medium of exchange. The Roman state used them for the payment of debts to particular groups, especially the army and the urban populace at Rome. After being introduced to the economy, it was intended that the coins become a broadly accepted means of payment for private debts and wages and also that they be used to pay taxes to the state.[141]

Besides the function they fulfilled as a mode of transaction they were also a clear representation of imperial power, bearing the faces of the head of state. Moreover, by emphasizing shared successes, like immortalizing victories on coins, an appeal could be made to a collective identity which might have influenced the unity within the Empire.[142]

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[140] I would like to advise caution to any researcher attempting to date armbrust/footbow fibulae by using their contextual remains as this has proven undoable for me. The easydans site, while its philosophy of a huge online database is laudable, has proven to be very unfriendly to work with and in my opinion requires a significant overhaul.
[141] Martin Beckmann, ‘Trajan and Hadrian’, In: W. Metcalf, *The Oxford Handbook of Greek and Roman Coinage* (Oxford 2012) 405-420, there 415.
[142] Manders, *Coining Images of Power,* 24.

Even though coins were theoretically supposed to circulate forever, they can thus be easily dated because they often answered contemporary issues and desires. [143] That said, according to Keith Hopkins With a loss rate of 2 percent per year, the number of coins circulating tends to halve every thirty-five years.

The habit to clarify the moment in which they were made, visible in the symbols depicted makes them easily dateable. Assistant Professor Claes of Leiden University, an expert on numismatics also stated that most coins realistically disappeared from the system through melting down, wear and tear, being lost etc. after about 50 years.[144]

3.2 Methodology

To carry out an investigation in depopulation of the Netherlands multiple sites need to be looked at to make any comprehensive statement about the region as a whole. In this case 5 different sites in the Netherlands have been chosen. From west to east: Praetorium Agrippinae (Valkenburg), Matilo (Leiden), Albaniana (Alphen aan den Rijn), Levefanum (Wijk bij Duurstede) and Ceuclum (Cuijk). The primary data was obtained by using the NUMIS website. This means: which coin from what period was found where. The NUMIS site uses the Nationale Numismatische Collectie (NNC) which is managed by De Nederlandsche Bank. A part of the NNC-collection database can be consulted online. These objects have been verified on the quality of their description and represent one of the larger numismatic collections of the world.

The sites that have been chosen were selected for several different reasons. For one, they are somewhat spread out, with three sites sitting on the western edge of the Netherlands, and two sitting on the eastern side. They also represent a somewhat mixed sample with Cuijk being a civilian site, Levefanum being a mix of primarily civilian with military, and Matilo and Albaniana being primarily military sites. There is some discussion regarding Praetorium Agrippina as it is listed as a settlement on the peutinger map, yet excavations have revealed only a military site.

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[143] Beckmann, ‘Trajan and Hadrian’, 405-410.
[144] Keith Hopkins, ‘Taxes and Trade in the Roman Empire (200 B.C.-A.D. 400)’, *The Journal of Roman Studies* 70:1 (1980) 101-125, there 107-108.

[145] Finally, the sites were chosen based on having a reasonably extensive sample size on the NUMIS site, at the very least more than 150 coins found between 100 and 400 AD. The religious site of Elst was also considered, as it fit the period and might have added to the argument, military, civil and religious sites would all have been represented in this case. Elst was eventually discarded however. The research question limits itself to determining the population of Germania Inferior. Religious sites like Elst would have attracted groups who cannot be considered part of the 'native' sedentary population. Rather, they would mostly be the result of visitors: pilgrims, merchants, travelling soldiers etc.

In addition to that, a portion of all coins from selected sites were eventually left out of the collected data. Coin hoards are not useful in this regard because they do not signify an increase in population. For example, a single coin hoard in the second century would have made it seem like there was a larger population size in the second century if there was no coin hoard in the third century. The opposite may be true however, as the act of burying money may have been the result of a portion of the population fleeing the area because of an increase in raiding.

A portion of the coins were also deselected because they were unable to be dated. If these were unable to be dated to a specific year, emperor or even one of the chosen periods as a whole this would not have been a problem. The graphs of the 300 year period have been divided into six large blocks but some coins which could only be dated as between 100-200 AD or even worse 1-400 AD were unusable. To put this into perspective, if there is a period A between 100 AD and 140 AD and a period B between 140 AD and 200 AD I could perhaps have given period A 40 percent of the coins between 100-200. However if there were also ten coins between 120-150, four between 122-165 and so on it would have been extremely difficult to 'fairly' distribute the coins. Especially if only a few of these had been found.

In general this seems to happen almost exclusively to coins between 1-192 AD. Almost 50 coins from Praetorium Agrippinae, 20 from Matilo, and 90 from Albaniana were deselected for this reason. From Levefanum and Ceuclum the

[145] <https://www.livius.org/articles/place/praetorium-agrippinae-valkenburg-zh/> 22-10-20.

number of deselected coins were roughly even for every period. This means that for Praetorium Agrippinae and Albaniana some statements will be made later to account for this as it would leave us with an inaccurate assessment of reality otherwise.

Finally, some coins were deselected from the search term ‘Wijk bij Duurstede’ and ‘Katwijk.’ The NUMIS database selects all coins found in that general area which means that not all 150+ coins were actually found in Wijk bij Duurstede. Luckily NUMIS provides the precise location in which an object was found as well if the object is clicked on and all sites had a clear difference between the actual military/civilian site and another excavation

Following all these reasons for deselection the following number of coins were selected at each site. For Ceuclum, this meant that 93 of 275 coins were selected. For Levefanum 115 of 206 were selected, for Albaniana 49 of 171, for Praetorium Agrippinae 113 of 252 and for Matilo 182 of 231 coins. For a more detailed table with coin types see the appendix.

Period	Total coins Ceuclum (Cuijk)	Total coins Albaniana (Alphen aan den Rijn)	Total coins Levefanum (Wijk bij Duurstede)	Total coins Praetorium Agrippinae (Valkenburg)	Total coins Matilo (Leiden)
Nerva to hadrian 96-138	15	22	7	34	52
antonine period 138-192	10	14	9	56	54
Severan period 193-235	3	12	9	23	21
Crisis third century 235-295	5	1	45	0	6
Constantine emperors 295-361	25	0	33	0	37
Late fourth century 361-400	35	0	12	0	12
Total coins of all periods	93	49	115	113	182

Table 1: all coins used in this research from Ceuclum, Albaniana, Levefanum, Praetorium Agrippinae and Matilo (by Steven Boekel).

I have decided to separate all coins in six different periods. The first is from Nerva to Hadrian, 96-138 AD. The second is the Antonine period, 138-192 AD. Third is the Severan period, 193-235. Fourth is the crisis of the third century, 235-295, one thing to note here is that the crisis of the third century officially ends when the reign of Diocletian starts in 284. However many coins were dated 260-290 or 270-290 and I preferred to keep those in the crisis of the third century since Diocletian still faced pretenders and several revolts until 290. Fifth are the Constantine emperors, 295-361. Sixth is the late fourth century, 361-400.

There are obviously problems with this division. Not every period has the same number of years in it. However, there are advantages in this division as well. Coins which cannot easily be dated are usually dated to being an Antonine coin for example. This division thus made it possible to use coins that would otherwise be unusable. Moreover, all periods except for the first and the last are already accepted and well known divisions. This makes it easier for scholars to use this data. This was therefore considered to be the most optimal division. Of course, some misconceptions caused by the difference in the size of each period need to be addressed in the results.

3.2.1 Issues with equating coinage to population

There are several problems with equating coin circulation with population. While it is true that in general more material culture means more people, the absence of coins does not mean an absence of people. Joris Aarts notes that one of the consequences of associating Roman coins with Roman monetary economy is that the presence of coins tends to be regarded as an index of monetization. It disregards other functions of money other than as a transactionary unit. Nor does a period of increased coin loss in a settlement mean a period of economic prosperity.[146]

Moreover, as Aarts rightly notes, comparing raw numbers of coins of different sites can be a hazardous occupation because of the many circumstances which can influence the retrieval of coins. For example how well the site has been investigated

[146] Joris Aarts, Coins or Money? Exploring the monetization and functions of Roman coinage in Belgic Gaul and Lower Germany 50 BC - AD 450 (PHD thesis Antique History VU, Amsterdam 2000) 2.

and the chemical properties of the soil. Aarts also concedes that this is the only way of getting at least some insight into the circulation of coins into the area.[147]

Another problem with equating money to people is that Roman society, even if it used coinage to express and sometimes pay the greater part of its debts and credits, remained a society that was incompletely monetized. Most of the population was still agricultural, living in villages in what was mostly a subsistence economy. Settlement of loans and rents and payment of taxes was thus done in coins, but much of the economy could have continued to flow by trading in goods.[148]

Christopher Howgego disagrees with this conclusion, stating that the Roman Empire was far more monetized than most think. He bases his arguments off of the literature of Strabo and Tacitus who comment on the absence of coinage. This indicates, he believes, that it is an apparently noteworthy feature of remote and backward areas or an idealized primitivism. He also uses papyri from Egypt as evidence of a highly monetized society.[149]

However, I would argue that Howgego places far too much value on his evidence. Egypt is the province which presents the modern historian with the most evidence, but it is also not representative of the empire. It was an exceptionally wealthy and advanced province, especially compared to Germania Inferior. There are also problems with Howgego's other examples. As Strabo comments on the Dalmatians: “they do not in general use coined money”.[150] For the Lusitanians Strabo states they: “cut off pieces from beaten silver metal and pass them as money,” which both suggest a form of limited monetization.[151] Tacitus, who comments on the German tribes, also states that the Germans mostly barter but that: “The coinage which appeals to them is the old and long-familiar: the denarii.” The Dalmatians did, indeed, not use money according to Strabo, and they were strange to reject it. But that was only “in that corner of the world,” as Strabo literally states because at the same time money was: “common with many barbarian tribes.”

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[147] Aarts, Coins or Money, 36.
[148] Ibidem, 36.
Hopkins, ‘Taxes and Trade in the Roman Empire’, 116.
[149] Christopher Howgego, ‘The Supply and Use of Money in the Roman World 200 B.C. to A.D. 300’, *The Journal of Roman Studies,* 82:1 (1992) 1-31, there 16.
[150] Strabo, XI.4.4.
[151] Ibidem, III.3.7.

In short, Howgego's presented examples are faulty. Strabo's comments on the Lusitanians and Dalmatians make it clear that even the Germans in northwestern Europe used money, albeit in a limited manner. The Dalmatians may have mostly spurned money, but as their neighbors did use it, it is likely that in some rare transactions they did use it. This also conforms with the image sketched by Tacitus who notes that the Germans mostly barter, but are familiar with the concept of money and do use it for some transactions.

Richard Duncan-Jones states that limited monetisation can take two obvious forms. Either bartering keeps its prominent role as it is for some reason perceived to be easier. Alternatively, bartering has to be used as there is monetary deprivation, where the market-place expects and wants money but too little coin is available. Both phenomena seem to exist in the Roman world, but where money was available it was clearly used. The wear-rate of low-denomination coins was quite high. The market for counterfeit coins also suggests that more money was needed than was actually circulating.[152]

3.2.2 Issues regarding coinage dating

Not everything regarding dating using coinage is straightforward either. Since AD 85, the denarius, the most common silver coin type, had retained a purity of approximately 93 percent silver. However, this percentage of silver was reduced to 84 in 148 and then continued to slide until 195, when it was substantially reduced to a little over 50. Although such figures derive from surface analyses, Roman coins tend to continually be reduced in purity and weight.[153]

In conjunction with this was continuing inflation, as especially the third century experienced high levels of inflation, as will be mentioned later in this chapter. There was a clear tendency for the silver content of the bullion coinage to decline progressively during the Roman Empire's history, despite periodic attempts to re-establish coinage of a better quality. Howgego notes that Walker has made a strong case that every debasement in the period he treated was in the context of

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[152] Richard Duncan-Jones, *Money and government in the Roman Empire* (Cambridge 1994) 20.

[153] Liv Yarrow, 'Antonine Coinage', *The Oxford Handbook of Greek and Roman Coinage* In: W. Metcalf (Oxford 2012) 423-449, there 424.

increased state expenditure. That inadequacies in state finances were a major cause of the lowering of standards cannot be doubted.[154]

Liv Yarrow opposes this trend of thought and states that increased state expenditure is not necessarily related to military campaigns. They may also be the result of extensive benefactions such as those associated with the ascension of a new emperor and key anniversaries.[155] In short, soldiers' pay eventually became inadequate as inflation went on which is why a system of 'bonuses' developed in which soldiers receive extra pay on coronation ceremonies or important anniversaries.

As stated before, one of the main uses for coinage was so that the Roman Empire could pay its army. However army pay was fixed for a long time and did not follow inflation. Perhaps it was that army pay had to be increased to counter inflation, Or maybe it was the other way around and the fact that the army had to be paid so much that despite a reduction in income that inflation occurred.

Caesar/Augustus ~0 AD	900 sestertii
Septimius Severus 197 AD	2400 sestertii
Caracalla 215 AD	3600 sestertii

Table 2: emperors and the army pay earned by a regular legionnaire (after Michael Speidel).[156]

Regardless, it is clear that annual pay for a regular legionnaire increased during Caesar/Augustus' reign to 900 sestertii per year. In 84 AD this became 1200, a 33,3 percent increase. During Septimius Severus' reign in 197 it was doubled to 2400 sestertii and his son Caracalla added 50 percent on top to make it 3600 sestertii.[157] Richard Abdy notes that over the course of the third century army pay had perhaps fallen behind rising prices for goods by a factor of a dozen times or more. The soldiers were therefore dependent on a new form of payment: bonuses

[154] Christopher Howgego, *Ancient History from Coins* (London 1995) 115-121.
[155] Yarrow, 'Antonine Coinage', 424-425.
[156] Michael Speidel 'Roman Army Pay Scales', *The Journal of Roman Studies* 82:1 (1992) 87-106, there 88.
[157] Speidel 'Roman Army Pay Scales', 87-90.

known as donativa which were given at important moments for the emperor, such as his birthday.[158]

Fluctuations in the availability of precious metals may also have played a part in the process of inflation and loss of bullion. Hopkins, who estimated coins produced by the Romans increased greatly from 50 BC to 200 AD, perhaps tenfold.[159] Moreover, the Roman state had no monopoly of silver coinage. Even conquered states often continued to mint silver coins.[160] That said, Hopkins speaks here of Spanish and eastern polities, it is unlikely these were a large factor in Germania Inferior, given the absence of large states prior to the Romans. Still, Hopkins' conclusion, that the volume of silver coinage circulating in the High Empire was considerably larger than in the late Republic seems correct. Hopkins bases himself on the volume of coins found across the empire.[161]

Regular and substantial payments to peoples beyond the borders of the empire were used from the first century onwards to buy off threatened attacks. Howgego believes that, based on comments from Cassius Dio and even when taking into account possible exaggeration, the frequency of this practice seems to have increased from the time of Marcus Aurelius onward.[162] Such expenditure reduced the quantity of precious metals in circulation, and thus available for recoining. On top of these payments the Romans could not mine as much as in the previous century. The silver mining settlement at Riotinto (Spain) collapsed around 160–170, and the Marcomannic invasion of 167 led to the abandonment of key gold mines in Dacia.[163]

The combination of all these factors likely resulted in the collapse of the metal composition of the denarius in the year 195. During Septimius Severus' reign the denarius dropped from around 70 percent silver in the middle of 195 to becoming a base silver coin of around 40 percent silver by the end of the year. Freed from the

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[158] Richard Abdy, 'Tetrarchy and the House of Constantine', In: W. Metcalf, *The Oxford Handbook of Greek and Roman Coinage* (Oxford 2012) 584-599, there 589.
[159] Hopkins, 'Taxes and Trade in the Roman Empire', 115-116.
[160] Ibidem, 107-108.
[161] Ibidem, 116.
[162] Howgego, 'The Supply and Use of Money', 5.
[163] Yarrow, 'Antonine Coinage', 424-425.

constraint previously caused by the raw material, production of the denarius increased.[164]

Caracalla's reign was unpopular so to secure it he increased the army's pay further. To pay for this he invented a new way of debasing the denarius in 215 by making a new denomination, the radiate or antoninianus. It was almost certainly valued as a double denarius.[165] However, it only contained 1.6 times as much silver as the denarius.[166]

The imperial mints introduced a new silver coin in 274, the aurelianus, or post-radiate/post-reform antoninianus. It preserved a radiate coin of silvered metal (the aurelianus) as its central element, whose weight was increased to 1/80 lb. (theoretically 4.03 g), with the fineness in silver guaranteed to a constant 5 percent and the exterior appearance improved, particularly by the technique of silvering to prevent counterfeiting.[167] That a constant of 5 percent in a coin, which was originally supposed to derive its value from the metal it was made up from, was considered an improvement says much about the state of Roman coinage in this period.

Abdy states that based on patterns of coin hoards, site finds and die studies in the Roman Empire at large, a consequence of this continual debasement was a massive increase in the volume of coin production. Abdy believes that the enormous increase in coin production during this period, traditionally seen as the result of the collapse of the early imperial coinage system in the teeth of rampant inflation, in fact had a positive effect as well. It spread the monetary economy far wider than ever before, at least in the northwestern provinces of the empire.[168]

On the other hand, Kropff and van der Vin came to another conclusion. They studied coin series of cities and army camps in England that are known to have been occupied throughout the 3rd century, and observed that coins from the years 235-260 and 275-296 were few in number or even completely absent. They concluded that coins from the first period mentioned are mostly absent because the

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[164] Richard Abdy, 'The Severans', In: W. Metcalf, *The Oxford Handbook of Greek and Roman Coinage* (Oxford 2012) 499-513, there 504.
[165] Abdy, 'The Severans', 507.
[166] Roger Bland, 'From Gordian III to the Gallic Empire (AD 238–274)', *The Oxford Handbook of Greek and Roman Coinage*, In: W. Metcalf (Oxford 2012) 514-534, there 515-516.
[167] Estiot, 'The Later Third Century', 546.
[168] Bland, 'From Gordian III to the Gallic Empire, 519-521.

short-reigning soldier emperors likely struck them in low numbers. For the latter period, coins of the Tetrarchy were not generally distributed in the northwest of the empire.[169]

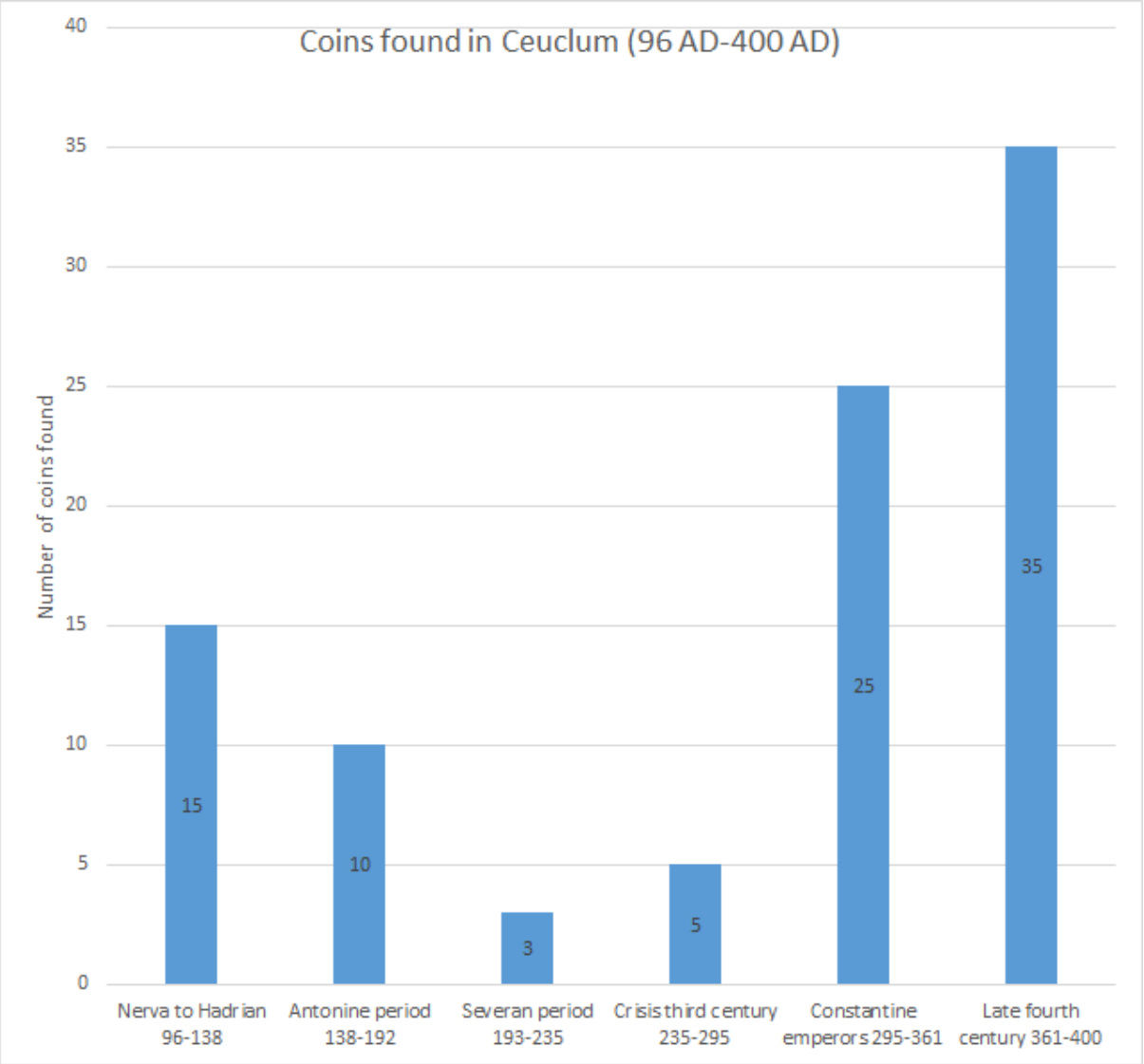
That said, in general a historian would expect to find more coins in later periods. This is based both on the presumed spread of the monetary system as coins became more numerous and less valuable, as well as the ongoing inflation itself. This is partially offset by the repeated attempts to reintroduce new coins into the system. One example being the earlier mentioned antoninianus, which was supposed to be valued at two denarii. However as Abdy states, the debasement of coins was likely well-known to many.[170] As trust in a coin decreases inflation increases. The previously mentioned edict of maximum prices by Diocletian was at least partially an attempt to address this.

I would be hesitant to say any two coins found in 250 would be equal to a single coin in 100. It is impossible for me to make a good judgement of how many coins in the year 400 equal a single coin in the year 100. Let alone account for the different denominations. I will simply assume that a very small difference of coins between two periods could possibly be because of chance. A large difference of quantity in the number of coins found between two periods, especially those directly succeeding the previous period, likely indicates a growth in economic prosperity. Given the reliance on manpower, discussed in earlier chapters, an increase in prosperity was almost always accompanied with an increase in population.

[169] Heeren, ‘The Depopulation of the Lower Rhine Region in the 3rd Century’, 275.
[170] Abdy, ‘The Severans’, 507

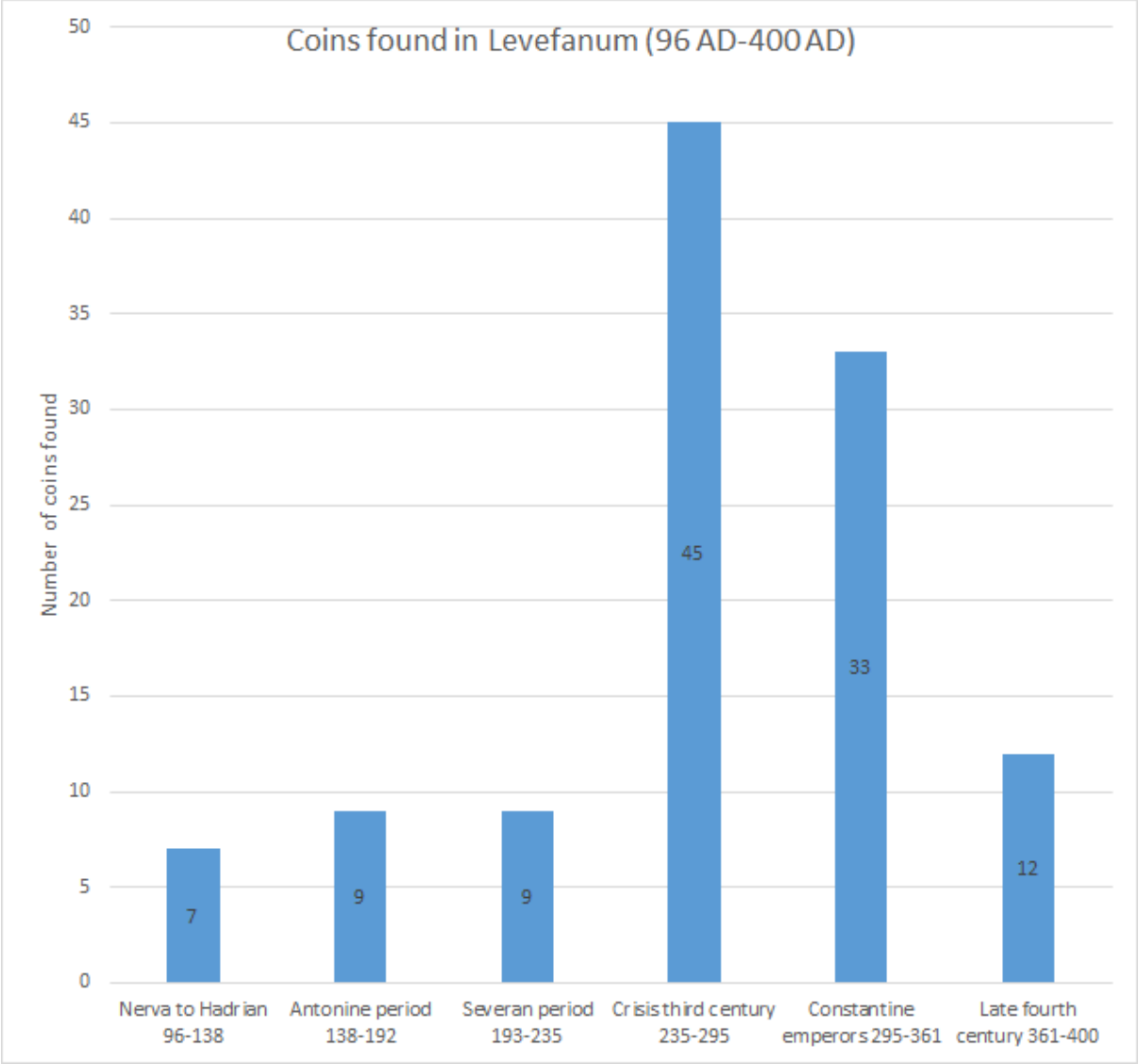
3.3 Results of the material inquiry: coin numbers of 5 Roman settlements

The results of the investigation of the five researched sites have been made visible below in five different bar graphs. The sites from east to west are: Ceuclum, Levefanum, Albaniana, Matilo, and finally Praetorium Agrippinae.



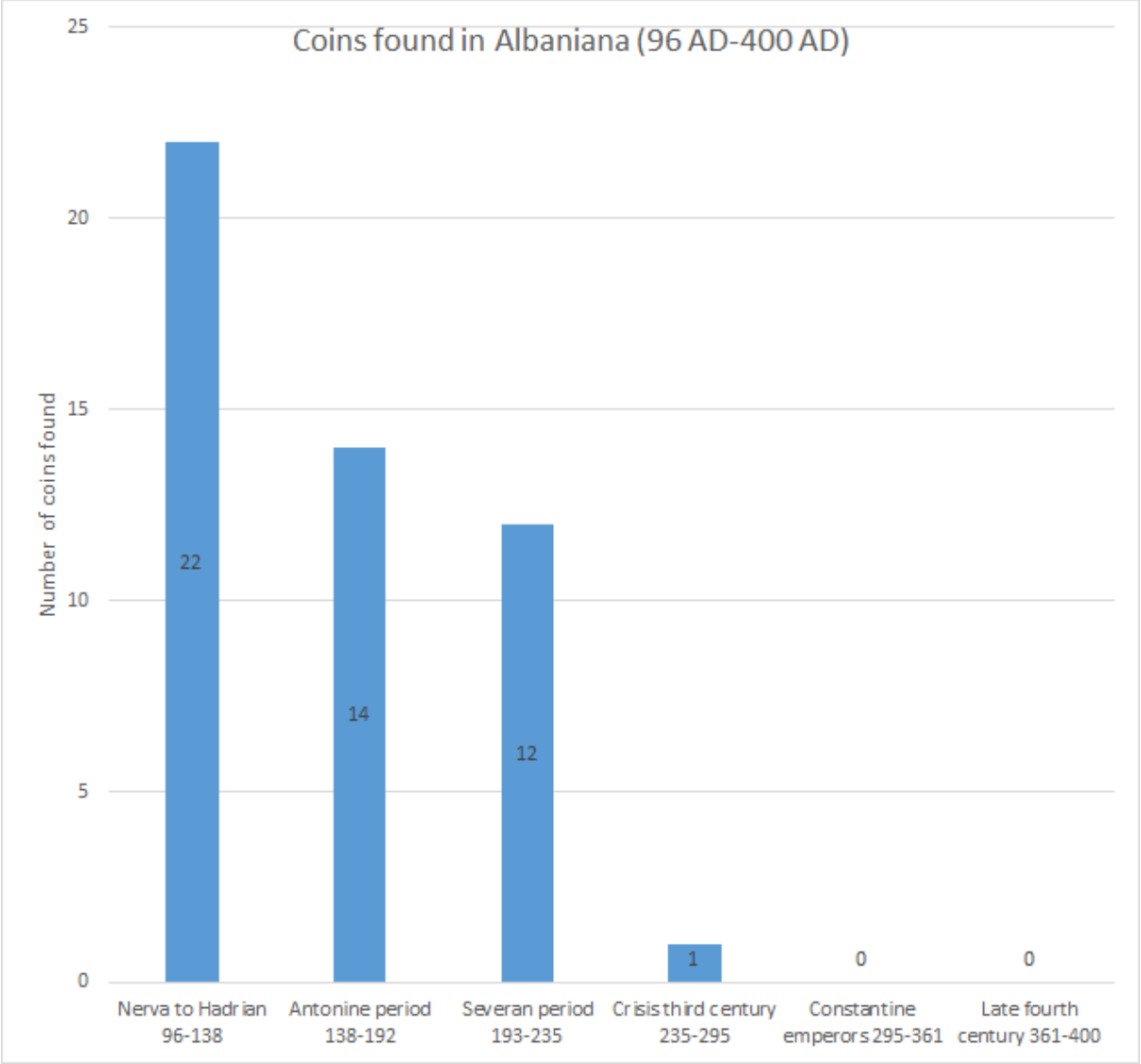
Bar graph 1: Roman coins found in Ceuclum, modern day Cuijk, from 96 to 400 AD (by Steven Boekel).

What becomes clear when looking at Ceuclum, the main civil site present, is that there is a steady decline up to the Severan period, and during the crisis of the third century we actually see an increase compared to before. After the crisis of the third century the number of coins rose dramatically and continued to rise steadily.



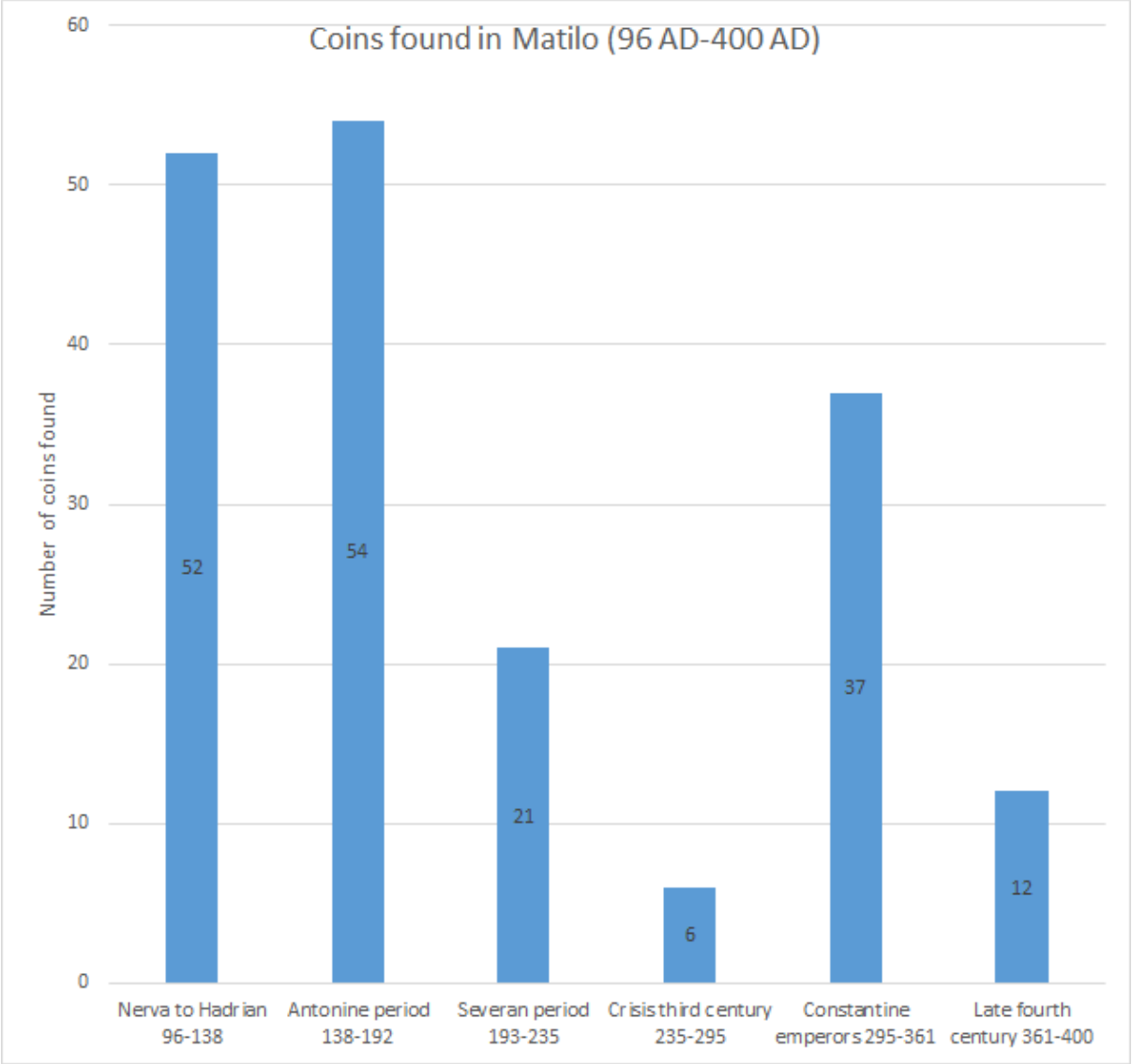
Bar graph 2: Roman coins found in Levefanum, modern day Wijk bij Duurstede, from 96 to 400 AD (by Steven Boekel).

Levefanum shows a completely different picture. A small and steady number of coins is found from Nerva up to the Severan period. Then, during the crisis of the third century, the number of coins explodes and increases to five times the amount found previously in periods with roughly as many years. After the crisis of the third century the number quickly declines during the Constantine emperors and declines even more during the late fourth century.



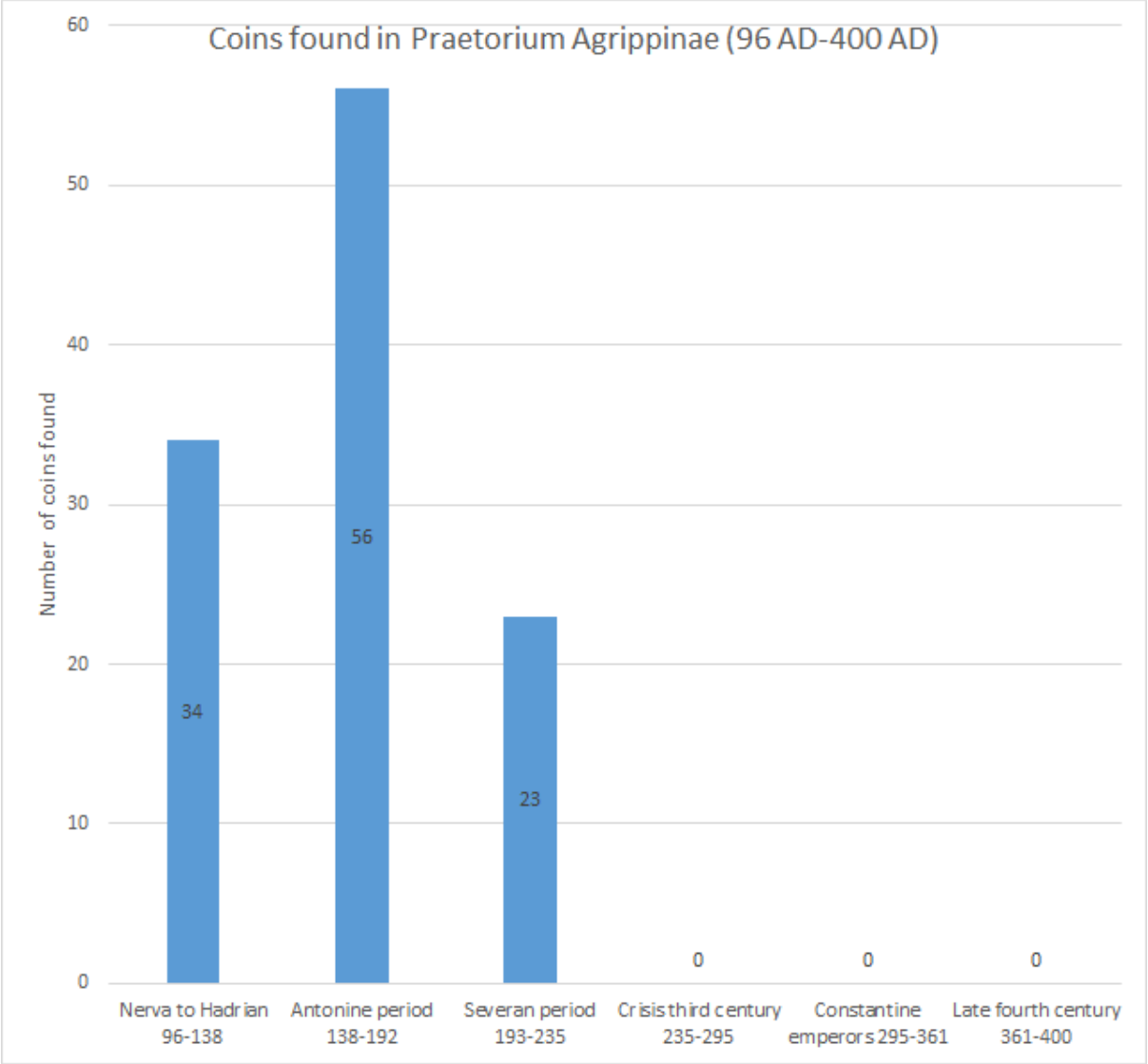
Bar graph 3: Roman coins found in Albaniana, modern day Alphen aan den Rijn, from 96 to 400 AD (by Steven Boekel).

At the site of Albaniana we see a large number of coins in the first period between 96 and 138 AD. This steadily declines up to the Severan period after which only a single coin is found in the crisis of the third century and nothing more is found in the century afterwards.



Bar graph 4: Roman coins found in Matilo, modern day Valkenburg, from 96 to 400 AD (by Steven Boekel).

At the site of Matilo we see a large number of over 50 coins from both the Nerva-Hadrian period and the Antonine period. This number drops to not even half that during the Severan period and, relatively, drops even more during the crisis of the third century. Even accounting for the differences in years of each period does nothing to change the general picture. After the crisis of the third century however we see a recovery in the number of coins, eclipsing the Severan period easily. In the late fourth century the number of coins declined again.



Bar graph 5: Roman coins found in Praetorium Agrippinae, modern day Valkenburg, from 96 to 400 AD (by Steven Boekel).

In Praetorium Agrippinae a large number of coins are found in the Nerva-Hadrian period which increases to almost double that in the Antonine period. We then see a sharp decline during the Severan period to not even half of what is found in the Antonine period and a complete absence of finds from the crisis of the third century onwards.

Some closing remarks to the results have to be made. For the site of Ceuclum we see an increase in coins found during the crisis of the third century, however the difference is only two coins and this could be explained as being within a margin of error. It is just as likely that the population remained stable as it grew.

At the site of Levefanum the number of coins is shown to have dropped sharply during the Constantine emperors and continued to decline during the late fourth century. However the late fourth century period is only 39 years compared to the Constantine emperors' 66 years. Still, even if the number of coins from the late third century were doubled they would not match up to the period of the Constantine emperors.

The site of Albaniana steadily declined up to the Severan period. From the crisis of the third century only a single coin is found and nothing more is found in the century afterwards. Like the site of Ceuclum, the difference between the antonine and the severan period is minimal however with only two coins so it might be a result of probability and the population was perhaps completely stable up to the crisis of the third century.

The number of coins found in Praetorium Agrippinae seems to suggest there was a large increase of the population in the Antonine period compared to the Nerva-Hadrian period. It needs to be kept in mind that the Antonine period encompasses 54 years to the Nervan-Hadrian period's 42. Even accounting for this disparity, it is still true that there is growth, however it is not quite as large as it may seem.

In 3.2 it was noted that a portion of the coins were deselected because they were unable to be dated. This occurred at all sites in small numbers in an evenly distributed manner across all periods. However, it occurred especially often during the period 1-192 AD in Praetorium Agrippinae, Matilo and Albaniana. 50, 20 and 90 coins respectively had to be excluded for this reason. When looking at the bar graphs however it becomes clear that this large number of excluded coins does little to change the general picture of a large number of coins in the first two periods and a sharp decline afterwards.

Likewise, the issues with coinage dating regarding things like new types of coins that were introduced and a general tendency of inflation provide little actual issues with the bar graphs. Recovery in coin numbers after the crisis of the third century is either so numerous, like at Ceuclum, Levefanum and Matilo, or completely absent, like at Albaniana and Praetorium Agrippinae, that it does not present a problem for correctly interpreting the bar graphs.

To conclude, the data from Ceuclum suggests a population decline as early as the second century, followed by revival afterwards. This coincides with data from the *Nationale Onderzoeksagenda Archeologie* which speaks of a higher population density in the Meuse Valley in the late Roman period compared to other areas in the Netherlands.[171]

The finds from Levefanum indicate a steady population up to the crisis of the third century. During this period the number of coins actually grows to five times as high as before and population likely increases sharply as well. After this period ends the number of coins drops hard but remains significantly higher than the periods before, suggesting that the population remained larger than it was during the second century. This contradicts other studies like by Luik van der Tuuk who suggests the Roman military abandoned the area around 270 AD.[172]

The site of Albaniana, like Ceuclum, suggests a population decline before the third century. Albaniana was completely abandoned during the middle of the third century and not resettled afterwards.[173] Here the general picture as historians paint it is followed by archaeololgical studies like Polak's and this one.

According to the results of the material inquiry of this thesis the site of Matilo likely had a large population during the first two periods but the smaller number of coins found during the Severan period suggest a sharp reduction again before the crisis of the third century. During the crisis of the third century the number of coins drops to almost nothing. The number of coins, and presumably the population in the area, mostly restores in the period afterwards and slightly declines again in the latest period. The results mostly coincide with other archaeological reports although most sources claim the site was abandoned in the third century, like most other sites in the

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[171] Harry van Enckevort, Tessa de Groot, Henk Hiddink and Wouter Vos, '18. De Romeinse Tijd in het Midden-Nederlandse Rivierengebied en het Zuidnederlands Dekzand en Lössgebied', *(Nationale Onderzoeksagenda Archeologie (versie 1.0)* (2005) 7.
[172] Luit van der Tuuk, 'Op zoek naar een Romeins grensfort, *Het Kromme-Rijngebied* (2013) 13-17, there 14.
[173] Rien Polak, René Kloosterman and Ryan Niemeijer, *Alphen aan den Rijn-Albaniana 2001-2002. Opgravingen tussen de Castellumstraat, het Omloopkanaal en de Oude Rijn* (Nijmegen 2004) 256.

area.[174] Archaeological reports say little beyond the third century as well.[175] The data provided here on the other hand seems to suggest habitation continued.

The number of coins found in Praetorium Agrippinae rises in the Antonine period. Afterwards we see a sharp decrease followed by complete abandonment at the onset of or even before the crisis of the third century. It may well be that in the period we assume depopulation occurred Praetorium Agrippinae was abandoned faster than would have happened otherwise. However the data here seems to suggest the site was declining before that. This earlier decline is not mentioned in other works.[176]

[174] <https://www.livius.org/articles/place/matilo-leiden-roomburg/> 02-06-21.
[175] Jasper de Bruin, 'Uncovering Roman fort Matilo in Leiden, 70-250 AD', *Analecta Praehistorica Leidensia* 45:1 (2015) 180-189, there 186-188.
[176] Anne de Hingh and Wouter Vos, *Romeinen in Valkenburg (ZH) : de opgravingsgeschiedenis en het archeologische onderzoek van Praetorium Agrippinae* (Leiden 2005) 99-115.

4 General or local depopulation

In this chapter the results of the third chapter will be compared to the general picture sketched in the first chapter and the signs of depopulation in the second chapter to see if they correspond. The bar graphs in the previous chapter hint that Albaniana, Praetorium Agrippinae and Matilo follow the theory of depopulation during the third century. Albaniana and Praetorium Agrippinae both have a large number of coins in the first two centuries AD and become completely abandoned afterwards. Matilo has the lowest number of coins during the crisis of the third century. Ceuclum and Levefanum do not conform to the theory of abandonment at all as their coin numbers remain stable or grow respectively.

However, the theory of general large scale depopulation in Germania Inferior proves problematic for Albaniana as well. The data shows that depopulation was an issue, or perhaps even a policy that occurred long before the crisis of the third century, at least in some areas of Germania Inferior. Albaniana experienced a steady decline before the third century, following the Nerva-Hadrian period and perhaps even before that. As such we cannot be sure to what degree the crisis of the third century was a factor in the eventual abandonment of the site.

For Ceuclum too there was a decline prior to the crisis of the third century. It is unknown why exactly this is the case. However, Boak notes that the population of many towns was already declining at the start of the third century.[177] Regardless if such claims are true it is clear the population suffered heavy losses from the Antonine plague, with some estimates between 60-70 million, around one third of the local population.[178]

In contrast to this, in Ceuclum the number of coins slightly increased during the crisis of the third century compared to the prior period. As was noted before, an increase with two coins during the crisis of the third century tells us little, especially because the period in question encompasses more years than the period before it.

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[177] Boak, *Manpower Shortage,* 55-57.
[178] <https://www.ancient.eu/Antonine_Plague/> 23-2-21.

At the very least we cannot conclude that depopulation occurred in Ceuclum during this period.

This seems to coincide with Stijn Heeren's conclusion, who stated that he found little evidence of violence with the signs of depopulation in the archaeological record.[179] For Albaniana and Ceuclum at least, the increase in conflict in the literary record does not seem to result in a decrease in population in the archaeological record.

Levefanum meanwhile had a low and consistent number of coins up to the crisis of the third century. It is during this troubling period that the site experienced a huge increase in the number of coins found, after which the site seemed to gradually lose importance again in the periods following it. The reasons for this are unclear. Perhaps the garrison decided to focus its forces on a single point of defence in the area. This would make sense if a large number of non-Romans like the earlier mentioned Franks were settled in the area, as their safety was their own concern. It is also possible Levefanum was kept safe through a treaty, attracting refugees from the vici of other fortresses which were abandoned.

Additionally, Levefanum has the highest amount of coins in a three hundred year period during the crisis of the third century. While three of the five sites do show signs of complete depopulation it has to be remembered that all three sites started out as military camps, with vici being constructed around them. If the soldiers were ordered to leave it stands to reason that most, if not all civilians, would follow them out of fear of being undefended. Also, many civilians could have decided to simply leave as the threat of the Germans and the unrest of the crisis proved untenable.

This is perhaps what occurred in Matilo. In Matilo, the number of coins found drops to next to nothing during the crisis of the third century. Unlike Ceuclum and Albaniana the population was stable in the two preceding periods. We know for a fact that the site was completely abandoned around 250 AD.[180] The fact that more coins are found from later periods suggests a large number of new settlers of Roman

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[179] Stijn Heeren, 'From Germania Inferior to Germania Secunda and beyond. A case study of migration, transformation and decline', in: Ibid, *Social dynamics in the northwest frontiers of the late Roman Empire : beyond decline or transformation* (Amsterdam 2017) 149-179, there 149-155.

[180] <https://www.livius.org/articles/place/matilo-leiden-roomburg/> 28-12-20.

or perhaps Frankish origin settled here. It is also possible that in this new situation troops were stationed semi-permanently, bolstering the local economy.

Moreover it is interesting to note that the sites with important links to the army that were inhabited during all periods, Levefanum and Matilo specifically, experienced a decline in the number of coins found in the late fourth century. This is possibly a result of stability in the region becoming increasingly fragile as a prelude to the final abandonment of the area by the Romans. As Ceuclum shows however, this was not necessarily detrimental to every town in the area.

The results differ slightly with other data like those of other inquiries made. Stijn Heeren's research claims that based on buildings and coins in the meuse - demer - scheldt regions all settlements with clear dating evidence disappeared in the course of the later 3rd century. The only notable exceptions being at the southern border of the study area. No settlement was functioning at all in the first half of the 4th century. At some time in the late 4th or early 5th century new settlements were founded again with different building types than before.[181]

The picture sketched by Heeren is irreconcilable with this research's findings. However, the only site Stijn Heeren's research shares with this thesis is Cuijk and in Heeren's data he does point out that Cuijk possibly had continued habitation. Moreover, Heeren notes that *"It is striking that the better researched settlements were all in use into the second half of the 3rd century."*[182] This is after what Heeren's data claims is the norm. This would indicate that while the conclusion Heeren came to may be different, the data does not directly contradict each other.

Jasper de Bruin also notes that around 240 to 300 AD most settlements in the area were abandoned and that Roman forts along the Lower Rhine Frontier show a radical drop in the amount of coinage after the Severan period.[183] The radical drop of coinage after the Severan period is certainly attested in most cases but abandonment appears to differ case by case. Bruin for example mentions that the military settlement at the Scheveningseweg in The Hague fell into disuse and that

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[181] Heeren, 'The Depopulation of the Lower Rhine Region in the 3rd Century', 280-281
[182] Ibidem, 289.
[183] Jasper de Bruin, 'Connectivity in the south-western part of the Netherlands during the Roman period (AD 0-350)', In: C. Bakels and H. Kamermans, *The End of our Fifth Decade*, *Analecta Praehistorica Leidensia 43/44,* 143-157, there 153-154.

the harbour at Voorburg silted up from AD 230 onwards.[184] This would have resulted in local depopulation as the economic significance of the site had eroded. It may also be part of the reason why in Matilo and Praetorium Agrippina the number of coins found decreases. Regardless, it is clear to see that based on coinage or the depopulation Bruin reports there is no picture of general depopulation during the third century when we expect it.

Moreover, de Bruin also writes that the Roman road which ran through the area was maintained until at least 250 AD as this is attested by three milestones. The first being dated to 242-244 and the latter to 250 AD.[185] This would suggest that the Romans did maintain a solid presence as roads could not be maintained if there were constant attacks by raiders or long term loss of control.

All these archaeological findings would make my suggestion of a bolstering of forces, rather than outright abandonment of the region, more likely. The normal tactics of the Romans relied on catching enemy raiding parties at the border and the river Rhine served as a natural barrier which was easily guarded. However, as the Roman military capabilities shrunk relatively, if not absolutely, the Roman population may have congregated to several sites. A defending force would still require a large enough garrison to effectively catch those enemies. This is perhaps what we observe when looking at the sharp increase of coins in Levefanum. Another factor that might explain why some of the Roman sites were able to survive was the presence of the Franks. They were a major player in late Roman politics and were perhaps capable of diverting most aggressors away from the region of Germania Inferior. On the flipside, the area they claimed was emptied of most of its original inhabitants according to the previous research de Heeren and de Bruin.

[184] de Bruin, ‘Connectivity in the south-western part of the Netherlands’, 153-154.
[185] Ibidem, 154.

4.1 Depopulation in the countryside

Although the datasample does not give any data about the countryside itself, some attention to presumed depopulation is still justified. In chapter 2 depopulation in the countryside was mostly discussed in relation to warfare and land taxes. Some authors like David Montgomery state that by the year 1 AD Roman farmers had degraded their soil to the point where they could no longer grow enough food and had to rely on imports from distant Egypt. Likewise, much land in North Africa was eventually eroded as well. He links Rome's eventual decline with this erosion of soil.[186]

There are indeed signs of erosion and smaller harvests in parts of the Roman Empire.[187] However, in Roman Times, many ancient philosophers–scientists and writers like M. Porcius Cato, M. Terentius Varro, Pliny the Elder, and Vergilius Maro already recognized the importance of soil fertility. They also gave comprehensive practical instructions on how to manage and fertilize the soil. Compared to the large amounts of documents available which show the Romans understood the concept of soil fertility, little evidence is seen that the Romans suffered from large-scale soil erosion in Northwestern Europe.[188] I would argue it is more likely that there were not enough people to actually farm said land. Excavations around Matilo seem to subscribe to this theory as it is noted to be an open landscape that was cultivated to a limited extent.[189]

Even in the law of the Twelve Tables, which dates back to the early republican period, it was already customary that the owner of a property is responsible for damage on a neighboring property caused by rainwater runoff.[190] That said, the situation in Germania Inferior was different from early republican Italy. According to

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[186] David Montgomery, *Dirt: The Erosion of Civilizations,* (Berkeley 2008). 49-83
[187] Gerald Matlock, 'North Africa : breadbasket of the Roman Empire - what went wrong?,' Papers presented of the 20th annual meeting of the African studies association (Waltham 1977) 1-23.
[188] Ibidem, 5.
[189] Chrystel Brandenburgh and Jasper de Bruin, *Met de voeten in het water. Archeologisch onderzoek aan de oostzijde van het Castellum Matilo te Leiden* (Leiden 2016) 57.
[190] Markus Dotterweich, 'The History of Human-Induced Soil Erosion: Geomorphic Legacies, Early Descriptions and Research, and the Development of Soil Conservation—A Global Synopsis', *Elsevier BV, Geomorphology* (Amsterdam, 2013), 201:1, 1-34, there 5.

excavations by Chrystel Brandenburgh and Jasper de Bruin the landscape possibly became more wet in the course of the 2nd and 3rd centuries due to the silting up of the drainage channels.[191] The full extent of these changes is unknown but it likely turned at least some once highly fertile farmland in the western Netherlands into a landscape more suitable for animal husbandry.

However, the material inquiry into coins found in Matilo shows us that these changes in landscape were not insurmountable. After all, during the Constantine emperors we see a large increase in coinage, which suggests the land surrounding Matilo was still capable of feeding a substantial population. Stijn Heeren also comments that erosion fails to explain the trend of the abandonments. Regional studies have shown that some regions were still densely populated in the early 3rd century, but completely empty by the end of that century.[192]

Moreover, harvesting tools did change over time to increase farmers' productivity. According to some historians, Roman landowners tried to improve upon the situation whenever possible. For example, historical sources and some artistic representations indicate that the Romans used a reaping machine in the open fields of Gaul.[193] It is likely this was used in Germania Inferior as well. Another example is the heavy-wheeled mould-board plough which the Romans started using in the late 3rd and 4th century AD.[194]

Others however point towards the leasing out of land for tenants who had little incentive to try to maximize yields. Roman landowners tended to go for reliable suboptimal yields that required little personal intervention.[195] Both points of view likely applied to some people. That said, while there may have been reduced

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[191] Brandenburgh and de Bruin, *Met de voeten in het water,* 76.
Jasper de Bruin, *Border Communities at the Edge of the Roman Empire: Processes of Change in the Civitas Cananefatium* (Amsterdam 2020) 24.
[192] Heeren, 'The Depopulation of the Lower Rhine Region in the 3rd Century', 291.
[193] William Caraher, 'Interpreting the Past through the Present: The Ethnographic, Ethnoarchaeological, and Experimental Study of Early Agriculture', In: L. Hall and Ibid, *Archaeology and History in Roman, Medieval and Post-Medieval Greece: Studies on Method and Meaning in Honor of Timothy Gregory,* (Florence 2008) 109-126, there 116.
[194] Evi Margaritis and Martin Jones, 'Greek and Roman Agriculture', J. Oleson, *The Oxford Handbook of Engineering and Technology in the Classical World,* (Oxford 2008) 158-174, there 166-170.
[195] Andrew Wilson, 'Machines, power and the ancient economy,' *Journal of Roman Studies* 92:1 (2002) 1–32, there 5.

harvests in parts of Africa, as stated by Matlock, much land in the empire as a whole was not being used.[196] The excavation by Brandenburgh and de Bruin mentioned before shows us there was no shortage of land locally either.

One final factor to take note of is that, as was noted in chapter 2, soldiers during late antiquity were at times paid in goods rather than money.[197] We know the eastern empire had large quantities of gold so lack of money was likely not the main issue in the west. This may have been because of a lack of faith in the monetary system combined with a shortage of goods. The existence, even if it were likely ineffective, of Diocletian's edict on maximum prices suggests as much.[198]

Although erosion is sometimes mentioned as a factor in Rome's fall, I would argue that it cannot have been a main factor. There are no indications for a long term food shortage for the region based on the data from the numismatic research. Instead I conclude that depopulation of the countryside may have contributed to depopulation of some towns. As mentioned in chapter 2, a prolonged period of conflict could drive farmers off their homes.[199] Stijn Heeren noted that we have little evidence for violent displacement.[200] However peasants close to the border may have decided to move if they lost faith the local garrison could handle the situation. Cities could not exist without a large rural population to support it. This may have been an issue for some of Germania Inferior's larger towns like Forum Hadriani.

4.2 Depopulation in the army

The general picture of the Roman military is relatively well known, as has been explained in chapter 1. However, the size, makeup and exact workings of how the military operated in Germania Inferior is unclear. For the period after the reforms of Diocletian we do have evidence of a smaller garrison than could be expected of the regular *limitanei*.[201] I argue this lack of *limitanei* could be explained by the incorporation of the Franks into the empire. As noted in the previous paragraph, the

[196] Matlock, 'North Africa : breadbasket of the Roman Empire', 1-23.
[197] Hopkins, 'Taxes and Trade in the Roman Empire', 116.
[198] Boak, *Manpower Shortage*, 119-120.
[199] Ibidem*,* 27-28.
[200] Heeren, 'From Germania Inferior to Germania Secunda and Beyond' 149-155.
[201] van Es, *De Romeinen in Nederland,* 12.

Franks migrated into the area. Though it would be more accurate to say they invaded the area and were allowed to stay afterwards according to van Es.[202]

The Franks served as '*foederati*' or Germanic allies who provided troops for the late Roman army. The Romans could also count on the Franks to defend themselves while any damage suffered by them would not matter as much to the empire proper.

There is some evidence for this theory of the Romans bolstering their forces. The sharp rise in coin numbers in Levefanum during the crisis of the third century. Ammianus Marcellinus makes note of Julian the Apostate fighting a large Frankish raiding party prior to his ascension as emperor. The Franks occupied Roman fortresses which were 'long left abandoned' along the river Meuse around 350 in the province Germania Inferior.[203] This suggests the area was still actively defended but again, it may have meant that unimportant parts were abandoned in favor of bolstering their forces elsewhere.

There is however evidence for enduring habitation and use of fortresses by the Roman army of the western part of the Dutch limes, such as the *horrea* in the *castellum* of Valkenburg as well as Brittenburg near the beach of Katwijk aan Zee. Paradoxically, This would suggest that the army felt the region was important. This likely stemmed from the grain transports from Britain to Germania, which were of high importance for the army in Germania. Enckevort states that it is therefore possible that there was only continuous habitation of the 'old' population along the mouth of the Rhine. It is unknown if remnants and/or newcomers joined these communities or returned to the old Roman settlements.[204] I argue it illustrates that the Romans continued to seriously attempt to defend the Rhine. The border of what they perceived as rightfully theirs, even if a part of the people living in the area did not owe their loyalty directly to the Roman state.

This is visible in the *castellum* near Arnhem-Meinerswijk, which was still being reinforced around 400 AD. It was designed to stop enemy forces that had crossed the Rhine from using the large roads to the hinterland. It also illustrates the

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[202] van Es, *De Romeinen in Nederland,* 15.
[203] Amm. Marc. 7.2.1.
[204] van Enckevort, Hendriks and Nicasie, *Nieuw Licht op Donkere Eeuwen*, 34.

uncertainty of the period and the incapability of the army to hold invaders at the Rhine.[205]

It is sometimes suggested that these defences were built simply to house the mobile *comitatenses* that were supposed to pin down and destroy invaders however we now know that all forces in a border province are considered *limitanei*. The *comitatenses* did not consist purely of fast moving cavalrymen and especially not Franks, who were as mentioned before the main force in this province. Comitatenses operated directly under the *magister militum per Gallias*, it is unknown where they were housed nor whether they even had permanent habitation when not campaigning.[206]

Given the new system of ‘defense in depth’ it would be understandable if the Romans decided to depopulate the region directly behind their border forts of Romans to protect their citizens. It is still unknown however if this was active Roman policy or if this was a natural result of increased aggression along the Roman border. It is clear However that this depopulation did not automatically mean the area was ‘empty’ as *foederati* were clearly settled in the region.

[205] Ward-Perkins, *The Fall of Rome,* 37-40.
[206] van Enckevort, *Nieuw Licht op Donkere Eeuwen*, 33.

5. Conclusion

This thesis started out to answer the following question: to what extent we could speak of large scale depopulation in Germania Inferior during late antiquity, between the third and late fourth centuries. This is difficult to answer as population numbers are rare in ancient sources and usually vary wildly, clash with each other and are at times impossible according to modern projections.

The first sub-question was whether the situation of the Roman Empire between 200 and 400 promoted depopulation or not. I started on a very basic level with the periodization. Most of the remaining Roman literature concerns itself with the republic and early Roman Empire. However the late Roman Empire of the third to fifth century was completely different. We usually refer to this period as late antiquity but there is no clear-cut boundary between this period and the medieval period. I would use the term late antiquity to refer to the period from 100 to 500 AD, roughly the time until the western Roman Empire collapsed.

Many changes occurred in the empire at the start of this period, long before the first long term large scale crisis, the crisis of the third century. The non-centralized system of government of earlier centuries was indeed transformed especially after this crisis, during Diocletian's government. However I have established that a build-up could be seen during Trajan's rule as well. Bureaucracy was gradually increased and various emperors tried to link both the cities and the wealthy in them closer to the empire. The city state model ended and *collegia* which can be compared to medieval guilds locked people in their profession in an attempt to create stability.

Some extra attention is given to the changes in army structure and defensive tactics as Germania Inferior is a border province. The static defenses in the early Roman Empire were replaced by Diocletian with a system of border guards or '*limitanei*.' Large invading forces that reached the interior would be fought off by the more mobile army units of the *'comitatenses*.' The knowledge about military

presence in Germania Inferior in this period is scant however and there is little evidence for *limitanei* in this specific province.

The need for this stability and the changes of the empire are discussed in the next paragraph. External threats pressured the empire's armies at all frontiers, internal turmoil was rampant, the rise of Christianity caused religious unrest and a devastating plague of presumably smallpox wiped out a large percentage of the empire's population. Although there has been discussion whether the crisis of the third century is not a product of later historians, I would argue that there are legitimate reasons to speak of general decline for a longer period. This is supported by both classical authors as well as quantifiable data from modern historians. Diocletian's rule thus transformed Roman society to deal with these issues. However it is unclear if prosperity recovered to the point it had reached in the late first century. Regardless, many factors that caused the early principate to change into the late Roman Empire promoted depopulation.

Chapter 2 handled the next sub-question: to what extent do ancient and modern authors speak of depopulation in Germania Inferior. In the second chapter I started off by describing the debate regarding Roman population numbers. I concluded that we have little data from the later centuries of the Roman principate. Moreover little progress has been made since the work of Beloch as little new primary data in literature has become available.

In the following paragraph general population guesstimates for the Roman Empire are discussed, including some done by ancient authors. What is clear is that the population increased greatly during the first century. In the following centuries population numbers in the empire declined according to all modern historians due to the reasons discussed in chapter 1: increased pressure on the borders, internal civil and religious unrest and several plagues. There were no doubt periods of recovery, but these were never maintained for as long as during the first two centuries of Roman occupation.

This can be observed in the countryside as several ancient authors indicate farmers leaving their homes due to unrest or government policy. Modern authors also state that farmers could quickly recover from short raids but left if there was long

term insecurity. Linking people to their jobs prevented quick recovery as people were not incentivised to make risky ventures.

The archaeology of the Netherlands also supports the image of depopulation, but it does not seem to be entirely straightforward. Some areas were completely abandoned around the second half of the third century while others only suffered some reduction. The state of many towns is unclear, but we do have indications that the native population was replaced by newcomers in the shape of the Franks.

Estimates about army size numbers, a typically well documented part of society, differ by more than 50 percent, however Romans continuously increased the size of the army. Secondly, the usual ways of recruitment were no longer sufficient. Thirdly, in contrast to the desire to increase the size of the army, individual Roman units became smaller and were likely not kept up to full strength either. All suggest military difficulties and a strain to find soldiers and especially ‘native Romans’ to supply the army with.

While scattered, there are thus many references to depopulation, both by ancient and modern authors. However it is difficult to make a coherent image. This is in part because of the size of the area discussed and the length of the period. Another reason may be the reluctance to speak of crisis and decline in modern history writing.

In the third chapter it is established that coins are an especially easy and accurate material group for dating. It is also a material group with a large quantity. Finally, since the amount of coinage in an area tends to increase linearly alongside an increase in population it can be used to make some comments about population as well.

Keeping these basics in mind, all coinage from Ceuclum, Levefanum, Albaniana, Praetorum Agrippina and Matilo was divided into five different periods. There are problems with such a simple methodology however because of factors like inflation, new denominations and an incompletely monetized society. However the basics of a large increase of coins between two succeeding periods is still likely to have meant an increase of economic activity. This in turn likely meant an increase of population as ancient societies are heavily reliant on manpower.

The results of the five sites was that coin numbers dropped abruptly and were completely absent during or after the crisis of the third century for Albaniana, Praetorium Agrippina and Matilo. However, Matilo did recover somewhat in later periods. Ceuclum on the other hand remained stable and Lefevanum actually grew rapidly in this period. This suggests that there was no complete depopulation during the period we assume it occurred. This flies in the face of the established image that suggests the Romans withdrew from the area and consolidated further south.

In the final chapter the answer is given as to whether the data gained in chapter 3 supported the image of depopulation as described by chapters 1 and 2. When going over the data gained it would appear that there is no outright abandonment or depopulation. Rather, there appears to be displacement, mostly within the province.It would seem as though the Romans bolstered their forces in certain key sites. Enckevort et al. spoke of large scale depopulation as seen in most archaeological sites. However not all towns were abandoned and from the small sample taken here all those that owed their survival to the Roman army. I suggest that the normal tactic of catching enemy raiding parties at river Rhine was perhaps untenable due to the strengthening of Rome's enemies. Therefore the garrisons may have been concentrated at certain sites like as is suggested by the sharp increase of coins in Levefanum.

Paragraph 4.1 discusses depopulation in the countryside. Although there is no data from the countryside from the research, towns are still closely connected to the state of the countryside. Some believe erosion of farmland played a role in the fall of the empire and the depopulation of cities but this cannot have been a factor as much farmable land remained unused in Germania Inferior. Moreover, the fact that some towns grew or continued to exist also seems to disprove this theory. A lack of manpower to farm enough land seems more likely. It is unknown if and how much this caused depopulation but it may have played a part in depopulating some of the larger cities in the empire.

The final paragraph, 4.2, discusses the effects on the population of the new defensive strategy the Romans adopted after Diocletian's reign. I argue it would be understandable if the Romans decided to depopulate the region directly behind their border forts of Romans to protect their citizens. Moreover by settling other

populations like the Franks in these areas, as is noted by some ancient authors, another layer of defense was added. It is unclear whether the Romans motivated ‘native Romans’ to vacate the area, barring some important towns, or if this happened on its own as a result of increasing hostilities. It is clear however that we need to be careful when equating the loss of Roman settlements with depopulation.

This thesis provides one small attempt to map the presumed depopulation of Germania Inferior. At the onset of the crisis of the third century around 240 we see signs of abrupt large-scale depopulation. However these abrupt events seem to have their roots in events dating back as far as Trajan’s reign in some cases. Additionally, depopulation was noticeably not absent in the periods before the crisis of the third century for some sites or regions of the empire. The third century also had some sites remain stable or even grow, which makes one wonder whether there was depopulation or redistribution. More research needs to be done and it might be conducive to look at coin numbers in other major sites like Forum Hadriani to provide a more complete map of the area of the Netherlands.

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Figures, images, Bar graphs, Appendix

Figures

Tables

Bar graphs

Appendix

Appendix

Ceuclum (Cuijk)	Nerva to Hadrian 96-138	Antonine period 138-192	Severan period 193-235	Crisis third century 235-295	Constantine emperors 295-361	Late fourth century 361-400
as	5	1				
as / dupondius	1	1				
dupondius	1	1				
sestertius	8	4				
antoninianus				5		
nummus					22	
denarius		2	3			
aes II					2	1
aes III					1	31
aes IV						
siliqua						2
solidus						1
aureus		1				
semissis						
quadrans						
total coins	15	10	3	5	25	35

Appendix 1: coin types and numbers found in Ceuclum, modern day Cuijk (by Steven Boekel).

Albaniana (Alphen aan den Rijn	Nerva to Hadrian 96-138	Antonine period 138-192	Severan period 193-235	Crisis third century 235-295	Constantine emperors 295-361	Late fourth century 361-400
as	12	4				
as / dupondius	1					
dupondius	4					
sestertius	1	5				
antoninianus						
nummus						
denarius	4	5	12	1		
aes II						
aes III						
aes IV						
siliqua						
solidus						
aureus						
semissis						
quadrans						
total coins	22	14	12	1	0	0

Appendix 2: coin types and numbers found in Albaniana, modern day Alphen aan den Rijn (by Steven Boekel).

Levefanum (Wijk bij Duurstede)	Nerva to Hadrian 96-138	Antonine period 138-192	Severan period 193-235	Crisis third century 235-295	Constantine emperors 295-361	Late fourth century 361-400
as	2	1			1	
as / dupondius						
dupondius						
sestertius	2	1				
antoninianus				45	2	
nummus					20	
denarius	3	7	9			
aes II					7	1
aes III					2	2
aes IV					1	6
siliqua						1
solidus						1
aureus						
semissis						1
quadrans						
total coins	7	9	9	45	33	12

Appendix 3: coin types and numbers found in Levefanum, modern day Wijk bij Duurstede (by Steven Boekel).

Praetorium Agrippinae (Valkenburg)	Nerva to Hadrian 96-138	Antonine period 138-192	Severan period 193-235	Crisis third century 235-295	Constantine emperors 295-361	Late fourth century 361-400
as	10	8				
as / dupondius	6	9				
dupondius		6				
sestertius	14	24	2			
antoninianus			1			
nummus						
denarius	4	9	20			
aes II						
aes III						
aes IV						
siliqua						
solidus						
aureus						
semissis						
quadrans						
total coins	34	56	23	0	0	0

Appendix 4: coin types and numbers found in Praetorium Agrippinae, modern day Valkenburg (by Steven Boekel).

Matilo (Leiden)	Nerva to Hadrian 96-138	Antonine period 138-192	Severan period 193-235	Crisis third century 235-295	Constantine emperors 295-361	Late fourth century 361-400
as	12	13				
as / dupondius	1					
dupondius	14	9		1		
sestertius	19	24	2	1		
antoninianus			1	3	1	
nummus					3	2
denarius	6	6	16	1		
aes II					1	
aes III					30	9
aes IV					2	1
siliqua						
solidus						
aureus		2	2			
semissis						
quadrans	1					
total coins	52	54	21	6	37	12

Appendix 5: coin types and numbers found in Matilo, modern day Leiden (by Steven Boekel).