
THE MONETARY INTEGRATION OF NORTHWEST EUROPE
DURING THE ROMAN PERIOD

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ABSTRACT

The Monetary Integration of Northwest Europe during the Roman Period

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Abstract: This thesis presents a study of the monetary integration of northwest continental Europe over the course of the Roman period (c. 50 BC – AD 410). ‘Integration’ is employed here to describe the relationship, as conveyed by the deposition of material culture, between heterogeneous regions and their inhabitants. In order to examine integration, the study combines an unprecedented amount of data from previous regional studies as well as numerous databases and catalogues to survey coin-finds within and beyond the Roman Empire. It places the coin-finds in the context of settlement development in order to understand the nature of the coin-finds. Several approaches are employed to ensure a foundational and extensive overview of coin-finds in the study-region. The period-based case studies consider the Roman provinces and their environs as a single complex geographical unit, rather than as two separate units as a result of a distinguishable (political) frontier between Rome and the ‘other’. However, the case studies identify differences within the study-region and smaller regional variations. A chapter is exploring to highlighting the limitations of the main two coin-find types employed in the thesis. The conclusion builds on the necessary and established overall patterns of coin-finds to provide some examples of how coins may have been used by the inhabitants of the study-region. The final two chapters also tie together the results from the previous period case-studies and use Denmark as a comparative case-study to compare the various degrees of integration of *barbaricum* and the Roman Empire. This thesis provides a much needed and long awaited overview of the Roman coin-finds from the northwest and seeks to demonstrate its use to future research.

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ABBREVIATIONS

FMRD – *Die Fundmünzen der römischen Zeit in Deutschland*

FMRL – *Die Fundmünzen der römischen Zeit im Großherzogtum Luxemburg*

FMRN – *Die Fundmünzen der römischen Zeit in der Niederlanden*

FMRVe – *Ritrovamenti Monetali Di Età Romana nel Veneto*

NUMIS – *Numismatisch Informatie Systeem (Nederland)*

PAS – *The Portable Antiquities Scheme (England and Wales)*

RIC – *The Roman Imperial Coinage*

RPC – *The Roman Provincial Coinage*

RRC – *Roman Republican Coinage*

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1 The Aims of this Study

1.1. Introduction

This dissertation is a study of the monetary integration and ‘connectivity’ of northwest continental Europe over the course of the Roman period (c. 50 BC – AD 410). The terms integration and connectivity are employed to describe the relationship, as conveyed by the deposition of material culture, between heterogeneous regions and their inhabitants, in order to indicate the connections between places. The study will not assess the various forms connectivity that may have taken place and can be traced. The role of water ways (seas or rivers) as a key factor linking regions to one another and facilitating exchange has become ever-increasingly studied. Two major studies, highlighting the role of the sea over the *longue durée* are those by Horden and Purcell, and by Cunliffe.¹ Corresponding studies focusing on a shorter period include those by Morris and Franconi.² Similarly, the exchange between the Roman world and the north of European *barbaricum* has also attracted considerable interest but has yet to be synthesised on a large geographical and material scale.³

This study combines data from previous regional studies as well as numerous databases and catalogues to survey coin-finds within and beyond the Roman Empire. Owing to the size of the study-region and the wealth of data available, there is no attempt to systematically update datasets. The study does, however, provide an unprecedented survey and analysis of the numismatic material and does so together with archaeological material within the study-region, to demonstrate the potential for future studies whilst providing a viable foundation for these.

¹ Horden and Purcell (2000); Cunliffe (2001).

² Morris (2010); Franconi (2014).

³ It has been analysed on a smaller regional basis: Erdrich (2001); Morris (2010); Grane (2007). Large volumes for a large portion of the study-region presenting the material are available but are slightly outdated and require new examination in light of new research and finds: e.g. Eggers (1951); Kunow (1983); Berke (1990); Lund Hansen (1987).

1.2. The Study-Region and Material

The study-region of this dissertation includes the modern countries of Belgium, The Netherlands, Luxembourg, Germany, and Denmark (Fig. 1.1). In ancient terms, this represents a considerable area within and beyond the Empire and has been selected on account of Rome's early interest in conquering it and the Empire's subsequent (consistent) interaction with the region. Other countries, where the publication record is correspondingly thorough as the chosen study-region, include Austria, Switzerland, and Czech Republic which all also could have been included but were consciously excluded in order to allow for a more comprehensive assessment of the chosen material. The study will make use of modern political boundaries despite being anachronistic because the majority of empirical studies have been published along the same lines, following traditional patterns of research within national institutions.⁴ Furthermore, although reference will be made to which ancient political unit a region may have belonged, relying solely on these types of affiliations presents unnecessary difficulties; ancient boundaries were rarely fixed and were also subject to change and reorganization. Additionally, as the study-region includes areas without any known type of administrative unit (such as a *civitas*), it would be inconsistent to employ an approach which embraced Roman constructed (tribal) entities with rigid boundaries.⁵ Appropriate concern has also been raised about the use of broad Roman ethnographical labels such as *Celti* and *Germani*,⁶ and therefore this study will avoid these. Where the term Germanic has been used, it is used simply to denote peoples living in Germany without any intention of referencing their ethnicity.⁷

The archaeological material this dissertation will work with has been selected on the basis of its potential to answer the research questions as well as on the grounds that it has been suitably well published. This latter point is

⁴ E.g. the FMR series or the CRFEB (*Corpus der römischen Funde im europäischen Barbaricum*).

⁵ For more on tribal areas and identification: Wolters (2009); Sicherl (2009). This is not to deny that boundary disputes did not occur: AM 28.5.11; Tac. *Ann.* 13.57.

⁶ Haselgrove (2007), 10; Heather (2008), 196; James (1999); Williams (2001), 5-14. For the other side: Koch (2007), 1; Sims-Williams (1998).

⁷ For more about terms and their use and meanings: Fernández-Götz (2014), 71-80.

imperative since the body of evidence is quantitatively and qualitatively cumbersome. This will allow the ‘connectivity’ and integration of the study-region to be examined through the distribution of numismatic evidence and settlement patterns.

1.3. The Research Questions

This study will specifically examine, on the basis of settlement and numismatic evidence, how integrated the study-region was and how this may have changed over time in content and scale. This will be done on the basis that the concordance or dissonance of the selected proxies will indicate how integrated regions were and will determine a broad scale of ‘connectivity’.⁸ In addition to examining the ‘connectivity’ and integration of the region, the dissertation also hopes to identify whether monetized market activity occurred in *barbaricum* and to address its significance (in the context of the historical development of Europe until the end of the Roman period). By addressing these questions, it is hoped that a model of monetary integration can be developed for the Roman Empire that encompasses regions beyond the Empire, thereby re-thinking those proposed by Hopkins and Duncan-Jones.⁹

The research questions will implicitly contribute towards the debate regarding the nature of the Roman frontier and the reason for its location. One of the reasons that the Roman frontier has been much discussed, besides its importance to inform us about the political situation in Rome (for example), is that frontiers are often assumed to be the same as boundaries, “because it is not

⁸ Horden and Purcell argue that the Mediterranean Sea bound its communities together culturally and economically which could tentatively be demonstrated in the shared concepts of honour and shame: Horden and Purcell (2000), 488-501. Similarly, Reece has attempted to classify site types on the basis of the numismatic evidence produced, arguing that similar types of sites produce similar coin deposition profiles: Reece (1991); Reece (1993); Walton (2012), 13-14. The methods of comparison have some complications and have been recognized by Reece as well: Reece (1995), esp. 180-181. An attempt to create a ‘pottery’ profile pattern for Britain (on the basis of Samian ware) has suggested that the finds properly reflect the pattern of import into Britain rather than historical congruence between phases on different sites: Marsh (1981). Morris has demonstrated the extent to which concordance of material between Britain and the Atlantic coast of Europe indicates ‘connectivity’: Morris (2010).

⁹ Hopkins (1980); Duncan-Jones (1990).

always easy to find a satisfactory way of separating them".¹⁰ Since Luttwak's *Grand Strategy*, the view that frontiers are determined from the centre with a clear plan in mind has been increasingly challenged, with the latest research pointing towards the fact that the frontier was subject to the conditions on the periphery.¹¹ Furthermore, the function and rationale behind the frontier is also unclear; there are still those who cite military constructions in Britain, Germany, and Africa, as evidence of a closed defensive barrier system,¹² despite the evidence of continued military campaigns beyond the *limes*.¹³ The archaeological evidence from the ground has also been interpreted to support both sides of the debate. Erdrich put forward an interpretation of six 'waves' of Roman imports to Free Germany tied to specific events, which came to an end in the second century AD. Afterwards, Roman artefacts supposedly entered free Germany via the Danube region.¹⁴ However, archaeological evidence also demonstrates that sites from beyond the frontier continued to serve as livestock markets beyond the second century.¹⁵ Therefore, this study will reveal the extent the Roman frontier (*limes*) influenced the 'connectivity' of the study-region, and which will invite an assessment regarding the possibility of any internal 'north-south' divides, which may have (pre-)determined where the Roman frontier was situated.¹⁶ In order to fruitfully assess the matter, it will be necessary to consider the Roman provinces and their environs as a single complex geographical unit, rather than as two separate units as a result of a distinguishable (political) frontier between Rome and the 'other'.¹⁷

¹⁰ Whittaker (2004), 5.

¹¹ Luttwak (1976); Review of Luttwak: Mann (1979). Criticising Luttwak: Isaac (1990), 372-418; Mann (1974).

¹² For a summary of some of the arguments: Whittaker (2004), 6-8.

¹³ For a summary of some of the argument against defensive frontiers: Whittaker (2004), 8-11.

¹⁴ Erdrich (2001).

¹⁵ Hanson (1997); Whittaker (1994), 98-131.

¹⁶ A 'north-south' divide along the Fosse Way in Roman Britain has long been promulgated: Mattingly (2011), 222-223; Howgego (2013), 8. Though the study of coin use, minting, and its history, a similar divide across Temperate Europe has most recently been put forward: Howgego (2013). A similar argument has previously been made considering structural genesis of 'Celtic' and Germanic societies from the Bronze to Iron Age: Kristiansen (1980; 1987); Brun (1993).

¹⁷ Wheeler (1949), 19: "The Roman provinces and their environs – the civilised world in other words – constitute a single complex organic unit of which the combined significance is too little

1.4. The Approach to the Dissertation

This thesis has divided the material into two main portions. The first addresses the settlement landscape and provides a historical overview to accompany the evidence. The second presents the numismatic evidence on a chronological basis. Given the immensity of the numismatic evidence collected, it was considered appropriate to provide an analysis of the numismatic database in its own right as well. This ensures that aspects of the numismatic data and its quality were clear from the start. Moreover, a brief chapter was included which presents the limitations of the numismatic evidence in order to stress some of the things that could and could not be addressed as well as the approaches utilised in preceeding settlement chapter.

Within the settlement landscape chapter, various settlement types and their development were considered separately and in chronological order. The numismatic chapters were aligned with political events and numismatic developments where appropriate. This inevitably means that certain particularities of each archaeological proxy may not fall neatly within the selected divisions. The numismatic evidence provides a coherent example of this; chapters 5.1 and 6.1 both address the circulation of Republican coins. The Middle Roman Period (AD 96-274) incorporates the transformation from the Augustan tri-metallic denominational system with fixed relationships between each denomination together with its demise, rather than considering both as two distinct periods, as is the case in exclusively numismatic studies.¹⁸

In order to approach the various archaeological categories and geographic scope of this dissertation, an electronic database with all the finds

understood, too little explored". Horden and Purcell (2000), 24: "[Frontiers] are very often better conceived as fluid zones of transition between jurisdictions than as clear-cut lines on landscape or map". Okun (1989), 2: "Because of the geographical limits of frontiers, which are identifiable and distinguishable, and their clearly delimited [sic] temporal limits, frontiers are circumscribed units of study". Whittaker (1983), 110: The frontier was not necessarily the outcome of military rationality. Mann (1974), 513: "There is no such thing as a 'natural frontier'". Lattimore (1962), 470: "[It is an] axiomatic statement that frontiers are of social not geographic origin". The literature of 'Roman' and 'other' is extensive and needs no repetition; see: Alföldi (1951). For a brief history of the interaction along the frontier: Todd (2004), 53-59.

¹⁸ E.g. Van Heesch (1998); Aarts (2000).

from each category was created. This allowed the data to be queried and to create distribution maps. It also ensured that the dataset as a whole can be easily updated and expanded in the future. The database and datasets are discussed in 2.3.

2 Literature Review

2.1 Archaeological Literature

In northwest continental Europe, the study of Germanic indigenous settlement pattern during the Roman period has its origin in the 1960s and 1970s in northwest Germany and the north of The Netherlands.¹⁹ Foundational work occurred on sites such as Wijster, Paddepoel, Feddersen Wierde, and Flögeln, which are now archetypes for current studies.²⁰ Recently, there has been an increase in the number of studies which concern Germanic indigenous settlements during the Roman period, elaborating some of the observations of the pioneering sites listed.²¹ Similarly, an increased interest in indigenous settlements within the Empire can be noted. Numerous studies have been undertaken which investigate the transition and changes observed within the Empire during Rome's occupational history. Studies on the lifestyle of locals in the northwestern Roman provinces have not been limited to examining various building styles and their changes. In-depth studies have also arisen which consider other aspects of daily life using archaeobotanical and archaeozoological evidence.²²

The study of Romanised or Roman-looking cities and structures has long received attention, partially due to their greater recognisability. Above all, villae and *civitas* capitals benefited from this bias. One of the earliest and most comprehensive works on the Roman villa in northwest Europe was De Maeyer's work on villae in Belgium.²³ However, with the development of new archaeological approaches, both the Roman city and villa in northwest Europe are being revisited and new surveys across the landscape are being

¹⁹ De Clercq (2009), 84; Hiddink (1999); Roymans and Heeren (2004).

²⁰ Van Es (1967; 1968); Haarnagel (1979); Kossack, *et al.* (1984); Zimmerman (1992). On Frisian terpen: Van Giffen (1936).

²¹ E.g. Heeren (2006); Sier (2003); Koot and Berkvens (2004); Gaitzsch (1986); Gechter and Kunow (1986); Lenz (1999).

²² E.g. Vos (2009); Van Es (1981; 1982; 1994a; 1994b); Willems (1981; 1983; 1984); Swinkels (2004); Heeren (2009); Groot (2008); Kooistra (1996); Lauwerier (1988).

²³ De Maeyer (1937).

conducted.²⁴ Some of the work has been focused on the theoretical, highlighting methodological issues identifying villa from non-villa,²⁵ while others have continued investigating the material evidence within these new frameworks.²⁶ In northwest Europe, considerable attention has also been devoted to aspects of the military. This is unsurprising given the longevity of continued Roman military presence as well as the high recognisability of a military site. The literature on forts is considerable and by utilising numerous past studies and sources, Franconi has compiled a dataset of 214 forts in Upper and Lower Germany.²⁷ This number excludes fortlets and watchtowers which would considerably increase the number of military sites.²⁸

While studies on daily life in indigenous settlements have been undertaken, a similar revision of secondary agglomerations and small urban settlements has also occurred. This has in part been inspired by the work on life within the *canabae legionis*, which was often one of the larger civilian settlement types found in the northwest. The return of veterans to their homes, following their service as auxiliary troops, has also encouraged work on assessing their impact on daily life. Like work on indigenous settlements, secondary agglomerations have also been increasingly investigated in new ways with a socio-economic focus.²⁹ The interpretation of 'Gallo-Roman' temples can be seen to have developed in a similar way. Despite being recognised as the remains of a non-classical type of temple from an early date,³⁰ they were still ascribed to the Romans. However, since the 1970s more emphasis has been placed on reassessing evidence of (Roman) religion. This has paved the way for larger studies which not only provide up-to-date site gazetteers, but also consider the material evidence in light of historical changes and cultural

²⁴ E.g. Dreschler (forthcoming)

²⁵ Roymans and Derks (2011), 2-3.

²⁶ E.g. Jeneson (2013).

²⁷ Franconi (2014), 88.

²⁸ For fortlets and watchtowers: Symonds (2008).

²⁹ E.g. Rorison (2001); Hiddink (1991); Polfer (2005); Polfer and Mangin (1999).

³⁰ De Vesly (1909), 150; Derks (1998), 3-4.

processes (e.g. 'Romanisation', 'acculturation').³¹ All these changes to the study of various site types have allowed for greater recognition of the impact of indigenous experiences and interaction with Rome and its culture.

Given the vast amount of archaeological work that has been undertaken, it is not possible to provide a substantial coverage of past work; the first-hand archaeological work across the entirety of such a large study-region is so extensive that a proper and complete survey cannot be presented. Moreover, evidence for the settlement landscape may take varied formats, and may be found in specialised journals, journals, government excavation reports, commercial archaeological reports, intensive (micro) studies or, large-scale studies. To complicate matters, recent developments in archaeology and archaeological databases have made it increasingly difficult to be able to keep up-to-date.³² There is another element of complication in that studies which make use of excavation reports may have overlapping study-regions, such as those which consider a Roman province, a single modern German state, or a landscape defined area. This all leads to a duplication of site-gazetteers produced at different stages. For example, an earlier source may list two villae under one modern name, while a later one may list three. The opposite is also possible, and it is often not possible to determine which is the correct number as no explanation is provided and a revision of the evidence may have occurred at some point. The different numbers may also be representative of different interpretations but this too is also rarely indicated. Chapter 3, on settlement patterns, provides an overview of various settlement types, each of which has their own way of conveying and presenting evidence.

2.2 Numismatic Literature

Numismatic studies analysing coin-find spots most frequently utilize one of two strategies. The first type of strategy is an intensive (micro) study. On the larger end, these involve the examination of the numismatic evidence from a

³¹ Derks (1998); Spickermann (2003); Spickermann (2008). For an overview of changes to the study of Roman religion in the northwest: Spickermann (2003), 18-27.

³² De Clercq (2009), 105-106.

specifically identified region or *civitas*,³³ whereas on the smaller, they comprise study of coin-finds from specific sites.³⁴ The second strategy is a systematic collection of data from a larger geographic entity, in order to produce regional databases or catalogues of the numismatic evidence. One of the earliest such studies is M. von Bahrfeldt's 'Übersicht über die im Vereinsgebiet gefundenen römischen Münzen'.³⁵ More recently this strategy was implemented in the influential publication by Bolin,³⁶ which was only surpassed by the FMR series (*Die Fundmünzen der römischen Zeit*) for the study-region. For the study-region of this dissertation, Luxembourg, The Netherlands, and Germany are covered by the FMR series; however, the series also provides coverage for other areas as well.³⁷ As a consequence of recent budget cuts, further work to the FMR series has been stalled, leaving the project incomplete and available only in print form.³⁸

Similar events also occurred in The Netherlands. In the 1990s, the Coin Cabinet at Utrecht started a project to input all coin-finds into a digitized database called NUMIS.³⁹ However, in 2008 the Money Museum at Utrecht underwent a restructuring and it too, experienced budgetary cuts before finally being closed in 2013.⁴⁰ The database, which was first published online in 2004 and continued to be updated until 2013, no longer received any updates.⁴¹ Fortunately it does remain accessible and also provides an indication of the extent to which its contents have been reviewed.⁴² The most notable numismatic studies which substantiate NUMIS and have analysed part of its data are Baart's *Inventarisatie van Romeinse muntvondsten in Noord- en Zuid-*

³³ E.g. Aarts (2000); Van Heesch (1998).

³⁴ E.g. Kemmers (2006); Berger (1996a).

³⁵ Bahrfeldt (1881).

³⁶ Bolin (1926).

³⁷ E.g. Poland, Austria, Hungary, Slovenia, Croatia.

³⁸ For a review of the FMRD: Carson (1976).

³⁹ Comparing NUMIS with the PAS: Pelsdonk (2011).

⁴⁰ A history of coin recording in The Netherlands: Beliën (2009). For detailed information of NUMIS: Pelsdonk (2013).

⁴¹ As this thesis was being completed, NUMIS was re-funded and is now operational again.

⁴² The scheme largely depended on volunteers and was similar to the PAS (Portable Antiquities Scheme) in Britain. Within NUMIS, each reported find has a red, orange or green light, informing the user of the extent to which the find has been controlled and verified.

*Holland and Aarts' Coins or Money? Exploring the monetization and functions of Roman coinage in Belgic Gaul and Lower Germany 50 BC-AD 450.*⁴³

In Belgium, no comprehensive database is accessible. The sole attempt for a Belgian catalogue was undertaken by Thirion and Lallemand, dating to the 1970s. The venture occurred at the time when Belgium was undergoing state reforms, which placed cultural heritage under the auspices of different communities (Wallonia and Flanders). Since then, cultural research and efforts have been managed separately and to complicate matters, access to this outdated catalogue is now restricted to the Koninklijke Bibliotheek van België.⁴⁴ Therefore, if one wishes to collect all the Roman numismatic evidence from Belgium, it is necessary to consult several sources, which all work on different principles. Recent works include parts of Belgium delimited by ancient *civitas* borders or landscape defined areas.⁴⁵ This not only leaves several parts of Belgium neglected but also requires a re-examination of previous works in order to exclude data that have been found outside Belgium but within the borders of ancient *civitates*. The consequence is a haphazard inventory of Roman coinage in Belgium, where some parts of the country are reasonably up to date and others are severely outdated. Recent attempts to create updated databases suffer from the political situation in Belgium,⁴⁶ producing both ventures and databases which are fragmented and disjointed.⁴⁷ This leaves much to be desired when considering approaches to the data, a concern that Van Heesch has recently expressed at the ICOMON conference in 2008.⁴⁸ Two

⁴³ Baart (1990); Aarts (2000). One of the earliest studies of Roman coin-finds in The Netherlands: Van Es (1960). Updated and briefly analysed by: Bazelmans (2003). There is also the FMRN series, but NUMIS has approximately 10-15 times more Roman coin-finds. For FRMN: Van der Vin, *et al.* (1992; 1996; 2002); Erdrich (2001), 146: Uses Van Es (1960) and the FMRN series.

⁴⁴ Van Heesch (1998), 19. Some of the data are available in Thirion's outdated corpus: Thirion (1967).

⁴⁵ Aarts (2000); Van Heesch (1998).

⁴⁶ The political situation in Belgium is very complicated with several linguistic and cultural divides governing regional (e.g. Francophone Wallonia and Flemish Flanders) legislation and institutional efforts.

⁴⁷ There are different regional laws that affect the collection of material as well. A summary of Belgian laws regarding metal detectors and coin-finds: Van Heesch (2002).

⁴⁸ Van Heesch (2008). A large portion of Van Heesch's inventory is based on material that has not been published: Van Heesch (1998), 19. Aarts' database stops at 1996: Kemmers (2009b), 154 note 542.

recent studies partly respond to Van Heesch's concern. The first is by Stéphane Martin, at the École Pratique des Hautes Études. His study considers coins in their archaeological context in Northern Gaul from 150 BC-AD 70.⁴⁹ The second is by Christian Lauwers who is currently using hoards and site finds to assess coin usage patterns in northwest continental Europe from the Iron Age to the Medieval Period, which will rely on some systematic synthesis of the available evidence.

To the east, the publication record for Roman coin-finds in Germany is impressive. The FMR series acts as a testament to the long tradition preceding its conception. The first systematic study of Roman finds in northwest Germany dates to 1867 and pays considerable attention to numismatic evidence.⁵⁰ The next major publications with numismatic material were by Barfeld and Theodor Mommsen,⁵¹ while the first map of Roman coin-finds in northwest Germany was published in 1871.⁵² However, the impressive record of catalogues and datasets which provide a wealth of data, have still not been fully utilized. The most recent synthesis of part of the FMR series is Berger's *Untersuchungen zu römerzeitlichen Münzfunden in Nordwestdeutschland*.⁵³ This means that, since its inception in the mid-1950s,⁵⁴ over 40 volumes of coin catalogues from the FMRD have not been systematically analysed or summarized in a meaningful way beyond the publication of coin-lists.⁵⁵ No doubt, part of the problem lies with the fact that many of the volumes are only available in print and not in a manageable database.

In Luxembourg the first volume of the FMRL series was published in 1972 with the goal of uniting all of the coin-finds into one single volume.⁵⁶ Over the next two decades, four more volumes were published. The origin of the FMRL series lies with the first collection of numismatic finds from Luxembourg

⁴⁹ Martin's PhD thesis is now published: Martin (2015).

⁵⁰ Wiberg (1867).

⁵¹ Bahrfeldt (1881); Mommsen (1885).

⁵² Friedländer (1871).

⁵³ Berger (1992).

⁵⁴ Carson (1976), 17.

⁵⁵ Erdrich (2001) has utilized a few extra volumes in addition to those covered by Berger (1992).

⁵⁶ Weiller (1972), 11.

which was formed by Jesuits in the 17th century. At the state archives in Arlon, a Jesuit manuscript entitled, *nummorum antiquorum bibliothecae collegii Societatis Jesu Luxemburgi; ab anno 1660. Item gemmarum, aliorumque cimeliorum Rom. et Graecor*, has been preserved.⁵⁷ Over time, this collection grew and was sold several times, before part of it finally made its way to Mrs Pescatore-Dutreux, who bequeathed the collection to Luxembourg City in 1902. Several other private collections followed a similar path, eventually finding their way to coin cabinets as well as historical and archaeological societies, both within and beyond Luxembourg. From these, more than 60 large private collections, with the majority of coins coming from a provenance in Luxembourg, have been identified.⁵⁸ In forming the FMRL volumes, the editors have followed the format and structure of the FMRD volumes and have only included reliable finds which can be traced to having a provenance in Luxembourg.⁵⁹ Incidentally, as is the case in Germany, the volumes from Luxembourg have not been transferred into a manageable database.⁶⁰

In Denmark, as is similarly the case in Britain,⁶¹ a treasure trove law dictates that all objects of the past, if of a special cultural heritage or of a valuable material, are to be handed over to the state.⁶² Unfortunately, the Portable Antiquities Scheme of Britain, where all the finds are recorded into an online database, has not been replicated. The treasure legislation from Denmark originally dates to the 13th century.⁶³ As is often the case, particularly with such antiquated legislation, we find that members of the upper class did in fact maintain their own collections.⁶⁴ During the period of the nation-state formation throughout Europe the bourgeoisie identified the ability to align archaeology with the concept of nationalism and the Register of Finds of the

⁵⁷ Weiler (1972), 13; Hollenfeltz (1924).

⁵⁸ Weiler (1972), 13-16; Probst (1961): responsible for many useful references to form the FMRL volumes.

⁵⁹ Weiller (1972), 16.

⁶⁰ For a review of FMRL: Elks (1973).

⁶¹ Walton (2012), 38-39; Department of Culture, Media and Sport: The Treasure Act of 1996.

⁶² Horsnæs (2010), 13. The current legislation dates from 2001: Museum Act no. 473.

⁶³ King Valdemar II in 1241, in the *Jyske Lov*, decreed that if anyone found gold or silver, it was to be handed over to the king: Horsnæs (2010), 13.

⁶⁴ Horsnæs (2010), 14.

Royal Coin Cabinet was initiated in Denmark in 1801.⁶⁵ In the 19th century catalogues of Roman coin-finds from Scandinavia were being produced, already providing a clear pattern of the geographical distribution of the finds. Bolin's work was an impressive contribution to the study of coin-finds from the region,⁶⁶ and was followed by a series of articles with coin-lists by Breitenstein in the 1940s and Balling in the 1960s.⁶⁷ Their comprehensive lists were reviewed and updated by Anne Kromann (for the Danish material) until the 1980s.⁶⁸ The latest coin-finds from Denmark are now listed in the annual reports of the Royal Collection of Coins and Medals published in the *Nordisk Numismatisk Årsskrift* (Nordic Numismatic Journal: NNA).⁶⁹ Horsnæs' studies, published in 2010 and 2013 are the latest works which has given considerable attention to the Roman numismatic finds in Denmark, with the exception of several smaller articles.⁷⁰

2.3 Databases and Sources

This thesis collated evidence for both settlements and numismatic material into two separate databases. The 'database' for the settlement landscape can better be described as a spreadsheet which has been entered into Microsoft Access (a database programme). Over 60 published sources were personally consulted to form part of the dataset (Appendix 1). After finishing the personal collection of evidence from published sources, contact was sought with Johan Åhlfeldt from the *Digital Atlas of the Roman Empire*, who shared his dataset, leading to an increase in the number of sites. The result was a dataset of over 3,500 sites of the settlement types considered in this thesis. Access to an additional and unique set of data of indigenous settlements in The Netherlands was given by the VU Amsterdam.⁷¹

⁶⁵ Horsnæs (2010), 15-16.

⁶⁶ Bolin (1926).

⁶⁷ Breitenstein (1942; 1943; 1944; 1946); Balling (1962; 1966); Horsnæs (2010), 17.

⁶⁸ Kromann (1983-1984).

⁶⁹ Between 1984 and 2002 the reports were published in the *Arkæologiske Udgravninger I Danmark* (Archaeological Excavations in Denmark: AUD); Horsnæs (2010), 17.

⁷⁰ Horsnæs (2010); Horsnæs (2013).

⁷¹ Stijn Heeren and Philip Verhagen graciously made this possible.

Data for numismatic evidence was gathered from a variety of sources. For Germany, the data almost exclusively came from *Die Fundmünzen der römischen Zeit in Deutschland* volumes. Additional data were added from elsewhere to incorporate the important Feldstraße hoard in Trier as well as from Pfahl for additional gold coin-finds in Germany.⁷² Data for Luxembourg came from the volumes published in the *Die Fundmünzen der römischen Zeit im Großherzogtum Luxemburg*. Numismatic evidence for The Netherlands came from various sources. A large portion of the data was available via NUMIS, the online Dutch coin-find repository. Additional data, in so far as it did not overlap with other sources, was accessed via Joris Aarts' PhD dataset.⁷³ By using both NUMIS and Aarts' datasets, the volumes published as the *Die Fundmünzen der römischen Zeit in den Niederlanden* were covered. Coin-finds in Belgium were accessed through two published sources. Hoards for the entire country were available through Thirion's publication in the late 1960s and single finds were also available for the western half of the country through the gazetteer included in Van Heesch's published PhD.⁷⁴ After data from the above sources were added, additional gold coin-finds were sought in Callu and Lorient's work, in so far as they did not overlap or duplicate existing coin-finds in the database.⁷⁵ For the final country within the study-region, Horsnæs provided a spreadsheet of the coin-finds from Denmark.

The numismatic evidence was entered into the database in two different ways. The first and largest portion of the data were obtained from the FMR series. After scanning the volumes, they were OCR-ed (Optimal Character Recognition) and then mass cleaned in spreadsheets. They were then transferred into a basic structured database (Fig. 2.1). The remaining data were entered manually after this initial step. The entire process took a considerable amount of time. For example, the FMRD volumes alone produced over 3

⁷² Gilles (2013); Pfahl (2013).

⁷³ Aarts (2000).

⁷⁴ Thirion (1967); Van Heesch (1998).

⁷⁵ Callu and Lorient (1990); Brenot and Lorient (1992). Additional finds were included in the spreadsheet which was provided by Jerome Mairat.

million cleaned and checked Excel cells (circa 500,000 rows). No catalogue of the coin-finds has been included with the thesis, since all material came from published sources and would have required over c. 20,000 pages to reproduce.

In order to produce maps, coordinates had to be entered for each findspot. In order to do this, a spreadsheet designed by J. Mairat pulled coordinates on from google earth. A random check of 25-30% of the coordinates was conducted in order to ensure accuracy. Where necessary, coordinates were corrected manually. The findspot coordinates were then entered into the databases manually. To create the maps after a query, the coordinates of the search (e.g. all coins of Augustus) were entered back into a spreadsheet which would then plot the list of coordinates onto a blank google map.

2.4 Evaluation of the Reliability of the Sources

The numismatic sources which will be utilized in this study can be safely viewed as being very reliable. The FMR series has an excellent reputation for its thorough and detailed inclusion of coin-finds recorded from the region/area. The only disadvantage with this source is that it has been published in print form, rather than in an electronic database. Due to its publication format, the FMR is very difficult to update and therefore, for the countries for which this study relies on the FMR series, the catalogues may be out of date. Despite this, it is fairly unlikely that the pattern of coin-finds will have changed considerably, given the extensive quantity of coins already recorded for such a vast region. For The Netherlands, despite an electronic database being available, it similarly has the potential of being outdated. As accounted for earlier, funding cuts or the lack of a proper accessible database (Belgium) has hindered the continuous and systematic updating of finds. Therefore, for the entire study-region, although some of the data utilized are not current, they still account for a reasonably large enough sample to be consistent enough that the find patterns should not radically change.

The archaeological record faces similar problems to the numismatic evidence. On the whole, detailed databases to consider the settlement landscape

are lacking. This means that many of the catalogues utilized may be outdated. However, the work that has been done can most certainly be considered as reliable and thorough. Through the publication of updated studies, no radically different patterns of distribution in the same study-region have been produced, even when utilizing different sources. It is possible that some of the sites have been incorrectly identified, but the sample size is large and consistent enough that even if a small portion of the sites are inaccurate, the entirety of the study is still reliable.

3 The Settlement Landscape

Rome's expansion into northwest Europe had a profound impact on the socio-political, economic, and cultural life of the indigenous populations. The introduction of Roman-style centres and the transformation of indigenous settlement types are two such examples.⁷⁶ The introduction of villae also played a key role transforming the appearance of the country side while also representing one of the most 'Roman' aspects of countryside habitation. Due to their 'Roman' physical appearance (large houses with tiled roofs, decorated facades, plastered and painted walls, hypocausts, baths, etc.), and greater recognisability than most other settlement types, villae have had a long history of research alongside studies on Roman cities.⁷⁷ However, in the past two decades there has also been a substantial increase in the publication and research of other rural settlements within the Roman Empire.⁷⁸

In this chapter, the general patterns of various settlement types within the study-region will be considered. This will allow one to determine the nature and differences of settlement organisation on both sides of the *limes*. Due to the size and complexity of the content in this chapter, the various settlement types have been allocated into the following five general categories: *civitas* capitals, (small) urban agglomerations, villae, rural sanctuaries, and indigenous/local farms. For each of the settlement categories, an account will be provided summarizing their nature in various areas within the study-region and these patterns will then be mapped. Two brief sections on military establishments and the transportation infrastructure have also been included to complete the picture. By doing so, the contexts for coin-use have been presented and one can

⁷⁶ Cities formed the backbone of Roman civilization and Rome attempted to replicate this Mediterranean model: Ward-Perkins (1974), 8.

⁷⁷ The description utilized here is a traditional one; The definition of a villa is by no means unanimously agreed upon. For more on the categorisation of villas in the northwest: Agache (1978); Lenz (1998); Heimberg (2002-2003); Roymans and Derks (2011).

⁷⁸ For a recent volume on the origin and development of Roman villa landscapes in the northwest (which also considers non-villa landscapes): Roymans and Derks (2011).

make inferences how the development of these settlements interacted with coin-supply and circulation (chapter 9).

3.1 *Civitas* Capitals

Although *civitas* capitals were not present in *barbaricum*, their role in the monetary integration south of the *limes* cannot be overlooked. Beyond their juridical and administrative role, *civitas* capitals represent centres of population where the cornerstone of activity was not necessarily agricultural production but focused on other activities such as craft production. As a result, their inhabitants depended on the development of a sophisticated economic system to sustain their urban activities.⁷⁹ Owing to the artificial delimitation along modern borders, not all the *civitates* or their capitals within the provinces of the northwest will be included; however, when appropriate reference will be made to some which fall outside the study-area (Fig 3.1; Table 3.1). The purpose of this section is briefly to outline the development of the region and its *civitates*, while also identifying the salient features of the *civitas* capitals. As *civitas* capitals had a shared function, their shared urban features demonstrate the extent to which they were able to rely on the development of the economic system to support their own urbanisation.⁸⁰

⁷⁹ Hitchner (2005).

⁸⁰ Wilson (2011a), 162.

No.	Modern Name	Ancient Name	Civitas
1	Voorburg	Forum Hadriani	Civitas Canenefates
2	Nijmegen	Oppidum Batavodurum+Ulpia Noviomagus	Civitas Batavorum
3	Xanten	Colonia Ulpia Traiana	Civitas Cugerni/Traiana
4	Cologne	Colonia Claudia Ara Agrippinensium	Civitas Ubiorum
5	Tongeren	Atuaca	Civitas Tungrorum
6	Tournai	Turnacum	Civitas Menapiorum
7	Cassel (Fr)	Castellum Menapiorum	Civitas Menapiorum
8	Trier	Colonia Augusta Treverorum	Civitas Treverorum
9	Mainz	Mogontiacum	Civitas Magontiacensium
10	Wiesbaden	Aquae Mattiacorum	Civitas Mattiacorum
11	Heddernheim	Nida	Civitas Taunensium
12	Dieburg	Med...	Civitas Audereinsium
13	Worms	Borbetomagus	Civitas Vangionum
14	Ladenburg	Lopodunum	Civitas Sueborum Nicrensis
15	Speyer	Noviomagus	Civitas Nemetum
16	Pforzheim	Portus	Civitas Antiensis?
17	Baden Baden	Aquae	Civitas (Aurelia) Aquensis
18	Brumath	Brotomagus	Civitas Tribocorum
19	Riegel	Not Known	Not Known
20	Rottweil	Municipium Arae Flaviae	Not Known
	Bad		
21	Cannstatt	Not Known	Civitas Aurelia G(--)
22	Bad Wimpfen	Not Known	Civitas Alisinensium
23	Rottenburg	Sumelocenna	Civitas Sumelocennensis
	Neuenstadt		
24	am Kocher	Not Known	Civitas A... G
25	Kempton	Cambodunum	Civitas Estiones?
		Augusta Vindelicum/Municipium Aelium	
26	Augsburg	Augustum	Not Known

Table 3.1: Civitas capitals with their modern city name and civitas name – ordered west to east.

Prior to the Roman conquest, the whole of Caesar's Gaul was a "world of villages".⁸¹ When Julius Caesar invaded and subsequently left the region, very little changed. It is supposedly between then (51 BC) and Drusus' activities in the region (15 BC) that some tribes slaughtered by Caesar were replaced; an example of this is the replacement of the rebellious Eburones of Ambiorix and

⁸¹ Woolf (1998), 111.

Catuvolcus by the Batavi.⁸² Despite the explanation for the ‘ethnogenesis’ of the Batavians, archaeological evidence points towards continued habitation in the region demonstrating that only a limited depopulation may have occurred.⁸³ Only a handful of later Roman *civitas* capitals show traces of pre-Roman occupation with sparse evidence (Table 3.2).⁸⁴ The exception is at Voorburg (later *Forum Hadriani*) where structural evidence has been found for a few farmsteads from the immediate pre-Roman period.⁸⁵ However, in none of these cases has the evidence suggested a pre-Roman central place.⁸⁶ The origin of the *civitas* capitals therefore did not lie with pre-Roman sites and they had a *de novo* foundation.⁸⁷

Under Augustus, the north was officially divided into *civitates* with a capital often named after the indigenous tribe inhabiting the area.⁸⁸ It is probable that in this context Brumath and *civitas* Tribucorum were founded.⁸⁹ Additionally, *civitas* Treverorum and Trier date to this period while the nearby *civitas* Ubiorum was probably established by Claudius when elevating Oppidum Ubiorum (Cologne) to a colonial status in c. AD 50.⁹⁰ Elsewhere along the Rhine, many of the sites were originally established as military sites in the context of Drusus’ campaigns (15-12 BC).⁹¹ Moreover, these sites were permanently occupied and therefore encouraged locals and traders to settle nearby. It is also likely that the areas of the Cugerni and Batavi were organized

⁸² Other examples include the ‘ethnogenesis’ of the Tungri, who also inhabited part of the former Eburones territory and the transfer of the Ubii: Nouwen (1997b), 43; Roymans (2004), 24; Wightman (1985), 53.

⁸³ Caes. BG. 8.24; Van Es (1972), 22-29; Van Es (1994a), 22, 27; Willems (1983), 109; Roymans (2004), 23-24, 27; Whittaker (1994), 74.

⁸⁴ Drinkwater (1983), 129-131; Bloemers (1990), 80; Vanderhoeven (1996), 230; Lenz (2000), 85.

⁸⁵ Buijtenorp (2010), 146. Trier is believed to have been already inhabited from c. 50 BC although only a military camp from c. 30 BC has been securely dated: Löhr (2003).

⁸⁶ E.g. Nijmegen was occupied in the pre-Roman period but the central place of the region was at Kessel/Lith, Ruimel, or Empel (pre-Roman religious centres): Buitendorp (2010), 151; Bloemers (1990), 76-77; Roymans (2004), 15-16, 148.

⁸⁷ Vanderhoeven (1996), 230, 233; Roymans (1990), 192.

⁸⁸ Vittinghoff (1994), 81; Roymans (2004), 199-200; Franconi (2014), 74-75.

⁸⁹ Brumath was the first capital of this *civitas*. Later, Strasbourg became the new capital as indicated in the Notitia Galliarum (then named: *Civitas Argentoratensium*): Scharf (2005), 13.

⁹⁰ Vittinghoff (1994), 71.

⁹¹ Raespaet-Charlier (2009), 275. These sites include: Nijmegen, Xanten, and Mainz.

into *civitates* in the context of Drusus' campaigns,⁹² and until after the Batavian revolt, *civitas* Batavorum also included the area of the Cananefates, who are believed to have been a 'sub-tribe' of the Batavi.⁹³

City	Pre-Roman Site?
Voorburg	Yes (farmsteads)
Nijmegen	Yes
Xanten	No
Cologne	Possible
Tongeren	No
Tournai	No
Cassel (Fr)	No
Trier	Likely
Mainz	Unlikely (some material)
Wiesbaden	Not Known
Heddernheim	Not Known
Dieburg	No
Worms	Unlikely (some material)
Ladenburg	Not Known
Speyer	Possible (grave material)
Pforzheim	Unlikely (some material)
Baden Baden	Not Known
Brumath	Possible (some material)
Riegel	Not known
Rottweil	Not known
Bad Cannstatt	Not known
Bad Wimpfen	Not known
Rottenburg	Not known
Neuenstadt am Kocher	Not known
Kempton	Yes (some finds)
Augsburg	Unlikely (some material)

Table 3.2: Civitas capitals with pre-Roman origin and occupation.

The area of the supposed Frisiavones, which has not been precisely located, was probably situated near the Cananefates and also formed part of *civitas* Batavorum. Meanwhile, Tongeren also appears to have been related to the Julio-Claudian military activities, as its development is more closely related to

⁹² Roymans (2004), 195-208.

⁹³ Willems, *et al.* (2009), 111; Buitendorp (2010), 155, 159. Some Cananefates and Batavi were still north of the Rhine in 12 BC (and were once part of the northern Chauci federation): Velleius Paterculus 2.105; Tac. *Hist* 4.12, 4.15; Tac. *Germ.* 29.1.

the capitals of *Germania Inferior* rather than those in *Gallia Belgica*.⁹⁴ Elsewhere in *Gallia Belgica*, the capitals of the Menapii (Cassel, Fr.) and Morini (Therouanne, Fr.) appear to have struggled to adopt the Roman urban model.⁹⁵

During the Flavian period, several more *civitates* were formed as Rome continued her activities along and beyond the Rhine and the movement of troops and garrisons freed up space for civilian sites to develop. It is in this context that the vacated forts at Speyer and Worms became capitals for the new *civitas* Vangionum and *civitas* Nemetunum. When Domitian reorganized the provincial borders, creating *Germania Inferior* and *Superior* as separate entities from *Gallia Belgica*, Cologne and Mainz were elevated to the status of provincial capitals (5.3).⁹⁶ It is also certain that by AD 90 Voorburg had become the capital of *civitas* Cananefatorum and no longer relied on Nijmegen as its administrative centre.⁹⁷ The next century of Roman expansion continued to provide new areas to the Empire and also provided the opportunity to settle the hinterland following the Batavian Revolt.

In AD 260, Rome abandoned the Upper German and Raetian *limes*, leading to a shift in the civilian (and military) population back to the Rhine,⁹⁸ as well as the loss of several *civitas* capitals. With Diocletian's Reform, the provincial and administrative borders were reshaped; *Germania Inferior* (now named *Germania Secunda* with its capital still at Cologne) saw the former *civitates* of the Cananefates, Batavi, and Cugerni amalgamated into *civitas* Ubiorum.⁹⁹ *Germania Superior* was split into two; *Germania Prima* (with its capital still at Mainz) and *Maxima Sequanorum* (with the capital at Besançon). Its

⁹⁴ Raepsaet-Charlier (2009), 275; Mertens (1983), 155; Vanderhoeven (2001). The latest revaluation of Tongeren has indicated that the settlement does not pre-date 10 BC: Vanderhoeven (1996), 197-200, 218-220. There is debate whether *civitas Tungrorum* belonged to *Gallia Belgica* or *Germania Inferior* following Domitian's reform. Those in favour of *Gallia Belgica*: Bérard (1999); Nouwen (1997a); Nouwen (1997b). In favour of *Germania Inferior*: Vanvinckenroye (1994); Raepsaet-Charlier (1995); Raepsaet-Charlier (2009); Vanderhoeven (2003).

⁹⁵ Vanderhoeven (1996), 191; Coquelet (2011), 48.

⁹⁶ Franconi (2014), 75. Mainz did not become a *civitas* capital until later and it is unknown which *civitas* it belonged to (it may have been an island *civitas* during this period).

⁹⁷ Buijtendorp (2010), 166.

⁹⁸ Johnson (1983), 136.

⁹⁹ Franconi (2014), 99; Harries (1978), 41.

former *civitates* experienced little change to their administrative arrangements.¹⁰⁰ The capital cities which survived the changes of the third century were different from those in the previous two centuries. Generally, the sizes of the cities substantially declined and the Germanic incursions in the AD 260s made it difficult to maintain civilian settlements.¹⁰¹ Nevertheless, many settlements do show signs of continued habitation and use beyond the raids. However, in many cases continued site use was undertaken by a new Germanic population or as a small military fortlet, rather than as a (large) civilian and administrative centre. In the later period, Mainz was walled twice; once in the third century and once under Julian, becoming the *civitas* capital of *Mogantiacensium* in Late Antiquity.¹⁰² Trier formed the exception to developments of the period by remaining equally large as its second-century walls, due to its status as imperial residence.¹⁰³ The loss of total urban space and population experienced by Roman *civitas* capitals during the fourth and fifth centuries was not a deliberate choice as Rome continued and attempted to maintain the remaining urban centres, such as at Cologne in AD 356. However, it still remains difficult to assess the full extent of urban loss;¹⁰⁴ Xanten was abandoned during the Frankish raids but was re-inhabited in the Constantinian period whilst Nijmegen, although believed to have been abandoned at the same time as Xanten, possibly continued to see some civilian activity as 10% of all Roman coins found in Nijmegen date to the fourth century (c.f. 7.3).¹⁰⁵

Much of the urban development of the study-region occurred during the *Pax Romana*. Following a similar trajectory of development, the *civitas* capitals of *Germania Superior*, *Inferior* and parts of *Gallia Belgica* constructed similar public buildings. Many of the public building plans were adopted from the classical Roman style with provincial irregularities.¹⁰⁶ In the study-region, evidence for

¹⁰⁰ Heijmans, *et al.* (2006).

¹⁰¹ De Koning (2003), 75; Franconi (2014), 99-101: Most cities declined, on average, 65% in size.

¹⁰² Franconi (2014), 101; Harries (1978), 41.

¹⁰³ Johnson (1983), 142.

¹⁰⁴ De Koning (2003), 75.

¹⁰⁵ Van Enckevort, *et al.* (2003), 87.

¹⁰⁶ Ward-Perkins (1974), 30-31.

public entertainment buildings is particularly scarce and for this reason it is rather difficult to provide any meaningful conclusions. Theatres and circuses were particularly rare. Only three instances of structural evidence for a theatre have been found. In Nida, a theatre is believed to have been constructed out of wood, while in two of the largest cities, Trier and Mainz, a stone structure was present.¹⁰⁷ The dimensions of the stone theatres of Mainz and Trier differ drastically, with auditoria measuring 116.25 and 60 meters wide in diameter respectively.¹⁰⁸ Circuses are nearly as rare as theatres and have only been suggested at Trier and Cologne. Amphitheatres are the most common public entertainment building. However, their discovery or plausible location has been restricted to larger capitals and/or where substantial troops were garrisoned for some period (7 capitals).¹⁰⁹ Unfortunately, insufficient evidence remains regarding their overall distribution and varying size to draw any meaningful conclusions as structures. However, the dominating presence of amphitheatres with regards to other public entertainment buildings may provide an indication of cultural preference of the locals.

Evidence for bathhouses (*thermae*) has been found in nearly every *civitas* capital; typically date to the second century AD, sometimes being associated with an elevation of status, as was the case at Voorburg when it received municipium rights and the new title of Municipium Aelium Cananefatium.¹¹⁰ The *civitas* capitals of *Germania Superior* and *Raetia* appear to have had multiple bathhouses, unlike those of *Germania Inferior*, where only one was present. It does appear that the overall availability of bathing space had some relation to the size of the city, the nearby garrison and its possible number of inhabitants,

¹⁰⁷ Cüppers (1990), 463-464, 594. Evidence for Mainz is no longer visible; Baatz, *et al.* (1982), 283.

¹⁰⁸ Avenches and Augst are roughly the same size as in Trier while the one in Soissons is believed to be 150m wide; Coquelet (2011), 154.

¹⁰⁹ These capitals are Nijmegen, Xanten, and Trier. Alternative evidence has been found elsewhere, such as an inscription at Speyer: Cüppers (1990), 564. We must not forget that even small auxiliary forts (smaller than 7ha) often had (temporary) amphitheatres nearby (whose measurements were 50-66% smaller): Sommer (2009).

¹¹⁰ Buijtendorp (2010), 241-247.

but this cannot be definitively concluded due to some gaps in the evidence (Table 3.3).¹¹¹

City	Theatre	Amphitheatre	Circus	Bathhouse
Voorburg	Unlikely	Possible; No structural evidence	Not Known	940 m ²
Nijmegen	No	58 X 46 m	Not Known	c. 500 m ²
Xanten	No	99 X 87 m	Not Known	11,500 m ²
Cologne	No	Thought to have had	Thought to have had	Yes; max. 12,500 m ²
Tongeren	Not known	Possible	Not Known	Min. 300 m ²
Tournai	Not Known	Not Known	Not Known	Hypocausts
Cassel (Fr)	Not Known	Not Known	Not Known	Not Known
Trier	Auditorium: c. 60 m wide	70.54 X 48.92 m	A slight dip in terrain (c. 400X100 m)	2; c. 7,500 m ² and c. 42,500 m ² ; Imperial baths; 36,250 m ² (Total: 86,250 m ²)
Mainz	Auditorium: 116.25m wide	Not known	Not Known	Not known
Wiesbaden	Not Known	Not Known	Not Known	3; Large thermes - c. 960 m ²
Hedderheim	54 m diameter (mainly wood)	Not known	Not Known	2; East Baths: 2,304 m ² ; West Baths: 3,060 m ² ; (Total: 5,364 m ²)
Dieburg	Not known	Not known	Not Known	Possible; hypocausts associated with 17.2X9.6 m building
Worms	Unlikely (found masks)	Probably	Not Known	Yes
Ladenburg	Not Known	Not Known	Not Known	Possible
Speyer	Masks found in private homes	Inscription evidence for amphitheatre	Not Known	Not known
Pforzheim	Not known	Not known	Not Known	Not known
Baden Baden	Not Known	Not Known	Not Known	At least 3-4; Largest known - 53X18 m (954 m ²)
Brumath	Not known	Not known	Not Known	Min. 600 m ²
Riegel	Not known	Not known	Not Known	Not known
Rottweil	Possibly	Not Known	Not Known	3 known; 21X18 m; 45X42 m; Hypocausts; (Total: 2,268 m ²)
Bad Cannstatt	Not Known	Not Known	Not Known	Not Known

¹¹¹ Most notably the provincial capitals Mainz and Augsburg.

City	Theatre	Amphitheatre	Circus	Bathhouse
Bad Wimpfen	Not Known	Not Known	Not Known	Hypocausts associated with 20m wall
Rottenburg	Not Known	Not Known	Not Known	3; 25X7 m (Large bath); 18X11 m (small bath); Hypocaust apse; (Total: 373 m ²)
Neuenstadt am Kocher	Not Known	Not Known	Not Known	c. 37 X 50 m (1,369)
Kempton	Not Known	Not Known	Not Known	3; 4,200 m ² ; Reduced to c.3360m ² (Mid C2)
Augsburg	Not Known	Not Known	Not Known	3

Table 3.3: Presence and size of public entertainment structures (Data: Appendix 1).

The association between city and public building size is similarly inconclusive with regards to the *forum*. In many instances the evidence is insufficient to permit ascribing a *forum* to the city, and when known, the possible measurement is difficult to determine. Where *fora* are known, including their measurements, two size categories appear; either large or small with no obvious intermediate size (Table 3.4). Two possible explanations can be put forward to explain the size of the *forum*. Either the size of the city and its military and civilian population were factored in when laying out the space or, as most cities with orthogonal street-grid saw a new spatial arrangement occur in the second century, at the same time when most (stone) public building occurred in the region, the size of the *insulae* determined the eventual size of the *forum*.¹¹² The transformation of the *forum* at Speyer, originally measuring 37 X 30 meters, led to a second-century *forum* measuring 100 X 125 meters following the arrangement of a (probable) grid street system layout.¹¹³ Given the similar development trajectory of the study-region, the status, role, and population of the *civitas* capitals (during the second century in particular) will have influenced the size and extent of their public munificence and urbanisation. A

¹¹² Coquelet (2011), 88, 133.

¹¹³ Only a partial street grid system is known at Speyer.

table summarizing the possible population sizes of the capitals on the city sizes (Table 3.5), which is not without its problems, does allow one to create a site hierarchy and begin to comprehend the scale of the economy of the region.¹¹⁴

City	Settlement Size (ha)	Wall Length (Km)	Forum	Grid Street Pattern
Voorburg	11	1.2-1.5	45X60m	Yes
Nijmegen	35	2.3	Yes; 166X137 m market hall; Possibly another forum	Yes
Xanten	73	3.4	c. 125 X 125 m	Yes
Cologne	97	3.9	135 m diameter of a semi-circle (Possibly <i>Arae Ubiorum</i>)	Yes
Tongeren	110	4.5//2.7	Yes	Yes
Tournai	40	min. 800m (maybe irregular rectangle)	Not Known	Principal Roads but no grid system
Cassel (Fr)	Not Known	Not Known	Not Known	Not Known
Trier	285	6.4	140 X 278 m	Yes
Mainz	178//118	c. 6.75//4.25	Not known	Partial
Wiesbaden	20	Incomplete	Not Known	No
Heddernheim	45	2.75	c. 17,500 m2	Irregular
Dieburg	25	Min. 1.2	Possibly; A "Market basilica" and a "Market hall" building are proposed	Possibly; Not Known
Worms	c. 42	Unlikely	c. 50 X 30 m	Partial
Ladenburg	42	2.7	2; 130 X 84 m; c. 100 X 90 m	Irregular parcelling
Speyer	25	Yes	Yes; 37 X 30 m (U-shape); Later c. 100 X 125 m	Partial (C2-3) - 2 main roads known
Pforzheim	12	Not known	Not known	Not known
Baden Baden	Not Known	Not Known	Not Known	Not Known
Brumath	35	Believed; no evidence	Probably; not known	Yes

¹¹⁴ Following Hanson (2011). Another method, which has many problems regarding reliability, is through the study of cemetery size and burial density. Using this method, the average population at Nijmegen has been estimated to be between 2,700 and 8,800: Koster (2013), 24.

City	Settlement Size (ha)	Wall Length (Km)	Forum	Grid Street Pattern
Riegel	27	Not Known	Yes; At least c. 30 X 20 m	Not known
Rottweil	31	No	Yes; Macellum - 48 X 16 m	Partial
Bad Cannstatt	Not Known	Not Known	Not Known	Not Known
Bad Wimpfen	19	1.9	Not Known	Possible - Not Known
Rottenburg	28	Yes	Not Known	Possibly - Not Known
Neuenstadt am Kocher	20	No	Possibly - 45 m X ?	Not known
Kempten	20	Yes	37 X 69m	Yes
Augsburg	80	Yes	2; Forum 125 X 75 m; Macellum 72.5 X 44.5m	Partially

Table 3.4: Size of *civitas* capitals, city walls, forum size and street grid presence (Data: Appendix 1).

Unsurprisingly, the largest *civitas* capitals are Trier, Mainz, Tongeren, Cologne, Augsburg, and Xanten. These six *civitas* capitals are all important urban centres in their own right. Either they were a provincial capital or they were important locations for military activity. More importantly, these larger capitals represent a concentration of people and resources in one specific area. This not only denotes a change to the location of demand and consumption (9.2), but it also required investment in transportation infrastructure (3.7). Equally interesting is the existence of small *civitas* capitals which may not have represented a similar change of consumption patterns, but still would have necessitated urban and transportation infrastructure investment, since they formed important centres for state administration. It would be difficult to associate smaller sized capitals with a resistance to urbanisation or Romanisation as other factors such as the longevity of Roman occupational history or the size of the military garrison may also have played an important factor. The fairly even sized *civitas* capitals in *Germania Superior* and the spread of garrisons in the province appears to give support to this impression, although exceptions elsewhere also exist (e.g. Tournai). Moreover, the population size in urban *civitas* capitals may also have

been influenced by the size of the rural population as well, a factor which is still very much understudied.¹¹⁵ Besides representing a concentration of population, *civitas* capitals were economic centres which formed a crucial part of Rome's management in the northwest. The presence of Roman-style urbanisation and buildings also demonstrates considerable (financial) effort went into their establishment which will have required the support not only from the state but locals as well.

City	Settlement Size				
	(ha)	100/ha	150/ha	200/ha	250/ha
Voorburg	11	1,100	1,650	2,200	2,750
Nijmegen	35	3,500	5,250	7,000	8,750
Xanten	73	7,300	10,950	14,600	18,250
Cologne	97	9,700	14,550	19,400	24,250
Tongeren	110	11,000	16,500	22,000	27,500
Tournai	40	4,000	6,000	8,000	10,000
Cassel (Fr)	Not known	Not known	Not known	Not known	Not known
Trier	285	28,500	42,750	57,000	71,250
Mainz	78	7,800	11,700	20,000	25,000
Wiesbaden	20	2,000	3,000	4,000	5,000
Heddernheim	45	4,500	6,750	9,000	11,250
Dieburg	25	2,500	3,750	5,000	6,250
Worms	24	2,400	2,700	3,600	4,500
Ladenburg	42	4,200	6,300	8,400	10,500
Speyer	25	2,500	3,750	5,000	6,250
Pforzheim	12	1,200	1,800	2,400	3,000
Baden Baden	Not known	Not known	Not known	Not known	Not known
Brumath	35	3,500	5,250	7,000	8,750
Riegel	27	2,700	4,050	5,400	6,750
Rottweil	31	3,100	4,650	6,200	7,750
Bad Cannstatt	Not known	Not known	Not known	Not known	Not known
Bad Wimpfen	19	1,900	2,850	3,800	4,750
Rottenburg	28	2,800	4,200	5,600	7,000
Neuenstadt am Kocher	20	2,000	3,000	4,000	5,000
Kempten	20	2,000	3,000	4,000	5,000
Augsburg	80	8,000	12,000	16,000	20,000
Total:	1258	114,000	171,000	232,400	290,500

Table 3.5: Civitas capital size and possible population estimates based on different scenarios for people/hectare (Data: Appendix 1).

¹¹⁵ E.g. The rural areas along the *via Belgica* were supposedly densely populated: Zimmermann, *et al.* (2009), 11.

3.2 Urban Sites/ Secondary Agglomerations

Within the study-region, with the exception of some of the previously mentioned *civitas* capitals, large(r) urban centres did not form part of the settlement hierarchy. On the Roman side of the *limes*, many smaller settlements, often referred to as 'vici', developed throughout the area.¹¹⁶ The term 'vicus', in this context, has a number of connotations and meanings. It was first used by Julius Caesar to describe settlements of the Helvetii, which were less significant than *oppida* but larger than *aedificia* (used to identify farmsteads).¹¹⁷ Other ancient sources have defined the term differently, ranging from a suburb to a rural settlement complete with a marketplace and elected magistrates.¹¹⁸ The natural consequence of the non-specificity of the term is that modern scholars comprehend the term differently. This is especially evident when comparing gazetteers of vici.¹¹⁹ The main area of contention stems from the features and characteristics which need to be present in order to determine whether a settlement is a vicus.¹²⁰ As the objective of this section is to consider *agglomérations secondaires* on both sides of the *limes*, a fairly inclusive understanding was necessary. In the case of settlements within the Empire, the sites were not reviewed when compiling various gazetteers (which were formed with varying definitions). Beyond the Empire, in order to distinguish between single standing structures which were identified as a *Siedlung*,¹²¹ a secondary agglomeration was considered to be present only when a cluster of five contemporaneous *Siedlungen* were found nearby one another (Fig. 3.2).

Within the Roman part of the study-region over 400 secondary agglomerations were identified (Fig. 3.3). The evidence available for these varies greatly, with some producing street and building plans and others only

¹¹⁶ Also known by French scholars as 'agglomérations secondaires' (= secondary agglomerations).

¹¹⁷ Caes. BG. 1.5.24.

¹¹⁸ Varro LL, V, 160; Festus 50.502-508; Isidore, *Etym.* 15.2.11-12; Rorison (2001), 1.

¹¹⁹ Hiddink (1991), 203.

¹²⁰ This ranges from minimum to maximum sizes, activities present in the settlement, the presence or lack of a street grid, access to a water or road way, or the population/building density. E.g. Rorison (2001), 3-5; Hiddink (1991), 203.

¹²¹ Most often, *Siedlung* (literally, settlement) is used to identify a single building.

structural foundations and a clustering of other archaeological material. Furthermore, the size of the settlements varied considerably, ranging from half a hectare to 60 ha (Table 3.6). Given the sizes of *civitas* capitals (Table 3.5), it is noteworthy that some *vici* were larger than *civitas* capitals. No doubt a number of factors influenced this, which could include a socio-cultural preference for (or resistance towards) urbanisation or the economic circumstances of the area (c.f. 3.1). As the majority of *vici* were positioned along roads, their orientation was adjusted accordingly. Rather than being orientated towards a central forum, the structures were typically placed in a row with their short side facing the road and their length going back. The front was where the workshops or shops were situated and at the back was the residential portion of the building.¹²² However, *vici* also developed at other economically advantageous points. Some of these places include: at the border of *civitates* (e.g. Fontaine-Valmont), in the vicinity of *civitas* capitals (e.g. Liersberg (Germ.) near Trier), at religious sites (e.g. Krefeld-Elfrath), in villa-dominated landscapes, along river-valleys (e.g. Bad Friedrichshall-Duttenberg), and of course near military establishments (e.g. Bonn).¹²³

Around the time of the Roman conquest, throughout temperate Europe, a process of socio-political sophistication was well underway. Although smaller settlements and single farmsteads remained the norm during the Late Iron Age, there was a movement towards larger and more permanent settlements which is demonstrated through the development of *oppida*, as the urban sites of the period.¹²⁴ From the Augustan period, the development process continued and *oppida* were replaced by *civitas* capitals and other smaller settlements.¹²⁵

¹²² Van Enckevort (1991), 282; Hiddink (1991), 205; Rorison (2001), 17-20.

¹²³ Civilian settlements nearby military camps are also known as *canabae legionis*.

¹²⁴ Roymans (1999), 215; Van Enckevort (1991), 283; Gerritsen (1999), 139; Wendling (2009). Nucleated settlements also develop in non-*oppida* areas such as by the Meuse: Jansen and Fokkens (2010), 141.

¹²⁵ E.g. Titelberg (Lux) was replaced as the main site of the *Treveri* to a large vicus; The site was, however, a possible location where early Augustan troops were stationed: Metzler (1995), 592-624. For a similar line of thought elsewhere in Gaul: Wightman (1977).

Modern Name	Est. Size (ha)
Bonn	60
Faimingen	40
Tabernae	32
Heilbronn	30
Weißenburg	30
Öhringen-West	26
Dalheim	25
Offenau	20
Heerlen	15
Maastricht	15
Zülpich	13
Jülich	10
Ennetach	10
Billig	10
Elfgem	10
Öhringen-Ost	9
Rißtissen	9
Pocking	8
Ouckenburgh bij Loosduinen	8
Dormagen	8
Eisenberg	8
Emerkingen	6
Taviers	6
Ertingen	5
Nassenfels	5
Treignes	5
Kornelimünster	4
Eriskirch	4
Amay	4
Düren-Hoven	3
Lixhe	2
Maurik-Rijswijk	0.5
Zetten	0.4

Table 3.6: Size of various secondary agglomerations within the Roman portion of the study-region – ordered from largest to smallest (Data: Appendix 1).

Given the typical context in which secondary agglomerations were built, their overall chronological development was dependent upon the historical development of the region.¹²⁶ As the historical development of various regions will be discussed below (3.3), it will suffice to summarize that between the first and second centuries AD the number of secondary agglomerations increases, with a peak in the mid to late-second century. Around and shortly before the mid-third century, many settlements were abandoned or destroyed (probably as a consequence of the Germanic incursions). However, some settlements continued beyond this period or were rebuilt. In several instances defensive walls were erected, a development seen at many *civitas* capitals.¹²⁷ Nevertheless, the majority of remaining settlements do not show continued habitation or use beyond the fourth century.¹²⁸

Secondary agglomerations served as a place of local (and sometimes specialised) activity. The main areas of involvement were pottery, metal work, food and agricultural processing, mining and quarrying, and textile manufacture.¹²⁹ Hiddink and De Boe have pointed out that the importance of craft activities should not be overestimated and that the use of the term 'industry' is usually incorrect.¹³⁰ Generally the number kilns at any given site (when known) is well below 15. At Schwabmünchen (Bavaria) 50 kilns were found for the production of pottery between AD 40 and 235.¹³¹ Furthermore, a maximum number of ten contemporaneous houses are at the site and together with the cemetery evidence, we can conclude that 7-8 families may have inhabited Schwabmünchen (Fig. 3.4). This indicates that the site had a modest permanent population size and invites careful consideration of production and

¹²⁶ E.g. the development of *vici* in the Rhineland, in general, was tied to the development of the province in A.D. 85: Ulbert (2012), 349. No Roman sites predate 10 BC in Belgium (on the basis of coin-finds): Van Heesch (1996).

¹²⁷ E.g. wall remains at: Maastricht, Arlon, and Dalheim.

¹²⁸ Van Enckevoort (1991), 286-289; Ulbert (2012).

¹²⁹ Rorison (2001), 51.

¹³⁰ De Boe (1976), 325; Hiddink (1991), 213; c.f. Polfer and Mangin (1999); Polfer (2005).

¹³¹ No further dating was provided to determine how many were in use at one time.

population size at other secondary agglomerations, which often had activity at an even smaller scale.¹³²

Pottery production centres were naturally situated in areas where the local environment permitted its manufacture. These were areas with good access to firewood and water as well as suitable clay.¹³³ Some of the largest ceramic production centres include capitals and secondary agglomerations, such as Rheinzabern, Trier, Cologne, Nida-Hedderheim, or Mainz.¹³⁴ With metalworking, there are several stages to the production of final products. The smelting and processing of metal ores often occurred at the site of extraction (e.g. with tin and copper) however, the amalgamation of various metals may have occurred at other places (e.g. 'silverplating' of copper).¹³⁵ Evidence for textile manufacture poses some problems, not only due to the durability of the material, but also because the process may have been broken into several stages and spinning will have been a widespread household craft. At Maastricht there is evidence for leather offcuts being used to produce very simple shoe types. This production required little skill and may therefore have possibly only been distributed on a local scale.¹³⁶ Food processing and involvement in agriculture will have been a general activity in which nearly all *vici* were involved. In the case of fish and salt production, this will have been limited to suitable locations along the coast.¹³⁷ In other areas, food products may have been processed. Even if secondary agglomerations were not involved in processing food, their inhabitants will no doubt have been involved working the land of nearby *villae*, especially during harvest season.¹³⁸

When detecting possible secondary agglomerations in *barbaricum* a threshold of five contemporaneous buildings was established.¹³⁹ This was done

¹³² Hiddink (1991), 213; Czysz (1987).

¹³³ E.g. Vertunum, Blicquy, and Howardries.

¹³⁴ For more on ceramic production in the Rhine basin: Franconi (2014), 165-175.

¹³⁵ E.g. Taintignies, Clavier-Vervoz, and Amay.

¹³⁶ Hiddink (1991), 213.

¹³⁷ For more: De Clercq (2009), 471-479. E.g. at the temple *vici* at Colijnsplaat and Domburg.

¹³⁸ Von Petrikovits (1977), 131; Wightman (1985), 96; Banaji (1992). E.g. Martelange, Arlon, and Heerlen.

¹³⁹ Others have set different pre-requisites to determine this (some without a numerical specification): Kossack (1997), 66; Leube (2009), 170.

for several reasons. In the first case, the first *terp* settlement (a settlement built on an artificial hill of cultural layers) of Feddersen Wierde began with five longhouses in the second half of the first century BC.¹⁴⁰ As the site later developed into a considerable *terp* settlement,¹⁴¹ it seemed justifiable to utilize this as a way of identifying settlements which may have started with a similar population, but failed to develop further. Secondly, in a regional study of settlements in the north-east of Germany, 2,230 *Siedlungen* were identified.¹⁴² However, by utilizing the threshold number of five buildings, the number of settlements in this area was reduced to 106. Another reason for establishing the threshold at five concerns the overall size and population. The case of Schwabmünchen has demonstrated that a vicus which appears to have been relatively productive due to a high number of kilns only had a possible population of 35-40 people. Therefore, even a spatially small settlement with 5 structures could have had a population around 30 individuals.¹⁴³

The overall internal structure of these settlements varies from site to site, as the conditions on which they were built differed. On the whole, the internal organization of sites falls within three basic kinds: a row-settlement, in which all the structures are placed in a row; a focal-settlement, in which an open space and/or a structure are the central focus of the settlement; and a haphazard settlement organization, where no internal organization can be determined. These internal settlement organizations are distributed throughout *barbaricum* and it was not possible to determine whether certain types of internal structures were predominant in any specific region.¹⁴⁴ For example, it is possible to consider the development of settlements along the North Sea coast (north Netherlands, northwest Germany, and Jutland) together, due to the shared presence of marshland area and the overall similar development of the

¹⁴⁰ Haarnagel (1979).

¹⁴¹ Terpen a.k.a. village mounds. "What is required to form a village mound is a permanent occupation for around 300 years and more at the very same location": Kaul (1999), 54.

¹⁴² Leube (2009): a total of 2,230 finds were listed as *Siedlungen* (from a total of 4,508 finds).

¹⁴³ Priorsløkke had 47 buildings in an area of 11,250 m² (150 X 75 meters; 1.125 ha): Kaul (1989), 87.

¹⁴⁴ Kossack (1997), 7-8; Leube (2009), 170-171; Martens (1998), 251.

individual farmstead and settlement structure.¹⁴⁵ Their main shared feature is their situation on *terpen*. At Feddersen Wierde (Germ.), from the first to second century AD, the settlement focus shifted towards its interior, creating a radial village plan focused upon a central place (Fig. 3.5).¹⁴⁶ However, these terp settlements did not always create a radial village plan. The excavated village at Priorsløkke near Horsens in Eastern Jutland demonstrated that five of the farmsteads were lying on an East-West row (Fig. 3.6).¹⁴⁷ Elsewhere in this northwest corner of *barbaricum*, settlements were established on low-lying 'geest' lands.¹⁴⁸ Nearby Feddersen Wierde, the excavated settlement of Flögeln shows that settlement moved slightly over its history but was essentially an enclosed village, a type also found elsewhere. The settlement history and building traditions in the north-east of the study-region are believed to be different to those from the northwest. However, due to a lack of evidence for this area, it is not yet certain whether the internal settlement organisation was identical. There are some similarities with regard to internal organisation,¹⁴⁹ but it seems reasonable to expect the settlement pattern of northwestern Germany to be different to that of central-eastern Europe (Fig. 3.7).¹⁵⁰

In the northwest, the aforementioned process of socio-political sophistication expressed through urbanisation and the development of an internal settlement hierarchy, continued along similar lines as to the south of the *limes*; the emergence of social stratification occurred from the late first century A.D. and continued to intensify throughout the subsequent centuries. Burial evidence provides a very strong case for this process with graves showing an increasing level of sophistication through the inclusion and

¹⁴⁵ There is a Scandinavian divided, where Jutland and Fyn are more closely related to northwest Germany and eastern Denmark and southern Norway contain a southern Scandinavian settlement pattern: Martens (1998), 252.

¹⁴⁶ Haarnagel (1979); Hvass (1989), 91; Kaul (1999).

¹⁴⁷ Kaul (1999), 60. Another example: Tåbel/Mariesminde site(s).

¹⁴⁸ Geest is a type of landform which occurs in northern Germany, northern Netherlands, and Denmark. It is composed of slightly raised land of sandy and gravelly soil.

¹⁴⁹ The differences are likely to stem from the actual farmsteads structures themselves; Leube (2009).

¹⁵⁰ Martens (1998), 257.

deposition of various materials and objects.¹⁵¹ Whether the deceased were (exclusively) the elite is unknown, but it is significant that the inclusion of weaponry formed part of this process. For the most part, these weapons were local but during the latter half of the second century and during the third, many Roman-made weapons were placed in burials (e.g. Putensen, Germ.). Sometimes, graves may have even contained elaborate weaponry such as the highly ornate legionary dagger in grave A4103 at Hedegård in Denmark. However, the process of sophistication was not only limited to weapons and can also be detected in the form of urns used for cremations, where occasionally bronze or other metal vessels of Roman manufacture were used instead of local handmade pottery.¹⁵² Moreover, graves which were richly outfitted are also found, such as at Marwedel (Germ.) where during the first half of the second century, Grave 1 was adored with a set of feasting equipment along with bronze and silver items which were of Roman manufacture.¹⁵³ Recently, a male burial at Gommern as part of the Haßleben-Leuna cultural region was found. This *Fürstengrab* (princely grave) accentuates the potential extent of this process, with objects made of gold, silver, bronze, glass, and wood found together with a male aged 25-30.¹⁵⁴

Simultaneous to the increased presence of more culturally sophisticated material culture in graves, settlements and individual structure sizes increase.¹⁵⁵ At Feddersen Wierde, in the second phase of the settlement (late first to second century), a chieftain's house is thought to have been identified, whereas previously all the longhouses appeared equal in social standing. In addition, the first artisanal structures date to this same period. In the next phase, a distinct artisanal/workshop area north of the settlement is dated to the third century and these have been interpreted as belonging to the chief as they

¹⁵¹ For the theory of social hierarchy based on grave goods: Schlüter (1970). For the ritualised framework of mortuary practices: Ekengren (2009).

¹⁵² Wells (1999), 239.

¹⁵³ For more on this grave: Wells (1999), 240; Laux (1992).

¹⁵⁴ Becker (2010).

¹⁵⁵ Headeager (1992), 184, 195-215; Rindel (1999), 90; Hiddink (1999), 84-86; Ringtved (1988).

concentrate around the chieftain's farm.¹⁵⁶ A similar process of settlement and individual structure size increase and social stratification is well recorded and discerned at Vorbasse, Hodde, and Gudme in Denmark.¹⁵⁷ Yet, on the whole, our evidence for economic activity in *barbaricum* is sparse. The evidence does seem to indicate that similar economic activities were undertaken outside as within the Empire. However, the sophistication and scale of these endeavours is often the principal noticeable difference. Agricultural and live-stock production appear to be the most significant activities within *barbaricum*, with metal production and processing as the dominant craft activities.¹⁵⁸

Given the differences in evidence and types of structures found in secondary agglomerations within the study-region, it is difficult to provide a summary which is equally pertinent to all. With Rome's arrival in the southern half of the study-region, the process of urbanisation was certainly accelerated but its progress was far from uniform. In the Meuse-Demer-Scheldt area (north Belgium, south Netherlands), the development of secondary agglomerations appears to be more similar to that seen north of the *limes*.¹⁵⁹ However, with regard to craft activities within the Empire, the absence of large pre-Roman centres (with a few exceptions) may provide some insights into the complexity of the economy at the time. Although central sites (i.e. *oppida*) are found in the study-region and some have argued for a sophisticated and complex economy,¹⁶⁰ we should question whether this actually resulted in large-scale changes to daily life. It is very likely that craft activity remained dispersed and agriculture and live-stock production remained central activities. The organisation of labour and local or regional markets, however, are likely to have developed. With Rome's conquest, this process was fast-tracked allowing for the foundation of secondary agglomerations and some urban centres, which

¹⁵⁶ Haarnagel (1979); Hvass (1982); Schmid (2010).

¹⁵⁷ Hvass (1989), 93-94; Hvass (1993), 190-191; Hvass (1985); Wells (2008), 123-126.

¹⁵⁸ E.g. Lack of local pottery production discussion in Leube (2009). The literature on metal working is extensive. E.g. Stupperich (1997); Hammer and Voß (1997); Nørbach (1999). For the rise of 'trading centres' in Denmark: Jensen and Watt (1993).

¹⁵⁹ For the process: Slofstra (1991). It was not restricted to this area: De Clercq (2009), 261: E.g. at Oss-Westerveld and Hoogeloon-Kerkakkers.

¹⁶⁰ E.g. Wells (1999), 52-56.

in turn facilitated economic and social differentiation.¹⁶¹ Beyond the *limes*, social stratification and diversification are also observed but craft activity remained limited. However, it is important to note that secondary agglomerations, on the whole, were far smaller in *barbaricum*, and the term *hamlet* to describe these settlements may be more appropriate. It is also clear that the uncritical continued use of the term 'vicus', when used to describe agglomerations between 0.4 and 60 hectares is not of useful (Table 3.6).

3.3 Villae

In a socio-economic system in which the majority of the population inhabited the countryside, it is necessary to consider the most Roman aspect of rural habitation: the villa. Defining a Roman villa is problematic for two main reasons. Firstly, various Roman sources have been liberal with their use of the term villa and consequently it has come to represent a range of different meanings. Secondly, within the study-region, it has been difficult to distinguish villa from non-villa settlements.¹⁶² Ideally, one would review all the evidence and then establish a consistent definition. As this was not possible to do within the parameters of this study, it was necessary to rely on the categorization provided by the original source.¹⁶³ The purpose of this section is to identify briefly general trends of villa development within the study-region. It will not be possible to trace the origin or development of the villa as a building in detail, as this subject requires separate attention.¹⁶⁴

In the study-region over 1,000 villae have been identified. From their distribution pattern, it becomes evident that villae only developed in particular

¹⁶¹ Roymans (1990), 213.

¹⁶² Courbot-Dewerd (2009); Bouet (2002); Slofstra (1991), 163, note 86; Woolf (1998), 149; Roymans and Derks (2011), 2-3: Emphasize the arbitrary nature distinguishing Roman 'villa' from 'indigenous' farm; Roymans, *et al.* (2011), 1-2.; In many catalogues the archaeological difficulty identifying villae can be seen. E.g. a square room with wall painting has been identified as a villa with no further information: Folmer, *et al.* (1980), 60.

¹⁶³ Whenever possible, a strict definition which required clear evidence was employed. E.g. It was insufficient to identify a 'villa' on the basis of foundations, or a stone building with painting, or a site with a 'bath', without other information. This was done in order to produce a 'minimalist' dataset.

¹⁶⁴ For more: Roymans and Habermehl (2011); Haselgrove (2011); Roymans, *et al.* (2011); Habermehl (2011); Gerritsen (2003).

areas (Fig. 3.8). Around Regensburg (*Reginum*) in *Raetia*, the habitation of the countryside only occurred once Roman troops were stationed at *castra Regina*. The decisive factor was the large demand for resources the troops brought with them as well as the development of the highway network (in particular, the connection between Regensburg and Straubing). It is also clear that the area was not previously inhabited, as the occupation of optimal sites only occurred during this early phase of Roman presence (c. AD 80-120).¹⁶⁵ The development of villae in the area peaked from AD 120 until the mid-third century. Between AD 260-300, following the Alemannic invasion, the number of rural settlements decreased by c. 80%. Rural settlement remained limited until the second half of the fifth century, when to the east of Regensburg Germanic settlements were founded, commencing a repopulation which lasted into the sixth century.¹⁶⁶ Elsewhere in *Raetia*, the development of villae in the rural landscape also appears to have been influenced by both political and military circumstances.¹⁶⁷

In the neighbouring province of *Germania Superior*, around the area of Heilbronn, villae first appear to the west of the Neckar River between AD 120 and 155.¹⁶⁸ Prior to this, few sites in the region have shown occupational history and those which do are most likely related to Domitian's military activities against the Chatti tribe. After the departure of the last troops (AD 155-180/200), the area east of the river was settled. However, this eastern area was given up within one century when the *limes* shifted.¹⁶⁹ Similarly 200 km to the south near the large settlement at Schleithem (Switzerland), civilian settlement only began in the early AD 70s despite the Augustan fort at Dangstetten (15 BC). Here too, the majority of villae date to the second century and following the shift of the *limes*, a change in countryside occupation is noted and sporadic Germanic settlements are registered in the region.¹⁷⁰

¹⁶⁵ Fischer (1990), 113-114.

¹⁶⁶ Fischer (1990), 116-118.

¹⁶⁷ Hüssen (1990); Moosbauer (1997); Struck (1996).

¹⁶⁸ Hüssen (2000), 116-117.

¹⁶⁹ Hüssen (2000), 117-119.

¹⁷⁰ Trumm (2000), 213-217, 231.

In the Rhineland of *Germania Inferior*, a comparable development can be noted to that in *Germania Superior*. On the whole, villa construction increased during the second half of the second century, despite significant military presence as early as the Augustan period. An explanation for this relatively late development (from the time of Roman military presence) can be viewed in relation to the formation of *Germania Inferior* as an independent province and the possible necessity of becoming economically independent in order to supply the significant numbers of the army along its *limes* border.¹⁷¹ However, the formation of the province did not have a similar effect in The Netherlands. On the whole, villae are almost absent with the exception of the southern tip of Dutch Limburg. Within the Eastern Dutch River area (the *civitates* of the Batavi and Cananefates) with a few exceptions, villae are not found,¹⁷² to such an extent that c. 98% of rural sites are non-villae in *civitas Batavorum*.¹⁷³ One explanation put forth has been that local cultural values may have prevented villae from being adopted.¹⁷⁴ In Belgium, as the northern part of *Gallia Belgica*, villae are restricted to the southern and eastern part of the country.¹⁷⁵ Landscape factors, such as the quality of soil, clearly contribute to the pattern of villae development (see below for more).

As is clear from the distribution map, the density of villae differed for various parts of the study-region. This may suggest that in certain areas the land was worked more intensively than elsewhere.¹⁷⁶ Several studies have reconstructed small regional villa landscapes by assessing the archaeological evidence for estate property size. Within the Neckar region in *Germania Superior*, the density of villae differed, which appears to have influenced the size of the estate. On average, estates measured 75 ha,¹⁷⁷ which is slightly larger

¹⁷¹ Gechter, *et al.* (1986), 390-391.

¹⁷² Dijkstra (2011), 68; Van London (2006), 181.

¹⁷³ Heeren (2009), 24: Heeren citing Vossen preparing a dataset of the rural sites (900 non-villa sites to 20 villae).

¹⁷⁴ Groot (2008), 24.

¹⁷⁵ De Maeyer (1937), 251. A few exceptions exist: De Clercq (2009), 250.

¹⁷⁶ In some instances, this is due to the archaeological factors such as research, publication and preservation. Most notably, the majority of villa studies concentrate on Bavaria.

¹⁷⁷ Hüssen (2000), 130. For the emptier area: 100-150 ha. For the denser: 50-100 ha.

than in the south of *Germania Inferior* where the majority of estates were 65-80 ha.¹⁷⁸ Elsewhere in *Germania Superior*, villae around the civitas capital Speyer have been estimated to measure between 50-260 ha,¹⁷⁹ and near the Raetian border, estate sizes are estimated between 120-150 ha.¹⁸⁰ Within *Raetia*, the sizes vary but average around 100 ha.¹⁸¹ Despite varying villa densities within the study-region's villa landscape, most estate properties can be expected to measure around 60-100 ha. If this is the case, we can approximate that 60,000 – 100,000 ha of land was part of the villa landscape. However, this estimation does not take into account the abandonment or establishment of villae, and simply calculates the maximum on the basis of the dataset gathered. More importantly, it should also not be assumed that all villa land was equally productive or even in use simultaneously nor does the regional variation in villa density or size necessarily inform about social status or social differentiation. It does, importantly, highlight regional differences and encourage investigation for the reasons behind the observed patterns.

In *Germania Superior* and *Raetia*, it has been demonstrated that one of the decisive factors influencing the development of the villa landscape was the relationship between the area and the presence of the military. However, this was not the sole factor of importance as can be seen by the historical development of villae along the border of the two provinces.¹⁸² In Oberschwaben (*Raetia*),¹⁸³ as in *Germania Inferior*, the military was already present during the Julio-Claudian period.¹⁸⁴ Although troops were relocated during the Flavian period, the road network developed and infrastructure improved which only then led to the settlement of the countryside two generations later.¹⁸⁵ From this point onwards, the development of the villa

¹⁷⁸ Kunow (1994), 157.

¹⁷⁹ Bernhard (1976), 63-64.

¹⁸⁰ Trumm (2000), 230.

¹⁸¹ Fischer (1990), 108-109; Moosbauerer (1997), 158; Struck (1996), 145-146.

¹⁸² Pfahl (1999).

¹⁸³ Oberschwaben = Upper Swabia, which is by the Swabian Jura, Lake Constance and the Lech (in the federal states of Baden-Württemberg and Bavaria).

¹⁸⁴ Camps mainly appear AD 45-50 but there are some earlier camps dating to Tiberius' reign.

¹⁸⁵ Meyer (2010), 341-347.

landscape proceeded along the same lines as elsewhere peaking in the second half of the second to early third century.¹⁸⁶ It is possible, however, that parts of the rural settlement in this area of *Raetia* were already abandoned before AD 254.¹⁸⁷

Another important factor influencing the development of villae was access to a developed transportation network. On either side of the Neckar River in the vicinity of Heilbronn, the majority of villae lay within 500 m to 3 km of the river.¹⁸⁸ Elsewhere, such as by Regensburg, the first villae first appear along roads which connected the early military and civilian centres to one another. As the infrastructure and road network developed, along with the increasing establishment of urban centres, villae developed further out into the available hinterland. This is also well recorded in the vicinity of Heilbronn, where the majority of villae lie within several kilometres of the larger vici/settlements.¹⁸⁹ The expansion of villae in the countryside will also have been influenced by the quality of the soil. The majority of the villae happen to have developed on fertile loess soils, which spread from Northern France into Belgium and the Rhineland.¹⁹⁰ However, good soil does not automatically mean a higher rural settlement density, as fertile lands were not always settled.¹⁹¹ A more important consideration appears to have been the proximity to a large clientele.

Villae have two main associations. They are seen as the lavish homes of the wealthy and as an indicator for large-scale agrarian production.¹⁹² These two functions are not exclusive and a villa may have served a dual intertwined purpose. Moreover, several studies have questioned whether an universal model of the villa and its function is appropriate for the entirety of the Roman

¹⁸⁶ Meyer (2010), 354.

¹⁸⁷ Meyer (2010), 358.

¹⁸⁸ Hüssen (2000), 120.

¹⁸⁹ Hüssen (2000), 122 (table 13). 55% lie within 3-4 km and 79% within 5 km. Also seen in east *Raetia* and in the vicinity Oberlauchringen (*Germania Superior*): Trumm (2002), 214.

¹⁹⁰ Roymans, *et al.* (2011), 15-17.

¹⁹¹ Hüssen (2000), 90; Meyer (2010), 349.

¹⁹² Slofstra (1991), 170; Roymans and Derks (2011), 21.

Empire.¹⁹³ The produce of villae in the study-region varied greatly in part due to the varying topography. Cereal production was an important commodity but livestock and even eventually wine, were also goods which one could expect to be produced at villae.¹⁹⁴ There is even some evidence that production at villae was not limited to agricultural goods, as can be seen at several villae in Belgium. At Braibant there is evidence of metallurgical activity while at Herstal and Voerendaal, evidence for extensive ceramic production has been found.¹⁹⁵

The development and introduction of the villa relied on a certain degree of acceptance and adaptation by the local population.¹⁹⁶ Additionally, the building of these villae needed to be financed. This could have occurred either as a direct consequence of the army's presence along the *limes* (thereby creating a stable and present market and demand for goods),¹⁹⁷ or through substantial state efforts to expand the available infrastructure (e.g. roads or administrative centres), which encouraged and aided the development of urban markets. However, despite what appears as an analogous development or causation for development, it is important to recognise that regional differences in social organisation and landscape hierarchy may have been present.¹⁹⁸ An excellent example is at a small villa in Houthem (The Netherlands). Here, bronze *tabulae* demonstrate that a magistrate from Colonia Ulpia Trajana occupied the villa. However, it is quite unlikely that this small villa served as his primary residence.¹⁹⁹ Pre-Roman traditions, the local inhabitants and their history will undoubtedly have influenced some of the regional differences in the development of the villa landscape.²⁰⁰ This might explain why in the *civitas* Batavorum, despite a high recruitment rate amongst the indigenous population, the villa was never adopted. This theory finds some favour over those who

¹⁹³ Millett (1990), 94; Woolf (1998), 148; Roymans and Derks (2011), 21.

¹⁹⁴ Franconi (2014), 125-129.

¹⁹⁵ Brulet (1990), 195-196, 205, 220-221.

¹⁹⁶ This is polar from the late Iron-Age, when within the study-region the house did not have an important role distinguishing social position: Roymans, *et al.* (2011), 15; Hales (2003), 245.

¹⁹⁷ Attempts to quantify this military grain demand: Millett (1990), 56-57; Kooistra (1996), 66-68, 96-98; Rothenhofer (2005), 54-57.

¹⁹⁸ For more: Crowley (2011); Habermehl (2011), 70-74.

¹⁹⁹ Roymans, *et al.* (2011), 25.

²⁰⁰ Habermehl (2011), 65-66; Gerritsen (2003); Roymans and Derks (2011), 34.

point to the lack of fertile land since villae need not necessarily be agriculturally productive and could have been involved in non-agricultural production as well.²⁰¹ Conversely, in *Raetia* where the villa was adopted, a distinct lack of a pre-Roman population did little to prevent its acceptance.²⁰²

Despite the many different factors contributing to development of the villa landscape within the study-region, the overall chronological development happened roughly to coincide with a peak of villae in the second half of the second century and a substantial discontinuity beyond the mid-third century. However, the failure for villae to develop in certain areas, such as the *civitas Batavorum*, may too provide insight into the market and monetary economy. The villa implies surplus production. The absence of such production centres may demonstrate a reliance on imports and a dependence on other areas. However, the matter of rural agricultural productivity at indigenous farms, still requires substantial work (3.5).

3.4 Rural Sanctuaries

The concentration and diversity of depositional offerings can act as an informative proxy to measure the integration of a certain region,²⁰³ however this is beyond the scope of the thesis. Instead, evidence for archaeologically determined Roman rural sanctuaries has been collected (Fig. 3.9).²⁰⁴ As well as functioning as a “borderland between the visible world of man and the invisible world of gods, spirits and ancestors”,²⁰⁵ rural sanctuaries functioned as secondary central places. The identification of religious sites and sanctuaries in *barbaricum* is slightly more problematic than within the Empire, as it is common to associate the manifestation of religious (and political) power with the

²⁰¹ Some argue that the villa was not compatible to a community where livestock raising was central to their identity: Groot (2004), 24; Roymans (1996).

²⁰² Struck (1996), 131, 158; Meyer (2010), 364-365.

²⁰³ Just as recurring sets of offerings can identify similar symbolic meanings: Kok (2008), 51. The deposition of material provides clues about the mentality and identity of the dedicator: Kiernan (2009), 214. “The grand monuments and great sanctuaries should not overshadow humbler but parallel transformations of the ritual system”: Woolf (1998), 226.

²⁰⁴ This means that, in so far as possible, only sites which have been archaeologically determined to be a Roman sanctuary have been included.

²⁰⁵ Derks (1998), 131.

deposition of precious objects, making their interpretation difficult.²⁰⁶ Within the Empire, the deposition of objects in certain landscapes also took place and these too are often difficult to assess when no building is nearby.²⁰⁷ Therefore, the aim of this section is to survey the development of rural religious sites within the Empire half of the study-region and to identify comparable characteristics.

There are four general periods which can be identified with regard to the development of Roman religion within the study-region.²⁰⁸ The first interval spans from the end of the Roman invasion until the start of the Flavian period. Assessing the distribution and density of rural sanctuaries in the pre-Roman period remains difficult, as these often constituted open spaces and their traces (if any) have almost exclusively been found under the remains of stone sanctuaries from the Roman period.²⁰⁹ The area of the Batavians can serve as an example of the changing circumstances following the Roman conquest and integration into the Empire. Kessel-Lith, Empel, and Elst are amongst several central religious sanctuaries dating to the pre-Roman period.²¹⁰ The development from pre-Roman to 'Roman' religious sites is best documented at Empel and Elst.²¹¹ Relatively early, in *c.* AD 50, Elst was transformed from an open-air sanctuary (with a possible intermediate wooden phase) into a simple rectangular stone building (Fig. 3.10).²¹² Following the Batavian revolt, during

²⁰⁶ By 'precious object' – either its intrinsic value or its functional value is referred to. For more on ritual communication in Denmark: Hedeager (1992), 27-82. For a catalogue of examples: Jørgensen, *et al.* (2003). Two small possible sanctuaries have been found in Thuringia but no plans of the sites have been included: Behm-Blancke (1958); Behm-Blancke (1960). The sites appear to be similar to those found in pre-Roman areas with open area sanctuaries and wooden poles as places for worship and offerings: Todd (1987), 179.

²⁰⁷ E.g. Kok (2008), 17; Derks (1998), 186. For the same problem in *barbaricum*: Sørensen (2006).

²⁰⁸ Phases taken from Spickerman (2003); Spickermann (2008).

²⁰⁹ Derks (1998), 169, 177. For his study-region, all but two cult places from La Tène period remained in use: Derks (1998), 168. For more on the *Viereckschanzen* debate: Derks (1998), 178-183. *Viereckschanzen* are rectangular enclosures surrounded by ditches, which may have been religious in nature.

²¹⁰ Others include Hoogeloon, Oss-Ussen, Alphen, Wijnegem, Neerharen-Rekem, and Wijshagen: Slofstra and Van der Sanden (1987), 126. It seems that all the temples of the *civitas Batavorum* are built upon pre-Roman open-air cult sanctuaries: Roymans (2004), 12.

²¹¹ For a summary of the development of pre-Roman to Gallo-Roman sanctuary: Derks (1998), 170-177.

²¹² Bogaers (1955); Van Es (1972), 153; Willems (2009), 129.

which the temple was destroyed, a replacement temple was built in AD 70. Elst II measured c. 30.90 by 23.10 meters, nearly 8 times larger than its predecessor (Fig. 3.11).²¹³ In 2002, a second nearby temple was found (560 m away), with two wooden phases; the first between AD 10-20 and the second AD 41. This building was then rebuilt in stone in AD 100.²¹⁴ What Elst demonstrates is that within a century the site had transformed from an open-air rural indigenous sanctuary into a religious complex with two stone Romanized temples.

During the initial occupation period, Augustus established an imperial cult to Roma and Augustus at Cologne (*ara Ubiorum*) sometime between 12 BC and AD 9.²¹⁵ However, little of this site has been archaeologically ascertained.²¹⁶ It is important to note that Cologne at this time was no more than a settlement of the recently transferred *Ubii* and would only later house two legions (in AD 14). Similarly at Mainz (*Mogontiacum*), which also primarily served as a military site during this period, a centre to the imperial cult was erected.²¹⁷ These examples reveal that during this early period, 'Romanized' rural sanctuaries were being erected at strategically placed points – either on top of existing sites or at sites which were later to become important centres.²¹⁸

The next phase, dating from the Flavian to the middle of the Antonine period (c. AD 70-150), was one of consolidation. As the provinces began to take a more familiar shape, new *civitas* capitals were being formed with their own religious centres. Capitals and their hinterlands were also becoming more settled with the expansion of the Roman road network. This provided new opportunities and locations for the development of more rural sanctuaries. At Friesenheim, across from a road station, a small temple, possibly dedicated to Diana Abnoba and Epona, was founded in approximately AD 80.²¹⁹ Friesenheim was not an exception and even larger rural sanctuary complexes

²¹³ Klok, *et al.* (1981), 16; Bogaers (1955), 46, 58; Derks *et al.* (1994), 54. Elst I c.11.60m X 7.80m.

²¹⁴ Spickermann (2008), 32.

²¹⁵ This is the counterpart to the *Condate altar* for Gaul.

²¹⁶ Spickermann (2008), 36. In AD 9 the priest Segimundus is named: Tac. *Ann.* 1.57.

²¹⁷ Spickermann (2003), 85-91.

²¹⁸ It is possible that a centre for the imperial cult was established in the forum at Waldgirmes, now evidenced only by fragmental remains of a bronze equestrian statue of Augustus.

²¹⁹ Spickermann (2003), 200-201.

have been found along the important roads or at crossroads. At Oberlauchringen a Gallo-Roman temple measuring 17.3 by 18 meters was found along with five other buildings near a crossroads. It is therefore plausible that the site represents a conglomeration of private enterprises which included taverns, rest houses, and small workshops, all taking advantage of passing traffic.²²⁰ Although not as many road station sanctuaries have been identified in *Gallia Belgica* or *Germania Inferior*,²²¹ the area too experienced a 'consolidation' phase as new *civitas* capitals built up their religious centres as well as new *vici*, such as at Grobbendonk.

Following the period of consolidation, there was a period of intensification (AD 150-230/260). The hinterland became increasingly more populated and thus there was a need to meet the demands of an ever increasing population, now occupying more space. During this period, not only do we see a rise in the amount of epigraphic dedications but more cult buildings and sites are also established.²²² Existing sites, such as at *Aquae Granni*, were further monumentalised.²²³ Grobbendonk (Bel) and Badenweiler had their temples rebuilt in stone,²²⁴ while Krefeld-Elfrath likewise was rebuilt in stone in the mid-second century and was then also expanded in the second half of the third century.²²⁵ Additionally, in the areas where villae developed, rural sanctuaries and/or shrines occasionally appear either as part of the villa complex or nearby. An example of this is at the villa of Hofstade in *Gallia Belgica*, where a temple appears to have been rebuilt after being destroyed c. AD 150. Furthermore, several buildings which have been interpreted as shops/boutiques have been

²²⁰ Spickermann (2003), 205-206. Possible other route-station sanctuaries include: Schenkenzell-Brandsteig, Antunnacum/ Andernach, Dittelsheim-Heßloch: Spickermann (2003).

²²¹ Fontaine-Valmont (Hainaut) could be considered a route station as it lay in the border between the *civitates* of the Nervii and Tungri, marking the provincial border and situated at a small *vicus* along a smaller Roman road between Bavai and Trier: Spickermann (2008), 97-99. It should be recalled that Elst was rebuilt following the Batavian revolt, and was located at an important crossroad in the Batavian hinterland: Spickermann (2003), 32.

²²² Spickermann (2003), 478; MacMullen (1982), esp. 242-243. E.g. the creation of a mithraeum at *Gelduba*/Krefeld-Gellep near the auxiliary camp: Spickermann (2008), 89-91. E.g. at Nideggen-Abenden over 54 altars have been found: Spickermann (2008), 91-92.

²²³ Spickermann (2008), 81-83.

²²⁴ Spickermann (2008), 99-102; Spickermann (2003), 194-196.

²²⁵ Spickermann (2008), 110-112.

found by the temple.²²⁶ Clients and kin relations may have visited the site,²²⁷ but even this may not have been sufficient to justify erecting permanent structures. It is therefore possible that in some instances rural villae sanctuaries served a wider community than the immediate inhabitants and workers of the villa.

The final phase is associated with the period of abandonment and transformation of the Roman Empire (AD 260 – c. 450). In this period, provincial and administrative borders were redrawn and troop movement also played a role in the prosperity of sites and regions.²²⁸ Furthermore, the depopulation of the urban and rural landscape led to a decreased density of rural religious sites and practices. In the region of former *Germania Superior* and *Inferior*, a total of 19 votive inscriptions are known from this period.²²⁹ Beside the general economic depression, there may have also been a decreasing need to boast one's citizenship or knowledge of Latin, following Caracalla's enfranchisement of AD 212.²³⁰ Additionally, many religious sites which were probably destroyed during the Germanic incursions in the mid-third century were never rebuilt. However, in some instances earlier temples were rebuilt as was the case at Vervigium Clavier-Vervoz. The vicus which continued to prosper as a commercial and industrial settlement into the fourth century (metallurgy and pottery industry) may have been able to afford the financial investment.²³¹ At some other rural sanctuaries, which were not within vici, there too was a phase of (re-)building.²³² On the other hand, at Fontaine-Valmont where one of the two temples was destroyed by a fire in the mid-third century, temple B remained to be visited along with the neighbouring Asclepius

²²⁶ Wankenne (1972), 65-66. Sometimes rural sanctuaries nearby villas are also associated with a necropolis like at Newel (Lux): Folmer, *et al.* (1985), 64.

²²⁷ Derks (1998), 187, note 225.

²²⁸ The continued use of baths at religious sites until the redeployment of the local army suggests continued use of the associated religious space. e.g. Aquae Granni and Baden-Baden: Spickermann (2008), 81-83.

²²⁹ Spickermann (2003), 485; Spickermann (2008), 246.

²³⁰ Derks (1998), 238.

²³¹ Wankenne (1972), 123-127.

²³² E.g. Bad-Münstereifel-Nöthen (Pesch): Spickermann (2008), 46-48.

sanctuary until the late fourth/early fifth century.²³³ Towards the end of Roman presence in the region, particularly during the early fifth century and onward, a number of Christian churches were built and in some instances on top of a Roman sanctuary.²³⁴

That much of rural sanctuary development can be dated to the mid-first to mid-third century is no coincidence. However, it remains difficult to determine a possible hierarchy for religious sites. Religious places in urban centres may have only served the immediate population while isolated sanctuaries which in the archaeological record appear to be insignificant, may have served as large religious centres during periodic festivals.²³⁵ The function of rural religious sites in the less urbanised areas will undoubtedly have had some regional importance.²³⁶ An example of the difficulty interpreting a possible hierarchy is provided by two nearby religious places in *civitas Batavorum*, at Elst and at Nijmegen. The two are less than 15 km away from each other, yet both were monumentalised fairly early and continued to play a significant role. The different deities worshipped at the two sites will have justified their co-existence but their economic status in hierarchical terms is difficult to determine. It is apparent that while size and/or monumentality could be an identifier of religious and economic significance, in the less urbanised areas this rule may not be entirely transferable.²³⁷

3.5 Indigenous Farms

Throughout the study-region, the single-standing farm unit was the unit of habitation for the majority of the population. As mentioned earlier, in two different areas (in north-east Germany and *civitas Batavorum*), the percentage of

²³³ Spickermann (2008), 97-99.

²³⁴ Spickermann (2003), 509-510; Spickermann (2008), 259-260.

²³⁵ Derks (1998), 186.

²³⁶ Derks (1998), 187.

²³⁷ For more on the role of sanctuaries as points of social aggregation, cults, and fairs: Fernández-Götz (2014), 171-181.

scattered farmsteads formed over 90-95% of the settlement landscape.²³⁸ The *Wohnstallhaus* (byre-dwelling; longhouse) structure was the most important building type in an agrarian society and its development reflected socio-economic changes.²³⁹ Given the significance of this 'settlement'-type, attention will be devoted towards the individual farmhouse and its development, in order to identify regional patterns of individual structures and their distribution. A detailed description of the varieties of types will not be possible as this subject merits attention in its own right.²⁴⁰

On the Roman side of the *limes*, the dominant structure in the early Roman period was the two aisle farmhouse. In the first century A.D. this structure was 6-7 metres wide and had a length of 12-20 metres. Its roof was supported by a row of central posts within the house, dividing the house into two-aisles.²⁴¹ This house-type is now known as the Alphen-Ekeren type (Fig. 3.12).²⁴² The Alphen-Ekeren building type is found from the Meuse-Demer-Scheldt area (west and central Belgium and south-west Netherlands) to the Flemish sandy soils and to the villa-landscape of the loess area of south Limburg (The Netherlands) and the Rhineland.²⁴³ The earliest example of this type is known from Oss-Ussen and dates to the middle of the first century BC.²⁴⁴ Roughly contemporaneous to the Alphen-Ekeren type was the Oss-Ussen farmhouse type (Fig. 3.13). The two types of farmhouses have been found together at various sites,²⁴⁵ with the earliest examples of the Oss-Ussen type dating to the second century BC and the latest to the mid-first century AD. Therefore, the Oss-Ussen type precedes and remains in use simultaneously to

²³⁸ In north-east Germany, 2,230 *siedlungen* were found, of which 106 formed secondary agglomerations: Leube (2009); In *Civitas Batavorum*, 900/920 rural sites were non-villae: Heeren (2009), 24; Heeren citing Vossen (forthcoming).

²³⁹ Hvass (1993), 188-189; De Clercq (2009), 272.

²⁴⁰ E.g. the various forms of three-aisle longhouses found at Flögelin-Eekhöltjen: Zimmermann (1992), 42-103.

²⁴¹ Slofstra (1991), 137-138.

²⁴² De Boe (1988).

²⁴³ Slofstra (1991), 138.

²⁴⁴ The Oss-Ussen type is more similar to the Middle Iron Age type (the Haps-type) than the Alphen-Ekeren type: Slofstra (1991), 139; De Clercq (2009), 273. On the Haps type: Verwers (1972).

²⁴⁵ Slofstra (1991), 140; De Clercq (2009), 273.

the emergence of the Alphen-Ekeren type, but was gradually superseded by the new type.²⁴⁶ The main outcome of this development was that the farmhouse became more durable allowing for longer occupation. This in turn will have had an effect on social and economic structure and behaviour.

Throughout the next few centuries, the Alphen-Ekeren farmhouse underwent several transformations. In the second and beginning of the third century, the farmhouse surface area increased. The length increased to 26-28 metres while the width was increased to approximately 8 metres. In addition to the growth in surface area, new building techniques can be observed with regard to the foundational work and the wall and roof construction.²⁴⁷ Another way in which local building traditions may have changed was the introduction of buildings measuring more than 9 metres in width. In order to compensate for the size and weight of the roof, an additional internal row of posts was included creating a three-aisled structure (e.g. at Grobbendonk).²⁴⁸ The development of the Alphen-Ekeren type was disrupted in the mid-third century, which was followed by a Late Roman-Germanic house type (e.g. at Neerharen) (Fig. 3.14).²⁴⁹ In addition to three-aisled farmhouses, single aisle structures influenced by Roman building traditions were built. However, the three- and single-aisle farmhouses are not as common as the two-aisle longhouse in this area within the Empire.

In the northern half of *civitas* Menapiorum (west Belgium), there was a mix of two building traditions. In the first instance, there is evidence for farmhouses influenced from the east of the study-region (i.e. the Alphen-Ekeren type). Besides two-aisle structures, three-aisle structures were also present, attaching the region to the building tradition of farmhouses found along the North Sea coast beyond the Empire (Fig. 3.15). The distribution of these building-traditions is not clear cut, but it is possible to observe a concentration

²⁴⁶ Slofstra (1991), 139-140; De Clercq (2009), 273-274. Some possible hybrids of the two type include Brecht-Zoegweg, Ekeren-Het Laar, and Varsenare-d'Hooghe-Noene: De Clercq (2009), 274.

²⁴⁷ Slofstra (1991), 141.

²⁴⁸ Slofstra (1991), 143.

²⁴⁹ Slofstra (1991), 143.

of three-aisle structures by the coastal marshlands and two-aisle farmhouses towards the interior.²⁵⁰ To the north in *civitas* Cananefatorum (west Netherlands), a similar settlement landscape can be observed; the most common building type was a three-aisle farmhouse while around the Maas river estuary, a two-aisled building tradition was present which was connected to mid-Dutch river area building traditions.²⁵¹ This area (*civitas* Batavorum) can also be considered a border zone of building traditions, as both two and three-aisled farmhouses were present. This point is best supported by the fact that farmhouses often have a combination of the two and three-aisle building traditions, whereby the three-aisle portion probably housed the animals and the two-aisle portion was the living-space (Fig. 3.16).²⁵²

Roman influences amongst the continuation of indigenous building traditions can also be discerned. The easiest identifiable 'Roman' elements in indigenous farmhouses are at structures now known as 'proto-villae'. However, the term is problematic as it implies a structure which failed to become a villa, rather than an indigenous structure with Roman architectural elements.²⁵³ Above all, the presence of a *porticus* is used as an identifying aspect.²⁵⁴ The presence of roof-tiles at indigenous structures is another example of the adoption of Roman architecture features. Heeren has argued that these elements have been uncritically seen as influences of villa-culture and that given the lack of villae in *civitas* Batavorum, the origin of influence may be better found from Roman military architecture.²⁵⁵ Other influences such as the development of structure size and construction techniques have already been discussed.

Within the *barbaricum* portion of the study-region, various building traditions can be identified. Along the North Sea coast, as was already alluded

²⁵⁰ De Clercq (2009), 272-276, 338-339.

²⁵¹ Dijkstra (2011), 195-196.

²⁵² Roymans (1990), 175; De Clercq (2009), 275.

²⁵³ Heeren (2009), 157; Roymans (1996), 74 note 201. In only a few cases did a villa develop from a proto-villa such as at Hoogeloon (Ned). For more on proto-villae in Germany: Lenz (1999a); Lenz (1999b).

²⁵⁴ Slofstra (1991), 159-163.

²⁵⁵ Heeren (2009), 157-160.

to before, the building tradition was rather homogenous.²⁵⁶ This three-aisle building tradition stretched from Jutland (Den) all the way south along the coast to western Belgium.²⁵⁷ In German Westfalen and southern Niedersachsen, in the pre-Roman period two-aisle structures were common but were later replaced during the Roman period by three-aisle farmhouses.²⁵⁸ In the interior of the northwest of *barbaricum*, the building traditions lean more towards the mix found in *civitas* Batavorum (Fig. 3.17). In the east of The Netherlands bordering western Germany and just north to the Rhine (north Gelderland and southern corner of Overijssel), around 40% of all floor plans show single-aisle structures. The remaining 60% offer many similarities with the settlement structures found in Drenthe (north-east Netherlands), where two-aisle farmhouses lean towards the Wijster A-type (Fig. 3.18).²⁵⁹ The occurrence of two-aisle structures in north-east Netherlands may have had its origin in the La Tène period, when in central Netherlands three-aisle structures were replaced by two-aisled ones.²⁶⁰ This may explain the combination of a two-aisle and three-aisle longhouse in Warburg-Daseburg, which was short-lived (AD 20/30 to 50/60).²⁶¹

Although the building tradition in north-east Germany was significantly different from elsewhere in the study-region, it is difficult to say much as the evidence is still limited.²⁶² However, it is possible to discern that the approximate border between west and east building traditions is situated in the middle of the Elbe and Havel area. In this area, three and four-aisle farmhouses are found as are semi-oval and round-post houses with a varying number of posts supporting the walls.²⁶³ Furthermore, while longhouses are dominant in

²⁵⁶ Hiddink (1999).

²⁵⁷ Martens (1998), 252; Hvass (1993), 189; Trier (1969); Schmid (1982).

²⁵⁸ Hiddink (1999), 93; Leube states this building tradition spread also into Hessen: Leube (2009), 109.

²⁵⁹ Van der Velde (2011), 201. For Wijster typologies: Van Es (1967). Single-aisle buildings are seen as Nebengebäude: Zimmermann (1992), 103.

²⁶⁰ Roymans (1990), 174.

²⁶¹ Günther (1990).

²⁶² Martens (1998), 257; Leube (2009), 108.

²⁶³ Geisler (1989); Behm-Blancke (1989); Leube (2009), 109; Leube (2009), 124 fig. 87: Demonstrates the distribution of three-aisle longhouses. The new finds (post 1990) in eastern

the northwestern European settlement landscape, in the eastern-central European landscape, smaller houses and sunken huts are more dominant (Fig. 3.19).²⁶⁴

As was the case within the Empire, there was a tendency for structure sizes in *barbaricum* to increase throughout the course of the Roman period. In Denmark during the pre-Roman Iron Age, longhouses were usually 8-14 metres long. In the early Roman period (first to second centuries AD), the structures become 15-20 metres long whilst in the Late Roman period (third to fourth centuries AD) lengths vary between 20 and 50 metres. The width remained unchanged measuring roughly 5.5 metres.²⁶⁵ This general increase in size can be observed all throughout *barbaricum*.²⁶⁶ In addition to longhouses increasing in size, both amongst settlements and single standing farmhouses, additional buildings are built which have been interpreted as storage areas or areas for economic activity.²⁶⁷ There appears, however, to be relatively little innovation with regard to building techniques.²⁶⁸ Where differences are noted, these contributed to smaller regional variations in building types and were mainly determined by the availability of building materials.²⁶⁹ It is therefore possible to deduce that the origins and a wide-series of varying factors within *barbaricum* caused a visible boundary of building traditions in the east and west, along with smaller regional variations with regard to construction techniques.

The entire study-region can therefore be divided into four principal zones of indigenous building traditions (Fig. 3.20).²⁷⁰ In the first zone, in the interior of the Empire, two-aisle structures were the norm for rural

Germany, are predominately found along the north-east coast or along rivers running connecting the North Sea to the interior.

²⁶⁴ Martens (1998), 257; Kokowski (1998).

²⁶⁵ Hvass (1993), 190-191. With different measurements: Hedeager (1992), 195-196.

²⁶⁶ Hiddink (1999), 97. E.g. sites: Klein Köris, Lkr. Dahme-Spreewald and Berlin-Buch in north-east Germany and Feddersen Wierde in north-west Germany: Gustavs (1998); Hofmann (1998); Haarnagel (1979).

²⁶⁷ The typologies and study of this was beyond the scope of summary here.

²⁶⁸ For the development of post-placement: Kossack, *et al.* (1984), 167-183. For Roman-provincial influence: Steidl (2000), 104.

²⁶⁹ Hvass (1993), 189; Kaul (1999).

²⁷⁰ The eastern part is less well-known so future studies may better qualify this portion of the study-region.

farmhouses.²⁷¹ In the second zone, stretching from within to beyond the Empire, along the North Sea coast (influencing its hinterland as well),²⁷² a building tradition of three-aisle structures is present. The third zone is what can be considered a 'mixed zone'. In the area around *civitas* Batavorum (both within and beyond the Empire) a mix of the building traditions of zone 1 and 2 can be observed. The fourth zone is in the (north) east of *barbaricum*, where despite the lack of good evidence, three and four-aisle longhouses appear together with other structural forms (e.g. semi-oval). In addition to the principal zones, smaller regional variations, sometimes coinciding with the principal zones can be observed, despite agricultural and live-stock production remaining the most important activities of this settlement type. The Alphen-Ekeren type farmhouses (zone 1) like the farms north of the *limes* had a byre section.²⁷³ In Ekeren and Oosterhout (zone 2) these possible byre sections compose almost half of the farmhouse, while in the Brabantse Kepmen (zone 1) the byres measure only 25-33% of the farmhouse. Consequently, one could deduce that cattle breeding was not as important in zone 1 as elsewhere.²⁷⁴ The regional variations seen in indigenous farm 'settlement' types throughout the study-region, as well as their development, may provide indications of the way local and supra-regional economies functioned. Undoubtedly, geographical conditions and access to particular goods will have been decisive elements, but the settlement patterns also lend support to the idea that they may also reflect some socio-economic differences. Similarities across larger regions and the *limes* (e.g. Zones 2 or 3) may allow one to determine the extent of contact and integration within the zones as well as the ways in which Rome's rule changed their trajectory.

²⁷¹ There are some differences within the Empire as well, such as in the *agri decumates* area, which were not possible to fully investigate. However, the principal zones can still be applied as two-aisle structures predominate.

²⁷² E.g. at Flögeln-Eekhöltjen.

²⁷³ Although the byre-section is not clearly demarcated by a section (until the end of the second century with sunken house sections interpreted as byres), there is evidence in an early Alphen-Ekeren farmhouse in Tongeren with hoof prints: Slofstra (1991), 141, 143.

²⁷⁴ Slofstra (1991), 143. E.g. What may have functioned as an outhouse in eastern Jutland may have formed a main building with a dwelling area and stall in Thy: Hvass (1993), 189.

3.6 Military Sites

As the permanent presence of the army set the northwest apart from other provinces, military establishments in the study-region should also be considered.²⁷⁵ The first permanent military establishments in the study-region date to the early Augustan period. One of the earliest Augustan forts is on the Petrisberg in Trier (c. 30 BC).²⁷⁶ Between 19-14 BC Drusus was responsible for establishing many of the legionary sites which would form the basis of Roman military occupation for the duration of the Roman period. Shortly after (12-10 BC), Drusus undertook campaigns across the Rhine into *barbaricum*, during which military bases were established along the Lippe River.²⁷⁷ However, the forts on the right side of the Rhine were not occupied continuously and were only used during the campaigning months of the summer,²⁷⁸ and most of these forts were abandoned following Varus' defeat (AD 9).²⁷⁹ During Tiberius' reign the Rhine frontier slowly became consolidated with the construction of several additional forts. During Claudius' reign, considerable military activity has been noted. Along the Dutch Rhine many military establishments (forts, fortlets, and watchtowers) were built and their construction can be related to preparations securing a supply route for the invasion of Britain in AD 43 as well as Corbulo's campaigns against the Cherusci and Chauci.²⁸⁰ During this period the majority of Rome's military system was established and fairly little would change in the overall layout.

Following the Batavian revolt (AD 69), Vespasian rebuilt and established several forts, whilst also shuffling troop deployment. Legio X Gemina was moved to Nijmegen and a new legionary fort replaced the double-legionary Augustan fort by Xanten. Furthermore, a push beyond the Rhine saw the Taunus and Wetterau region and the right bank of the Upper Rhine included

²⁷⁵ For a general discussion of military sites in the northwest: Reddé *et al.* (2006). For an overview and detailed breakdown of military figures and sizes: Franconi (2014), 93-99.

²⁷⁶ Löhr (2003).

²⁷⁷ Becker (2005).

²⁷⁸ Reddé *et al.* (2006), 29-32.

²⁷⁹ Campaigns undertaken by Germanicus and Tiberius imply that some forts may have still been in use.

²⁸⁰ Tac. *Ann.* 11.18-11.20

into the Empire. Traditionally, Domitian's reign has been understood as a key period for the establishment of the *Limes Germanicus*. Kortüm's revision of the forts in the Taunus and Wetterau region and those along the Neckar River, has led to the conclusion that the majority of these actually have a Trajanic date.²⁸¹ During this period 45 new forts were built in *Germania Superior*. The Antonine period saw 15 more forts built along the *limes* in *Germania Superior* and eventually establish the outer limit of the Empire. From then, the frontier outline and troop occupation remained stable until AD 260, when the Upper German and Raetian *limes* were abandoned.²⁸²

As a consequence of the Germanic disturbances in the third century the military presence and situation along the Rhine changed. Along the Dutch Rhine forts which had been in use since the AD 40s were abandoned. The legionary camp at Vetera II was also abandoned (c. AD 270) and around AD 280 nearly all the auxiliary camps from Xanten to the North Sea were abandoned.²⁸³ With the military reforms of the Tetrarchy, military establishments along the Rhine underwent a renewal process; new forts were built and many towns were walled.²⁸⁴ The Donau-Iller-Rhein *limes* began under Diocletian as the Upper Rhine had been undefended with the abandonment of the *agri decumates* in AD 260.²⁸⁵ Constantine continued to devote attention to defending the Rhine, establishing more forts along the *limes* as well as its hinterland. The defence of the Cologne-Tongeren road and roads to Cologne, Trier, and Koblenz was also undertaken.²⁸⁶ Julian as Caesar was also responsible for securing the *limes* through efforts at existing sites as well as building additional forts.²⁸⁷ The last concerted military building effort was undertaken by Valentinian I between AD 368-369.²⁸⁸ His efforts ensured continued Roman control over the river and

²⁸¹ Kortüm (1998).

²⁸² Hind (1984); Baatz (2002), 217; Mathisen (2011); Reuter (2012).

²⁸³ The formation of the Gallic Empire adds to the confusion caused by the Germanic incursions: Drinkwater (1987), 215.

²⁸⁴ Nuber (2011), 80-84.

²⁸⁵ Drinkwater (1987), 226-228.

²⁸⁶ Von Petrikovits (1971), 184; Symonds (2008), 208.

²⁸⁷ Ammianus 18.2.4; 17.1.11; Von Petrikovits (1971), 184.

²⁸⁸ Ammianus 28.2.1-4.

helped stabilize the *limes* until the AD 390s when many Germanic incursions successfully penetrated beyond the fortifications, leading to the fall of the Rhine frontier in AD 405.

3.7 Transportation Infrastructure

The development of the region's economy and settlement hierarchy is inextricably linked to its transportation infrastructure. The evolution of pre-existing Iron Age land and riverine routes provided faster and more secure lines of connectivity between regions other than those along the Rhine and the coast, and therefore are important features when considering the development of the region's settlement hierarchy.²⁸⁹

Strabo writing in the first two decades AD described continental Europe (*Ulterior Gallia*) as an area covered by navigable waterways which were easily linked by short distances over land.²⁹⁰ In this regard, the Rhine served as the main artery linked to the hinterland through smaller waterways. Since the riverine systems did not reach everywhere, roads and canals provided supplementary means of transport and were not necessarily as susceptible to volatile seasonal variations. This means that most travel would have been undertaken through a combination of water and land transport.²⁹¹ On the Roman side of the *limes*, the frontier zone needed adequate transportation infrastructure to permit fast and efficient military movement and communication. Many of the region's routes were in fact developed with this purpose in mind.²⁹² In the later period, the army was stationed along major routes in order to secure the lines and hinterland as well as to collect *portoria*.²⁹³

²⁸⁹ More fully, see: Franconi (2014), 32-70.

²⁹⁰ Strabo. *Geo.* 4.1.2.

²⁹¹ Campbell (2012), 215-217; Adams (2012); Franconi (2014), 32; De Boe (1978), Fig. 35.

²⁹² In Britain, the military constructed roads have been referred to as "Britain's first real information revolution": Haynes (2000), 112-113; Woolf (1998), 89.

²⁹³ Franconi (2014), 33, n. 172: Epigraphic evidence of *stationes* collecting the *quadragesima Galliarum* and the *portus Lirensis* is known from several locations on the Rhine (Cologne, Bonn, Koblenz, Bingen, Mainz, Altrip, and Ehl): De Laet (1949), 125-173. Collection was partly overseen by the *beneficarii consulari*: Ott (1995), 139-140. The nature of the *portus Lirensis* is uncertain but it may have been an additional tax charged for the Rhine, which was later added to the *quadragesima Galliarum*: Campbell (2012), 286-287. It is widely believed that the *classis germanica* maintained a series of bases along the Rhine in *Germania Inferior* as it was responsible

As riverine rich environments were not stable, the creation and use of canals enhanced the use of waterways.²⁹⁴ They could provide safer passages than rivers (e.g. Trajan's canal through the Iron Gates of the Danube) or natural canals in river deltas which were subject to sedimentation. The earliest canal along the Rhine was made by Drusus in 12 BC (the *fossa Drusiana*), which was meant to facilitate his campaigns north of the Rhine delta.²⁹⁵ Another structure constructed by Drusus is the *moles*, a dam built at the division of the Nederrijn and the Waal rivers near Rijnwaarden, resulting in a larger volume of water moving north along the Nederrijn. The *moles* was so instrumental that when it was destroyed by Civilis during the Batavian revolt it, it caused significant flood damage.²⁹⁶ Under Claudius the *fossa Corbulonis*, built by general Corbulo, connected Niderrijn to the Maas.²⁹⁷

Military harbours have been found at Velsen and Haltern whilst civilian harbours have been located at Xanten, Mainz, and Cologne.²⁹⁸ They have all provided insight into the shipping, loading, and unloading processes. Particularly noteworthy is the use of wood to reinforce the river banks and to build piers (Fig. 3.21).²⁹⁹ Numerous ships have also been found, particular in the Dutch Rhine delta area, where the soil is particularly favourable preserving wood. The most common type of ship found is the barge which was generally a long flat ship with the ability to navigate in shallow rivers. These boats measured 2.3-3 meters wide and 6.5-40 meters long, with some load capacities estimated at 85 and 110 tons.³⁰⁰ It was believed in the past that these boats were built only for a single one-way journey, being too simple to manage an

for frontier control: Konen (2000), 180, 465-466; Starr (1993), 147, 150; Viereck (1996), 254-255. Against this: Rummel (2008), 144-146.

²⁹⁴ Franconi (2013), 708-9; Franconi (2014): 34-41; Henderikx (1986), map 2. Influential factors include: temperature, precipitation, and the paleoenvironment (esp. the lack of pre-industrial canalisation).

²⁹⁵ Suet. *Claud.* 1.2; Tac. *Ann.* 2.8.

²⁹⁶ Tac. *Hist.* 5.19; Wells (1972), 112.

²⁹⁷ It is possible that Corbulo's canal replaced an earlier canal from Caligula's reign: Kort and Raczynski-Henk (2014), 59-60; Hettema (1951), 242-257; Tac. *Ann.* 11.20; Dio 61.30.6.

²⁹⁸ For a review of all possible naval sites along the Rhine: Rummel (2008), 146-206.

²⁹⁹ For more: Franconi (2014), 44-46.

³⁰⁰ Bockius (2000), 445-446, 482; Vos *et al.* (2011), 104-105.

upstream journey.³⁰¹ Although sails were used, this would have been insufficient to allow the boat to navigate upstream. However, the recently excavated boats at Woerden 7 and De Meern have demonstrated that barges had a sail as well as rowing benches and oars (Fig. 3.22).³⁰² Other options to propel boats include punting and towing, but archaeological evidence for these options is lacking and is based on epigraphic evidence (Fig. 3.23).³⁰³ Military boats were similar to barges with the exception that they had banks of oars,³⁰⁴ while the other kinds of boats were dugout canoes made from logs, known as *Einbäumer* (Fig. 3.24).³⁰⁵

While waterways provided a useful method to move, overland travel was equally necessary. The general location and routes of Roman roads in the region are generally known from a combination of milestones, itineraries, the Peutinger Table, and excavated road segments. Roads often followed river courses (such as along the Rhine and Moselle) but they also cut through the landscape which was inaccessible via waterways. As was the case with the earliest waterway development, roads were initially established and developed for military purposes.³⁰⁶ The most direct route from the Mediterranean to the region was the road from Marseille to Cologne (1,170 km long), with a series of major cities established alongside it. Stretching east to west was the road along the Rhine connecting Augst in the south to Voorburg in the north, with important Augustan military sites established along it (e.g. Mainz, Neuss, Xanten, and Nijmegen).³⁰⁷ The *Via Belgica* connected Cologne with Tongeren and continued to the English Channel. It was established during the Augustan

³⁰¹ Vos *et al.* (2011), 111-113.

³⁰² Vos *et al.* (2011), 111-113. Having found this at Woerden 7, similar pieces have now been recognized at the Zwammerdam 6 ship.

³⁰³ Ellmers (1978), 10-11.

³⁰⁴ Bockius (2006; 2002a; 2002b)

³⁰⁵ E.g. at Pommeroeul, Belgium: De Boe (1978). A summary of log boats found in Bavaria: Weski (2009). Other types of boats have been depicted in the epigraphic evidence. For more comparing archaeological with epigraphic evidence: Ellmers (1969); Höckmann (1986); Höckmann (1998); Bockius (2000).

³⁰⁶ Strabo credits the development of the road system to Marcus Agrippa when he was governor of Gaul. However, it is unclear which governorship period he referred to (39-37 BC or 19-17 BC). For a concise summary of the debate: Kemmers (2006), 64-65.

³⁰⁷ Schönberger (1969), 144, 156.

period but later served as a fortified line against Germanic incursions into the province.³⁰⁸

Archaeological publications have shown that many Roman artefacts travelled beyond the Empire,³⁰⁹ but ambiguity still exists as to how and by whom these objects were transported. Much literature concerned with Roman imports into *Germania magna* still, uncritically, refer to the amber-trade route.³¹⁰ Given the high transportation cost overland within the Empire,³¹¹ and the considerable volume of amber that was supposedly traded,³¹² it is reasonable to expect this principle to transfer into a world with far less developed roads. Roads certainly had their place and function in *barbaricum*, but whether used as the route for long-distance trade is problematic.³¹³ Harbours too had an important role for long-distance trade. Nearly all of the largest settlements in *barbaricum* (3.2) had some sort of *Ufermarkt* (embankment market), that could accommodate some ships.³¹⁴ The major rivers will also have served as direct and indirect routes for trade with various regions.³¹⁵ Additionally, there is pictorial evidence that Roman ships travelled to the mouth of the Weser River (Fig. 3.25).³¹⁶ Therefore, as was the case within the Empire, transportation will have occurred overland and by waterways, but the extent to which infrastructure was available greatly differed.

3.8 Conclusion

The purpose of this chapter has been to provide an overview of the various settlement types, in order to identify differences and similarities in settlement

³⁰⁸ Symonds (2008); Von Petrikovits (1971), 188-189; Franconi (2014), 51-53.

³⁰⁹ E.g. *Corpus der römischen Funde im europäischen Barbaricum*.

³¹⁰ Ellmers (1997), 1.

³¹¹ Yeo (1946); Adams (2012), 220-223.

³¹² Pliny. *NH*. 37.45. As well as the large volume of primarily metal vessels to the region.

³¹³ Note the absence of roads in discussing transportation methods in *barbaricum*: Todd (1980), 17-18. A road 'network' already existed in the Iron Age period; Tac. *Germ.* 41; Timpe (1985), 260-263.

³¹⁴ Ellmers (1997), 2. Centres of commerce (*commercias*) have been described along the Baltic coast: Pliny. *NH*. 37.45.

³¹⁵ Höckmann (1985), 136-143; Bursche (2008), 153. Ancient shipping coordinates for *Germania magna*: Ptol. *Geog.* 2.11. For the Rhine's importance at an early date: Caes. *BG.* 4.3;

³¹⁶ Ellmers (1997), 2.

organisation within and beyond the Empire. Above all, urbanisation and the development of large(r) nucleated settlements was largely absent in *barbaricum*. It is clear that settlements in *barbaricum* were significantly smaller than within the Empire and the secondary agglomerations north of the *limes* should, in nearly all instances, be regarded as hamlets. However, the settlements in the study-region, whether in the form of villae, rural sanctuaries, vici, or individual farmsteads, developed along a similar trajectory. Throughout the entire study-region, a peak in settlement development can be noted in the second to mid-third century. Within the Empire, the number of villae, rural sanctuaries, vici and urban centres is at its greatest then. Additionally, the size of single-standing farmhouses within and beyond the Empire increases, as does the general density of hamlet settlements in *barbaricum*.

Therefore, despite differences in geography and socio-political regimes, people on either side of the *limes* were subjected to similar trajectories. One factor will have been the development and availability of the transportation infrastructure. In the study-region, any transportation which may have involved waterways will also have included a portion of the journey overland. Even though within the Empire much of the transportation infrastructure owed its origin to the military and its needs, Rome fostered civilian connectivity through the construction of bridges, canals, ports, and roads.³¹⁷ The effect this development had beyond the Empire should not be understated. The expansion of shipping routes and lanes along the Rhine and North Sea coastlines can explain why an intensification of inhabitation and settlement south of the *limes* was reciprocated in the north. Furthermore, the construction of the *moles* at the division of the Nederrijn and the Waal rivers near Rijnwaarden resulted in a large volume of water moving north. It is therefore conceivable that distributaries branching off the Nederrijn into *Germania magna* increased in

³¹⁷ Horden and Purcell (2000), 133-143.

volume, facilitating (shipping) movement from beyond the *limes* into the Rhine.³¹⁸ This was of course not the only contributing factor.

The differences noted in farmstead settlement patterns, may reflect differences in geography and socio-economic-cultural regimes. Four distinctive zones of indigenous building traditions were identified. The farmhouses in zones 2-4, despite differing in outward appearance, shared the similar feature that their byre portions composed more than 33%. In zone 1, the only zone completely within the Empire, the byre measured 25-33% signifying possible differences in farmstead utility and socio-cultural values. The influence of geographic conditions on socio-economic-cultural regimes is well noted in the Batavian *civitas* (zone 3). Despite being situated within the Empire the Roman villa was virtually absent. The mix of farmstead types may be interpreted as Roman influence (a.k.a. Romanisation) penetrating part of the indigenous socio-cultural regime,³¹⁹ but insufficiently to dislodge geographically tied values. This was also noted in west Flanders (zone 2). In areas where little pre-Roman occupation was present (e.g. around Regensburg in *Raetia*) and geographical conditions were favourable there was little resistance towards the development of a Romanised villa-landscape.

Each zone of indigenous farmstead style could therefore be understood as a region of socio-economic-cultural regimes entrenched by the physical environment. The study-region can therefore be understood to be composed of micro-regions interacting with one another. The reason behind their interaction can be regarded as a natural consequence of “both fertility and connectivity [...] as interlinked strategies for the avoidance of risk and insurance against uncertainty of livelihood”.³²⁰ Within the Empire, the role of the army establishing early foundations for large(r) nucleated markets and (re-)

³¹⁸ It has been noted that across all the streams stemming from *Germania magna* in west of the Dutch river area a Roman military site has been built: Graafstal (forthcoming). The Frisians were able to attack Rome’s winter camp via the sea: Tac. *Ann.* 4.15.

³¹⁹ Roman architectural features also penetrated beyond the Empire: Steidl (2000), 104.

³²⁰ Horden and Purcell (2000), 392.

distribution networks had profound and long-lasting effects.³²¹ However, equally important will be the role and development of nucleated settlements as market centres in *barbaricum*. By considering coin distribution in the study-region one can begin to consider whether market centres in *barbaricum* developed as a response to the changes within the Empire and how rooted the socio-economic-cultural regimes were. It will also provide an opportunity to further assess the degree to which developments outside the Empire were integrated to those within. In the conclusion chapter, the use of coins in the various settlement types covered in this chapter will be discussed in order to further assess monetary integration.

³²¹ E.g. Titelberg is replaced as the main city of the region by Trier, and remained smaller than Trier during and after the Roman period.

4 The Numismatic Dataset

The purpose of this chapter is to serve as an introduction to the numismatic dataset which will allow one to explore mean values of coin-finds in the study-region. This will establish an overall profile for the entire dataset and permit one to assess the coin-find profile over time. On the whole, the patterns observed can be tied to general monetary history and provide a basis for future larger regional studies elsewhere in the Empire. This chapter may also allow one to examine in subsequent chapters the extent to which regional supply and circulation were affected by chronological events, geography, and users of the coins. However, it is important to note that the data presented here are from the database and do not take the find-spot into consideration, unless otherwise noted.

4.1 Methodology

As identified earlier (2.3), this thesis faced numerous challenges to collect all the necessary data. Various sources were consulted which employed different methodological approaches and stopped collecting data at different dates. Occasionally there were overlaps in the datasets which needed to be checked and removed manually. The FMR series provided the majority of the data for Luxembourg and Germany, while other sources were used for Belgium and The Netherlands. Furthermore, awareness of the different categories of coin-finds is vital to comprehend what the data actually represent. Coin-finds have been categorized broadly as being 'single', 'hoard' and 'context' finds and it is necessary to be aware that they are all recovered and created in a variety of processes.

4.1.1 Single Coin-finds

The majority of coin-finds (both in terms of find-spots and quantity) are identified as 'single' finds. This is especially the case since metal detectors have become increasingly utilized and amateur metal detector users have begun

collaborating with archaeologists and national institutions by offering information regarding their finds. This has radically changed the amount of data available for numismatic studies.³²² Despite the benefits of this development, limitations exist as well. The quality of data and the thoroughness of the metal detector user will be influenced by the quality of the machine, by the terrain covered (accessibility), the experience of the user and their mentality; i.e. metal detector users will often focus on areas that have already proven to be fruitful for metal finds, producing a skewed dataset, focused on areas with known finds.³²³ Some metal detector users can also be inclined to keep high denomination coins (i.e. gold and silver) hidden and only report low denominations (bronze).³²⁴ Furthermore, there is no consensus how to record and consider these kinds of finds.³²⁵ Therefore, there are several possible approaches. A study may decide to ignore single finds as many are metal detector finds. Alternatively, they may be included for statistical and geographical coverage purposes, despite lacking a precise archaeological context. Since casual single losses when utilized correctly can provide an accurate and random sample of non-recovery, this study will utilize them.³²⁶ This study has also identified these kinds of coin-finds as “non-hoarded” rather than using the extensive glossary of terms which exists to identify a single coin.³²⁷

³²² Walton (2012). In Belgium, there is a strong distrust between amateur metal detectorists and academics/museum administration due to the legal situation: Van Heesch (2002), 37. For a debate about the benefits of metal detectorists and legal implications (in The Netherlands): Bos (1990); Van der Zwaal (1990); Willems (1990); Hasselt (1991); Zeiler (1991); Zeiler (1989).

³²³ Walton (2012), 28-29. A review of the PAS data and its biases: Robbins (2013).

³²⁴ For a comparison of excavated and amateur coin collections from Alphen aan den Rijn: Kemmers (2008), 46-49. It is rumoured that volunteers using metal detectors at the official excavations on the Hunerberg only reported bronze coins: Kemmers (2006), 24.

³²⁵ Within the PAS there is no consensus on what metal-detected coins are recorded in the system and how this should be done: Walton (2012), 29-30.

³²⁶ Wigg (2009b), 122. An attempt to test this has been done using modern coins in Australia and England: Frazer and Van der Touw (2010); Newton (2006). For estimates of survival rates of certain types of ancient coins: Duncan-Jones (1994), 170-171.

³²⁷ E.g. “site-find”, “single-find”, or “stray-find”.

4.1.2 Hoards

Hoards are regularly dealt with separately and they are extremely useful as they are a record of deliberate and, most commonly, isolated deposits. They are sometimes complemented by an informative archaeological context but even without a specific archaeological context, hoards provide their own closed context;³²⁸ they offer a wealth of information, ranging from possible closing dates for certain coin series to different uses of coinage. When compared to similar hoards, hoards can demonstrate the coins circulating at the time of their deposition, through identification of the *terminus post quem* dates (c.f. 8).³²⁹ However, even with an archaeological context historians are left to speculate the reason for hoarding the material and its deposition. When an increase in non-recovery of hoards or hoarding activity occurs, overarching explanations are most often sought (e.g. wars, epidemics, and intrinsic metal debasement).³³⁰ In addition, as there is debate whether a single gold coin should be regarded a hoard, careful deliberation and thought is necessary when approaching gold coinage and hoards (4.2).³³¹

4.1.3 Archaeology and 'Context' Finds

The location of a coin-find should reveal some information about its context. Most commonly, coins have been used to inform us about the site/context that they were found in, especially for general dating purposes (c.f. 8).³³² In theory,

³²⁸ Aarts (2000), 19.

³²⁹ For more: Howgego (1995), esp. 88-89. A hoard studied by itself cannot accurately represent which coins were in circulation at the time as coins may have been added over a long period of time: Crawford (1969), 77. An attempt to establish criteria to determine the time between hoarding and deposition: Fischer (1968). A new model of hoard circulation periods: Creighton (2014).

³³⁰ In favour of an explanation of 'insecurity': Crawford (1969); Duncan-Jones (1994), 77-78, 82-85. It was possible for someone to bury a hoard and forget where they buried it: *Dig.* 41.2.44.

³³¹ E.g. Lorient (2003); Van Heesch (2014); Callu (1983); Bland and Lorient (2010); Kent (1956); Howgego (2015). The compilers of corpus of hoards in France consider single aurei as hoards: Lorient and Nony (1982), esp. 8.

³³² Using coins exclusively to date the context or site is dangerous as coins can be found anywhere and in disturbed context. E.g. An antoninianus struck in honour of Divus Claudius Gothicus was found in the upper layers of a sewer system constructed in the late-Flavian period in the *canabae legionis* at Nijmegen: Kemmers (2006), 124 note 451.

the site should also be able to inform us about the coin.³³³ Contexts can attempt to answer why a coin was located in a specific context. The exact location of a coin on a specific site type and the circumstances that it was found in can be crucial to determine the precise function of the coin at the time of deposition/loss.³³⁴ If a coin is found in a grave, a significantly different interpretation is derived whether the coin was found on the eyes or mouth of the deceased, or simply alongside the body.³³⁵ Likewise, two similar coins found at opposite ends of a settlement may have been deposited/lost through different processes and use. Whether coins have been intentionally placed or accidentally lost will also be significant in determining its purpose. Furthermore, the date that the coin was 'deposited' will reveal changes in the use and function of coinage. In archaeology, it is commonly assumed that recovered coins are the result of accidental loss (hence the term 'coin loss' in numismatic literature) rather than an intentional deposit.³³⁶ However, evidence from Iron Age sites has put an ever-stronger argument against this and that in some contexts some coins were deliberately deposited.³³⁷ It is clear that the archaeological context in which Roman coins are found is significant and requires thorough consideration.³³⁸ Since archaeology is an imprecise science when it comes to interpretation there is always some subjectivity involved. This subjectivity stems primarily from our lack of knowledge. Haselgrove has provided a very concise example for the Iron Age that is equally pertinent; "many hoards were buried near springs and sources, which [...] evidence implies were often sacred in character. Does this mean, however, that they should be interpreted as offerings to the relevant deities, or were they merely placed there for safe keeping by those gods, but never recovered?"³³⁹ Another issue is whether finds are found in their original context or have been found

³³³ An entire debate about 'Coins in Context' has recently been published: Von Kaenel and Kemmers (2009).

³³⁴ Haselgrove (2005), 129.

³³⁵ Such as Charon's obol. As a common anthropological rite: Bursche (2002), 5.

³³⁶ Walton (2012), 27.

³³⁷ Haselgrove (2005), 130.

³³⁸ E.g. Kemmers (2006).

³³⁹ Haselgrove (2005), 131.

moved from elsewhere. The loss of original context may date from the modern era caused by ploughing, geomorphological disturbances, animal or human interference.³⁴⁰ However, the process of human interference may have occurred in the past, as has been demonstrated on long-lived sites.³⁴¹ It is therefore necessary to consider contextual information available for sites and the coins themselves when available in order to assess the possibility of residuality.³⁴² In this thesis, these kinds of coin-finds will be included within the category of “non-hoarded” as exact stratigraphic contexts were not investigated.

4.1.4 Statistical and Numerical Analysis Techniques

Several mechanisms have been employed and specifically designed to study numismatics. This study will employ those developed by Reece and more recently adapted by Walton, alongside the traditional numerical representation of coin-finds (i.e. percentage and raw numbers).³⁴³ Reece originally developed a mechanism which analysed coins with a *per mill* value. This technique requires the total number of coins in each period to be divided by the total number of coins in the sample and then multiplied by 1000. This can identify larger regional fluctuations in overall coin presence per issue period. Walton has further developed this to create denominational means, which she has identified as the most useful manner to compare regional and national denominational compositions.³⁴⁴ This technique requires the total number of each denomination for each period, to be divided by the total number of coins in the sample, and then multiplied by 1000.

The matter of which numismatic issue periods to use is essential in a study with such a large spatial and temporal scope. Issue periods provide a system of dating coins by issuing authority within a single period. Above all, it

³⁴⁰ Haselgrove (1985); Taylor (2000).

³⁴¹ Haselgrove (1987); Butcher (2003), 29-31.

³⁴² Butcher (2003), esp. 27-31.

³⁴³ Reece (2002), 147; Walton (2012), 50. Another increasingly utilized method is the use of contextual archaeology, where coins are compared by their stratigraphic context. E.g. Haselgrove (2005); Martin (2015).

³⁴⁴ Walton (2012), 50.

enables efficient statistical analysis of a large set of data. In Britain, the most commonly referenced periods are Reece periods (periods based on Reece's configuration).³⁴⁵ However, it would be problematic to employ Reece periods in this study as they have been specifically formed with regard to the British coin-find situation.³⁴⁶ Casey periods offer an alternative but are also unsuitable as it too is shaped based on the British coin-find situation.³⁴⁷ Others have also formed and adjusted their own issue periods but these have not been as widely used, such as Aarts or Brickstock.³⁴⁸ Brickstock's attempt to take copies and barbarous radiates into account is commendable but ultimately difficult to implement. Aarts' periods are based on Reece's but have been adjusted to better reflect the continental situation. Therefore, in order to explore mean values of coin-finds and regional profiles, this study will utilize the overall periods implemented by Aarts but they have in some instances been slightly adjusted by a couple of years in order to better reflect the numismatic and chronological developments on the continent (Table 4.1). However, when necessary, different resolutions of periods will be applied in order to better assess distribution patterns. For ease of access, a copy of Table 4.1 has been provided on the last page of the dissertation.

³⁴⁵ Walton (2012), 27.

³⁴⁶ Reece Period 1 includes all pre-Claudian coinage (i.e. Iron Age, Augustus, Tiberius, Caligula).

³⁴⁷ Casey (1986), 90.

³⁴⁸ Aarts (2000); Brickstock (2004).

IP	Period/Reign
1	Celtic
2	Republic
3	27 BC – 14 AD
4	14-41
5	41-54
6	54-68
7	69-96
8	96-117
9	117-138
10	138-161
11	161-180
12	180-192
13	193-222
14	222-238
15	238-260
16	260-275
17	275-294
18	294-318
19	318-330
20	330-348
21	348-364
22	364-378
23	378-388
24	388-403
25	Post 403

Table 4.1: Issue Periods used in this study.

In order to assign coins to issue periods, Aarts' approach of assigning coins with date ranges to a single year by utilizing their mid-point will not be followed.³⁴⁹ While this approach makes the data 'cleaner' and greatly simplifies calculations, the method is problematic as it will ultimately skew the data. Some coins will be given a typical range or identification when uncertain and will

³⁴⁹ Aarts following Ryan: Ryan (1989).

therefore always be assigned the same issue period.³⁵⁰ Regrettably, there is no ‘clean’ way to assign imprecisely attributed coins. One could attribute coins with two issue periods equally over the relevant periods, which greatly eases calculations but may flatten the precise data. In section 4.3.1, the data were considered on a century basis. Subsequent tests only utilised coins which could be attributed to one or a reasonable range of issue periods (e.g. Constantinian Dynasty). Coins which were attributed to more than one issue period were divided proportionally according to the distribution of coins attributed to a single issue period. This therefore allows one to consider some of the imprecise data without creating too much statistical noise and permits a better comparison of disparate periods.

Unless otherwise specified, no distinction was made between ‘normal’ official coins and ‘abnormal’ coins. This has been done as there is a lack of consensus about how to regard these coins.³⁵¹ Doubtless, the Roman government was aware of these coins and one can point to the high number of imitations and forgeries in Britain during the Claudian period, and that they were found at Camulodunum suggests their acceptance.³⁵² The outcome is that all coins which were intended to be Roman coins are included as Roman coins.³⁵³ Pre- and post-Roman coinage when included in the original datasets has been incorporated into the database, but will not be thoroughly investigated. Cut coins have also been included since they formed part of available coin pool. However, unless specified, fractionally cut coins have been

³⁵⁰ E.g. All “Julio-Claudian” coins will fall in the same issue period, causing an artificial peak. The same conclusion was derived when evidence for ancient shipwrecks using mid-points was reviewed. Ancient shipwrecks: Parker (1992). Revised: Wilson (2011b).

³⁵¹ All plated coins regarded as forgeries: Crawford (1974), 560-566. For the laws on counterfeiting: King (1996). For a summary of the debate: Vons (1983). On different legal statuses: Grierson (1956).

³⁵² Boon (1988); Sutherland (1935); Crawford (1982). 50% of Republican and later coins are plated at Neuss, which Chantaine considers generally to originate from the central mint: Chantaine (1982), 40. On the Hunerberg the majority of pre-Augustan silver plated coins belong to the civil war period: Kemmers (2006), 35, n. 47. The high quality of some copies in Northwest Gaul and Germany has led some to attribute these coins to Gallic mints of a semi-official nature: Sutherland (1984), 114-115.

³⁵³ This is slightly problematic as copies are not necessarily contemporaneous with what they copy.

counted as whole coins to simplify calculations. This has been done as cut coinage has often been recorded as ‘fragment’. When the denomination of a coin was unknown (e.g. “Augustan coin”) its denomination has been recorded as “?” and when the denomination of a coin was unspecified (e.g. ‘large bronze’) this was then simply expressed as AE, AR, or AV to reflect its metal content.³⁵⁴

4.2 Exploring and Using the Database

This section will briefly explore some of the basic statistics of the database as this is the first time that it has been possible to explore the published data from the *Fundmünzen* series along with other datasets. Above all, it is necessary to provide a *caveat* that due to the process of data collection, errors and omissions are likely to have occurred but due to control checks they have been kept to a minimum.³⁵⁵ Errors in the database are also not always a consequence of the final data collection process undertaken here, but may have occurred at any stage; from a coin’s identification, the first publication, to the compilers and editors of the *Fundmünzen* volumes and other regional datasets.³⁵⁶ It is therefore necessary to remember that as the database is used it will incrementally improve leading to some minor statistical discrepancies over the course of the written piece. When such discrepancies became significant to the overall picture, tables and numbers were amended.

The dataset sources and collection methodology have already been discussed (2.3). The numismatic database has a total of 602,433 recorded coins from Luxembourg, Belgium, The Netherlands, and Germany.³⁵⁷ Of these, nearly

³⁵⁴ The database has kept the original denomination designations.

³⁵⁵ E.g. During the OCR process some information was lost. E.g. The identification of Gallienus’ coinage as being joint or sole rule was lost. When necessary, the data were revised to include such information.

³⁵⁶ E.g. Whilst performing a check, an error published in FMRD 2.1 (1086) was noted: A coin of Domitius Domitianus was assigned the year 270 and the coin denomination of “An” (=Antoninianus). When checking the original publication, it appears that the original coin was a “AE” of Domitius Domitianus, meaning that during the incorporation into FMRD the coin was inaccurately recorded.

³⁵⁷ It was not possible to include the Danish dataset as its format differed from the other sources. The Danish data were kept separately in its original Excel format (5,809 entries).

two-thirds are situated in Germany (Fig. 4.1; Table 4.2). However impressive the total quantity of coins recorded, it is important to note that the quality of data for each country (and source in the case of multiple sources for the same country) greatly differs and therefore affects the kind of tests which can be performed (Table 4.3).

Country	Quantity
Germany	390,630
Belgium	114,428
Luxembourg	62,234
The Netherlands	35,141
Total	602,433

Table 4.2: Quantity of coins/country.

Country	With Mints	With Reverse Type or Reference
Germany	46%	50%
Belgium	0.18%	0.67%
Luxembourg	54%	83%
Netherlands	43%	39%

Table 4.3: Coins with mints and reverse type or reference recorded.

In the case of Belgium, almost no mints or coin-type references have been included. Even accounting for the unincorporated mint data from Van Heesch's dataset the overwhelming majority of Roman coins in Belgium do not have any information regarding their mint or reverse type or coin reference.³⁵⁸ In the case of Germany approximately half of the coins were comprehensively recorded. Mint recording of coin-finds in Luxembourg and The Netherlands also match up along similar lines to the data from Germany. The reason for a spectacularly high quantity of coins in Luxembourg with a reverse type or reference recorded is difficult to fully comprehend, but appears to correlate with the high number of Late Roman bronze coins which have vague reverse descriptions attributed (e.g. "Salus" or "Victoria"). It is likely that during the identification processes in Luxembourg emphasis was placed on providing some sort of attribution to as many coins as possible, which can be seen by the many coin references

³⁵⁸ Van Heesch (1998).

identified as “illegible” or “corroded”. In the case of The Netherlands, the lower number of identified coin-types may be related to the smaller operational scale, which is further exacerbated by budgetary cuts enforced by the Dutch government.³⁵⁹ This is exemplified best by the extremely high number of coins without a reference type (18,733) excluding references such as “Undeterminable” or references with notes such as “Revise”.

As has been discussed above, the coin-find type can be significant for its interpretation. In the case of the database nearly half of the coins (46%) have been recorded as part of a hoard (Table 4.4). This number also includes any finds which have tentatively been identified as hoards (Fig. 4.2).³⁶⁰

Country	Coins in Hoards	Hoards
The Netherlands	8,028	114
Luxembourg	28,441	424
Belgium	104,349	272
Germany	139,972	695
Total	280,790	1505

Table 4.4: Number of hoards and coins in hoards.

Country	Total Coins	Hoard Coins	Non-Hoard Coins	Percentage of Hoard Coins
The Netherlands	35,141	8,028	27,113	22.8%
Luxembourg	62,234	28,441	33,793	45.7%
Belgium	114,428	104,349	10,079	91.2%
Germany	390,630	139,972	250,658	35.8%
Total	602,433	280,790	321,643	46.6%

Table 4.5: Hoard vs. non-hoard coin totals.

However, the data from Belgium greatly distort the proportion of hoard to non-hoarded coins as very few non-hoarded coins have been digitally recorded for Belgium but an entire volume of hoards has been digitized (Table 4.5).³⁶¹ In the other national datasets (Germany, Luxembourg, and The Netherlands) a less biased overall picture can be found (av. 36.1%). The difference between these countries will be influenced by the recording process, geographical size and

³⁵⁹ Beliën (2009). As of 2011 only three people contribute to the maintenance and records of NUMIS (Paul Belien, Jan Pelsdonk, and Arent Pol): Pelsdonk (2011).

³⁶⁰ E.g. “Schatzfund oder Komplexfund”. For a recent review of “hoard” identification since the use of metal detectorists: Horsnæs (2013), 43-45.

³⁶¹ Thirion (1967).

more significantly, their relationship with the Roman Empire (completely vs. partially within the Empire).

Country	Number Gold Coin	Percentage
Luxembourg	84	3.4%
Belgium	176	7.1%
The Netherlands	535	21.6%
Germany	1678	67.8%
Total	2473	99.9%

Table 4.6: Non-hoarded gold finds.

As has been mentioned, the interpretation of single gold finds is debatable (4.1.3). In the database, single gold coin-finds have been recorded as single finds but this decision does not preclude their functional equivalence to hoards. They have primarily been recorded as single finds so that it will be easier to query for gold coins independently from hoards and consider them separately if necessary. A total of 2,196 gold coins (including Iron Age gold coins such as staters but excluding data entered from Pfahl) have been found outside of hoards (Table 4.6).³⁶² Their national distribution is clearly uneven and only slightly changes when hoard gold coins are also considered (Table 4.7). Therefore, the explanation behind their national distribution cannot be attributed to data collection biases.

Country	Number Gold Coin	Percentage
Luxembourg	239	4.9%
Belgium	640	13.1%
The Netherlands	601	12.3%
Germany	3,413	69.8%
Total	4,893	100.0%

Table 4.7: Total gold coin finds.

It is imperative to recall that due to the lack of any long-term national schemes of recording such as the Portable Antiquities Scheme (PAS) in Britain, that the data collected in the database only provides snapshot of a sample from various

³⁶² In the case coins from The Netherlands, 208 triquetrum staters were removed (although they do sometimes contain a small quantity of gold or are gilded): Aarts and Roymans (2009), 13. Data Pfahl: Pfahl (2013).

different points in time.³⁶³ The data from The Netherlands are the most up-to-date.³⁶⁴ The hoard data of Belgium date to Thirion's publication in 1967 and the single-coin-finds date to the mid- to late 1990s.³⁶⁵ The data from the German *Fundmünzen* date differently depending on the Bundesland and the administrative unit therein, while the latest data from Luxembourg date to the mid-1990s (Table 4.8; Fig. 4.3). Coins which have been published since have not been included as the dataset is designed to act only as a large and fairly comprehensive overview of the coin-finds and not to be all-inclusive. Several minor updates occurred but only where practical and necessary (2.3).

On a final note, it is also necessary to consider whether the data are a fair reflection of coins in use and deposited over time and space. Although the corpora utilised to create the database relied on a variety of sources to differing degrees, many of the same types of sources were utilised. All the corpora utilised gathered some of their data from antiquarian and grey literature. In the case of antiquarian literature, we can be fairly confident that the coins were relatively well identified as ancient numismatics has been studied in detail from the Renaissance onwards. In the case of numismatics, the amateur community has often had very knowledgeable and active members (e.g. De Bast).

³⁶³ Denmark does have a similar treasure act as Britain and The Netherlands had a similar system as the PAS dedicated exclusively to coin-finds.

³⁶⁴ Data received mid-2014, but not fully up-to-date due to staff shortages. Data from Denmark are equally up to date, but has not been included in the database.

³⁶⁵ Van Heesch (1998); Aarts (2000).

Country/	Latest Source	Find-Type
Belgium	1967	Hoard
Belgium	Mid 1990s	Single-Finds
The Netherlands	c. 2014	All
Luxembourg	1996	All
Germany/ Bayern /Oberbayern	1960	All
Germany/ Bayern /Niederbayern	1970	All
Germany/ Bayern /Oberpfalz	1978	All
Germany/ Bayern /Oberfranken	1978	All
Germany/ Bayern /Mittelfranken	1965	All
Germany/ Bayern /Unterfranken	1975	All
Germany/ Bayern /Schwaben	1962	All
Germany/ Baden-Württemberg /Nordbaden	1980	All
Germany/ Baden-Württemberg /Südbaden	1980	All
Germany/ Baden-Württemberg /Südwestfalen-Hohenzollern	1993	All
Germany/ Baden-Württemberg /Nordwestfalen	1993	All
Germany/ Saarland	1962	All
Germany/ Rheinland-Pfalz /Rheinhausen	2010	All
Germany/ Rheinland-Pfalz /Stadt Mainz	2006	All
Germany/ Rheinland-Pfalz /Pfalz	1965	All
Germany/ Rheinland-Pfalz /Stadt Trier	2008	All
Germany/ Rheinland-Pfalz /Koblenz: Der Martberg bei Pommern I	2005	All
Germany/ Rheinland-Pfalz /Montabaur	1985	All
Germany/ Hessen /Wiesbaden	1994	All
Germany/ Hessen /Darmstadt	1989	All
Germany/ Hessen /Kassel	2003	All
Germany/ Nordrhein-Westfalen /Stadt Köln	1984	All
Germany/ Nordrhein-Westfalen /Aachen	2010	All
Germany/ Nordrhein-Westfalen /Düsseldorf: Krefeld-Gellep	2011	All
Germany/ Nordrhein-Westfalen /Düsseldorf: Stadt Neuss	2006	All
Germany/ Nordrhein-Westfalen /Münster	1971	All
Germany/ Nordrhein-Westfalen /Arnsberg	1973	All
Germany/ Nordrhein-Westfalen /Detmold	1973	All
Germany/ Niedersachsen	1988	All
Germany/ Bremen	1988	All
Germany/ Schleswig Holstein	1994	All
Germany/ Hamburg	1994	All
Germany/ Sachsen	1997	All
Germany/ Brandenburg	1997	All
Germany/ Berlin	1997	All
Germany/ Mecklenburg-Vorpommern	1997	All
Germany/ Thüringen	2003	All
Germany/ Sachsen-Anhalt	2003	All

Table 4.8: Terminal dates for data collection by region and find-type.

Furthermore, grey literature is often overlooked and sometimes considered irrelevant or ill-informed, but this does not need to be the case with numismatics.³⁶⁶ Data were also collected from excavated sites of a varying nature (e.g. religious, military, civilian, etc), and these are spread over time, thereby also utilising excavated data which were subject to different excavation and recording techniques, including the increasing use of a metal detector. Furthermore, the corpora also collected unpublished data from varying sources such as from private coin collectors and museum inventories. Coin-finds which were subject to the metal detector have also been included to varying degrees. In The Netherlands a large portion of the coin-finds in the database were gathered as part of the NUMIS scheme, which managed the efforts of amateurs. Elsewhere, even though prohibited, many of the surface finds were obtained through the use of the metal detector and metal detectorists reported the finds in *bona fide* to local authorities or museums.³⁶⁷ As the data utilized here come from nearly all possible sources and include a statistically large number of coins, the overall patterns observed will, on the whole, be reflective of coin loss/deposition in the ancient world. However, it must be borne in mind that the way in which coins were deposited was not random and patterns can be observed which are intrinsic to all coinages.³⁶⁸ Hence, coin-finds are often proportional to the volume of coinage originally supplied to the region, which is presumably one of the reasons why gold coinage is on the whole rarer than silver,³⁶⁹ which is in turn rarer than low denominational coinage. Coin-finds will also reflect in some way different patterns of value,³⁷⁰ use, circulation, and deliberate deposition, as otherwise the entire study-region would be homogenous or nearly homogenous (accounting for different recording techniques). On a final note, the difference in coin composition of hoards and

³⁶⁶ Van Heesch (1998), 18. Unpublished rescue archaeology can be crucial to shaping our understanding of the ancient landscape. See the Rural Settlement of Roman Britain project: Fulford and Holbrook (2015).

³⁶⁷ Van Heesch (1998), 19.

³⁶⁸ Casey (1986), 69; Walton (2012), 56.

³⁶⁹ People took care not to lose high valued coins.

³⁷⁰ Butcher (2003), 21.

non-hoarded coin-finds is evident and although they can never be combined together, both can serve as a corrective to one another.

4.3 Exploring Mean Profiles

The previous section outlined some of the key statistics along with some of the constraints and robustness of the dataset. In this section, several tests are undertaken in order to identify mean profiles. To begin, a breakdown by century of the dataset will be presented. This will then be compared to the imprecisely identified coins of each century so that one can better recognize periods during which coins have been generally less well recorded in the database. The results from these tests will be then utilized in order to develop an overall mean profile.

4.3.1 Exploring Century Profiles

Nearly all studies utilizing vast amounts of numismatic data tend to disregard coins which could not be well attributed.³⁷¹ The decision to approach imprecisely identified coins in such a manner is entirely understandable. In many cases the coins are too numerous to review personally and it is questionable whether many coins could be better attributed due to their condition. In other cases, the coins simply have not been recorded to a high level of detail to begin with. Nevertheless, an attempt should be made to at least consider these coins when analysing mean profiles as it is unclear whether these coins would make a statistical difference.³⁷² By providing a general breakdown of the dataset by century and fine-tuning the resolution to more precise periods, it will be possible to determine to what extent imprecisely identified coins make a difference to the overall coin-profile. Above all, it is necessary to define what is meant by an imprecisely identified coin. Some may regard the identification of an issuing authority as sufficient whereas others may find the lack of a

³⁷¹ E.g. Coins with a longer period than 40 years were assigned “missing” issue period: Aarts (2000), 23. Walton does not mention whether PAS coins which could not be assigned a Reece Period were excluded or included: Walton (2012), 41.

³⁷² Some studies do make use of imprecisely identified coins. E.g. Kemmers (2006), 115-116.

specific year or coin-type reference insufficient. In all cases, the attempted tests will indicate how precisely identified the coins will need to be. In the database utilized in this study, approximately 23% (139,697 coins) of the coins were recorded without a specific reign, with an extended period, or simply could not be properly attributed beyond (presumably) Roman.

In the first test undertaken here, the entire non-hoarded dataset was divided by century. The decision to separate hoarded coins was based on three factors; hoarded coins *tend* to have slightly better condition allowing for better identification (see below), hoards compared to non-hoarded coin-finds have historically received different attention though their identification and publication processes, and most significantly, surviving hoards have been subject to different processes of formation. In addition, as the methodology of hoard publication greatly differs (regionally and chronologically), hoards have sometimes been published with an extremely limited description. As a consequence, when hoards were described in a restrictive manner, they were entered into the database as a single coin entry fitting the description. So a fictional hoard published with the description “23 coins, ranging from Augustus to Nero” would be entered into the database as a single coin entry of which there was a quantity of 23 and the reign as “Augustus – Nero”. Therefore, some of the imprecise dating of coins stems from the formatting of the database in correlation to the method of publication. However, this was the preferred method of handling such hoard descriptions as it had less of an effect on the current state of knowledge.

In this initial test, non-hoarded coins which could not be attributed to any specific century were not included (65,021; c. 10%). Many of these coins were surprisingly recorded in the FMRD and FMRL volumes with a denomination assigned but not any period other than “Unknown” or “Undeterminable”. Some of these designations should be attributed to the digitization process but on the other hand some coins were given a clear denomination but without any period attribution. This is especially surprising as in some instances the denomination was only in existence for a defined

period of time (e.g. Antoninianus coins were dated as “unknown” rather than post AD 215). It is, however, not the intention to review those data and amend them for the publishing decisions, but rather to scope out general trends of imprecisely identified coins and compare these to the general pattern of the coins by century.

From a total of 321,643 non-hoarded coins, 247,168 (c. 77%) had a ‘precise’ attribution (Table 4.9). In order to determine whether a coin had a ‘precise’ attribution, it was necessary that the “reign” of the coin was identified and that this was with a reasonable scope of time. This means that a coin with two emperors listed (e.g. “Antoninus Pius or Marcus Aurelius”) was considered as a ‘precisely’ identified coin. However, if the scope in time was identified as “first half of the first century”, this was considered an ‘imprecisely’ identified coin.

Period	Gold	Gold/Silver	Silver	Bronze	Radiates	Unknown	Total
Pre-Imp	325	250	3940	8454	0	133	13102
C1	534	0	3383	37803	0	479	42199
C2	224	8	5247	30382	0	710	36571
C3	134	17	6814	3110	27815	5704	43594
C4	348	0	209	105480	0	2102	108139
C5	318	0	136	3084	0	25	3563
Total	1883	275	19729	188313	27815	9153	247168

Table 4.9: Non-hoarded coins with precise attribution; quantity.

Period	Gold	Gold/Silver	Silver	Bronze	Radiates	Unknown
Pre-Imp	2.48%	1.90%	30.10%	64.52%	0%	1.00%
C1	1.26%	0%	8.02%	89.58%	0%	1.35%
C2	0.61%	0.02%	14.34%	83.07%	0%	1.94%
C3	0.31%	0.03%	15.63%	7.13%	63.80%	13.08%
C4	0.32%	0%	0.19%	97.54%	0%	1.94%
C5	8.92%	0%	3.82%	86.56%	0%	0.70%

Table 4.10: Non-hoarded coins with precise attribution; percentage composition.

From Tables 4.9 and 4.10 and Figure 4.4, it is evident that the number of identifiable bronze coinage remained fairly consistent during the first two centuries AD but their total composition of the issued coinage fluctuates slightly over time whilst the presence of gold and silver reverses during this

period.³⁷³ The lower proportion of identified bronze coins in the third century correlates with a substantial increase of “unknown” coins from the period and more significantly, with the introduction of the radiate. The possible metal composition of these “unknown” coins is likely to be found when considering the ‘imprecisely’ dated coins.

Date	Gold	Silver	Bronze	Radiates	Unknown	Total
Pre-Imp	2	4	19	0	0	25
Pre-Imp - C1	0	7	63	0	1	71
Pre-Imp - C3	0	0	4	0	0	4
Pre-Imp - C4	0	0	10	0	0	10
C1	1	21	1037	0	14	1073
C1-C2	0	46	1309	0	45	1400
C1-C3	1	38	195	1	8	243
C1-C4	2	8	283	2	273	568
C1-C5	6	2	56	2	100	166
C2	4	37	329	0	7	377
C2-C3	1	17	41	1	210	270
C2-C4	0	0	4	0	0	4
C3	0	16	187	499	23	725
C3-C4	0	0	600	34	19	653
C3-C5	0	0	44	0	3	47
C4	3	3	1988	0	264	2258
C4-C5	4	0	646	0	79	729
C4-C6	1	0	0	0	0	1
C5	9	36	11	0	0	56
C5-C7	28	6	0	0	0	34
Total	62	241	6826	539	1046	8714

Table 4.11: Non-hoarded coins with imprecise attribution; quantity.

³⁷³ The exact denominational breakdown, especially the difference between Bronze and Antoniniani coinage, will be investigated below.

Date	Gold	Silver	Bronze	Radiates	Unknown
Pre-Imp	8.00%	16.00%	76.00%	0%	0%
Pre-Imp - C1	0%	9.86%	88.73%	0%	1.41%
Pre-Imp - C3	0%	0%	100%	0%	0%
Pre-Imp - C4	0%	0%	100%	0%	0%
C1	0.09%	1.95%	96.64%	0%	1.30%
C1-C2	0%	3.28%	93.50%	0%	3.21%
C1-C3	0.41%	15.63%	80.25%	0.41%	3.29%
C1-C4	0.35%	1.41%	49.83%	0.35%	48.06%
C1-C5	3.61%	1.21%	33.77%	1.21%	60.20%
C2	1.06%	9.81%	87.26%	0%	1.85%
C2-C3	0.37%	6.29%	15.20%	0.37%	77.77%
C2-C4	0%	0%	100%	0%	0%
C3	0%	2.21%	25.79%	68.82%	2.91%
C3-C4	0%	0%	91.88%	5.21%	3.00%
C3-C5	0%	0%	93.60%	0%	6.40%
C4	0.13%	0.13%	88.04%	0%	11.69%
C4-C5	0.54%	0%	88.61%	0%	10.84%
C4-C6	100%	0%	0%	0%	0%
C5	16.07%	64.28%	19.64%	0%	0%
C5-C7	82.36%	17.64%	0%	0%	0%

Table 4.12: Non-hoarded coins with imprecise attribution; percentage composition.

When one considers the breakdown of ‘imprecisely’ dated coins (Tables 4.11 and 4.12 and Figure 4.5), one can immediately see that bronze coins are subject to broader chronological attributions. Furthermore, this correlates well with those of “unknown” denomination. These two observations can no doubt be largely attributed to their condition. Given the breakdown of ‘imprecisely’ dated coins, particularly for the third century, “unknown” coins from ‘precisely’ dated coins are likely to be radiates. We must therefore keep in mind that radiate coinage almost certainly accounted for well over 63.8% of the coin-find pool of coins issued in third century (Table 4.10). Likewise, for the first and fourth centuries, when considering the breakdown by metal composition, it should be recalled that the number of bronze/billon coinage should be considerably higher than it is in Table 4.10 and Figure 4.4.

Period	Gold	Gold/Silver	Silver	Bronze	Radiates	Unknown	Total
C0	482	130	2398	3233	0	35	6278
C1	196	7	2749	1729	0	192	4873
C2	157	2	9337	5889	0	70	15455
C3	57	3	19775	34320	79442	6292	139889
C4	997	0	234	47485	0	3731	52447
C5	255	60	493	692	0	2	1502
Total	2144	202	34986	172790	79442	10322	220444

Table 4.13: Hoarded coins with precise attribution; quantity.

Period	Gold	Gold/Silver	Silver	Bronze	Radiates	Unknown
C0	7.66%	2.10%	38.20%	51.50%	0%	0.55%
C1	4.02%	0.14%	56.41%	35.48%	0%	3.90%
C2	1.01%	0.01%	60.41%	38.10%	0%	0.45%
C3	0.04%	0%	14.14%	24.53%	56.80%	4.49%
C4	1.90%	0%	0.44%	90.53%	0%	7.12%
C5	16.90%	3.99%	32.82%	46.07%	0%	0.13%

Table 4.14: Hoarded coins with precise attribution; percentage composition.

A total of 280,790 coins were identified as belonging to a hoard. From these, 220,444 had a 'precise' attribution (c. 78.5%) (Table 4.13). This is remarkably similar to the amount of non-hoarded coins which had a 'precise' attribution (c. 77%). Therefore, hoarded and non-hoarded coins from the dataset had an equal chance of being identified. However, when we compare the number of coins which could not be attributed to any century (52,751; 18.8%), we must conclude that a significant quantity of hoard coins, (twice as many hoarded coins than non-hoarded coins) were not fully investigated or described. This also correlates well with the smaller number of hoarded coins which were attributed with an 'imprecise' date by century (6,136) (Table 4.15). Therefore, it appears that the publishing approaches of the different find-types does affect coin attribution. From the data in Tables 4.13 and 4.14 several key observations can be made. Just as with non-hoarded coins, the presence of gold and silver coinage switches over time (excluding the pre-imperial period). Likewise, the overall pattern in composition of hoarded low denominational coinage (bronze and radiates) is similar to the non-hoarded finds, but a key difference is noted in terms of quantity. Non-hoarded low denominational quantities peak in the fourth century, whereas when hoarded they peak in the third century (Figures

4.4 and 4.6). Another important observation to be made regarding bronze coinage is its reduced presence in hoards during the first two centuries AD, compared to non-hoarded coins. Hoards from this period are silver orientated (Table 4.14), a fact which is further strengthened when considering the composition and quantity of ‘imprecise’ attributed coinage to the first two centuries AD (Tables 4.15 and 4.16 and Figure 4.7).³⁷⁴

Period	Gold	Silver	Bronze	Radiates	Unknown	Total
?	0	314	647	68	328	1357
BC	0	1	0	0	1	2
C 0-1	0	0	0	0	1	1
C 1	0	1	8	0	2	11
C 1-2	33	3388	162	0	0	3583
C 1-3	0	3	8	1	0	12
C 1-4	0	0	2	0	1	3
C 2	7	26	35	0	0	68
C 2-3	0	18	32	0	1	51
C 3	0	7	21	534	20	582
C 3-4	0	0	90	4	10	104
C 4	9	0	36	0	1	46
C 4-5	1	25	287	0	0	313
C 5	3	0	0	0	0	3
Total	53	3783	1935	607	365	6136

Table 4.15: Hoarded coins with imprecise attribution; quantity.

Period	Gold	Silver	Bronze	Radiates	Unknown
?	0%	23.14%	47.68%	5%	24.17%
BC	0%	50%	0%	0%	50%
C 0-1	0%	0%	0%	0%	100%
C 1	0%	9.09%	72.72%	0%	18.19%
C 1-2	0.92%	94.56%	4.52%	0%	0%
C 1-3	0%	25%	66%	8%	0%
C 1-4	0%	0%	66%	0%	33%
C 2	10.30%	38.23%	51.47%	0%	0%
C 2-3	0%	35.29%	62.74%	0%	1.96%
C 3	0%	1.20%	3.61%	91.75%	3.44%
C 3-4	0%	0%	86.50%	3.85%	9.61%
C 4	19.56%	0%	78.26%	0%	2.17%
C 4-5	0.32%	7.98%	91.69%	0%	0%
C 5	100%	0%	0%	0%	0%

Table 4.16: Hoarded coins with imprecise attribution; percentage composition.

³⁷⁴ The high quantity of imprecisely dated silver coins (C 1-2) is the result of 3,000 AR coins from one hoard (Baarlo-Kerk, The Netherlands).

The initial tests undertaken here investigated several key issues on the basis of metal content by century. First, a distinction was made on the basis of the find-type (hoarded vs. non-hoarded coins). Second, the coins of these find-types were then divided into three groups; those with a 'precise' attribution, those with an 'imprecise' attribution, and those which could not be attributed to any century. By undertaking this approach, it was possible to determine differences in overall patterns by century between hoarded and non-hoarded coin-finds. Furthermore, by making a distinction on the basis of coin attribution precision, it was possible to determine to what extent imprecisely identified coins make a difference to the overall coin-profile. In the case of non-hoarded coins, it was possible to note that low denominational coinage (bronze and radiates) was susceptible to larger chronological attributions, and that for the third century, the overall composition of radiate coinage will have been significantly higher than is the case when utilising only 'precisely' attributed coins. In the case of hoarded coins, it was observed that the method of investigation and publication of hoards does influence coin attribution. Finally, it was possible to compare the results of each category to one-another and draw basic conclusions regarding the content and composition of hoards.

4.3.2 Exploring Issue Period Profiles

This section is dedicated to exploring the mean values within the overall dataset. This will allow one to utilize the results to act as a background against which patterns at the regional level can be compared. As the overall breakdown of imprecisely dated coins by century has already been considered (4.3.1), only coins which could be assigned a single or range of issue periods were utilized (i.e. coins which could only be attributed to a century were removed). A total of 401,623 coins could be assigned to a single issue period while 67,116 coins were assigned multiple issue periods and were proportionally divided into single issue periods in the method described above (4.1.4).

In the first instance, only coins which could originally be assigned to a single issue period were graphed (Fig. 4.6). On the basis of the find type, three

profiles were created: non-hoarded coins, hoarded coins, and one combining the two. Figure 4.8, while confirming the overall picture established in Figures 4.4 and 4.6, permits one to see whether any specific issue period lay behind the century profile. In the case of the significant amount of hoarded coins in the third century, the peak observed in IP 16 (AD 260-275) is clearly behind the pattern. However, the peak of coins observed in the fourth century cannot be found considering only coins with a precise single issue period, indicating that fourth-century coinage was susceptible to greater inaccuracy and is presumably due to greater precision needed to assign to fourth-century coins to a specific issue period (Fig. 4.5 and Table 4.11). When coins with precise issue periods are combined with those assigned with multiple issue periods the pattern observed earlier is better supported (Fig. 4.9). The peak of hoarded coins in the third century remains approximately the same, but the peak of non-hoarded coins in the fourth century (IP 20, AD 330-348) is almost doubled. This better reflects the observation made in 4.3.1.

On the basis of the issue period profile, several observations can be made. Above all, the peak of third-century issued coins found in hoards is largely attributable to coins issued in the period AD 260-275. Although dwarfed by the coins hoarded from IP 16 (AD 260-275), it should not be overlooked that coins issued from AD 238-260 (IP 15) also contributed a significant amount.³⁷⁵ Together, the coins issued between AD 238 and 275 constitute *c.* 52% of all hoarded coins in the database (from the late Iron Age to early fifth century). If all coins are considered, regardless of their find, the period AD 260 to 275 once again represents a peak with *c.* 26-30 % of the total coins. Another interesting observation is the relationship between hoarded and non-hoarded coin quantities. For the first two centuries AD, until the end of the reign of Commodus, the number of issued coins found in hoards remains relatively stable. Two peaks of non-hoarded coins in this period can be observed from the Augustan period and the beginning of Vespasian's reign (including coins from the AD 68-69 civil war). Undoubtedly, the number of issued coins from these

³⁷⁵ They could belong to the same period of 'loss'.

periods is related to the historical development in the study-region (5.1, 5.3). Significantly, the number of coins found in hoards outnumbers those found as non-hoarded coins from AD 193 until approximately AD 275 (Aurelian's Reform). Post-reform, the relationship between number of coins hoarded and non-hoarded fluctuates greatly, until IP 25 (post AD 403), when coins tend to be only found within hoards. An additional observation which can be made, is that although fourth-century coinage also makes up a significant portion of the database (c. 25-30%), this cannot be clearly seen in Figure 4.8. When comparing the total *per mill* values of precise and imprecise profiles (regardless of find type), it becomes clear why fourth-century coinage is not well represented (Fig. 4.10). Coins from the fourth century that could be well dated were issued in the period AD 330-348. Furthermore, another significant portion of the coins were given ranges, most of which included IP 20 (AD 330-348). This is because many coins were not given an attribution other than Constantinian Dynasty or Constantinsöhne, which may produce a slightly unnatural peak in AD 330-348 relative to the issue periods before or after, but is not inconsistent with a peak of coin production/deposition during this part of the fourth century. These observations indicate that combining precise and imprecise coins to create a coin-find profile for the entire database is undesirable. Using a *per mill* profile, which combines precisely and imprecisely dated coins is problematic for the first three centuries AD as it causes significant statistical noise for non-hoarded coins (Fig. 4.11). This statistical noise will further distort any mean profile created on the basis of denominations and therefore a separate profile mean for the first three centuries AD is necessary.

4.3.3 Exploring Denominational Profiles

For the first to third century, the denominational mean for only precisely dated coins was considered. In addition, only coins which were given an exact denomination were graphed. This means that coins identified as Dp/As will not be graphed or recalculated, so that the data presented here will only include

precisely identified coins.³⁷⁶ In order to calculate the *per mill* values, the total number of coins used in the previous section were utilised. The total sample size for non-hoarded coins was 196,922 and for hoarded coins was 204,701. Utilising these base numbers was necessary in order to ensure a comparable *per mill* to the previous figures (Fig. 4.8-4.11). The graphs will also only present the main denominations for the first three centuries.

When considering the non-hoarded coins (Fig. 4.12), several clear patterns emerge. Above all, the as was clearly struck as a key low denomination until Issue Period 10 (AD 138-161). From Antoninus Pius' reign, the sestertius appears to have started to replace the as until IP 13 (AD 193-222). Additionally, throughout this period, the presence of denarii as non-hoarded coins follows the overall pattern of the as. After AD 222, sestertii continued to be issued/found, but the only issued denomination of consequence is the denarius. This is followed by the expected radical reversal issuing the denarius and the antoninianus, which takes place towards the end of IP 14 (AD 238). When the denominational profile of non-hoarded coins is compared to hoarded coins (Fig. 4.13 and 4.14), the overall pattern of denarius and antoninianus remain roughly the same, although values and proportions differ, reflecting differences in deposition processes. Moreover, as was the case with non-hoarded coins during the Julio-Claudian period (IP 3-6, 27 BC – AD 68), the denarius and the as are also the main denominations found in hoards. However, the relationship between the as and the sestertius found within hoards appears slightly different than when found outside. The relative higher and earlier presence of the sestertius in hoards may reflect the gradual increase of sestertius presence as well as its increased value and use. On the whole, figures 4.12-4.14 demonstrate a steady increase in the value of the denominations minted until the middle of the third century.

³⁷⁶ Dupondii and assess are often confused with one another as they are the same size. In the case of hoards, 2,480 were identified either as an as or dupondius, while only 69 were identified as dp/as. In the case of non-hoarded coins, 1,558 were identified as dp/as while 46,711 were identified either as a dupondius or as. In both cases the majority of dp/as coins date to the late first century and second century. Including these coins in graphs would not alter much.

In the case of the fourth century, it was established that imprecisely dated coins would need to be included in any future mean profiles (4.3.2). However, developing mean profiles for the fourth century is further complicated due to uncertainties of the denominational system and the “degree of change and its frequency, especially of subsidiary coinage”.³⁷⁷ In addition, we often do not know with certainty the names of many of the coins in the fourth century.³⁷⁸ It is for this reason that when developing the profile mean of the fourth century, only the metal content of the coin was indicated. The total sample size for non-hoarded coins was 247,469 and for hoarded coins was 220,929. When considering the metal composition of coins issued in the fourth century found in hoards (Fig. 4.15), the dearth of precious metals is quite remarkable. Only occasionally does issued gold properly register on the graph (IP 22, 24, 25; AD 364-378, 388-403, Post 403) and only after AD 403 does the quantity of gold and silver coins outnumber other coinage (Table 4.17).

IP	Ant	?	AE	AR	AV
18 (AD 294-318)	0.25347417	0.044811	29.92041	0.064726	0.045263
19 (AD 318-330)	0	0.079211	47.02987	0.020052	0.029421
20 (AD 330-348)	0	1.583173	73.73618	0.109763	0.488934
21 (AD 348-364)	0	14.28431	43.68618	0.04979	0.413208
22 (AD 364-378)	0	0.030145	7.053371	0.031684	1.618206
23 (AD 378-388)	0	0.015978	5.171688	0.022632	0.370434
24 (AD 388-403)	0	0.134432	11.89418	0.830581	1.607569
25 (Post 403)	0	0.04979	1.038973	2.179425	1.166072

Table 4.17: Hoarded ‘denominational’ per mill values.

IP	Ant	?	AE	AR	AV
18 (AD 294-318)	0.41621316	1.573043	41.812895	0.1721021	0.1486043
19 (AD 318-330)	0	1.900195	39.936784	0.0930216	0.0294582
20 (AD 330-348)	0	3.900685	227.73681	0.16992	0.1884274
21 (AD 348-364)	0	0.482605	43.504377	0.149271	0.2970469
22 (AD 364-378)	0	0.479494	63.336167	0.2195827	0.5828601
23 (AD 378-388)	0	0.130319	10.711427	0.1083771	0.1246215
24 (AD 388-403)	0	0.297936	18.647602	0.1330266	0.3259798
25 (Post 403)	0	0.059846	0.6431504	0.4295077	1.0025484

Table 4.18: Non-hoarded ‘denominational’ per mill values.

³⁷⁷ King (1993), 33.

³⁷⁸ King (1993), 1.

The non-hoarded data for the fourth century provides a slightly different picture. The peak of lower denominational coinage in AD 300-348 is the same, but the quantity is significantly higher. However, the steady decline of bronze/billon coinage post AD 364 is the same regardless of find-type (Fig. 4.16). The scarcity of precious metal as non-hoarded coinage is to be expected particularly in view of their near-absence in hoards. Precious metals outside of hoards remain nominal until AD 402 (IP 24). Coinage issued after AD 403 found outside of hoards is rare but what little is found is dominated by gold and silver (Table 4.18). On the whole, the pattern of the fourth century suggests a change in supply and possibly new ways of using coinage, with only precious metals arriving to the study-region after Roman rule (7.3).

4.4 Conclusions

This chapter sought to explore and describe the numismatic dataset utilised in this thesis. It did so by examining the dataset on the basis of the quality of the data, starting with a basic century breakdown, and further analysing the data by issue period and by denomination. By utilising this approach, the analysis permits one to appreciate the varying degree of quality of the data. A significant portion of the data collected (over 100,000) could not be utilised due to a lack of attribution to any specific century. As has been observed on a smaller scale, coin-lists and studies on coin-finds often have around 20% of the coins which cannot be properly qualified.³⁷⁹ In addition, the amount of data which could be attributed to a specific period in time varied in its specificity as well (several issue periods, such as “Constantinian”, to a specific year). The quality of the data is further problematized by the fact that different sources provided data of varying quality (ranging from simple reign identification to specific coin-type). Of particular note, the data for coins issued during the first three centuries were less susceptible to poor identification than the fourth century, necessitating different approaches utilising the data for these periods. Finally, it is important to remember that the observations made in this chapter

³⁷⁹ Kemmers (2008), 33.

do not represent the supply and use of coins for any specific time or area within the study-region, but rather can act as a comparative case for any area time-specific studies.

5 Coin-Finds: The Early Roman Period

In this chapter, three time-period case studies will be undertaken in order to investigate several pivotal moments in the study-region. The first study explores Augustus' reign with a focus on the impact of Drusus' campaign between the Rhine and Elbe, whilst devoting some attention to the pre-Augustan coinage. The second study assesses coin-finds in the study-region for the rest of the Julio-Claudian period and the third case-study investigates the transition from the Julio-Claudian period to the Flavian dynasty and the impact of Domitian's new provincial borders.

5.1 The Augustan Period

In 50 BC, after eight years of campaigning, Julius Caesar left Gaul without any clear Roman administrative system.³⁸⁰ After Caesar's death, little is known about Gaul as his heir Octavian was focused on the internal political strife in Rome.³⁸¹ However, it is known that an occupying force remained to retain the newly acquired territory and to deal with any localised uprisings (e.g. the Menapii and Bellovaces).³⁸² In 39 BC, following the treaty of Brundisium, Agrippa was sent to Gaul to pacify and organise the province (3.1). In addition to developing a road network (3.7), Agrippa also supervised the movement of the Ubii across to the left bank of the Rhine.³⁸³ Until the end of the civil war in 31 BC the situation in Gaul remained the same. After Actium, Octavian's attention once again returned to the pacification and organisation of Gaul.³⁸⁴ In

³⁸⁰ Some components of the administration were left with local pro-Roman leaders; Nash (1978a), 116; Drinkwater (1978), 818.

³⁸¹ Summary of Roman literary and epigraphic evidence: Wightman (1975), 474-475; Woolf (1998), esp. 29-47.

³⁸² Livy. *Per.* 114; Cic. *Ad Fam.* 16.12, 4. Exact numbers and locations of troops are not known: Wightman (1978). It is not impossible that Caesar left 8 legions in *Gallia Comata* temporarily: Brunt (1971), 474-47; Caes. *BG.* 8.54; Cic. *Ad. Fam.* 10.8., 15.12; Dio. 46.29.6. It is known that during the Caesarian civil war L. Munatius Plancus had 3 and then 5 legions to govern Gaul: Nouwen (2009), 110. Gaul was used as a source for troop supply during the civil wars: Cic. *Phil.* 5.5; Dio. 48.49.2.

³⁸³ Strabo. *Geog.* 4.6.11. Against too easily assuming the massiveness of the road system: Grenier (1931-1960), 321-322; Strabo. *Geog.* 4.3.4; Tac. *Germ.* 28.

³⁸⁴ Small-scale rebellions were recurrent in this period. E.g. 30-29 BC the Morini and c. 30 BC the Treveri at the oppidum at Titelberg; Nouwen (2011), 113.

19 BC the situation deteriorated to such an extent that Agrippa was sent to Gaul for a second time to deal with internal friction and Germanic raids. However, shortly after, Agrippa was sent to the east and after the loss of the eagle by Lollius in 17/16 BC, it was Augustus who personally visited the region to oversee the situation.³⁸⁵ Undoubtedly, the beginning of Augustus' rule in northwest Europe was connected with asserting (military) authority in order to consolidate Roman rule.³⁸⁶

Augustus then relied on Drusus to carry out the necessary operations in order to secure the newly acquired territory of Gaul (3.6). One of Drusus' objectives in Gaul was to launch campaigns into *Germania* with the goal of conquering the area up to the Elbe.³⁸⁷ For this reason, this section is concerned with three key questions. Was there a significant influx of Roman coinage to the region with the start of Drusus' campaigns? Can the distribution of coins be associated (exclusively) with the military? Do we see a change in coin distribution after Varus' defeat?

In order to address the question whether a significant influx of Roman coinage can be associated with Drusus' campaigns it is necessary to first identify the constituents of pre-Drusus coinage. In the case of local coinage this is problematic. Prior to Rome's conquest, the use of coinage was not equally spread throughout the study-region and pre-Roman Iron Age coinage was still being used during the Augustan period.³⁸⁸ This means that only hoards and non-hoarded coins with specific archaeological contexts can be considered in order to assess the coin pool during this period. From a total of 41 hoards that contained Iron Age coins, only five hoards also contained Roman coins (Fig. 5.1; Fig. 5.2). Of these five, the context of only three could be determined and these were all associated with an early Roman military context. However, at least seven Iron Age coin-hoards may also be connected with coin circulation in the early Roman period on the basis of their context (Fig. 5.3; Table 5.1).

³⁸⁵ Nouwen (2011), 115-117; Hor. *Odes*. 4, 2, 2, 34-37.

³⁸⁶ Gruen (1996), 147.

³⁸⁷ The Elbe was not necessarily the end-goal: Wells (1972), 6, 161; Brunt (1963).

³⁸⁸ Wigg (1996); Martin (2015), 51-52.

HoardID	Country	Find Name	Quantity of Coins	Last IP	Mixed?	Metal Content	Context
7490	Germany	Steinstrass	46	1	No	AV	Civilian
5333	Germany	Altenhöfe	12	1	No	AV	Civilian
12673	The Netherlands	Nijmegen	15	1	No	AR; AE	Civilian; Military
5332	Germany	Goldgrube	47	1	No	AV	Civilian
5331	Germany	Heidetränk	15	1	No	AV	Civilian
133047	Belgium	Peissant	16	1	No	AV; AE (pot)	Grave; Possibly Early Roman?
8556	Germany	Bergkamen	37	3	Yes	AR; AE	Military
12602	The Netherlands	Nijmegen-Kops Plateau	164	4	Yes	AR; AE	Military
131931	Luxembourg	Titelberg	18	2	Yes	AV; AR; AE	Military? Civilian
12640	The Netherlands	Echt	17	1	No	AV	Religious?
12599	The Netherlands	Elst	30	1	No	AV	Religious?
133162	Belgium	Pommeroeul	10	1	No	AE	Roman
5979	Germany	Nippes-Riehl-Niehl	31	1	No	AE	Roman context?

Table 5.1: Hoards with possible Roman context.

When examining non-hoarded coin contexts, only finds from Luxembourg and Germany were considered (see below for The Netherlands and Belgium).³⁸⁹ Furthermore, in most cases the exact stratigraphic context of a coin was not identified, but a generalisation was made on the basis of the context's general vicinity. Approximately 6,800 Iron Age coins were found outside of hoards in Germany and Luxembourg, of which the majority were associated with a

³⁸⁹ This is because data for non-hoarded Iron Age coins from Belgium were not systematically collected. In the case of the The Netherlands, the data from NUMIS did not indicate a context and would therefore distort the overall picture of known contexts.

settlement from either the Iron Age and/or Roman period(s) (Table 5.2).³⁹⁰

When the period of the context is considered a clearer picture of coin use emerges (Table 5.3; Fig. 5.4). A significant amount of Iron Age coinage was found in exclusively Roman contexts (43%), and approximately 20% were situated in an early Roman military context. Over a third of the coins were found in settlements dating to the (late) Iron Age and Roman period, to which the coins from Titelberg contributed 95% (2,290 coins).

Context	Quantity	Composition
Military; Settlement	119	1.7%
Religious	1029	15.1%
Unknown	1110	16.3%
Military	1440	21.2%
Settlement	3108	45.7%
Total	6806	100.0%

Table 5.2: Contexts of non-hoarded Iron Age coins in Germany and Luxembourg.

Context/Period	Iron Age	Iron Age & Roman	Roman	Unknown
Military	1	0	1440	0
Religious	0	65	964	0
Settlement	164	2407	533	1
Unknown	1	18	67	1024

Table 5.3: Contexts by period of non-hoarded Iron Age Coins in Germany and Luxembourg.

If data from Titelberg are excluded from the figures, not only is its significance as a place of coin-finds acknowledged,³⁹¹ but the overall lack of Iron Age coins from other Iron Age settlements can be better observed (Fig. 5.5), which changes the picture of where Iron Age coins were ‘lost’. Concluding that Iron Age coins were not readily available at other Iron Age sites would be hasty as it is important to note that at Donnersberg and Heidetränk substantial numbers of coins have been found by detectorists, but not recorded. Therefore, it is possible that Titelberg may simply have a special status with regard to coin finds and publication. At the same time, however, the general impression is that Titelberg

³⁹⁰ Isolated cases of Celtic coins in post-Roman contexts were not included in graphs or tables.

³⁹¹ “We should be aware that on all sites, modern ideas of economic sense and rational behaviour may offer little clue to the motivation behind Iron Age coin deposition”: Haselgrove (2005), 173.

does represent an actual exception.³⁹² In addition, we may infer that the way these coins were used changed as significant quantities of coins were deposited in religious sites dating to the late first century BC to the mid/late Julio-Claudian period. However, the evidence for this suggestion may be related to the differing natures of Iron Age and Roman religious sites as many of the Iron Age open-air religious sanctuaries were built up during the Roman period (see 3.4 and 9.1), making it harder to trace this development.³⁹³

Although the distribution of Iron Age non-hoarded coins in Belgium is not mapped, we can still make a few observations (Fig. 5.6). Most of Belgium lay to the north of the *oppida* culture and relatively little Iron Age coinage was struck and found in the *civitates* of the Nervii and Menapii.³⁹⁴ Furthermore, most Iron Age coins in Belgium are stray finds without a context or are from Roman sites but are unable to provide sufficient evidence for pre-Roman occupation.³⁹⁵ However, a considerable amount of Iron Age coinage is found to the north, in The Netherlands, which we may interpret due to the increased presence of troops along the Rhine. Until Rome's presence in the area, coins were generally not used in high quantities or struck and therefore a commencement of local coin issuing may be associated with the increased military presence.³⁹⁶ The influence of the army in The Netherlands may also explain why relatively few Iron Age hoards are recorded in Roman contexts in Belgium (Table 5.4), while a sizeable amount of Iron Age coinage found in The Netherlands has been attributed to local tribe(s).³⁹⁷ When the Roman contexts of Iron Age coins from Luxembourg and Germany are mapped (Fig. 5.7), the army

³⁹² Wigg (2011), 308. Published coin finds of the Donnersberg: Wigg (2009a).

³⁹³ For the deposition of Iron Age coins at Iron Age religious sites and changing ritual practices: Roymans (1990), 77; Roymans and Aarts (2005), esp. 357-359; Wigg (2005), esp. 377-379; Martin (2015), 166-170, 265-267.

³⁹⁴ In west Belgium less than 750 Iron Age coins were found (hoard and non-hoard): Van Heesch (1998), 32 (Fig. 5.9), 43 (Fig. 5.20). Also noted by Martin: Martin (2015), 31.

³⁹⁵ Van Heesch (2005), 247-248.

³⁹⁶ Van Heesch (1998), 52; Metzler (1995), 619-624. Aduatuci bronze: Wigg (1999a), 328. AVAVCIA coins: Aarts and Roymans (2009).

³⁹⁷ Approximately c. 3.5% which may have been of high-value and are believed to have been struck by the Batavi are found in The Netherlands near the *limes*. For Batavian issued coins: Roymans (2004), 82-88. Some of the Batavian types have been hypothesized belonging to the Ubii: Heinrichs (1999), 283-289; Heinrichs (2003), 279.

as an influential source on the distribution of Iron Age coinage is clear (Fig. 5.5-5.6) and with some predominant types such as *Scheers* 217, we may ask whether they were actually commissioned by Rome.³⁹⁸

Country	Sum
W. Belgium	c. 600
The Netherlands	2069
Luxembourg	2676
Germany	4450
Total	c. 9795

Table 5.4: Non-hoarded Iron Age coins by country.

The cluster of Iron Age coins found in Roman contexts between the Rhine and Meuse rivers aligns well with the road between Cologne and Tongeren which was built to facilitate Roman military activity. A second cluster, located in Luxembourg, is unsurprising given the importance of Titelberg during the pre-Roman period, leading it to become utilised as an early Roman military site.³⁹⁹ The third cluster along the Neckar is more difficult to associate with Augustan military activity, as the distribution of Iron Age coins does not correlate well with the distribution of Augustan coins. The first phase of occupational history in this area is associated with Domitian's campaigning against the Chatti,⁴⁰⁰ which is reflected in the overall lack of Iron Age coins in Iron Age contexts (Fig. 5.8), the lack of Iron Age hoards (Fig. 5.1), and the general dearth of coins prior to Domitian's campaigns (Fig. 5.9). If one compares the contexts of Iron Age coins in the Neckar valley with Luxembourg (a landscape richly populated by villae and Iron Age coinage), it appears that during the initial phase of occupation of the Neckar valley Iron Age coins were still in use. This is further supported by the distribution of Domitianic (809) and Iron Age (374) coins which demonstrate that their overall dispersal roughly coincides and in several instances they are found together (Fig. 5.10).⁴⁰¹ However, the Iron Age coins

³⁹⁸ Martin (2015), 182; Aarts and Roymans (2009); Scheers (1977).

³⁹⁹ Metzler (1995), 553-555; 592-624; Metzler, *et al.* (2000), 431; Martin (2013), 342; Fichtl (1998). A garrison was posted here from 29 BC to 16 BC: Rüger (1996), 527.

⁴⁰⁰ Hüssen (2000), 115, 139; Sommer (1988), 282.

⁴⁰¹ The cluster of Iron Age coins without a context to the east of the Neckar may be associated with the few pre-Roman inhabitants: Wieland (1997), 76-78; Fischer (1981), 76; Weiland (1994),

that have been attributed to tribes originate from nearby entities (e.g. Sequani) implying that Iron Age coins were not brought with the army. All this would suggest that during the pre-Roman period the area was sparsely inhabited and that some of the Iron Age coinage used during this period remained in use until (at least) Domitian's campaigns. It is therefore necessary to acknowledge that the movement of a good deal of Iron Age coinage was undoubtedly linked to the presence of Rome but in some instances the final find-spot location was not directly linked to the military activities of Drusus.⁴⁰² It is also important to recall that Iron Age coins that appear to have been in use toward the end of the first century may have also been used in earlier military contexts, such as the payment of auxilia troops, and then remained in a local context.⁴⁰³

Roman Republican coins face some similar difficulties as Iron Age coinage. Their origin is ambiguous as they may have entered the coin pool of the study-region before, during, or after Drusus' campaigns.⁴⁰⁴ A total of 101 hoards were recorded with Republican coins of which 16 hoards (14%) had a Republican issue as the latest coin (Fig. 5.11) and accounted for 175 (11%) of the 1,582 hoarded Republican coins (Fig. 5.12).⁴⁰⁵ It may be safe to assume that some of the withdrawal of Republican coins during the Julio-Claudian period is simply a consequence of normal wastage from circulation while the effect of Nero's and Trajan's reforms on Republican coin circulation and their withdrawal will be revisited later (6.1).⁴⁰⁶ However, Republican coins may also have been supplied and withdrawn prior to the Augustan period, most likely

205. In Central and Northern Gaul (south of the Limes), large quantities of Celtic coins were in use into the reign of Nero or even later: Wigg (1997), 283; Nash (1978b), 24-25.

⁴⁰² Martin has noted that late Iron Age coinage became more regionalised during the early Augustan period: Martin (2015), 192-197.

⁴⁰³ Van Heesch (1998), 51; Nash (1978b), 22; Caes. *BG.* 3.59.3-4; Kemmers (2009a), esp. 271-272. Against Celtic coins as auxiliary pay: Wolters (1988).

⁴⁰⁴ For general circulation of Republican coins: Lockyear (2007).

⁴⁰⁵ Many of the Republican coins which circulate beyond this period are the Marc Antony legionary type: Butcher and Ponting (2015), 163-167. The figures include Republican bronze, but this forms a minority of hoarded coins.

⁴⁰⁶ The absolute numbers presented here are very much against that which was demonstrated by Duncan-Jones. Duncan-Jones (1994), esp. 197. Causes for this difference may lie with Duncan-Jones' conflation of too distinct regions or the imposition of a HS 400 threshold for hoards.

during Caesar's campaigns but possibly, either via trade or as mercenary/soldier pay (in the civil war).⁴⁰⁷ Five Republican hoards are found in *barbaricum* (Fig. 5.13). A possible settlement context is only known for one of these, but due to the inability to link the hoard to one of three settlements (from different periods), it is difficult to ascertain when the hoard was actually deposited.⁴⁰⁸ From the hoards within the Empire, those with a context appear to have a possible (but not always certain) connection with the military. When Republican hoards are compared with the overall distribution of non-hoarded Republican coins (c. 4,300) (Fig. 5.14) it is striking that despite a significant quantity of coins found along the *limes* and at known military areas (e.g. along the Lippe river), few Republican hoards have been recorded. As Republican coins found in the study-region on the whole reflect areas of troop concentration and activity in the early Imperial period, many of them will have been used in the framework of Drusus' campaigns and remained in use throughout the early Julio-Claudian period.⁴⁰⁹ Interestingly, parts of the *Via Belgica* also can be traced on the distribution map, which may also be connected to early Roman (military) activity.

In order to investigate whether Drusus' campaigns caused a significant influx of Roman coinage, the last category of pre-Drusus coinage needs to be considered (i.e. early Augustan). Many of the early Augustan coins will, like Republican coins, have entered the regional coin pool as a consequence of the military activities undertaken by Drusus. It is especially necessary to remain cautious when using (Roman) non-hoarded coins to determine the period of loss as in the best case they only provide a *terminus post quem*. However, once supplied to a local coin-pool, the circulation of lower denominations tends to remain local due to the cost and difficulty of shipping. When this is not the case, as is occasionally known, it is indicative of overarching directive(s) such as the

⁴⁰⁷ On early (wine) trade relations between Gaul and Rome: Martin (2015), 84-91.

⁴⁰⁸ Hoard of Hedemünde.

⁴⁰⁹ Some caution is reiterated as Republican (and Mediterranean) coins may have been used earlier: Martin (2015), 41-48; Martin (2013), esp. 343; Doyen (2011a); Kemmers (2006), 68. Republican bronze coins, however, are very strong indicators of some sort of military site: Martin (2015), 146.

supply of old Augustan bronze from Rome to the northwest by Tiberius.⁴¹⁰ This also means that some Augustan coins ‘lost’ outside the Empire will have formed part of the coinage used by Germanicus’ troops and therefore may not be straightforwardly representative of Augustan campaigning. Nevertheless, it is necessary to determine to what extent this coinage was already in the region in order fully to appreciate the effect the campaigns had on the coin-pool. 32 hoards were found to contain and close with Augustan coinage, of which four certainly close prior to 15 BC (Table 5.5). When one considers the composition of these hoards, one immediately notes the scarcity of Augustan coinage (Table 5.6). This demonstrates that coins issued by Augustus prior to 15 BC did not reach the study-region in any significant quantity. Indeed, from the total non-hoarded coin pool, only 6.71% of Augustan coinage was issued prior to 15 BC.⁴¹¹

HoardID	Findname	Country	Date of Last Coin
1102	Westendorf a.d. Gennach	Germany	27BC
1990	Stühlingen	Germany	26BC
5929	Köln	Germany	20BC
10125	Niderlangen	Germany	27BC

Table 5.5: Hoards with Augustan coinage, closing with IP 3 (27 BC – AD 14) coins prior to 15 BC.

HoardID	Republican	Augustan
1102	11	1
1990	14	1
5929	16-18	1-3
10125	61	1

Table 5.6: Composition of hoards with Augustan coinage, closing with IP 3 (27 BC – AD 14) coins prior to 15 BC.

Given the distribution of the coins (Fig. 5.15), it seems unlikely that they formed any substantial part of the coinage used to finance the campaigns between the

⁴¹⁰ Walker (1988); Howgego (1994), esp. 13-15; Millar (1991), esp. 146-153; Kemmers (2006), 66-68. Bronze coins are “fossils directeurs” of the chronology of Roman military presence on the Rhine: Van Heesch (1996), 96.

⁴¹¹ Only coins which were clearly issued before 15 BC were considered against the total sum of coins (regardless of dating precision).

Rhine and Elbe, but rather may have been used earlier for the campaigns nearby the German Alps. Equally, some may also be associated with the foundation of the Hunerberg prior to Drusus' campaigns to deal with Germanic threats during Agrippa's governorship and begin gathering intelligence for the invasion beyond the Rhine.⁴¹² This is supported by the fact that approximately 50% of the non-hoarded coins issued prior to 15 BC are lower denominations with a slight majority concentrated in the northern half of the study-region, particularly in the area of Nijmegen and Mainz (Fig. 5.16). If one takes the coin finds from northern Italy (near to the borders of Switzerland and Austria) into consideration, Augustan coins issued prior to 15 BC comprise c.35% of the total Augustan coin pool, indicating a concentrated presence of these coins to the northern Italian Alps (Table 5.7), followed by a complete lack of newer coins during the period of Drusus' campaigns across the Rhine.⁴¹³ In Switzerland, as early Augustan coinage is dwarfed by later coinage in Augst/Kaiseraugst,⁴¹⁴ the Swiss hoards can better act as a supplement and appear to confirm the data from the northern Italian Alps (Table 5.8).⁴¹⁵

Dates	Quantity	Percentage
Pre 15BC	74	34.90%
15-9BC	7	3.30%
9BC-9AD	70	33%
9-14AD	24	11.32%
Other Aug	37	17.45%
Total	212	99.97%

Table 5.7: Total of non-hoarded Augustan coinage by date in northern Italy (FMRVe I.1, I.2, I.3, III.2, III.3, IV.1, IV.2).

When one considers the number and distribution of coins issued over the period of Drusus' *Germania* campaigns, a change in coin supply can immediately be noted in the finds. Unfortunately, no hoards could accurately be ascribed a closing date between 15 and 9 BC, but from the non-hoarded coin

⁴¹² Rüger (1996), 525; Kemmers (2006), 66, 69-70; Kemmers (2006), 38-43. The fort at Neuss also precedes those built by Drusus and contains significant quantities of early Augustan coinage. For more: Chantraine (1968); Chantraine (1982).

⁴¹³ Data for Augustan hoards in North Italy were not published in the relevant FMRVe publications.

⁴¹⁴ Peter (2001).

⁴¹⁵ Data provided by the Coin Hoards of the Roman Empire project in Oxford via collaborating partner, Swiss Inventory of Coin Finds (IFS).

pool, it is possible to note an increase in recovered coins that were issued in this period (Table 5.9),⁴¹⁶ as well as a change in their distribution (Fig. 5.17).

Undoubtedly, the main theatre of military attention had shifted from the Alpine hinterland to the north. It is interesting to note that despite Drusus' prolific campaigning in *Germania magna* the distribution of coinage up until his death appears to be limited both in spatial distribution and number, especially considering that some of the coinage will still have been in use and in circulation during Tiberius' campaigns.⁴¹⁷

Findname	Country	Date of Last Coin
Lausanne, Vidy.	Switzerland	26 BC
Augst, Ins. 17	Switzerland	23 BC
Villarepos	Switzerland	18 BC
Augst, Ins. 42	Switzerland	10 BC
Basel, Altstadt, Münsterhügel	Switzerland	10 BC
Baden, Römerstrasse	Switzerland	6 BC
Giubiasco	Switzerland	6 BC
St. Gallen	Switzerland	1 BC
Augst, Ins. 31E1	Switzerland	AD 14 (?)

Table 5.8: Hoards closing within the Augustan period in Switzerland.

Period	Quantity	Percentage
Pre 15 BC	1009	6.71%
15-9 BC	1126	7.49%
9 BC - 9 AD	2066	13.74%
9 - 14 AD	1207	8.03%
Other	5729	38.10%
Reign	3901	25.94%
Total	15038	100%

Table 5.9: Total Non-hoarded Augustan coins by period in study-region.

Following Drusus' death Tiberius returned to the Rhine and in 8 BC once again crossed the Rhine and achieved great successes.⁴¹⁸ In 7 BC Tiberius celebrated a triumph which has been interpreted as a sign that the German war was over,⁴¹⁹

⁴¹⁶ The coins dated as "other" are nearly exclusively coins from 16 BC to AD 10. These include the Nemausus series I-III, Moneyer's series and the Altar series (Altar Series II is predominately post AD 10).

⁴¹⁷ From the non-hoard coin pool, a total of 226 Republican and 419 Augustan coins issued prior to 9 BC are found beyond the Empire.

⁴¹⁸ Dio. 55.6; Vell. 2.97.

⁴¹⁹ Eck (2004), 13-14.

but he nevertheless was forced to return briefly to deal with some unrest.⁴²⁰ In 6 BC Tiberius left the Rhine, but following the commands of L. Domitius Ahenobarbus and M. Vinicius, he once again returned in AD 4 to take over the German command. The period between 9 BC and AD 9 (prior to the Kalkriese disaster) was unquestionably one with continued Roman military intervention accompanied by some peaceful ventures such as the establishment of Waldgirmes,⁴²¹ and is characterised by an increase in the quantity and spatial distribution of Augustan coinage (Table 5.9; Fig. 5.18). A slight shift in military activity can be noted in the coin finds, when during the Pannonian revolt (AD 6-9) nearly half of the Roman army was located along the Danube. During this period, the command of the German region was handed over to P. Quinctilius Varus.⁴²² The story of Arminius' ambush of the Romans is well known and following the loss of three legions, Tiberius once again returned to the Rhine but failed to claim any substantial victory in the immediately succeeding years.⁴²³ From the Augustan coin finds of AD 9-14, it is clear that coins issued during this period are generally not 'lost' beyond the Empire as only 17 coins have been found and coin-find activity is slightly retracted back towards the Empire (Fig. 5.19), despite Tacitus informing us of a legionary detachment in the Chauci tribal area in AD 14.⁴²⁴ Through the shifts in coin-find distribution patterns (Fig. 5.16-19), it is possible to detect an increase and withdrawal of coin activity coinciding with Roman military activity in *Germania magna* during Augustus' reign. Moreover, the overall effect of the military on early monetary supply and use in the study-region can also be observed.

⁴²⁰ Dio. 55.8.3, 9.1.

⁴²¹ Activities of L. Domitius Ahenobarbus: Dio. 55.10a; M. Vinicius' "immensum bellum": Vell. 2.104; Waldgirmes: Becker (2005); Raschbach (2009).

⁴²² Although ancient sources are critical of him, he must have been a capable and a suitable candidate for the position. For a discussion: Timpe (1970), 123-126; Vell. Pat. 2.117-120; Tac. *Ann.* 1.55-1.71; Suet. *Tib.* 18.

⁴²³ For more on Kalkriese: Murdoch (2006); Franzius (1993). On Kalkriese coin-finds: Berger (1996a); Berger (2000); Dio. 56. 24.6, 56.25. 2-3. Velleius' account is more favourable: Vell. 2.120.

⁴²⁴ The Chauci area is between the Weser and Elber rivers; Tac. *Ann.* 1.38.

5.2 The Julio-Claudian Period to Nero's Coin-Reform

Following Augustus' death, campaigns into *Germania* continued under Germanicus' overall command. The campaigns were not fought to expand the Empire, but rather to provide military *gloria* to Tiberius and his adopted successor, Germanicus.⁴²⁵ They were also carried out to send a message to the tribes living across the Rhine that the Roman military was still a force to be reckoned with. Soon after, the campaigns into *Germania magna* came to an end in AD 16 when Tiberius sent Germanicus to the east.⁴²⁶ While pro-Roman conflicts continued to occur both within and beyond the Empire,⁴²⁷ the left bank of the Rhine was slowly transformed into a defensive line against possible Germanic incursions (3.6). This sub-chapter is concerned with investigating how the development of the *limes* during the Julio-Claudian period influenced the supply and distribution of coin-finds. Is it possible to detect a change in coin-find distribution patterns after the end of Germanicus' campaigns and during Tiberius' reign? Does Claudius' invasion of Britain in AD 43 cause any disruption to the coin-supply along the Lower Rhine? And what does the coin circulation prior to Nero's coin-reform look like?

In order to determine whether Rome developed a new 'military policy' along the Rhine,⁴²⁸ it is necessary to consider the coins which can be associated with Germanicus' campaigns and to separate these out from post-campaigning coins. As no hoards closing within the first two years of Tiberius' reign were recorded, the only method to trace a possible change in 'military policy' during Tiberius' reign is through the distribution of non-hoarded coins. When the distribution of coins issued in AD 14-16 is compared to the remainder of coins issued during Tiberius' reign, it becomes clear that 'coin-loss' is focused along the *limes* with very few Tiberian coins outside the Empire (Fig. 5.20).⁴²⁹ In fact, only one coin from the period AD 14-16 was 'lost' outside of the Empire which

⁴²⁵ Wiedemann (1996), 209.

⁴²⁶ Wiedemann (1996), 210.

⁴²⁷ E.g. The rebellion among the Treviri in AD 21: Tac. *Ann.* 3.40-3.47; Le Bohec (1999).

⁴²⁸ For a military 'grand strategy': Luttwak (1976). Review of Luttwak: Mann (1979). For more: Isaac (1990).

⁴²⁹ Total: 86 coins.

implies that either no coins were 'lost' during these campaigns or that soldiers did not carry any new coin with them; two scenarios which are unlikely and highlight the difficulty differentiating the period of 'loss' of non-hoarded coins.⁴³⁰ Furthermore, on the basis of a stratigraphic study of coin finds in Lugdunum, it may be necessary to push the dates of the Augustan Nemausus type 3 and Lugdunum type 2 bronzes into the early Tiberian period, which would result in more Tiberian coins lost outside the Empire.⁴³¹ When Tiberius' reign is broken into smaller periods, it is noteworthy that within a short time span of three years, a relatively high number of coins issued during this period were lost in the study-region (Table 5.10). Not only did these coins comprise almost exclusively lower denominational coinage (93%), but their distribution almost entirely reflects the presence of the army along the *limes* (Table 5.11). This apparent immense demand for bronze coin at the beginning of Tiberius' reign may be a consequence of Germanicus' obligation to pay the army Augustus' bequest (HS 300/legionary).⁴³² However, we should question what proportion was paid in bronze and remain cautious about when these coins entered circulation in the study-region.⁴³³ Moreover, an alternative or contributing factor may also have been the consolidation of the *limes* under Tiberius and coins struck early in his reign were only supplied later (3.6).

A significant change in the ratio of high to low denominations (silver and gold to bronze) occurs in the period AD 33-37, which may be related to the

⁴³⁰ One solution to determine whether Augustan coins were used by Germanicus' troops, which is beyond the scope of the thesis, would be to consider the number and distribution of Augustan coins marked with Tiberian stamps: Kraay (1956), esp. 119-134; Werz (1999). The one coin from AD 14-16 'lost' outside the Empire, may in fact be considered inside the Empire as it is just beyond the Lower Rhine, in a territory which was considered part of the Empire until the Claudian period.

⁴³¹ Flück (2013).

⁴³² Tac. *Ann.* 1.8; Tac. *Ann.* 1.36. Much of the bronze may have been provided by (stockpiled) old bronze from Italy which was not countermarked: Wigg (1999a), 338-340; Wigg (1997), 284.

⁴³³ Wolters (2000-2001). Despite apparently high numbers of gold, silver, and bronze issued during Tiberius' first years as emperor, the absolute numbers of high-value coinage are relatively low (hoarded or non-hoarded), however 208/234 hoarded coins are of high-value. It is, however, uncertain how many these coins can be attributed to the beginning and end of Tiberius' reign due to the lack of a detailed chronology for this coinage: Wolters (2000-2001), 583.

financial crisis of AD 33.⁴³⁴ It is hazardous to provide any overarching explanation for the financial crisis on the basis of coin-finds, particularly as data from Italy (the area presumably most affected by the crisis) are not readily available (yet) and we still have an incomplete understanding of coin production quantities,⁴³⁵ but *faute de mieux* something can be gleaned from the evidence in the study-region.⁴³⁶

Period	Quantity	Percentage	Av. Per Annum
AD 14-16	117	3.97%	39
AD 14-32	35	1.19%	1.8
AD 17-32	881	29.88%	55
AD 33-37	94	3.19%	18.8
IP 4/Other	1821	61.77%	76
Total	2948	100%	123

Table 5.10: Number of non-hoarded Tiberian coins by 'period'.

Period	High	High %	Low	Low %
AD 14-16	8	6.84%	109	93.16%
AD 14-32	0	0%	35	100%
AD 17-32	5	0.56%	876	99.43%
AD 33-37	14	14.89%	80	85.11%

Table 5.11: Number of non-hoarded high-value to low-value coins by Tiberian period.

In northwest Europe, the crisis does not appear to have had any effect on the supply of low denominational coinage. This is unsurprising given that during the early Roman period some of the most monetized areas were in and around military sites, which would necessitate a high number of low-value coins for daily transactions.⁴³⁷ This concept is demonstrable as there appears to have been a continuous supply of new bronze during a period of a break/reduction

⁴³⁴ Tac. *Ann.* 6.16-6.17; Dio, 58.21.1-5; Suet. *Tib.* 48.1; Rodewald (1976), 1-17, 70-71.

⁴³⁵ On the dangers of coin production estimates: Buttrey (1993); Buttrey (1994); Howgego (1992), 3; De Callatay (1995). Calculation methods: Esty (1986); Howgego (1995), 30-33.

⁴³⁶ It is possible to use coin-finds to quantify regional patterns of coin supply: Howgego (1992), 3.

⁴³⁷ Kemmers (2006), 147-152; Aarts (2000), 67, 219. "the as was designed particularly for the soldier's pay", despite being calculated in denarii: Mattingly (1923), xlviii. For military pay amounts: Speidel (1992), 101-105; Speidel (1994), 28, 101, 108-109, 133; Fink (1971), 241-276. For what coin was used to pay the military: von Kaenel (1999), 372-374; Peter (1996), 316-318; Peter (2001), 91-92; Wigg (1997); Kemmers (2006), 192-196. Caesar records payment of bronze coin to the military by Pompey: Caes. *Civ.* 3.103.

in bronze minting at Rome (AD 23-34).⁴³⁸ In fact, the increase of bronze coin finds issued during the minting break in Rome, may be related to developments across the Rhine (876 vs. 109 – Table 5.11). Tacitus reports a Frisian revolt in AD 28 due to an increase in tribute/taxation demands.⁴³⁹ As supporting troops were called in from *Germania Superior*, an increase of total and *per annum* bronze coin-finds from this period may hint towards a mobilization of troops. The recommencement of bronze minting dated to AD 33 does not appear to have any bearing on the coin-find pattern in the study-region, but may well be related to developments in Italy.⁴⁴⁰ In the case of gold or silver, a relatively high number of coins from this period (AD 33-37) has been found and their distribution does not appear to be related to any other event (Fig. 5.21).⁴⁴¹ Unfortunately, the hoard data were unable to provide strong evidence supporting this observation. While 93% of all Tiberian coins in hoards were either aurei or denarii,⁴⁴² only three were well-dated to AD 36-37 with the others only recorded by reign. However, the chronological profile in the study-region supports the case that precious-metal coin issuing increased at the end of Tiberius' reign.⁴⁴³

A change in 'military policy' is even more pronounced when considering the distribution pattern of non-hoarded coins issued by Caligula, as only 34 of these coins have been found outside of the Empire. It should not be surprising that high-value coinage issued by Caligula is extremely rare in the study-region.⁴⁴⁴ Although only 15 non-hoarded Caligulan coins were gold or silver (0.5%), their distribution clearly demonstrates a tendency to be recovered along the German and Dutch Lower Rhine and at Velsen (Fig. 5.22). It is clear that that

⁴³⁸ Sutherland (1984), 95-99.

⁴³⁹ Tac. *Ann.* 4.72-4.73.

⁴⁴⁰ If not related to the financial crisis, it may be related to Augustus' 50-year-old Saeculum: Sutherland (1951), 103.

⁴⁴¹ The serious fire of Rome in AD 37 may also have encouraged Tiberius to strike more gold and silver: Tac. *Ann.* 6.45.

⁴⁴² 206/211 Tiberian coins in hoards.

⁴⁴³ Duncan-Jones (1994), 25, 250-251.

⁴⁴⁴ Not only was a restricted amount of gold and silver struck, but in AD 41, silver was struck only until 24 January and no gold has been recorded for this year: Sutherland (1984), 104. In addition, from the dies and number of coins, Caligula's coinage appears to have been withdrawn: von Kaenel (1994), 51-52, Abb. 3.

the clustering of Caligulan coins along the Lower Rhine is not restricted to high-value coinage but true of all non-hoarded coins issued by Caligula (Fig. 5.23).⁴⁴⁵ Following Caligula's capture of Adminius/Amminius (son of the chief of the British tribe, the Catuvellauni),⁴⁴⁶ preparations for an invasion of the entire island were undertaken during the winter of AD 39/40. The construction of forts in Alphen aan de Rijn and De Meern, as well as a considerable number of coins issued by Caligula found at Vechten points towards military preparations.⁴⁴⁷ The Rhine as the main supply route is especially clear when considering the distribution of coins but the clustering of coin-finds along the Scheldt and Meuse rivers, as well as along part of the *Via Belgica* between the two rivers, also suggests that goods may have been supplied from there as well.⁴⁴⁸ However, some of these coins may have been supplied and/or 'lost' here during Claudius' campaign preparations (see below).

In AD 42, after Scribonianus' attempted rebellion in Upper Illyricum, Claudius turned his attention towards the annexation of Britain and built at least two dozen auxiliary forts between Katwijk and Xanten.⁴⁴⁹ Despite the obvious attention towards Britain, the coin-find pattern during Claudius' reign in the study-region is of importance. When coin-finds from the reigns of Augustus to Claudius are considered, it is curious to note that from Tiberius to Claudius, the total number of coins recovered in the study-region is fairly consistent (see below for copies). However, it is noticeable that for the reigns during which a substantial amount of military campaigning and preparations are undertaken, the per annum coin-find is high(er), but the per annum coin-find is also affected by the duration of the reign as a consequence of peak

⁴⁴⁵ The cluster at Mainz and the Main River can be related to short expedition Caligula led against the Chatti: Grant (1985), 26; Lendering and Bosman (2012), 84. Only one hoard closing in Caligula's reign was recorded in the study-region (ID: 5684, Erfelden) but did not have a high-value Caligulan coin and only one hoard recorded had a high-value Caligulan coin (Denarius; ID: 12694, Vechten).

⁴⁴⁶ Suet. *Cal.* 44.2.

⁴⁴⁷ Bosmand and de Weerd (2004). Other forts include Vleuten and Laurum/Woerden.

⁴⁴⁸ Dendrochronological and paleobotanical studies have shown a strong link between the west of Flanders and the Dutch *limes* area (via the Scheldt): Jansma, *et al.* (2014), esp. 493.

⁴⁴⁹ Lendering and Bosman (2012), 86.

minting activity in the early years of any reign (Table 5.12).⁴⁵⁰ This observation is significant as it may demonstrate that on the whole there was some sort of harmonized demand for fresh coin throughout the entire study-region but that certain areas therein became focal points. The distribution pattern of both Caligula's and Claudius' coins which focus on the (Dutch) Lower Rhine, is consistent with a continuation of the British invasion plans (Fig. 5.24).

Reign	High-Value	Low-Value	Total Coin	Per Annum
Augustus	766	14217	14983	356
Tiberius	298	2618	2948	123
Caligula	15	2589	2619	524
Claudius	73	2677	2784	199

Table 5.12: Total number of non-hoarded coins, Augustus to Claudius.

Reign	Total	Inside	Outside	% Outside
Augustus	15038	13115	1923	12.78%
Tiberius	2948	2862	86	2.90%
Caligula	2619	2617	2	0.07%
Claudius	2784	2747	37	1.30%

Table 5.13: Total non-hoarded coin quantities inside/outside Roman Empire, Augustus to Claudius.

In addition, a considerable number of coins struck in IP 5 (AD 41-54) are not only recorded elsewhere along the Upper Rhine or Danube,⁴⁵¹ but are also found in the hinterland of the Empire in Belgium and Luxembourg. Once again, the coin-finds from Belgium may not be unrelated to military developments, as their distribution is concentrated along the Scheldt. However, the distribution pattern does demonstrate that coins were increasingly being circulated between the militarized and civilian zones. Equally interesting is that Claudian coins have a wide geographic distribution beyond the Empire, but their total quantity is limited (Table 5.13). It is clear that the number of coins found beyond the

⁴⁵⁰ This also seems to imply that there was no large scale demonetization of Caligula's *aes* coinage. Dio. 60.22.3; Barrett (2002). The high *per annum* coin-find for Caligula *may* also be indicative of his extravagant spending behaviour (and need to strike coin), if we believe the ancient sources: Suet. *Cal.* 37-41; Dio. 59.14-59.15, 59.18, 59.21, 59.22.3-4, 59.28.8-11. It may also be simply the result of peak minting activity at the beginning of a reign: Carradice (1983), 90, 141.

⁴⁵¹ Coin finds significantly increase from Tiberius' reign along the Danube. For more on Augsburg-Oberhausen: Bakker (1999).

Rhine significantly decreases with the end of Germanicus' campaign when a change in 'military policy' took place. How and when non-hoarded Claudian coins found their way beyond the Empire is difficult to determine but it is curious that the coins are primarily low denominations.⁴⁵²

The composition of Claudian coinage is also revealing, counting 73 high-value denominations from a total non-hoarded coin-pool of 2,784. This number is particularly high when compared to the number of Claudian denarii recorded by the PAS in Britain (13 denarii out of 255 Claudian coins).⁴⁵³ This may indicate that Republican coins which are far more plentiful in Britain were the predominant high-value coins brought with the army. As troops will have crossed to Britain from the coast along northern France to the Dutch river delta, it is possible that the coins were pre-selected on the continent. This finds support through the dearth of Republican coins (in absolute numbers) in hoards closing with Claudian coins (Fig. 5.11 and 5.12), although it does not signal any changes in circulation patterns but rather an absence of deposition (for more on Republican circulation: 6.1). With regard to the circulation of Claudian denarii, both in Britain and the study-region, these coins had a relatively short circulation period due to the debasement of the denarius under Nero causing a large proportion of the coins to be withdrawn from circulation either by hoarding, melting, or export (Table 5.14; for more: 6.1). In addition, in both these areas, the distribution of Claudian denarii correlates with areas of military activity and supply routes (Fig. 5.25).⁴⁵⁴

⁴⁵² 1 AR; 16 As; 2 D; 2 Dp; 1 Qd; 6 S: Total 28.

⁴⁵³ PAS data from March 2008; Walton (2012), 150; In the study-region, 39 are denarii with another 7 identified as AR (non-hoarded coin-pool). From Claudian hoarded coins there are c. 15 aurei and 7 denarii.

⁴⁵⁴ Walton (2012), 150; Ornstein (1997), 26-29; Butcher and Ponting (2015), 208-210, 227, 448-449.

Hoard ID	Country	Find Name	Find Type	Inside Empire?	Last IP
133129	Belgium	Zulzeke	Hoard	TRUE	?
12664	The Netherlands	Lith	Hoard/Complex	TRUE	7
4201	Germany	Ludwigshafen-Rheingönheim	Hoard	TRUE	7
10069	Germany	Tautenburg	Hoard?	FALSE	11

Table 5.14: Hoards with Claudian denarii.

The distribution and composition of low denominational coinage also reveal some interesting parallels and differences between Britain and the study-region during Claudius' reign. Only 7 (2.94%) Claudian sestertii have been recorded by the PAS,⁴⁵⁵ while in the study-region sestertii account for over 14% of all Claudian coinage. In Britain, it has been argued that sestertii indicate a military function for a site.⁴⁵⁶ When the distribution of sestertii is considered in the study-region, it is noticeable that sestertii are nearly exclusively found along rivers, which served as military supply routes (Fig. 5.26). In fact, from the German sites where a context has been recorded *c.* 50% of Claudian sestertii have been found on exclusively military sites and another *c.* 20% from sites nearby or associated with military activity. However, the core of Claudian coinage, just as in Britain, is composed of asses and dupondii which account for 75% of the total coinage recorded for IP 5 (AD 41-54). Unlike the distribution of sestertii, considerable quantities of asses and dupondii are found in the hinterland and this observation has implications for our understanding of coin-use in the study-region during the Early Roman period (Fig. 5.27; see 8.2 and 9.1).

As is the case in Britain and elsewhere in the west, a significant portion of Claudian asses and dupondii is composed primarily of imitations/copies. In 1935, Sutherland estimated that in Britain 70% of the imitation coins were asses.⁴⁵⁷ In the study-region 90% of the imitations are asses. However, it is still uncertain whether all other imitation coinage (such as Augustan) should also be

⁴⁵⁵ PAS data from March 2008; Walton (2012), 151. 2.94% of total Claudian coins.

⁴⁵⁶ Walton (2012), 151; Kenyon (1991).

⁴⁵⁷ Sutherland (1935), 12.

assigned to IP 5 (AD 41-54).⁴⁵⁸ The question of where these copies originated and whether or not they were (semi-)officially sanctioned is difficult to answer,⁴⁵⁹ but several observations can be made. It has been argued that in Northern Gaul, large numbers of imitations were of civilian origin and their distribution centred upon native (Celtic) sites.⁴⁶⁰ However, from the dataset, this does not entirely appear to be the case (Fig. 5.28). Once again, imitation coins are primarily found in areas of military activity and interaction (which may of course include civilian settlements). The most commonly cited reason for the presence of these coins is a shortage of coin due to the invasion of Britain in AD 43 in conjunction with the closure of the mint of Lyons and a recall of Caligulan coinage by Claudius.⁴⁶¹ There certainly was an acute shortage of coin across the western half of the Empire but when comparing the distribution of coin-finds in the study-region over the course of the first half of the first century AD, it is noticeable that increasing amounts of lower denominational coinage are found further south of the Rhine. This may also indicate a rise in demand for more coin in less militarized areas.⁴⁶² The end of this 'copying epidemic' has been dated to the re-opening of the Lugdunum mint and the arrival of Neronian bronze around AD 62/64 (Table 5.15).⁴⁶³

Period	Gold	Silver	Low	Total
AD 54-64	19	14	14	47
AD 64-68	132	90	1708	1930
Other	49	45	1014	1108
Total	200	149	2736	3085

Table 5.15: Number of non-hoarded Neronian coins by 'period'.

⁴⁵⁸ Die links of imitation Augustan reverses found at sites such as Hofheim demonstrate that they belong to the Claudian period, but it is not known to what proportion: Wigg (1996), 427.

⁴⁵⁹ Die links have been made between Britain, France and Spain. For more: Harper (2010); Besombes and Barrandon (2000); Besombes and Barrandon (2003/4); Giard (1970).

⁴⁶⁰ Wigg (1999b), 115; Wigg (1996), 425. Production: Nash (1978b), 26; Scheers (1977), 179-180, 806-808.

⁴⁶¹ Boon (1974), 103-104.

⁴⁶² Wigg (1999b), 120; Wigg (1996), 434. This can also be seen in central Gaul, north of the Loire, where local imitations flourished: Giard (1970).

⁴⁶³ Wigg (1996), 429. For the term: Boon (1988); Boon (1974), 106.

During Nero's reign military campaigns were undertaken at both ends of the Empire, in Britain and against the Parthian Empire. However, throughout his reign very little changed in the study-region with the exception of his coinage-reform (AD 64) before the civil war. There are several things to note when one considers the number and composition of non-hoarded coins issued by Nero before the coin-reform (Table 5.15).⁴⁶⁴ Above all it is surprising that high-value coinage issued before the reform makes up a considerable part of the total coin recovered during this period (but is still low in absolute numbers).⁴⁶⁵ The fact that so little low-value coin minted during this period was recovered can be explained in several ways; bronze coinage from this period is particularly susceptible to misattribution, or significant quantities of pre-reform Neronian coinage were susceptible to some sort of recycling, or as has been suggested above, very little bronze coin may have been issued and/or supplied to the study-region. In chapters 4.3.1 and 4.3.2 it was determined that first-century bronze was generally less susceptible to broad chronological dating. In addition, it has been argued that bronze coinage that was supplied to the northern part of the study-region during Nero's reign consisted of comparatively large issues.⁴⁶⁶ It seems highly unlikely that some sort of bronze coin recycling occurred, as it does not explain why unreformed bronze coin after Nero's precious metal coin-reform would have remained untouched. The case of Nero's *de facto damnatio memoriae* cannot explain this pattern either,⁴⁶⁷ as only a minority of coins indicate an effort to deface Nero's portrait. This leaves only the possibility that bronze coin was simply not supplied in great quantities prior to the coin-reform, as PAS data in Britain also demonstrates.⁴⁶⁸ The question then arises why this should be the case. A combination of two answers is able to explain this. First, an immense amount of bronze was circulating in

⁴⁶⁴ The traditional date of AD 64 for the coin-reform was used. There is evidence of some "pre-reform" issues with different levels of fineness: Ponting (2009), 274; Butcher and Ponting (2005), 167, 178-180; Sutherland (1984), 133-134.

⁴⁶⁵ No low value coins issued AD 54-64 are hoarded.

⁴⁶⁶ Sutherland (1984), 142.

⁴⁶⁷ Suet. *Ner.* 49.2. In general: Vittinghoff (1936).

⁴⁶⁸ Walton (2012), 73, Fig. 5.14, 420 Table 5.7.

the study-region during Nero's reign, which may therefore have obviated the need for a sizeable supply of bronze coin.⁴⁶⁹ Second and most likely, the mere 14 bronze coins identified as belonging to before the reform are misattributed to this period and should actually belong to the period of or after the reform in AD 64. The misidentification occurs from a debate where and when the Neronian bronze coins without "SC" were struck: Lugdunum or Rome. Given that the majority of the sources utilised follow RIC dating and attribution,⁴⁷⁰ the numbers demonstrate that the coins are in fact wrongly attributed in RIC and that Giard's attribution is correct.⁴⁷¹ Moreover, a lengthy break in bronze coin issuing is certainly not uncommon as a consistent annual supply (sic) of coinage was not established until Vespasian's reign.⁴⁷² All this points to a near absence of fresh *aes* coin that was neither supplied nor struck in any great quantity prior to Nero's reform. The absence of low-value coin was not limited to Nero, but was also a problem during Claudius' reign causing the 'copying epidemic' to break out. One of the reasons for the 'epidemic' was that during the Julio-Claudian period coin was increasingly supplied and used in non-military contexts in the study-region placing the distribution channels and production of coin under stress.

5.3 The End of the Julio-Claudians and the Flavian Dynasty

In AD 63/64, Lugdunum ceased to strike gold or silver coins and, around the same time, the mint of Rome began producing aurei and denarii. In Rome, the weights of both the gold and silver were lowered and copper was added to the denarius, reducing its silver bullion content.⁴⁷³ Duncan-Jones has concluded that the weight of the aureus was lowered by 4%,⁴⁷⁴ while the denarius seems to

⁴⁶⁹ The demand may have subsided due to the continuation of Claudian imitation coinage.

⁴⁷⁰ The edition of RIC is irrelevant as already in the first edition the bronze coins concerned were misattributed. The second edition of RIC 1 follows Mac Dowall; Mac Dowall (1979), 42-43, 58-59.

⁴⁷¹ Mattingly (1923), clxvi; Giard (1988), 30; Giard (2000), 29-31; Rathbone (1996), 318.

⁴⁷² Sutherland (1951), 180.

⁴⁷³ Pliny. *NH.* 33.47. The Neronian silver debasement was not a single episode, but rather a series of several adjustments: Butcher and Ponting (2015), 211-220.

⁴⁷⁴ Duncan-Jones (1994), 218.

have had a weight reduction of about 5.75%.⁴⁷⁵ Thus the reductions will hardly have constituted a 'major weight reduction', despite being noticeable.⁴⁷⁶ In terms of overall production, the post-reform aureus was struck in large quantities, whilst denarius production was rather limited.⁴⁷⁷ This picture is confirmed by the non-hoarded coin-finds in the study-region (c.f Table 5.15); the absolute number of gold coins outnumbers those of silver issued after the reform c. AD 64. Moreover, the production of post-reform Neronian aurei is substantial given their short production period (c. 4 years) and high absolute numbers (132). During the Julio-Claudian period, the two other reigns of the highest number of gold coin finds belong to Augustus and Tiberius. From these two reigns, 52 and 64 gold coins respectively were recorded.⁴⁷⁸ This highlights how significant Nero's post-reform gold production and supply to the region was.

There is no significant difference between the distribution of pre-reform and post-reform non-hoarded aurei. Both their distributions are focused on zones of military activity and waterways (Fig. 5.29). The main difference between the two is that post-reform aurei are far more numerous and their distribution is more widespread, reaching places such as sites along the Neckar valley and Mosel. As has been noted above (5.2), the 'epidemic' of Claudian imitation coins ceased approximately AD 62/64 when bronze coins were once again struck at Lugdunum under Nero.⁴⁷⁹ Their distribution continues the pattern observed earlier in that an increasing number of low-value coins are found in the hinterland and more civilian areas of the Empire (Fig. 5.30). It is difficult to draw any conclusions from the mere nine hoards which close during Nero's reign. Only one hoard, found in *barbaricum*, may demonstrate a conscious decision to hoard pre-reform coins; in Tensfelderau (ID: 9110), three

⁴⁷⁵ Butcher and Ponting (2015), 204-206.

⁴⁷⁶ Butcher and Ponting (2015), 206; Sutherland (1987), 97.

⁴⁷⁷ Mac Dowall (1979), 138-140; Duncan-Jones (1994), 117, 198; Butcher and Ponting (2015), 208.

⁴⁷⁸ An additional 77 quinarii (most likely all silver quinarii) were recorded for Augustus.

⁴⁷⁹ Presumably to supply the northwest.

Tiberian, one Claudian and two pre-reform Neronian aurei were found together.⁴⁸⁰

Period	Gold	Silver	Low	Total
AD 54-64	8	1	0	9
AD 64-68	897	31	91	1019
Other	192	51	61	304
Total	1097	83	152	1332

Table 5.16: Number of hoarded coins, IP 6 (AD 54-68), by 'period' (regardless of closing period).

Region	Non-Hoarded	Hoarded	Total
Britain	78	106	184
NW Europe	200	1097	1297

Table 5.17: Number of gold coins issued by Nero, by region.

More informatively, the number and composition of coins issued by Nero found in hoards confirms the production and supply of gold to the study-region (Table 5.16). A comparison between the numbers of Neronian gold in the study-region and Britain highlights the extraordinary situation in Northwest Europe (Table 5.17).⁴⁸¹ Given Britain's noteworthy PAS recording system, it is certainly no longer viable to consider the absolute figures for Nero in Britain and Northwest Europe as similar (even if the 866 Neronian aurei from the Feldstraße hoard in Trier are excluded).⁴⁸²

Reign	Gold	Silver	Low	"Coin"	Total
Civil War	1	27	7	0	35
Galba	10	72	154	0	237
Otho	6	41	0	6	53
Vitellius	3	107	34	0	144
Total	20	247	195	6	469

Table 5.18: Number non-hoarded coin finds issued during the civil war.

Following the death of Nero in the summer of AD 68, Rome would see four new emperors in quick succession over the course of the next 18 months. What stands out from the non-hoarded coin-finds issued during this period is the high number of silver coins, especially compared to other denominations (Table 5.18). Both Galba and Vitellius struck denarii and aurei at Rome as well as in

⁴⁸⁰ Neronian Aurei: RIC 24 (AD 59) and RIC 28 (AD 60).

⁴⁸¹ Figures for Britain: Bland and Lorient (2010), xxv; Gilles (2013).

⁴⁸² For "similar" figures: Bland and Lorient (2010), 18, 20.

Spain and Gaul,⁴⁸³ which may explain why their coins are more prevalent in the study-region. Furthermore, although output during Otho's three-month reign is said to have been considerable with nearly 1,000 obverse dies used for gold and silver,⁴⁸⁴ this intense production is not easily discernible from the evidence in Northwest Europe. On the whole coins issued by Otho are rare as he would not have supplied coin to the troops of his rival Vitellius. However, the proportion of recovered coins that were silver (c. 77%) may hint towards his immense denarius emission, although care is needed when only considering the total composition of coinage as Otho did not strike any *aes*.⁴⁸⁵ When comparing to the number of dies recorded for precious metal coins of the period of AD 37-54 and the silver of Domitian, it is striking how large Otho's output was for such a short period.⁴⁸⁶ His successor, Vitellius, was also able to maintain a similar level of denarius production.⁴⁸⁷ When the composition of all the coin-finds is considered it is remarkable how little bronze coin was supplied, except during Galba's reign, whose bronze coins even form a perceptible portion of hoarded coins (Fig. 5.31). However, this may not be unusual as new emperors may have placed a priority on issuing high-value coinage at the beginning of their reign, but Otho's and Vitellius' emissions appear to be abnormally large.⁴⁸⁸

It is uncertain where the majority of Galba's bronze coins were issued, but Rome seems the most plausible candidate (especially for sestertii). Most of the low-value *aes*, however, may originate primarily from mints in Gaul (Narbo, Vienne, and especially Lugdunum) and Spain ('Tarraco').⁴⁸⁹ Vitellius also issued bronze coin at Rome and 'Tarraco', sharing a significant number of

⁴⁸³ Butcher and Ponting (2015), 239; Sutherland (1984), 216-231, 262-267.

⁴⁸⁴ Butcher and Ponting (2015), 248; Butcher, *et al.* (2009), 292; Metcalf (1993), 157-158.

⁴⁸⁵ Sutherland (1984), 258 note 2. In one instance a sestertius was identified (as a forgery) and in five other instances "coin". The lack of identification may be attributed to their condition, possible forgeries, or that these coins are provincial and were therefore unclassified at the time. For Otho's provincial: Burnett, *et al.* (2006), 51.

⁴⁸⁶ Carradice (1983), 83-84; Von Kaenel (1994), 52-55. There are a total of 830 and 720 identified obverse dies for Caligula/Claudius and Domitian respectively.

⁴⁸⁷ Butcher and Ponting (2015), 262.

⁴⁸⁸ In the case of Pertinax's short reign, 92% of all non-hoarded coins in the study-region were either aurei or denarii.

⁴⁸⁹ Sutherland (1984), 217.

reverse dies with Galba.⁴⁹⁰ It is striking, given the established pattern throughout the Julio-Claudian period that so little bronze was supplied to the frontier region by the commander of the army in *Germania Inferior* during a period of military activity. The coins issued by Galba, Otho, and Vitellius, regardless of their denomination, are all equally widespread and dispersed throughout the study-region and do not suggest that any of Vitellius' coins were struck in Germany.

In late December AD 69, Vespasian was declared by the Senate to be the fourth Emperor of the year. The lack of centralised production during the first part of Vespasian's rule 'presents [an] important opportunit[y]' and can demonstrate inter-regional circulation.⁴⁹¹ With regard to Vespasian's eastern aurei, Howgego has recently collected the (sparse) available evidence and tested the extent to which gold might move across the Empire. Finds of Vespasian's eastern aurei from Britain and Raetia suggest that one reason for their long distance movement might be the military.⁴⁹² The movement of other coins issued by Vespasian in the east may help support the argument for the reason of their movement. While the movement of silver can be better linked to troop deployment and transfer,⁴⁹³ the movement of provincial coins which are unlikely to have had any formal monetary value outside of their local/regional area, may similarly provide fruitful results.⁴⁹⁴ On the whole, provincial coins are rare in the northwest and those that did reach the study-region will probably have only been accepted due to their size. No provincial coins were recorded for Tiberius, Caligula, or Claudius.⁴⁹⁵ Under Augustus, a considerable number of provincial coins were supplied to the study-region but the majority

⁴⁹⁰ Sutherland (1984), 262.

⁴⁹¹ Howgego (2015), 125.

⁴⁹² Howgego (2015), 133.

⁴⁹³ Howgego (1994), esp. 15; Howgego (1996). 7 eastern denarii have been recorded (all except one were issued AD 69-71).

⁴⁹⁴ Howgego (1994), 13; Howgego (1985), 24-31, esp. 30. Bronze circulation acting similarly as provincial coinage: Walker (1988b), 282. Some of Vespasian's provincial coins may have been struck in Rome and then sent to the relevant province: Butcher and Ponting (2015), 331; Carradice and Cowell (1987); Butcher and Ponting (1995); Burnett, *et al.* (1999), 11, 13.

⁴⁹⁵ This may not be wholly surprising given the decline of western RPC coins after Augustus: Burnett, *et al.* (2006), 18-19.

of these are from either Gaul or Spain, which on the whole followed minting standards at Rome (and Lyons).⁴⁹⁶ One explanation for the rarity of other provincial coins during the Julio-Claudian period is that those from the east were struck at different standards and were mainly smaller. They were therefore unlikely to be mistaken for Imperial bronze coinage, preventing their Empire-wide circulation.⁴⁹⁷ Only one provincial coin is recorded for Trajan, 18 for Hadrian, and 25 for Antoninus Pius, but their distribution is less concentrated, which may support the notion that over time provincial coins may have increasingly (but still minimally) been mistaken as Imperial bronze coins.

Three non-hoarded and one hoarded Roman provincial coins issued by Vespasian have been recorded in the database (Table 5.19). Their mints should be no surprise given Vespasian's command in Judea. Unfortunately, no exact find contexts are known for any of the coins.⁴⁹⁸ It is noteworthy that there is a slight predisposition to find Vespasian's eastern coins by the Danube and close to the *agri decumates* (Fig. 5.32). It is likely that these coins found their way to the area during the campaigns undertaken by Vespasian and/or Domitian. This theory is further supported by consideration of the distribution of Neronian (12) and Domitianic (11) provincial coins (Fig. 5.33).⁴⁹⁹

ID	Site	Find Type	Denom	Year	Mint	Ref
10855	Groningen, NL	Non-Hoarded	Tdr	69-70	Alexandria	Geissen 276
557	Passau, Germ.	Non-Hoarded	AE	77-78	Antioch	Wruck 118/9
3194	Weissachflact, Germ.	Non-Hoarded	AE	69-79	Apamea Phrygia	BMC (Phrygia) 150
2293	Buchau, Germ.	Hoard	Tdr	66 or 69	Alexandria	BMC 114/115

Table 5.19: Roman provincial coins issued by Vespasian.

⁴⁹⁶ Burnett, *et al.* (2006), 34-35.

⁴⁹⁷ Burnett, *et al.* (2006), 35-36.

⁴⁹⁸ The same can be said about the eastern denarii, with the exception of one denarius (Ephesus) from a hoard in a Roman fort.

⁴⁹⁹ The coin found in Nijmegen is identified either as Neronian/Vespasianic or Domitianic (RPC II, 324-325); Burnett, *et al.* (1999), no. 324-325.

Mint	Bronze	% of Bronze	Silver	% of Silver	Gold	% of Gold
Lyons	1278	32.58	14	1.48	6	6.89
Rome	1189	30.31	682	72.25	48	55.17
Rome/Lyons	438	11.16	6	0.64	3	3.45
Unknown	987	25.16	228	24.15	26	29.89
Other	31	0.79	14	1.48	4	4.6
Total	3923	100	944	100	87	100

Table 5.20: Number of non-hoarded coins issued by Vespasian by mint and metal.

In addition to the inter-regional circulation traceable by eastern issued coins, the role of Lyons and Rome supplying coin to the northwest can also be investigated. The dominant role of Rome in striking and supplying denarii throughout the Empire has already been observed and can be confirmed with the dataset collected (Table 5.20).⁵⁰⁰ However, progress can now be made regarding *aes* production and supply during Vespasian's rule as previously 'no systematic survey of bronze finds for Vespasian has been published'.⁵⁰¹ From a modest sample Carradice and Buttrey observed that 'if other mints [i.e. mints besides Rome] had been included for denarii and bronze their impact [on the output graphs] would have been minimal or even invisible. Rome was by far the dominant mint'.⁵⁰² From the finds in the study-region, a different conclusion could be drawn regarding *aes* production. A 'non-issue' arises from the dataset in the fact that the majority of references (where included) use the first edition of *RIC* Volume 2, which has recently been revised,⁵⁰³ and since only a small portion of the coins attributed to Lyons (with a reference) belong to the period of AD 70-72 (c. 20-25%). Even taking into account that the globe, which was previously believed to be a distinctive characteristic of the mint of Lyons on *aes*, also appears on some of the bronze minted in Rome in early AD 71, the overall

⁵⁰⁰ Carradice and Buttrey (2007) 48; Carradice (1998), 114.

⁵⁰¹ Carradice and Buttrey (2007), 50.

⁵⁰² Carradice and Buttrey (2007), 51.

⁵⁰³ Carradice and Buttrey (2007). For *RIC* 2 (1st Edition): Mattingly and Sydenham (1926).

picture changes little.⁵⁰⁴ Therefore, the finds from the study-region are either representative of the volume of bronze production by mint (which given its limited period of bronze production is impressive) or the study-region almost exclusively received the bronze struck in Lyons in addition to some of the bronze struck in Rome.⁵⁰⁵

In addition to an increased supply of bronze (cf. Tables 5.12 and 5.20), an extraordinary high number of silver and gold coins was ‘lost’ in several concentrated areas (Fig. 5.34). Two clusters that can be associated with military activity are found by the *agri decumates* and along the Dutch Rhine (Batavian Revolt). The *Via Belgica* is also clearly visible which may also be connected to the military activities and supply thereof. Additionally, the number of finds in *Germania magna* is also noteworthy, with a cluster along the Dutch North Sea coastline and another in the middle of Germany. The distribution of *aes* throughout the study-region broadly reflects that of precious metals, although with only 67 specimens of *aes*, quantities beyond the Empire are significantly lower than within. Furthermore, the distribution of coins issued by Vespasian in *Germania magna* appears to follow water routes and areas of settlement.⁵⁰⁶ The increased numbers of gold and silver finds may also only reflect increased mint production, possibly as a consequence of lowered fineness standards and some recycling of older coins.⁵⁰⁷ Finally, while increasing quantities of coins are found beyond the Empire, despite limited military campaigning, the same can be noted within the Empire, where more new coin is found in the civilian areas of the Empire. However, it is also not always clear when these coins arrived to the study-region as was demonstrated with the distribution of provincial coins.

Much has been written about the reign of Domitian and his coinage.⁵⁰⁸ Here we focus on one aspect of Domitian’s reign: the reorganisation of the

⁵⁰⁴ Also noted before: Carradice and Buttrey (2007), 51.

⁵⁰⁵ For limited period of bronze production: Carradice (2007), 33; Kraay (1953), 183. On Lugdunum supplying the Northwest (Britain, Gaul, and Rhine frontier): Kraay (1953), 117. On utilising hoards to estimate mint output: Volk (1987). On Lyons *aes* production: Giard (2000).

⁵⁰⁶ Berger (1992), 131-132.

⁵⁰⁷ On silver fineness: Butcher and Ponting (2015). Recycling and ‘restoration types’: Buttrey (1972a); Mattingly (1930), xxxviii.

⁵⁰⁸ E.g. Butcher and Ponting (2015), 360-408; Carradice (1983).

provincial borders, creating *Germania Inferior* and *Germania Superior* as separate entities from *Gallia Belgica* around AD 80-85 (3.1), and whether this reform had had any influence on coin-supply. It has already been demonstrated that the presence of provincial and eastern issued coins may have some relationship to military activity. A similar observation has also been made regarding the presence of particular types of quadrantes issued by Domitian, which have been found exclusively in military contexts (cf. 5.1).⁵⁰⁹ In AD 84, Domitian increased annual legionary pay to HS 1,200 but no marked increase of newly issued high-value coins to compensate for this can be detected in the study-region (Table 5.21) (8.1).

Find-Type	Gold	Silver	Low	Total
Non-Hoarded	32	407	5124	5563
Hoarded	24	360	353	737
Total	56	767	5477	6285

Table 5.21: Total number of coins issued by Domitian, by metal, by find-type.

However, there are two obstacles that may explain this. First, it has been noted that Domitian's denarius production fell when he improved the standard.⁵¹⁰ Second, it is possible that Suetonius' allegation that Domitian tried to lighten military expenses by reducing the number of troops is true,⁵¹¹ and occurred at the time when the denarius standard was improved and he increased pay for the soldiers.⁵¹² Of course, the amount of coin recycled from previous reigns may further have downplayed the need to supply freshly struck coin (c.f. 8.1).

As was noted with the quadrantes, it is possible that other *aes* was specifically supplied for the army.⁵¹³ The numbers of coin finds issued during the first century AD indicate that the second highest quantity of bronze supplied to the study-region was issued by Domitian (cf. Table 5.12 and Table

⁵⁰⁹ Kemmers (2006), 216-219.

⁵¹⁰ Carradice (1983), 160.

⁵¹¹ Suet. *Dom.* 12.1.

⁵¹² For increase pay: Suet. *Dom.* 7.3; Speidel (1992); Speidel (2014); Carradice (1983), 160-162.

⁵¹³ Domitian's reputed desire to return to the norms of Augustus period may have been reflected by improving the silver standard and minting sufficient quadrantes: Carradice (1983), 160-161. Supplying quadrantes to the army: Kemmers (2006), 215-219.

5.21). Given the high quantities of gold (Nero and Vespasian) and silver (Vespasian) which were supplied and still circulating, it would make sense that Domitian would concentrate on providing new and more small change and less gold and/or silver.⁵¹⁴ By providing fresh small change, it is possible that a sizeable outbreak of imitations was prevented.⁵¹⁵ Furthermore, the distribution of low denominations would suggest that the majority of *aes* remained along the *limes* with some clustering around Titelberg, between the Scheldt and Sambre rivers, and along the road between Tongeren and Cologne as well (Fig. 5.35). Domitian's silver coin-reforms appear to have had little influence on the circulation of Flavian coinage, but do appear to have affected Julio-Claudian pre-64 denarii (6.1).⁵¹⁶

In order to determine whether any differences can be noted in coin-supply to the newly formed provinces within the study-region, I have assigned modern countries to a Roman province, as the database does not do so. Belgium and Luxembourg were wholly assigned to *Gallia Belgica*, although it is possible that part of the northeast of Belgium belonged to *Germania Inferior*. The Netherlands, south of the Rhine (and the Oude Rijn) was assigned to *Germania Inferior* together with anything west of the Rhine and to the north of the Vinxtbach river in Germany.⁵¹⁷ A straight line north was drawn from Lake Constance to the *limes* to divide the remaining German area between *Germania Superior* and *Raetia*. While these boundaries are not exact, they will suffice to investigate whether any significant differences can be detected. In the case of coin quantities, it immediately becomes clear that *Germania Inferior* and *Superior* as the two main military provinces received far more coin than the other provinces (Table 5.22). Unsurprisingly in *barbaricum* a larger portion of the coin-finds are either gold or silver than within the Empire (Table 5.23).

⁵¹⁴ Kemmers (2006), 219. *Aes* might have been welcomed as a gift in areas with high demand for bronze: Speidel and Doppler (1992), 14-16.

⁵¹⁵ Carradice (1983), 160; Kemmers (2006), 218. Only 27 *aes* imitational were recorded for Domitian.

⁵¹⁶ For more on Domitian's coin-reform: Carradice (1983); Butcher and Ponting (2015), 377-408.

⁵¹⁷ Trier has also been included as part of *Germania Inferior* due to its close proximity to the *limes*.

Province	Gold	Silver	Bronze	Total
G. Belgica	2	49	475	526
G. Inferior	8	98	2231	2337
G. Superior	13	144	1600	1757
Raetia	7	71	696	774
Outside	2	45	122	169
Total	32	407	5124	5563

Table 5.22: Breakdown of non-hoarded coins by metal by province, issued by Domitian.

Province	Gold	Silver	Bronze	Total
G. Belgica	0.38	9.32	90.30	100%
G. Inferior	0.34	4.19	95.46	100%
G. Superior	0.74	8.20	91.06	100%
Raetia	0.90	9.17	89.92	100%
Outside	1.18	26.63	72.19	100%

Table 5.23: Breakdown of non-hoarded coin by metal issued by Domitian, expressed as a percentage of total province coin.

A difference between the two Germanies can also be noted with regard to the amount of bronze supplied, but the difference between the two becomes more pronounced when considering the breakdown by metal from the entire study-region (Table 5.24). It is clear that the provinces of *Raetia* and *Germania Superior* received a higher proportion of high-valued coins, which will probably have been associated with military activity.

Province	Gold	Silver	Bronze
G. Belgica	6.25	12.04	9.27
G. Inferior	25.00	24.08	43.54
G. Superior	40.63	35.38	31.23
Raetia	21.88	17.44	13.58
Outside	6.25	11.06	2.38
Total	100%	100%	100%

Table 5.24: Breakdown of non-hoarded coins by metal issued by Domitian, expressed as a percentage of the totals of the study-region.

RIC	Year(s)
242	AD 82/84
333	AD 86
353	AD 87
395	AD 90/91
397	AD 90/91
408	AD 92/96

Table 5.25: Years of production of As types by Domitian.

Since asses were the main low denomination struck during the reign of Domitian,⁵¹⁸ it may be worthwhile considering whether specific issues were supplied to certain provinces (Fig. 5.36; Table 5.25). While the quantity and proportion of bronze was a significant indicator of differences in supply, this cannot be entirely traced in the evidence by coin-type. However, a substantial difference in the as supplied to the military provinces between AD 91 and AD 92/96 can be observed. Whether this is a true reflection of different provincial supply is difficult to know with the current evidence, especially when the distribution patterns of all the RIC types are considered (Fig. 5.37-5.42). What can be detected is that the reverse types in the military zones do point towards some sort of pre-determined selection,⁵¹⁹ but that different areas received these coins at different times and/or in different batches.⁵²⁰ Furthermore, a central administrative structure responsible for managing supply and/or distribution appears to be situated at Mainz, as revealed by a central place of coin 'loss' in the distribution patterns. This is unsurprising as Domitian was stationed at Mainz for several months during his war against the Chatti.⁵²¹ In addition, this centralisation is traceable after his stay, which may either be a consequence of some sort administrative centre established during his stay or due to the new provincial boundaries and Mainz's elevation to provincial capital.⁵²² What the proportion and distribution of coin-types does demonstrate, alongside the overall quantity and distribution of coinage, is that different provinces and areas therein received coin in different ways and batches and in most cases, this coin then circulated locally.

5.4 Conclusions

Despite Caesar's campaigns in Gaul during the first half of the first century BC, a tangible and significant influx of Roman coinage to the study-region did not occur until the start of Drusus' campaigns. This does not necessarily mean that

⁵¹⁸ Hobley (1998), Fig. 3.9

⁵¹⁹ Kemmers (2006), 244.

⁵²⁰ For batches of supply to Britain: Walker (1988).

⁵²¹ Strobel (1987), 427-428.

⁵²² On Domitian: Carradice (1983), 156-157; Levick (1982).

Roman coinage was absent prior to Drusus', but if present, will have been limited in quantity, overall distribution, and possibly access. Similarly, through the use of hoards, it was possible to detect that Augustan coinage also failed to arrive in significant quantities until preparations for Drusus' subsequent campaigns in *Germania magna*. These observations point to a considerable 'laissez-faire' attitude during Rome's early rule of the northwest, at least through the lens of coin-finds.

The Augustan non-hoarded coin-finds were mapped by issue date. They were also compared numerically to those found in northern Italy which allowed for changes to be detected. Through their overall distribution, it was possible to note that non-hoarded Augustan coin-finds may partially reflect shifts of military activity. This is especially the case with Tiberian coins, which are not found in any quantity beyond the *limes*. Although the contrast between Augustan and Tiberian coins outside of the Empire is a useful indicator for a change in military policy, caution is needed as campaigns continued until AD 16, suggesting the continued use of Augustan coins. Moreover, it is known that old Augustan coins were deliberately supplied under Tiberius.

The continued use and circulation of Iron Age coinage was also considered. Hoards show that Iron Age and Roman coins rarely mixed, which may give the false impression that the two spheres of coin-use did not interact or overlap. Moreover, since Roman coin appears to have been limited prior to Drusus' campaigns, it incorrectly imprints the idea of 50-15 BC as the period of transition, at which point with the influx of Roman coinage, Iron Age coins disappear from use. In order to address this issue, the contexts of hoards with Iron Age coinage were investigated, and it could be identified that they remained in use at least until the Tiberian period but in some parts of the study-region, possibly even until the second half of the first century. In addition, the distribution of Iron Age coins showed a military oriented distribution and some predominant types such as *Scheers 217* may have been commissioned by the Roman army further highlighting the complexity of the situation.

The presence of other Julio-Claudian coinage was also addressed. Of note are the remarkably similar distribution patterns for non-hoarded coins issued by Caligula and Claudius. It was suggested that this was a consequence of their shared interest in invading Britain. The high-value coin-finds issued by Claudius are of importance for this theory as they are nearly exclusively found along the German and Dutch Lower Rhine and at Velsen. Although Claudian coins can be linked to his military activities in Britain, their distribution pattern also demonstrates that coin was increasingly being circulated between the civilian and military zones.

An interesting drop of Republican coins in hoards closing during IP 5 (AD 41-54) was identified and may have been connected to their selection on the continent for military pay on the island. This proposal finds assistance through the general lack of Claudian denarii in Britain during this period, although this may simply be a consequence of delayed supply. IP 5 (AD 41-54) also provides the opportunity to assess the presence and possible origin of Claudian imitations. From the dataset gathered and employed in this thesis it appears that the Claudian imitations may have had their origin with the military, since they are primarily found in areas of military activity and interaction (which does include some civilian sites). During the first ten years of Nero's reign (AD 54-64), bronze coin appears to have been limited. The most plausible reason for this is that the coins dated prior to the re-opening of the mint of Lyons have been incorrectly identified and that simply no fresh bronze was supplied since it was not being struck (in significant quantities). This break in bronze coin production was not unusual during the Julio-Claudian period and given the increasing use of coin outside of the military sphere, may have been a catalyst for the production of imitations.

During the Flavian dynasty, coins struck during the reign of Vespasian provide an opportunity to assess the movement of coin. The reason for their movement across the Empire is plausibly connected to the transfer of military troops. RPC coins struck under Domitian and Nero were used as a control and may also have moved simultaneously or for similar reasons, due to their similar

distribution patterns. An assessment of the distribution of assess struck under Domitian revealed Mainz as a central place of 'coin-loss', which may be connected to the formation of the two Germanies as separate provinces, revealing that different provinces and areas therein could expect to be supplied with coin in different batches.

6 Coin-Finds: The Middle Roman Period

In this chapter, three period case studies will be undertaken to provide an overview of coin-finds and important moments within the study-region during the second and third centuries. The first case study assesses coin-finds, supply, and circulation in the study-region during the second century. The second study will consider the establishment of the Severan dynasty, the changing supply of coin as well as changes to the monetary system. The third and final study will conclude the chapter by providing an overview of coin-circulation patterns in the context of Empire-wide developments of the mid-third century.

6.1 Nerva and the Antonines

Nerva's reign may only have lasted a brief sixteen months but is of numismatic interest. First, he is known to have struck a considerable amount of coin,⁵²³ despite the general picture of Nerva's need for money and several public expenditure reductions. Yet, he is also known for his munificence in establishing schemes to help farmers and poor children.⁵²⁴ All this was managed while maintaining the weight of Domitian's later aurei (7.63g) and the fineness of the denarii at the Revised Neronian Standard of 90% (5.3), although the denarius does appear to have declined slightly in weight.⁵²⁵ Furthermore, clear differences in the western provinces of the distribution of various types have been investigated, which was believed 'to be driven by propaganda requirements, but there may be other reasons to do with the production cycle of the mint' (see below).⁵²⁶

From the dataset, it is possible to detect that Nerva was either responsible for a considerable issue of coin, a fact which may not be wholly unusual at the beginning of a new emperor's reign,⁵²⁷ or a significant proportion of the total coin struck during his reign was supplied at some point

⁵²³ Hobley (1998), 34.

⁵²⁴ Shotter (1983), 220; Grainger (2003), 54-61; Pliny, *Pan.* 62.2; Pliny, *Ep.* 2.1.9; Dio, 68.1.1, 68.2.1.

⁵²⁵ Woytek (2008), 437-439; Butcher and Ponting (2015), 409-418; Duncan-Jones (1994), 222.

⁵²⁶ Hobley (1998), 34. For more on propaganda circulation: Noreña (2011).

⁵²⁷ Carradice (1983), 90, 141; Hobley (1998), 7.

to the study-region. However, it is only possible to recognise this when considering the length of Nerva's reign as well, by doing a coin per day calculation (C.P.D) (Table 6.1).

Reign	Gold C.P.D	Silver C.P.D	Bronze C.P.D	C.P.D
Augustus	0.0035	0.0477	0.9500	1.0012
Nero	0.0401	0.0299	0.5485	0.6185
Vespasian	0.0238	0.2586	1.0748	1.3573
Domitian	0.0058	0.0741	0.9330	1.0129
Nerva	0.0040	0.3018	1.9316	2.2374
Trajan	0.0086	0.1419	0.8177	0.9682

Table 6.1: Non-hoarded coin per day calculations.

While considering the distribution of bronze coin throughout the western provinces, Hobley noted that even when only the first year of each emperor's reign was considered, Nerva's C.P.D. (coin per day) value was still higher than the next five emperors and his predecessor. Several explanations have been put forward to explain this, ranging from a theoretical *damnatio memoriae* for Domitian to a better survival rate of the other 'good emperors'. Hobley favoured an explanation which was based on 'propaganda', where Nerva needed to present themes of Liberty and Good Fortune as well as gain the support of the army, which was pro-Domitianic.⁵²⁸ This explanation seems more convincing if one considers that the C.P.D. values of Vespasian and Augustus are amongst the highest in the first century. It is interesting that Galba's C.P.D. value is similar (1.28) but it is necessary to keep in mind that the high number of coins for Vespasian and Augustus may be due to their military campaigning, as can also be seen with Domitian's C.P.D. Yet, some weight may be placed on the evidence of the iconography of the reverse types too. Pax and the imperial family are the key reverse types on Vespasianic silver coinage,⁵²⁹ which appears to indicate that propaganda associated with the establishment of a new dynasty was at least of some consideration. A similar quantitative study on the coinage of Augustus is necessary to determine whether this argument can be solidly put forward as an explanation.

⁵²⁸ Hobley (1998), 7-8, 32; Dio. 68.3.

⁵²⁹ Noreña (2011), Appendix 3.

Trajan succeeded Nerva at the beginning of AD 98 and ruled until the middle of AD 117.⁵³⁰ He embarked on several campaigns along the northern frontier (*Germania* and *Dacia*) and Dio also records that he withdrew worn coins.⁵³¹ There is a preponderance of coins issued by Trajan between AD 101 and 106 along the Danube and Upper Rhine (Fig. 6.1) (3.6). The overall distribution of Trajanic coins confirms this but also highlights several key differences. Above all, the *Via Belgica*, the Dutch Rhine area, the Dutch North Sea coast are densely populated by coin-finds (Fig. 6.2). It is possible that the density of coin-finds in the Dutch Rhine area may be linked to Nijmegen's elevation in municipal status, having been granted market rights by Trajan (3.1, 9.1). What is also interesting is the distribution of coins, where silver is preferred to bronze in the whole of *barbaricum*, but surprisingly along the Dutch North Sea coastline this preference is not as prevalent as elsewhere (Table 6.2 and 6.3) (9.1-9.2).

Area	Bronze	Silver	Gold	Total
Outside	99	170	4	273
Inside	5731	842	57	6630
Total	5830	1012	61	6903

Table 6.2: Non-hoarded coins issued by Trajan, by area, by metal.

Area	Bronze	Silver	Gold	Total
Germ. Out	31.64%	66.10%	2.26%	100%
NL Out	44.79%	55.21%	0%	100%

Table 6.3: Non-hoarded coin composition, issued by Trajan, by metal, outside of the Roman Empire.

Trajan's first denarii were issued at the same standard as his predecessors (c. 90%). However, from AD 100, his denarii were on the First Neronian Standard which had a fineness level of about 80%.⁵³² Butcher and Ponting have recently described Trajan's reversion to Nero's standard of c. AD 64 as having far-reaching consequences.⁵³³ Early historians linked the debasement with Cassius Dio's comment that Trajan withdrew all obsolete/worn coins from circulation

⁵³⁰ For an updated catalogue of Trajan's Imperial coins: Woytek (2010).

⁵³¹ Dio, 68.15.3

⁵³² Butcher and Ponting (2015), 418-423; Woytek, *et al.* (2007). His gold was also slightly adjusted, which ensured a consistent ratio between the two: Woytek (2010), 20-22.

⁵³³ Butcher and Ponting (2015), 423.

(in AD 107), because they regarded them as supposedly bad. However, Mommsen argued that this withdrawal concerned denarii and was done for financial reasons, as earlier coins contained more silver and were therefore better.⁵³⁴ Although the debasement has now, on the basis of metallurgical analysis, been fairly securely dated to AD 100, a connection between the recall of coinage and Trajan's coin-reform may still exist as the recall is not securely fixed to AD 107.⁵³⁵ Even if it is dated to AD 107, it would not be surprising to see legislation passed as a response to individual hoarding and non-state withdrawal of better quality coins (i.e. Gresham's Law in practice). In the case of hoards, two aspects may be of interest to compare (albeit on the partial basis of the available evidence);⁵³⁶ the withdrawal of Republican and Julio-Claudian denarii issued before AD 64.

Figures 5.11 and 5.12 presented the absolute numbers of Republican coins in hoards, although this is not the only mechanism to identify circulation periods. Duncan-Jones used percentage composition of Republican and Julio-Claudian coins in hoards to determine their circulation period. This is a slightly better method to investigate the matter, but is not the only way to do so, as it does not mathematically take into account previous periods/reigns and increasing quantities of coin in circulation and the duration of their circulation. By utilising Duncan-Jones' method the dataset gathered here is also able to obtain a roughly similar result with Republican coins (including those issued by Mark Antony) mainly withdrawn during Hadrian's reign (Fig. 6.3).⁵³⁷ However, by utilising a correlation test a more precise and different result is attained. A correlation graph calculates the correlation coefficient between two sets of data to determine their relationship.⁵³⁸ A correlation coefficient of 100% indicates a perfect correlation; as variable X increases, variable Y increases. A correlation of

⁵³⁴ Mommsen (1873), 31. For a discussion of various arguments from the eighteenth century to present day: Butcher and Ponting (2015), 423-428.

⁵³⁵ Butcher and Ponting (2015), 428.

⁵³⁶ The Coin Hoards of the Roman Empire Project, undertaken by OXREP and the Ashmolean Museum should be able to provide a much larger and statistically significant dataset to test.

⁵³⁷ Duncan-Jones (1994), 194-200.

⁵³⁸ A simple example is the relationship between average temperatures and the use of air-conditioning.

-100% indicates a perfect negative correlation; as variable X increases, variable Y decreases. A correlation of 0% indicates no correlation. Ideally, shorter and more precise periods should be utilised for a correlation test as one which utilises less values will create more statistical noise.⁵³⁹ However, since this was not possible to do here, the correlation calculations take the previous three issue periods into account which means that it was not possible to provide a correlation calculation for Issue Periods 2 and 3. Nevertheless, a beneficial basis for analysis can be generated through this initial approach in order to determine the trend, rather than absolute values of correlation, and therefore circulation.

Through several correlation graphs, it is clear the reign of Trajan is a key point. When one considers the correlation between hoarded Republican coins (excluding those issued by Marc Antony) and all other hoarded coins, between the reigns of Trajan and Hadrian, a positive correlation turns into a negative one (Fig. 6.4). This therefore indicates that Republican coins were found less in hoards during this period. However, already during IP 8 (AD 96-117), the correlation between Republican hoarded coins and other hoarded coins decreases. This too designates that Republican coins were less and less present in hoards. As there is a continued negative correlation from IP 9 to 11 (AD 117-180), this indicates that although a handful of Republican coins find their way into hoards, those which had not yet been removed from circulation (through hoarding or melting down) either continued to circulate or found their way into hoards closing in later periods via selection and saving.

The correlation graph of the coins of Marc Antony (Fig. 6.5) shows that during IP 8 (AD 96-117), there was a weak correlation between his coinage and the others which were hoarded (excluding other Republican coins). This reveals that his coinage behaved similarly during Trajan's reign to other Republican coins. However, during IP 9 and 10 (AD 117-161), a strong positive correlation turns negative which demonstrates that Marc Antony's coinage became scarcer

⁵³⁹ Ideally one would calculate correlation on a yearly basis, but this was not possible with the current dataset, due to insufficient available data.

in hoards until IP 13 (AD 193-222). This also connects well with the *restitutio* coinage of Marc Antony under Marcus Aurelius. As there is a positive correlation for the period AD 193-222, this once again establishes that those coins which had not yet been removed from circulation either continued to circulate or found their way into hoards closing in this or later periods via selection and saving.

Finally, by considering the denarii issued by the Julio-Claudians prior to Nero's reform in AD 64, a very different circulation pattern is uncovered (Fig. 6.6). From the collected data, Julio-Claudian denarii in the study-region have a near 0% correlation (-13%) in IP 9 (AD 117-138), which represents independence between Julio-Claudian denarii and other denarii in circulation. In absolute numbers, very few Julio-Claudian denarii are found in hoards closing with coins issued after the Flavian period. The correlation graph therefore confirms two observations. Firstly, hoarders removed 'better' coins due to the high output of silver during the Civil War and Vespasian's reign.⁵⁴⁰ Secondly, the graph demonstrates the importance and impact of Trajan's coin-reform on circulation. Furthermore, given Domitian's changing fineness and weight standards of the denarius,⁵⁴¹ it is possible that these changes also contributed to the hoarding of Julio-Claudian denarii with a slightly higher weight.⁵⁴² The return of a positive correlation once again in IP 11-12 (AD 161-192), as was the case with coins of Marc Antony, demonstrates that the remaining Julio-Claudian denarii which had not yet been hoarded were once again selected for hoarding. Why and how some Julio-Claudian denarii continued to circulate (or be hoarded) after IP 9 (AD 117-138) is unclear, but the answer may well lie with their condition, seeing some worn early Julio-Claudian denarii mistaken or regarded as having equivalent value as Neronian denarii, perhaps due to their

⁵⁴⁰ Butcher and Ponting (2015), 321.

⁵⁴¹ Butcher and Ponting (2015), 383.

⁵⁴² The changes to fineness under Domitian were long unrecognized, which may also have been the case during his reign as well: Butcher and Ponting (2015), 377-379.

reduced weight. The debasement of the denarius under Antoninus Pius may too have contributed to their hoarding, resulting in a positive correlation.⁵⁴³

The debasement of the denarius was one of the most important monetary events for the study-region during Antoninus Pius' reign of peace. Marcus Aurelius succeeded Antoninus Pius in March AD 161 and inherited the beginning of external troubles in *Germania magna* which had already started to cause internal problems in *Germania Superior* with raids by the Chatti in the early and mid-AD 160s.⁵⁴⁴ The most significant campaigns undertaken by Marcus Aurelius in the north were those against the Marcomanni and other tribes in the vicinity (outside the study-region). For the reign of Marcus Aurelius, 4,704 non-hoarded coins have been recorded, of which 512 are gold and silver. The distribution of non-hoarded gold and silver coins allows for some initial observations (Fig. 6.7). Within the Empire, there is a dense clustering of high-value coinage at the Dutch *limes* whilst in Belgium some sort of line is present along the Scheldt and the *Via Belgica*, which is also confirmed when considering the distribution of non-hoarded *aes* (Fig. 6.8). Beyond the Rhine, there is a gathering of coin-finds in the middle of Germany and a vast amount of coin is found along the Dutch North Sea coast in Groningen and Friesland.

There are several possible explanations for the coin-finds in the middle of Germany. As campaigns were not actively undertaken in the area, a possible explanation is that coins found their way to the middle of Germany via bribes paid by Marcus Aurelius to pay off local tribes,⁵⁴⁵ or as a result of plunder which may have originated from the Marcomanni campaigns and the Chauci raids. Once the coins arrived into *barbaricum*, their distribution may have been affected by trade/circulation within *barbaricum*, making it hard to judge their

⁵⁴³ For a revision of the Antonine debasement moved from Marcus Aurelius to Antoninus Pius: Butcher and Ponting (2012). Weight reductions: Duncan-Jones (1994), 225-229. On weight loss as an index of coin-wear and circulation: Duncan-Jones (1987).

⁵⁴⁴ Birley (2000), 121-122; Rüger (2000), 503.

⁵⁴⁵ Berger (1996a), 158; Dio, 72.11.1; SHA Marcus 21.6-8; Dio, 72.12.1 (Marcus Aurelius); Dio, 74.6.1 (Commodus); Dio, 78.13.3, 14.1 (Caracalla); 'Germanic peoples' were also recruited: Birley (2000), 160.

arrival/supply date.⁵⁴⁶ Some have argued that the increased presence of coin could be linked to 'an increased demand for Roman goods in the north'.⁵⁴⁷ However, it may only be possible to determine which explanation is more plausible once a detailed study of coin-finds and coin-types is undertaken further along the Danube.⁵⁴⁸ It should not be immediately discounted that some of the newly procured coin was the result of or led to an increase in trade across the *limes* which is detectable in the archaeological record.⁵⁴⁹ Trade across the Rhine and intra-*barbaricum* circulation may also be an explanation for the finds in the north of Netherlands. Unfortunately, it is not possible to compare coin-types from Belgium and the north of The Netherlands as the necessary data from the former are lacking, which prevents an assessment of the extent to which the Chauci pirate raids along coast of Belgica in AD 172 influenced the coin-finds.⁵⁵⁰ Erdrich has interestingly noted that decorated Samian ware from the North German and Dutch coastal areas are similar to those found in the military and civilian areas in Raetia and Pannonia, meaning some of the material may originate from there. He also suggests that some of the Chauci pirates after their defeat may have joined as irregular auxiliaries, which would explain the presence of the Samian ware,⁵⁵¹ and could have contributed to the dispersal of Roman coin in *barbaricum*.

Both the reigns of Marcus Aurelius and Commodus brought changes to the supply of coin to the study-region in the second century. Throughout most of the Antonine dynasty a relatively consistent number of coins for each emperor has been recorded, but a marked decline occurs for coins issued during reign of Marcus Aurelius and especially during that of Commodus

⁵⁴⁶ On the production and circulation of counterfeits produced in *barbaricum*: Stribny (2003). *Barbaricum* circulation: Bursche (1996); Bursche (2002). On coins entering circulation in *barbaricum* due to the Marcomannic war: Kolinkova (1994); Bursche (1994).

⁵⁴⁷ Wielowiejski (1970), 317. Contra: Berger (1996a), 158.

⁵⁴⁸ There is a peak in bronze coinage in AD 173 throughout the western provinces. In addition, Pannonia, Gaul and Italy have a higher percentage of dupondii and asses than other provinces. All this may be connected to the Marcomannic war: Hobley (1998), 83-84.

⁵⁴⁹ Wolters (1986), 85-86.

⁵⁵⁰ Rüger (2000), 503. Comparing the finds from the north and south of The Netherlands, no clear pattern could be detected, confirming a strong link between the two coin-find groups.

⁵⁵¹ Erdrich (2001), 123-125.

(Tables 6.4, 6.5, 6.6, Fig. 6.9).⁵⁵² The simplest explanation for the apparent decline of coins by IP in the study-region is that it was reduced as a consequence of re-directed concentration, spending more newly issued coin for military campaigns in the East and further along the Danube against the Marcomanni.⁵⁵³ However, the supply of old coins by Marcus Aurelius and/or Commodus cannot be discounted either. Nevertheless, it is interesting that few of their own coins were ever supplied to the study-region.

Reign	Gold	Silver	Bronze	Total
Nerva	2	150	960	1112
Trajan	61	1012	5830	6903
Hadrian	55	887	6000	6942
Antoninus Pius	48	1369	6282	7699
Marcus Aurelius	22	490	4192	4704
Commodus	3	325	1772	2100

Table 6.4: Number of non-hoarded coins by reign in study-region, IP 8-12 (AD 96-192).

Reign	Gold	Silver	Bronze	Total
Nerva	4	138	88	230
Trajan	276	1591	959	2826
Hadrian	401	1527	1531	3459
Antoninus Pius	537	2765	1431	4733
Marcus Aurelius	163	1897	1310	3370
Commodus	8	966	496	1470

Table 6.5: Number of hoarded coins by reign in study-region, IP 8-12 (AD 96-192).

Reign	Gold	Silver	Bronze	Total
Nerva	6	288	1048	1342
Trajan	337	2603	6789	9729
Hadrian	456	2414	7531	10401
Antoninus Pius	585	4134	7713	12432
Marcus Aurelius	185	2387	5502	8074
Commodus	11	1291	2268	3570

Table 6.6: Number of hoarded and non-hoarded coins by reign in study-region, IP 8-12 (AD 96-192).

Another explanation, which many have favoured, is a link between the detectable drop in coin-supply and a decline in coin production during Marcus

⁵⁵² It is important to recall that numbers in tables are based on the sources utilised in this thesis and therefore discrepancies may exist. See 2.3 for sources used.

⁵⁵³ On M. Aurelius being the precursor to the third-century crisis due to warfare: De Blois (2002), 213. For a list of external pressures: Howgego, *et al.* (forthcoming).

Aurelius' reign around AD 167 to AD 173.⁵⁵⁴ Supporting this line of thinking is the reduction in silver coins of this period in several Roman provinces of modern day Germany, Britain, Italy, and France under the reign of Commodus.⁵⁵⁵ It therefore invites consideration of a potential link between the well-known Antonine Plague (Plague of Galen) and the decline of coin-supply and production.⁵⁵⁶ It may well be plausible that the epidemic ravaged the army and population to such an extent that coin no longer needed to be supplied in equal quantities. The exact extent of population decline and mortality rate is unknown but on the basis of coin-finds, we could accept that "*this pestilence must have raged with incredible fury; and it carried off innumerable victims*".⁵⁵⁷ From ancient accounts, it appears that army was one of the main 'target' population groups for the plague.⁵⁵⁸ This too may have affected coin-supply to the region as there may have been fewer troops to pay along the *limes* in the study-region either because they were moved to the campaigning region and/or a significant number had suffered from the plague, which would also explain some of Marcus Aurelius' recruitment programmes.⁵⁵⁹

Another affected group may be those who worked the mines. Many of the mines, such as the gold and silver mines in Spain, which were the most important to the Empire, did not outlast the second century. At Rio Tinto and other sites a disruption in the AD 160-170s is detectable in the archaeological record.⁵⁶⁰ In addition to the decline of precious metal mining in Spain, the

⁵⁵⁴ Duncan-Jones (1996), 131-132.

⁵⁵⁵ Wilson (2009); Hopkins (1980), 113, Fig. 4. For the supply to civilian sites in Gaul (which shows similar patterns as the study-region): Meisssonier (2000), 564, Fig. 9.

⁵⁵⁶ On mint output and finds: Volk (1987).

⁵⁵⁷ Niebuhr (1849), 251. Gilliam's 1-2% mortality rate is too low according to Littmann and Littmann, who estimate 7-10%: Littmann and Littmann (1973), 252; Gilliam (1961). 33-47% on the basis of Egyptian tax poll: Duncan-Jones (1996), 120-121. 20-30% on Egyptian evidence: Rathbone (2007), 700. Duncan-Jones has noted that in the second century, epidemics became more frequent in China around the time of the Antonine Plague: Duncan-Jones (1996), 117. For more, see contributions in Lo Cascio (2012). Zelener has estimated a total loss of c. 20-25% of the Empire's population: Zelener (2012), 175.

⁵⁵⁸ Jerome, Helm 206; Eutrop, 8.12.2; SHA Marcus 21.6; Oros, *Hist.* 7.15.5-6; Amm, 23.6.24.

⁵⁵⁹ SHA Marcus 17.2, 21.6-7; Eck (2012); Jones (2012).

⁵⁶⁰ Wilson (2007), 114-115; Duncan Jones (1996); Howgego, *et al.* (forthcoming); Howgego (1992), 4-8, esp. 7-8. The south Spanish mines and miners may have suffered at the hands of the raiding Mauri in AD 172-173: SHA Marcus 21.1.

abandonment of the many mine galleries at Rosia Montana (*Dacia*) during the Marcomannic War was also a considerable loss.⁵⁶¹ However, Greenberg who has criticised Duncan-Jones' proxies assessing mortality rate during the Antonine plague, suggests the flight of miners in Dacia as an alternative explanation for declining production of aurei (fleeing barbarian invasion rather than the plague).⁵⁶²

The shortage of bullion, put forward as a possible explanation for the decline of supply and production from Marcus Aurelius' reign onwards, may actually have been foreshadowed; the coin debasement of Antoninus Pius may act as an indicator of an impending shortage of silver.⁵⁶³ There are two key explanations regarding changes to silver coinage: either fiscal inadequacy/difficulties or reforms which were reactive (often to monetary problems).⁵⁶⁴ There is no reason to avoid an association between a debasement and a lack of bullion (or at least an insufficient amount for the required coin). This does not necessarily need to conflict with the idea of financial difficulties, as the two are linked in a cycle. Antoninus Pius' debasement may explain how a slightly larger output of denarii was possible, but then was followed by two successive cuts of approximately 45-50% to the apparent denarius production (as seen through finds) under Marcus Aurelius and then Commodus. There may simply have been sufficient money circulating in the system. However, a debasement of the Egyptian tetradrachm in the mid AD 160s has also been detected as a possible consequence of Antoninus Pius' denarius debasement. Following Commodus' reign, during which additional modifications to the Egyptian tetradrachm are detected,⁵⁶⁵ more changes occur to the production of

⁵⁶¹ Bowman and Wilson (forthcoming).

⁵⁶² Greenberg (2003), 424; Wilson (2007), 117. Wilson also acknowledges the possibility of only a reduction of activity at some mines. Once underground mines had been abandoned for a few weeks, galleries below the water table would have flooded, it would have been very difficult to dewater some (areas of) mines: Wilson (2009), 78. The examination of proxies: Duncan-Jones (1990), 59-76. Wax tablets of a *collegium* at *Alburnus Maior* all date to AD 131-167: Wilson, *et al.* (2011).

⁵⁶³ Possible hints of stress due to military activity in the east: Butcher (2004), 39.

⁵⁶⁴ Howgego, *et al.* (forthcoming); Butcher and Ponting (2015), 42, 236. Nero financial difficulties: Crawford (1978), 151-152; Mac Dowall (1979), 147-149; Duncan-Jones (1994), 221 n. 35. Trajan financial difficulties: Bennett (1997), 127-131.

⁵⁶⁵ This will have been a modest reactive monetary reform: Howgego, *et al.* (forthcoming).

silver in the third century (6.2). Likewise, the continuing changes to the silver content of the coins may have been done to keep new coins in line with the actual weight of the circulating coins reduced through wear. No single explanation will suffice; a combination of fiscal difficulties and monetary and bullion supply issues will have been exacerbated by the plague and constant warfare and, certainly have put the monetary system of the Roman Empire under considerable strain and pressure.

6.2 The Severan Dynasty

The Severan period provides ample opportunity to investigate two crucial facets of numismatics; the supply and circulation of coins struck during an episode of decentralised coin production as well as the introduction of a new denomination and its effect on circulation patterns. Just as with previous emperors (6.1) some attention was devoted towards publicity and the establishment of a new regime.⁵⁶⁶ The reign of Septimius Severus shares another similarity with Vespasian, in that he too struck aurei and denarii in the East (Caesarea in Cappadocia, Antioch in Syria, and Alexandria).⁵⁶⁷ Furthermore, as Septimius Severus took over the mints of Pescennius Niger in the East,⁵⁶⁸ it is possible to investigate the distribution of his competitor's eastern coinage as well.

Coins of Pescennius Niger are uncommon and although none of his denarii are recorded as part of the Reka Devnia hoard,⁵⁶⁹ a total of 8 denarii and 1 aureus struck in the east have been recorded in the study-region.⁵⁷⁰ Given that Pescennius Niger's troops never managed to get beyond Byzantium, one possibility is that these coins may have travelled across the Empire via

⁵⁶⁶ This is not to imply that other emperors did not place any value on reverse types or the quantity or frequency of their appearance, but with the establishment of a new dynasty this was especially important. Septimius Severus also had himself and his family posthumously adopted into Marcus Aurelius' family to secure a claim with a 'good' emperor: Campbell (2005), 5. For more on Severan numismatic iconography: Noreña (2011); Rowan (2013); Manders (2012).

⁵⁶⁷ Van Heesch (2014), 145; Carradice and Buttery (2007), 8-9.

⁵⁶⁸ Van Heesch (2014), 145; Van Heesch (1978); Bland, *et al.* (1987).

⁵⁶⁹ Mouchmov (1934), 5-6.

⁵⁷⁰ The aureus found at Lokeren in Belgium was probably a cast copy of a denarius: Bland, *et al.* (1987), 74.

Septimius Severus' troop movement and deployment (see more below).⁵⁷¹ Together with Pescennius Niger's coins, 265 non-hoarded eastern denarii issued by Septimius Severus have been recorded in the study-region. Their distribution is mainly limited to the area along the *limes* (Fig. 6.10). Over 50% of Septimius Severus' non-hoarded (eastern) denarii have been found in a context related to the military, whilst a considerable portion of the coins have also been found in civilian contexts belonging to larger settlements situated near urban and military centers (Fig. 6.11). This provides support to our understanding of army pay, especially in the east. The nature of the evidence in the study-region indicates that primarily the military or those closely connected to or who interacted frequently with the military could expect to handle coins struck in the east (see also 5.3). It also means that the armies in the east could certainly expect some of their cash salary to be paid out in Imperial coins rather than only local coinage.⁵⁷² However, caution is required with some of the eastern RIC because a recent re-assessment of Septimius Severus' denarii has indicated that some of these coins (approximately 20% of the denarii examined by Gitler and Ponting) may actually have been struck in Rome.⁵⁷³ Nevertheless, a strong association remains between the military and denarii struck in the east.

Kemmers has also observed that Severan bronze coinage never was supplied beyond the Alpine mountain range in any significant quantity and a complete reversal of the ratio of precious metal to *aes* coinage occurs from the first two centuries AD.⁵⁷⁴ The absolute number of bronze struck during IP 13 (AD 193-222) and recorded in the study-region confirms this (compare Table 6.7 with Tables 6.4-6.6). Their hoarding pattern also shows a fairly consistent removal. However, it has also been argued during the Severan period the "civilian and military spheres of coin-use and circulation were not fully integrated".⁵⁷⁵ There is a problem with this argument as the lack of (coin)

⁵⁷¹ Legio XXII Primigenia: Franke (1998), 100. Possibly Legio II Adiutrix: Reddé (1998). Legio I Italica moved from the west to the east and then to Gaul: Absil (1998).

⁵⁷² Van Heesch (2014), 149-155.

⁵⁷³ Gitler and Ponting (2003), esp. 49-52.

⁵⁷⁴ Kemmers (2009b), 147.

⁵⁷⁵ Kemmers (2009b), 143.

integration was determined on the basis of slight differences of the coin-finds found in these spheres.

Find-Type	Aes	All	% of Aes
Hoarded	132	14061	0.94%
Non-Hoarded	754	5060	14.9%

Table 6.7: Number of coins struck during IP 13 (AD 193-222) in the study-region by find-type.

From Kemmers' own figures, the proportion of Severan coins per year in military and civilian contexts in the German provinces show a very similar pattern with most variations measuring less than 0.5%.⁵⁷⁶ Furthermore, the variations of reverse types between military and civilian contexts on the whole measured less than 1% (with a few exceptions measuring c.1.5%).⁵⁷⁷ Both these variation calculations did not include hoards or the actual supply of coin (see below) and in fact support the idea that, at least in 'military provinces', coin-supply was principally orientated towards the military (see above). The variations of Severan coins per year and reverse types in civilian contexts in *Gallia Belgica* differ more from those in the German provinces. This *could* indicate a difference in supply mechanism, but it cannot be stated with any certainty as no single difference was greater than 2% whilst utilising a smaller dataset which creates more statistical noise.⁵⁷⁸ Moreover, Kemmers noted that the (alleged) lack a homogenous coin-pool of Severan silver may have been because there wasn't enough time for these coins to be mixed due to the introduction of the radiate, which drove Severan silver out of circulation (see below).⁵⁷⁹ If all this is true, it makes the already minor variations even less significant. What is clear is that the variations between the provinces do

⁵⁷⁶ Kemmers (2009b), 153 Fig. 5.

⁵⁷⁷ Kemmers (2009b), 154 Fig. 6.

⁵⁷⁸ Kemmers (2009b), 155, Figs. 7 and 8. Civilian coin datasets used by Kemmers are 236 for *Gallia Belgica* and 630 for German provinces.

⁵⁷⁹ Kemmers (2009b), 156. Even with the same financial procurator for *Gallia Belgica*, *Germania Superior*, and *Germania Inferior* variations were minor.

demonstrate differences in supply,⁵⁸⁰ but that within the study-region there was only one principal supply mechanism present.⁵⁸¹

Reign	Eastern Denarii	All Coins
Pescennius Niger	8	9
Septimius Severus	282	2801

Table 6.8: Number of non-hoarded coins.

Mint	Denarii	All	Composition
East	308	364	84.6%
Other	3964	5060	78.3%

Table 6.9: Non-hoarded IP 13 (AD 193-222) coins, by mint and denomination.

The overall development of coin minting and supply throughout the Severan dynasty is also of importance (see below for supply). As described above, 10% of all of Septimius Severus' non-hoarded coins recorded in the study-region are eastern denarii (Table 6.8). The evidence demonstrates the first implications of a continuous break from centralized minting dating to the late first century AD.⁵⁸² Throughout IP 13 (AD 193-222) imperial silver coins continued to be struck in the east. However, the quantity which was struck after Septimius Severus and that reached the study-region was rather restricted. Table 6.9 demonstrates that of all the non-hoarded eastern denarii from the period AD 193-222 that reached the study-region over 90% were issued by Septimius Severus.⁵⁸³ Although it must be conceded that some of the coins issued by Caracalla and Geta which have been identified as being struck at Rome may be better classified as belonging to mints in the East on the basis of metallurgical analyses, very little changes in the overall impression.⁵⁸⁴ Table 6.9 also

⁵⁸⁰ Kemmers (2009b), 156.

⁵⁸¹ It does not rule out that in certain provinces there were different supply mechanisms utilised than in the study-region.

⁵⁸² A possible exception to centralised minting is the striking of denarii in Antioch under Hadrian: Butcher (2004), 98; McAlee (2007), 216-217. Other denarii struck by Hadrian have also been assigned to "Mints of Asia Minor", BMC 1027-1046: Mattingly (1936), 374-377. An argument has been made that some denarii may have been struck by Trajan in the east. Pro: Besombes (2008), 27, 116 (nos. 968-971). Contra: Woytek (2009), 432.

⁵⁸³ I.e. 282/308. From the hoarded eastern denarii issued in IP 13, 72% were struck by Septimius Severus.

⁵⁸⁴ Gitler and Ponting (2003). An example is RIC IV, p. 222, no. 63 (Rome should actually be Laodicea). However, 'eastern' denarii struck by Elagabalus might belong better to a mint in the Balkans as they are rare in Syrian hoards but more common in European hoards: Butcher (2004), 109.

demonstrates that a fairly substantial quantity (56) of non-hoarded provincial coins reached the study-region. Only 16 (28%) of these coins were struck under Septimius Severus, so while the presence of eastern denarii after Septimius Severus' reign was rather restricted, it seems to have been supplemented by a slightly higher number of provincial coins. In fact, the increase of provincial coins represents a doubling from that during various reigns in the Antonine period (see 5.3).⁵⁸⁵ However both these phenomena could be explained by mint output. The third century sees an increase of provincial coinage struck in an ever increasing decentralized minting system and the fact that more eastern denarii of Septimius Severus are supplied to the study-region than those of his immediate successors may ultimately only be reflective of his longer reign and possibly higher production rates.⁵⁸⁶

The distribution of provincial coins from the period AD 193 to 222 (IP 13) remains closely tied towards the *limes*. While provincial coins on the whole fail to reach the Dutch river area, curiously two specimens did reach the Dutch North Sea coast in *barbaricum* (Fig. 6.12). Moreover, the general contexts in which non-hoarded provincial coins have been recorded are quite different than that of the eastern denarii. On the whole, more provincial coins are found in civilian contexts and especially in graves (Fig. 6.13). Unfortunately, the hoards do not provide any indication as to how these coins may have ended up in such different contexts so we may only speculate that their general *limes*-orientated distribution has some connection with the military. What the contextual non-hoarded provincial coins undoubtedly do represent is a key difference in the usage of eastern coins. Provincial coins may perhaps have served as small change to settle particular transactions. Alternatively, they could have been used as grave goods either because they were not widely accepted, as a substitute for the lack of any suitable alternative low-value coin or, in reference

⁵⁸⁵ From the hoarded coins, provincial coins struck by Septimius Severus constitute 2 out of 5 hoarded.

⁵⁸⁶ We should bear in mind that Caracalla may have struck large quantities of Syrian tetradrachms to pay for his Parthian campaigns: Callu (1969), 171-174; Corbier (2005), 34. For more eastern denarii under Septimius Severus: Duncan-Jones (1994), 137-138.

to the origin of the deceased. An additional feature for the presence of provincial coinage is that they may act as evidence for increased mobility of the civilian population, especially in light of Septimius Severus' reform allowing soldiers to live with women outside the camp and Caracalla's citizen edict.⁵⁸⁷ However, owing to the sample size it remains difficult to provide any satisfactory account of their use in the west as well as when they were supplied.

Another important development during IP 13 (AD 193-222) was the introduction of the 'antoninianus' or radiate by Caracalla in AD 215.⁵⁸⁸ There is almost no doubt that the coin had a value of a double denarius but initially only weighed one and a half times more. This allowed for the production of a coin which had a higher face value than warranted on the basis of its bullion. Although the long-term implications of this new domination cannot be exaggerated, it remained somewhat a 'novelty' in the Severan period, being struck only in restricted quantities for four years (AD 215-219).⁵⁸⁹ The number of non-hoarded and hoarded radiates found during IP 13 and 14 (AD 193-238) in the study-region appears to support the assertion that production was limited in its early years.

Issue Period	Non-Hoarded	Hoarded
IP 13 (AD 193-222)	116/5060	504/14057
IP 14 (AD 222-238)	17/2542	303/6492

Table 6.10: Struck radiates against total coins by issue period, by find-type.

Table 6.10 shows that radiates formed an insignificant portion of the coin struck and recovered. However, it is more important to investigate when early radiates actually came into circulation, when they appear to have been removed, as well as whether they had any influence on the circulation and hoarding of denarii. It is always difficult to determine a date of supply of non-hoarded finds as the coin may have been supplied to the study-region at any time after its production, either directly from the mint or indirectly via various distribution channels (e.g. troop movement, taxes and/or trade). Hoards are

⁵⁸⁷ On living outside the camp: Le Bohec (1989), 192; Herodian, 3.8.5. For a similar suggestion regarding the Edict of Caracalla: Howgego (2014), 310.

⁵⁸⁸ Mattingly and Sydenham (1936), 85.

⁵⁸⁹ Crawford (1975), 565.

able to provide a possible time-frame when early radiates were supplied to the study-region. Almost no radiates (3) struck during IP 13 (AD 193-222) are found in hoards closing in the same period. This demonstrates that either radiates were not considered 'valuable' enough to be hoarded (at this time) or were not supplied in a sufficient quantity to end up in hoards. Although some denarii struck in IP 13 (AD 193-222) are found in hoards (230), this only represents 1.9% of denarii from IP 13 (AD 193-222) recovered in all hoards (11,902). As most denarii from the same period are only found in hoards later, it cannot be argued with any certainty that radiates were deliberately excluded from hoards closing in IP 13 (AD 193-222).

An explanation for this phenomenon may lie with the reign of Septimius Severus and his denarius reforms. During his reign, the denarius underwent several reforms which saw its silver content and weight decrease.⁵⁹⁰ With Septimius Severus' reform in AD 194 the denarius fineness had decreased by c. 18% from Commodus' latest standard, to a fineness of 46%.⁵⁹¹ Moreover, this course did not stop with him but continued all throughout IP 13 (AD 193-222), with continual debasements and lower weight standards under Caracalla, Macrinus, and Elagabalus.⁵⁹² A likely reason for these coin-reforms was a shortage of silver, as Dio records Septimius Severus (already) faced a major financial crisis at the beginning of his reign.⁵⁹³ Moreover, both Septimius Severus and Caracalla gave pay rises to the army, which undoubtedly also provoked their reforms.⁵⁹⁴ If one also includes the introduction of the radiate in

⁵⁹⁰ Walker (1978), 3-12, 59-62; Bland (1996), 67.

⁵⁹¹ Harl (1996), 126-127; Crawford (1975), 562; Walker (1977), 33-45; Walker (1978), 1-39. See also: Cope (1974); Cope, *et al.* (1997); Walker's and Cope's absolute figures are not entirely reliable due to the metallurgical analysis method but the pattern of development does not change. Reviewing Walker's method: Howgego (1995), 118; Butcher and Ponting (2015), 8-18. For a revision of some denarii using a more reliable technique: Butcher and Ponting (1997); Gitler and Ponting (2003).

⁵⁹² Walker (1978), 1-39.

⁵⁹³ Dio, 74.8.4-5; Bland (1996), 67. He also had to pay his troops without access to the revenues of the eastern provinces, under the control of Pescennius Niger: Crawford (1975), 562. Evidence for more financial trouble: Dio, 78.17.2-4, 21.2; 78.9; Herodian, 4.4.7; Campbell (2005), 20.

⁵⁹⁴ Septimius Severus: Herodian 3.8.5; SHA Severus 12.2. Caracalla: Herodian 4.4.7; Speidel (1992). Macrinus had such difficulty in maintaining Caracalla's pay-scale that it ultimately led to his murder: Campbell (2005), 20; Dio, 77.36.

the picture of the development of the coinage system, it would seem that there was a shortage of coin and/or silver. However, rapid changes to coinage do not necessarily indicate fiscal inadequacy and could also have had monetary motives, such as ensuring new coin matched the weight of long circulating worn coins or may have been a conscious decision to reflect the changing value of silver. If this is the case, the Severan coin-reforms could be seen as an attempt to carefully manage the system, rather than a series of poorly thought out reactions to a shortage of silver and/or coin.⁵⁹⁵

The evidence of hoards closing during IP 13 (AD 193-222) and IP 14 (AD 222-238) reveals that the introduction of the early radiates did not have any bearing on hoarding patterns, especially as it appears that radiates were not circulating until IP 14 (AD 222-238, more below). We may therefore exclude this denomination as a reason for the dearth of IP 13 (AD 193-222) denarii in hoards closing in the same period. When we consider the number of denarii in hoards closing in IP 15 (AD 238-260), we find a near-complete absence of denarii struck before IP 13 (AD 193-222, Table 6.11).

Issue Period	Quantity	Percentage
2 (Rep.)	67	1.41%
3 (27 BC- AD 14)	1	0.02%
4 (14-41)	1	0.02%
5 (41-54)	0	0%
6 (54-68)	8	0.17%
7 (69-96)	28	0.59%
8 (98-117)	33	0.69%
9 (117-138)	44	0.93%
10 (138-161)	94	1.98%
11 (161-180)	95	2.00%
12 (180-192)	43	0.91%
13 (193-222)	2368	49.84%
14 (222-238)	1907	40.14%
15 (238-260)	62	1.30%
Total	4751	100%

Table 6.11: Number of denarii in hoards closing in issue period 15 (AD 238-260), by struck issue period.

⁵⁹⁵ For an explanation of debasement representing monetary motives (writing about first two centuries AD): Butcher and Ponting (2015), 43-46.

This is a clear indication that the Severan debasement drove earlier, finer coins out of circulation (see 6.3 as well).⁵⁹⁶ The hoards also demonstrate that by IP 14 (AD 222-238), approximately 38% of all hoarded IP 13 (AD 193-222) radiates had already been hoarded. Moreover, by the end of IP 15 (AD 238-260), *c.* 57% of the first issue of radiates had been hoarded signifying a relatively short circulation lifetime, as is expected in the context of declining silver content of new coin. The denarii struck during IP 13 (AD 193-222) also appear to have been hoarded in a similar fashion, albeit at an even faster rate, with 64% hoarded by IP 14 (AD 222-238) and 85% by IP 15 (AD 238-260). An important contributing factor to the circulation pattern and lifetime of coins struck in IP 13 and 14 (AD 193-238) undoubtedly must be the debasement and reforms under Septimius Severus and his successors. We may also link the radiate as having an effect on coin-hoarding patterns but only from IP 14 (AD 222-238) onwards.

The final question which arises then is when early radiates and eastern denarii arrived in the study-region. Only 2.75% of recovered IP 13 (AD 193-222) denarii struck in the east are found in hoards closing in the same period. Perhaps, the slightly heavier weight of denarii struck at Rome (at least for the period AD 195-197) may have been a consideration,⁵⁹⁷ although a detailed analysis of the purity and weight of the coinage is still lacking. Whatever the reason for their hoarding, the fact remains that they were not hoarded in any significant quantity during this period and along with the circulation pattern of other denarii and radiates from IP 13 (AD 193-222), designates an overall scarcity of fresh coins available for circulation at this time. The evidence for denarii struck in the east suggests that they arrived in two batches, the first around AD 235 and the second around AD 240.⁵⁹⁸ In fact, we may question the overall quantity of silver coins struck in this period that were supplied to the

⁵⁹⁶ Also generally noted for hoards throughout the rest of the Empire: Bolin (1958), 234-235, 351-357. For more on Gresham's Law: Bolin (1958), 51-103. Differing figures between here and Bolin may be a consequence of a combination of reasons such as Bolin's smaller dataset and/or Bolin seeking an explanation for hoards across the Empire (which subdues regional variation).

⁵⁹⁷ Debate on the reason for the hoarding Septimius Severus' eastern and western denarii (weight and fineness standards, or movement/supply of coin): Duncan-Jones (2001); Duncan-Jones (2002); Howgego (1996); Howgego (2002); Hellings (forthcoming).

⁵⁹⁸ Hellings (forthcoming).

study-region, especially when one looks at the data from Britain.⁵⁹⁹ The PAS records a peak of denarii during Reece Period 10 (AD 193-222) which is also mirrored by the evidence at the Sacred Spring in Bath.⁶⁰⁰ The supply of denarii coincides well with Septimius Severus' campaign in Britain and with Cassius Dio's account that he brought a great deal of money with him.⁶⁰¹ Moreover, the distribution of denarii struck by Septimius Severus in Britain has a slight concentration in Yorkshire, where he is known to have resided.⁶⁰² All this sheds light on a probable reason for the dearth of fresh coin-supply to the Germanic *limes* during the reign of Septimius Severus.

The lack of fresh coin-supply throughout IP 13 (AD 193-222) during the reigns of Caracalla and Elagabalus necessitates some further consideration, in light of the former's military activity against the Alamanni. The eastern denarii struck by Septimius Severus are predominantly found in the area where the Alamanni and Cenni were situated and Caracalla led his campaigns (Fig 6.12), which would incline one to suppose a connection between the two. However, the campaigns only lasted from 11 August until September AD 213, when Caracalla proclaimed himself victor. The reality of the matter is that the brevity of the campaign may have been a result of an illness and consequently resulted in a treaty to pay a subsidy to some of the Germans.⁶⁰³ Following his recovery, Caracalla subsequently turned his attention to the east.⁶⁰⁴ Further supporting the lack of fresh coin-supply, in addition to the hoard evidence, is a limited quantity of coins outside the Empire struck by Septimius Severus and/or Caracalla.⁶⁰⁵ Coins of Caracalla and/or Septimius Severus therefore cannot have formed (a significant) part of the subsidy payment to the Germans, indicating that *if* the subsidy was paid for by coin, this must have been with the

⁵⁹⁹ Data from Augst and Kaiseraugst fit the overall developments from the study-region and highlight the difference between Britain and the study-region: Peter (2001), 193.

⁶⁰⁰ Walton (2012), 91; Walker (1988b), 306-307.

⁶⁰¹ Dio, 76.11.

⁶⁰² The hoards in Britain also suggest coin-supply was largely directed to the North-East: Creighton (2014), 19.

⁶⁰³ Dio, 78.13.3, 14.1.

⁶⁰⁴ Campbell (2005), 18-19.

⁶⁰⁵ Less than 3% of all non-hoarded denarii from IP 13 are found outside the Empire. *c.* 8% of non-hoarded radiates from IP 13 are found outside the Empire.

local circulating coin-pool and/or by older coins which were brought specifically for this purpose. However, it is also possible that the subsidy was paid with bullion (e.g. precious metal objects) in conjunction with, or instead of, coin.

During IP 14 (AD 222-238), approximately 63% of the eastern denarii struck during IP 13 (AD 193-222) were hoarded out from circulation (see above). While their distribution shows an orientation towards the Main River and the area of the Alamanni, this may also be explained by the military activities undertaken by Severus Alexander. Once again the Alamanni were threatening to break through the Taunus Mountains near Mainz and Severus Alexander undertook action in AD 234,⁶⁰⁶ although the amount of troop deployment and severity of the situation may have actually been more limited than Herodian describes.⁶⁰⁷ Maximinus continued campaigning in Germany after the murder of Severus Alexander and the non-hoarded coin-find evidence of his silver coinage (radiate and denarius) does demonstrate a marginal inclination to be found along the *limes* (Fig. 6.14).⁶⁰⁸ However, the location of hoards closing at the end of his reign (i.e. end of IP 14, AD 222-238) and also those in IP 15 (AD 238-260) suggest that these new coins did not form (a considerable) part of the coins utilized to pay the troops (Fig. 6.15). Raiding parties into the northwestern provinces continued while imperial attention was directed towards the east, the lower Danube, and to resolving internal strife, although Gallienus exceptionally undertook campaigns along the Upper Danube.⁶⁰⁹ By the end IP 16 (AD 260-275) most of Septimius Severus' eastern denarii and early radiates were no longer circulating, as demonstrated by the hoard evidence. It does not appear as if Gallienus' campaigns brought a significant influx of eastern coinage, but we may not discount the possibility of continued supply of these eastern denarii (see 6.3).⁶¹⁰ What we have seen is that

⁶⁰⁶ Campbell (2005), 26.

⁶⁰⁷ Herodian, 6.7.2; Drinkwater (2005), 29.

⁶⁰⁸ Drinkwater (2005), 30.

⁶⁰⁹ Wilkes (2005), 223.

⁶¹⁰ Howgego argues this is the case in Britain: Howgego (1996).

all the evidence indicates that early radiates and Septimius Severus' (eastern) denarii were supplied to the study-region no sooner than nearly a decade after their production. Moreover, the dangers of solely relying on issue periods of non-hoarded coins have been further highlighted, with the possible use of older coins from the Antonine period as subsidy payment to the Germans in the early-mid third century (e.g. Caracalla).⁶¹¹

6.3 The Mid-Third Century

The mid-third century has often been referred to as a period of 'crisis' and instability (see chapter 3 for the effects on settlement landscape).⁶¹² Our evidence is scanty and coming to grips with the rapid pace of change that occurred during the period is difficult.⁶¹³ The best evidence available comes from coins but even this body of evidence, in the case of the Gallic Empire,⁶¹⁴ has only recently been re-assessed. It is important to recognise that many issues still exist with the evidence and its quality. Even its basic chronology is one of the most disputed aspects of the mid-to-late third century.⁶¹⁵ From the available evidence, this section will focus on analysing circulation patterns and will attempt to contextualise the observations in the Empire-wide developments of the mid-third century.

Between AD 238 and 241, supporters of Gordian III governed the Roman Empire in the name of the then c.13-year-old emperor.⁶¹⁶ When Timesitheus became the sole councillor to Gordian III, he turned the Empire's attention, once again, towards the east (Persia), to undertake campaigns from AD 236 to 244.⁶¹⁷

⁶¹¹ German preference for older and finer coins: Tac. *Germ.* 5. Crawford argues that the sudden end of silver to *barbaricum* is a result of German capability to distinguish between silver content of c. 50% and c.78%: Crawford (1978), 152-153. Some believe that coins were no longer supplied in any quantity to *barbaricum* after Septimius Severus (for different reasons): Berger (1996b); Berger (1992); Kolendo (1980). However, it is known that emperors would at times pay subsidies to tribes beyond the Empire: Gordon (1949).

⁶¹² Drinkwater (2005), 28; Liebeschuetz (2007). Contra crisis: Witschel (1999), 377.

⁶¹³ At least 51 individuals legitimately or illegitimately received the title of Roman emperor: Drinkwater (2005), 28.

⁶¹⁴ Contra 'secessionist' Gallic Empire: Mairat (2014), 247-254. Pro 'secessionist': Drinkwater (1987).

⁶¹⁵ Drinkwater (2005), 28. On quality of available sources: Drinkwater (2005), 65-66.

⁶¹⁶ Drinkwater (2005), 32-36.

⁶¹⁷ Having previously dealt with the Goths and African revolt: Drinkwater (2005), 34.

One of the (recurring) problems throughout Gordian III's reign was financial difficulties, as suggested by the debasement of the re-introduced radiate. Table 6.11 demonstrated that during IP 15 (AD 238-260) denarii from before the third century had nearly all been removed from circulation and almost half of the total of denarii supplied from IP 13 (AD 193-222) had been hoarded (6.2). What requires more elaboration is the low number of denarii struck and hoarded from this period.

Denarius production at Rome was limited during AD 238-239 but was revived in 240 with the production of large quantities. However, this already ceased by the end of the year (AD 240) when denarii were no longer struck by Gordian III.⁶¹⁸ After Gordian III, denarii were not produced in significant enough quantities to have formed an important part of the coin-pool and may have only been struck in limited amounts for ceremonial purposes.⁶¹⁹ Around 130 denarii struck by Gordian III have been recorded in hoards. Approximately a third is in hoards which close during IP 15 (AD 238-260) and two-thirds in hoards closing in IP 16 (AD 260-275). It is clear that these coins were never supplied in any quantity to the study-region, probably reflecting their limited mint output. Their circulation period is also quite short, limited from their time of production to hoards closing at the latest by AD 275. This is a phenomenon noted across the entire Empire, where denarii progressively disappear from circulation between AD 241 and 274.⁶²⁰ Bland has argued that since denarii are still present in hoards from the 260s, hoards do not show the radiate rapidly driving the denarius out of circulation because the radiate was over-valued in relation to the denarius.⁶²¹ While it is true that contemporary denarii do not seem to have been specifically selected for hoarding, the removal of Severan

⁶¹⁸ Bland (1991), 398.

⁶¹⁹ Bland (1991), 399. For the function of the denarius after Gordian: Bastien (1987). The same is attested for Gallic Empire denarii and quinarii, which often share dies with gold coinage: Mairat (2014), 225, 51-102; Bastien (1988), 43-46.

⁶²⁰ Bland (1991), 455-456. For hoards in the Danubian provinces: Fitz (1978), 229-231. For western Belgium: Van Heesch (1998), 128.

⁶²¹ Bland (1991), 456.

denarii certainly does point towards some sort of preferential treatment of older and better silver.

The use of hoard evidence to identify this phenomenon is also hindered due to active coin withdrawal by the state. When Republican coins were withdrawn (6.1) some of Trajan's new denarii issues restored the Republican designs of the withdrawn coins. This is because Romans regarded coins as monuments (*monumenta*) in their own right.⁶²² During the reign of Trajan Decius the production of a series of "Divo" coins in the names of previous emperors on the obverse and CONSECRATIO on the reverse strongly indicates a similar phenomenon.⁶²³ The hoard numbers provide support for active state withdrawal, with concerted hoarding activity occurring simultaneously. When IP 15 (AD 238-260) is broken into two periods, pre- and post-withdrawal by Trajan Decius in c. 250, more than half the denarii are found in hoards closing with coins of Trajan Decius (Table 6.12).

IP	IP 15 Total	238-250	% of IP 15 hoards	250-260	% of IP 15 hoards
2 (Rep.)	67	1	1.49%	66	98.51%
3 (27 BC- AD 14)	1	?	?	1+	?
4 (14-41)	1	0	0%	1	100%
5 (41-54)	0	0	N/A	0	N/A
6 (54-68)	8	6	75.00%	2	25.00%
7 (69-96)	28	19	67.86%	9	32.14%
8 (98-117)	33	26	78.79%	7	21.21%
9 (117-138)	44	34	77.27%	10	22.73%
10 (138-161)	94	89	94.68%	5	5.32%
11 (161-180)	95	89	93.68%	6	6.32%
12 (180-192)	43	33	76.74%	10	23.26%
13 (193-222)	2368	1439	60.77%	929	39.23%
14 (222-238)	1907	1128	59.15%	779	40.85%
15 (238-260)	62	31	50%	31	50%
Total	4751	2895	61%	1856	39.07%

Table 6.12: Number of denarii/ AR coins in hoards closing in IP 15 (AD 238-260).

Moreover, denarii from the first and especially the second centuries were specifically selected for hoarding whilst denarii from the third century were not

⁶²² Meadows and Williams (2001); Buttrey (1972a); Komnick (2001).

⁶²³ Mairat (2014), 149; Howgego (2005), 5.

favoured to the same extent, despite the debasement of the radiate. Silver coins from the Republican period appear to have been regarded in a similar fashion as those from the third century, indicating that their worn condition probably prevented their identification or resulted in an assumed lower silver content.⁶²⁴ There is also no evidence from hoards that would support the idea that radiates dating before Trajan Decius' reform were withdrawn. In fact, less than 0.1% of all radiates struck during IP 15 (AD 238-260) are found in a hoard closing in the same period, and as has been discussed earlier (6.2), the first issue of radiates was supplied late and in minimal quantities.

In previous chapters (5.3 and 6.2) the import of eastern and provincial coinage to the study-region was discussed in the context of military activity. During the Flavian and Severan periods eastern denarii were supplied in some quantity, and over time, the number of provincial coins found in the study-region increased. Although this coin transfer occurred during periods of military activity, other explanations were proposed to explain the distribution patterns such as Caracalla's citizenship edict. The reign of Valerian-Gallienus provides another opportunity, prior to the formation of the Gallic Empire, to reassess the model whether military pressure at a particular time and region is reflected by an intensification of supply or transfer of coin. It is clear that Rome remained an important mint during this period (Table 6.13). However, nearby mints from the decentralised system played an equally important part (Milan, Lyons, and Cologne). Care is needed when considering the mints during the joint rule of Valerian-Gallienus as the attribution to the mint of Cologne is based on the old RIC. The coins of the 'Cologne' mint have now been re-allocated to Trier and the reattribution is further supported by the distribution of 'Cologne' radiates (Fig. 6.16).⁶²⁵

⁶²⁴ The rate of wear of Republican denarii has been calculated in Britain. A Republican denarius may have a weight around 2.65 grams in a hoard closing AD 230: Creighton (1992), 54-55. This means a Republican denarius would have 2.57 g of silver compared to a denarius of Septimius Severus (198-211) with approximately 1.86 g of silver.

⁶²⁵ This does not imply that Cologne was not of strategic importance: Mairat (2014), 46-50, esp. 49; Besly and Bland (1983), esp. 43-65; Bland and Burnett (1988), esp. 148-155. The mint of Lyons is also incorrectly identified.

Mint	Number	Percentage
Antioch	10	1.63%
Asia	21	3.41%
Cologne	64	10.41%
East	1	0.16%
Lyons	146	23.74%
Milan	47	7.64%
Rome	250	40.65%
Viminacium	4	0.65%
Unknown	72	11.71%
Total	615	100%

Table 6.13: Number of non-hoarded radiates by mint, AD 253-260.

From the raw numbers of non-hoarded coins (Table 6.13), eastern radiates (Asia, Antioch, and Viminacium) do not appear to have been imported in number. In fact, no hoards closing during the joint reign of Gallienus-Valerian have radiates from the east. During IP 16 (AD 260-275) only 49 eastern radiates struck during the joint reign were identified in hoards ($49/2773 = 1.76\%$). This kind of dislocation between the eastern and western parts of the Empire over the course of the third century has been identified by Howgego and should not be too surprising.⁶²⁶ However, this does not necessarily disprove a model which explains transfer of coin as a consequence of military activity and troop deployment. One reason that so few eastern radiates struck during the joint-reign of Valerian-Gallienus are recovered is that their circulation lifetime was limited to 20-30 years after minting. The case-study of Septimius Severus' eastern denarii demonstrated that they were only supplied to the study-region up to 30 or more years after their minting (6.2).⁶²⁷ Therefore, the short circulation lifetime of Valerian-Gallienus' eastern radiates will have limited long-distance circulation unless by deliberate dispatch. All of this has to be placed in the context of monetary reforms, during which the silver content of radiates increasingly declined, whilst the Empire became ever increasingly fragmented through internal political strife.

⁶²⁶ Howgego (1996), 222-223.

⁶²⁷ Hellings (forthcoming).

As it has been postulated that the east and west of the Empire were separated in terms of interaction represented by coin-finds, it is necessary to investigate whether a divide also exists between the Central Empire of Gallienus and his successors and that of the Gallic Empire. Duncan-Jones has observed that gold coin will have been important in the flow of money between regions.⁶²⁸ Hiernard has studied the circulation of gold coinage in the Gallic Empire and came to the conclusion that gold coins struck by the Central Empire do not appear to have made their way into the Gallic Empire.⁶²⁹ Likewise, gold coins struck by the Gallic emperors stayed in the regions under their control.⁶³⁰ Moreover, the majority of gold coins from the period found outside of the Empire were struck by the Gallic emperors, signifying a potentially closer contact between the Gallic Empire and *barbaricum*, than between the Central Empire and *barbaricum*. The gold finds in *barbaricum* have traditionally been interpreted as returning booty from the Germanic raids although trade and mercenary pay cannot be excluded with any certainty.⁶³¹ Bribes and tribute payments to tribes beyond the frontier, a phenomenon known from the late second and early third centuries, may also explain the gold coin-finds (see 6.1 and 6.2). The find locations of the non-hoarded gold coins struck in AD 260-275 very clearly concentrate in a particular area in *barbaricum*, specifically around Thuringia (Fig. 6.17). At the same time, there is a weakening in the record of coins from this period in “Central Barbaricum” (i.e. generally Poland),⁶³² further highlighting the significance of the concentration in central and eastern Germany. It has been suggested that the outflow of aurei represented remuneration to the chiefs of *ingentia auxilia Germanorum* participating in the conflict on the side of Victorinus. If this is indeed correct, the participants presumably came from the confined coin-find area. The coin-find area also happens to overlap with a concentrated area of Roman grave goods from the

⁶²⁸ Duncan-Jones (1989), 122-125.

⁶²⁹ Hiernard (1983), 83-85.

⁶³⁰ Hiernard (1983), 81; Mairat (2014), 220; Howgego (1994), 12.

⁶³¹ Use as mercenaries: *SHA, Gallieni Duo* 7.1. Trade: Brogan (1936); Kolendo (1981). See also: Lafaurie, (1975), 982; Hiernard (1983), 87-88; Bursche (1996), 101-123; *SHA, Tyr. Trig.* 6.2.

⁶³² Bursche (1996), 126.

same time-period providing additional support for the origin of the auxiliary troops.⁶³³

During the first half of the third century gold coinage in Gaul was limited to those from the Antonine period and a small quantity from c. AD 200-260.⁶³⁴ Mairat has argued that by issuing gold coins, the Gallic emperors contributed to a renewal of the gold currency, but that this may have necessitated melting down some of the older aurei. If this is the case, then the significance of gold coinage as a means for propaganda rather than a real increase in the quantity of gold in circulation is emphasized.⁶³⁵ In terms of absolute numbers, the case for gold coinage as an instrument of propaganda can be made as a meagre 49 non-hoarded gold coins have been recovered. However, the yearly average of recovered aurei was similar to that of the early Antonine emperors which could, in conjunction with die-studies of gold coins, indicate a withdrawal effort of Antonine gold by the Gallic emperors (Table 6.14; c.f. 8.1). As was already the case from the 240s, the production of denarii and quinarii was rare. Only c. 33 non-hoarded 'silver' coins have been found, with the majority of them around Cologne and Trier, pointing to their symbolic function in the regular monetary system.⁶³⁶

Reign	Number	Per Day	Per Year
Nerva	2	0.0040241	1.4688129
Trajan	61	0.0085554	3.122721
Hadrian	55	0.0071755	2.6190476
Antoninus Pius	48	0.0058076	2.1197822
Postumus	29	0.0099315	3.625
Laelianus	2	0.0666667	24.333333
Victorinus	7	0.009589	3.5
Tetrici	11	0.0100457	3.6666667

Table 6.14: Non-hoarded gold coins of various emperors, expressed as absolute, per day, and per year numbers.

The role of *aes*/bronze coinage in the Gallic Empire may have been both symbolic as well as functional. The existence of Postumus' early bronze coinage

⁶³³ Werner (1973); Drinkwater (1987), 31, 68-69, 89, 225; Bursche (1996), 127.

⁶³⁴ Callu and Lorient (1990), 106-110.

⁶³⁵ Mairat (2014), 222. Debasement of Gallic Empire gold: Mairat (2014), 199-205. Gallic Empire gold as propaganda: Mairat (2014), 148-152.

⁶³⁶ Bastien (1988), 43-46.

may even have been enough to make reference to the monetary standards of the 'good old days' in the hopes to gain popularity and consolidate his reign.⁶³⁷ However, in order to produce his new *aes* coins, Postumus had to withdraw older sestertii and turn them into double sestertii. This could be done either by melting the old sestertii or by overstriking them.⁶³⁸ In addition to these new *aes* coins, the presence of worn second-century sestertii in hoards is a well-known phenomenon and indicates a lack of fresh bronze coins.⁶³⁹ Moreover, the relatively high frequency of imitations stresses the point, as was also the case during the first century (5.2).⁶⁴⁰ On the basis of the relatively low number of recovered bronze coins (including *aes* imitations), we may question whether Postumus' bronze coins actually had a functional purpose in the monetary system in the study-region. The only indication that bronze had a monetary function is that imitations were made throughout Postumus' reign, signifying that it was a profitable endeavour and that there was a (limited) demand. However, on a propaganda and/or economic basis, it appears to have been a failed endeavour for the state to continue *aes* production, which caused Postumus to stop striking sestertii in late AD 261 and then double sestertii by early 262.⁶⁴¹ Hollard has made the case that the state decided to dedicate its limited metal supply to the production of significant quantities of radiates rather than for a smaller amount of bronze coin.⁶⁴² This fits well with the development of the radiate, especially as their weight increased in AD 262 and had MONETA AVG on the reverse, promoting the superiority quality of Postumus' radiates compared to those of Gallienus.⁶⁴³

What makes this period stand out, besides the temporary division of the Empire for an extended period of time, is the quantity of radiates and hoards. As this is typically characterised as period of 'crisis', hoards are often associated

⁶³⁷ Mairat (2014), 227.

⁶³⁸ For overstrike examples: Thirion (1960), 29-31, 166-167; Bastien (1967), nos. 143b, 171, 156b, 246a, 275b, 279B1, 279b2, 285c, 288c, 382-394.

⁶³⁹ Bastien (1967), 106-107; Buttrely (1972b), 48-50.

⁶⁴⁰ Bastien (1967), 77-92; Hollard (1992), 73-77; Pilon (2011); Van Heesch (1988); Giard (1969).

⁶⁴¹ Mairat (2014), 228-230.

⁶⁴² Hollard 1992, 91.

⁶⁴³ Mairat (2014), 230, 69-72.

with disastrous events such as Germanic incursions.⁶⁴⁴ Gricourt interpreted 9 hoards closing c. AD 268 on the west coast of Gallia Belgica as evidence for pirate raids by the Franks.⁶⁴⁵ Undoubtedly Germanic raids affected daily life and influenced coin-circulation in the study-region. Some hoards may well be a result of these events, but the fact that the period is also characterised by drastic monetary debasement should not be dismissed either.⁶⁴⁶ In an impressive study of coin hoards (AD 253-269) in the Roman west, De Greef considered various other explanations for the increase of hoards during this period, such as banditry, epidemics, and usurpations.⁶⁴⁷ His conclusion was that only violence in the form of Germanic invasions could provide a suitable overall explanation for the chronological and spatial distribution and occurrence of hoards.

While Germanic attacks may certainly explain the non-recovery of many hoards, one also needs to re-evaluate the monetary explanations more comprehensively and be mindful of other factors which have not been considered. Reasonable counter-arguments can be made against De Greef's arguments which aim to minimize the effect of coin debasement. First, a concentration of hoards from AD 260 takes place in northern Gaul and the Rhône-Saône region, but not elsewhere. De Greef argues that it is unusual that a similar pattern is not present in Aquitaine, Provence, Britain, or Spain at the same time and therefore the coin debasements of AD 260 cannot explain the pattern. Second, the non-recovery of hoards has been interpreted as a result of violent causes prohibiting owners from recovering their hoards.⁶⁴⁸ Violence and/or mass-death is certainly a (strong) explanation for the non-recovery of hoards, but cannot provide a definitive explanation for all hoards.⁶⁴⁹ One consideration that has not yet been analysed is how concentrations of hoards may reflect concentrations of coin-supply. In other words, how does increased access to coin help create the conditions for more hoarding activity? Until this

⁶⁴⁴ E.g. Blanchet (1900); Blanchet (1936).

⁶⁴⁵ Gricourt (1988), 12.

⁶⁴⁶ Radiate debasement: Mairat (2014), 205-212.

⁶⁴⁷ De Greef (2002).

⁶⁴⁸ De Greef (2002), 53-54.

⁶⁴⁹ Crawford (1969). The plague of Cyprian may too have been a factor: Harper (2015).

substantial question is fully and properly addressed, it remains difficult to determine the extent supply, coin debasement, and violence contributed to hoarding activity.

An initial approach available to address the relationship between hoarding activity and access to coin is to consider the distribution of non-hoarded radiates of the Gallic Empire. This too is an important consideration which has not yet been attempted for the obvious reason that collecting such a vast amount of data is cumbersome. Moreover, non-hoarded coins may also provide a control on hoards as well. The distribution of hoards closing between AD 260 and 275 and non-hoarded Gallic Empire radiates from the same period highlights an immediate overlap as well as the necessity to consider supply of coin more closely (Fig. 6.18). There are a few points which require a bit more clarification, but the initial impression is that coin-supply may be well suited to provide a better overall explanation for the phenomenon of intensive mid-third century hoarding activity, as the lack of high-denominations cannot have had such a profound and variable hoarding pattern throughout the Gallic Empire. Two large clusters of hoards appear in the study-region by Trier and Belgium. The concentration of hoards in Belgium may not be so exceptional but cannot be properly assessed because a proper and comprehensive inventory of non-hoarded coin-finds has yet to be created (4.2). However, it may be related to the strategic importance of the *Via Belgica*. For the rest of the study-region, areas with high concentrations of non-hoarded coins also have hoards which is especially true for the hinterland of Trier. This may not be surprising given that the main mint was located here but it too partially reflects the state of publication, with Luxembourg comprehensively published (4.2). A third minor concentration is situated by the important city of Mainz. In addition to providing an initial insight into the connection between hoarding activity and access to coin is to study, Fig. 6.18 also demonstrates a shift in the seat of power. The growing importance of Trier is clear, especially in comparison with Cologne, where no significant cluster of finds has been found. Mainz, as during the Early Roman period, appears to have remained an important city but on a

limited scale. While it is true that ‘silver’ coins of the period are only found around Cologne and Trier, this does not indicate an actual seat of power at Cologne. Like many other cities (except for Trier), Cologne decreased in size around this period and the fact that Postumus’ main mint was at Trier rather than Cologne provides additional support for the notion that Cologne in itself was slowly transformed into a symbol of the ‘good old days’.

6.4 Conclusions

A concentration of coins struck during Trajan’s reign was found by Nijmegen. It is possible that this is a consequence of Nijmegen’s elevation in municipal status. Equally intriguing are the coin-finds from *barbaricum*. Overall, silver is preferred although along the Dutch North Sea coastline this preference is not as prevalent as elsewhere in *barbaricum*. Trajan’s reign also saw significant changes to the purity of the silver denarius. A different method of assessing the impact of this reform is presented (correlation) and convincingly points towards the reform having an immediate impact on the circulation of Republican denarii. Although the method is problematic and difficult to comprehend, the correlation approach is able to further refine the results one is able to obtain from percentage composition. However, both methods indicate that the reform had significant effects on Republican coin-circulation. The denarii of Marc Antony were assessed separately and it was possible to link their circulation patterns to the restitutio coinage of Marc Antony under Marcus Aurelius. These denarii generally stop circulating at the end of IP 13 (AD 193-222).

The circulation duration of Julio-Claudian denarii was also assessed through the correlation method. This highlighted a very different circulation pattern from that of Republican denarii, suggesting that the users of these denarii were capable of determining their intrinsic content. Julio-Claudian denarii were withdrawn as a consequence of the silver issued during the Civil War (AD 68-69) and Vespasian’s reign. Additionally, Domitian’s coin-reforms may have contributed to their withdrawal. Yet, the correlation method was also able to determine that some Julio-Claudian denarii continued to circulate (or be

hoarded) after IP 9 (AD 117-138). Their condition may have been the reason for this as well as the debasement of the denarius under Antoninus Pius.

The coins issued by Marcus Aurelius and found in the middle of *Germania magna* are assessed and believed to have come, in part, during this period. It is also possible that some arrived later on, such as under the reign of Caracalla. More importantly, the number of coin-finds from the second half of the second century sees a significant decline, although this may have been compensated through the circulation old coin. An additional explanation for this was sought with the Antonine Plague and decreasing supplies of bullion from the mines.

The early third century provides a unique opportunity to assess coin-transfer/movement across the Empire as large quantities of eastern denarii struck by Septimius Severus have been found in the study-region. Likewise, a high number of provincial coins struck by Caracalla were also recorded. The presence and movement of both appear to have had some-sort of connection to the military but caution was also stressed in the case of RPC since their increased presence may actually reflect minting patterns. Moreover, their movement may not have dated to their actual issue period. An overall lack of supply of all fresh coin during IP 13 (AD 193-222) was noted by investigating the quantities of contemporary coin in hoards. The newly introduced radiate, which was not supplied in any quantity, had no effect. Rather, it highlights an ongoing problem with a decreasing availability of precious metals, resulting in other reforms, which once again drove out better coin.

The mid-third century is often described as a period of 'crisis' and instability. In part, this is a consequence of the dearth of non-numismatic evidence and even the numismatic evidence is contentious and subject to recent revision. With the (re-)introduction of the radiate, hoard evidence from this period (c. 230-240s) suggests that older denarii were quickly withdrawn whilst contemporary denarii remained unaffected by the presence of the overvalued radiate. Investigation of the hoarding of denarii during this period is hindered by the active removal of older silver coins under Trajan Decius. In addition, the

ability of silver coin to move across the Empire appears to have been hindered due to the impoverishment of silver coinage during the period. However, this does not mean that the movement of coin could not occur, but rather that it increasingly relied on deliberate supply. The division of coin circulation pools therefore appears to have occurred before the formation of the Gallic Empire, and persisted. Gold coin-finds outside of the Empire point towards a closer relationship (whether benevolent or malevolent) between the Gallic Empire and *barbaricum* than between the Central Empire and *barbaricum*.

During the Gallic Empire, a 'revival' of the Augustan monetary system was attempted by striking sestertii and double sestertii as well as denarii. The latter were simply symbolic, while *aes* may have had a monetary value, but since it was a short-lived endeavour it could be interpreted as a symbolic coinage as well. The Gallic Empire also produced high number of hoards, which traditionally have been interpreted as a consequence of Germanic raids. An alternative explanation was put forward which attempted to link the presence of hoards as reflecting concentrations of coin-supply. The evidence is sparse but there does appear to be a connection with the availability of coin and the presence of hoards. If the suggested connection is proven to be correct, then the presence of hoards demonstrates that these coins were placed in the ground since they may have been too unwieldy for daily use. One can see how carrying large quantities of coin to make simple purchases/payments is uneasy and it is not difficult to imagine that they were simply kept in the ground until 'another time'.

7 Coin-Finds: The Late Roman Period

In this chapter, the late third to early fifth centuries are covered by three sub-chapters. The first case-study considers the period from Aurelian's (re-) conquest of northwest Europe to Diocletian's reform. The second study assesses the circulation from the early to mid-fourth century in light of decentralised coin production,⁶⁵⁰ whilst the final case-study provides an overview of the supply and distribution of coin towards the end of Roman rule in the region. Throughout the chapter, it will be important to recall that the data for the fourth century are particularly susceptible to imprecise dating and that there are numerous uncertainties regarding the denominational system and the "degree of change and its frequency" (4.3.2 and 4.3.3).⁶⁵¹ As a result, numbers, percentages, figures, and distribution maps are more than ever only approximations rather than absolutes.

7.1 The Reforms of Aurelian and Diocletian

In early AD 274, Aurelian defeated Tetricus at Châlons-sur-Marne and united the Roman Empire once again. However, the *agri decumates*, which had already been given up by the Gallic emperors, were not recovered (3.6). In that same year, Aurelian also introduced a major coin-reform.⁶⁵² Since the purity of radiate billon coinage had declined to its lowest point under the reign of Claudius II, Aurelian introduced the aurelianus as a reformed radiate. The number XXI with its Greek equivalent of KA is found on these coins and has been accepted by most to indicate the fineness of the coin as one part silver to twenty parts copper or one part silver of twenty parts.⁶⁵³ According to Zosimus, Aurelian recalled poor coin and issued his new aurelianus to avoid confusion in

⁶⁵⁰ Decentralised production had already started in the mid-third century AD.

⁶⁵¹ King (1993), 33.

⁶⁵² Callu (1969), 230.

⁶⁵³ Corbier (2005), 332; Bolin (1958), 292. Some coins are marked with XI or IA (Greek), which indicates either one tenth pure silver or one part silver to 10 parts bronze. For a summary of the monetary system in the second half of the third century: Estiot (2004), 39-48. An alternative explanation could be the value in relation to the existing radiates: Mattingly (1951).

trade.⁶⁵⁴ Whatever intention Aurelian's new coin had, it did not have a significant impact on coin-circulation in the study-region. As has already been noted elsewhere, aureliani are only found in limited quantities throughout the northwestern provinces. The same is observed in north Africa but aureliani were common in Italy, which demonstrates a clear difference of coin-supply throughout the Roman Empire.⁶⁵⁵ The reason behind the different circulation patterns of radiates and aureliani is difficult to explain. It could be that the production of aureliani was simply inadequate, necessitating other coins to circulate in order to fill the void.⁶⁵⁶ Alternative explanations include the resistance to aureliani by users and that the closure of the mint at Trier by Aurelian resulted in a "*rupture brutale*" in the production of coin.⁶⁵⁷

Possible problems with the supply of coin to the northwest do not appear to have been restricted to the newly formed aureliani. Any coin struck during the reign of Aurelian is scarce in the study-region. Only c. 1,500 coins have been found and well-attributed to Aurelian, two-thirds of which have been found in hoards.⁶⁵⁸ Given the rate of radiate production and supply to the study-region throughout the third century,⁶⁵⁹ this is a remarkably low figure. In fact, hoards indicate the possibility that many of Aurelian's coins did not circulate in the study-region until well after his death.⁶⁶⁰ A basic breakdown of hoards containing Aurelian's coins demonstrates that these coins did not circulate for a long time (Table 7.1), but may have still been circulating after Diocletian's reform (see for more below). It also provides an initial corroboration that Aurelian's coins did not enter circulation until after his death. Only analysis of the hoards closing during Aurelian's reign can confirm

⁶⁵⁴ Zos. 1.61.3.

⁶⁵⁵ Howgego (1995), 138; King (1981); Burnett (1987), 123-126; Van Heesch (1998), 135; Hollard (1996), 206-208; Nizolek (2015), 43-47.

⁶⁵⁶ Burnett (1987), 126.

⁶⁵⁷ Mattingly (1951), 278-280; Hollard (1996), 206.

⁶⁵⁸ This number excludes the Divo Claudio coins, which are numerous, especially as imitations.

⁶⁵⁹ A staggering average of over one million coins/day during the reign of Tetricus has been extrapolated on the basis of a die study made for the short reign of Laelianus: Burnett (1987), 123.

⁶⁶⁰ Rare during the existence of the Gallic Empire: Mairat (2014), 196; Van Heesch (1998), 139.

the extent to which his coins were readily circulating throughout the study-region.

IP	Dates	Number	Percentage
16	260-275	160	17.67
17	275-294	379	41.87
18	294-318	347	38.34
19	318-330	3	0.33
20	330-348	2	0.22
21	348-364	9	0.99
22	364-378	0	0
23	378-388	3	0.33
24	388-403	2	0.22
16-24	260-403	905	99.97%

Table 7.1: Quantity of hoarded coins struck by Aurelian, by closing period.

Hoard ID	Findname	Total Coins	Aurelian Coins	Percentage
133096	Tongeren	6	1	16.66667
630	Painten	8	1	12.5
132932	Flobecq	22	2	9.090909
131884	Remich, Reimicherboesch	22	1	4.545455
131913	Septfontaine 16	23	1	4.347826
3398	Hüttersdorf, Ortsteil Buprich	727	31	4.264099
131651	Burmerange, Tritlingen	318	8	2.515723
731	Forchheim	285	6	2.105263
132185	Tetelbiërg 1973-1974	57	1	1.754386
131674	Dalheim Ricciacus, Petzel (year?)	227	3	1.321586
132513	Dalheim Ricciacus, (year?)	467	4	0.856531
133182	Tournai 18	437	3	0.686499
132557	Goeblange 1983	2773	19	0.685179
5105	Trier und Umgebung 2 (1959)	158	1	0.632911
133119	Wepion	1867	11	0.589181
133084	Surice	180	1	0.555556
133064	Saint-Mard (259)	229	1	0.436681
132838	Steinfort, 52 Rue de Kleinbettingen (1991)	2120	8	0.377358
132994	Macon	43433	52	0.119725
131787	Kleinbettingen 1921	1060	1	0.09434
133094	Toernich	1831	1	0.054615
133061	Saint-Mard (256)	5574	2	0.035881
133062	Saint-Mard (257)	12452	1	0.008031

Table 7.2: All hoards closing in IP 16 (AD 260-275) and containing coins struck by Aurelian.

Table 7.2 presents all hoards closing during IP 16 (AD 260-275) containing coins struck by Aurelian. It is clear that very few hoards have a high percentage of coins struck by Aurelian, once again highlighting their limited presence during this period. Moreover, this is further emphasized when a minimum threshold of 10 coins of Aurelian in any hoard is set (Table 7.3): only two hoards actually contain more than 1% of coins struck by Aurelian and close by AD 275. Hoard 3398 (Hüttersdorf) was interpreted to have been buried during the end of Tetricus' reign and in the context of Germanic incursions,⁶⁶¹ while Hoard 131651 (Burmerange), found no more than 50 km away from Hüttersdorf, is thought to have been buried during the reign of Probus.⁶⁶² The composition of the two hoards is quite different and each of their different proposed dates of deposition may be correct. Regardless of the interpretation of their deposition, a clear picture emerges which demonstrates that Aurelian's coins did not circulate in any quantity during or even after his lifetime in the study-region.

Hoard ID	Findname	Total Coins	Aurelian Coins	Percentage
3398	Hüttersdorf, Ortsteil Buprich	727	31	4.264099
132557	Goebblange 1983	2773	19	0.685179
133119	Wepion	1867	11	0.589181
132994	Macon	43433	52	0.119725

Table 7.3: All hoards closing in IP 16 (AD 260-275) and containing at least ten coins struck by Aurelian.

Reign	Non-Hoarded	Hoarded
Tacitus	157	531
Florianus	20	38
Probus	786	1522
Carus	54	125
Numerian	46	97
Carinus	62	137
Total: AD 275-285	1125	2450

Table 7.4: All coins by find-type, by reign, during IP 17 (AD 275-294).

⁶⁶¹ FMRD 3.1133-1134.

⁶⁶² FMRL 1.57.

An additional problem with coin-circulation in the study-region is manifested when one considers the numbers of coins issued and recovered for the subsequent emperors Tacitus, Florianus, Probus, Carus, Numerian, and Carinus. Very few coins from these emperors, covering a time span of 10 years from AD 275 to 285, have been recorded (Table 7.4). Moreover, their peak presence in hoards occurs during IP 18 (AD 294-318), but they also do have a strong presence in hoards during their actual period of issue (Table 7.5). Taken together with the hoarding patterns of coins issued by Aurelian (Table 7.1), we may deduce that fresh coins were not continuously supplied, but that coins of several emperors came together sometime during IP 17 (AD 275-294). When considering the hoarded coins of Probus, Table 7.6 demonstrates that any fresh coin most likely only arrived sometime during or shortly after his reign. If this is the case, until the late 270s/early 280s some other coin will have had to have been used for monetary transactions.

IP	Dates	Number	Percentage
17	275-294	686	28
18	294-318	1709	69.76
19	318-330	0	0
20	330-348	2	0.082
21	348-364	24	0.98
22	364-378	3	0.12
23	378-388	3	0.12
24	388-403	23	0.94

Table 7.5: All hoarded coins issued by Tacitus, Florianus, Probus, Carus, Numerian, Carinus by closing period.

IP	Dates	Number	Percentage
17	275-294	466	30.62
18	294-318	1021	67.08
19	318-330	0	0
20	330-348	1	0.06
21	348-364	12	0.79
22	364-378	2	0.13
23	378-388	1	0.06
24	388-403	19	1.25

Table 7.6: All hoarded coins issued by Probus, by closing period.

As was previously discussed (6.2 and 6.3), coin-supply to the study-region was not consistent and the coin-pool was continuously being impoverished through hoarding activity and coin-reforms (6.1-6.3). This means that most of what was circulating in the 270s and after must have been the coins of the former Gallic Empire. It consequently also means that some hoards, which according to their internal composition close during IP 16 (AD 260-275), may actually belong to a later period. Detecting this phenomenon is further complicated because when fresh coin does seem to have been supplied, it appears to have been in a limited quantity thereby preventing a thorough mixing of old and new coin.⁶⁶³

Reign	Quantity	Percentage
Philip I	1	0.6
Trebonianus Gallus	3	1.79
Valerian	2	1.19
Gallienus	35	20.83
Claudius II	33	19.64
Carus, Carinus	2	1.19
Central Empire Total	76	45.24
Postumus	25	14.88
Marius	1	0.6
Victorinus	11	6.55
Tetricus	43	25.6
Gallic Empire Total	80	47.63
Undetermined	12	7.14
Total	168	100.01

Table 7.7: Hoard 2282, Schwenningen (FMRD 2.3.3220)

According to Estiot, hoards in the former Gallic Empire demonstrate that coins of the Gallic emperors remained in circulation until the reigns of Probus and Carus only to be replaced by poor billon coins of Gallienus and Claudius II, imported from elsewhere in the Empire.⁶⁶⁴ The evidence is significant and one example of this phenomenon is Hoard 2282 (Schwenningen),⁶⁶⁵ where a near equal amount of Gallic Empire coinage is hoarded together with earlier coins (Table 7.7). The hoard may also indicate that some earlier coinage was also imported, as a single coin of Philip I was recorded as part of the hoard as well. However, it is uncertain where the earlier third-century radiates may have

⁶⁶³ New coin may also have been hoarded separately from the old coin.

⁶⁶⁴ Estiot (2004), 44; Estiot (1997), 78-81; Estiot, *et al.* (1994), 40-47.

⁶⁶⁵ FMRD 2.3.3320.

originated from. Likely candidate regions include those where fresh coin was supplied, such as Italy, but this then provides another problem as several sizeable parts of the Empire do not appear to have been quickly supplied with new coin. The regions which would have relied on this 'recycled' coin were far and wide, and confirmed areas include: Britain, northern Gaul and the German provinces, northern Africa, parts of Asia Minor, and Bulgaria.⁶⁶⁶ It is evident that the amount of old(er) available coin will have been limited, given the chronic debasement throughout the third century (6.3). As a result, a mass of poor imitational coins augmented the worn coins in circulation and hoards from the end of the third century show a significant presence of these poor coins.⁶⁶⁷

Studying the circulation, presence, and quantity of imitations on the basis of hoards is not a simple task. The primary prohibiting factor is that hoards tend to contain coins which have been selected for the purpose of keeping and depositing. Consequently, imitations are far less well represented in hoards than their non-imitation counterparts or precious metal coins. Nevertheless, a noticeable presence of imitations in hoards could provide a lens into their circulation patterns. A second impediment is that imitations of particular coinage do not necessarily have to be contemporary. Between AD 275 and 285 there was an overall shortage of fresh coin, and yet, the absolute number of imitations bearing a name of any of the contemporary emperors is minute. Only 216 non-hoarded and 3 hoarded coins resembling coinage from the same period were recorded. However, in percentage terms, this translates to 19.2% of non-hoarded coins as imitations.⁶⁶⁸ This real example highlights the difficulty of using hoards exclusively to assess the matter of imitational coins.⁶⁶⁹

The majority of imitations made during this period will most likely have been based on the coins in circulation and in the case of the study-region, this

⁶⁶⁶ Burnett (1987), 124; Besly (2006), 50; King (1981); Nizolek (2015), 10.

⁶⁶⁷ Estiot (2004), 44; Estiot (1998), 197-198.

⁶⁶⁸ Only 0.12% of hoarded coins were copies.

⁶⁶⁹ Another problem is that there is no consensus what constitutes a copy or an official issue: Kropff (2005), 78-79; Schulzki (1996), 32-33; Drinkwater (1987), 190.

was largely the coinage of the Gallic Empire supplemented (intentionally) by old radiates of Gallienus and Claudius II. As a result, the most frequent copies of the Central Empire include Gallienus' "seventh consulate", Claudius II and the DIVO CLAUDIO type, and those of Tetricus I and II from the Gallic Empire.⁶⁷⁰ The data collected from hoards (Table 7.8) reveal the majority of Divo Claudio coins in hoards were imitations, providing an insight into their prevalence in everyday life. It also emphasizes the difference in hoarding patterns of the most prevalent copied types. However, a comparison of the overall composition of coins (regular vs. imitation) by find-type highlights an issue with the data (Table 7.9).

Reign	Imitations	Total	Percentage
Gallienus	132	3964	3.3
Claudius II	1121	11051	10.14
Divo Claudio	281	483	58.18
Tetricus I/II	3815	53749	7.1
Total	5349	69247	7.72

Table 7.8: Number of imitations and total coins by emperor, found in hoards (all periods).

Reign	Imitations	Total	Percentage
Gallienus	93	2231	4.17
Claudius II	1370	3697	37.06
Divo Claudio	1136	1418	80.11
Tetricus I/II	6556	10416	62.94
Total	9155	17762	51.54

Table 7.9: Number of imitations and total coins by emperor, non-hoarded.

Reign	Imitations	Total	Percentage
Postumus	73	8915	0.82
Laelianus	0	34	0
Marius	3	527	0.57
Victorinus	38	7962	0.48
"Gallic Emperor"	220	314	70.06
Total	334	17752	1.88

Table 7.10: Number of imitations and total coins by Gallic Emperor, found in hoards (all periods).

⁶⁷⁰ Estiot (2012), 545.

As expected, imitations proportionally form a greater part of the non-hoarded coin-pool than in hoards.⁶⁷¹ However, it is troubling that there is a significant difference between the proportional amounts of imitations of Tetricus I/II by find-type (7.1% vs. 62.94%). In order to determine whether this represents a historical phenomenon or a data quality issue, the coinage of other Gallic emperors in hoards was also assessed (Table 7.10). Here too, the proportion of imitations in hoards is practically negligible. This therefore confirms that imitations of Gallic emperors were perceived differently from those of the central Empire. Imitations of the Gallic Empire may have been exclusively produced for the purpose of settling monetary and daily transactions during a period when the supply of fresh coin was limited.⁶⁷² Other imitations appear to have been treated with a slightly higher regard, as they do appear to have been hoarded in significantly high proportions compared to their official counterparts (e.g. Divo Claudio 58%). However, an alternative explanation can be put forward, by simply assessing their overall numbers. As legitimate coins of Tetricus I/II were so common it was easier for the users of these coins to detect imitations, whereas official coins of the Central Empire do not appear to have been as common, thereby making it slightly harder to produce copies (if one could even be fooled regarding their authenticity as they were hardly rare). It seems probable that both these factors will have played a role in the way that imitations were used and regarded.

A key question of the period and phenomena observed therefore concerns the status of the imitations and their purpose. Some scholars claim that as these coins were clearly counterfeits, which the state would never have recognised,⁶⁷³ while others have left the question open.⁶⁷⁴ The state will undoubtedly have been aware of the situation and any effective sanctions against imitations can be ruled out, especially as copying may not even

⁶⁷¹ Lallemand argues that the better (i.e. genuine) pieces were selected for hoarding: Lallemand (1980), 121.

⁶⁷² King has asked whether we can assume these imitations were produced AD 270-280: King (1981), 94.

⁶⁷³ King (1996), 245-246; Boon (1988), 118.

⁶⁷⁴ Giard (1969), 29, 34; Schulzki (1996), 35.

represent one single phenomenon due to significant variations in size and quality of the imitations. However, given that imitations form a considerable portion of site coin-finds, it is plausible that the counterfeits were produced as an “emergency coin” for local purposes.⁶⁷⁵ However, not all imitations are equal, as the evidence appears to suggest (see above). Another point to recall is that thus far the study-region, as a whole, has been considered. King has already pointed out that the circulation patterns of imitations differed throughout the Empire and even within areas in the study-region (Fig. 7.1).⁶⁷⁶ This highlights not only the difficulty of studying imitations and their status, but also the complexity of the period under consideration. From the data collected, the distribution patterns of both the hoarded and non-hoarded imitations confirm the difference of their presence and use in various areas (Fig. 7.2 and 7.3). We can also deduce that imitations were not accepted in all areas, such as in southern Germany. However, the overall distribution of non-hoarded imitations strongly resembles (part of) the *limes* and imitations are also widely found in the hinterlands of important urban centres such as Mainz, Cologne, and Trier (3.1). Whether this indicates some sort of semi-official status, such as military or administrative authorities authorising their production, or simply the areas with the highest demand for coin, cannot be determined with confidence.

It is not entirely certain when the production of imitations stopped, but since Probus is the latest emperor whose coins were counterfeited, a date of c. AD 282 has been postulated.⁶⁷⁷ However, it seems probable that imitation production continued beyond the reign of Probus since they continued to circulate until IP 18 (AD 294-318), by which time 94% of all IP 16 (AD 260-275) hoarded imitations are withdrawn (Fig. 7.4). Moreover, Hollard has published an imitation coin with a radiate crowned bust on the obverse and a ‘barbarous’ representation of *gloria exercitus* (AD 330-336) on the reverse. This does not

⁶⁷⁵ Hill (1949), 2; Reece (2002), 48-49; Kropff (1987), 13; Ziegler (1983), 75; Lafaurie (1975), 895-898; Kropff (2005), 77.

⁶⁷⁶ King (1981); Kropff (2005).

⁶⁷⁷ Estiot (2012), 551.

definitively demonstrate their continued mass production but does show some continued to be used into the fourth century (see 7.2).⁶⁷⁸ Furthermore, as has already been discussed, the number of imitations in hoards closing in IP 16 (AD 260-275) is unrepresentative of their actual circulation pattern as fresh coin was not supplied in great quantity, resulting in many hoards deposited in the 280-290s with closing date coins of the 260s. Similarly, although Aurelian's coinage is not well represented in the study-region's coin-pool, c. 97% of these coins were also withdrawn by IP 18 (AD 294-318). A final and important factor to consider when analysing the non-recovery of hoards, the impact of Aurelian's coin-reform, and the lack of fresh coin, is that through Aurelian's reign and his subsequent successors, Germanic incursions into the study-region (and beyond) persisted.

From approximately the early AD 280s (Probus), a recovery process commenced during which some of the Frankish and Germanic raids were driven back.⁶⁷⁹ This recovery process, however, was fragile at best. Problems continued to persist and include the *Bagaudae* and the revolt of the Menapian Carausius, a naval commander, who was so successful dealing with the Frankish and Saxon pirating raids that he was able to capture enough booty to revolt against Maximian in AD 286.⁶⁸⁰ He then fled to Britain, where he controlled the island and part of the Gallic coast. Meanwhile, various tribes including the Burgundiaces/Alamanni crossed the Rhine during AD 287 and 288, redirecting Maximian's attention. When Maximian failed to regain Britain, the island remained under separate control from the rest of the western half of the Empire.⁶⁸¹ During this period, a limited quantity of the coinage from the Britannic Empire made its way to the study-region but their distribution shows no inclination to be found only along the coastline (Fig. 7.5).⁶⁸² Similarly, very few pre-reform coins of Maximian and Diocletian have been recorded in Britain

⁶⁷⁸ Hollard (1991); Doyen (1980), 80, n. 41.

⁶⁷⁹ SHA Probus, 13.5-8, 14-15.

⁶⁸⁰ Bowman (2005), 70-71; Eutrop.9.20.3, 9.21; Aur. Vict. *Caes.* 39.17. For a summary: Wightman (1985), 198-201.

⁶⁸¹ Bowman (2005), 71-73.

⁶⁸² 31 non-hoarded and 3 hoarded coins.

via the PAS.⁶⁸³ This may indicate some sort of isolation between the Britannic and Western Empires, or at least that coins were not susceptible to travelling outside their intended region of circulation.⁶⁸⁴ Although more research is required to determine whether the island was (partially) isolated from the continent, it is important to note that pre-reform coinage of Maximian (AD 286-294) was relatively limited on the continent as well. Over the course of a 12-year period, only 231 non-hoarded and 1,332 hoarded coins were recovered. This is less than half of the 10-year period following the end of the Gallic Empire and even accounting for the pre-reform coins issued by Diocletian, coin-supply still appears to have been limited prior to Diocletian's reform (Table 7.11).

Reign	Non-Hoarded	Hoarded	Total
Total AD 275-285	1125	2450	3575
Maximian		231	1332
Diocletian		262	1118
Total AD 285-294	493	2450	2943

Table 7.11: Number of coin-finds, by find-type, by period, All pre-reform (AD 294).

Undoubtedly the period between the fall of the Gallic Empire and Diocletian's reform was one of political and monetary instability. On the one hand, inhabitants of the study-region had to live with the constant knowledge and fear of Germanic raids into the Empire and on the other hand, the restricted coin-supply to the study-region cannot have made life any easier. Although Aurelian aimed to limit mint fraud and to encourage confidence in the fiduciary nature of his newly reformed radiate (aurelianus), the positive effect it had was minimal.⁶⁸⁵ Users were forced to utilise coinage which had little value: old worn radiates from the 240s and radiates of the Gallic Empire alongside (local) imitations. All this was done while the value of the coins (excepting local imitations?) may have changed.⁶⁸⁶ At this point in Roman history the coin-finds

⁶⁸³ 35 coins for Maximian and 61 for Diocletian: Date of last search, 25 January 2016.

⁶⁸⁴ Wightman suggests that coins of Allectus found in Gaul may point to a continued but limited control on the continent: Wightman (1985), 200.

⁶⁸⁵ It may actually have been the trigger to cause price inflation: Haklai-Rotenberg (2011).

⁶⁸⁶ The official radiates were halved in value to one denarius to ensure that the aurelianus maintained a two denarius value: Estiot (2012), 545-550. Alternatively, the aurelianus may have doubled in value to four denarii, and the radiates maintained their original double denarius value.

and circulation patterns point towards the (temporary) monetary disconnection of northwest Europe from the rest of the Empire.⁶⁸⁷

7.2 The Early to Mid-Fourth Century

For the case-studies of the fourth century (7.2 and 7.3), unless otherwise indicated, all coin is grouped together (gold, silver, and bronze). This was done as the limited quantity of gold and silver does not distort the overview of bronze but would require significant effort to separate. This means that the tables which group together all metals are accurate representations of bronze but not necessarily truthfully represent precious metals (e.g. by mint).

Diocletian's coin-reform was not a single event but was composed of a series of measures beginning with gold in c. AD 286 lasting until the 290s.⁶⁸⁸ According to the Aphrodisias Currency Inscription dated to AD 301, there was a decentralised yet unified monetary system,⁶⁸⁹ resulting in the same coinage being used *in maiore orbis parte*.⁶⁹⁰ The radiate continued to circulate after the coin-reform (7.1) and it has been inferred from the Currency Inscription that it may have doubled in value.⁶⁹¹ The new post-reform coinage will therefore have circulated together with the old,⁶⁹² but it is not easy to determine at what exact date radiates and their imitations stop circulating, particularly as radiate production continued until AD 306/307. Radiate imitations are only found in two hoards with the latest coin belonging to IP 18 (294-318) and have closing dates of AD 301 and AD 316 (see also Fig. 7.4).⁶⁹³ Furthermore, the majority of radiates (on the basis of hoards) will have stopped circulating within two

⁶⁸⁷ Many regions may have been disconnected from each other, if based on the lack of fresh coin: Brem, *et al.* (1996).

⁶⁸⁸ Sutherland (1955). AD 294 is traditionally used as the date as it particularly affected silver and bronze: Sutherland (1967), 1-2.

⁶⁸⁹ Erim, *et al.* (1971); Reynold (1989); Chaniotis and Fujii (2015).

⁶⁹⁰ Abdy (2012), 588. It was previously thought that as there was no change to the physical aspects of the coin, that the Price Edict (and Currency Inscription) were contemporary with the coin-reform: Sutherland (1967), 99.

⁶⁹¹ Abdy (2012), 585.

⁶⁹² Van Heesch (1998), 159, 167; Bastien and Huvelin (1969), 9-16; Bastien (1978), 798-801; Bruun (1987), 15, 22, 30-31; Amandry and Gautier (1985), 108-109.

⁶⁹³ FMRL I 123 and 203. The hoard dating to AD 316 (FMRL I 203) is odd as it contains a denarius of Vespasian together with bronze from the fourth century and two Tetrici imitations.

decades of the coin-reform and less than a decade after the Currency Inscription. An interesting parallel occurs in some areas in the east where the withdrawal of provincial coinage appears roughly to coincide with the end of radiate circulation in the west,⁶⁹⁴ giving credence to the claim (and reality) that the same coinage was being used throughout most of the world.⁶⁹⁵

In addition to the coin-reform of *c.* AD 294, the Empire was reorganised into 12 districts/dioceses and 101 provinces. The Galliae and Viennensis dioceses were ruled by Maximian for a short period, before power over the district was handed to Constantius I. Given the shortage of coin during the last quarter of the third century, it is not surprising that more (fresh) coin was once again supplied. An initial examination of the coin-pool immediately following the coin-reform will provide a useful basis for any future studies regarding coin-supply and circulation, especially for those assessing the impact of the coin-reform and Currency Inscription. In the case of the study-region, during the period AD 294-305, coins with the name of Diocletian are the most prevalent followed closely by those of Constantius I (Table 7.12).

Reign	Non-Hoarded	Hoarded	Total
Diocletian	382	920	1302
Maximian	228	651	874
Galerius	205	178	383
Constantius	461	804	1264
Total	1276	2553	3823

Table 7.12: Approximate number of coins, by find-type, AD 294-305.

It is not surprising that Constantius' coins are very common since he held power over the district. The high prevalence of Diocletian's coins, especially in comparison with those of Maximian, may be interpreted as the expression of his

⁶⁹⁴ Bonchev (forthcoming). Absence of evidence in Dacia: Gazdac (2002), 98. RPC possibly circulated the longest in Pamphylia and Pisidia where the last issues of RPC were struck under Tacitus: Howgego (1985), 67. Some hoards in Syria show that tetradrachms may have continued circulating until the early AD 290s: Butcher (1991), 215. Other civic coins circulating into first quarter of fourth century: Butcher (2003), 75-76, 114.

⁶⁹⁵ Doyen states that radiate imitations stop circulating by AD 320, at the latest, while Hollard argues that the date is too rigid: Doyen (1980), 86; Hollard (1991), 18. The excavation at Arras (Pas-de-Calais) has found radiate imitations in Theodosian layers: Gricourt (1987). Areas of the East also were short of coin between 275 and the reform: Macdonald (1974).

superior position in the tetrarchy. However, as the mints struck coin in the names of all the Augusti and Caesars, mint attribution can be more useful to assess the supply, circulation, and movement of coin.

The breakdown of the coin-finds by mint is presented in Table 7.13. A difference of mint attribution accuracy can be noted between the find-types as far fewer hoarded coins have an “uncertain” mint designation (see 4.2 and 4.3). Moreover, for both find-types several key mints can be identified.

Mint	Non-Hoarded	Hoarded
Uncertain	38.32	13.94
Aquileia	1.96	1.76
Carthage	4.78	3.02
Cyzicus	1.33	0.04
Heraclea	1.02	0.08
London	2.66	1.88
Lyons	7.6	5.05
Rome	5.17	2.82
Siscia	1.02	0.63
Ticinum	4.54	22.05
Trier	29.62	48.06
Other	1.98	0.67
Total	100	100

Table 7.13: Coin finds by mint, by find-type, expressed as percentage, AD 294-305.

The fact that Trier is the primary mint of supply is not surprising given its location within the study-region and its role as a regional capital and imperial residence. That the mints of Rome and Lyons contribute a sizeable portion to the coin-pool is also logical given their status and proximity to the study-region. However, the proximity of a mint is not the sole determining factor with regards to the origin of coin. Coins issued in London make up less of the total coin than one would anticipate, especially if one considers Constantius’ military activities in both Britain and Germany. More research on the circulation and supply of coin within Britain is necessary to assess the monetary situation on the island, but two possible explanations for the negligible British coin-finds in the study-region may include limited mint production in London during this period and/or coin-circulation between the island and continent was

restricted.⁶⁹⁶ The mints of Carthage and Ticinum are surprising contributors to the coin-pool. With both find-types, the coins of Carthage contribute a similar portion to the coin-pool but the difference between non-hoarded and hoarded coins of Ticinum is especially noteworthy. The comparison between the two find-types highlights the danger of relying on any one find-type for analysis. The reason for Ticinum's apparently high contribution to the coin-pool is the result of one hoard found in the south of Germany, which distorts the overall picture.⁶⁹⁷ It is likely that despite Ticinum's relative proximity to the study-region (Pavia, Italy) its contribution to the overall coin-pool would have been similar to that of Rome.

During the period of the Gallic Empire, it was noted that radiates from the Central Empire generally did not circulate in the study-region (6.3). By considering IPs 18 and 19 in small sub-periods, a similar analysis can be attempted, in light of the turbulent and tense political situation during which the seats of power changed several times.⁶⁹⁸ The advantage of this approach is that one can examine the political changes more closely as reflected by coin-supply and production. It is not possible to note any changes of power and influence if all the coins of Constantine from IP 19 (AD 318-330) are grouped together. However, it was necessary to exclude some coins from consideration, as the sub-periods were devised on the basis of historical events and not on numismatic grounds (cf. 5.1); for example, coins which were dated AD 308-317 could not be included in an analysis of coin-finds from the sub-period AD 307-313. The use of sub-periods particularly affected coins of Constantine I and Licinius I, which one should note when examining figures and tables. The use of these periods did not distort the historical overview but only affected the total quantity of coin involved in analysis in absolute numbers. The second sub-

⁶⁹⁶ Few coins of the Britannic Empire crossed the channel (7.1), so it may be possible that coin went to Britain but only travelled back towards the continent in limited quantities. Contra Bastien (1978), 802-803. Bastien argues that coin from London may have been reserved for continental circulation (he suggests they may have been dispatched to Amiens, as it was on the *via militaris*).

⁶⁹⁷ FMRD 1.7.7157.

⁶⁹⁸ Cameron (2005), 91-93.

period of IP 18 (AD 294-318) under consideration is the 6-year interval between AD 307 and 313. During this sub-period, there were several short-lived reigns, such as that of Severus II, which allows one to measure the impact of such reigns on the coin-pool (Table 7.14 and 7.15).⁶⁹⁹

Mint	Galerius	Constantine	Licinius	Maxentius	Maximinus Daia	Maximian	Severus II	Total
Uncertain	0	39	0	6	3	3	11	62
Alexandria	0	0	0	0	4	1	1	6
Aquileia	0	2	0	4	7	0	1	14
Arles	0	0	0	0	16	0	0	16
Carthage	2	0	0	1	3	1	7	14
Cyzicus	0	0	3	0	5	0	0	8
Heraclea	1	0	1	0	7	0	0	9
London	1	55	6	0	9	7	1	79
Lyons	1	16	2	0	11	2	6	38
Nicomedia	0	0	0	0	7	0	0	7
Ostia	0	3	1	4	1	0	0	9
Rome	0	8	0	6	2	0	3	19
Siscia	3	2	2	0	5	1	0	13
Thessalonika	0	0	0	0	5	0	0	5
Ticinum	1	9	0	56	14	13	17	110
Trier	8	145	10	0	41	11	10	225
Total	17	279	25	77	140	39	57	634

Table 7.14: Hoarded coins, By reign and mint, AD 307-313.

⁶⁹⁹ All coins of Severus II were included, despite his reign beginning in AD 306.

Mint	Galerius	Constantine	Licinius	Maxentius	Maximinus Daia	Maximian	Severus II	Total
Uncertain	6	111	6	48	45	18	7	241
Alexandria	2	0	0	0	8	3	2	15
Aquileia	0	2	0	23	1	1	2	29
Arles	0	2	0	0	0	0	0	2
Carthage	1	0	0	1	3	0	2	7
Cyzicus	5	1	2	0	1	0	0	9
Heraclea	3	0	1	0	5	0	0	9
London	1	86	6	0	12	5	0	110
Lyons	0	54	0	0	5	3	5	67
Nicomedia	0	1	0	0	1	0	0	2
Ostia	0	4	3	22	5	0	0	34
Rome	1	12	9	23	0	0	0	45
Siscia	5	4	3	0	7	0	0	19
Thessalonika	0	1	6	0	1	0	1	9
Ticinum	0	10	2	19	6	1	3	41
Trier	7	470	21	1	93	34	18	644
Total	31	758	59	137	193	65	40	1283

Table 7.15: Non-hoarded coins, by reign and mint, AD 307-313.

Coins struck during this period in the name of Constantine are the most common in the study-region, followed by Maximinus Daia and Maxentius. Coins struck in the name of Licinius are surprisingly sparse during this period, despite his appointment as Augustus of the west late in the year AD 308. Therefore, on the basis of coin-finds, from one area of the Empire, and their overall mint attribution, a possible monetary division between the East and West of the Empire may be suggested (Table 7.16).⁷⁰⁰ Coins struck in AD 307-313 no longer appear to have been supplied from an equally varying assemblage of mints as in the previous decade (AD 294-305) and certainly not from distant mints such as Carthage. The role of Rome as a supplier of coin also seems to have decreased while the contribution of mints in Trier, Lyons, and London increased.⁷⁰¹

⁷⁰⁰ Whether the finds accurately portray production cannot be known from a single region alone, die-studies and/or other regions need to be studied to determine the validity of this alternative.

⁷⁰¹ The mint of Ticinum is disproportionate due to one hoard: FMRD 1.7.7157.

Mint	Non-Hoarded	Hoarded
Uncertain	18.78	9.78
Alexandria	1.17	0.95
Aquileia	2.26	2.21
Arles	0.16	2.52
Carthage	0.55	2.21
Cyzicus	0.70	1.26
Heraclea	0.70	1.42
London	8.57	12.46
Lyons	5.22	5.99
Nicomedia	0.16	1.10
Ostia	2.65	1.42
Rome	3.51	3.00
Siscia	1.48	2.05
Thessalonika	0.70	0.79
Ticinum	3.20	17.35
Trier	50.19	35.49
Total	100	100

Table 7.16: Coin finds by mint, by find-type, expressed as percentage, AD 307-313.

While the breakdown of the coin-pool by mint allows for the possibility of a monetary division, several complications arise from the numismatic evidence. The mint of Carthage only struck coin in AD 296-307 and 308-311, which may explain why coins from Carthage during the sub-period AD 307-313 are less prevalent than during AD 294-305. The mint of Ostia, which was established AD 308/309 by moving personnel from Carthage to Ostia, ceased production in AD 313. It cannot be ruled out that the addition of a new mint in Italy had an effect on coin-output levels at the other Italian mints, and this could explain why coins from Rome are also less common in the sub-period AD 307-313 than in 294-305.⁷⁰²

The fact that the names of various Caesares and Augusti were struck on coins at Trier also emphasizes the complexity of the numismatic material. It demonstrates that if one accepts the possibility of a monetary division, this cannot have solely been the consequence of the political situation. Coins in the name of Severus II are quite prevalent considering his short reign and it is interesting that nearly a third of the coins found were struck at Trier. Between

⁷⁰² Sutherland (1967), 5-6.

the defeat of Severus II (Autumn AD 307) and the end of AD 308, coins were struck at Trier by Constantine in the names of Galerius, Maximian (Herculius), Maxentius, and Maximinus. From AD 309 until May AD 313, the mint of Trier's coin repertoire changed and coins only with the names of Licinius, Maximinus, and Constantine were struck.⁷⁰³ Moreover, the quantity and proportion of coin struck in the names of the other Caesares and Augusti can allow one to understand Constantine's political situation. According to Sutherland, Constantine's position was delicately balanced, giving formal but minimal recognition to Galerius, Maximinus, and Maxentius, while focusing coins in his own and Maximian's name.⁷⁰⁴ While there are few coins of Galerius and Maxentius struck at Trier, there are three times more coins of Maximinus than of Maximian. Even accounting for dating errors and the exclusion of some of Maximian's coins,⁷⁰⁵ this still is a significant difference. Although Constantine joined forces with Licinius against Maximinus, it is possible that until AD 311 he showed some partiality towards his fellow Caesar as they both had been overlooked in November AD 308,⁷⁰⁶ when Licinius was appointed as the new *Augustus ex nihilo*. However, more research into mint-production and circulation throughout the Empire during this period is necessary to confirm the validity of such a proposal. If a monetary division is to have existed, it appears that the political situation did not have a direct influence.

Following the victories of Constantine and Licinius, the Empire was divided between the two of them, with Constantine ruling the West and Licinius the East. Their uneasy joint rule of the Empire lasted from c. AD 314 to 324. The number of coin-finds from this period is particularly low due to dating problems with the coinage (see above). However, from the coins that were able to be used for analysis of this sub-period, it is possible to observe that the pattern from the previous sub-period (AD 307-313) is repeated. Coins do not

⁷⁰³ Sutherland (1967), 156.

⁷⁰⁴ Sutherland (1967), 156.

⁷⁰⁵ E.g. Those which did not fit the sub-period.

⁷⁰⁶ AD 311 - When Licinius agreed to marry Constantine's younger half-sister, Constantia.

appear to have originated from very far outside the study-region, if at all (Table 7.17).

Mint	Non-Hoarded	Hoarded
Uncertain	18.22	21.51
Alexandria	0.01	0.06
Antioch	0.07	0.06
Aquileia	0.92	1.06
Arles	3.89	3.59
Cyzicus	0.26	0.21
Heraclea	0.49	0.54
London	8.99	9.29
Lyons	9.28	11.04
Nicomedia	0.20	0.18
Rome	1.80	1.33
Sirmium	0.13	0.12
Siscia	3.39	3.65
Thessalonika	1.75	1.93
Ticinum	3.04	2.93
Trier	47.55	42.50
Total	100	100

Table 7.17: Coin finds by mint, by find-type, expressed as percentage, AD 314-324.

Coins of Carthage and Ostia no longer appear as both mints ceased operation in AD 313.⁷⁰⁷ Moreover, coins struck at Cyzicus and Nicomedia from the period 314-324 do not arrive in the study-region at any point in time, despite being struck in the names of both Augusti,⁷⁰⁸ while the contribution other eastern mints such as Heraclea, Siscia, and Thessalonika decreased. Above all, the meagre supply of coins from Siscia to the study-region is noteworthy as Sutherland has identified this as an important mint for Europe and it fell under Constantine's control early on (c. AD 314-316/7).⁷⁰⁹ Thessalonika also fell under Constantinian control in AD 317, which further demonstrates that the lack of supply from eastern mints cannot solely have been a consequence of the political circumstances of the Empire.⁷¹⁰ Aquileia struck coin sporadically

⁷⁰⁷ Bruun (1966).

⁷⁰⁸ Bruun (1966), 591-608, 636-346.

⁷⁰⁹ Sutherland (1967), 411.

⁷¹⁰ Sutherland (1967), 484.

which explains its limited impact on coin-supply to the northwest.⁷¹¹ The fact that Ticinum has a reduced supply is especially important as it was a city ideally situated for Constantine, with access to the West (Gaul), East (Balkans), and South (Italy). A die-study is necessary to confirm whether output levels may have decreased, but it is likely that with Trier situated in the northwest Ticinum was not needed to supply the study-region with coin. The biggest change is the increased role for Arles as a main supplier of coin to the study-region, whose mint was founded *c.* AD 313, by moving the mint from Ostia to southern France.⁷¹²

Several factors lie behind the reason why coin no longer travelled as far during the periods 307-313 and 314-324. The political situation between various rivals does not provide an adequate explanation. One further factor may be the weight reductions of nummi struck in the western half of the Empire (Table 7.18).⁷¹³ With each reform, heavier coins may have been increasingly sought after, preventing long-distance movement, which under 'normal' circumstances would have taken some time.⁷¹⁴

Reduction	Year	Theoretical Weight Standard	Weight (grams)
Diocletian	End 294	1/32 Pound	10.08
First Reduction	April 307	1/36 Pound	8.96
Second Reduction	May 307	1/41 Pound	7.84
Third Reduction	November 307	1/48 Pound	6.72
Fourth Reduction	End 309/Beg 310	1/72 Pound	4.48
Fifth Reduction	Mid 313	1/96 Pound	3.36

Table 7.18: Weight reductions of the nummus.

It is unclear when the Balkan and eastern mints reduced their weights, but King argues that it must have occurred at some point between late AD 308 and 311.

⁷¹¹ Sutherland (1967), 388.

⁷¹² Sutherland (1967), 227. This may have led to the closure of Lyons in AD 316: Bastien (1980).

⁷¹³ For figures: Bastien (1980), 85-93.; Cf. King (1993); Bagnall (1985), 31-35. However, by the mid-century, denominations were very high in line with rising prices: Bagnall (1985).

⁷¹⁴ Cf. The movement of silver coins in the third century: Howgego (1996).

The fifth reduction (1/96 pound) was carried out in the east at the same time as in the west (AD 313) and was more-or-less maintained until AD 330.⁷¹⁵ In addition to the decline in weight, the nummus was halved in value to 12 ½ denarii as all coins from AD 318-324 struck in the east carry the mark XIII.⁷¹⁶ This too could have impacted the circulation of coins from afar. A second factor may have been that the mint of Trier increasingly became important to produce significant quantities of coin for the entirety of the study-region. It is one of only five mints that continuously struck bronze between AD 313 and 337, while conceivably the other mints only issued coin when required.⁷¹⁷

After Constantine's victory over Licinius, he focused on unifying the Empire and promoting his family members. During IP 20 (AD 330-348), Constantinople was officially dedicated as the new imperial capital in AD 330 and upon Constantine's death in AD 337 the Empire was divided amongst his remaining sons. Upon turning of age, Constans campaigned against Constantine II, and emerged victor and ruler over the western half of the Empire in AD 340.⁷¹⁸ Constans followed this with a successful campaign against the Franks (AD 341-342) but was assassinated in AD 350 by supporters of Magnentius, who had in the meantime declared himself emperor. If one excludes the uncertain-mint coins from consideration (see below for reason),⁷¹⁹ over the course of IP 20 (AD 330-348), the coin-finds show that the mint of Trier remained central for the supply of coin (Table 7.19). The other Gallic mints of Lyons and Arles increase in their importance reducing the significance of the Italian mints to the study-region. Since the mint of London was closed c. AD 325 until the 380s, their minimal 'presence' is the result of minor attribution and digitisation errors.⁷²⁰ Nevertheless, the overall mint attribution pattern of coins

⁷¹⁵ King (1993), 22-23. More work is required on the fineness of fourth-century coinage.

⁷¹⁶ A papyrus provides 'insider' information in advance to the joint emperors' decree that common 'Italian' coinage will be halved in value: P. Ryl. 607; Abdy (2012), 592-593.

⁷¹⁷ Sutherland (1967), 18. The other four mints: Arles, Siscia, Heraclea, and Cyzicus.

⁷¹⁸ For more on the dynastic feuds after Constantine's death: Hunt (1998), 3-5.

⁷¹⁹ With both find-types the number of 'uncertain' mint coins was so great that it hides the true pattern of mint supply.

⁷²⁰ Sutherland (1967).

issued during the second quarter of the fourth century shows a contraction with more than 85% of official coins from the three Gallic mints.

Mint	Non-Hoarded	Hoarded	Average
Alexandria	0.20	0.33	0.26
Antioch	0.40	0.28	0.34
Aquileia	1.65	0.16	0.90
Arles	9.57	9.29	9.43
Carthage	0.01	0.00	0.01
Constantinople	0.91	1.06	0.98
Cyzicus	0.73	1.15	0.94
Heraclea	0.42	0.61	0.52
London	0.23	0.79	0.51
Lyon	13.88	23.86	18.87
Nicomedia	0.44	0.49	0.47
Ostia	0.03	0.00	0.02
Rome	2.98	3.51	3.25
Sirmium	0.02	0.02	0.02
Siscia	2.31	2.68	2.49
Thessalonika	1.09	1.61	1.35
Ticinum	0.03	0.68	0.35
Trier	65.09	53.49	59.29
Total	100	100	100

Table 7.19: Coin finds by mint, by find-type, expressed as percentage, IP 20 (AD 330-348) (excluding 'uncertain' mint).

The study-region during IP 20 (AD 330-348) also experiences the highest *per mill* values during the fourth century (Fig. 4.15-4.16). Part of this is accounted for by the high incidence of imitations.⁷²¹ This skews the data for mint-attribution, as does the apparent poor condition of many coins (4.3.2). Bastien dates a reduction to the weight of the nummus to AD 330.⁷²² A few years later, in AD 335 (or 336), Bastien identifies another weight reduction.⁷²³ In addition, King has identified a drop in fineness during IP 20 (AD 330-348), but questions whether such low silver levels (c. 1.1-0.68%) were deliberate or the result of re-using older metal, before the coinage was reformed in AD 348. Presumably the

⁷²¹ Wigg (1991), 120-121; King (1996), 240.

⁷²² Bastien (1980), 67-68. 1/132 to the pound (theoretical weight of 2.46g).

⁷²³ Bastien (1980), 46, 68. 1/192 to the pound (theoretical weight 1.69g).

reform was the result of the failing coinage system in place.⁷²⁴ Certainly the numerous weight reductions, the high quantities of coin (which may have been a result of non-recovery of coin following the reform) and the higher incidence of imitations indicates a system under stress. Whether the contraction of mint suppliers to the study-region is a political or economic consequence of the period is difficult to distinguish, but the second quarter of the fourth century was quite different than the first quarter, during which coin travelled more widely.

7.3 The Late Fourth Century and Beyond

The late fourth century was characterised by civil strife and Germanic invasions, which weakened Rome's grip over the northwest provinces. At the same time, increasing numbers of Germanic people began to reside within the Empire, taking up important Roman administrative and military functions, which contributed to the changing settlement landscape (chapter 3). The shifting political, social, and economic atmosphere of the Empire can be traced through the changeable supply and distribution of Roman coin in the study-region in the later fourth and early fifth century.

Over the course of the early to mid-fourth century, coins were increasingly supplied from closer mints, most notably from the Gallic mints and chiefly Trier (7.2). During the second half of the fourth century notable changes occur. For a brief period between AD 350 and 353, a new mint was added to the repertoire of the Empire's decentralised mints, at Amiens. Wigg has argued that the coins from the mint of Amiens make no impact upon north Gallic circulation.⁷²⁵ However, this may not be entirely correct as Amiens, striking coin for only 3 years, contributed c. 1.8% of the coin-pool for IP 21 (AD 348-364). On the basis of hoards, it is the third most important mint for the entirety of IP 21 (AD 348-360, Table 7.20).

⁷²⁴ King (1993), 26.

⁷²⁵ Amiens is an important mint for Britain, replacing the role of Trier: Wigg (1991), 158.

Mint	IP 21 NH AD 348-364	IP 21 H AD 348-364	IP 22 NH AD 364-378	IP 22 H AD 364-378	IP 23 NH AD 378-388	IP 23 H AD 378-388
Alexandria	0.57	0.20	0.05	0.12	0.08	0
Amiens	1.86	1.81	0	0	0	0
Antioch	0.46	0.04	0.29	8.59	0.69	0
Aquileia	3.23	0.42	10.68	7.10	4.06	10.22
Arles	5.48	1.25	35.65	22.67	27.08	22.04
Constantinople	1.14	0.16	0.18	1.74	0.61	5.38
Cyzicus	0.80	0.02	0.08	0.25	0.84	0
Heraclea	0.46	0.09	0.10	0.25	0.31	0
London	0	0	0.01	0	0	0
Lyons	10.87	2.95	20.53	12.45	27.39	10.22
Milan	0.04	0	0.03	0.87	0.46	11.83
Nicomedia	0.49	0.13	0.09	2.49	0.46	0
Rome	5.25	0.58	8.34	7.47	6.04	6.99
Sirmium	1.14	0.13	0.05	0.87	0	0
Siscia	3.19	0.45	8.08	6.60	1.61	0
Thessalonika	0.87	0.09	0.32	2.37	0.84	5.91
Trier	64.14	91.67	15.50	26.15	29.53	27.42

Table 7.20: Coin finds, by mint, by issue period, by find-type, expressed as percentage, IP 21-23 (AD 348-388)(excluding 'uncertain' mint; NH = non-hoarded; H = hoarded).

Since the comparison being made considers the number of coins struck at a mint for 16 years (i.e. all of IP 21, AD 348-364) to coins struck at Amiens for three years, the numbers need to be normalised. In order to do so, one must make some assumptions which include: an equal yearly production rate and continuous mint activity throughout IP 21 (AD 348-364). Neither of these assumptions need to be true, but can allow one to express the finds as 3/16th and provides an impression of a significantly high output level at the mint of Amiens. This method certainly does not accurately represent other mint production levels, but it does demonstrate a mint's relative contribution over any three-year period to the coin-pool (Table 7.21). In this way, Amiens can be shown to be more significant than at first glance, but a more precise study is

needed to confirm this impression.⁷²⁶ Yet, over the course of a longer period, it cannot be questioned that Amiens was an insignificant mint.

Mint	Non-Hoarded	Hoarded	Average
Alexandria	0.53	0.19	0.36
Amiens	9.19	8.95	9.07
Antioch	0.42	0.04	0.23
Aquileia	2.99	0.39	1.69
Arles	5.07	1.16	3.11
Constantinople	1.06	0.15	0.60
Cyzicus	0.74	0.02	0.38
Heraclea	0.42	0.08	0.25
London	0.00	0.00	0.00
Lyon	10.06	2.73	6.40
Milan	0.04	0.00	0.02
Nicomedia	0.46	0.12	0.29
Rome	4.85	0.54	2.70
Sirmium	1.06	0.12	0.59
Siscia	2.95	0.41	1.68
Thessalonika	0.81	0.08	0.45
Trier	59.35	85.07	72.21

Table 7.21: Coin finds by mint, by find-type, expressed as percentage, for any three-year period of IP 21 (AD 348-364) (excluding 'uncertain' mint).

Furthermore, during the same period as Magnentius' revolt in AD 350-353, Wigg has noted that a coin-circulation division between east and west of the Empire can be noted.⁷²⁷ A division of circulating coin across the Empire has also been demonstrated during the Gallic Empire (6.3) and during the early to mid-fourth century (7.2).⁷²⁸ Following the re-conquest of the west by Constantius II, coin from the east once again arrives and the role of the Italian mints significantly increases. Many of these coins arrived with Constantius II's army, which had moved from the east to the Balkans before moving into Italy in AD 352. From there, his army moved to the northwestern frontier, bringing the

⁷²⁶ Either multiple die-studies or an in-depth analysis of coin-finds with precise dating attribution to AD 350-353 by mint.

⁷²⁷ Wigg (1991), 157-163.

⁷²⁸ More generally: Howgego (1994), 12-16.

new coin from these regions. This too is the case with the transfer of eastern coin coinciding with Julian's activity along the Rhine in AD 356-361.⁷²⁹

During the same period, *c.* AD 350-360, the study-region also experienced another copying 'epidemic'.⁷³⁰ Undoubtedly the suspension of minting at Trier in AD 354 until 364 will have been an important impetus.⁷³¹ Wigg has studied the distribution and significance of these copies and has demonstrated that the incidence of copies corresponds closely with areas which did not suffer greatly from the Germanic raids of AD 351-355 (e.g. south Belgium) as well as the areas where Julian was campaigning in AD 356-361.⁷³² Therefore, the incidence and geographic distribution of copies attests to a continued demand for coin in areas least affected by the Germanic invasions. It also demonstrates the extent to which the civil war between Magnentius and Constantius II affected the region despite their battles taking place further south. Magnentius' army was primarily formed by withdrawing troops from the Rhine garrisons, and the loss of 24,000 men at the battle of Mursa (from a total of 36,000) resulted in a long-term recovery process for the western army. In addition, Constantius II's decision to open a second front against Magnentius, by inviting the Germans to invade the northwest, had long lasting effects as well since both he and his successor (Julian) were forced to undertake actions against the Germanic tribes.⁷³³

The mint of Trier resumed activity under Valentinian in AD 364 but does not appear to have been as influential as earlier in the fourth century (Table 7.20). This is a phenomenon which can be noted across all of Gaul and Germany, since Trier no longer struck as much bronze as before.⁷³⁴ Even making Trier the imperial residence (again) in AD 367 had little effect. There are several possible hypotheses available to explain the changes to minting activity.

⁷²⁹ Wigg (1991), 163-174.

⁷³⁰ King (1996), 240. Wigg dates the copying epidemic to AD 354-360: Wigg (1991), 126-134.

⁷³¹ Kent (1981), 137; Pearce (1951), 3; Wigg (1991), 35-82, 48-49; Gilles (1984), 56.

⁷³² Wigg (1991), 134-138. Contra Aarts who sees the distribution of copies as representative of where the copies were struck, rather than monetisation: Aarts (2000), 228. However, where copies were struck and used could be one and the same place.

⁷³³ Wigg (1991), 19-27.

⁷³⁴ Van Heesch (1998), 160.

Above all, the encroaching Germans and the unstable *limes* would have been two important considerations to reduce the importance of Trier as a minting city. More practically, the creation of the COM mint (*comitatus*), a mint travelling with the emperor which was responsible for precious metal coinage, may have required the transfer of staff from the *monetae publicae* of Trier to COM.⁷³⁵ A probable result of troop movement during this period is the increased contribution from the mints of Aquileia, Rome, and Siscia.⁷³⁶ However, the majority of bronze coins were being shipped from Lyons and especially Arles (Table 7.22).

Mint	Non-Hoarded	Hoarded	Average
Alexandria	0.11	0.33	0.22
Antioch	0.80	0.16	0.48
Aquileia	12.52	10.03	11.28
Arles	26.93	18.91	22.92
Constantinople	0.23	4.11	2.17
Cyzicus	1.03	0.00	0.51
Heraclea	0.17	0.33	0.25
Lyon	14.75	11.84	13.30
Milan	1.89	23.68	12.79
Nicomedia	0.34	0.00	0.17
Ravenna	0.17	0.49	0.33
Rome	8.81	7.24	8.02
Sirmium	0.29	6.74	3.51
Siscia	0.57	0.33	0.45
Thessalonika	0.69	1.32	1.00
Trier	30.70	14.47	22.59

Table 7.22: Coin finds by mint, by find-type, expressed as percentage, IP 24 (AD 388-403) (excluding 'uncertain' mint).

In combination with the aforementioned factors for Trier's diminished contribution, Valentinian's military building and campaigning activities may also have necessitated the development of more secure mints. Thus the mint of Arles expanded from two to three officinae. Consequently, Trier did not produce large quantities of coins, and therefore coin-supply was supplemented

⁷³⁵ Van Heesch (1998), 174.

⁷³⁶ Van Heesch (1998), 173-174. The high quantity of coin from Siscia may not only be a consequence of troop movement as a similar pattern has been noted in Britain and the mint at Siscia seems to have been very active with over thirty different mint-marks: Reece (1987), 66.

by mints in the interior of the Empire. This development continued towards the end of the fourth century.

Another development was the decreasing supply of fresh coin over the course of Rome's diminishing control over the northwest (Fig. 4.8-4.11). This is especially the case for coins struck after IP 22 (AD 364-378) and the same overall pattern has also been noted for Roman Britain by Reece.⁷³⁷ The increase in coin-supply during IP 22 (AD 364-378) could be connected with Valentinian's efforts along the Rhine to once again establish a clear frontier.⁷³⁸ In addition, the coinage of the period underwent more changes. Throughout the early to mid-fourth century lower denominational coinage was provided with a silver surface coating and no more than a few percent (usually around 2-3%), but in AD 364 both the larger and smaller low-value coins had no more than 0.20% silver fineness, making it unreasonable that silver was deliberately added. Rather, for the remainder of the century, low-value coinage was only composed of bronze.⁷³⁹ As silver was no longer required for low-value coinage, it is not inconceivable that immediately after the reform, significantly more quantities of base-metal coin could be struck.⁷⁴⁰ Additionally, the incidence of copying appears to stop at the time of this change, suggesting that there may be a connection between the two. This may also have happened by allowing older coins to continue to be used, rather than demonetising them.

In addition to the decreasing supply of fresh coin, a transition in the metal composition of the coins being supplied also occurs. Bronze coinage was still being struck, supplied, and used, but there is a relative and absolute increase in the presence of precious metal coins. Only coins struck during IP 24 (AD 388-403) form an exception to the declining presence of new bronze coin (Fig. 4.8-4.11).⁷⁴¹ This could be explained by yet another reform of bronze

⁷³⁷ Reece (1995), 183.

⁷³⁸ *Amm. Marc.* 28.2.1-4; Franconi (2014), 95-96; Von Petrikovits (1971), 184-187; Curran (1998), 83-86; Aarts (2000), 70: was this paid in gold or low-value coin?. "Only a blind man could deny that the aes-3 coins minted by Valentinian I were not intended for military purposes": Callu (1980), 105.

⁷³⁹ King (1993), 30-31.

⁷⁴⁰ Only gold finds slightly increase: Table 4.12.

⁷⁴¹ This is also after an apparent break in coin-supply: Lallemand (1983), 83, n.2.

coinage in AD 388, when the size of the coin decreased to coins now known as aes-4. A similar coin-find profile is noted at some British forts, such as at Richborough,⁷⁴² which may demonstrate a possible military connection. After IP 24 (AD 388-403), the quantity of bronze coin struck during the fifth century found in the entirety of the study-region is extremely limited, as from the non-hoarded coin-finds only c. 17% (30 coins) with a certain date attribution were not precious metal coinage. These limited finds may be indicative of a failure to supply bronze coins after c. AD 400,⁷⁴³ but may also be representative of changes to Roman influence in the region as well as changes to the (monetary) economy.

Of particular interest across the study-region is the proportion of high-value coins to low-value coins. The scarcity of the latter makes it difficult for them to have had a monetary value that would be based on their 'typical' face-value as there were not enough available coins to permit such transactional behaviour, if used similarly and equally available throughout the northwest. Availability is a crucial determinant to determine whether base-coins were used in a monetary way. To complicate the matter, it is difficult to judge the circulation duration of low-value coins in the study-region due to the decreasing quantities of coin arriving, thereby similarly replicating the period between the end of the Gallic Empire and the early fourth century (7.1). Graves are one useful context to determine the circulation duration of low-value coins. A grave in Tongeren, dated to the reign of Valentinian III (AD 425-455), had a purse of bronze coins from AD 388-402, demonstrating the continued availability of low-value coinage into the fifth century.⁷⁴⁴ Hoards deposited in c. AD 450 also contain coins from IP 24 (AD 388-403), demonstrating their continued circulation.⁷⁴⁵ In fact, the lack of new bronze coins may have prompted active searches for older bronze, as grave 104 in Oudenburg contained a bronze coin of Valentinian II along with three old bronze coins of

⁷⁴² Reece (1987), 80-88, esp. 82.

⁷⁴³ Van Heesch (1998), 161.

⁷⁴⁴ Van Heesch (1998), 161.

⁷⁴⁵ Van Heesch (1992); Van Heesch (1998), 166.

Trajan and Hadrian.⁷⁴⁶ If it is indeed the case that bronze coin was increasingly sought, at the same time that precious metal coins were supplied in increasing quantities, it is difficult to interpret the role of bronze coins. It must be noted that their (re-)distribution may also be tied to the larger settlements or cities of the Franks such as at Tournai and Cambrai.⁷⁴⁷

Reece interprets high numbers of late Roman low-value coins as an impetus for a monetary economy as they allowed for transactions to be conducted with coin.⁷⁴⁸ If correct, this cannot be the case throughout all the study-region. The increase of coin-finds in the third quarter of the fourth century was not uniform in the study-region. Aarts has noted that since less coin is found in the Dutch river area along the Rhine after AD 348, any bronze coins found here may not have been used in a typical monetary way.⁷⁴⁹ It is possible, as has been noted elsewhere, that bronze may have been used as scrap metal or only saved to be used in the few urban or nucleated settlements which remained.⁷⁵⁰ The distribution of all coin struck during IP 24 (AD 388-403, Fig. 7.6) shows a concentration along the Dutch Rhine although in absolute quantities, coins struck in IP 24 (AD 388-403) found in The Netherlands only account for *c.* 6.7% (224 coins), of which nearly half are precious metal. The distribution of hoarded *aes* coinage struck in IP 24 (AD 388-403) is limited with a particular concentration near Trier and its hinterland (Fig. 7.7). This area also accounts for *c.* 33% of all non-hoarded *aes* coinage struck during IP 24 (AD 388-403, Fig. 7.8), which could indicate the existence or the continuation of a monetary economy with variable prices for goods and services. The extent that economic activity in this area affected the monetary/coin activity elsewhere in the northwest is unclear, but the continued (limited) striking of coin at Trier and the localised distribution of its *aes* coinage could suggest a monetary use which was not the case elsewhere (Fig. 7.9).

⁷⁴⁶ Van Heesch (1998), 161. For this phenomenon: Delmaire (1983), 142-147.

⁷⁴⁷ Van Heesch (1998), 174.

⁷⁴⁸ Reece (1987) cited in: Aarts (2000), 228.

⁷⁴⁹ Moreover, hoards do not suggest a prolonged circulation of older bronze.

⁷⁵⁰ Aarts (2000), 68-74.

A claim for a complete breakdown of the economic system and especially the monetary economy could find support with the overall decreasing quantity of coin and the absence of a full multi-denominational system. However, an interpretation of this nature is somewhat similar to that which equates the non-recovery of hoards with insecurity, such as that seen in the third century (6.3).⁷⁵¹ It fails to acknowledge other contributing factors that may reflect change and transition. In the case of the fourth century, it is necessary to take into account the changing nature of transactions within the economic system. There is no evidence to suggest that regular taxes were collected in bronze from Constantine's time. The *capitatio* was a money tax payable in 'denarii' but after Diocletian's reign it was merged with the *iugatio* and paid in kind.⁷⁵² Soldiers would still receive their *stipendium et donativum* in coin but this payment could possibly have only been "pocket money" with the soldier's main pay consisting of goods in kind with occasional donatives in gold and silver.⁷⁵³ The material evidence implies a transition, over time, of the form precious metals took shifting from coin to object.⁷⁵⁴ During the third century, when (coin) hoarding reaches its height in the study-region, the area of modern France up to the Dutch Rhine and including the German area within the Empire is also a "hotspot" for silver plate finds.⁷⁵⁵ Silver plate finds are nearly exclusive to this area of the Empire in addition to finds of gold and silver jewellery which are found elsewhere in the Empire as well. However, in the fourth century (AD 318-411), the focus of hoarded material shifts from silver to gold in the form of coin and object. The overall areas of deposition move northwards, with the "hotspot" on either side of the Rhine.⁷⁵⁶ In the fifth century, the deposition

⁷⁵¹ Note the relative silence of hoarding activity in the late fourth-early fifth century, a period when "hordes of Vandals, Sueves, and Alans crossed the Rhine, and sweeping over Gaul, created a desolation of which lurid accounts have come down to us": Jones (1973), 184.

⁷⁵² For more: Jones (1957). For taxes in coin and/or in-kind: Duncan-Jones (1990), 187-198; Brunt (1981). For a persuasive critique about taxes in-kind and their increased role/presence: Bowman (1980), 26-29.

⁷⁵³ Jones (1973), 441. Brunt (1950), 69; Guggisberg (2013); Painter (2013).

⁷⁵⁴ This is not to say that precious metal objects were not common in the first two centuries of Rome's presence.

⁷⁵⁵ Hobbs (2006), 85-92.

⁷⁵⁶ Hobbs (2006), 92-94.

“hotspot” continues its northerly move, to Scandinavia, where gold is prevalent but silver is present too.⁷⁵⁷ It is important to note that the change from coined precious metal to object was not uniform in space or time, nor was it unanimous.⁷⁵⁸

Banaji has argued that the size of gold coin hoards could be used to track changes in economic prosperity.⁷⁵⁹ If this were the case, then the late-fourth century increase of precious metal objects in part of the study-region, at a time when Rome’s presence and influence was diminishing, would represent a booming economy or at least, a less even distribution of wealth. Yet, it is difficult to imagine how the abandonment of villae, urban/nucleated settlements, and large areas of the rural landscape would have (further) contributed to a flourishing economy (Chapter 3). What can be said is that the nature of transactions as well as the importance and supply of precious metal changed. Literary texts make reference to the form in which particular donatives or payments were made; levies and payments are generally stated in the form of pounds of silver or a number of solidi (or pounds of gold). They are never expressed as face value of silver coins (e.g. so many denarii).⁷⁶⁰ This behaviour does not demonstrate faith in the monetary system, but places value on the possession of precious metals. An example of this is the recently excavated hoard in Echt-Pey (The Netherlands) which contained 12 solidi, a gold ring, a silver bar, and pieces of undecorated silver vessel(s).⁷⁶¹ The total silver contents of the hoard weighed 168.37 g only deviating 1.4% from half a Roman pound (163.7 g), while the total weight of the gold coins weighed less than 2 *unciae* (2/12 of a Roman pound). However, the gold is likely to have been expressed in terms of the Roman pound by containing a factor of the pound (12 coins).⁷⁶² The additional gold ring may have been used to

⁷⁵⁷ Hobbs (2006), 127-128.

⁷⁵⁸ Hobbs (2006). 120-134.

⁷⁵⁹ Banaji (1996).

⁷⁶⁰ Jones (1973), 440. The SHA also exhibits a similar mind-set by listing coins of particular emperors which ought to be paid: SHA Probus, 4.4-4.6.

⁷⁶¹ Heeren and Roymans (2014); Heeren, *et al.* (2014). This find was not recorded in the database.

⁷⁶² Heeren and Roymans (2014), 20.

compensate for the wear on the older solidi (Valentinian I), and is representative of practices which has precedents historically and geographically.⁷⁶³

The presence of precious metal hoards in 'periphery' / frontier provinces may indicate something about the way different people across the Empire perceived wealth (e.g. estate holdings vs. precious metal objects), although it is inconceivable that precious metal objects were absent in what traditionally have been regarded the richer provinces of the Empire. Therefore, the evidence represents different regard and use (and deposition) of precious metal objects in the Empire. In the case of the northwest, hoards such the one found in Echt-Pey, have been interpreted as evidence for Constantine III's payments to local Germanic peoples to purchase their military support.⁷⁶⁴ At least 18 other gold hoards closing AD 395-412 have been investigated in northwest Europe as part of this wider phenomenon,⁷⁶⁵ and as a concentrated group they may provide strong evidence for a drain of precious metal from the (western) Roman Empire. This in turn also provides a possible contributing explanation for the lack of precious metal hoard finds in western Mediterranean provinces during the same period. If the distribution of gold coins from AD 364 until AD 411 (death of Constantine III) is considered, a clear concentration can be noted along the lower Rhine (Fig. 7.10). The distribution map includes both hoarded and non-hoarded coins from IP 22-25 (AD 364 – post AD 403) but excludes hoarded coins with a closing date prior to AD 388. This was done in order to allow for some normal wastage from circulation and to compensate for the inability to determine the date of loss of single gold finds. In this way the estimated proportion of coins in circulation during this period can be better assessed.⁷⁶⁶ The relative lack of gold finds in the vicinity of Trier may demonstrate that gold was not necessarily representative of areas of monetised

⁷⁶³ Medieval practice distinguishing between 'fresh' and 'old' coin: Goitein (1967), 236-237. A late sixth century papyrus in rural Egypt: P. Oxy. I. 132; Banaji (1996), 43-44, 48.

⁷⁶⁴ Heeren and Roymans (2014), 23.

⁷⁶⁵ Heeren and Roymans (2014), 25-26.

⁷⁶⁶ This reduces the number of hoarded gold coins from 722 to 644.

activity, but rather indicate places where the possession of precious metal was related to prestige and status.⁷⁶⁷ Considered together with the distribution of bronze, there certainly cannot have been the notion of paying and supplying military forces with bronze coin.

Interpreting the changing settlement landscape and numismatic coin-find pattern is particularly difficult as evidence for both provides some contrasts. What is clear is that there was an ever decreasing access to, and supply of coin, due to a transition from multi-denominational coinage system to one of precious metals. Nevertheless, pockets of monetized areas continued to exist with the use of a developed denominational system (e.g. small-change). Other areas co-existed but had more or less given up the practice of using small change. While some of these latter areas continued to be part of the Roman Empire (or at least were conceived as being part of it), their inability to fully partake in the monetary economy may have been a result of changing relations and their inhabitants. Moreover, the concentration of precious metal finds in the early fifth century along the Rhine attests to a continued connection to the Roman (economic) system, but that this integration had significantly changed from that of previous centuries and new forms of monetisation may have been in development foreshadowing a Medieval system of precious metal coinage.

7.4 Conclusions

Aurelian's newly reformed radiates ('aurelianus'), had a minimal impact in the study-region because its supply was limited. In fact, many provinces throughout the Empire rarely received these newly reformed radiates. After Aurelian had reconquered the western half of the Empire few coins were supplied for over a two decades. Injection of coins did occur but at limited times and in limited quantities. They often also comprised of old coins such as those struck by Gallienus and Claudius II. A small injection of 'contemporary' coin occurred in late 270s/early 280s. This was detected by investigating the

⁷⁶⁷ We may also consider the effectiveness of the sacking of Trier in AD 411: Greg. Tur. *Franc.* 2.9; Wightman (1970), 69. It also demonstrates, that around Trier, the state was extremely effective in recuperating gold and silver and offering bronze 'bait': Reece (2003), 142.

quantity and proportion of coin issued by Tacitus, Florianus, Probus, Carus, Numerian, and Carinus by closing period. Coins of these emperors appear to largely have come together. Identification of these problems is important as it highlights the fact that much of the circulating medium in the 270s and 280s must have been the coinage of the former Gallic Empire. Consequently, hoards which have a *terminus post quem* coin dating to IP 16 (AD 260-275), may belong to a significantly later period. Assessing and analysing the phenomenon is further complicated since the contemporary coinage was not supplied in sufficient quantities to allow a thorough mixing of old and new coin.

To compensate for the limited supply and access to old and new coin, significant quantities of poor imitational coins were produced. It was possible to note that imitations of coinage struck between AD 275 and 285 were extremely limited. Consequently, imitations copied what was in circulation and in the case of the northwest this was primarily coinage from the Gallic Empire supplemented by the old radiates of Gallienus and Claudius II. It was possible to note that imitations of Central Empire emperors were more frequently hoarded than those of the Gallic Empire, which may indicate that the two types were perceived differently. The reason for this is difficult to assess since it would have been difficult for anyone to be fooled by any imitation but the quantity of official coinage of the Gallic and Central Empire may have affected their respective imitational hoarding patterns. The distribution of imitations demonstrates that their presence across the study-region was not equal and consequently we may infer that they were not accepted everywhere, such as in southern Germany. Imitations are found in the hinterlands of large urban centres and along the *limes* which suggests that there may have been some sort of semi-official status or at least a (greater) need to use imitations as “emergency coin” in these areas.

Although a recovery process began in early AD 280 (Probus) it was fragile at best and the lack of fresh coin supply continued until the early fourth century. The revolt and formation of the Britannic Empire under Carausius affords the opportunity to once again investigate the movement of coin. Only *c.*

30 coins made their way across the channel and were found sporadically across the study-region showing no inclination to be found only along the coastline. Similarly, few contemporary coins from the Empire have been recorded by the PAS in Britain. Yet, pre-reform coinage of Maximian (AD 286-294) was limited on the continent as well, so it is difficult to assess whether Britain was monetarily isolated from the continent. However, it is possible to say that between Aurelian's reconquest and Diocletian's reform there was a (temporary) monetary disconnection of northwest Europe from the rest of the Empire.

During the early fourth century, old radiates were slowly 'removed' from circulation and, across the Empire, the end of provincial coin circulation in the East appears to coincide with the end of radiate circulation in the west. Following Diocletian's reform in AD 294, coins appear to have moved relatively freely as it is possible to note that far away mints such as Carthage contributed noticeable quantities to the coin-pool. Over time, however, the contribution from a geographically diverse number of mints decreases and contracts to a select few. It is possible that this process, in part, is a reflection of the political circumstances of the Empire. However, certainly important, is each mint's unique activity since mints were moved or temporarily closed. It is therefore most likely that there is a possibility of a monetary division, but it cannot solely have been influenced by the political circumstances. This certainly can be proven by considering coins issued by Constantine between *c.* AD 314 and 324. Both Siscia and Thessalonika fell under Constantine's control early on (*c.* 316), yet neither mint contributed significantly to the coin-pool in the northwest. Changes to the weight of the nummus may have affected the movement of coin across long distances. In addition, Trier increasingly became important to produce significant quantities of coin for the entirety of the study-region reducing the need for coins to arrive to the northwest in significant quantities.

The changes to mint supply in the mid and later fourth century can be clearly noted in two instances. In the first instance, the introduction of minting at Amiens, for a brief period in AD 350-353, suggests that a significant quantity of coin was produced in a short period of time. The second occasion is the

suspension of minting at Trier between AD 354 and 364, which not only caused another copying 'epidemic' but also may have contributed to Trier's diminished minting status following its reopening. This resulted in coin arriving primarily from the other Gallic mints (Lyons and Arles). Overall, the study-region sees a decrease of fresh coin supplied in the second half of the fourth century and it is not impossible that one factor was the reduced status of Trier. Changes to the metal of the fresh coins being supplied also changed, with higher absolute and proportional quantities of precious metal coinage. This in part, may have been a response to the changing needs of an increasingly Germanic population within the Empire. Even when Rome's control over the area was nearly nil, gold coins of Constantine III were supplied with other precious metal coinage and objects, possibly for recruitment purposes. Without a doubt, some areas in the northwest continued to be part of the Roman Empire (or at least were conceived as being part of it) whilst elsewhere precious metals became the primary form taken by coinage, signifying different levels and forms of integration.

8 Date of Issue versus Date of Deposition

In the study and use of material culture coins are unique in that they have the benefit of being well dated. Consequently, coins are often employed to provide a definitive date for an archaeological context. However, the date of a coin cannot be used so simplistically to date a context. The only certainty is where and when the coin was struck (and even this is not always the case). Since this thesis has not been concerned with the dating of archaeological contexts, but rather has used non-hoarded coins to assess coin-supply and circulation, this chapter is dedicated to highlighting some of the problems doing so. It also will demonstrate through some examples the ways non-hoarded coin-finds can be used and the manner that hoards may assist in better utilising the former category. The chapter will conclude by providing examples of the way contextualised coins may act as a control on non-hoarded and hoarded coin-finds as well as providing an assessment of limited use of contextualised coins throughout this thesis.

This thesis divides coin-finds into two categories: hoarded and non-hoarded. Within the definition of non-hoarded, a varying and extensive glossary of terminology exists. In English, terms such as “site-find”, “stray-find”, “single-find”, and “excavated-find” can and have all been used to identify one single coin. To further add confusion, many of the terms are used interchangeably. By grouping these descriptive terms under a single category (non-hoarded), some ambiguity between these coin-finds is created, but a clearer distinction can be made between them and hoarded coins. The exception is that some non-hoarded coins may in fact behave like hoards (e.g. single gold coins), an issue which was highlighted earlier (4.1.2 and 4.2) but care has been taken to highlight gold non-hoarded coin-finds when necessary (c.f. below). As this thesis has not sought to investigate coin-finds on the basis of their exact stratigraphic context, and has instead focused on the overall picture, these individual categories are less significant. Since the majority of the non-hoarded coins used in this thesis do not have a well dated context this is not a serious

detriment. This is not a problem confined to the type of work undertaken here or to the sources used. Schemes which involve metal detectorists, such as the PAS and NUMIS, cannot always record the archaeological context of a coin, as often this has been destroyed, lost or, may never have been recognised. However, the lack of an archaeological context is not only a persistent problem in countries with national recording schemes. In fact, it can be worse elsewhere as coin-finds are dependent on publication. In the case of antiquated literary sources, and even some recently excavated sites, coins may be recorded in the form of a list, with little or no attention to context. The crucial role of a precise context is only now becoming widely recognised.⁷⁶⁸

Coin-finds are often uncritically used. This problem is not restricted to the non-specialist who uses non-hoarded coins to date a site or to make assertions about the extent of monetisation or the 'Romanisation' of a province.⁷⁶⁹ It is a problem current amongst numismatists as well. Many numismatists discuss the amalgamation of all non-hoarded coin-finds, such as those recorded in national schemes, without considering what the patterns actually mean.⁷⁷⁰ Non-hoarded coin-finds cannot and should not be exclusively used to investigate coin-circulation. There are many benefits and uses of these coin-finds but a thorough investigation of coin-circulation cannot be properly undertaken without the inclusion of hoards. The pioneering work by Reece has demonstrated that there is a use for coin-lists from sites.⁷⁷¹ They can be used to compare the coin-find mean of a single site to that of the national mean in order to determine the relative access to coin during any one particular period. Although this approach has had success,⁷⁷² it also has a significant problem. The method of comparing site means to one another or to a national mean is reliant upon the assumption that supply was equal across a single

⁷⁶⁸ Doyen (2011b). See more generally the foundation of the *Journal of Archaeological Numismatics*.

⁷⁶⁹ Esmonde Cleary (1989), 94; Millett (1990), 180; Reece (1988), 6.

⁷⁷⁰ Reece insists that the fluctuating fortune of a city/site cannot be measured through coin-lists: Reece (1988), 45. Further criticism of this assumption: Metcalf (1991).

⁷⁷¹ Reece (1991).

⁷⁷² The foundation of the fort at Reculver in Kent was re-dated by using coin-finds to compare the per mill values of Marcus Aurelius and Commodus with the British Mean: Reece (2005), 106.

province/area, when this need not be the case.⁷⁷³ When comparing sites across the Empire, it can only highlight similarities and differences of individual site histories and access to coin. It would be convenient if the number of coins found by period were an accurate representation of coins in circulation and coin-supply but unfortunately this is not the case. In addition, sites also have the usual problems that precious metal finds are underrepresented whilst forgeries/imitations and demonetised coins are overrepresented. Given the intricacies of coin-circulation, where some fourth century coins circulated for a long period and others for a short, or where older radiates (c. 240s) were re-used and re-supplied in northwest Europe during the late third-century, non-hoarded coin-finds cannot be easily used to make assertions regarding coin-circulation.

8.1 The Use of Hoards

If we are to study non-hoarded coins properly, this must be done with reference to hoards. In this way it is possible to establish a better understanding of the coin-lists from sites or the amalgamated non-hoarded coin-find means in a particular country or Roman province. Without knowing how much old coin is re-supplied or how long a coin stays in circulation, it is not possible to understand properly the coin-find patterns of non-hoarded coins or site assemblages. Moreover, without dated contexts for coins, it is not possible to study the frequency of coin-loss over time. A particular site or region may have many coins from the fourth century, but it is perfectly possible that they only arrived and were lost in the fifth century. Reece summed up this issue using Carthage as an example.⁷⁷⁴

1. A good number of coins **of** the fourth century were lost at Carthage
2. Very few coins were lost **in** the fourth century at Carthage

⁷⁷³ The internal age structure of a hoard may provide information regarding differences of supply to a province/area: Creighton (2014).

⁷⁷⁴ Reece (2003), 149.

These two statements describe two different aspects of the coin-finds from Carthage. The first statement describes the coins which have been recorded from Carthage, while the second quantifies the number of coins found (and therefore lost) in fourth-century contexts. However, the second statement is often undeterminable and consequently the first statement is used to make assertions regarding coin-finds. It would be unfair to point specifically to any individual who has made this error; some numismatists show awareness that coin-finds by issue period are not representative of 'coin-loss', yet (their) figures and tables are still identified as such. Instead, these should be labelled as "coin-find profiles" since "coin-loss" actually denotes something about the nature of the coin-find and more importantly, about coin-circulation. It is this mislabelling which has serious implications about how we use and understand non-hoarded coin-finds. It also often leads one to make interpretations regarding 'coin-loss' when discussing coin-finds by equating the two or showing their distribution on a map without consideration of hoard profiles.

Reece's two statements about the coin-finds from Carthage are useful to inform us about coin presence. However, there is another and crucial piece of evidence that is missing. A third statement should be included that tells us something about the arrival/supply of coins to a site. Attempts to understand this from coin-find lists may make one more conscious of what coin-find profiles of non-hoarded coins can actually do. This is equally applicable to numismatists who are aware that their site-assemblage lists by issue period are not representative of 'coin-loss' but do not show the same awareness for the possibility of a delayed supply/arrival. So, while there is the acknowledgement that non-hoarded coin-finds do not show 'coin-loss', the same attention is not given to the fact that they also do not indicate the period of supply/arrival. A well-known example from the northwest is the arrival of Augustan bronze to Germany under Tiberius by supplying old Augustan bronze from Italy (5.2).⁷⁷⁵

⁷⁷⁵ Tac. *Ann.* 1.8; Tac. *Ann.* 1.36. Much of the bronze may have been provided by withdrawing old bronze from Italy which was not countermarked: Wigg (1999a), 338-340; Wigg (1997), 284.

In general, evidence of this nature cannot rely on non-hoarded coins and can only come from properly contextualised coin-finds or hoards.⁷⁷⁶

Hoard and contextualised coin-finds have their own problems to help determine the date of arrival for a particular group of coins. Data for the latter are sparse and are difficult to use from older literature. Only two large scale and chronologically significant studies of this type have been recently undertaken (8.2). Contextualised coin-finds in particular suffer from the problem of residuality, where coins are found in deposits later than the date of the loss as a consequence of layer disturbance.⁷⁷⁷ The interpretation of the hoards, despite being better studied and published, is not straightforward either. Hoards may have been created by adding coins periodically to form an assemblage, or may even have had a single coin added many years later than the rest, and some hoards may be selective and may not represent fairly what was in circulation. To complicate the matter, some coin-find assemblages may have been incorrectly interpreted as a 'scattered hoard', whilst the opposite is also possible, whereby coin-finds across a large area actually were actually deposited as a hoard but have not been identified as such.⁷⁷⁸ Furthermore, the date of the latest coin is at best a *terminus post quem* and a hoard may well have been deposited considerably later. Fortunately, many of these issues are often apparent when one considers a hoard on an individual basis as well as collectively (see below on Feldstraße hoard from Trier). The biggest issue in using hoards to date the supply, circulation, and 'loss' of non-hoarded coins is that there is a general problem of non-comparability. Hoards tend to be formed of high value coinage (intrinsically or face-value), while non-hoarded coin-finds normally have a bias towards lower denominations.⁷⁷⁹

Nevertheless, without many well documented and contextualised non-hoarded coin-finds, a data-orientated approach using hoards is the best option

⁷⁷⁶ Even a basic table can demonstrate this. For Carthage: Reece (2012).

⁷⁷⁷ Stroobants and Poblome (2015), 80-82; Butcher (2003), esp. 27-31. Other concerns include the extent and methods of an excavation.

⁷⁷⁸ Horsnæs (2010), 34-37; Horsnæs (2013), 43-45.

⁷⁷⁹ However, bronze/billon coins of the fourth century (nummi/folles) are frequently found in hoards and as non-hoarded coin-finds.

available. Moreover, it has the benefit of being able to implement an approach similar to Reece's British Mean, by amalgamating hoards closing in the same period or year. This would then create a "hoard mean" which would provide a rough indication of when a particular group or type of coinage was first supplied and when it stopped circulating. However, it is absolutely vital that the established mean is carefully formed and tested. Hoards from large discrete areas across the Empire cannot be merged together.⁷⁸⁰ This would distort the nuances in the patterns of coin-circulation. As is the case with Richborough and the British Mean, some hoards have the potential to considerably skew the dataset.⁷⁸¹ Richborough has a unique coin-find profile with an unusual peak in the later fourth century, contrary to the British Mean. However, since such a large quantity of coin was found on the site, it can skew the overall profile. The Feldstraße hoard can also have a similar effect, depending on one's interpretation of its closing date (see below).

At the same time, determining what areas are appropriate units for examination is also problematic. It is easy to see differences on opposite sides of the Empire (e.g. East and West, North and South), although both these concerns are occasionally ignored.⁷⁸² Attempting to identify areas within a single (large) country can become complicated. Should one apply a rigid line or a transitional zone when different patterns emerge in a single country? Roman provincial boundaries can be equally problematic as coin-finds and circulation patterns may not follow them and there is the added complexity of which provincial boundaries to apply and when. Should the date of the coins be used or should one follow the *TPQ* of hoards to determine which boundaries to use? An example of this issue are the coin-finds from Toulouse which are left out of consideration from other work of the same Roman province to which they belong, as the coin-finds seem to link the site to the north rather than the south east.⁷⁸³ Currently, as we still do not have a clear and complete understanding of

⁷⁸⁰ Reece identifies why this is the case: Reece (2011), 1-2.

⁷⁸¹ E.g. The Reka Devnia hoard: Mouchmov (1934).

⁷⁸² E.g. Duncan-Jones (1994), 198-199.

⁷⁸³ Reece (2011), 2; Geneviève (2000), 13-22.

coin-circulation, the use of modern countries is a defensible decision since coin-finds are typically published by national institutions. Over time, the question of provincial boundaries and areas defined by coin-circulation may become clearer and more appropriate to use.

Throughout this thesis, examples have been provided that demonstrate the problem of relying on a coin's *issue period* to determine patterns of coin-supply, 'loss', and circulation. These examples include:

5.1: The continued use of Iron Age coins into the first century AD, where it was shown that in some areas they may have continued to be used until the Flavian period, and elsewhere until the middle of the century

5.1: The supply and 'loss' of Republican coins, where it was shown that Republican coins mainly arrived in the context of Drusus' campaigns, despite earlier Roman contact.

5.2: The use of Augustan coins for Tiberian campaigns into *Germania Magna* due to a lack of Tiberian coin-finds outside of the Empire despite continued military activity as well as the deliberate supply of old Augustan bronze under Tiberius.

5.2: The overlapping distribution pattern for coins struck by Caligula and Claudius, where it was shown that the non-hoarded coin-finds of both corresponded very closely due to their preparations to invade Britain. It was also highlighted that as a result of their shared preparations and the lack of hoard evidence, that some coins issued by Caligula may have been supplied and used for the purposes of Claudius' campaign preparations.

5.2: The lack of Republican denarii in hoards closing under Claudius in the study-region was seen as an unusual break from a normal hoarding pattern during a period of no significant denarius debasement, and therefore may have been a consequence of his British campaign, which deliberately selected and supplied Republican silver to the island instead of fresh denarii.

5.2: The periodization of Claudian and other Julio-Claudian imitations, where imitations bearing portraits of pre-Claudian emperors may have belonged to the same period as those imitating Claudian asses and dupondii. The end of the

‘copying epidemic’ appears to coincide with the reopening of Lugdunum and the arrival of Neronian bronze around AD 62/64.

5.3: The localised concentration of provincial coins issued by Nero and the Flavians, which was believed to have been a consequence of troop movement and military campaigning by Domitian across the Rhine. No hoards could substantiate their supply date, but their confined distribution supports the suggestion for arrival as a consequence of a state action rather than coin-drift.

6.1: The effect of Trajan’s reform which caused the majority of Republican denarii to be hoarded or melted down, ending their 100+ year circulation duration.

6.1: The effect of Antoninus Pius’ debasement, which caused Julio-Claudian denarii to be hoarded and largely ended their circulation period.

6.1: Over the course of the second century it was shown that there was a declining number of coin-finds by Antonine emperor, with the lowest coin-finds under Marcus Aurelius and Commodus. An explanation was sought to explain the decreasing presence of ‘fresh’ coin and explanations on the basis of mine and metal access as well as the re-use and re-supply of older coin were favoured.

6.2: Although lacking hoard evidence, it could be fairly reasonably assumed that the presence of coins issued under Pescennius Niger’s in the study-region could only have arrived after his reign.

6.2: The movement of Septimius Severus’ Eastern denarii, where it was demonstrated that they may have arrived in two batches, AD 235 and AD 240, some 30-40 years after their issue date.

6.2: The inability to determine when provincial coins from IP 13 (AD 193-222) were supplied, due to a lack of hoard evidence, although their general distribution along the *limes* may have indicated some connection with the military.

6.2: On the basis of hoards, the early radiates struck during IP 13 (AD 193-222), were not circulating or supplied until sometime during IP 14 (AD 222-238).

6.2: The lack of 'fresh' denarii during the reigns of Caracalla and Elagabalus indicates that both re-used and re-supplied older coins for their military campaigns.

6.2: Subsidy payments were made to Germanic tribes but few contemporary denarii are found in *barbaricum*. If the payments were made in coin, they must have been conducted with old coin.

6.3: As demonstrated through hoards, new bronze coin was decreasingly issued during the third century necessitating the continued use of second-century bronze into the third century.

7.1: Very few coins issued between AD 274 – c. 300 are found in the study-region, indicating that older coins from the Gallic Empire remained in circulation long after it was reconquered. Hoard profiles also indicate that there was a conscious re-supply of old radiates issued during the 240s during this period, to compensate for the lack of newly issued coinage.

7.1: The circulation of radiate imitations was attempted on the basis of hoards and it was noted that primarily radiates of the Gallic emperors and Divo Claudio II were copied. It was also determined that the hoarding patterns of both these groups of imitations was different as imitations of the central Empire emperors were hoarded more than those of the Gallic Empire.

7.2: Despite Diocletian's coinage reform(s), radiates from the third century (and their imitations) continued to circulate into the fourth century. Although it is difficult to determine the exact end date of their circulation, hoards suggest that this may have largely occurred during the first two decades of the fourth century.

7.3: Through a simple presentation of the *per mill* coin-finds profile, it is clear that there was a general decline in newly issued coins found in the study-region (IP 22-25, AD 364- post AD 403). This was explained through the changing political and military situation across the Empire as well as the end to cycles of demonetisation as occurred during the first half of the fourth century.

7.3: The decreasing supply also encouraged active 'recycling' of older coins during the last quarter of the fourth century. Some graves in Belgium show

first- and second-century coins in fourth-century contexts indicating that early coins may have continued to be available as curated objects or were actively sought from abandoned sites.

7.3: It was shown that gold coins issued during IP 22-25 (AD 364- post AD 403) were used to pay Germanic tribes in The Netherlands c. AD 410. This not only shows the longevity of their circulation but also that clusters of coin-finds may have been formed decades after their issue period.

Two selected examples will be used to reiterate and demonstrate some of the pitfalls of relying on non-hoarded coins for understanding coin-supply, circulation, and 'loss'. There are several ways one could interpret the non-hoarded coin-find profile of the study-region during the first two centuries AD (Fig. 8.1 and 8.2). The first and traditional way is to interpret the peaks seen in IP 3 and 7 (27 BC – AD 14 and AD 69-96) representing periods of increased monetisation, particularly as they largely consist of asses and dupondii,⁷⁸⁴ while the low-points in IP 5 and 6 (AD 41-54 and 54-68) indicate economic decline. This interpretation equates coin-finds with 'coin-loss' by issue period and argues that IP 3 and 7 (27 BC – AD 14 and AD 69-96) were periods of high-supply and IP 5 and 6 (AD 41-54 and 54-68) were of low supply. Unfortunately, this approach fails to consider the re-use and re-supply of old coin as well as the longevity of their circulation period. It also immediately associates the façade of a lack of 'fresh' coin in any issue period with economic decline, when the absence of coinage need not imply this at all. In fact, there is a negative correlation during IP 5 and 6 (AD 41-54 and 54-68), which sees an increase in higher denominations supplied, so the total face-value of coin supplied need not have decreased.

IP 6 (AD 54-68) provides an interesting case as Nero reformed the coinage by lowering the silver content in the denarius and slightly decreasing

⁷⁸⁴ The lowest denominations supplied in any considerable quantity.

the weight of the aureus (5.3).⁷⁸⁵ In particular, the production and supply of Nero's gold coinage provides a worthwhile case-study. The non-hoarded coin-find profile demonstrates that an immense number (200) of Neronian aurei found their way to northwest Europe, despite an overall per mill decrease in all coin. The vast majority of these were post-reform and were struck between AD 64-68. Given the brevity of this period, we can assume that either the production of these coins was considerable and/or substantial numbers arrived to the study-region at some point in time (see below). During the Julio-Claudian period, the two other reigns with the highest number of gold coin-finds belong to Augustus and Tiberius. From these two reigns, 52 and 64 gold coins respectively were recorded, highlighting how significant Nero's post-reform gold coin-finds are (Fig. 8.3).

The Neronian aurei in hoards confirm the high incidence of post-reform aurei. Consequently, there is little to say about the pre-reform aurei since their numbers are particularly limited although this may indicate something about supply and/or production patterns too. In creating a hoard profile, the Feldstraße hoard from Trier with 866 Neronian aurei was excluded from analysis as it would otherwise skew the overall hoard profile in northwest Europe.⁷⁸⁶ Gilles states that the hoard accounts for *c.* 10% of all known world-wide gold coins of the period AD 64-167. If included, it would radically change the overall profile as it has been interpreted to have been deposited in AD 167 and remained untouched until a few coins of the third century were added. If this interpretation is correct most Neronian gold would appear to have stopped circulating during IP 11 (ad 161-180). However, the overall composition of the Feldstraße hoard corresponds well with the amalgamated hoard profiles across all of northwest Europe, with Neronian gold comprising approximately 33% (see below).⁷⁸⁷ Therefore, either the closing date of the Feldstraße hoard (AD

⁷⁸⁵ Pliny. *NH.* 33.47. The Neronian silver debasement was not a single episode, but rather a series of several adjustments: Butcher and Ponting (2015), 211-220; Duncan-Jones (1994), 218; Sutherland (1987), 97; Butcher and Ponting (2015), 204-206.

⁷⁸⁶ Mespelare was included but only on the partial basis it has been recorded.

⁷⁸⁷ Gilles (2013).

167) is contrary to all other hoard evidence in the northwest (which also confirms a lack of gold for IP 12, AD 180-192) or the hoard has been incorrectly interpreted.

The hoarding profile of Neronian aurei shows that they were in circulation at least until IP 13 (AD 193-222, Fig. 8.4). This should immediately make one aware that any post-reform aureus may have been lost between AD 64 and AD 222 (or even slightly later) which has serious implications for the non-hoarded coin-find profile of the first and second century. The question regarding their supply cannot be answered as only 44 Neronian aurei have been found in three hoards closing during IP 6 (AD 54-68). The only other period in the first two centuries from which a large number non-hoarded gold coins have been found is IP 7 (AD 69-96). Given the overall low numbers of non-hoarded gold from other issue periods, we can assume that, if gold was circulating in Northwest Europe, the same aurei from the mid to late-first century were re-used (Fig. 8.5).

The hoard profile has several implications for understanding non-hoarded coin-finds. By consulting hoards, it has been possible to demonstrate that the aurei of some emperors circulated longer than those issued by others. This means that some non-hoarded gold coins *may* have been deposited closer in time to their issue date than others. In this particular case, it has been shown that Neronian aurei will have formed a considerable portion of the circulating gold for at least 150 years. The case of the non-hoarded Neronian gold coins also deserves more attention. Gold coins, given their high-value, tend not to be 'lost' or casually deposited. In Britain, where non-hoarded gold coins have been studied in some detail, it was found that military sites and towns form two of the most common known contexts, whilst religious sites do not form a noteworthy proportion of the sites.⁷⁸⁸ It is unlikely that this excludes the possibility that non-hoarded aurei were deposited during some sort of ritual process but it certainly is telling. It is most likely that the non-hoarded aurei were used as stores of wealth which over time were deposited and never

⁷⁸⁸ Bland and Loriot (2010), 53-56.

recovered. However, the situation requires closer investigation as it may provide insights into the use and function of gold coinage as a whole.

An additional benefit of consulting both hoards and non-hoarded coin-finds from a single area is that a comparison between the two can be made and the high incidence of Neronian aurei can be interpreted in different ways. Rather than being specifically selected for deposition/hoarding or suffering from biases from the survival of evidence, the patterns observed reflect historical realities. What the coin-finds demonstrate is that production of Neronian gold was exceptionally high, while during the rest of the second century it appears to have been much lower. Bland has argued, on the basis of die-studies, that a similar level of aurei production continued from the second into the third century despite fewer coin-finds dated to this century.⁷⁸⁹

An economic account can be sought to provide an explanation for these observations. First, the continuation of a similar level of production over the course of two centuries need not necessarily be surprising. During the third century the aureus saw significant reductions in weight and was also debased,⁷⁹⁰ which under normal circumstances should allow for more gold coins to be struck. Since it appears that there was only a maintenance of same level of production, one could interpret this as a consequence of the state failing to recover older gold. Moreover, there was a decline in the supply of new gold from the mines directly, which too will have contributed to the inability to strike more aurei.⁷⁹¹ This would also fit well with the low(er) number of aurei found from the third century in part as the state efficiently recovered these,⁷⁹² and in part as these later aurei were less desirable for hoarding. Therefore, there is a correlation between the debasement of third-century aurei, and the third century hoarding peak of first and second century aurei. A possible reason for the lower production of second century aurei is that the high incidence of Neronian aurei negated the need to produce more and the state may have

⁷⁸⁹ Bland (2013).

⁷⁹⁰ Bland (1996), 67-72; Bland (2013), 275.

⁷⁹¹ For more: Howgego (1992), 7-8.

⁷⁹² A suggestion by Reece to Bland: Bland (2013), 274-275.

decided it inefficient or unnecessary to melt down and restrike aurei for the contemporary emperor.

Earlier it was established that hoards have the ability to indicate when particular coinage was supplied to a region. This, however, can only be the case when certain conditions are met. In the first instance, a sufficiently large sample size is needed. Second, one needs to accept the assumption that hoards represent the currency in place where the hoard was recovered at the date of its latest coin. Third, no significant changes to the coinage can occur during the period under investigation, as this will have an influence on hoarding behaviour (if hoarding behaviour is influenced by economic rationality). If all these conditions are met, then the absence of a particular coinage in hoards may demonstrate their absence in the circulating coin-pool in a specific region. Their sudden appearance, may then also demonstrate their supply/arrival to a region. In the case of the Neronian aurei, it was not possible to trace a 'delayed' arrival. Moreover, in no instances could a 'delayed' arrival of gold (by issue period) be confidently determined (Table 8.1).

Last Issue Period	IP 6 54-69	IP 7 69-96	IP 8 96-117	IP 9 117-138	IP 10 138-161	IP 11 161-180	IP 12 180-192	Total
6 (54-69)	100.0%							100%
7 (69-96)	75.0%	25.0%						100%
8 (96-117)	23.8%	66.7%	9.5%					100%
9 (117-138)	35.7%	35.7%	16.7%	11.9%				100%
10 (138-161)	17.5%	8.8%	29.8%	29.8%	14.0%			100%
11 (161-180)	4.9%	9.9%	12.3%	42.0%	23.5%	7.4%		100%
12 (180-192)	33.3%	0%	16.7%	16.7%	0%	16.7%	16.7%	100%

Table 8.1: Percentage of Gold by Issue Period, by Closing Issue Period, IP 6-12 (AD 54-192)

A similar kind of approach has successfully been undertaken with eastern silver in Britain. Howgego interpreted the absence, followed by the increasing presence of eastern denarii struck between AD 193-196/7 as an indication of the arrival of these coins via some sort of supply mechanism (Fig. 8.6).⁷⁹³ This example reveals that if one were to find one of these denarii in Britain as a non-hoarded coin-find, it will likely only have been 'deposited' some 30 or more

⁷⁹³ Howgego (2002); Howgego (1996).

years after its date of issue. In Roman Germany, the hoarding and supply pattern of the same coinage was radically different, highlighting how different regional variations can be.⁷⁹⁴ In the northwest of Europe, another example can be cited in relation to the supply of Domitianic silver. In the Flavian *canabae legionis* at Nijmegen, it was shown that there was significant fluctuation of the silver coinage by issue date (Fig. 8.7).⁷⁹⁵ Kemmers discussed the coins used in a military context to pay the Tenth Legion Gemina after Domitian's pay rise.⁷⁹⁶ Since there was no increase in the following decades, it was concluded that soldiers could not have (exclusively) been paid in new coin (5.3). Across northwest Europe only one hoard was found to contain and close with Domitianic silver, but with an unknown quantity (Fig. 8.8).⁷⁹⁷ Vespasianic silver, although it has a limited presence in hoards, is not absent (Fig. 8.9). If the two figures presented are interpreted as being representative of coin-arrival/supply, then we may conclude that Flavian silver was slow to arrive during IP 7 (AD 69-96). It also confirms the general observation that donatives and military pay were not always paid (exclusively) in new coin.

The cases presented were chosen for several purposes. First, the cases highlight some of the problems of using non-hoarded coins-finds in isolation from hoards. By doing so, they also provided an opportunity to demonstrate the ability of hoards to reveal nuances in coin-circulation. Second, the chapter and the cases allowed for the demonstration of a little-used method which can be used to determine the arrival of coin. It also identified some of the methodological problems and limitations of using hoards to determine the difference between evidence of absence and absence of evidence. Third, there are few occasions when the number of precious metal non-hoarded coin-finds is sufficient to remove the complication of non-comparability between hoards and non-hoarded coin-finds. IP 6 and 7 (AD 54-68 and 69-96) are unique in that

⁷⁹⁴ Hellings (forthcoming).

⁷⁹⁵ Kemmers (2006), 207.

⁷⁹⁶ Speidel (1992); Duncan-Jones (1994), 87.

⁷⁹⁷ Neerpelt, Belgium: Thirion (1967), no. 217. If it is true that Domitian's coins were differentially hoarded and they were in circulation, one would expect to see more hoards closing during his reign.

large quantities of precious metal coinage are found both within and outside of hoards, allowing for a useful evaluation in the ways that hoards may be used to date non-hoarded coin-finds.

Historically, the two cases are significant as well. Duncan-Jones theorised that new coinage was used for donatives.⁷⁹⁸ The evidence presented for gold and silver coinage struck during IP 6 and 7 (AD 54-68 and 69-96) has shown that old coinage was often re-used for donatives and other purposes. This also often occurred over a lengthy period of time. It has also, perhaps more significantly, been tentatively established that new coinage was not always supplied in this context. Moreover, the pay rise (*stipendium*) during Domitian's reign did not result in a sudden or even gradual increase in new precious coin across the northwestern frontiers. Although a small peak in the *canabae legionis* in Nijmegen could be identified for coins issued by Domitian in AD 90, possibly coinciding with Domitian's suppression of Saturninus' revolt in 89,⁷⁹⁹ hoards across northwest Europe do not demonstrate the same tendency (Fig. 8.10).⁸⁰⁰ This, therefore, confirms that silver supply and/or production was erratic.

For the time-being, hoards are one of our best options for the study of coin-supply and circulation. If one were to rely exclusively on means of non-hoarded coin-find or site-assemblages to consider aspects of monetisation, Romanisation, or coin-circulation, the assertions made would be incomplete and potentially misleading. Likewise, considering hoards exclusively would distort one's understanding of coin-use with an overemphasis on precious metal coinage. If we are to determine what non-hoarded coin-profiles mean, hoards are needed. However, non-hoarded coin-finds are able to help assess whether the observed pattern of hoards (when compatible) is representative of coin-production values, supply, or patterns of deposition. However, these cannot always be distinguished on the basis of a single region. It would require

⁷⁹⁸ Duncan-Jones (1994), 77-84, 176-177.

⁷⁹⁹ Kemmers (2006), 193, 207-210.

⁸⁰⁰ Contra: Duncan-Jones (1994), 87. Duncan-Jones argues that a *congiarium* coincides with his German victory and a hoard cluster.

Empire-wide hoard data to measure further the relative importance of these three factors.⁸⁰¹

8.2 Contextualised Coins

As was previously noted, there is a limited availability of properly contextualised coin-finds. Where these do exist, access is usually cumbersome. Within the study-region, two particular works are useful to act as a control to the evidence gathered from hoards and non-contextualised non-hoarded coin-finds: that of Martin, who considers coins in their archaeological context in Northern Gaul from 150 BC-AD 70, and that of Horsnæs who assesses the Roman coin-finds in Denmark.⁸⁰² Both work on vastly different areas of the study-region and with a different chronological framework. However, both the work in Denmark and northern Gaul can serve as examples of some of the ways in which contextual studies can further refine and nuance the evidence available from hoards and other non-hoarded coin-finds, particularly as archaeologically stratified coin-finds become increasingly available.

The evidence for the circulation and use of Iron Age coinage is particularly difficult to manage as rarely are they hoarded together with Roman coinage. From a total of 41 hoards with Iron Age coinage gathered for this thesis, only five also contained Roman coins. These five largely conform to what one would expect and close at the latest during Tiberius' reign. However, on the basis of general distribution of non-hoarded coins with no contextual archaeology, it appeared that some Iron Age coinage may still have been used in the second half of the first century AD (5.1). Through the study of coins in stratigraphic contexts, Martin was able to demonstrate that Iron Age coins form a minute portion of the coin-finds in Tiberio-Claudian contexts. More specifically, in Tiberian contexts only the sites furthest away from the militarised zone of the Rhine still had majority of Iron Age coinage as part of the coin-finds.⁸⁰³ This certainly refines our understanding of late Iron Age

⁸⁰¹ E.g. The Coin Hoards of the Roman Empire Project.

⁸⁰² Martin (2015); Horsnæs (2010); Horsnæs (2013).

⁸⁰³ Martin (2015), 252-271.

hoards as it adds a layer of complexity. One is now better able to recognise that the *TPQ* of a hoard can mean different things depending on its location; a hoard containing only Iron Age coins may have deposited in different decades if found in the south of northern Gaul or near the Rhine. In addition, the lack of mixed hoards with Iron Age and Roman coinage could give the impression that the transition from non-Roman to Roman coinage was near-immediate. However, through the study of coins in contexts, it is possible to determine that Roman coinage only came to replace Iron Age coinage in a ‘natural’ and gradual manner. Regional variation and chronological differences in this process are also determinable, but cannot be determined through hoards alone.⁸⁰⁴

The work undertaken on coin-finds in Denmark is particularly important. Thus far in the thesis, Denmark has been excluded because of its unusual situation in relation to the rest of the study-region. The country, unlike other parts of the study-region, is unlikely to have ever had direct contact with Rome but that is not to say that contact was non-existent or that Roman imperial influence had no effect in this part of *barbaricum*. Throughout the thesis, explanations were brought forward to explain when particular influxes of coin flowed out to *barbaricum*. Obvious examples include the Augustan campaigns and the subsidy payments to some groups/entities beyond the Rhine (e.g. under Caracalla or Valentinian III). Denmark, however, is slightly different as there is no clear evidence for similar circumstances. Roman textual sources and knowledge about *barbaricum* are limited, especially when concerned with the Danish portion of the study-region, as can be seen from Strabo who wrote that the areas beyond the Elbe along the Ocean are unknown.⁸⁰⁵ Although Augustus’ *Res Gestae* boasts undertaking expeditions in the northern seas, we do not know to what extent this is true or even how far

⁸⁰⁴ Martin (2015), 267.

⁸⁰⁵ Strab. *Geog.* 7.2.4. For summary of the literary sources on the ethnography of the Nordic tribes: Grane (2003).

north they may have gone.⁸⁰⁶ Coin-finds provide a useful proxy to assess the situation.

Few Republican and Julio-Claudian coins have been found, and from the dated contexts, their deposition is likely to have occurred during the late first or early second century. Flavian denarii also appear to belong to the same chronological period. Interestingly, their geographical distribution has the appearance of continuing existing traditions of long distance contact going back to the Bronze and Pre-Roman Iron Ages. But what can be said is that although the Augustan campaigns left a clear numismatic trace in the rest of *barbaricum* this cannot be seen in Denmark with a mere 25 Republican and 30 Julio-Claudian denarii.⁸⁰⁷ Through the study of coins in graves, Horsnæs has been able to date the circulation of second-century denarii (which are the most plentiful denarius type in Denmark) to the Severan period until the mid-fourth century (C1b to C3 = c. AD 200-364).⁸⁰⁸ This kind of dating and assessment of circulation in Danish *barbaricum* cannot come from the hoards but relies on stratigraphic and dated contexts. If reliant upon the hoards alone, it would appear as if they were nearly all deposited during the second century.

Another dated context one can use from Southern Scandinavia is provided by weapon sacrifices which occasionally contain coins. The weapon sacrifice of Illerup is one of the most important finds of this category. Within the excavated moor, three deposits were found, although only Illerup A, the largest, contained coins (198 denarii and a sestertius).⁸⁰⁹ Together with the coins, the deposit consists of weaponry, horse equipment, and warriors' personal gear, which appear to have been deliberately destroyed before they were thrown off a boat. The coins were found among the personal objects, and so it has been interpreted that they must have been carried in purses hanging from belts. This means that the coins, despite having all been deposited during one act, do not form one single hoard, but several smaller hoards/assemblages

⁸⁰⁶ RG. 26.2.4.

⁸⁰⁷ Horsnæs (2010), 121-124, 180.

⁸⁰⁸ Horsnæs (2010), 71.

⁸⁰⁹ Horsnæs (2010), 71. Summary of the excavation: Ilkjær (2000).

and single finds.⁸¹⁰ The latest denarii of the Illerup deposit were struck during the reign of Commodus (IP 12, AD 180-192). This provides a useful *TPQ* for the entire sacrifice but caution is necessary since the dearth of third-century denarii in Denmark, which may have been a consequence of the Severan debasement, may have influenced what was available to deposit. Indeed, through dendrochronological analysis of the oak in the shields found in the deposit, the wood used was felled in the period from AD 164 until “after c. AD 205”.⁸¹¹ This is a marginally later date than the coins would suggest and we must accept the later date as the more accurate *TPQ*, meaning that the sacrifice may have taken place at the earliest in the early third century.

It is difficult to know whether the participants of the sacrificial ritual were locals or from abroad as material from Sweden and the Roman Empire has been found together. It is also unknown whether the military equipment is a result of a nearby battle or simply the possessions of individual men. Most academics interpret the finds as being booty taken from the losers who came from a distance to attack the area near the moor, which would mean that Roman coins only arrived indirectly to Denmark.

Settlements in Denmark are also able to refine the circulation period of Roman denarii in the area. One denarius from Gudme II was part of a hoard which also consisted of gold items such as a finger-ring. The hoard was found in a small pit which was interpreted as one of the holes for roof-bearing posts of a small house. As nine bracteates were found along with the denarius it is clear that second-century Roman coins were available at least until the late fifth or early sixth century. The area north of Gudme II, where the Great Halls of Gudme are located, has also produced dated contexts for Roman denarii. Here too late first- and second-century denarii appear to have been in use and deposited from the late third to early sixth century.⁸¹²

The various contexts in Denmark indicate that the date of the coin is nearly meaningless in determining its deposition date in the region. In nearly

⁸¹⁰ Kromann (1991); Ilkjær (1993); Horsnæs (2010), 71.

⁸¹¹ Horsnæs (2010), 71-72.

⁸¹² Horsnæs (2010), 95-97.

all instances the deposition occurred a few decades to several centuries later than the coin's issue period. What the study of contextualised coin-finds from Denmark does highlight is that a similar undertaking is necessary in other areas of to determine whether similar circumstances are present. The case of Denmark is also able to demonstrate that Roman coins as objects could have an extremely long life which might even exceed the existence of the Roman Empire itself, while the general dearth of Roman coins in Danish contexts before AD 200 suggests a considerable time lag for the arrival of Roman coins in Denmark. The following chapter contains an assessment of the impact the various coin-find categories can have.

9 Coin-Use and Monetary Integration

The expansion of Rome into the northwest brought with it the presence and the (increased) usage of coinage both within and beyond the Empire.⁸¹³ The importance and introduction of a taxation system as a stimulus for the increased use of coinage cannot be overstated.⁸¹⁴ However, one must take care not to take the presence of Roman coins as an automatic indicator of monetization,⁸¹⁵ as the presence and distribution of coins in a rural area within the Empire does not necessarily immediately imply their function as money.⁸¹⁶ However, it is equally necessary to apply the same logic and prevent the immediate interpretation of coin presence in *barbaricum* as non-monetary. It is absolutely essential to remember that coin use “varied place to place and from time to time”.⁸¹⁷

Thus far, this thesis has primarily adopted a ‘top-down’ perspective providing overviews for the development of the settlement landscape and the presence of Roman coinage. Consequently, homogeneity may at times have been overstressed and heterogeneity underplayed. It is important to recognize that the process of cultural interaction between local and ‘Roman’ was not a one-way process. Moreover, local/indigenous/native and Roman are not uniform groups either. The work by Woolf on Roman Gaul has stressed the point well by underscoring regional distinctions, especially between Narbonensis and the north.⁸¹⁸ Likewise, within the study-region under investigation, although a broadly similar trajectory of settlement development can be noted, there were variations in both time and space. A Gallo-Roman temple in one area will have looked different elsewhere, either through its building materials, design, worshipped deity, and/or its exact construction

⁸¹³ In some areas, coin-use was well established already. The function of coins was different as well and could have been limited to diplomatic and prestige object exchange, while elsewhere coins could (also) have served as money. See 9.1 for more.

⁸¹⁴ About the significance of taxes in kind: Duncan-Jones (1990).

⁸¹⁵ Hopkins (1980), 17; Aarts (2000), 2.

⁸¹⁶ Aarts (2000).

⁸¹⁷ Reece (1988), 58.

⁸¹⁸ Woolf (1998).

period. However, in attempting to consider the entirety of the northwest as one heterogeneous unit, some aspects of difference will have been underplayed in favour of highlighting the similarities. AD 68-69 may have been an important year across the study-region but for different reasons. In The Netherlands, the suppression of the Batavian Revolt will have been more important than elsewhere and similarly the Year of the Four Emperors and battles thereof may have been more important in other areas. (e.g. Lucius Verginius Rufus using Upper Rhine legions to suppress Vindex at Besançon). When summarizing the development of the study-region, the year AD 68-69 is important and both events may have had similar consequences, but how and why this year is important, will have been different.

9.1 Coin-Use and the Settlement Landscape

This thesis has presented an overview of settlement landscape and some of the possible ways this influenced lifestyles. It is a fact that any individual of the study-region during the timeframe under investigation will have lived in and will have been in contact with at least one, if not more, of various settlement types presented (Chapter 3). One can therefore begin to imagine, as their developmental trajectories as a settlement category have been provided, how interaction in and around these various settlement types alongside the general development of coin-supply, circulation, and access, will have influenced their use of coinage. The thesis has not attempted to reconstruct the complex and myriad sets of personal and societal relationships based on social structure and hierarchy. Nor has it engaged with all forms of economic or primary production or ways of living. This section will attempt to present briefly some of the ways that coins may have been used at various settlement types and how this will have been influenced by ways of life and economic activity. As has been highlighted before (8.1), contextualised coin-finds are best used and needed for this type of assessment but are, on the whole, difficult to obtain which will limit some of the possible observations which can be made at this time. Figure 9.1 provides a map of all the sites discussed in this chapter.

Although pre-Roman Iron Age gold coins were still struck and used throughout parts of the study-region following Caesar's campaigns, their role and significance considerably decreased over time (5.1 and see below for more).⁸¹⁹ In part, this will have been a consequence of Caesar's successful plundering and campaigning in Gaul,⁸²⁰ whilst limitations on the right to produce gold coinage may also have been imposed.⁸²¹ The spread of silver Iron Age coinage was not equal throughout the study-region either. In some cases, any silver shortage was made up for by Roman denarii. Although it was concluded that the majority of Republican coins arrived in the northwest during the Augustan campaign period (5.1), this underplayed the fact that Republican coins were present in parts of the study-region earlier. The imitation of the traditional Republican style denarii by Gallic mints and the local elite in pre-Augustan Gaul, indicates that contact with Roman coinage must have occurred before. On the basis of stylistic analysis, the first coins imitating Roman style, in the 'Centre-Est' (Burgundy, Champagne, and Franche-Comté), date to c. 150 BC.⁸²² Similarly, the production of potin and Gallic bronze also attests to Mediterranean influences in certain regions of temperate Europe, such as areas with *oppida*.⁸²³ Potin and Gallic bronze were the most common and available Iron Age coinage in the late first century BC and provide evidence for a relatively high degree of monetisation, since their fiduciary nature requires some sort of guarantee and acceptance.⁸²⁴ This explains why it was not equally available everywhere in the study-region (e.g. lack thereof in western Belgium). Of obvious significance in the study-region, is the Iron Age/Roman site at

⁸¹⁹ For more: Martin (2015). It is also possible that the violence of the Caesarean campaigns in northeastern and central Gaul corresponds with the surge of gold coin production and peak in burial of hoards: Roymans and Scheers (2012), 30. Some debased gold coins were still struck until c. 20 BC: Haselgrove (1999).

⁸²⁰ This happens to coincide with regular production of Roman gold coinage.

⁸²¹ Van Heesch (1998), 40; Roymans (1990), 127, 140-144.

⁸²² More generally on this subject: Scheers (1969). Also: Roymans (1990), 124. From excavated finds, Roman coins only arrive c. 100 BC: Martin (2015), 41-45.

⁸²³ Howgego (2013).

⁸²⁴ "[...] potin provides small change and shows that transactions were increasingly reckoned in monetary terms": Wightman (1985), 21. However, some have argued that equated Late Iron Age bronze/potin with Roman bronze is too simple and may have been high in value: Aarts (2000), 111-112.

Titelberg, where large quantities of Iron Age coinage have been found. However, potin coinage was also available at secondary agglomerations and at religious sites.

The site of Titelberg (Lux) was significant in the pre-Roman period, despite being 'relegated' to the status of *vicus* later during the early Roman era (5.1). Not only has a considerable quantity of Iron Age coin been recorded on the site, but it also produced its own coinage such as the ARDA types.⁸²⁵ At Titelberg, Metzler was able to identify four phases of coin-circulation.⁸²⁶ It is clear that over time potin coinage comes to dominate the coin-pool at the site, which may be because Titelberg was on the Rhone-Saone-Moselle commercial axis.⁸²⁷ When the economic importance of Titelberg decreased c. 20 BC, a drop in the number of Celtic coins coincides with increasing numbers of Roman bronze.⁸²⁸ Metzler interprets this as evidence for a smooth transition from late Iron Age to Roman coinage, with similar functions. Even if correct, this is unlikely to be the case everywhere. Of all the Iron Age coinage struck 50-30 BC and recorded in Luxembourg, c. 70% was found in Titelberg. Aarts has been able to further refine this observation and identify some nuances within the distribution of coin-finds. He was able to determine that there is a distinctly higher proportion of gold coinage in the countryside (c. 6%) than within Titelberg (c. 0.3%). He argues that this demonstrates that coins in the countryside are not simply a residual part of coin distribution and circulation.⁸²⁹ However, it is possible that gold was used everywhere but only deposited/buried/lost 'at home' in the countryside, rather than in the 'city' as their absolute numbers are similar. Another important factor may be the changing role of Iron Age gold (and silver), moving from a prestige object gift-exchange sphere in Late Iron Age societies,⁸³⁰ to a monetary one.

⁸²⁵ Aarts (2000), 81. Other *oppida* also produced coinage such as at the Martberg.

⁸²⁶ Metzler (1995), 162; Aarts (2000), 109-110.

⁸²⁷ Metzler (1995), 150.

⁸²⁸ Metzler (1995), 572; Aarts (2000), 111.

⁸²⁹ Aarts (2000), 110-111.

⁸³⁰ For more: Roymans and Scheers (2012), 27-29.

Since bronze coins still form the majority of coinage in the countryside, the finds cannot simply represent two pools of circulation, one monetary and the other non-monetary.⁸³¹ It is possible that gold coinage may have been more important in the countryside than in Titelberg. Roymans recognises different levels in exchange of valuable goods,⁸³² whereby gold may have belonged to another level than potin/bronze coinage. This higher proportion of gold coinage may be associated with the elite, who inhabited the countryside, and may therefore represent a continuation of prestige gift-giving with patron-client relations.⁸³³

The religious site at Empel offers an opportunity to further investigate the use of Iron Age coinage towards the turn of the century. Roymans identified two periods of circulation of Iron Age coinage at Empel: Phase 1 (70–15 BC) and Phase 2 (15 BC – AD 50). The first phase consists only of gold and silver coinage and the second entirely of bronze and potin coinage.⁸³⁴ The site demonstrates a similar progression of Celtic coin production which can be noted elsewhere. Aarts has raised the question whether one should interpret the use of potin/bronze at religious sites in the same way as gold and silver. To him, if the introduction of potin/bronze coin production was a result of the lack of precious metals, then one can assume that the new coinage was struck with the same intended purposes as gold and silver had been in the past. However, he also identifies that tracing this intention is not simple since bronze was added and did not replace the circulation of gold and silver. Therefore, “a new, lower level was introduced in the circulation of precious goods, which had the potential for other uses besides the traditional ones”.⁸³⁵ It is also important to recall that coin-finds are not a feature of all Iron Age sanctuaries, and that coins were not found within all individual temples at a single site (e.g. at the

⁸³¹ Aarts (2000), 111, 113.

⁸³² Roymans (1996), 48.

⁸³³ Aarts (2000), 9, 111, 113.

⁸³⁴ Roymans (1994), 113. 20 (worn) silver and 5 bronze Republican coins were found as well as 8 silver and at least 33 complete and 33 halved bronze Julio-Claudian coins. Most silver coins are worn, indicating a probable later deposition/loss period. For the Roman coins: Rijnen (1994).

⁸³⁵ Aarts (2000), 112.

Martberg).⁸³⁶ At Möhn, Martberg, and Empel, coin deposition continued from the late Iron Age to the Roman period, but thins out during the first century AD, despite continued site use. The architectural development of sanctuaries may have played a role (construction in stone), but changes to ritual could have been equally, if not more, significant (3.4). Since stone architecture may have brought paved surfaces at sanctuaries, coins or other votive objects could not disappear into the ground and will have remained visible. As such, they could be cleared away, redeposited, or reused. Consequently, from the late first/early second century evidence for a new context for coin-deposition has been found in the form of collection boxes.⁸³⁷ The coins placed in these contexts could have been recycled and used to pay for the maintenance of the sanctuary or offerings.⁸³⁸ The implication of this is that it is difficult to discern economic from ritual behaviour, but one may expect that coin-use at religious sites increased as access and supply to coin also intensified.⁸³⁹

The sites covered thus far give the impression that monetisation was well in progress by the turn of the first century BC to first century AD, although coin-presence and production was not equal throughout the study-region. It has been suggested (admittedly without any conclusive evidence), that Iron Age bronze in western Belgium was struck in the Augustan period because the *Nervii* did not strike (or hardly struck) bronze before the permanent installations of troops along the Rhine.⁸⁴⁰ If this is indeed the case, then the striking of Gallic bronze is representative of a pro-active attempt to integrate the local economy into the Roman. Similarly, the establishment of *civitas* capitals and the expansion of the road network may also have encouraged the production of local bronze coinage.⁸⁴¹ Yet, this initiative may also have been

⁸³⁶ Wigg (2005), 366. For other examples: Delestrée (1996), 121-122.

⁸³⁷ One collection box took the form of an altar to Lenus Mars found in the Irminenwingert sanctuary in Trier. On collection boxes from the end of the fifth century BC until the third century AD: Kaminski (1991).

⁸³⁸ Wigg (2005), 378-379.

⁸³⁹ Walker (1988b).

⁸⁴⁰ On the basis of coin-finds in military camps and if *Nervii* bronze coins are contemporary to the well dated *Avaucia* coins. The link between the *Nervii* and *Avaucia* bronze coins is based on weight standards as well: Van Heesch (1998), 52.

⁸⁴¹ Van Heesch (1998), 52.

short-lived with increasing quantities of RIC and RPC coins being supplied to the northwest.⁸⁴² The end of RPC in the western provinces as a whole can be dated to the reign of Claudius and there is debate whether Claudian as imitations are a 'Roman' response and phenomenon or a continuation of local Gallic bronze coin, thereby extending the gradual decline of local Iron Age coin production into the first half of the first century AD, and compensating for the shortage of low-value coinage which increasingly became used.⁸⁴³ Whatever the case, transition from the late-first century BC to the mid-first century AD, saw an increase in the use of coinage as well as a change in how and which coins were used. However, in some areas of the study-region, the transition from Iron Age to Roman coin-use will have been less remarkable than elsewhere.

Given the increased functionality and presence of Iron Age coinage and a simultaneous process of socio-political sophistication/change, as seen through the development of the settlement landscape (3.2, 3.5, 3.8), one could assume the start of the Augustan campaigns would act as a further impetus to these processes throughout the northwest. An unprecedented quantity of coinage was supplied to the study-region towards the end of the first century BC and the early-first century AD, yet its distribution was heavily orientated towards the zones of military occupation. Only when military focus shifted away from the Rhine and *Germania magna* towards other regions, such as Britain in the mid-first century, are coins increasingly found in the southern part of the study-region. In some areas, such as along the Scheldt, this may still have been linked to the military, with the shipment of supplies coming from nearby the coast. Elsewhere, the role of veterans acting as mediators between Roman and indigenous, as well as civilian and military, cannot be overemphasized. Roymans has estimated that c. 60,000 men of indigenous origin, in the Lower Rhine region, would have served at some point in time as an auxiliary soldier during the pre-Flavian period. He goes on to argue that the dense distribution of militaria in rural Batavian contexts is, in part, representative of the intensive

⁸⁴² Haselgrove (1999), 162-164.

⁸⁴³ Pro 'Gallic': Wigg (1999b); Wigg (2005); Pro 'Roman': Martin (2015), 294-312.

recruitment of the Batavians and one could expect a similar level pattern of finds in other areas of substantial ethnic recruitment. These areas include *civitates* Cugernorum and Tungrorum, but the archaeological evidence is not as conclusive (yet).⁸⁴⁴ If this is true for militaria and other cultural commodities/regimes, such as the consumption of wine and *terra sigillata*,⁸⁴⁵ then the spread, presence, and use of coinage throughout the Roman half of the study-region may also follow similar patterns, in other regions which experienced substantial levels of recruitment.

While the spread and use of coinage may have come, in part, with the return/settlement of veterans in parts of the study-region, distinctions within the coin-finds found in the military and civilian zones of the Roman portion of the study-region can be noted. In this thesis it was determined that non-hoarded Claudian sestertii were nearly always associated with sites with a military function or settlements of an urban character near military sites (5.2). Through the study of coins in archaeological contexts, Martin has been able to elaborate on this and noted that sites in the civilian zone furthest away from the military camps, rarely had access to high or multiple denominations, with only low-value coins available, such as the semis and quadrans. Conversely, the sites closer to the military and of a more urban character, had access to more and higher bronze denominations. Martin hypothesizes that this phenomenon could be justified by price differences in both regions, where a large portion of the population in the military zone was non-productive. However, he also recognises that fractional coins are more common along the Rhine than in the interior of Gaul, which suggests otherwise.⁸⁴⁶ The distribution of Claudian imitations presented in this thesis would also suggest otherwise (5.2). Moreover, the injection of quadrantes by Domitian may demonstrate that there was a continued demand for good small change in the military zone.⁸⁴⁷ The

⁸⁴⁴ Roymans (2011), 140, 144; Roymans (2004), 222.

⁸⁴⁵ Roymans (2011).

⁸⁴⁶ Martin (2015), 290-292.

⁸⁴⁷ Kemmers (2006), 215-219.

differences noted can therefore not be easily explained, although differences in supply may provide an explanation.

Coin-finds outside of the Empire in *Germania magna* over the course of four centuries demonstrate a close relationship to military activity. During the first century, only Republican silver and Augustan bronze and silver coins are found in any significant quantity until the Flavian period, when coins are found in quantity once again. The relationship between the coin-finds and military activity can be well observed with Republican non-hoarded coins; the ratio between silver and bronze, inside and outside the Empire is remarkably *similar* (c.f. Fig. 5.14). How coins were used outside the Empire is difficult to determine with limited archaeological contexts available (c.f. 8.2) but, in general, the dearth of low-value bronze coinage indicates that sophisticated monetary transactions cannot have occurred. However, it is not theoretically impossible that precious metal coins were used in a monetary fashion between 'Romans' and locals. Subsequently, once available in *barbaricum*, coins may have taken on a different form and purpose within local society, shifting from money to prestige status objects, regarded highly for their intrinsic and 'exotic' value. The supply/export of Roman coinage in such a fashion need not have occurred as bullion but may have been a by-product of trade in other goods (e.g. slaves, furs, wine, or olive oil). On several occasions throughout the thesis, the Dutch North Sea coast was highlighted as a unique location with regard to coin-finds. Here, a relatively stronger presence of bronze than elsewhere in *barbaricum* was noted (Table 6.3). However, it is difficult to determine the function of coinage in this area due to limited contextual coin-finds. One reason for this, in Groningen and Friesland, is the commercial levelling of terpen during the 19th and 20th centuries.⁸⁴⁸ Yet these sites are a promising area of possible monetary activity. An encouraging site is the terp at Wijnaldum with 87 coins. The relatively high number of 'stray' coin-finds along the coast is also suggestive as it forms approximately half of the coins (absolute numbers). Similarly, sites such as Feddersen Wierde, Westick, and Soest-Ardey have produced quantities (late)

⁸⁴⁸ Galestin (2010), 70-71. Terpen are settlements built on an artificial hill of cultural layers.

bronze coins which Berger has interpreted as possibly fulfilling a monetary function.⁸⁴⁹ Since Frisians may have enlisted in the Roman army as mercenaries, and archaeological material shows some sort of contact (possibly trade?),⁸⁵⁰ it cannot be ruled out that coins may have served a monetary purpose. This is unlikely to have been the case everywhere or at all times, but the use of coins in such a manner cannot be entirely dismissed either.

In the hinterland of the Dutch North Sea coastal area (i.e. in Drenthe and Overijssel), a different pattern of coin-finds emerges, where the preference is orientated towards precious metal coinage, and coin-finds from sites are very rare. Examples of these indigenous secondary agglomerations are Wijster and Colmschate (3.2, 3.5).⁸⁵¹ Similarly, the distribution maps in this thesis demonstrate that less coin has been generally found to the east of the Elbe river. Therefore, it should not be surprising that coin-finds from sites are also minimal. It may be that this is reflective of coin-use and functionality in the north-east of the study-region but one needs to be aware that relatively significant quantities of coins have been found in Poland, negating distance as a decisive factor. The lack of demand/need for coin is likely to have been the determining factor for the general dearth of coin-finds from northeast Germany. This demand was undoubtedly influenced by various factors such as societal structures, total population and density, as well as ways of living and long-distance contact.⁸⁵²

During the second century, the distribution of coin-finds continued to spread further south (Figs. 5.23-5.24; c.f. 6.1, 6.2, 6.8) into the Roman civilian area of the study-region. No high quality silver coins have been found at Voorburg (i.e. at the Julio-Claudian standard of near purity). This has been interpreted as revealing the slow monetisation process Voorburg underwent, as these coins went out of circulation by the end of the Flavian period (6.1). A similar observation has been made at Nijmegen-West (civilian site) where

⁸⁴⁹ Berger (1992), 195-196.

⁸⁵⁰ Van der Vin (2000), 637.

⁸⁵¹ Van Es (1967); Van der Vin and Alföldi (1996), 187-190; Van der Vin (2000).

⁸⁵² Modern reporting and excavation methods are also factors.

imperial denarii from before AD 64 are virtually absent unlike at Valkhof (military site).⁸⁵³ More significant along the Dutch Rhine was the departure of around 6,000 soldiers from Nijmegen around AD 104. It is believed around the same time Nijmegen was renamed to *Ulpia Noviomagus* once it received a city charter. More certain is that Nijmegen received market rights, possibly to compensate for the economic hardship which would have followed the removal of such a large force. Later, in AD 121 or 122, Voorburg followed Nijmegen's example, receiving the status of "forum", a formal status established by the Lex Rubria, which also granted *ius nundinarum*.⁸⁵⁴ Aarts has been able to demonstrate the impact of these events, by comparing the absolute number of coin-finds from Luxembourg to those of Dutch River area. The latter displays a relative downward trend of coin-finds by issue period after the Flavians, whilst the former has a steady increase during the second century.⁸⁵⁵ Although these patterns are relative trends, the downward number of coin-finds by issue period still can confirm the relative importance of the military, regardless of whether the Dutch river area was unusually high in the early-first century or unusually low in the second century. A similarly forceful impact has also been noted outside of the study-region, with the withdrawal of Legio XI from Vindonissa in AD 101, which ended the supply of *aes* to the whole region.⁸⁵⁶

Coin-finds from villae, as important centres of production and luxury, offer a worthwhile investigation although limited by available data. In a preliminary study of coin-finds from villae in Luxembourg, Aarts identified that there is no easy correlation between villa type/size and the number of coins. He was able to note that at villae with larger coin-lists (greater than 20 coins), virtually no coins issued during the Julio-Claudian period were found.⁸⁵⁷ Given the general developmental trajectory of villae throughout the study-region, with most villae only being built in the later first to early second century

⁸⁵³ Buijtendorp (2010), 748.

⁸⁵⁴ Buijtendorp (2010), 241.

⁸⁵⁵ Aarts (2000), 217-218.

⁸⁵⁶ Peter (2001), 91-92.

⁸⁵⁷ Aarts (2000), 83-87.

and a peak of villa construction in the second half of the second century, this is not too surprising. Good quality coins were in the process of being withdrawn (6.1) at the peak developmental period of villae in the area (3.3). In western Belgium, a few exceptions have been noted, and they may exist elsewhere too; some villae and other productive centres (e.g. salt production centres), have noticeable quantities of Iron Age and Augustan coinage with contemporary archaeological material such as *terra sigillata*. Van Heesch interprets this as evidence of monetary and economic activity during the first century, in the light of Roman contact with local (elite) inhabitants.⁸⁵⁸ Elsewhere, in the Meuse-Demer-Scheldt area, few villae have produced significant coin assemblages, although one interesting site is that of Hoogeloon-Kerkakkers (NL), which shows an early peak of coins issued by Augustus, followed by a lull until the Flavian period. Few coins after the end of the second century were found as the villa fell into disuse.⁸⁵⁹

Between the second century and the first half of the third century, a significant decrease in the quantity of coin in western Belgium, by issue period, has been found.⁸⁶⁰ This fits well with the overall profiles established in chapter 4. An interesting excavated site is Riethoven-Heesmortel (NL), a rural village which produced 80 coins.⁸⁶¹ The site produces a slightly later decline of coin by issue period in the second century, but still fits into the general pattern, but also demonstrates that *vici* closer towards the Dutch Rhine show a decline of coins, by issue period, earlier in the second century than those found in Belgium. This may be related to the withdrawal of troops from Nijmegen and demonstrate the magnitude of its impact. Simultaneously, it could also identify possible different points and areas of monetary interaction; *vici* further away from the Rhine will have focused their activity and interaction with other large urban centres, such as Tongeren. Already in the third century, parts of the Dutch

⁸⁵⁸ Van Heesch (1998), 116-118. Although this does not mean a fully monetised economy.

⁸⁵⁹ Aarts (2000), 156-157.

⁸⁶⁰ Van Heesch (1998), 108-109.

⁸⁶¹ Aarts (2000), 149, 158. The site was occupied in the early first century until the second half of the third.

Rhine were inhabited by Germanic populations and the number and denomination of coins recorded gives some indication of the change. Hoards demonstrate that coins do continue to circulate, but it is unknown whether coins continued to be used in the same ways as in the late first to mid-second centuries.⁸⁶²

In Luxembourg, although archaeologists have focused on excavating the large luxurious villae, some general observations can be added to those already made about the second century. Villae produce an irregular pattern of coin-finds, but from the mid-third century, at sites which continue to produce coin-finds, the absolute numbers soar. This is also true at villae with fourth-century coinage.⁸⁶³ This fits the overall pattern of coin-finds in the study-region (chapter 4). It is also a probable consequence of monetary development, with increasingly limited access to gold and silver (6.1-7.3), which was made up for by using large quantities of *aes/radiates*. At the villa in Élouges (Belgium, *civitas Nervii*) clay moulds to create cast denarii of Caracalla or Geta have been found.⁸⁶⁴ The predominant denominations at villae from the *civitates* of the Nervii and Menapii, between AD 69 and 253, were (in order of frequency): sestertii, dupondii, assess, and denarii.⁸⁶⁵ This order of importance is also noted at villae in the Meuse-Demer-Scheldt region and to a lesser degree in Luxembourg.⁸⁶⁶ At *vici* in the *civitates* of the Nervii and Menapii, false silver coins are most commonly attributable to the reign of Caracalla, although these are virtually absent at villae. In addition, during the same period (AD 69 and 253), radiates are rare at villae while common at *vici* (from Gordian III). This contrast may demonstrate the relationship and circulation between different sites in the same region as well as the ways coins were used. However, the continued use of second-century bronze into the third century and the increasing and substantial presence of the radiate (6.2, 6.3), makes it very

⁸⁶² Aarts (2000), 68-70.

⁸⁶³ Aarts (2000), 87.

⁸⁶⁴ Van Heesch (1998), 118.

⁸⁶⁵ Van Heesch (1998), 119.

⁸⁶⁶ Aarts (2000), 125, 193.

difficult to determine the ways coins were used at sites, without any stratigraphic survey.

Without a doubt, the massive flood of official and imitation radiates to the coin-pool throughout the Roman portion of the study-region had a significant impact on the ways and places in which coins were used. It would not be controversial to claim that the general economic development of Roman coinage led to, or appears to have led to, its increased presence throughout the Empire. This is not to say that coins were used as money or that it was always feasible to do so. However, with the debasement of the radiate and concurrent price inflation, large quantities of coin would be required for simple transactions, thereby increasing the chance for casual loss. This does not necessarily mean that more coinage was circulating or that the economy was more monetised, although the impression is that the former is true. What this should denote is that sites with unusually low quantities of coin (regardless of denomination) are of great interest. However, here the debate once again returns to evidence of absence and absence of evidence (8.1).

It has recently been speculated, as an alternative hypothesis, that because of the flood of radiates to the coin-pool and their low purchasing power, that they were of little monetary use and were hoarded for ritual purposes.⁸⁶⁷ Several scholars have interpreted the Frome hoard in England as evidence for ritual activity.⁸⁶⁸ Part of the argument is that, since the ceramic pot for the coins was too weak to allow for the hoard to be recovered without breaking the container, there cannot have been an intention to recover the hoard and use the coins again (i.e. therefore it is ritual). First, this interpretation fails to recognise that it would not be necessary to take the ceramic pot out, or all the coins at once. One could simply take out portions of the hoard if desired. This is dismissed as a possibility by some as they claim the coins could not be

⁸⁶⁷ Walton and Moorhead (forthcoming): “the willingness to deposit such large quantities of coins may indicate that they had little or no monetary value [...] and should be compared with earlier votive deposits of coins”; Walton (forthcoming): “It is possible that, as radiates had little value in the rural marketplace, they were offered to the gods as part of numinous transactions”.

⁸⁶⁸ Moorhead, *et al.* (2010), 36.

recovered without breaking the pot (although there is no reason to suppose that the burier(s) considered the practical aspects of recovering their coins).

Secondly, their argument is that if the hoard was intended for recovery a stronger pot would have been chosen or several smaller containers. This assumes that the hoarder is consciously aware of the weakness of the pot and, more importantly, that there was a large selection of containers to use.⁸⁶⁹

Neither of these assumptions have been addressed, and they are fundamental to the argument. An alternative explanation for the Frome hoard and other large radiate hoards,⁸⁷⁰ which have also been found throughout the northwest of the Empire, is that they were deposited in the ground due to their weak purchasing power, thereby reducing overall levels of monetisation. They may also have been demonetised before or after their deposition explaining their non-recovery, although in the past, many of the large radiate hoards have been interpreted in light of Germanic raids. All these conflicting interpretations demonstrate the difficulty interpreting coin-use at any sites during the mid-third century but highlight an area for future research.

Comparing distribution maps of coin-finds from the third to the fourth-century, it is clear that there is a global reduction in the overall spread of Roman coinage. However, the *castellum* of Liberchies/*Brunehaut* serves as an example of some of the issues in assessing late Roman coin-use. In the first publication (1974) of the site, 259 coins were recorded with 2 coins from AD 388-402 (0.8%). In a new list published in 1990, 52 coins out of 1,081 were recorded for the same period (4.8%).⁸⁷¹ These types of problems with data can especially distort the assessment of coin-use using archaeologically excavated coins only. Although these kinds of problems exist for excavated coins dating to all periods, it appears to be particularly severe for late Roman bronze, which may be related to their high numbers, poor condition (or are unnoticeable), and

⁸⁶⁹ Moorhead, *et al.* (2010), 36.

⁸⁷⁰ E.g. Macon, Belgium; 43,433 radiates: Thirion (1967), no. 176. 25, 936 radiates: Van Heesch (1998), 266-267.

⁸⁷¹ Van Heesch (1998), 161-163. Factors causing this difference may depend on each site but usually include different areas of a site being excavated, coins not being (properly) identified, or simply coins not being recovered.

a lack of interest (cf. 4.3-4.4).⁸⁷² Yet some general observations can be made from the available coin-lists. In western Belgium, most settlement types have a limited number of coin-finds from fourth or fifth century but generally conform to the pattern observed in this thesis, with peaks during IP 20 and 22 (AD 330-348 and 364-378, chapter 4).⁸⁷³ The peaks often coincide with military activity and so fit into a model of civilian-military coin interaction. Further south in the Roman portion of the study-region, significant quantities of fourth-century bronze have been recorded. The area of Luxembourg and the hinterland of Trier produced a high number and concentration of (bronze) coin throughout the fourth century. In fact, all settlement types in the area portray the expected increase of coin-finds from the mid-third and fourth century, attesting a continued monetary economy.⁸⁷⁴

Even though many sites were abandoned during the third century (if not before), others continued such as at the site of Neerharen-Rekem (Bel). The site was a villa on the sandy soils, but abandoned in the mid-third century. However, shortly afterwards, on the same location, a Germanic village developed. The site has a large quantity of coins from the fourth century (98%), but has a significant peak with 80% of the total coins dated to IP 24 (AD 388-402).⁸⁷⁵ Not only is the periodization of the coin-finds important, but the quantity of coins dated to IP 24 (AD 388-402) is remarkable for the area. The urban site of Tongeren only produced 84 coins whilst at Neerharen-Rekem 412 have been found.⁸⁷⁶ Although it must be conceded that a significant quantity of coins issued during IP 20 (AD 330-348) have been found at Tongeren, which may compensate for the differences noted (if these coins were not demonetised), it is possible that the settlement of Neerharen-Rekem was connected to the pocket of monetised activity around nearby Trier in the late fourth century. At the nearby site of Holtum (NL), which shares many

⁸⁷² Walton (2012), 59.

⁸⁷³ Van Heesch (1998), 163-166.

⁸⁷⁴ Aarts (2000), 85-87.

⁸⁷⁵ Stroobants (2013), 78.

⁸⁷⁶ Stroobants (2013), 79.

similarities, Kemmers notes that bronze coins struck in IP 24 (AD 388-402) were often found together with other incomplete or cut pieces of metal objects. She concludes that these late Roman bronze coins were therefore a source of metal rather than currency.⁸⁷⁷ However, since the coin-finds at Neerharen-Rekem may belong to a scattered hoard, their exact function within the site is difficult to define.⁸⁷⁸ Whether Holtum and Neerharen-Rekem are exceptional with their possible continued use of bronze coinage for monetary purposes, or simply fit into one of the pockets of monetised activity, is difficult to determine. It is quite probable that some settlements continued to interact and use coinage, although this may have occurred both in a monetary and non-monetary fashion.

9.2 Monetary and Economic Integration Assessed

Bowman and Wilson writing on coinage and monetisation observed that, “this might appear to be the most straightforward of our diagnostics of integration but the appearance is somewhat deceptive”.⁸⁷⁹ There has long been debate regarding the nature of money and the ancient economy.⁸⁸⁰ It is not the purpose to rehearse this fully here, but rather to assess on the basis of coin-finds and the settlement landscape whether the study-region was monetarily integrated, internally and with the rest of the Empire. The extent to which coined money served as a means of exchange has already been treated elsewhere.⁸⁸¹ One important aspect of monetisation and the monetary economy which has not been treated in this thesis is the role of other forms of money. Credit and credit notes will also have supplemented coinage and increased the volume of available money.⁸⁸² The exclusion of these other forms of money should not be regarded as a denial of their role in the (monetary) Roman economy. There is a limited amount of evidence for credit throughout the Roman world and

⁸⁷⁷ Kemmers (2014).

⁸⁷⁸ Stroobants (2013), 88.

⁸⁷⁹ Bowman and Wilson (2009), 21.

⁸⁸⁰ Aarts (2005), 5.

⁸⁸¹ E.g. Crawford (1970); Howgego (1992); c.f. Aarts (2005), 5-6.

⁸⁸² Harris (2006); Howgego (1992), 27-28; Lo Cascio (2003); Rathbone and Temin (2008); Kay (2008), 107-128.

especially so from the study-region.⁸⁸³ Yet there is no reason to suppose that credit did not play a role at the frontier of the Empire or in the study-region, as the tablets from Vindolana have demonstrated.⁸⁸⁴

One well-studied and relevant epigraphic source from the study-region is the ox sale wax tablet, found outside the Empire in Friesland.⁸⁸⁵ The tablet dates to c. AD 29 and finds further justification for its context, as the people recorded in the transaction have been linked to the legion stationed at Xanten.⁸⁸⁶ The most important aspect of the tablet is that it records the sale of an ox outside the Empire, in a monetised and formal Roman manner. It also demonstrates that the legions along the Rhine could have relied on *some* of their supplies coming from *barbaricum*.

One of the most influential works on the Roman (monetary) economy is the article “Taxes and Trade” by Hopkins.⁸⁸⁷ Among several arguments, Hopkins argues for an integrated monetary economy on the basis of similar chronological distribution of denarii across the Empire. His model also allows for monetary integration to develop as part of a process rather than taking a static view. However, monetisation and regional integration into the Roman monetary economy is placed on the same level as Romanisation, where indigenous societies (unilaterally) adopt the Roman monetary model.⁸⁸⁸ Duncan-Jones’ work provides a useful criticism and reminder, that taxes need not have been paid in coin.⁸⁸⁹ Moreover, he argues that cash payments of taxes only occurred where monetary economies had existed prior to Rome’s conquest (e.g. the cities in the east), which simultaneously refines Hopkins’ monetisation model. Additionally, through analysis of denarii across the Empire, Duncan-

⁸⁸³ For more on credit: Harris (2006); Harris (2008); Andreau (1974); Andreau (1987); Andreau (1999). Andreau records five inscriptions of *argentarii* and *nummularii* in the two Germanic provinces: Andreau (1987), 320.

⁸⁸⁴ Bowman (1994), 77-78.

⁸⁸⁵ Bowman, *et al.* (2009).

⁸⁸⁶ Bowman, *et al.* (2009), 166-167.

⁸⁸⁷ Hopkins (1980).

⁸⁸⁸ Aarts (2005), 7-8.

⁸⁸⁹ Duncan-Jones (1990), 187-198. Even if taxes were not required to be paid with coins, they may still have been necessary as Tacitus indicates that payment of taxes in grain in Britain still required a monetised economy because tax-payers who do not themselves produce grain have to buy it from landowners who do, and who are hoarding it to push the prices up: Tac. Ag. 19.

Jones has also determined that the similarities noted by Hopkins are superficial (as seen through analysis by RIC type).⁸⁹⁰ Duncan-Jones therefore concludes that provincial economies remained isolated and there was limited monetary and economic integration across the entire Empire. Shortly after, Howgego argued that “an economy can be integrated in meaningful ways without achieving full homogeneity of coinage” and was able to provide several supporting cases in his article.⁸⁹¹ However, according to Aarts, like Hopkins “[Duncan-Jones] focuses on the function of money in commercial exchange, with little consideration of other types of use”. Aarts continues, lamenting that since Duncan-Jones’ work, most academics have focused on quantification.⁸⁹² He concludes hoping that a more cultural-economic perspective is applied to coin assemblages rather than a purely economic one.⁸⁹³ A similar, more recent call, has also been made by Kemmers and Myrberg.⁸⁹⁴

This thesis has tried to address some of the non-economic concerns, but there are several reasons why they cannot all be addressed. First, a cultural-economic approach would rely a great deal on a detailed analysis of contextualised coin-find data. Given the recent explosion of data available and its poor dissemination, it is difficult to attempt such an approach on a supra-regional level.⁸⁹⁵ Even on a smaller regional level, considerable difficulty exists (8.2). Second, with new data, it is always worthwhile to revisit some of the ‘older’ issues in order to evaluate whether conclusions still hold true. Third, if one wishes to compare stratified coin-finds from various areas of the Empire, a regional overview must be known as well. One cannot hope to determine cultural or social differentiation properly without knowing whether a site or assemblage fits the norm or otherwise. Despite these difficulties, this thesis has tried to address some of these aspects from a cultural-economic perspective, such as the non-monetary use of coins as well as possible variations in coin-use

⁸⁹⁰ Duncan-Jones (1990), 38-42.

⁸⁹¹ Howgego (1994), 11.

⁸⁹² Aarts (2005), 9.

⁸⁹³ Aarts (2005), 27.

⁸⁹⁴ Kemmers and Myrberg (2011).

⁸⁹⁵ Haselgrove (2005b), 31-32.

in particular regions within the study-region. Further, since a contextualised approach adds a significant dimension, a compromise using smaller case-studies has been attempted here (9.1).

The calls made by Aarts and by Kemmers and Myrberg ought to be acknowledged as many of their concerns are valid and may further provide nuances to the economic approach many have taken without consideration of ‘cultural-economic’ aspects. Howgego has already attempted to answer their calls, but in different terms. In addition, Howgego argues that,

“monetisation also needs a higher level treatment embracing the Iron Age and Roman periods as a whole and geographically both the East and West of Temperate Europe. In this way some major structures and developments become apparent, and it is possible to think about them”.⁸⁹⁶

It is hoped that this thesis provides some of the necessary work that Howgego argues for. The primary purpose of this thesis has been to investigate the concordance or dissonance of coin-finds in order to determine a broad scale of monetary integration. The thesis also aimed at providing a supra-regional overview on a scale not previously attempted, but it has not been the intention to assess the various forms of connectivity, nor all of functions of coinage. The concept of monetary integration of this thesis is therefore intended not to exclude non-monetary uses of coin although it is primarily concerned with coinage fulfilling a ‘typical’ monetary function.

Within the *barbaricum* portion of the study-region, the Dutch North Sea coast appears to have been an area monetarily and economically integrated with the Roman Empire (at least to a limited extent). The flow of goods and the coin-finds certainly indicates this to be a promising area for further research (9.1). It is plausible that other areas (just) beyond the *limes* experienced a similar extent of integration, which will have been dependent on the availability and development of the transportation infrastructure (3.7) and the settlement landscape. Promising areas are to the west of Mainz/Frankfurt as well as along

⁸⁹⁶ Howgego (2013), 4-5.

the Main and Lippe rivers but it was not possible to analyse these areas closely here.

One unquestionably important factor, which has been highlighted frequently, is the Roman army and Roman military campaigns/events. The army provided security and an impetus for economic development. Soldiers were also an important source of coinage (paid out via the state), and provided a continued large demand for goods and products. Franconi, however, has written that the Roman military

“did not dictate the formation of the regional economy beyond the initial phases of conquest and settlement in the region. As the population of the region grew, so too did the influence of the civilian population. As local food production took off and cities grew, the state did not have to organize supply lines to the region, as merchants were already doing it for them. The spending power of the army and the wealthy citizens of the region ensured the continued importation of goods as they became part of the daily lives of those living along the Rhine. The role of the military in the economy of the Rhine frontier can, therefore, best be described as one of maintenance: spending money, repairing roads, and keeping the peace. Each of these roles helped lower transaction costs, thereby making economic development more efficient and sustainable. This is not an insignificant role and this re-fashioning of interpretation is not meant to suggest that the military was not a vital part of frontier economies. Instead, it is meant to shift the emphasis on the military from a role of prime agent to part of a wider system”.⁸⁹⁷

Although there are some gaps in the available evidence, coin-finds may further refine this picture. The majority of coin-finds are situated very neatly along the northwest *limes* throughout the Roman period. If the role assigned to the military by Franconi is correct (and there is no reason to question this), then the distribution may reveal a less monetised civilian area compared to the *limes* area. However, it is difficult to judge satisfactorily to what extent the civilian zone of the study-region was monetised as the coin-finds gathered provide a conflicting picture. The presence of vast quantities of low denominational coinage in the Roman part of the study-region gives the impression that a monetised economy was certainly possible by the mid-first century AD

⁸⁹⁷ Franconi (2014), 228.

(Chapter 5 and 9.1). Some areas south of the *limes* had significant amounts of coin (e.g. the vicinity of Trier), while elsewhere this was less so. The distribution of coinage, moreover, is also limited to particular areas where contact between the military and civilian populations could be expected (5.2). If generalised, sufficient quantities have been found throughout the Roman portion of the study-region by the mid-first century to make a case for routine monetised transactions. Paradoxically, virtually no high-value non-hoarded coins are found in the hinterland of the *limes* until the Flavian period (with the exception of those issued by Augustus and Nero). In addition, the number of hoards (by closing IP) remains relatively limited until the early to mid-second century. This may suggest, given the circulation duration of high-value coins (5.1, 5.3, 6.1, 8.1) that until at least the end of the first century AD, the hinterland was still undergoing development, explaining the overall lack of (large) stores of wealth in the form of precious metal coinage.

During the second century, as the settlement landscape developed and became increasingly populated, coin-finds by issue period are progressively distributed over a larger area of the study-region within the Empire (Chapter 6). This fits well, not only with the general settlement landscape, but also with the region's general economic development.⁸⁹⁸ In this sense, Franconi's description of the Rhine frontier army as an important agent of a wider system is correct. A similar process of 'coin-trickling' has been noted in Roman Britain: military sites have above-average early coinage, which was generally concentrated at military sites and *civitas* capitals. The expansion of coin-use then spread to 'towns', to 'villae', and then 'rural sites'. Temples are associated with later coins, while villae are associated to the mid-to-late coin cluster phase.⁸⁹⁹ Although both Roman Britain and the study-region share some similarities with the expansion of coin presence, some noticeable differences can be detected. The decline of villae and coins at villae during the third century is not seen in Britain. Likewise, the Late Roman phase of coin presence at 'rural sites' in Britain is not

⁸⁹⁸ Franconi (2014).

⁸⁹⁹ Lockyear (2000). Also see: Howgego (2013), 23-29.

duplicated in the study-region (on the whole). The presence of coin in Roman Britain appears to have been less interrupted, while in (parts of) the study-region this is not the case.

If one accepts that the army was an important agent in a wider system, it does not adequately explain why coin-finds, if representative of monetisation and a monetary economy, continue to dominate the *limes* area and remain, by contrast, less prevalent in the ever economically more developed civilian area. To some extent the pattern may reflect the emphasis by German archaeologists on investigating military sites. However, in The Netherlands a similar pattern can also be observed despite the considerable difficulties of discovery resulting from sedimentation along the Dutch Rhine. The distribution of hoards and all unique find-spots of the study-region also do not suggest any overt bias along the *limes*. The pattern is further problematic as the number of troops stationed along the Rhine decreased throughout the second century (9.1).⁹⁰⁰ An explanation for this paradox could simply be that the most economically developed area was the riverine (Rhine) basin. Yet, it is also plausible that the available transportation infrastructure may have been a highly decisive factor, creating and perpetuating a harmonious cycle of economic development in the same areas. The finds along the *Via Belgica* provide a case for this.

The settlement landscape chapter also revealed an important developmental process (3.5). Over the course of four centuries (first to fourth century), the indigenous single-standing farm unit increased in size and became more durable, which allowed for longer occupational periods. The regional variations of indigenous farm 'settlement' types throughout the study-region can provide some indications of the way local and supra-regional economies functioned. Geography undoubtedly was a decisive element. The Dutch North Sea coast was inhabited in a similar way as the Belgian and Dutch coastline within the Empire. The ox-sale wax tablet together with coin-finds also indicates a monetary and economic connection to the Empire. Elsewhere in *barbaricum*, it is known that subsidy payments were made by Roman emperors

⁹⁰⁰ Franconi (2014), Fig. 3.16, 3.17, 3.21.

and this too indicates some kind of monetary integration. It may not be a coincidence that subsidy payments occurred at a time in *barbaricum* that indigenous farms and secondary agglomerations enlarged in size. Moreover, some have postulated that cross-frontier trade increased (in part) as a consequence of increased access to coin (6.1).⁹⁰¹ These developments all show that despite the original reason for supply of coins to *barbaricum* being diplomatic in nature, there was a harmonious development which benefited all parties; the Roman state was able to collect import duties, inhabitants could acquire different and more goods, and local Germanic leaders could further distinguish themselves within their own area and amongst other Germanic groupings, through the recycling of Roman coin and goods as prestige objects.

The events of the third century brought (some) disruption to these developments. Although settlement sizes in *barbaricum* continued to increase, considerable disruption can be seen within the Empire. Judging the extent of this disruption to the monetary economy in the study-region is particularly difficult. The evidence that is available, such as the debasement to coinage, along with political and military upheaval, provide a grim impression.⁹⁰² This is compounded by the difficulty of interpreting the meaning and purpose behind the many and large third-century radiate hoards (6.3, 7.1, 9.1). Yet, the region showed some recovery, although this did not last for the entire fourth century. Coin-finds show that the study-region was well-connected to other (distant) parts of the Empire in the early fourth century (7.1). However, already by the mid-fourth century, coins do not appear to have travelled long distances, giving the impression of a more disconnected Empire (7.2). The renewed troubles from within and beyond the Empire will undoubtedly have contributed to the decline in coin standards, as the low-denomination coinage was reduced in weight several times. The loss of parts of the Empire during this period (and earlier) will also have weakened Rome's control over the study-region, as well as the general monetary economy.

⁹⁰¹ Wolters (1986), 85-86.

⁹⁰² Franconi (2014), 28, n. 154

In the late-fourth and early-fifth century, Trier and its hinterland continue to produce low-value coin-finds, suggesting that despite the troubles in the northwest, pockets of monetised areas persisted. This is further supported by the fact that low-value coins were still needed, as graves attest to active searches for older bronze and the relatively long circulation duration for IP 24 (AD 388-402) *aes* coinage (7.3). However, even areas which were no longer under Roman control, such as the Dutch Rhine, were still monetarily integrated with the Empire. It is not clear whether coins in these area fulfilled a 'typical' monetary purpose, but some Late-Roman gold may have served as such, at least originally, because some of it was supplied by the Roman state as payment for military service. The areas where a reasonable quantity of coinage issued in the late-fourth and early-fifth century have been found could also demonstrate monetary and economic integration and connectivity with one-another. The distribution of *aes* is relatively limited, with Trier and its hinterland particularly populated with low-value coinage, with reasonable quantities around Mainz/Frankfurt and Cologne (Fig. 7.10). It cannot be ruled out that the movement of coin from one area to another may have accompanied other goods and, if correct, this would lend support to the idea of continued cross-frontier trade in the later Roman period as well as continued monetary integration south of the Rhine.

9.3 Epilogue

It still remains to be seen whether the study-region shares similarities with other parts of the Empire (and beyond). The initial comparisons made throughout the thesis highlight some similarities and some noticeable differences between the study-region and Britain. Whether one would obtain similar results with other parts of the Empire remains to be investigated. Howgego has already noted that monetisation of Temperate Europe was implicit in the creation of Roman provincial culture and participation in Rome's Cultural Revolution.⁹⁰³ Consequently, it may be the case that all areas of the

⁹⁰³ Howgego (2013).

Empire shared some similar aspects to their Roman monetary histories, but each with their own unique regional response and outcome. Some regional differences across the Empire are obvious. First, the volume and items traded across the *limes* of the study-region can be compared to other frontiers (notably the east). The Muziris papyrus and Pliny's concern about the eastern trade deficit, *minimaque computatione miliens centena milia sestertium annis*,⁹⁰⁴ provide an indication of the scale of this trade in the East. It is difficult to determine the scale of trade across the frontier in the West owing to a lack of documentary evidence. However, the settlement and coin-find patterns in *barbaricum* presented in this thesis can provide some indication of where trade 'centres' may have been situated. More importantly, some of the coin-find clusters in *Germania magna* certainly allow for the possibility of monetised trade and activity to have occurred across the frontier, and also indicate that it cannot have been at an equally extravagant scale as trade across the Eastern frontier.

A second regional difference within the Empire will be the relationship and connections between civilian and military settlements. The study-region may have more parallels further along the Danube than in other parts of the Empire (e.g. Britain). In Moesia and Thrace, a similar process of 'coin-trickling' has been noted (c.f. 9.2), with Claudian *aes* coinage being the first to reach non-military sites. These sites are also the earliest centres in the region and had close connections with military sites.⁹⁰⁵ However, Roman coinage only became abundant at the start of Trajan's reign, as a result of his military attention to the area and the subsequent urbanisation of Thrace.⁹⁰⁶ Dacia was also part of this process and saw a doubling of coin-finds by IP from the start of Trajan's reign until the 160s.⁹⁰⁷ Carnuntum (Austria, Pannonia Superior) also exhibits a

⁹⁰⁴ The Muziris papyrus: Rathbone (2000); Casson (1989). Pliny. *NH* 12.41.84. Even if Pliny is incorrect, this gives an insight into the perceived values involved (i.e. 100 Million sesterces per annum); The debate whether this formed a large part of the Empire GDP is considerable. For more: Rathbone (2000); Hopkins (2002); Temin (2007).

⁹⁰⁵ Paunov (2013), 410.

⁹⁰⁶ Paunov (2013), 413-414. A study of coin-finds from Moesia Inferior AD 100-300 is currently in progress by Ivan Bonchev.

⁹⁰⁷ Gazdac (2010), 100.

similar tendency of coin-finds by IP.⁹⁰⁸ Yet unique regional responses can also be noted, such as the incidence of RPC. Roman Provincial Coins fulfilled a similar function as imperial bronze in the west and demonstrate some regional differences between the Danubian and Rhine *limes*. Overall, an increase in civic bronze is matched by a decline of imperial bronze in the early to mid-third century, which does not occur in the west. Moreover, in Dacia there is a doubling of coin-finds by IP in the early third century, which can be explained by the development of urban life.⁹⁰⁹ These processes are reminiscent of the early Augustan period in the study-region and demonstrates some of the similar, yet uniquely regionalised monetary histories throughout the Roman Empire.

A third difference across the Empire will be the extent of monetary integration. This thesis has demonstrated that even within the study-region, various areas experienced different degrees of monetary integration with each other and in relation to the Empire as a whole. There are also significant variations of this integration and meaningful differences can be observed in time, content, and scale. While the approach this thesis has utilised (c.f. 9.0) may have prevented the identification of nuances and some smaller regional variations, key differences and patterns have been recognised. Within the study-region, the most significant factor affecting a particular area's monetary integration was the distance from the *limes*, size of garrison in the area, and military events/campaigns. Other important factors include the transportation infrastructure, which influenced the settlement landscape and vice-versa. Although there may be a slight bias in the archaeological record, the *limes* area (or riverine (Rhine) basin) does appear to have been a highly economically developed area, which created and perpetuated a cycle of economic development in the same areas. Few exceptions to this cycle are known, such as Trier and its villa hinterland. This beneficial cycle did suffer at times of unrest but had its own unique regional response, such as the formation of the Gallic Empire and the use of subsidies to relieve external pressure.

⁹⁰⁸ Hahn (1976), 24.

⁹⁰⁹ Gazdac (2010), 101.

During the first two centuries AD, coin-finds and circulation patterns show that the study-region was integrated and connected to the Empire-wide coinage and economic system. The increasing troubles within and beyond the Empire alongside the instability of the coinage in the mid and late third century caused significant monetary disintegration of the study-region from the rest of the Empire. The beginning of the fourth century showed signs of recovery and re-integration within the Empire-wide system, although this too began to weaken towards the last third of the fourth century, with only pockets of monetary and economically integrated areas continuing to exist.

This thesis has identified that these archaeological and historical factors must be considered together with the coin-finds in order to determine the monetary integration of any region in relation to each other as well as to the Empire. By doing so, it was possible to identify a co-dependent relationship between the military and civilian spheres. Further away, to the south of the *limes*, regions were still reliant on the army defending the Roman border, but were able to develop more independently from the army. It is also hoped that this thesis has demonstrated the importance of approaching the Empire together with neighbouring regions beyond (*barbaricum*) when attempting to develop a model of monetary and economic integration. At particular points in time areas immediately beyond the Empire,⁹¹⁰ or even some further away, could exhibit remarkable similarities in terms of coin-finds to those within. It is clear that some areas were more integrated with the Empire than others and their impact on the Roman monetary economy should not be ignored.

⁹¹⁰ Hobbs (2006), 92-94.

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FIGURES



Figure 1.1: The study-region.

- 1 = Belgium
- 2 = Denmark
- 3 = Germany
- 4 = Luxembourg
- 5 = The Netherlands

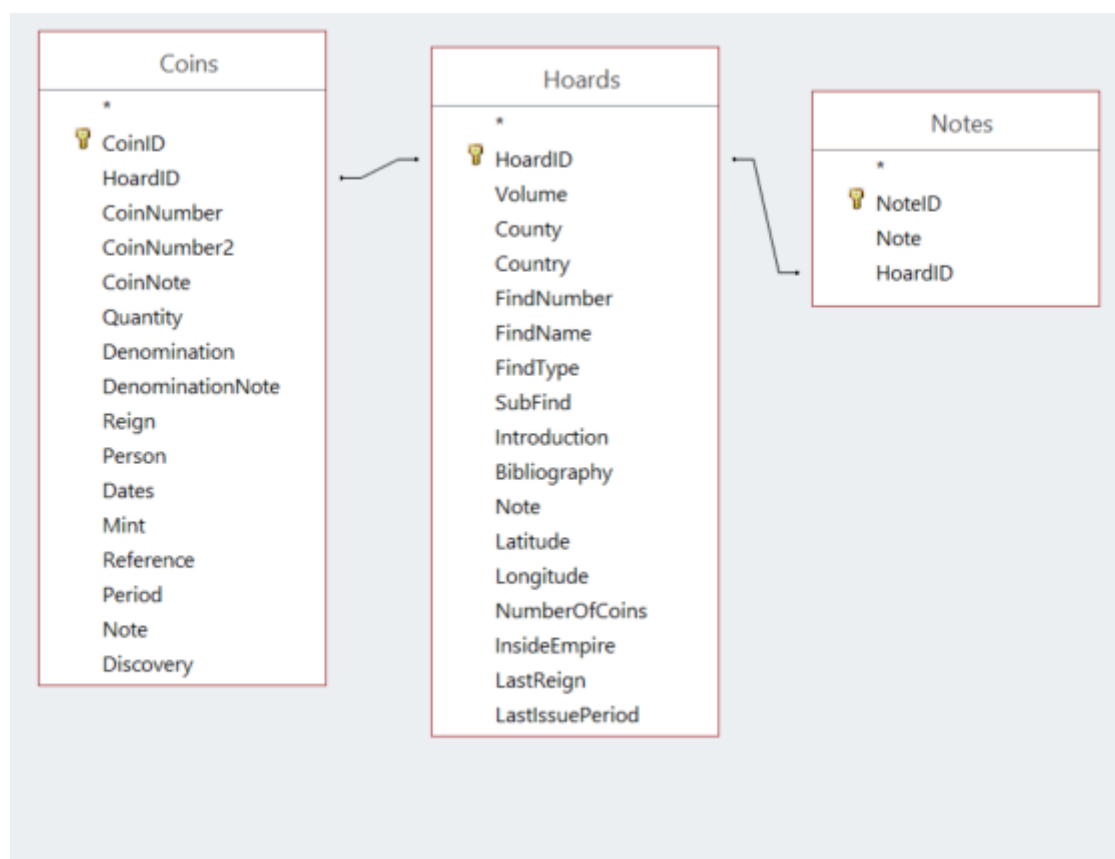


Figure 2.1: The database.

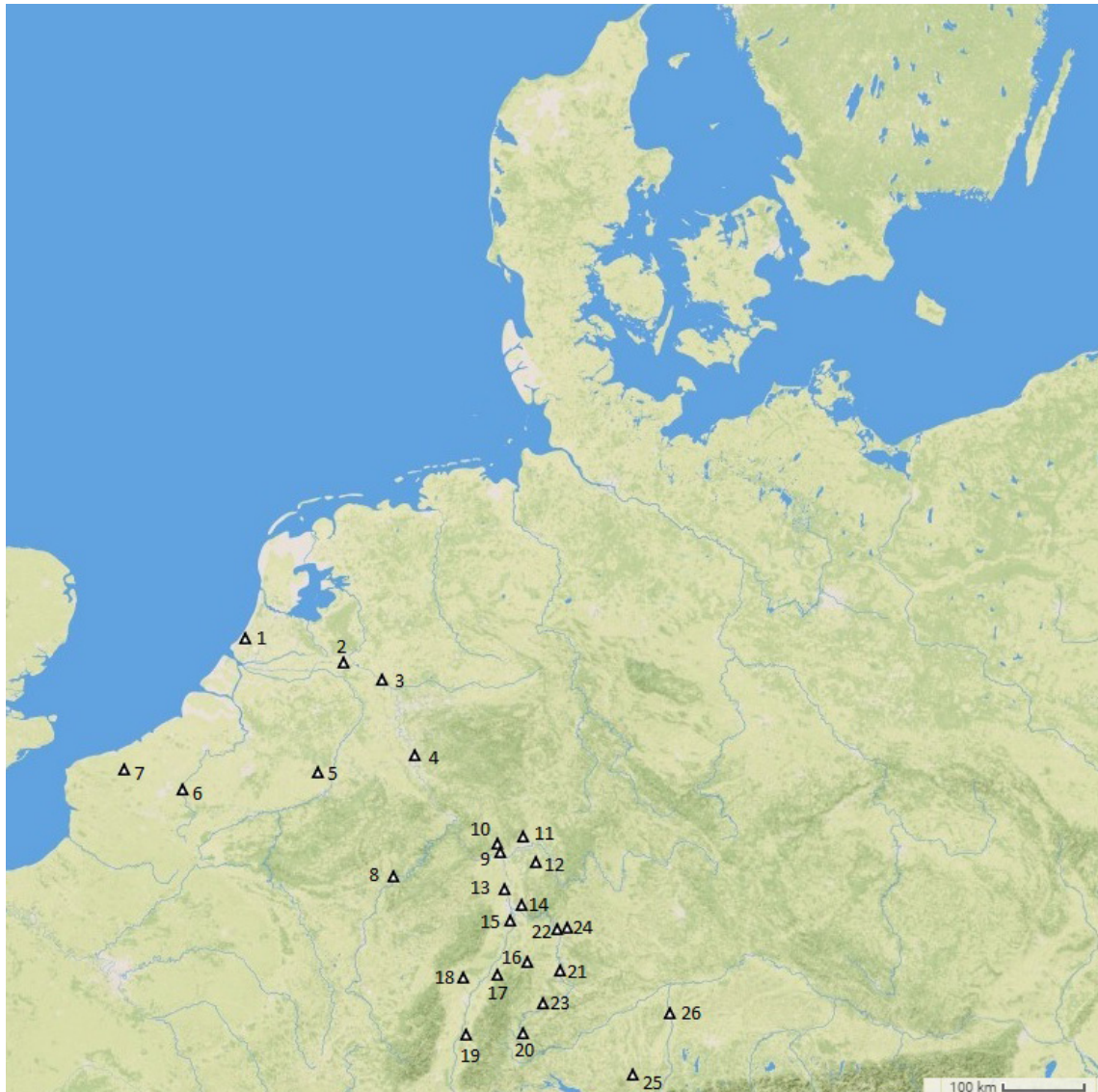


Figure 3.1: Spatial distribution of civitas capitals within the study-region (Data: Appendix 1).

1 = Voorburg	14 = Ladenburg
2 = Nijmegen	15 = Speyer
3 = Xanten	16 = Pforzheim
4 = Cologne	17 = Baden Baden
5 = Tongeren	18 = Brumath
6 = Tournai	19 = Riegel
7 = Cassel (Fr.)	20 = Rottweil
8 = Trier	21 = Badd Cannstatt
9 = Mainz	22 = Bad Wimpfen
10 = Wiesbaden	23 = Rottenburg
11 = Hedderheim	24 = Neuenstadt am Kochen
12 = Dieburg	25 = Kempten
13 = Worms	26 = Augsburg

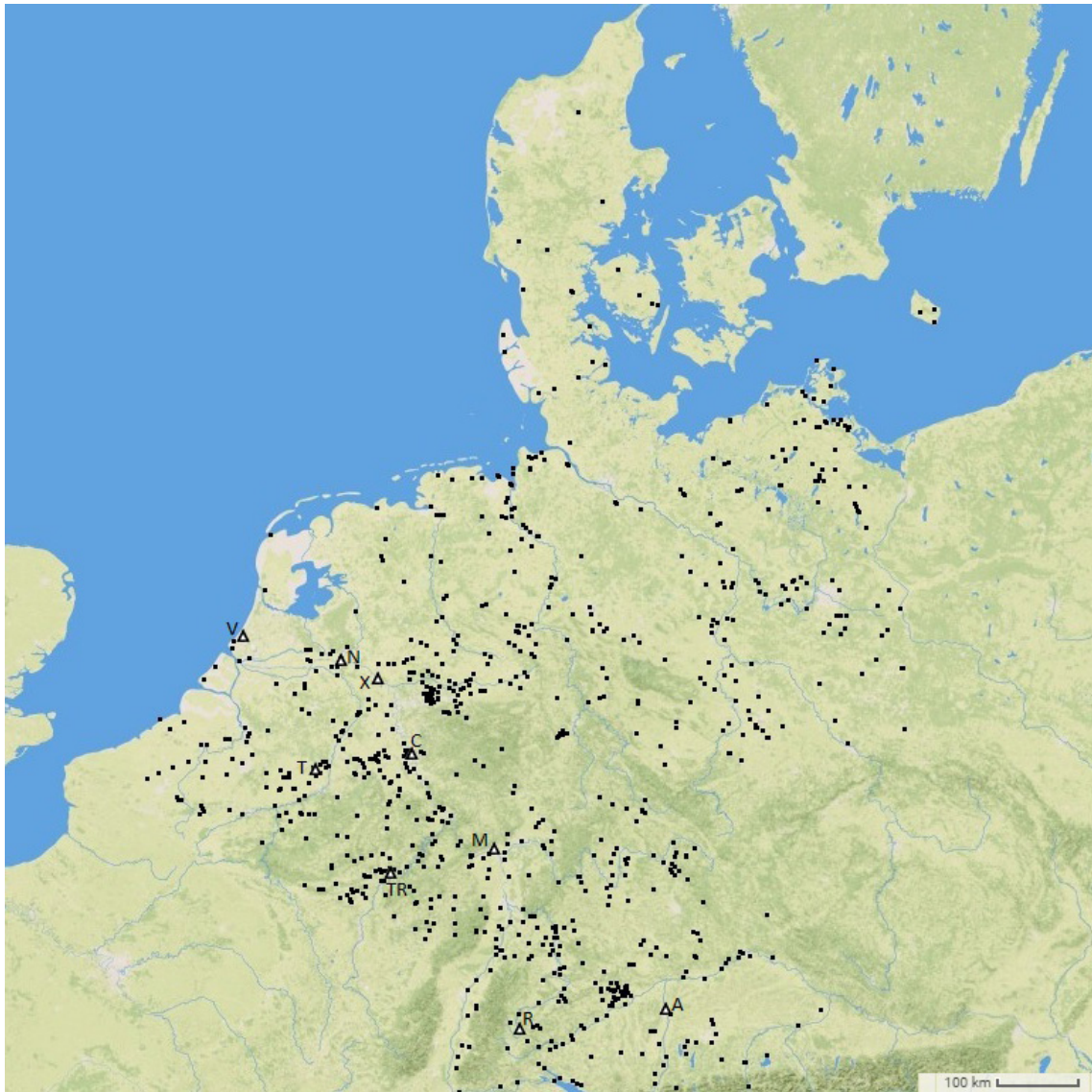


Figure 3.2: Spatial distribution of secondary agglomerations within the study-region (Data: Appendix 1).

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

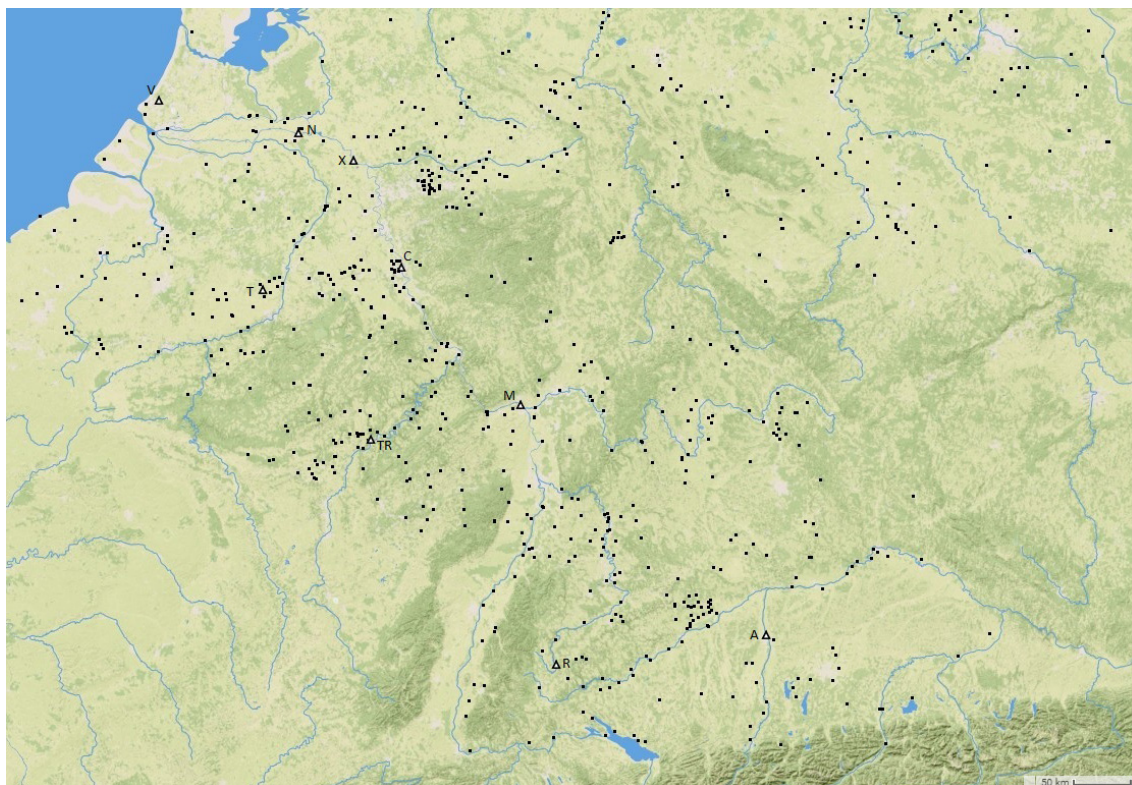


Figure 3.3: Spatial distribution of secondary agglomerations within the study-region, focus on southern half (Data: Appendix 1).

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg



Figure 3.4: Reconstruction of Schwabmünchen (Czysz 1987, fig. 86).

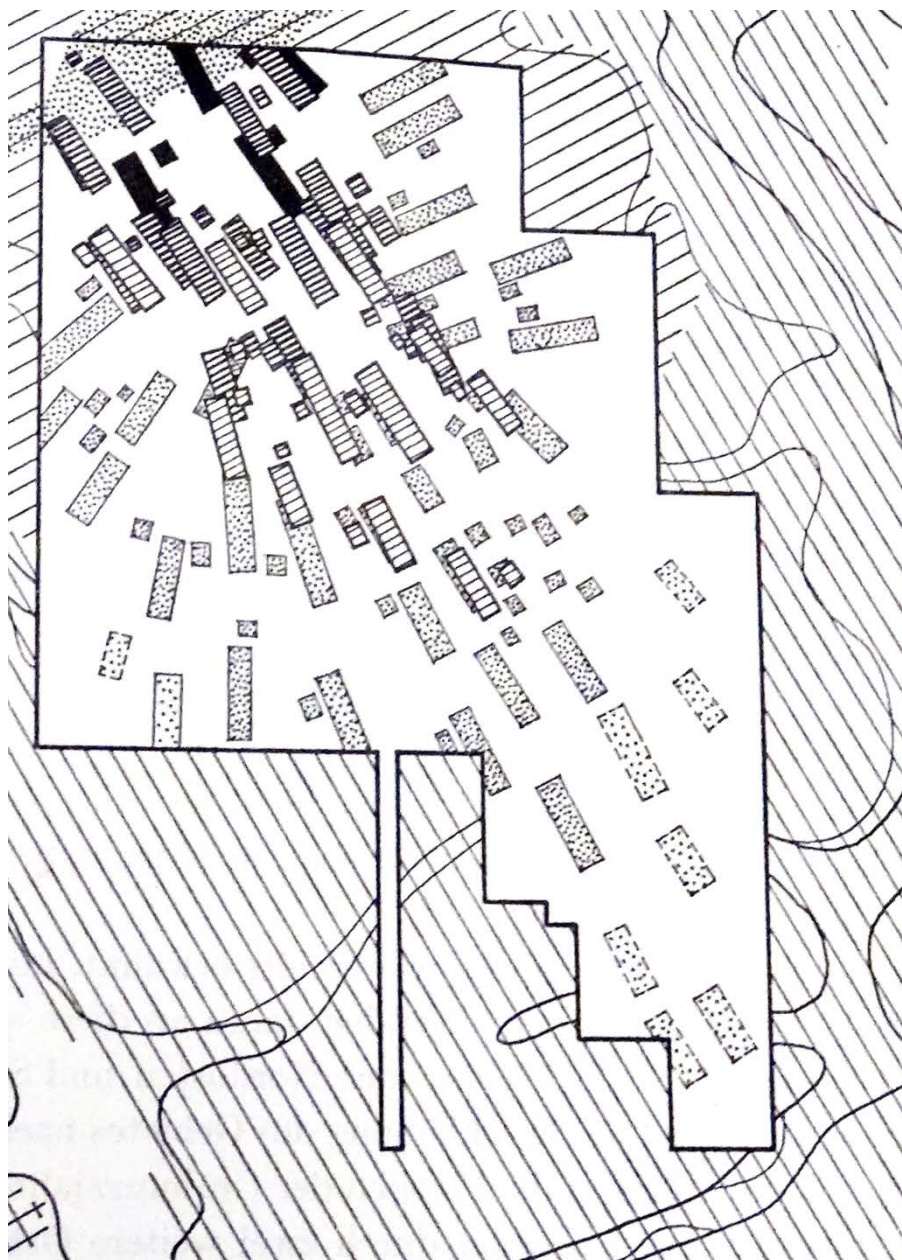
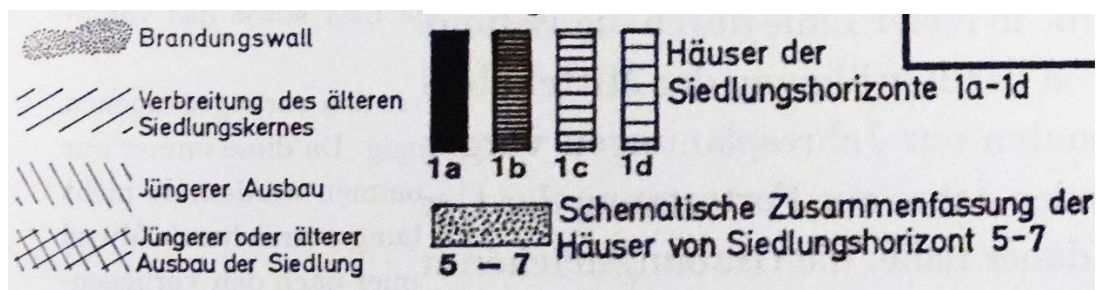


Figure 3.5: Layout of Feddersen Wierde (Haarnagel 1979, Abb. 15).



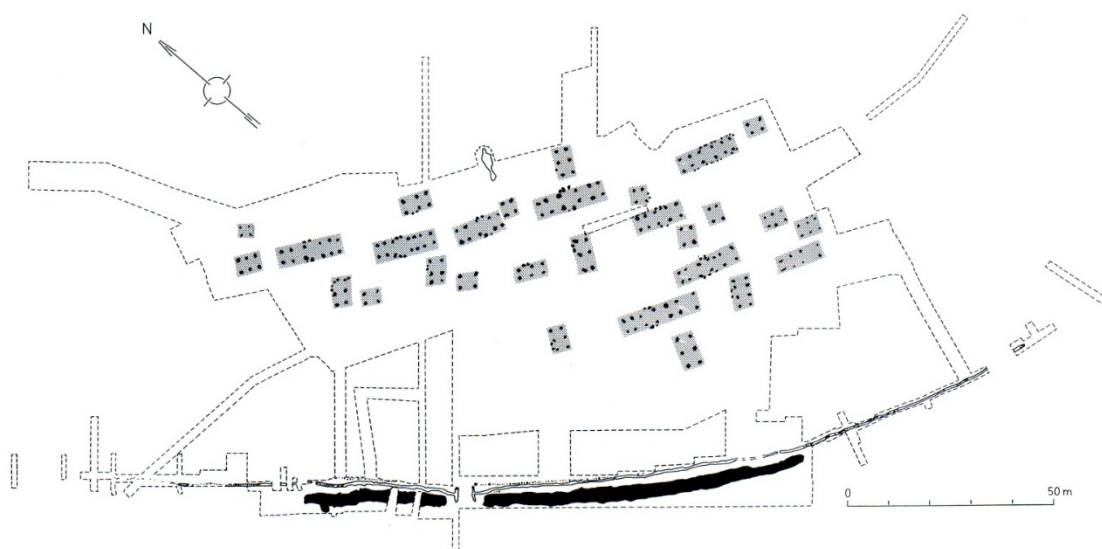


Figure 3.6: Layout of Priorsløkke (Kaul 1989, Fig. 2).

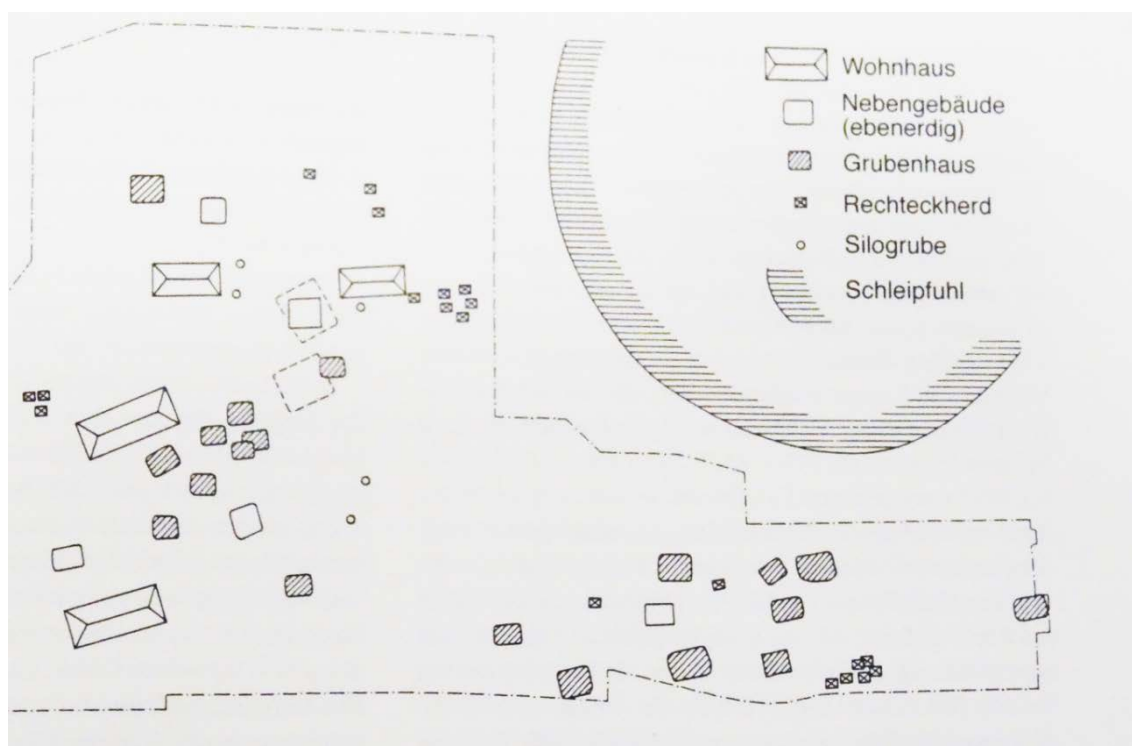


Figure 3.7: Layout of a sample village in north east *barbaricum* - Berlin Hellersdorf (Leube 2009, Abb. 141).

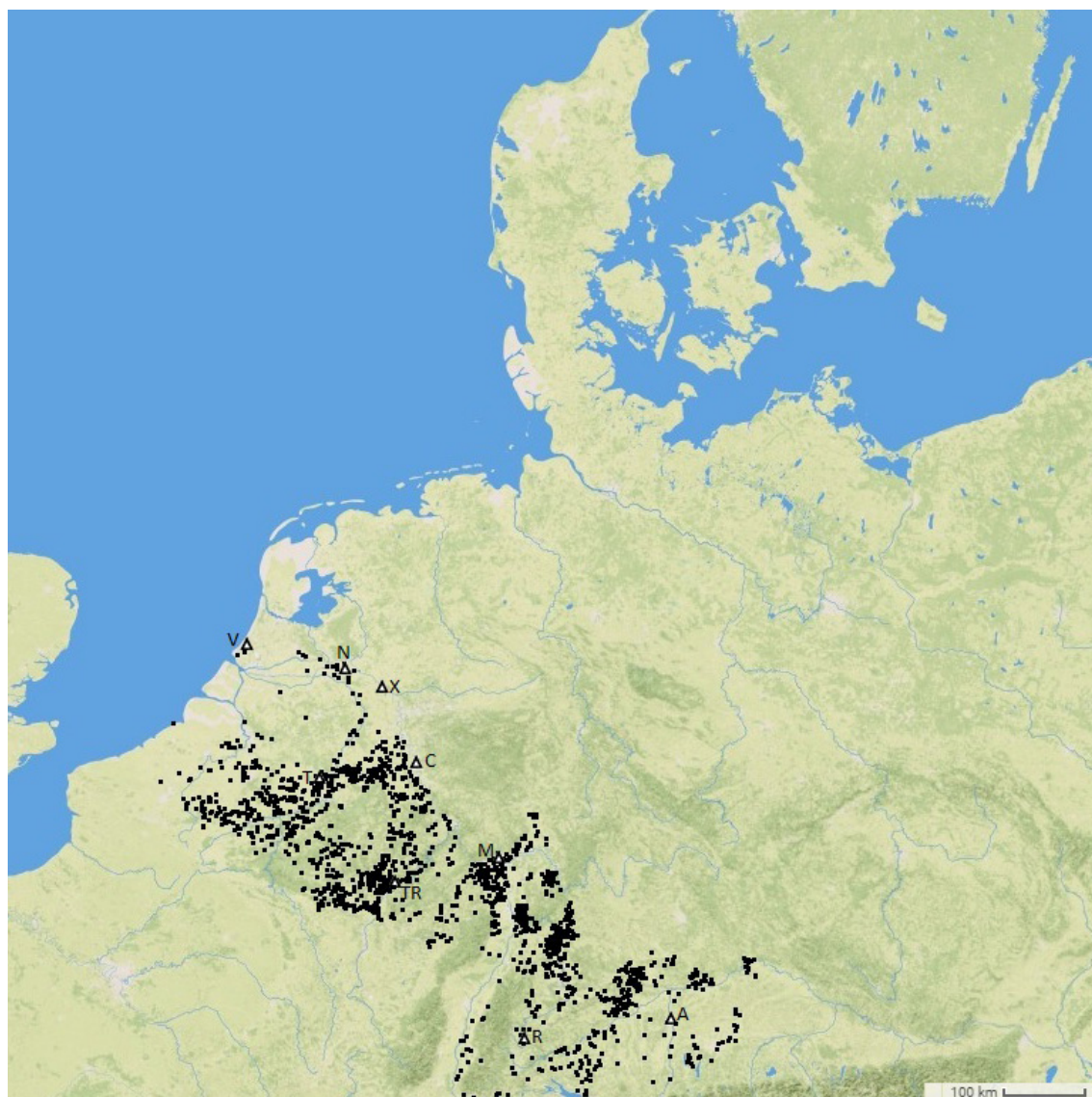


Figure 3.8: Spatial distribution of villae within the study-region (Data: Appendix 1).

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

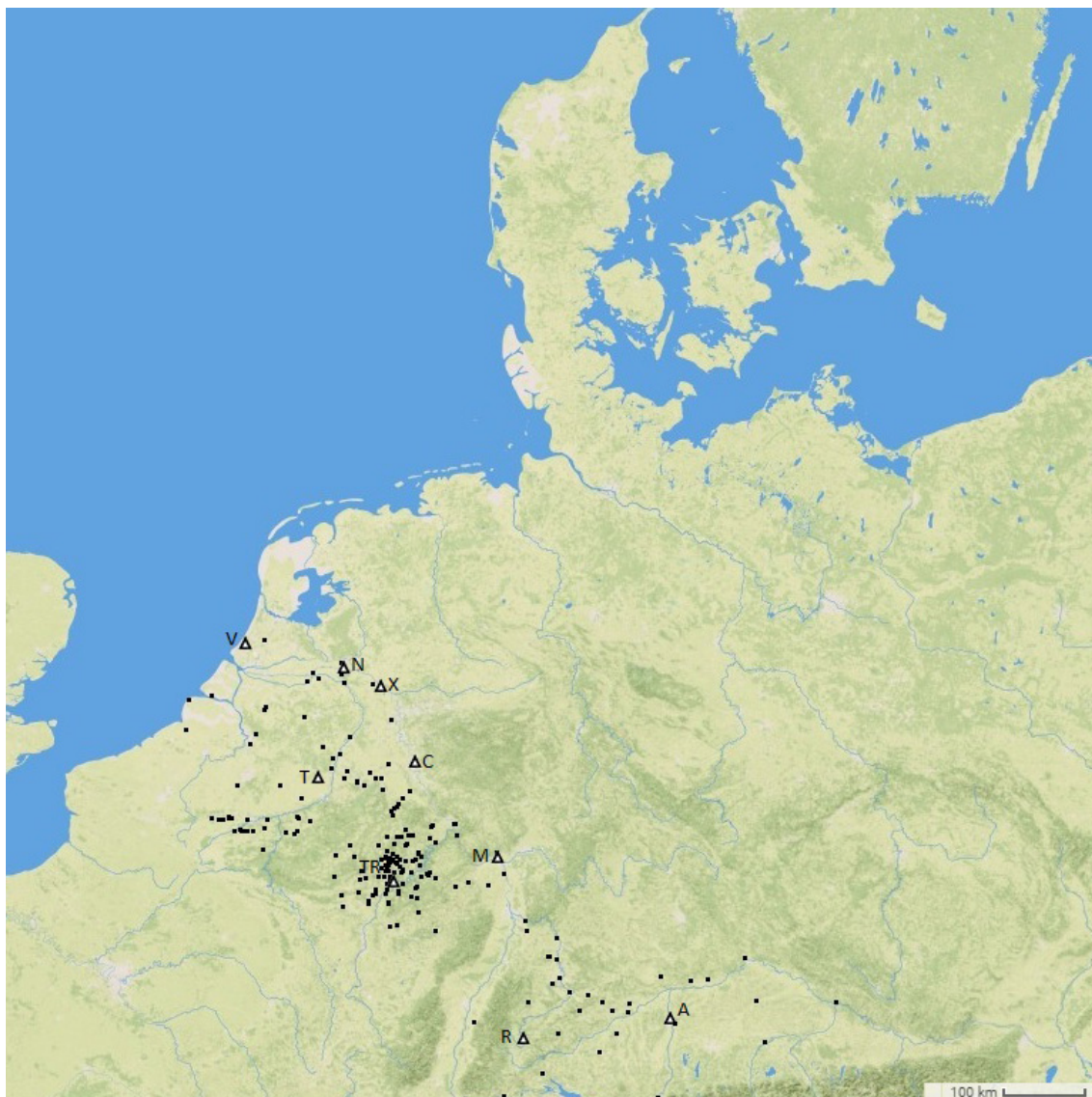


Figure 3.9: Spatial distribution of Roman sanctuaries within the study-region (Data: Appendix 1).

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

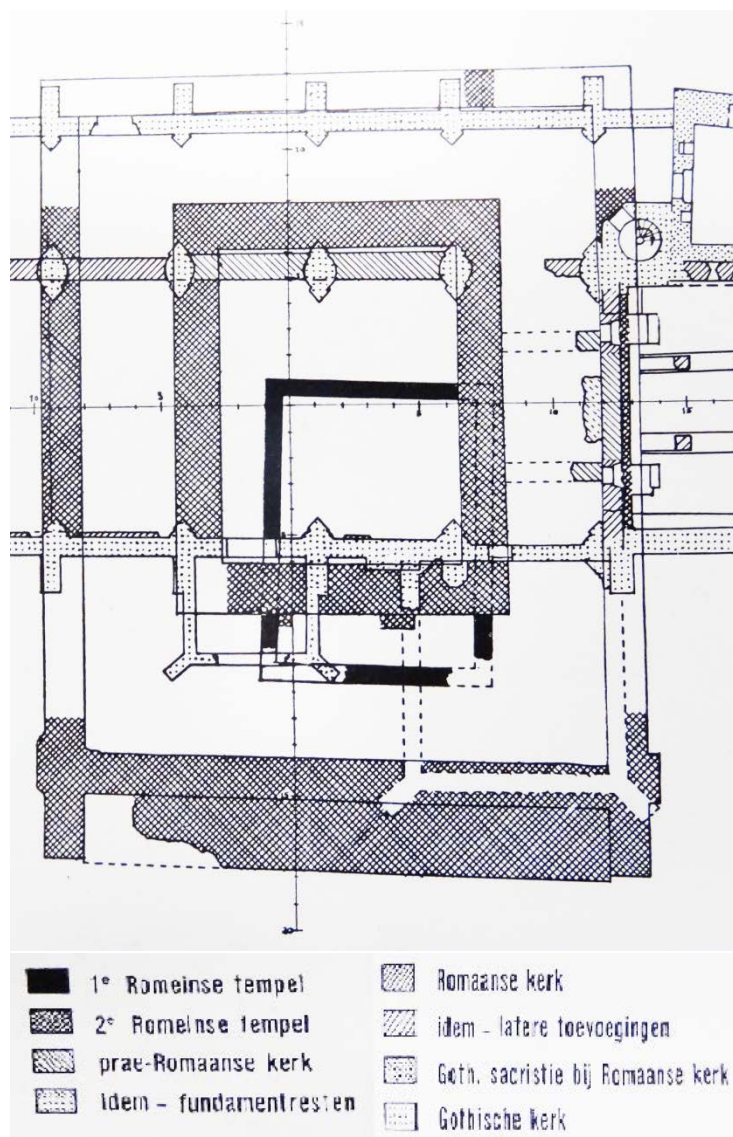


Figure 3.10: Layout of Elst I and Elst II under the church (Bogaers 1955, Pl. 46).

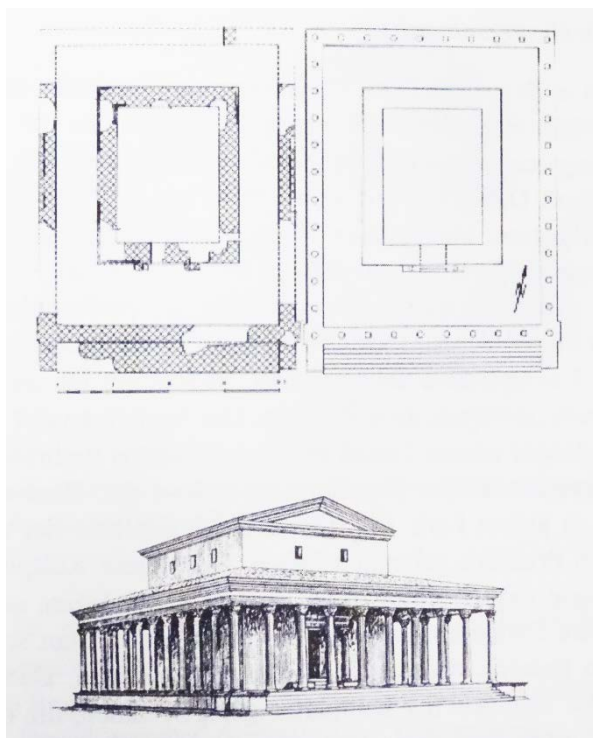


Figure 3.11: Layout and reconstruction of Elst II (Spickermann 2008, Abb. 18).

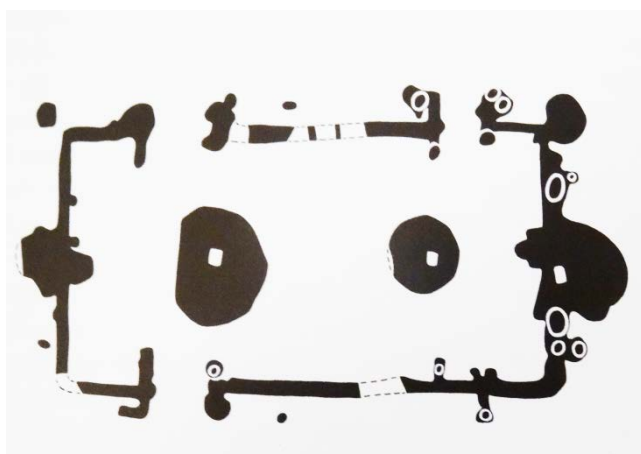


Figure 3.12: The Alphen-Ekeren house-type (Slofstra and Van der Sanden 1987, Fig. 7b).

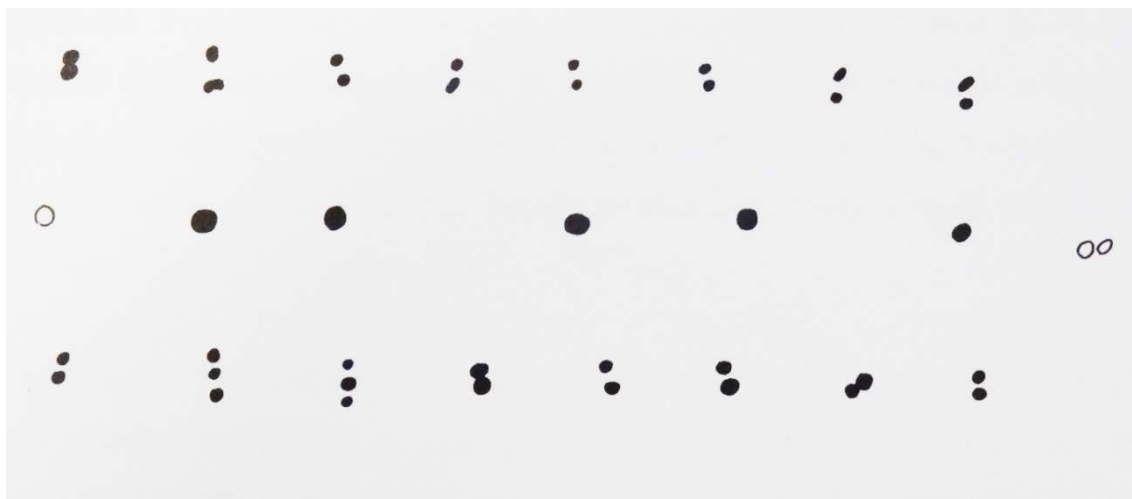


Figure 3.13: The Oss-Ussen house-type (Slofstra and Van der Sanden 1987, Fig. 7c).

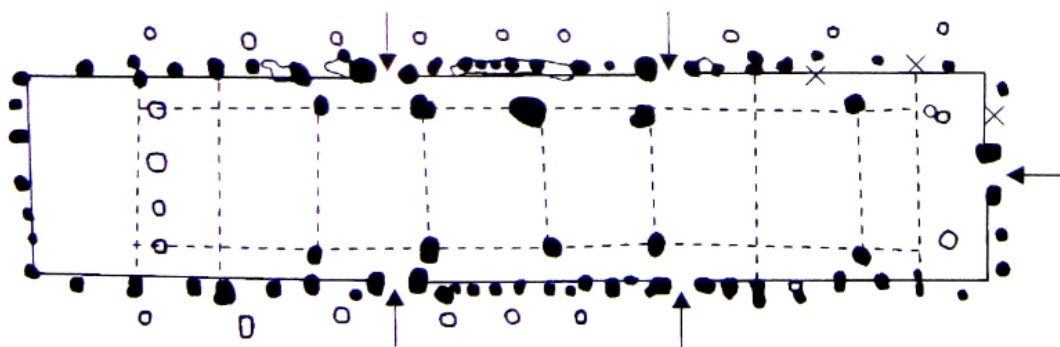


Figure 3.14: The Late Roman-Germanic house-type, Peelo B (Waterbolk 1999, Fig. 1).

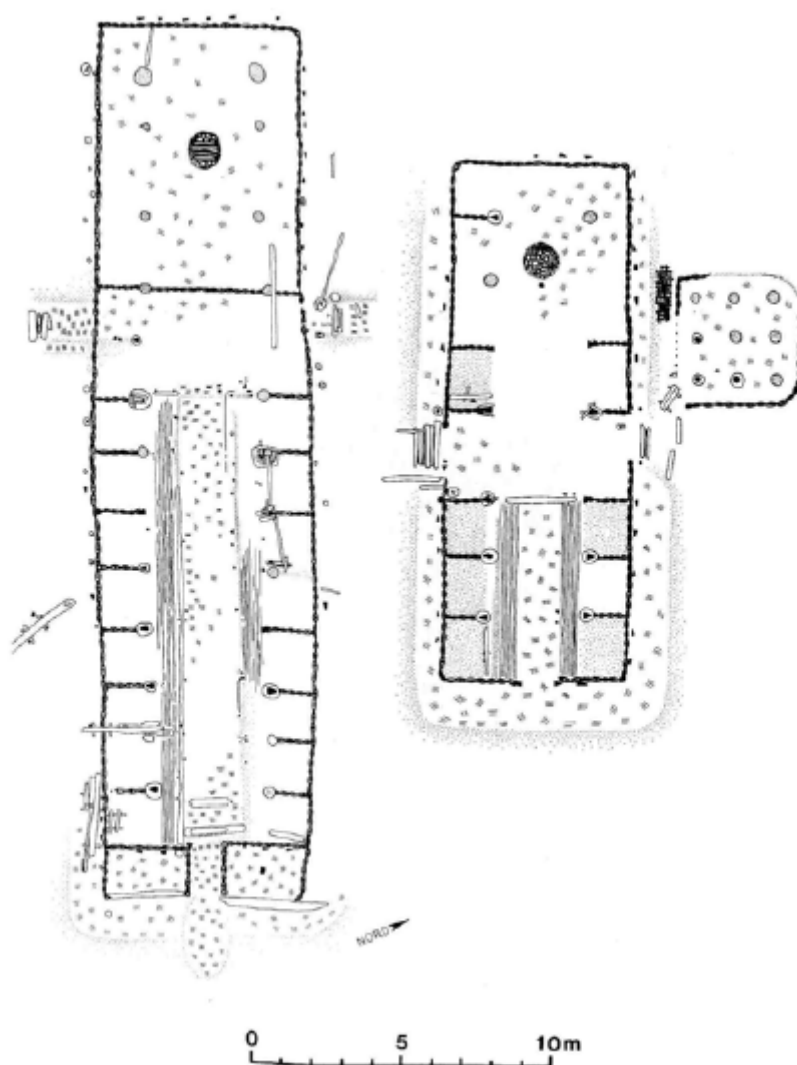


Figure 3.15: The three-aisled house-type – Feddersen Wierde (De Clercq 2009, Fig. 10.3).

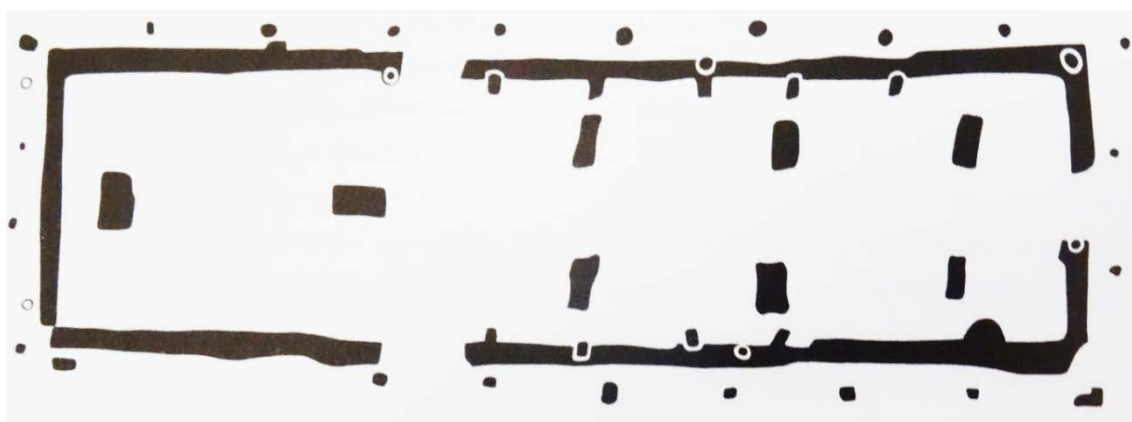


Figure 3.16: A mix of the three- and two-aisled house-type (Slofstra and Van der Sanden 1987, Fig. 7d).



Figure 3.17: Spatial distribution of individual farmsteads in civitas Batavorum (Data: VU Amsterdam).

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

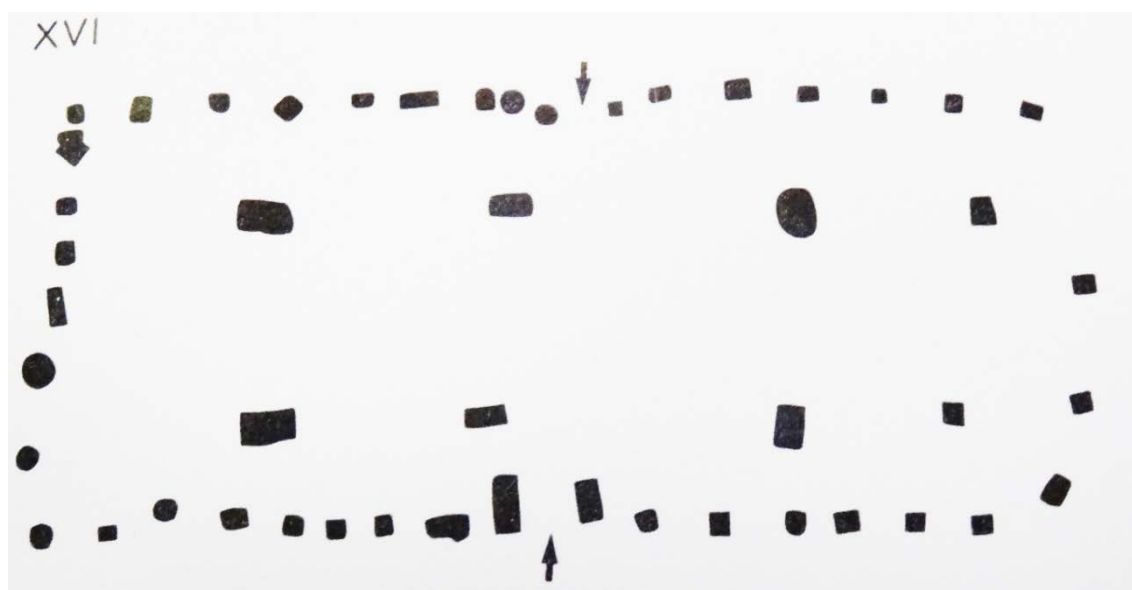


Figure 3.18: Wijster-A house-type (Van Es 1967, Pl. 16).

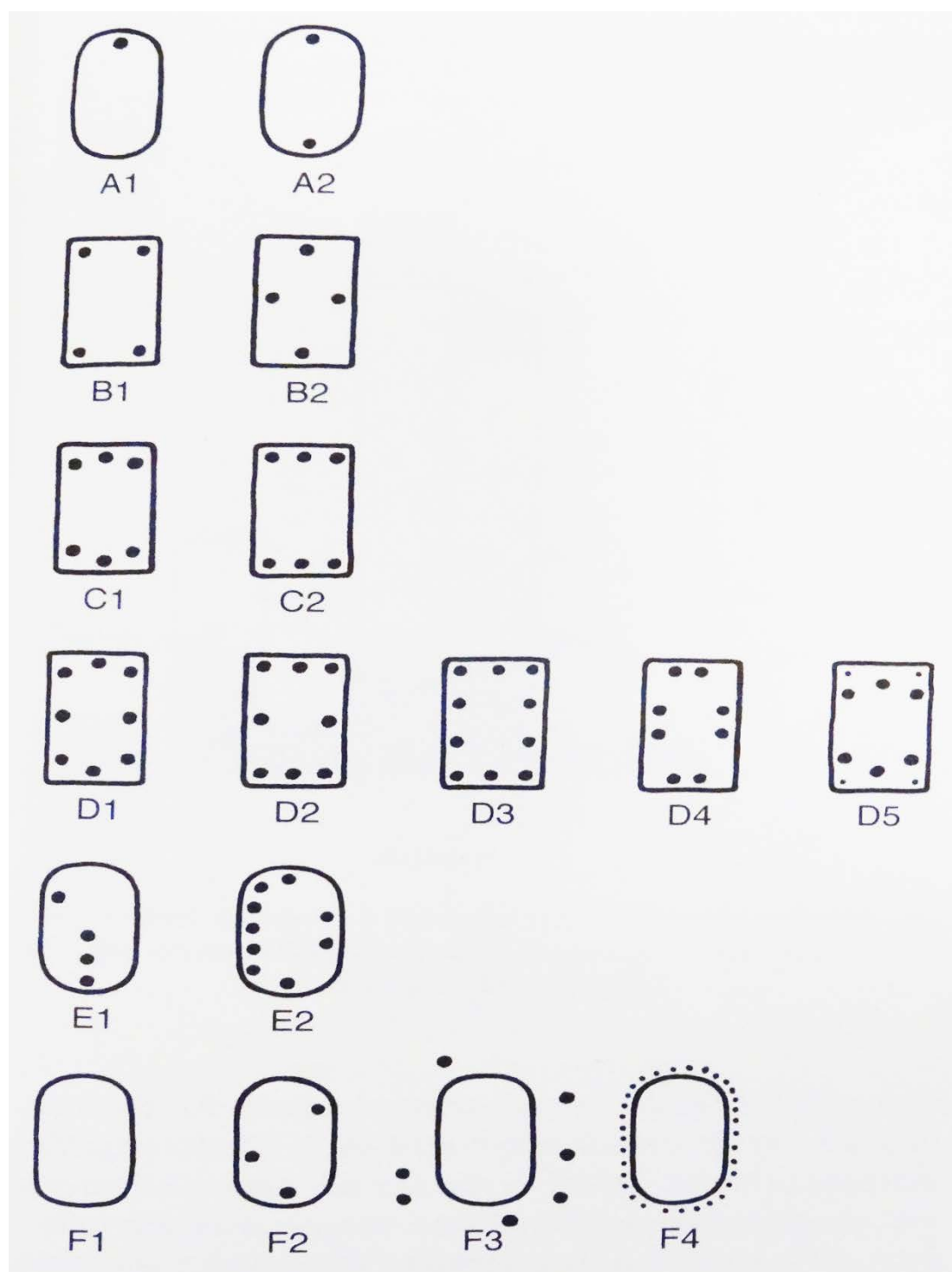


Figure 3.19: House-types (Grubenhaustypen) found in central Europe (Leube 2009, Abb. 99).



Figure 3.20: Spatial distribution of indigenous building traditions.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg



Figure 3.21: Example of wooden wharf (De Boe 1978, Fig. 28).



Figure 3.22: Excavated boat of De Meern (Bazelmans and Jansma 2005, Abb. 1).



Figure 3.23: Relief on Trajan's column of Danubian cargo boat (Höckmann 1989, Abb. 116).



Figure 3.24: An Einbäumer found by Cuxhaven in *barbaricum* (Wendowski-Schünemann 2011, Abb. 1).

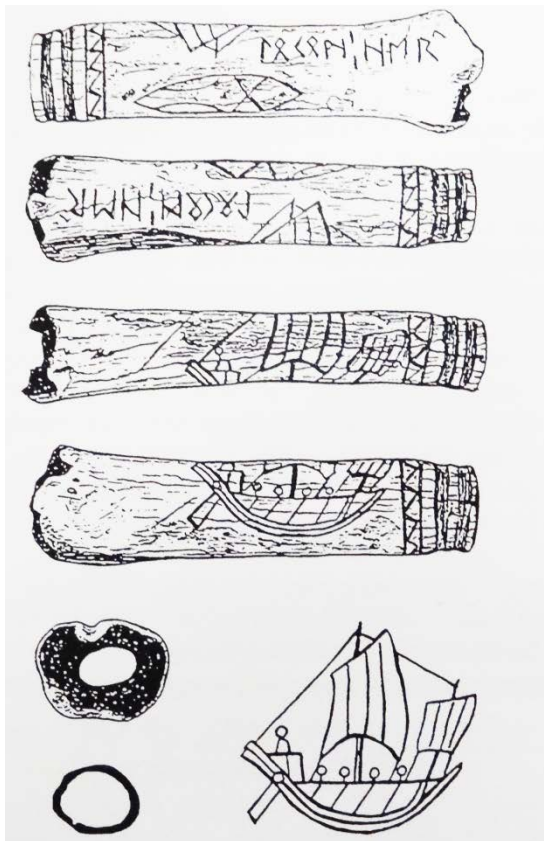


Figure 3.25: Pictorial evidence of Roman ships at Weser River mouth (Ellmers 1997, Abb. 2).

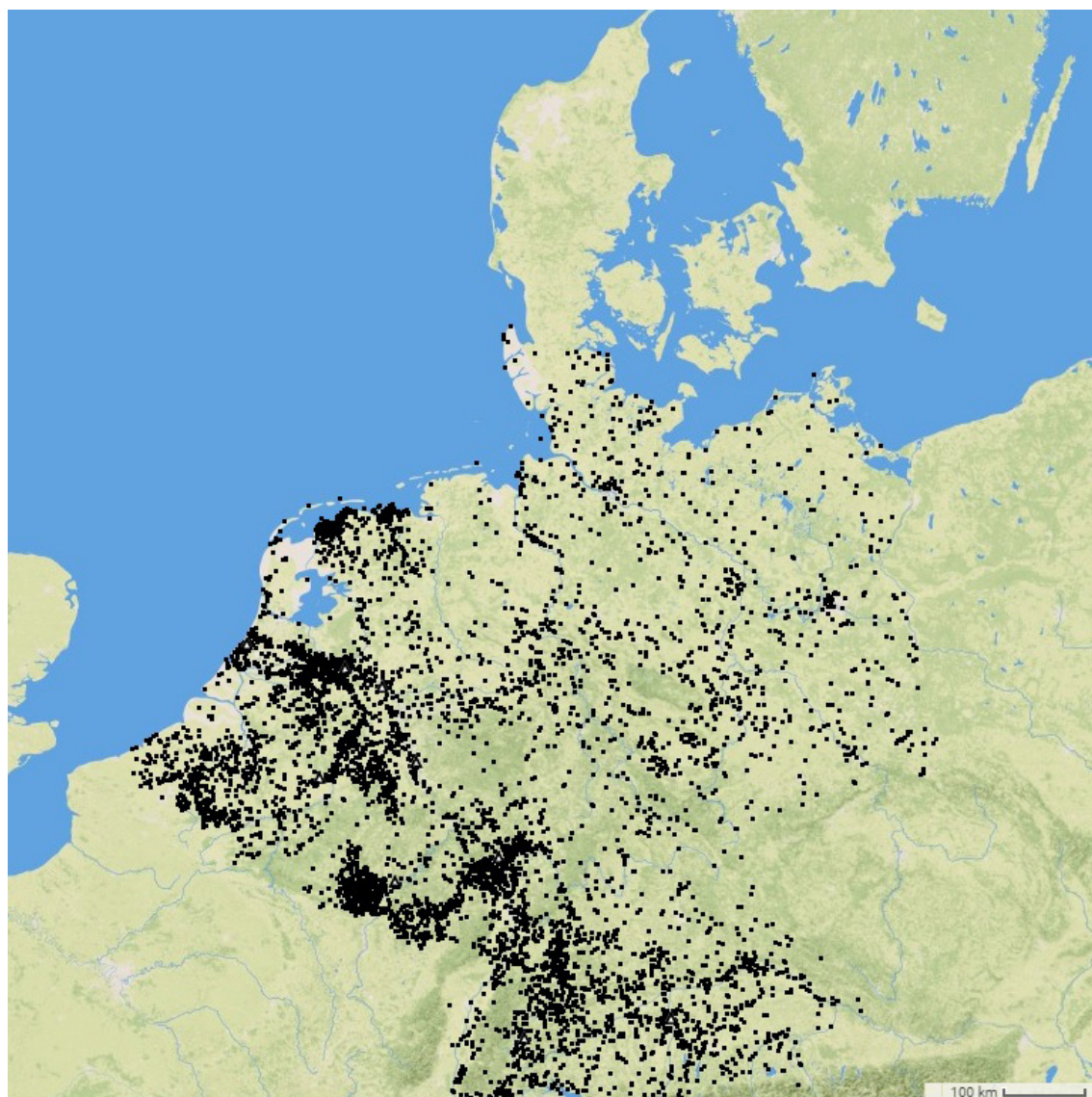


Figure 4.1: Distribution of all unique find-spots, all find types.

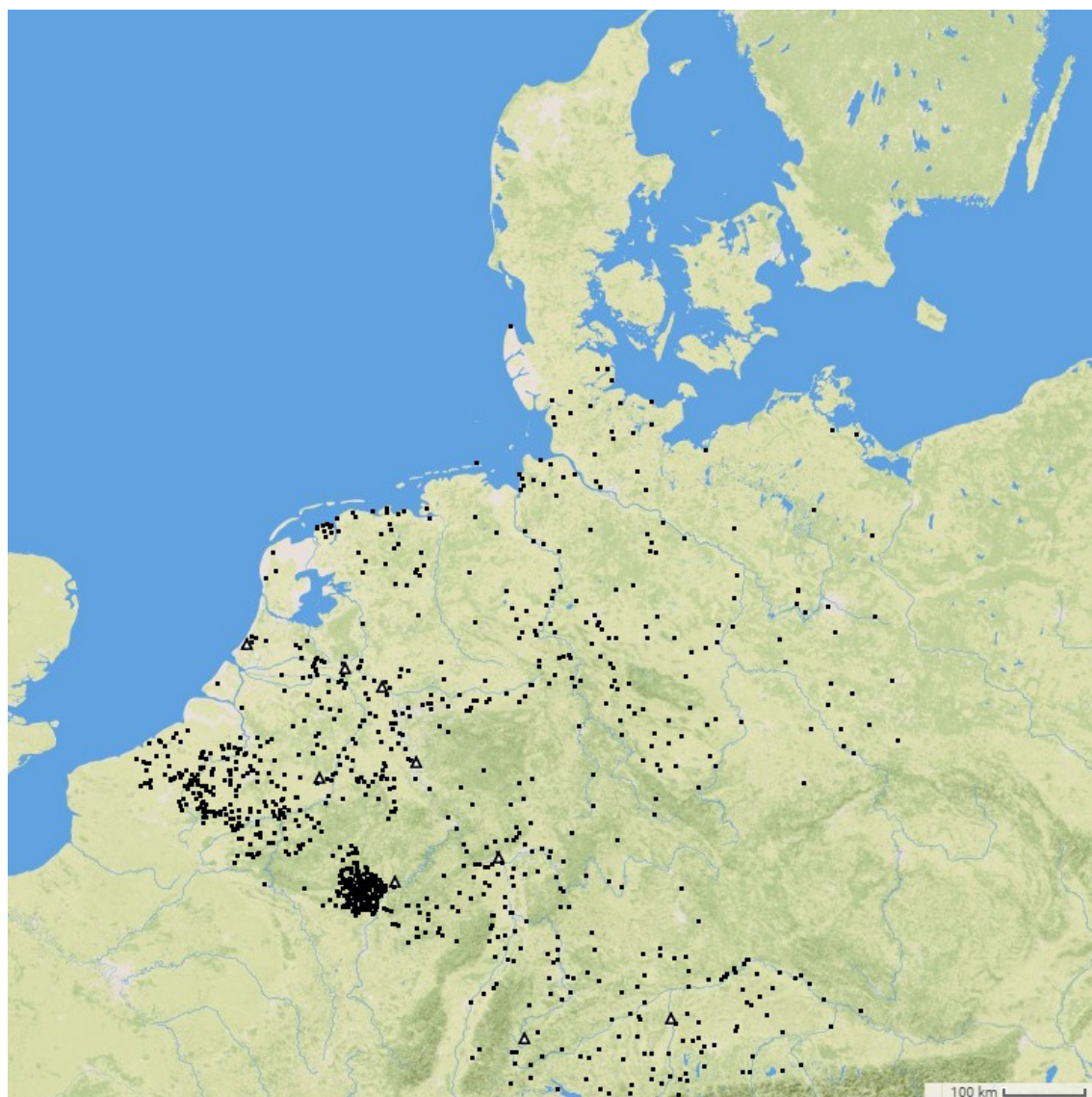


Figure 4.2: Distribution of all possible hoards.

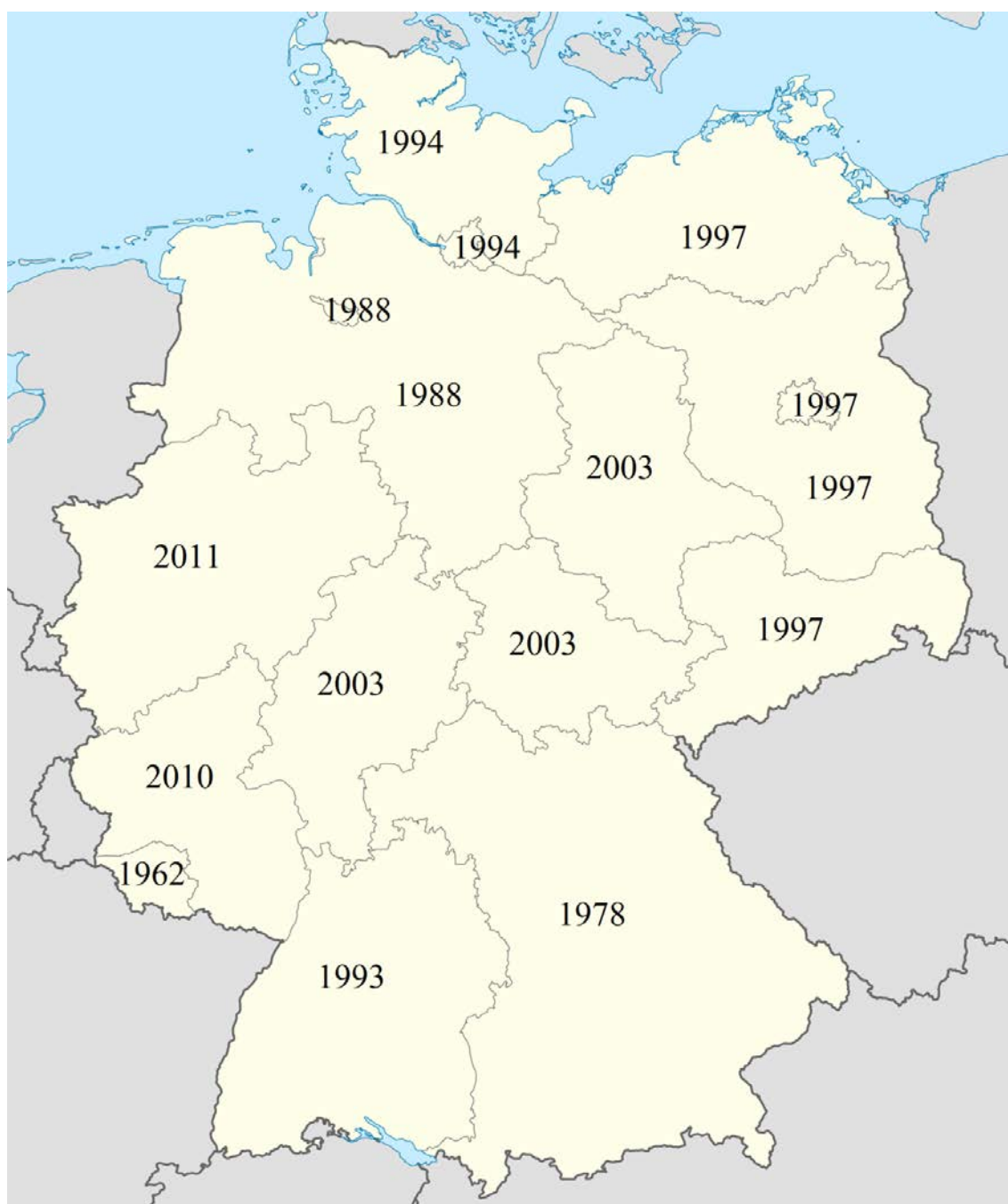


Figure 4.3: Latest FMRD volume by Bundesland.

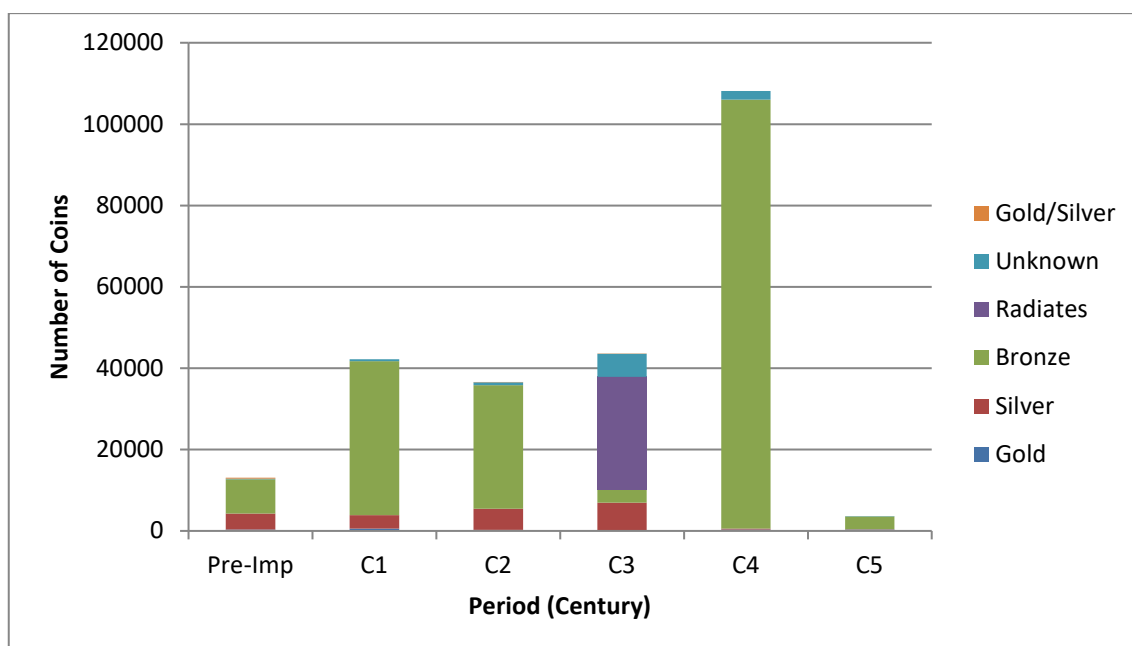


Figure 4.4: Non-hoarded coins with precise attribution; quantity.

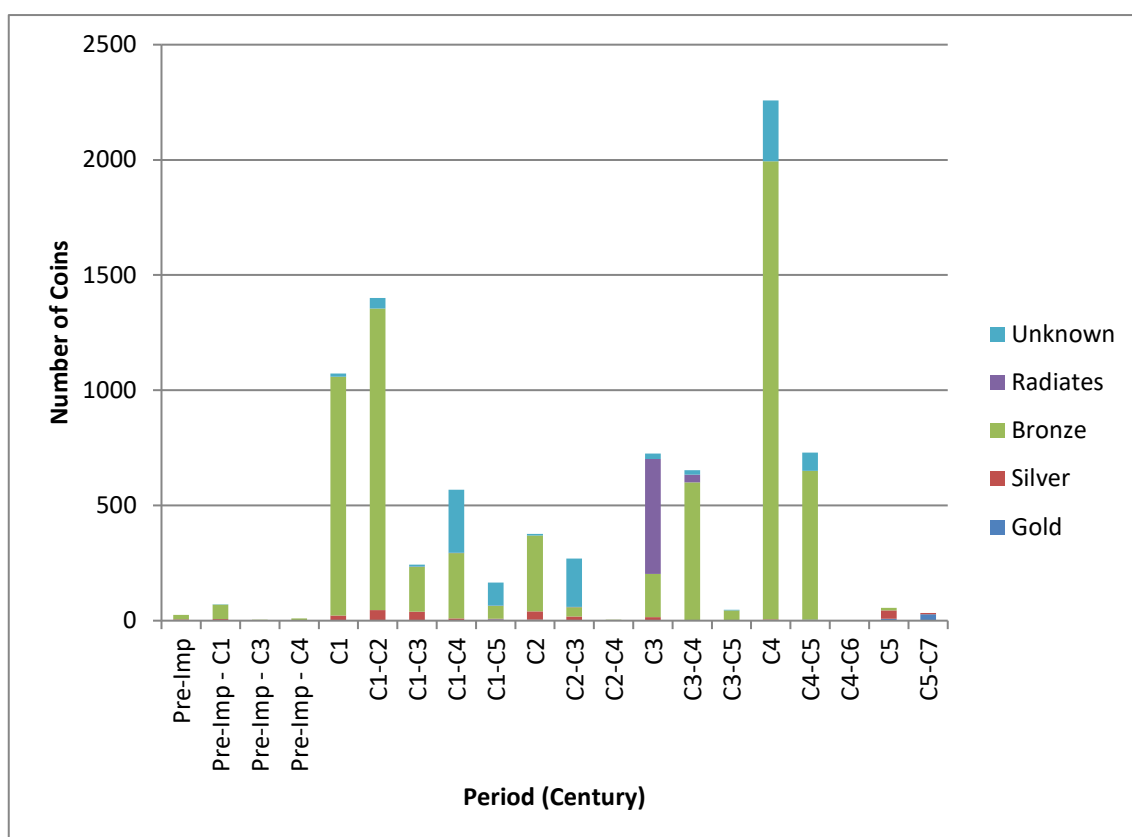


Figure 4.5: Non-Hoarded coins with imprecise attribution; quantity.

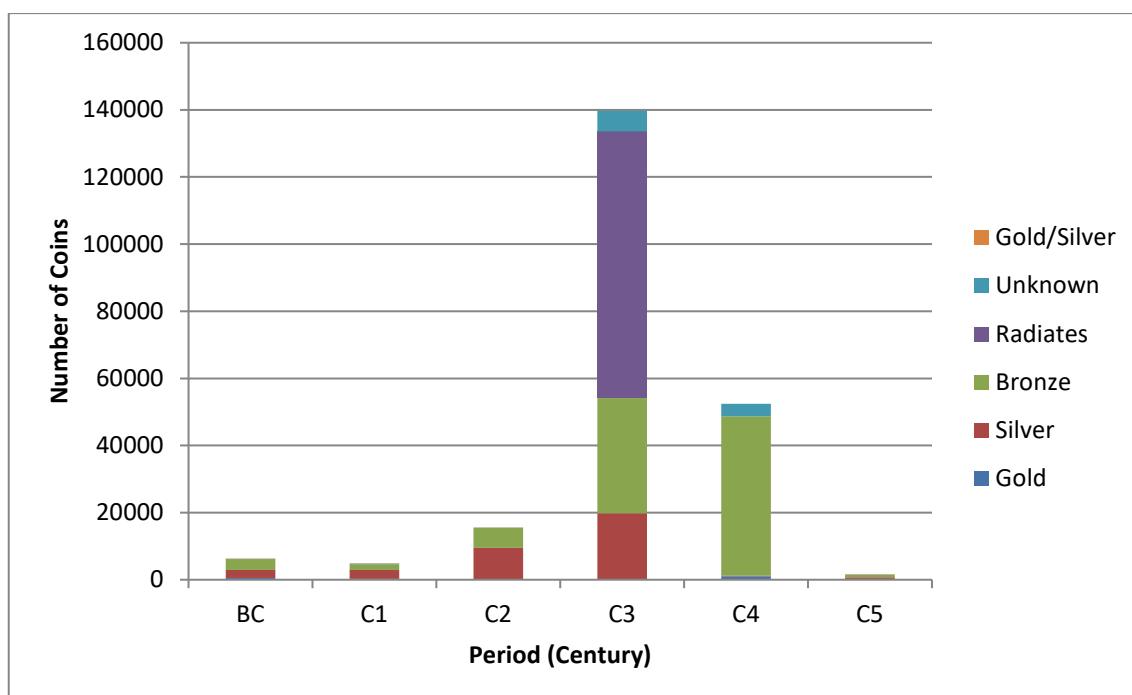


Figure 4.6: Hoarded coins with precise attribution; quantity.

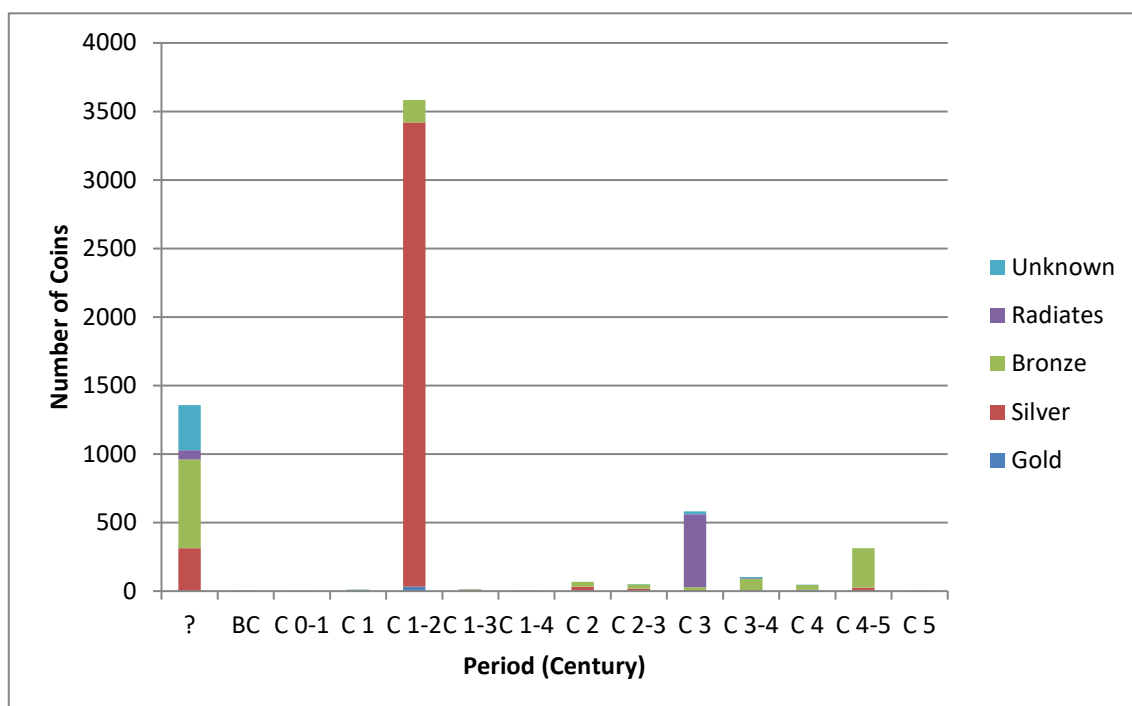


Figure 4.7: Hoarded coins with imprecise attribution; quantity.

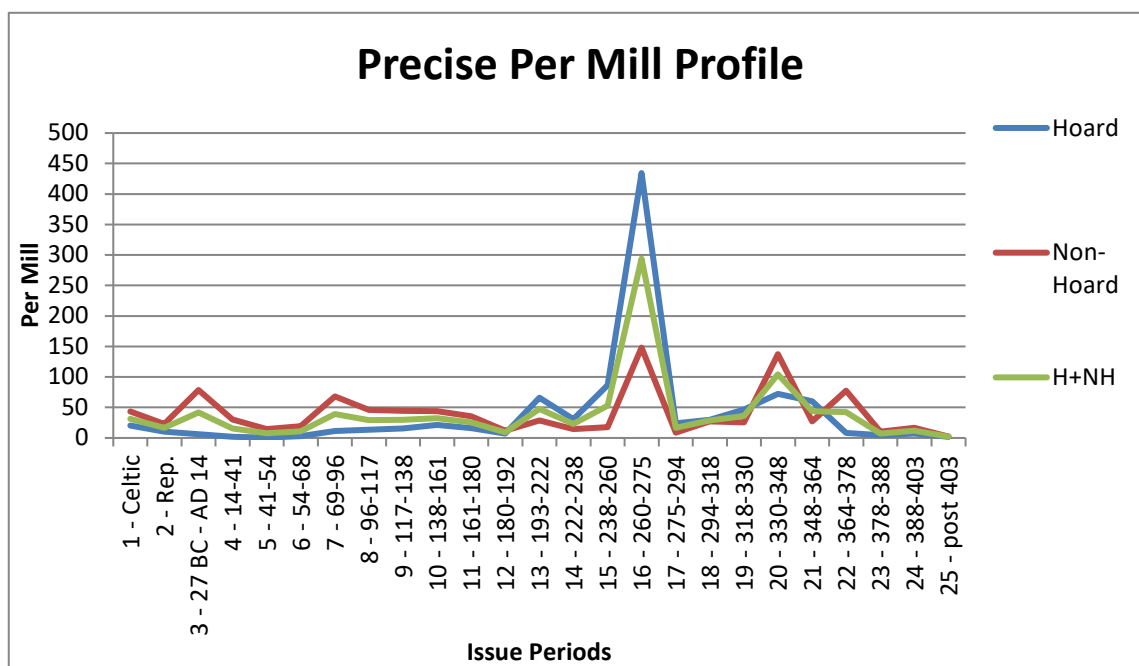


Figure 4.8: Per mill profile of coins with a precise issue period by find type.

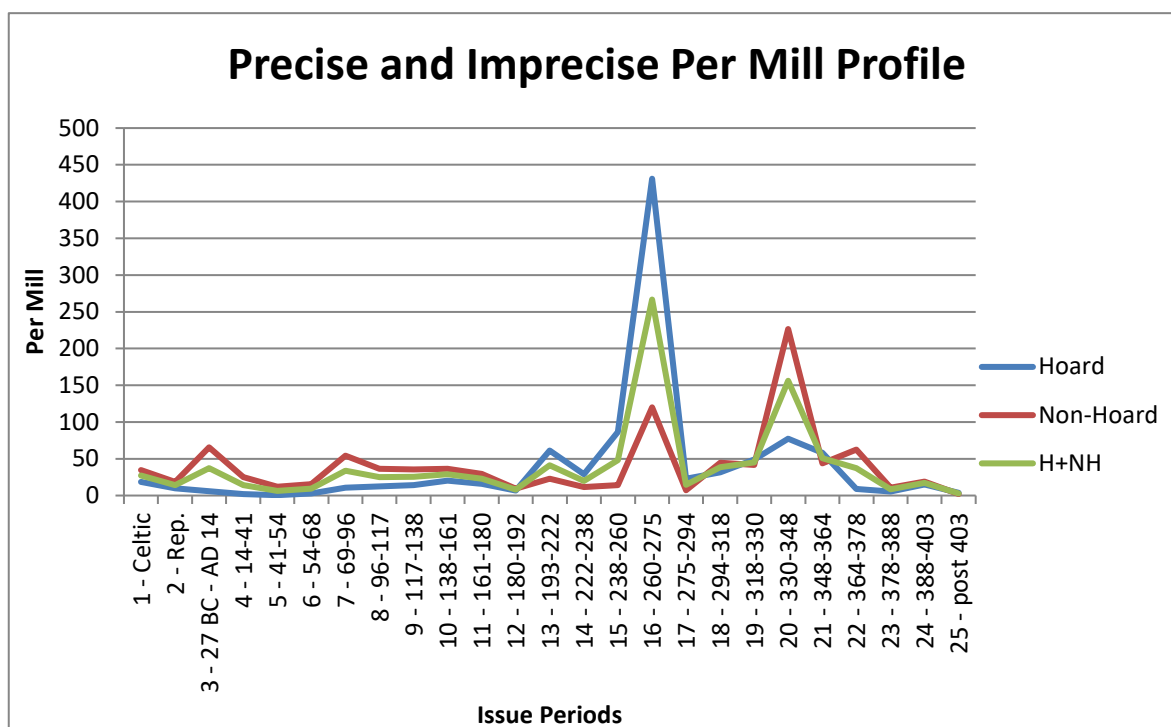


Figure 4.9: Per mill profile of coins with precise and imprecise issue periods by find type.

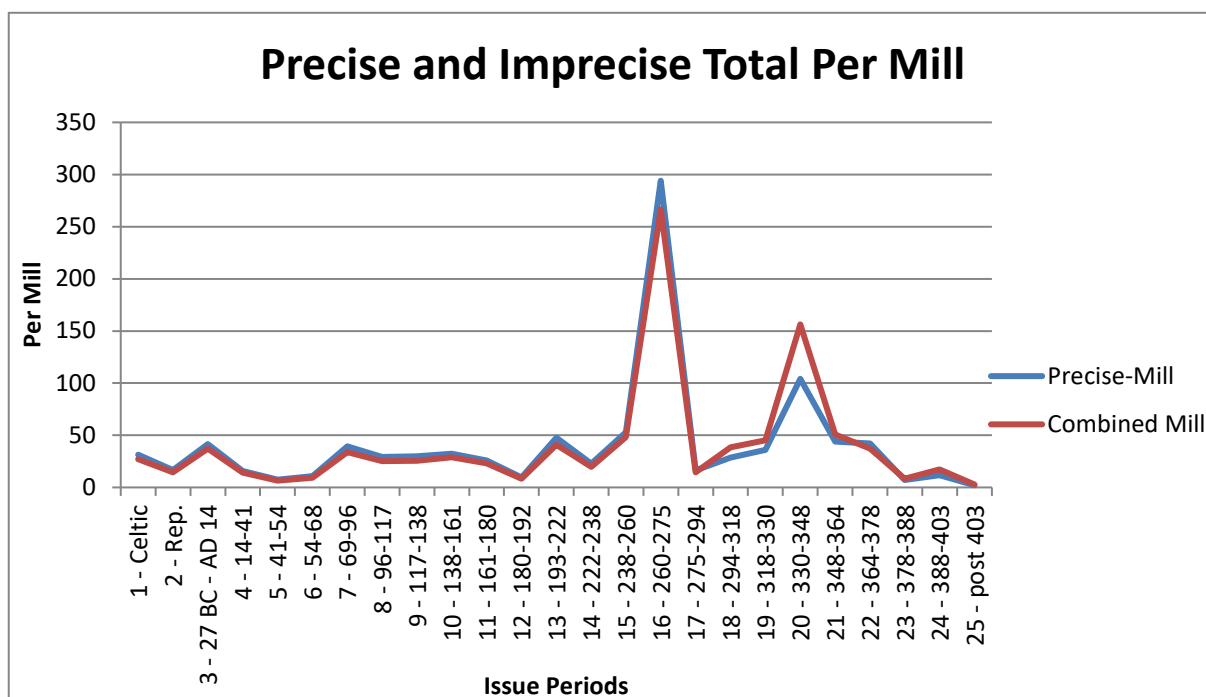


Figure 4.10: Total per mill with precise and combined issue periods, all find types.

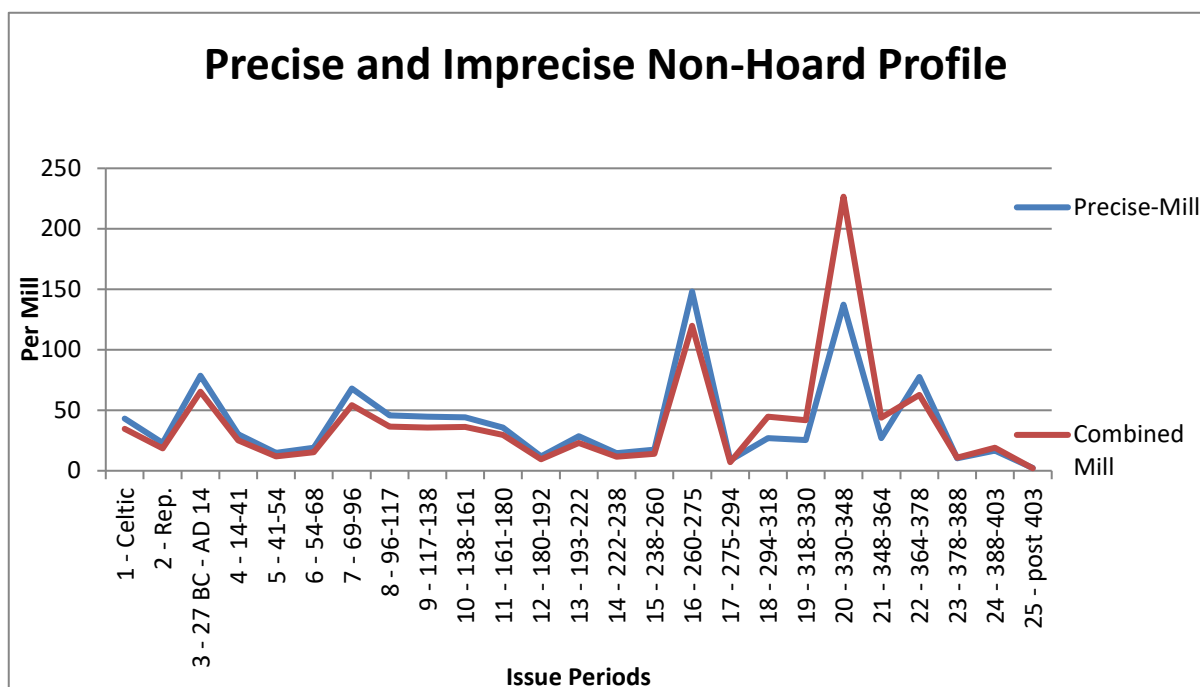


Figure 4.11: Per mill profile of precise and combined issue periods of non-hoarded coins.

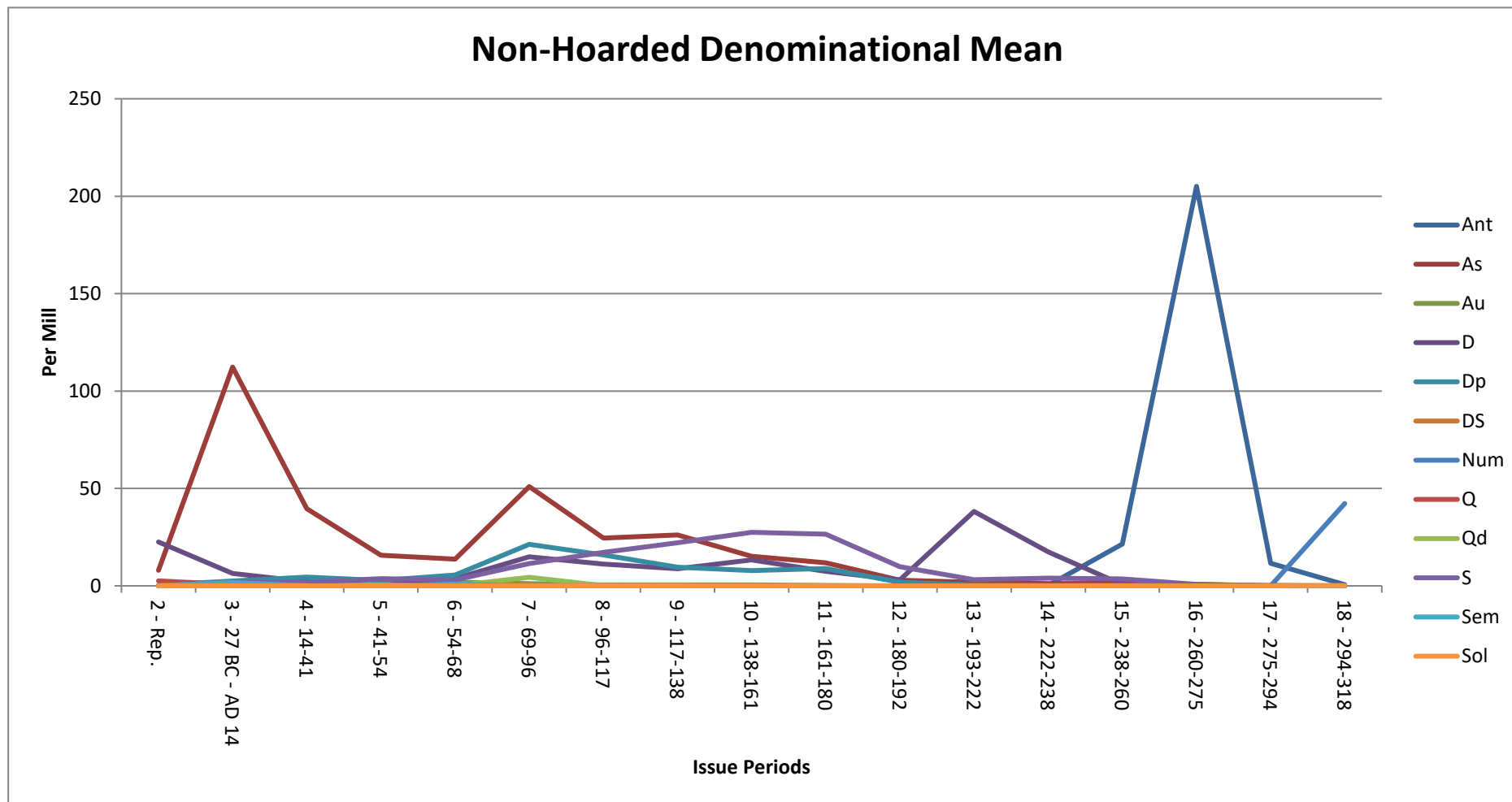


Figure 4.12: Non-hoarded denominational per mill profile.

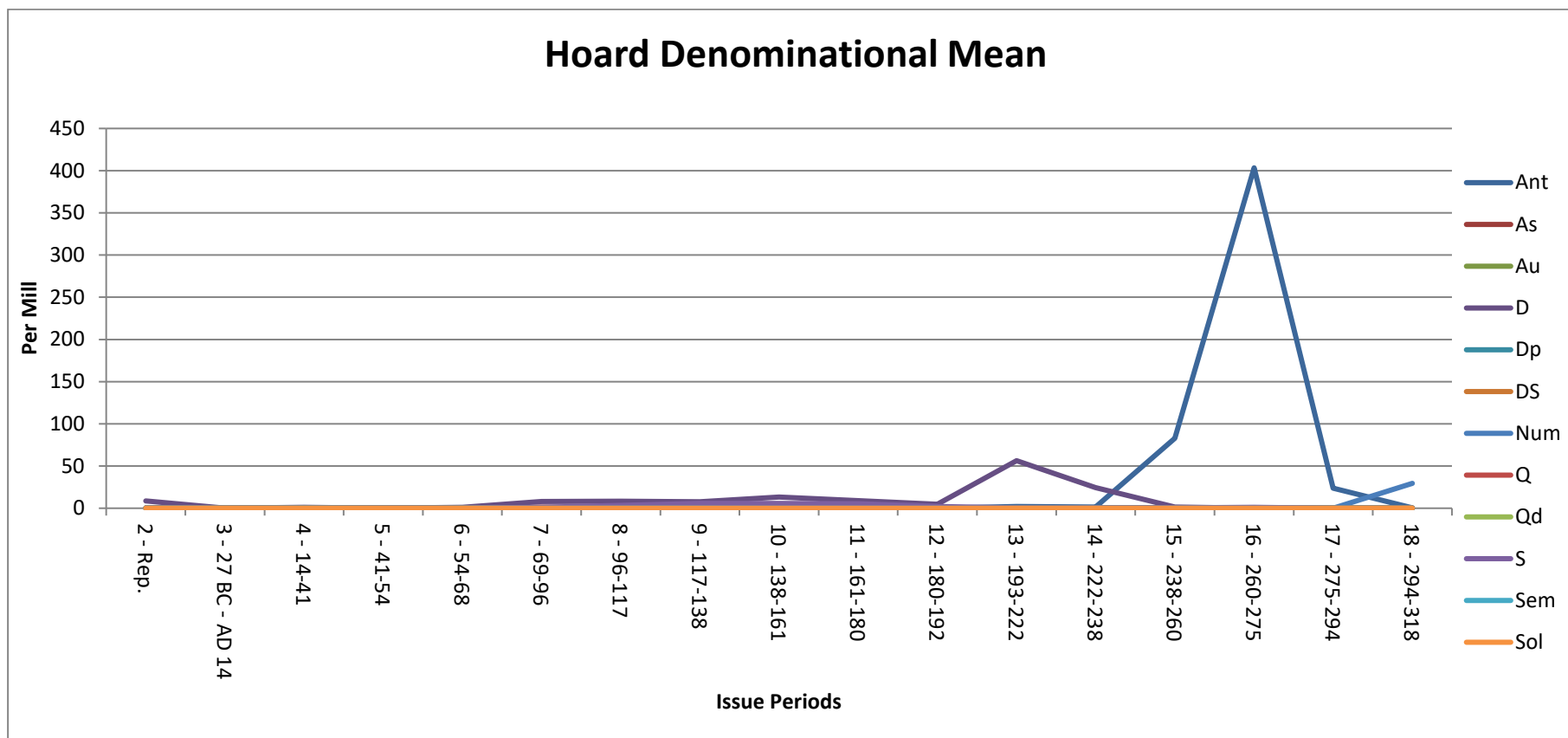


Figure 4.13: Hoard denominational per mill profile.

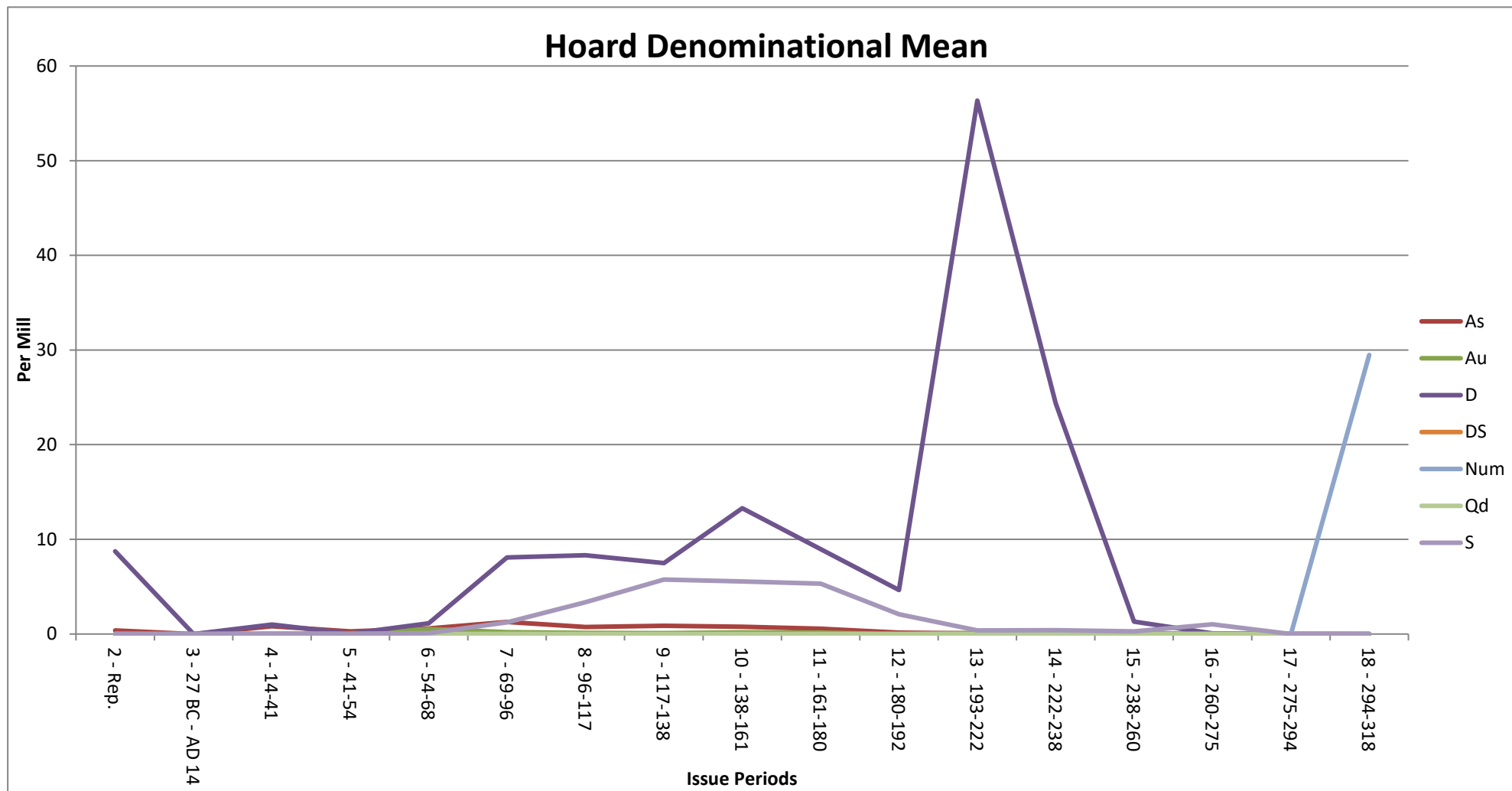


Figure 4.14: Hoard denominational per mill profile (without all important denominations).

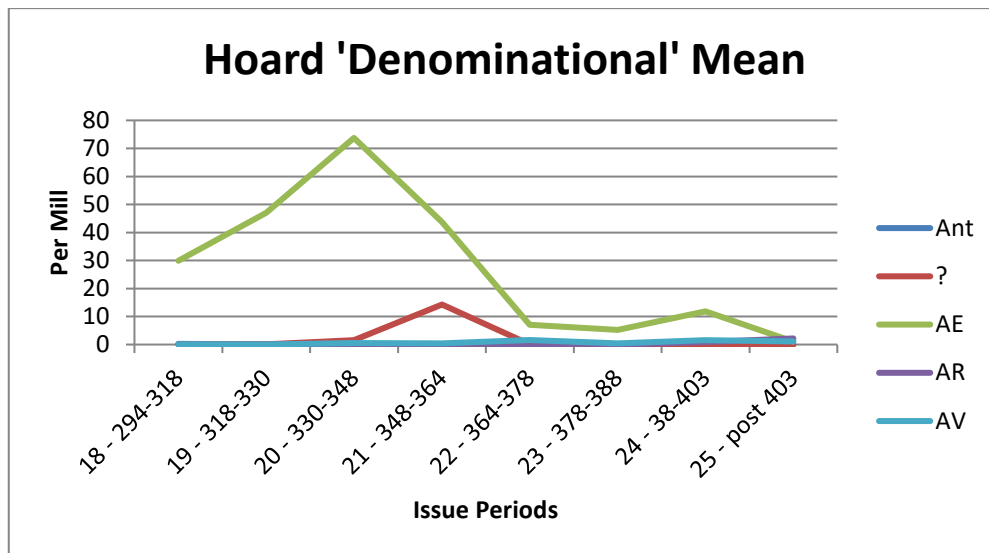


Figure 4.15: Hoard 'denominational' per mill profile.

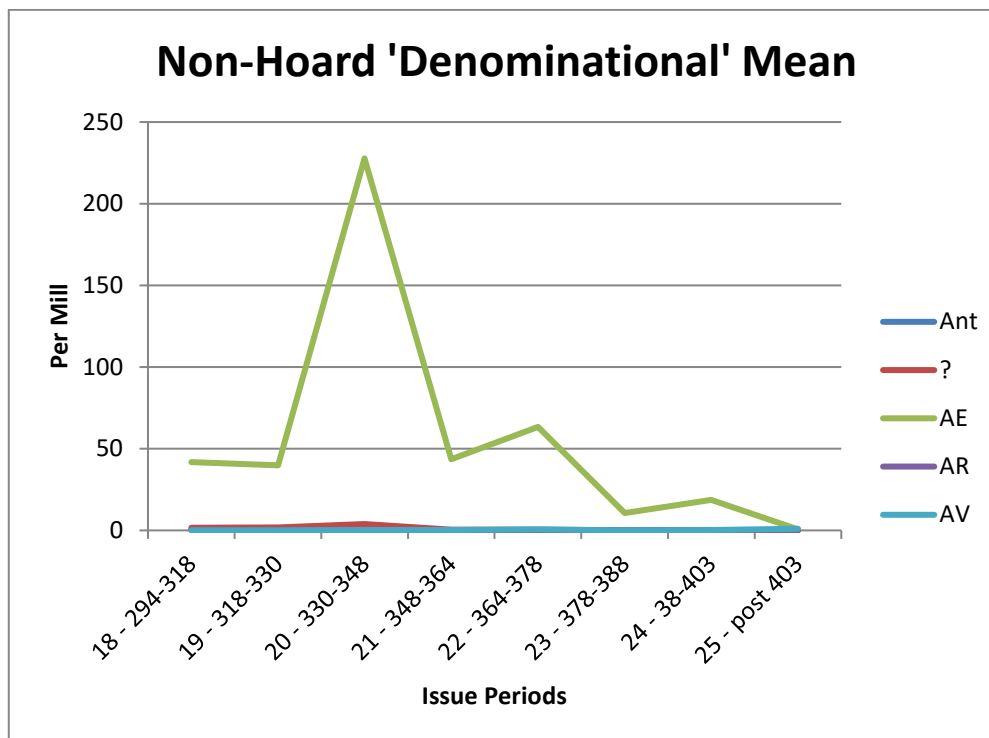


Figure 4.16: Non-hoarded 'denominational' per mill profile.

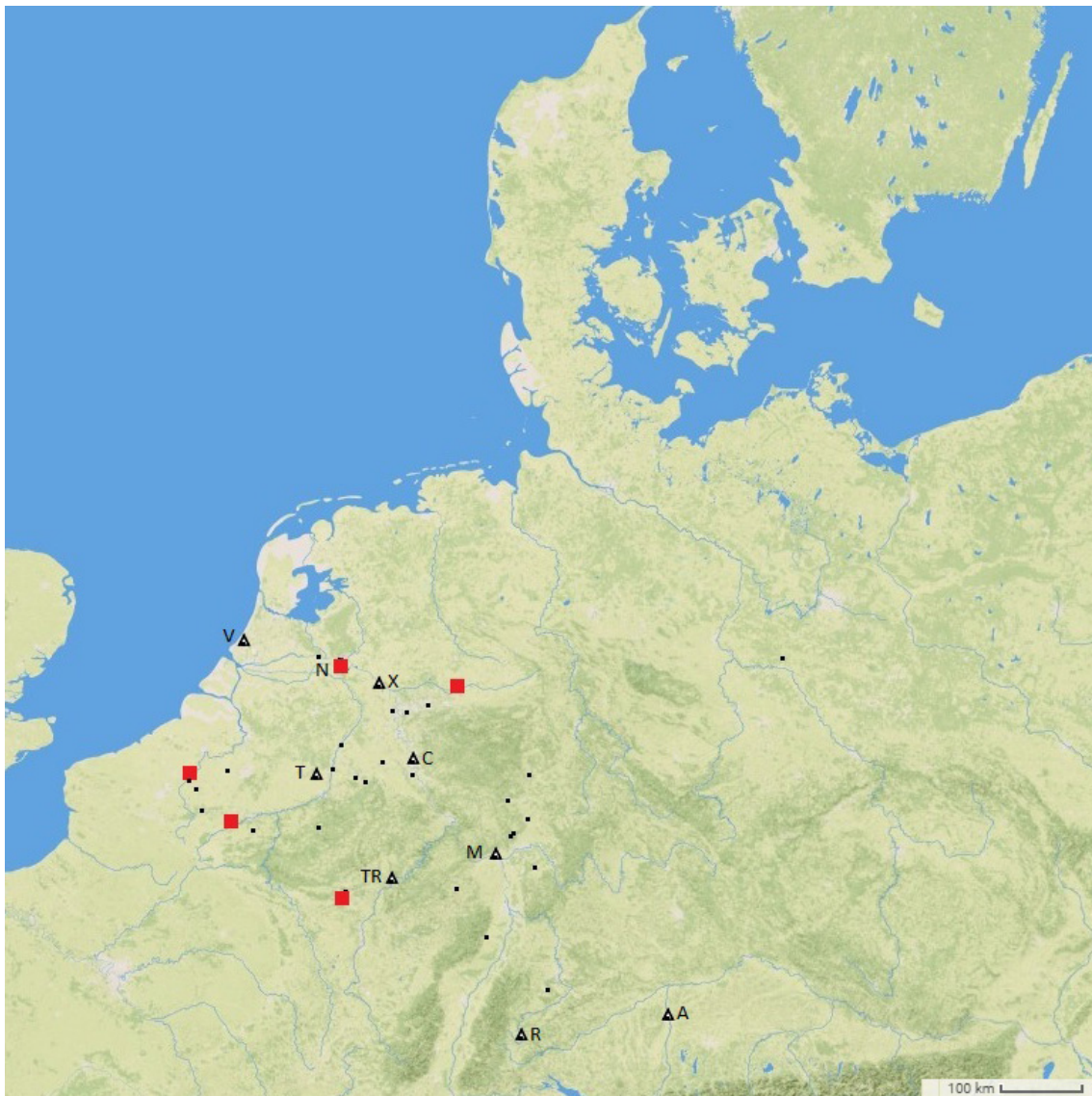


Figure 5.1: All Roman hoards with Iron Age coins.

Red = Mixed Hoards

Black = Iron Age Hoard

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

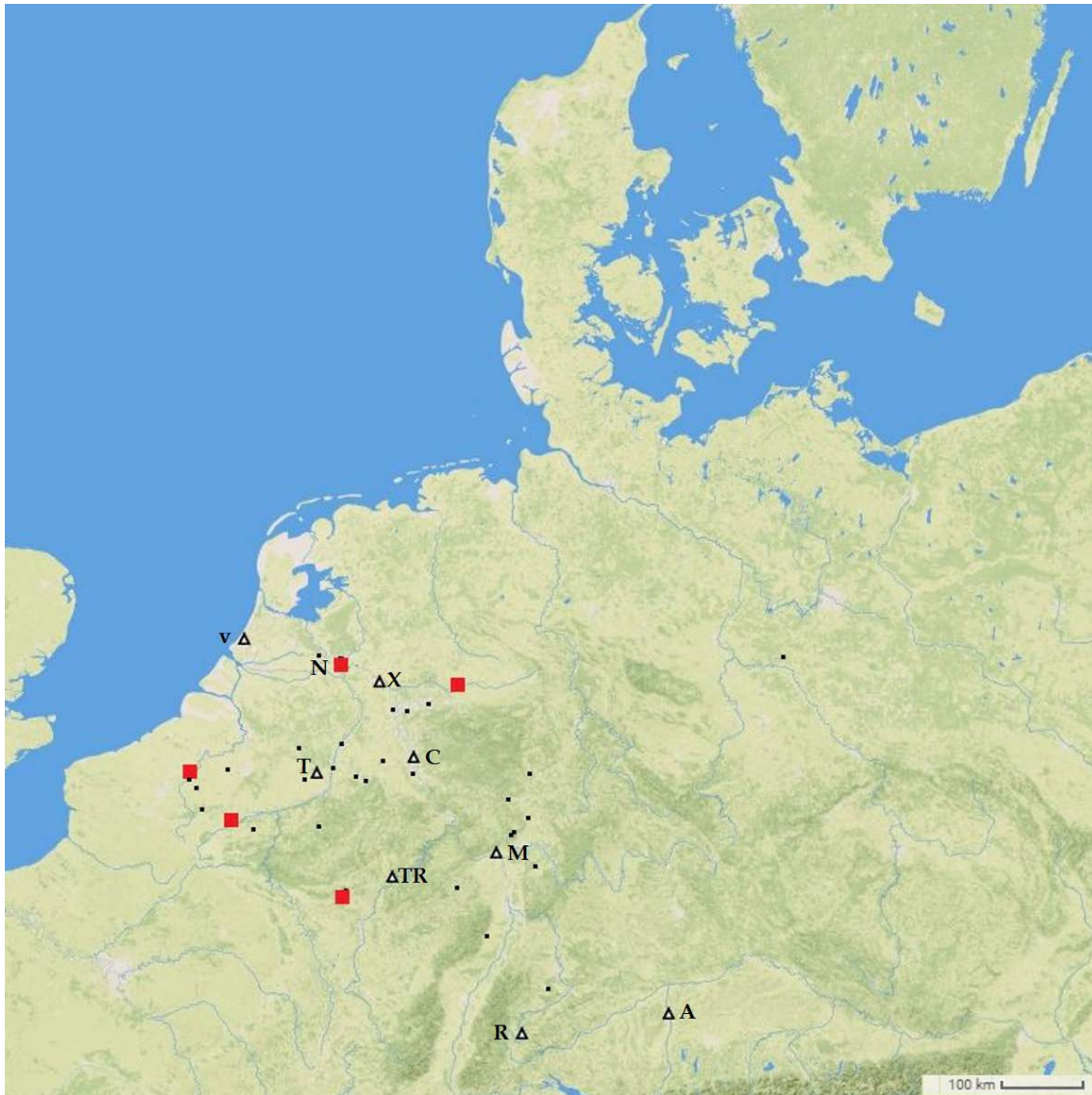


Figure 5.2: Hoards with Iron Age coins.

Red = Roman and Iron Age coins

Black = Iron Age coins

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

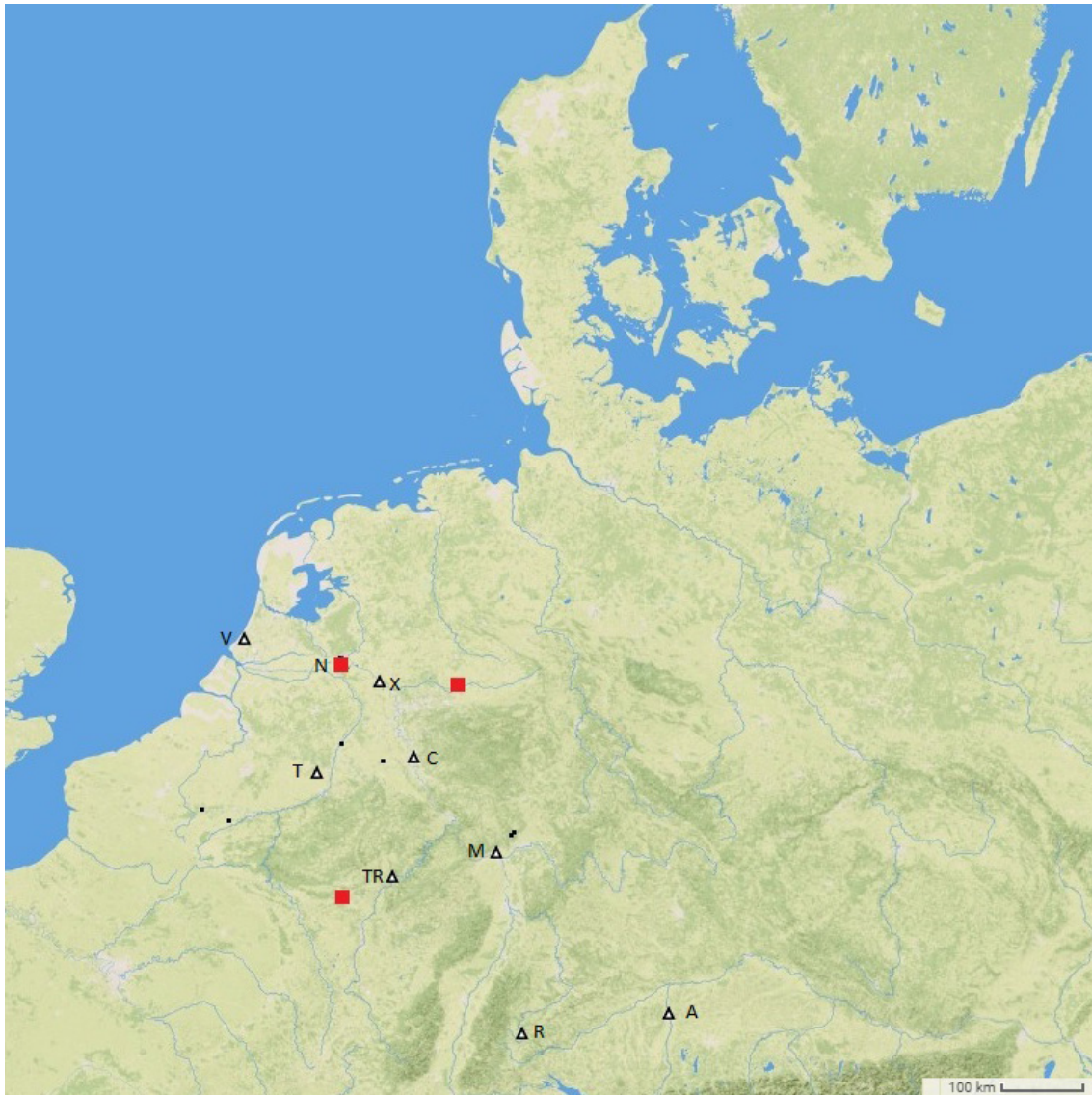


Figure 5.3: Hoards with Iron Age coins in possible Roman contexts.

Red = Military Context

Black = Other Context

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

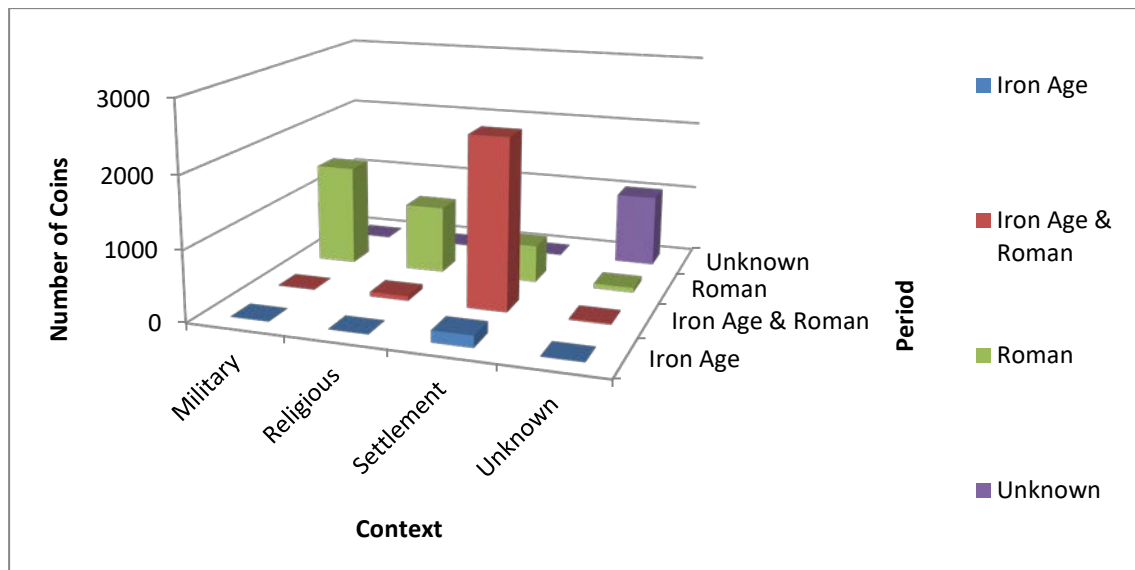


Figure 5.4: Non-hoarded Iron Age coins in Germany and Luxembourg by context by period.

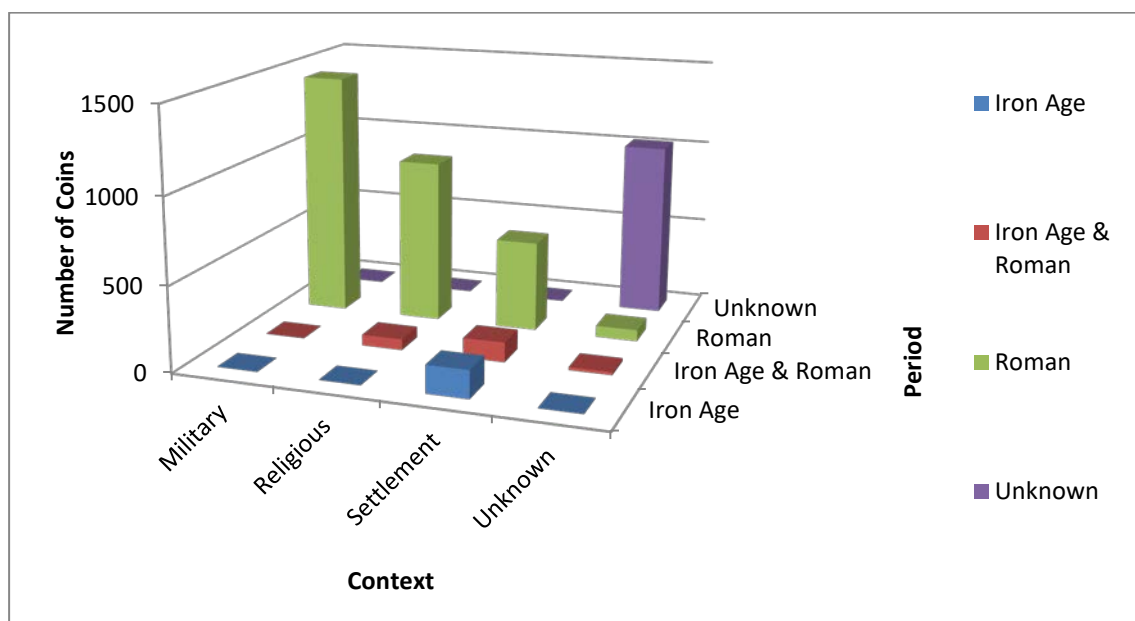


Figure 5.5: Non-hoarded Iron Age Coins in Germany and Luxembourg by context by period, excluding Titelberg.

This allows a useful comparison between figures 5.4 and 5.5 to demonstrate the impact of Titelberg on Iron Age coin-finds by context, by removing an extraordinary site.

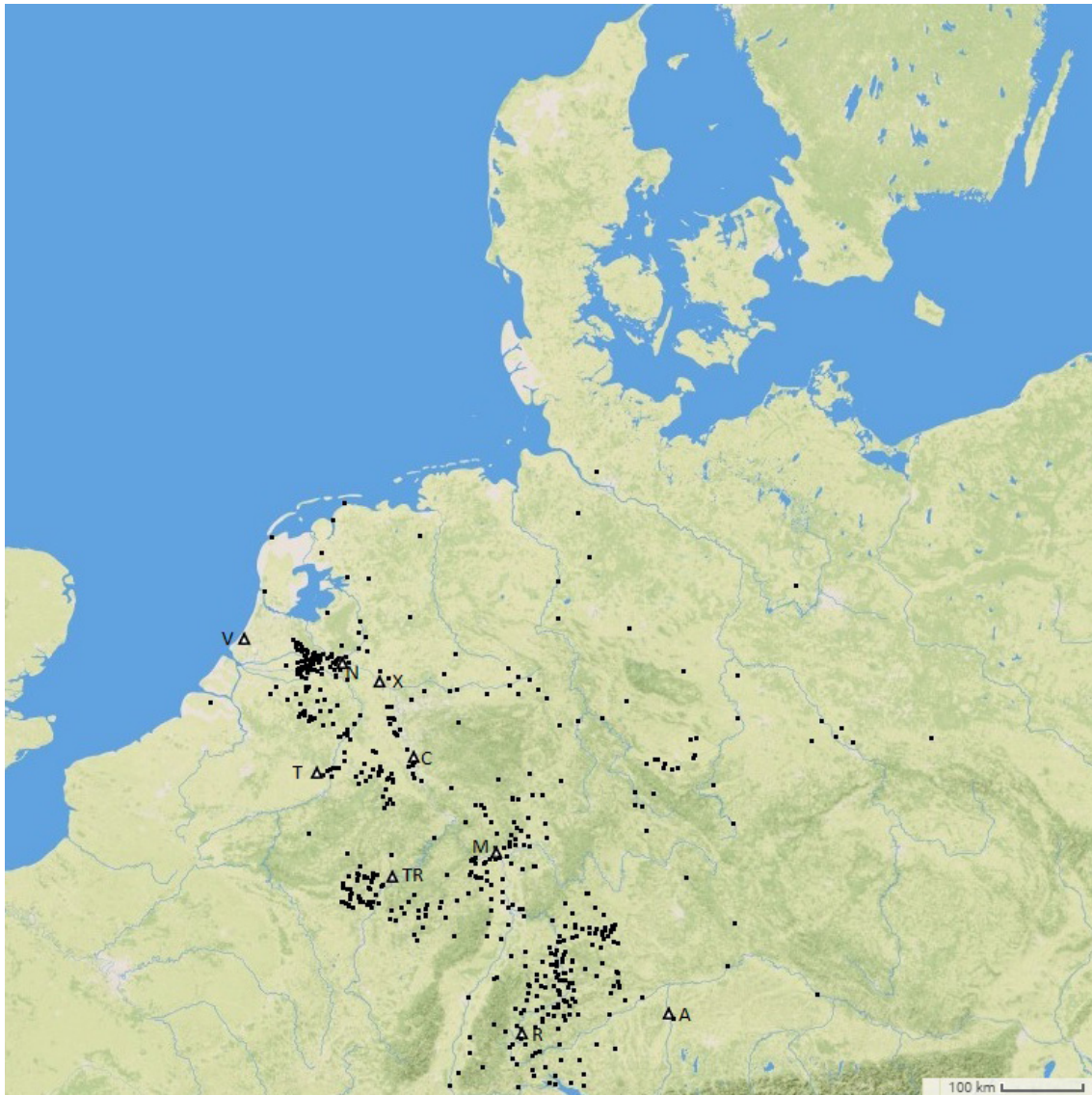


Figure 5.6: Distribution of non-hoarded Iron Age coins, excluding Belgium. Belgium was excluded as the data was not digitised or collected systematically. If included in the distribution map, it would provide a wholly inaccurate overview.

Triangle = Urban Settlements

V = Voorburg
N = Nijmegen
X = Xanten
T = Tongeren
C = Cologne
TR = Trier
M = Mainz
R = Rottweil
A = Augsburg

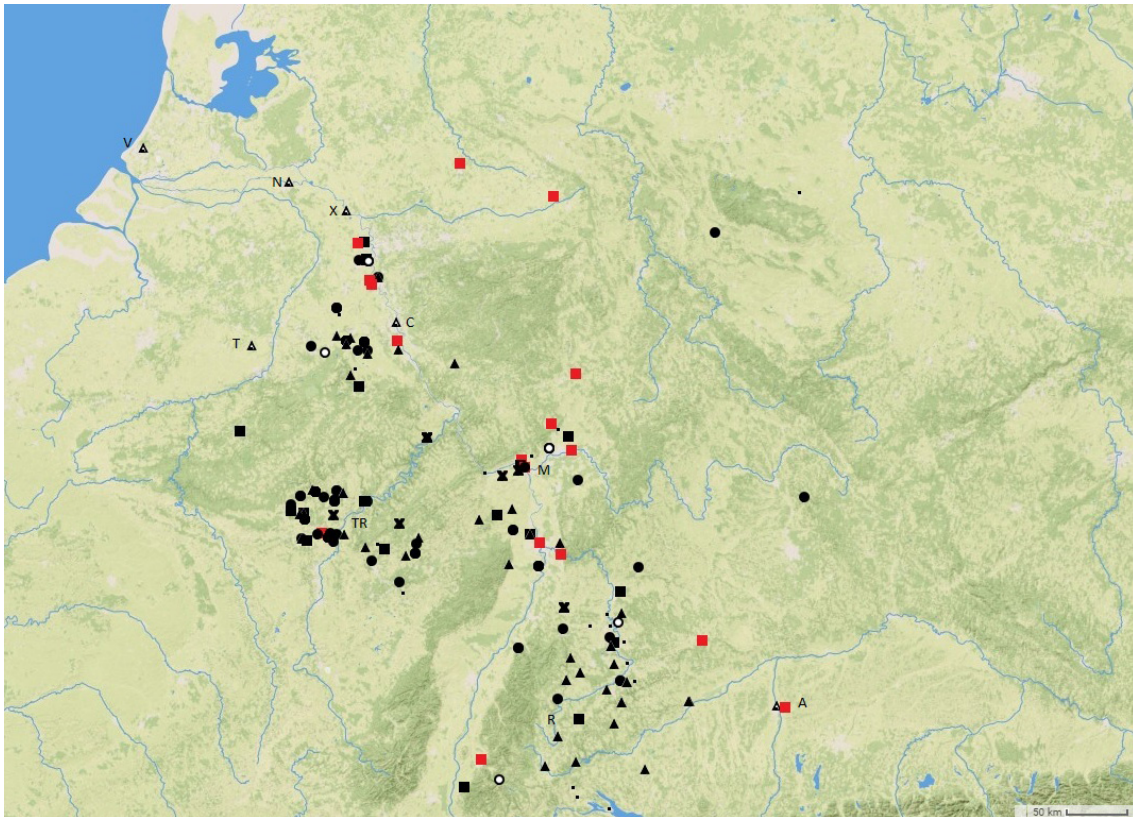


Figure 5.7: Distribution of non-hoarded Iron Age coins in Roman contexts in Luxembourg and Germany.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

Context	Military	Military/Settlement	Other	Religious	Settlement	Villa	Unknown
Symbol	■	○	■	×	●	▲	•

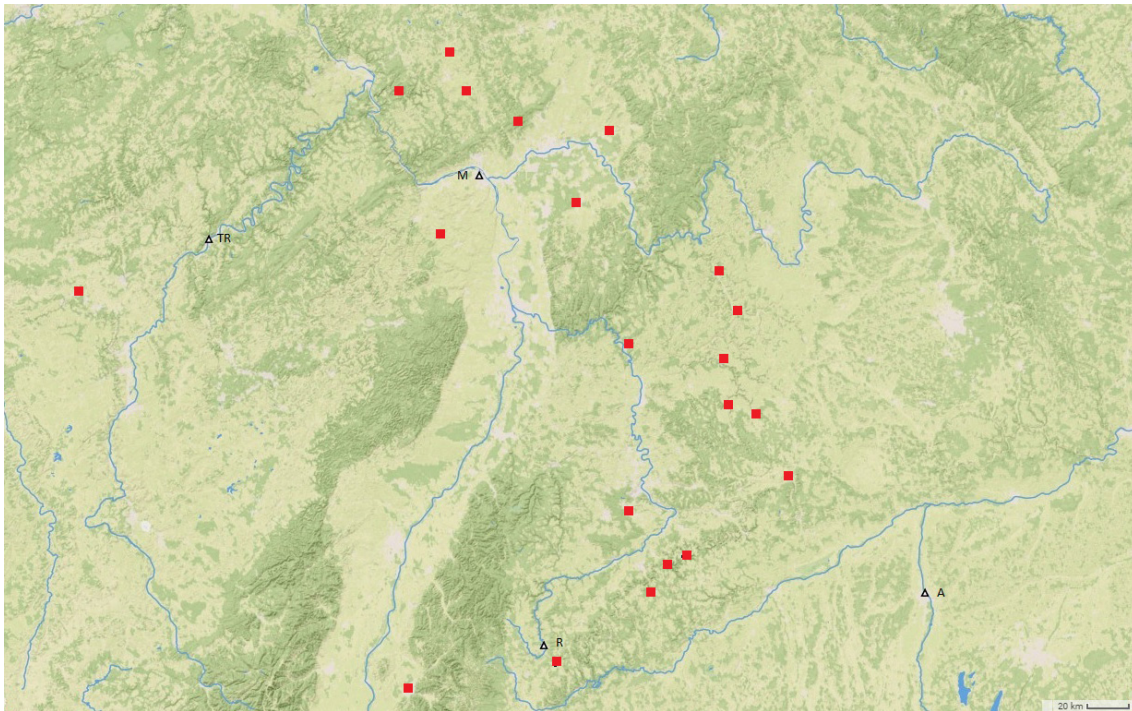


Figure 5.8: Non-hoarded Iron Age coins in Iron Age contexts; focused around Neckar river valley.

Triangle = Urban Settlements

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

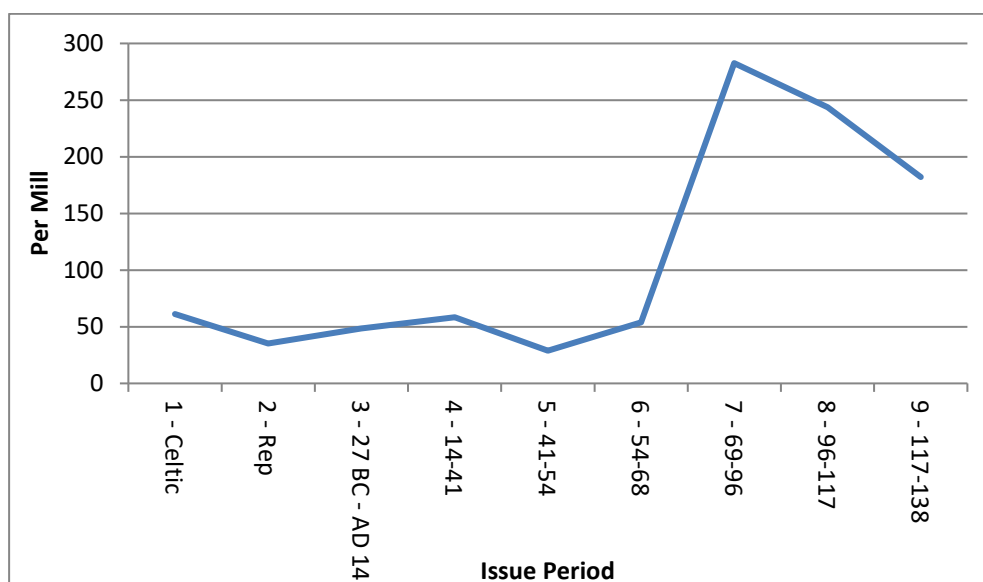


Figure 5.9: Per mill profile of coins with exact issue period, by issue period, in Baden-Württemberg.

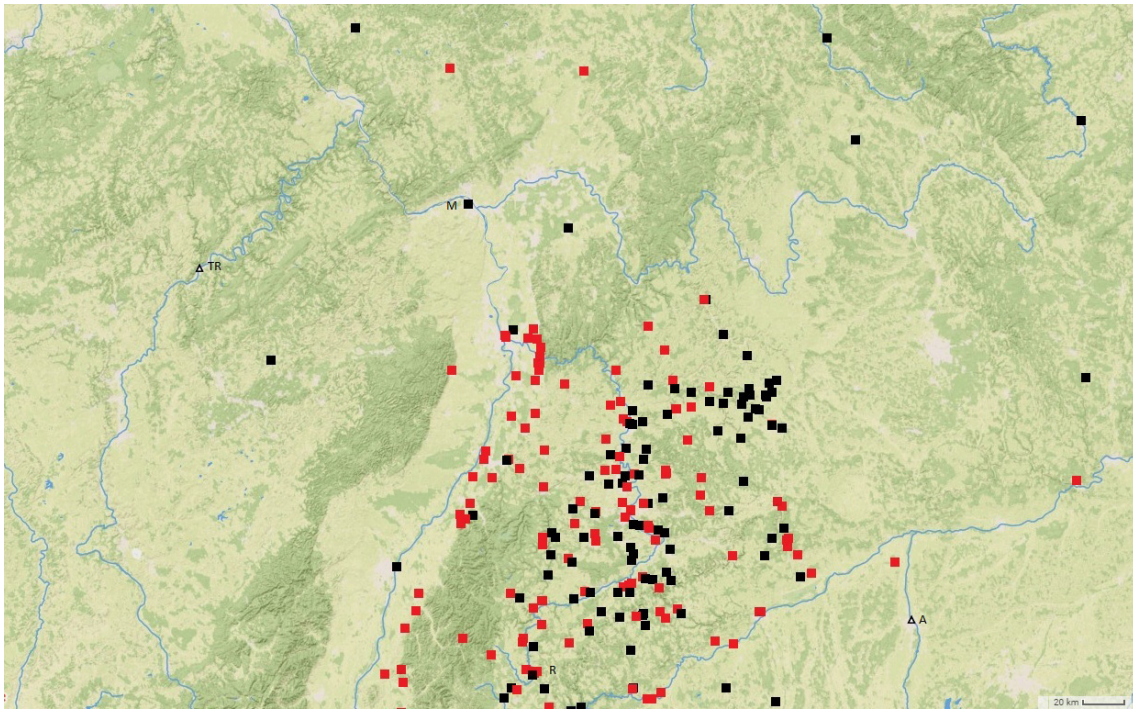


Figure 5.10: Distribution of non-hoarded Iron Age and Domitianic coins by the Neckar valley.

Red = Iron Age

Black = Domitianic

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

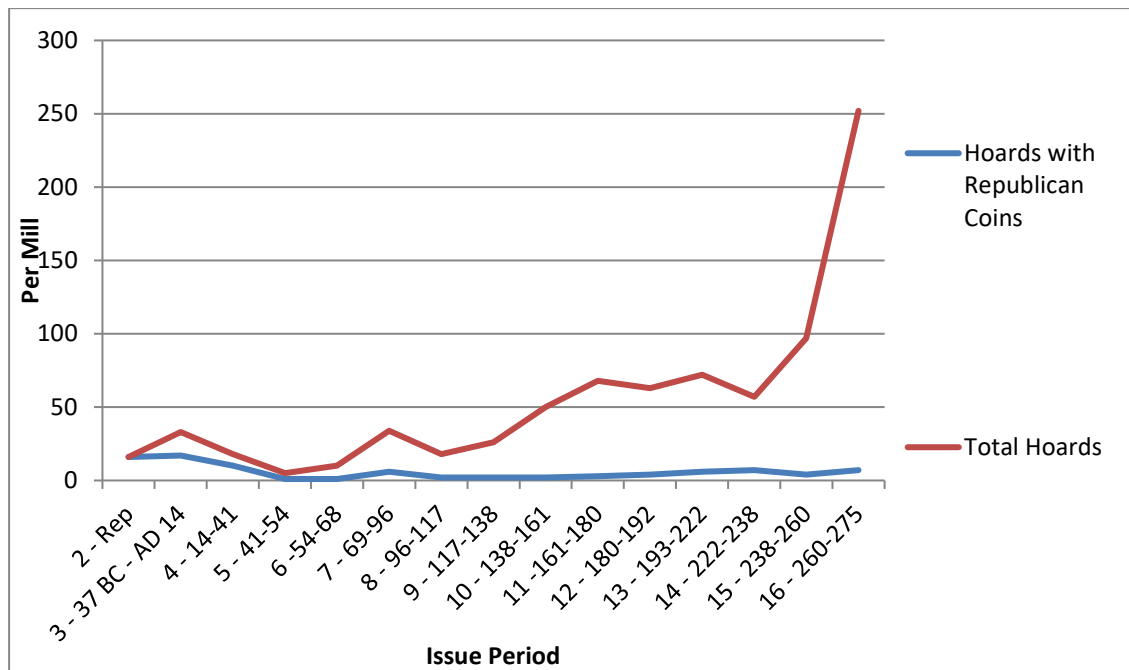


Figure 5.11: Hoards with Republican coins, by closing issue period (First Two Centuries).

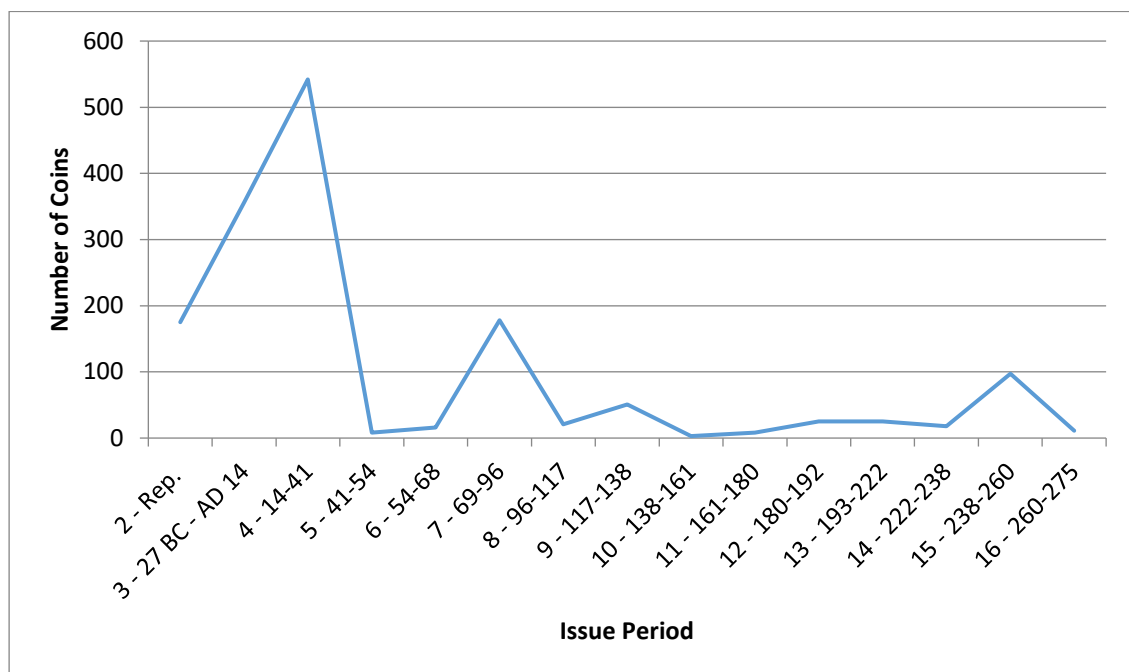


Figure 5.12: Number of hoarded Republican coins by closing issue period of hoard.

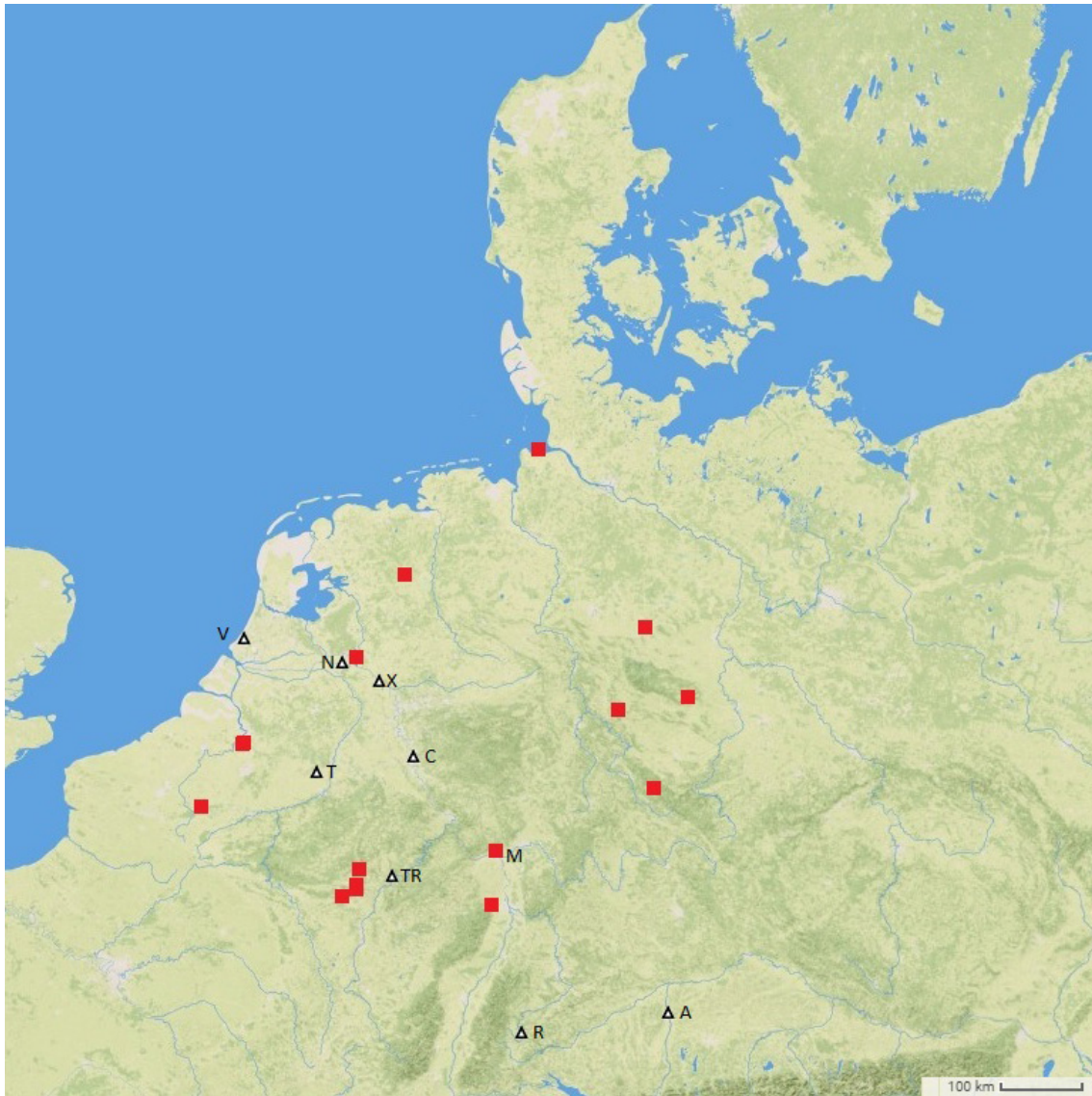


Figure 5.13: Distribution of hoards with Republican coins, closing with coins from Issue Period 2 (Republic).

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg



Figure 5.14: Distribution of non-hoarded Republican coins.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

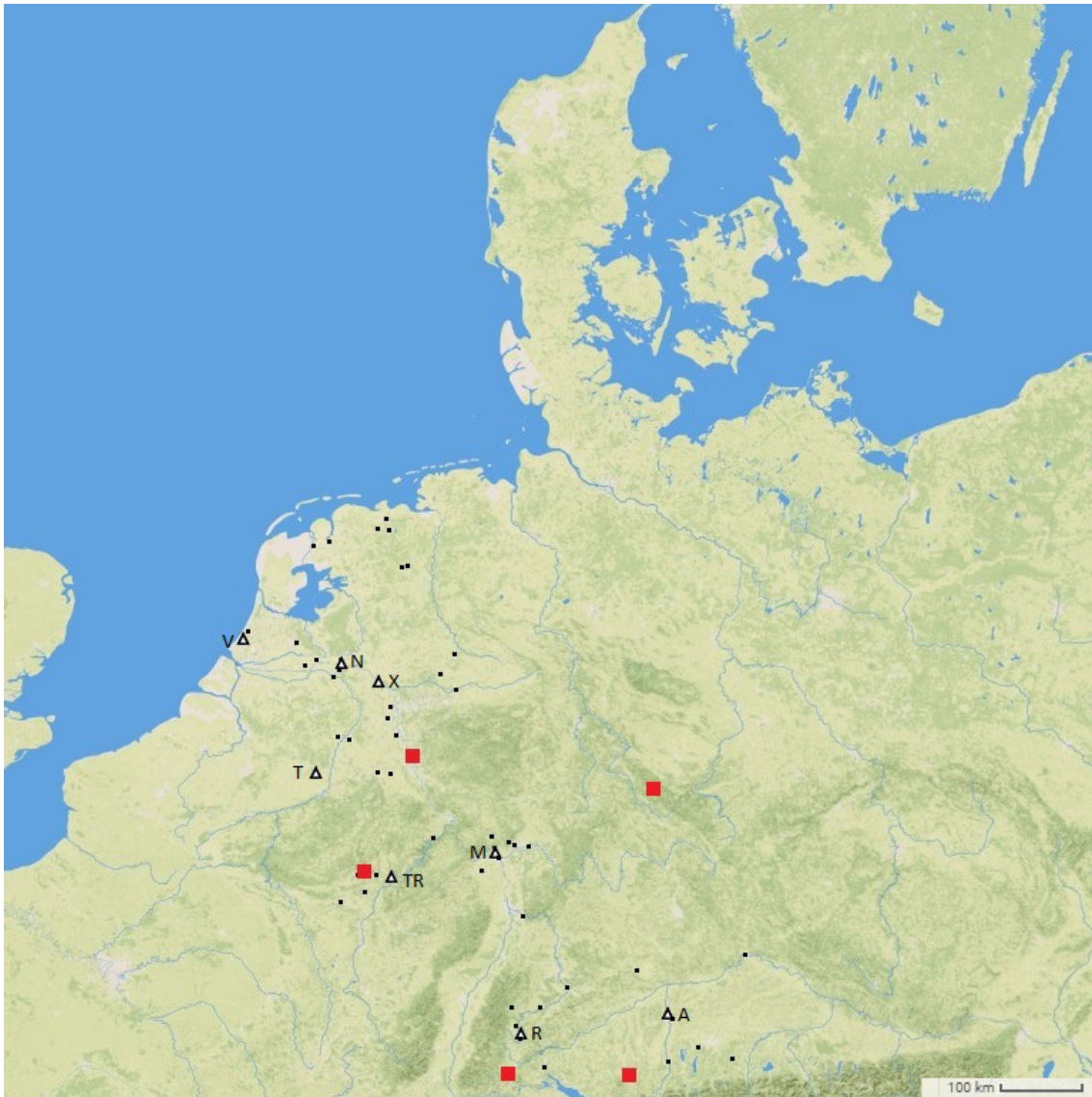


Figure 5.15: Distribution of Augustan coinage issued before 15 BC, showing pre-campaign coin distribution.

Red = Hoards with Augustan coinage closing 15 BC or earlier

Black = Non-hoarded coins

Belgium was excluded as the collected data did not contain dated coins fitting the dating scheme applied.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

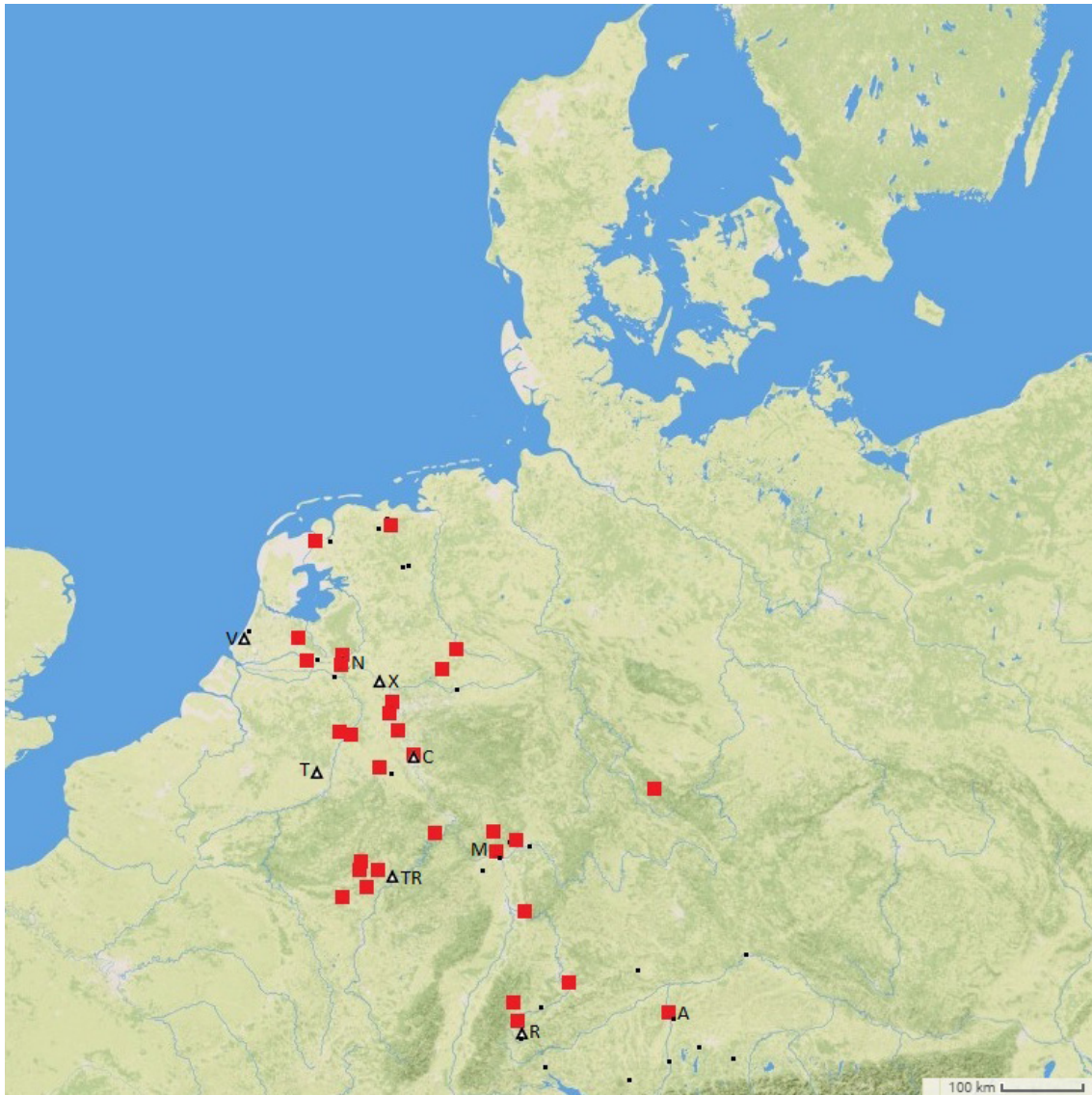


Figure 5.16: Distribution of non-hoarded Augustan coinage issued before 15 BC, showing pre-campaign coin distribution.

Red = High denomination

Black = Low denomination

Belgium was excluded as the collected data did not contain dated coins fitting the dating scheme applied.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg



Figure 5.17: Distribution of non-hoarded Augustan coins, dated to the period 15-9 BC, showing Drusus campaign coin distribution.

Belgium was excluded as the collected data did not contain dated coins fitting the dating scheme applied.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg



Figure 5.18: Distribution of non-hoarded Augustan coins, dated to the period 9 BC – AD 9, showing post-Drusus and pre-Kalkriese campaign coin distribution.

Belgium was excluded as the collected data did not contain dated coins fitting the dating scheme applied.

Triangle = Urban Settlements

V = Voorburg
N = Nijmegen
X = Xanten
T = Tongeren
C = Cologne
TR = Trier
M = Mainz
R = Rottweil
A = Augsburg



Figure 5.19: Distribution of non-hoarded Augustan coins, dated to the period AD 9-14, showing post Kalkriese coin distribution.

Belgium was excluded as the collected data did not contain dated coins fitting the dating scheme applied.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

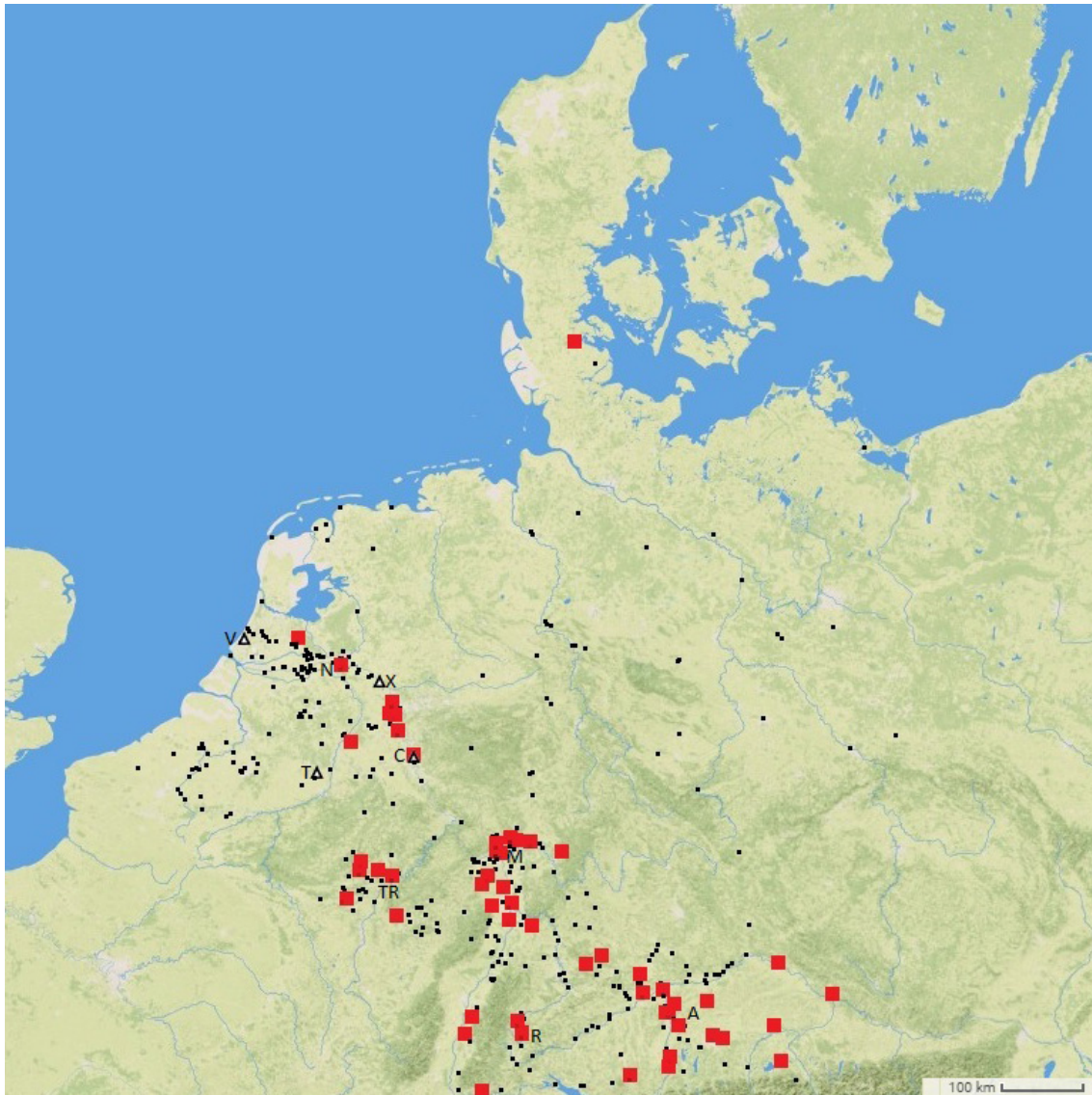


Figure 5.20: Distribution of non-hoarded Tiberian coins, emphasizing withdrawal of campaign activity.

Red = Certainly dated to AD 14-16

Black = All other Tiberian coins

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

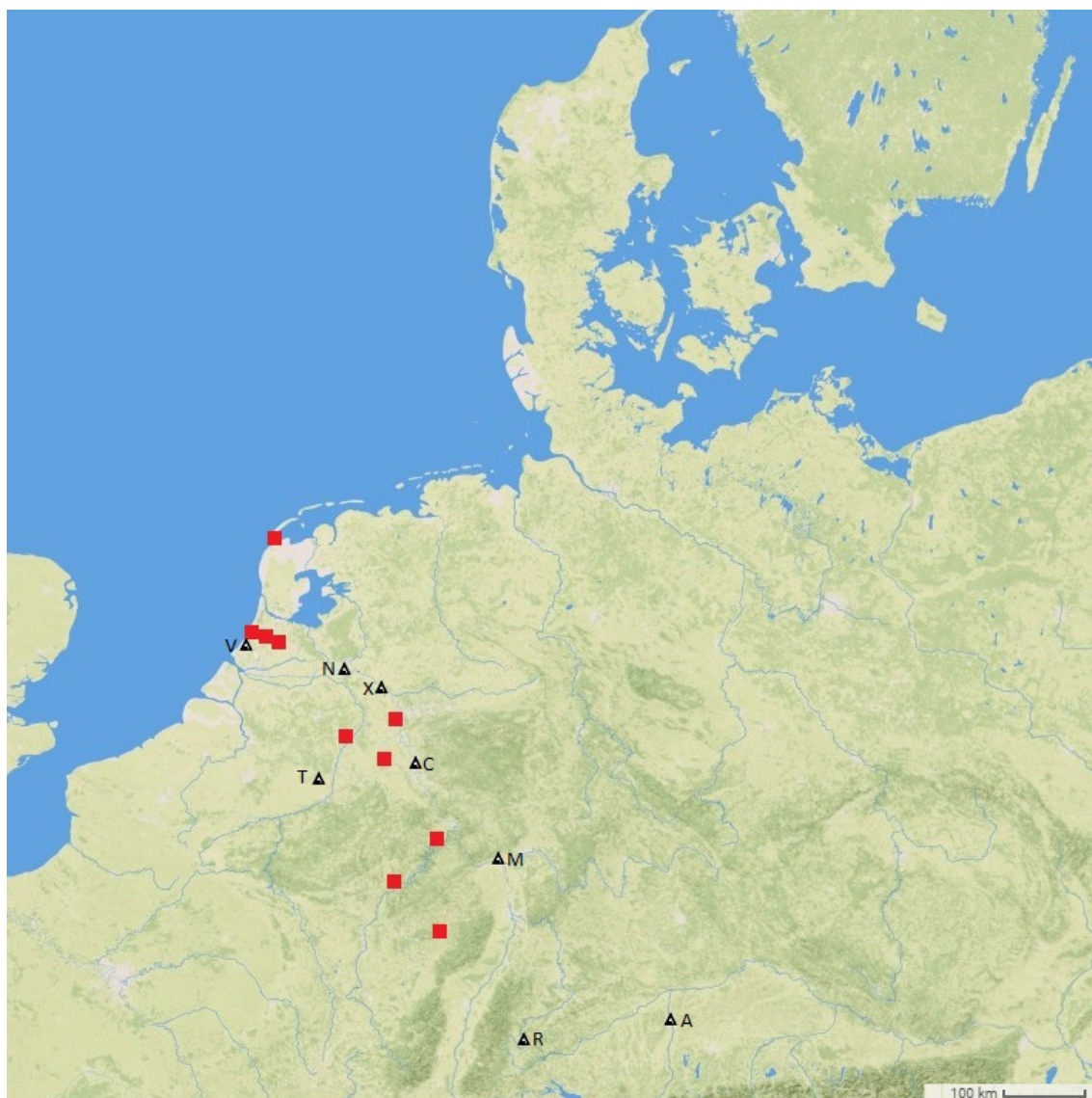


Figure 5.21: Non-hoarded Tiberian high value coins, issued AD 33-37.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

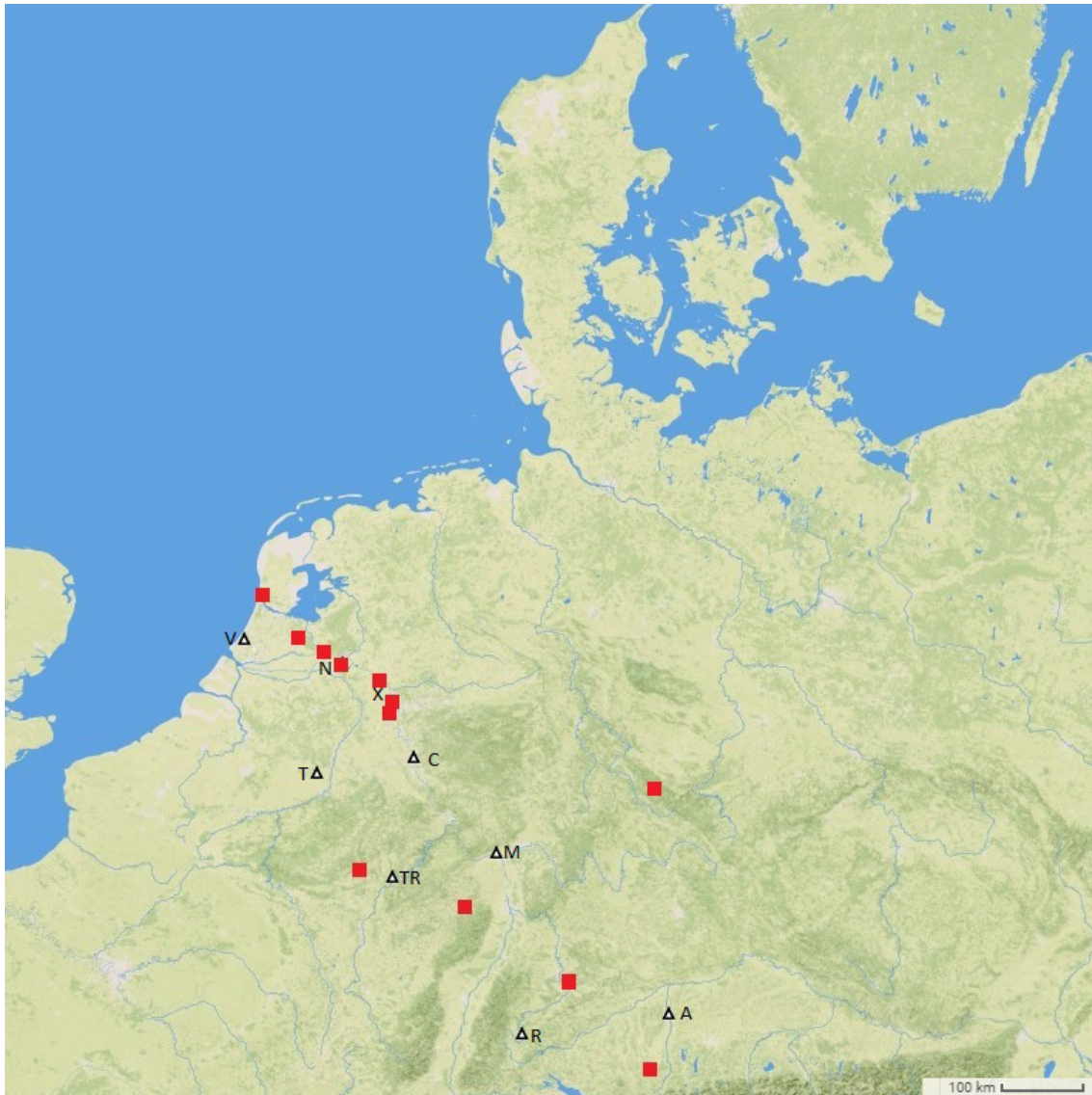


Figure 5.22: Distribution of high value non-hoarded coins issued by Caligula.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

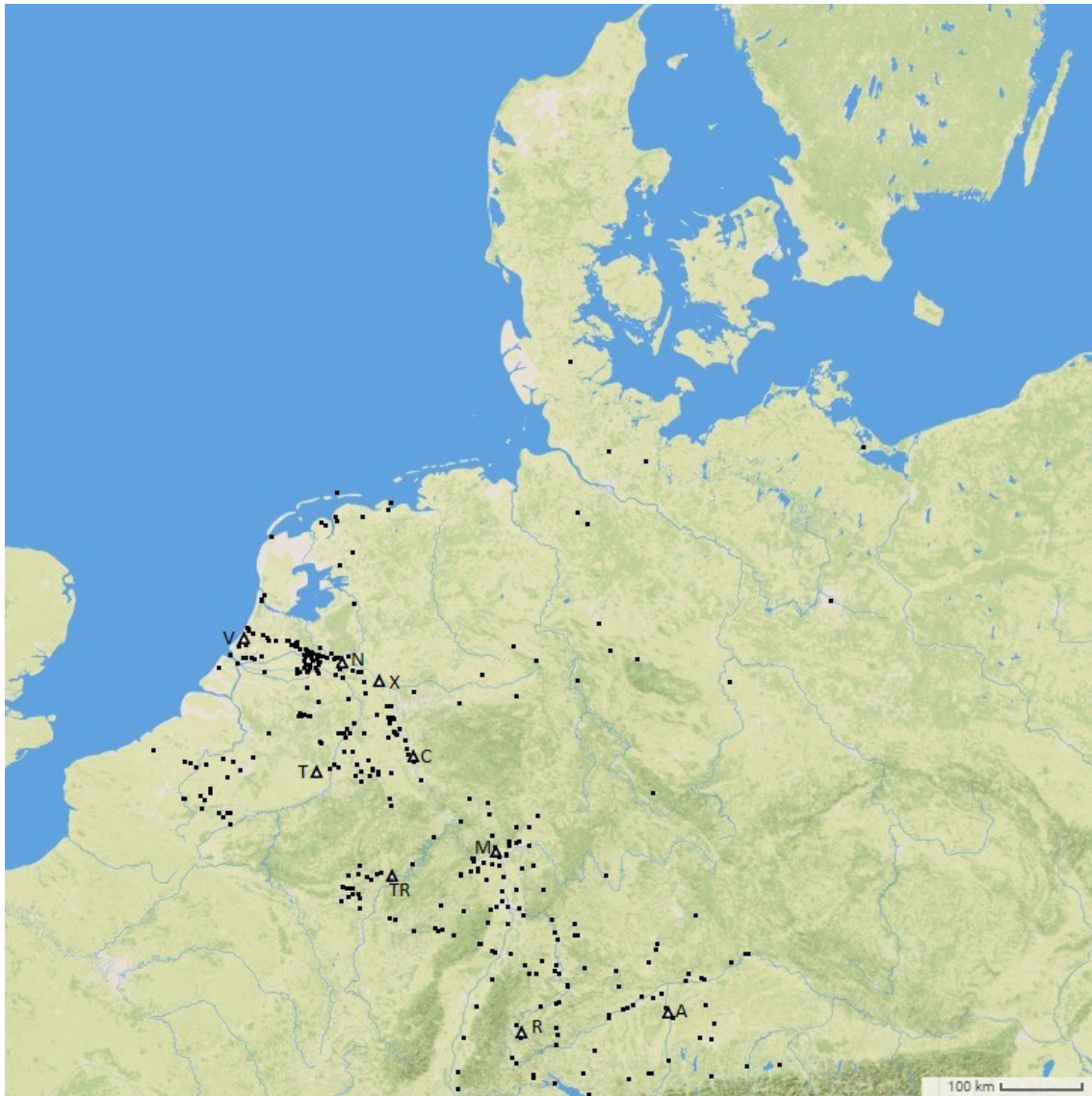


Figure 5.23: Distribution of non-hoarded coins issued by Caligula.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg



Figure 5.24: Distribution of non-hoarded coins issued by Claudius.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

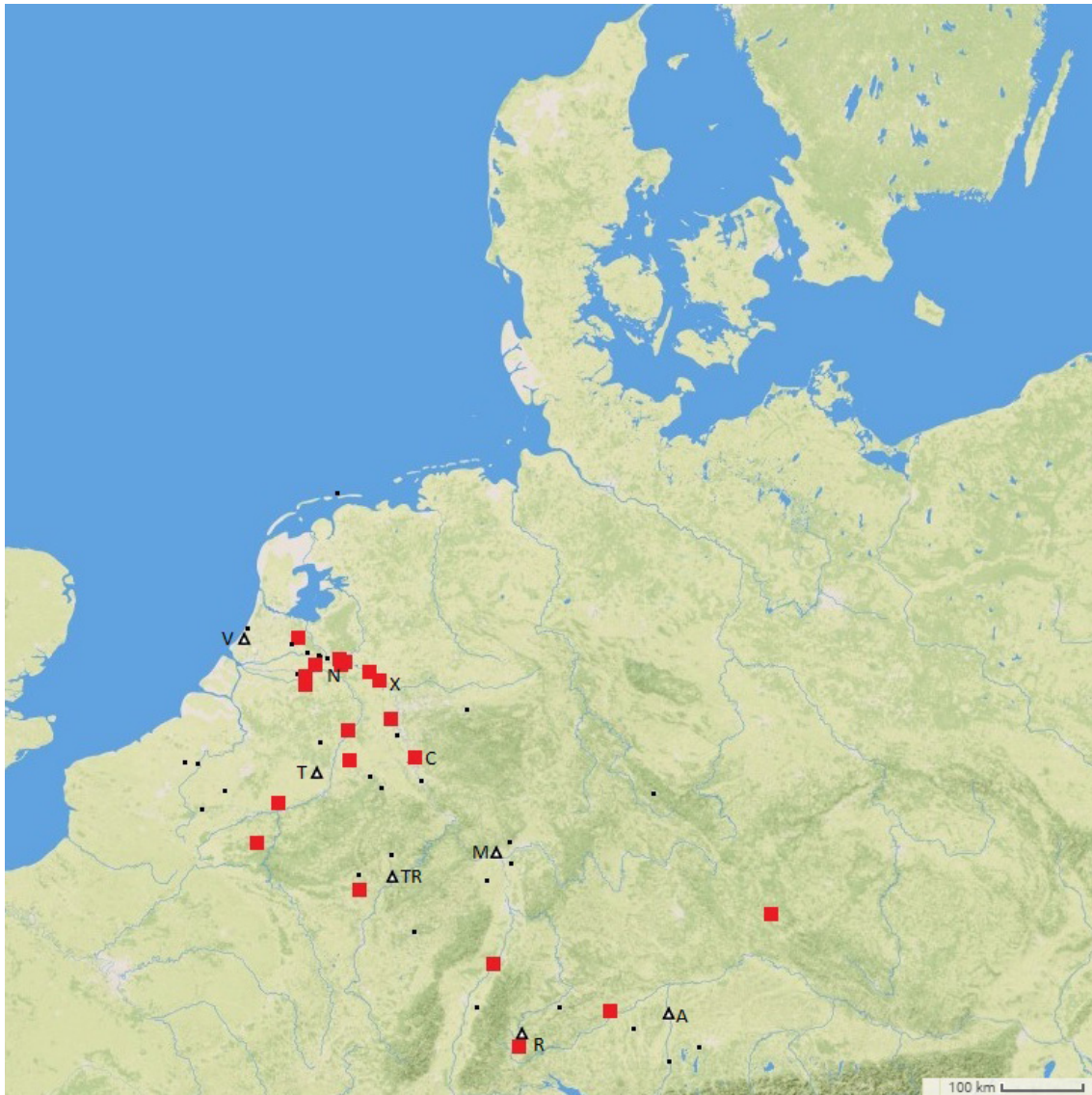


Figure 5.25: Distribution of non-hoarded high value coins issued by Claudius.

Red = Gold

Black = Silver

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg



Figure 5.26: Distribution of non-hoarded sestertii issued by Claudius.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg



Figure 5.27: Distribution of non-hoarded asses and dupondii issued by Claudius.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg



Figure 5.28: Distribution of non-hoarded imitational coins from issue period 5 (AD 41-54).

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg



Figure 5.29: Distribution of non-hoarded gold coins issue period 6 (AD 54-68).

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

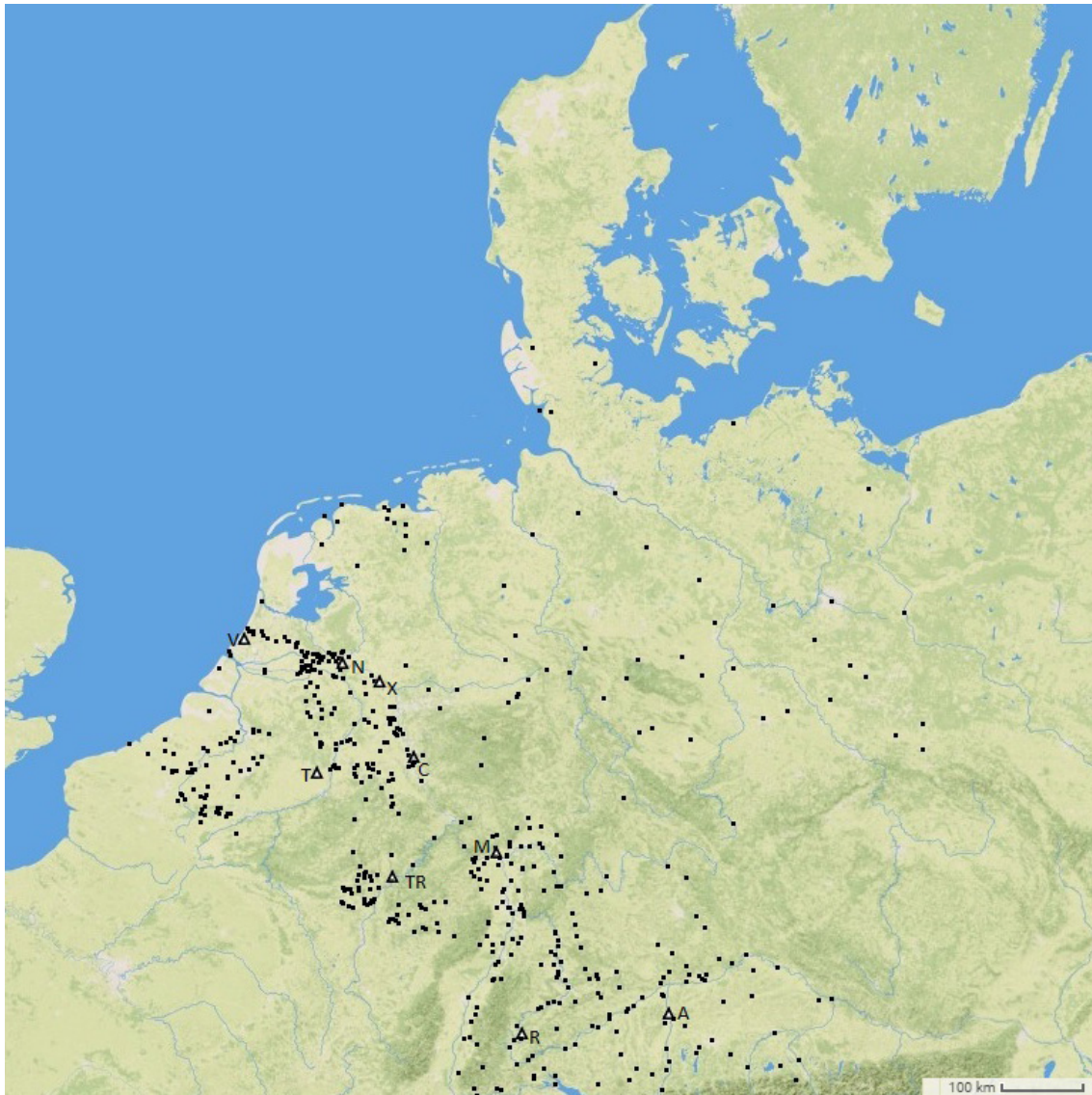


Figure 5.30: Distribution of non-hoarded low-value coins issue period 6 (AD 54-68).

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

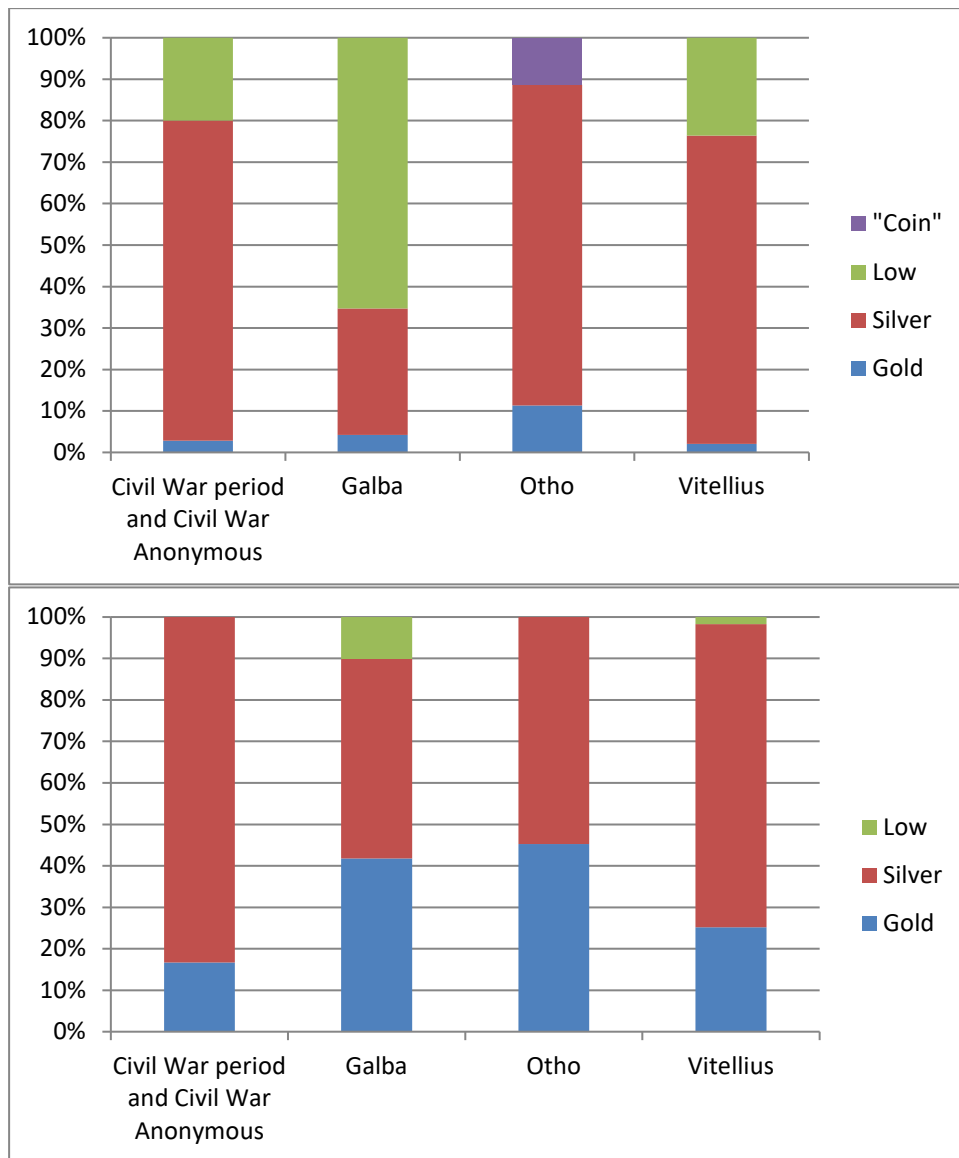


Figure 5.31: Percentage composition of coins issued during the civil war (AD 68/69); non-hoarded (top) and hoarded (bottom).

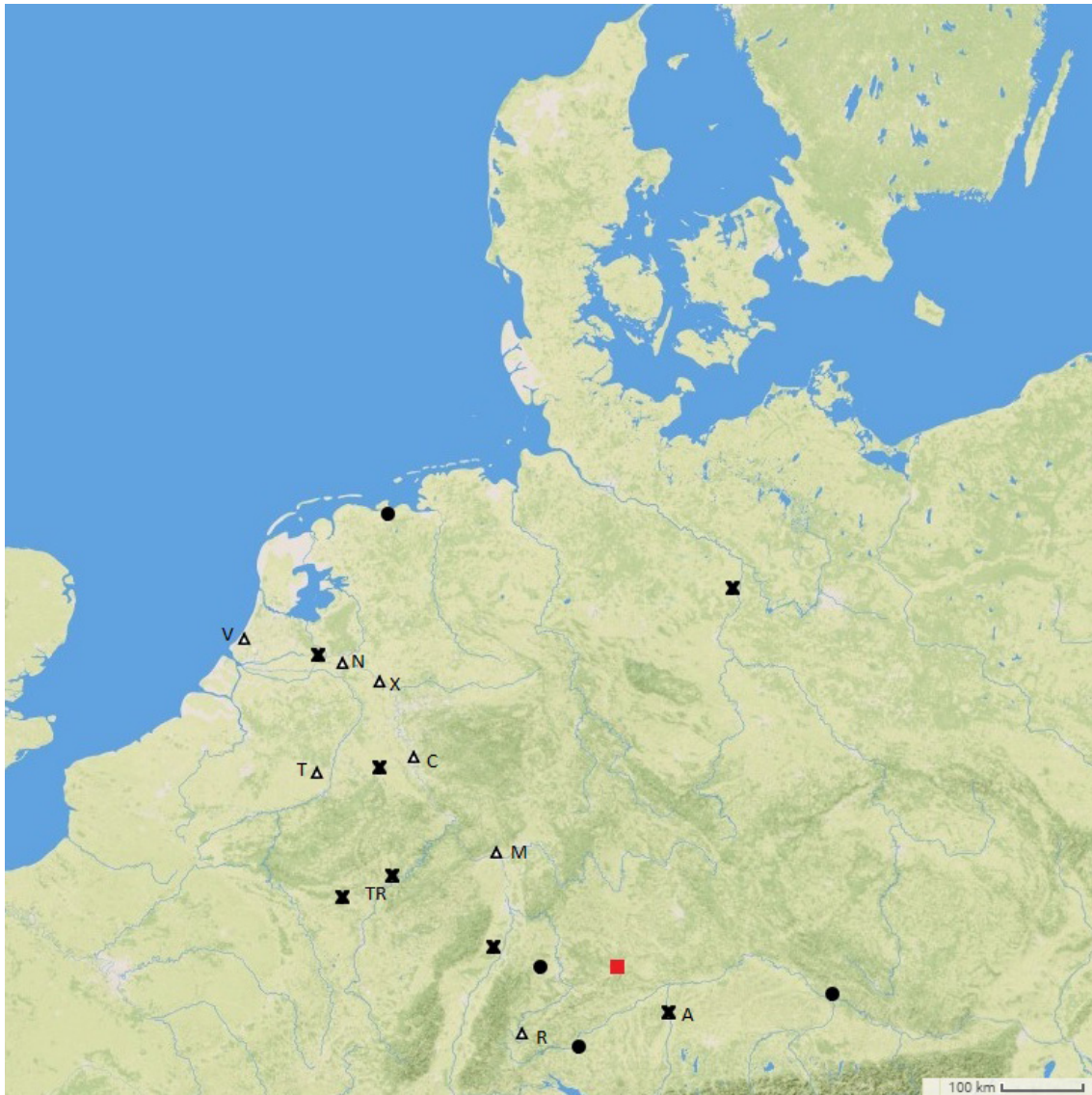


Figure 5.32: Distribution of coins Issued by Vespasian in the East.

Red = Aureus

Cross = Denarius

Circle = RPC

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

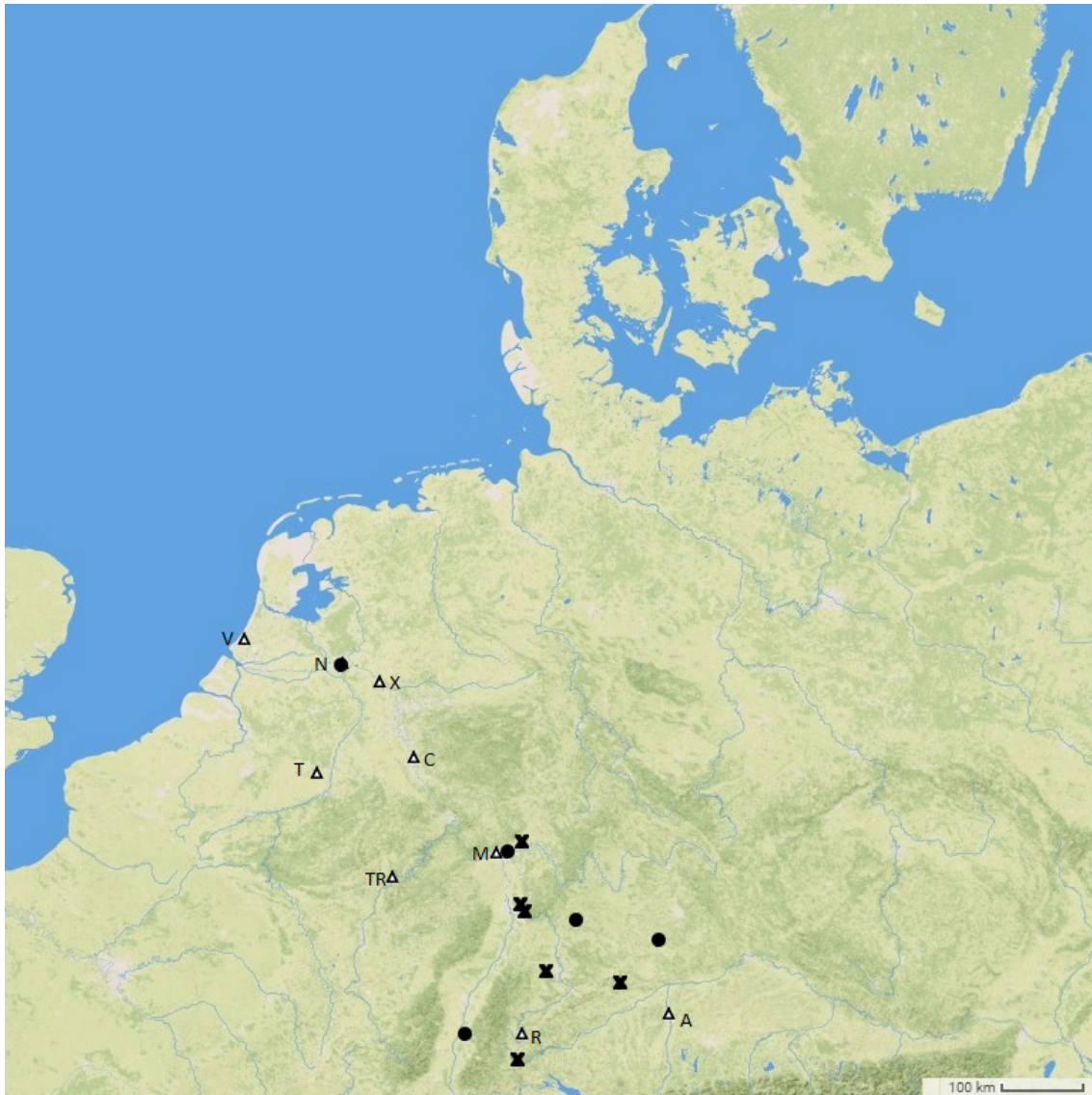


Figure 5.33: Distribution of provincial coins issued by Nero and Domitian.

Cross = Nero

Circle = Domitian

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

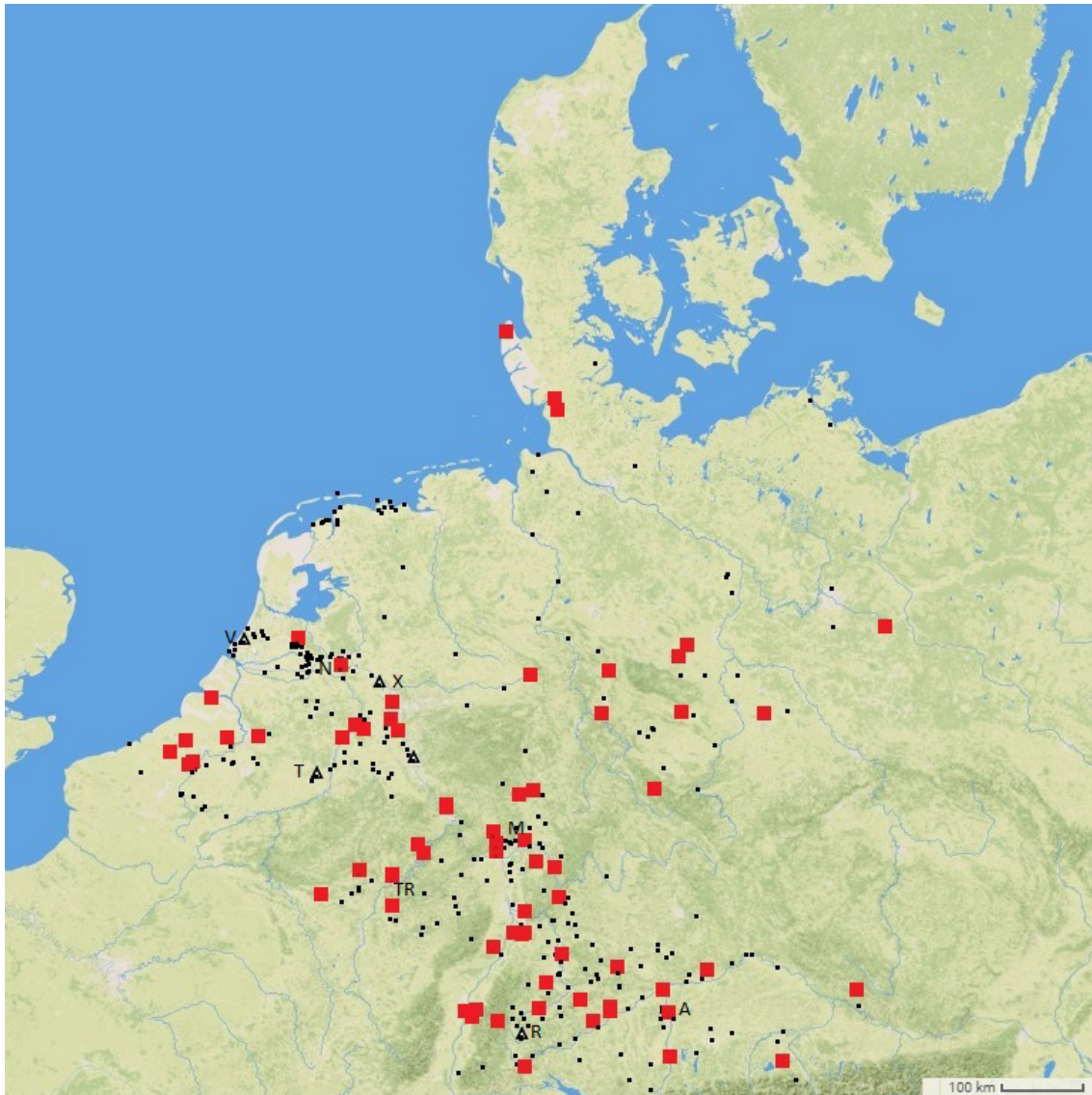


Figure 5.34: Distribution of non-hoarded Vespasianic gold and silver.

Red = Gold

Black = Silver

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

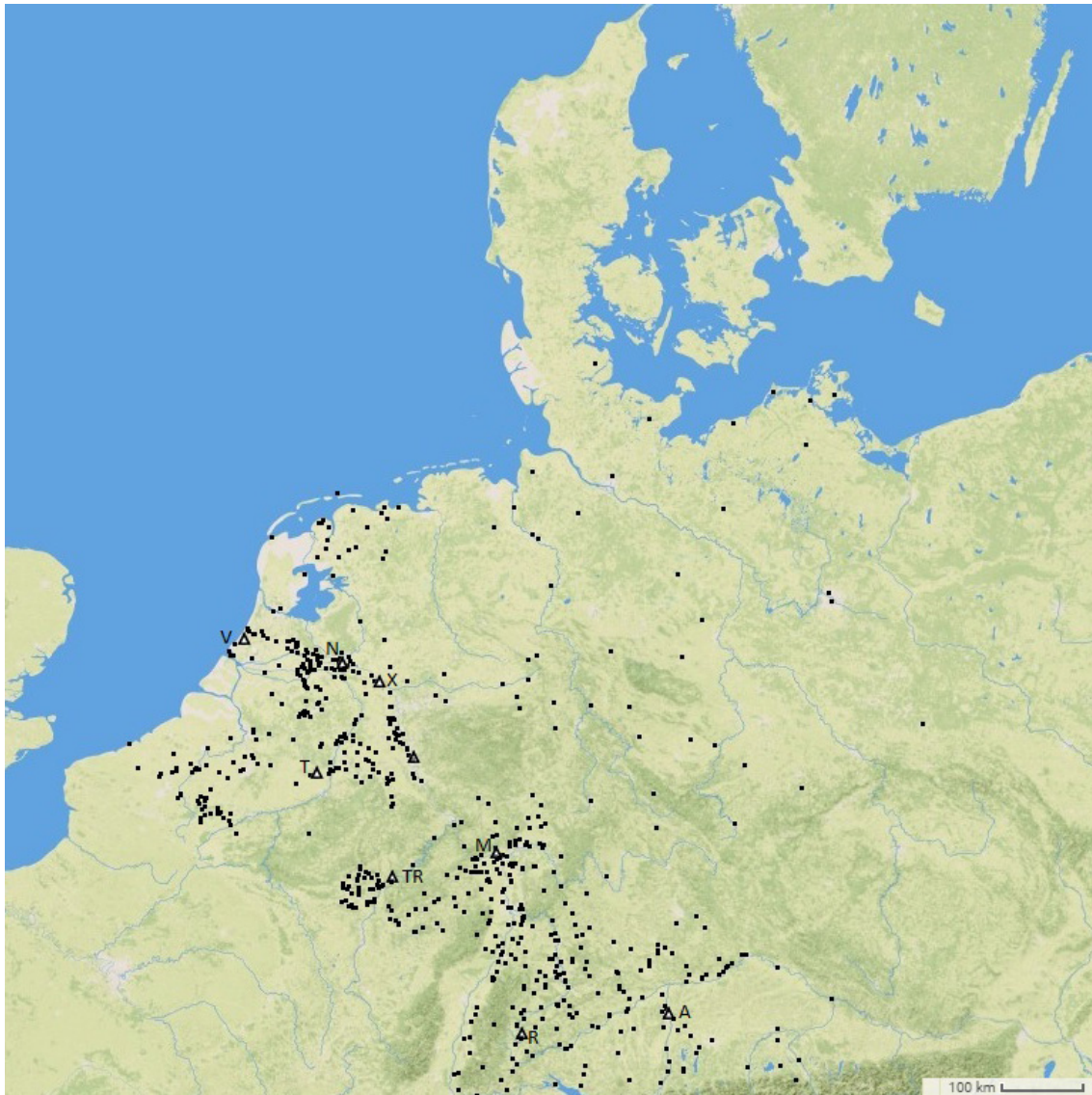


Figure 5.35: Distribution of non-hoarded lower denominational coins issued by Domitian.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

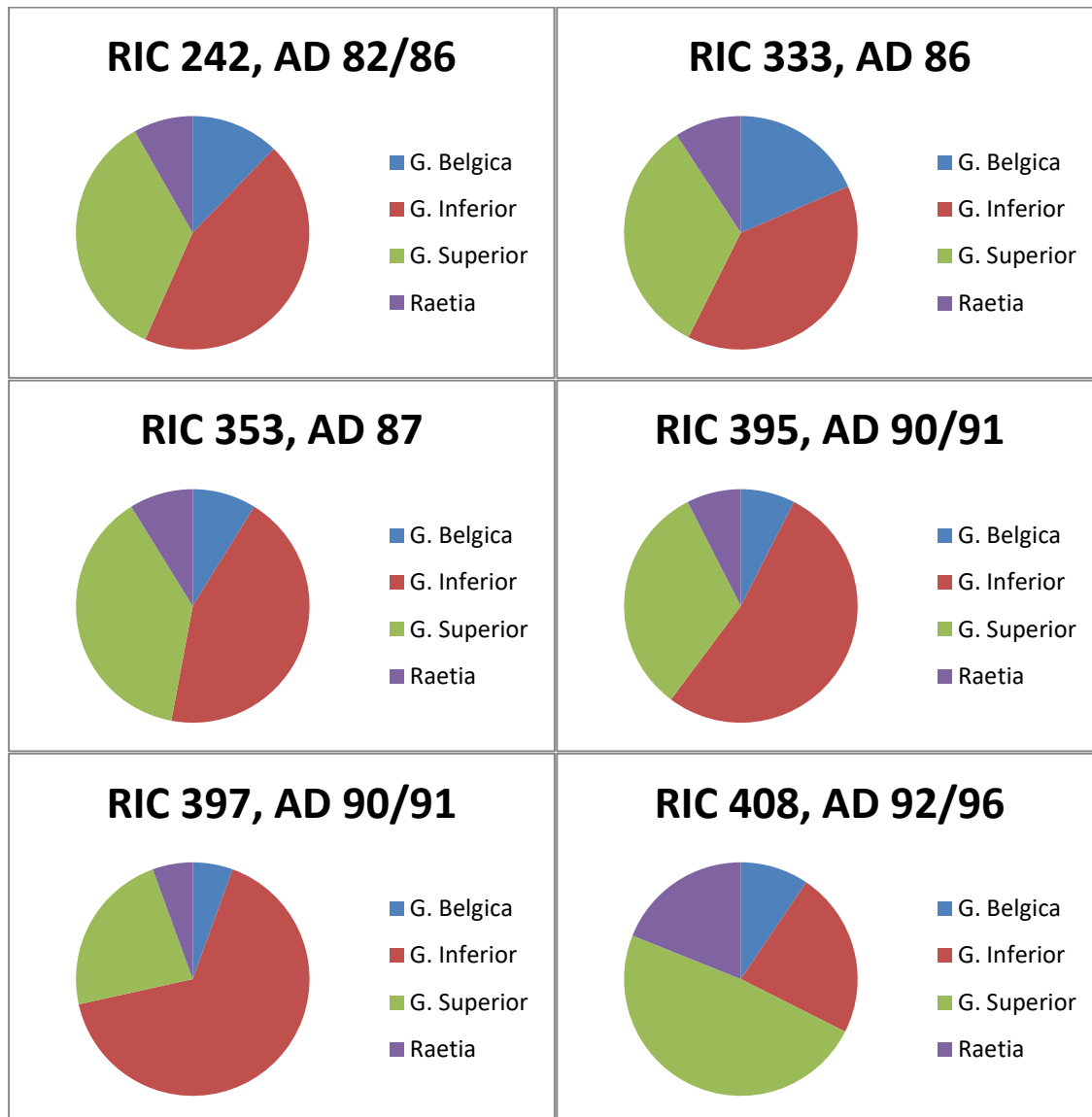


Figure 5.36: Proportion of non-hoarded coin issued by Domitian, by province, by RIC type.



Figure 5.37: Distribution of non-hoarded RIC 242 (AD 82/84), issued by Domitian.

Triangle = Urban Settlements

V = Voorburg
N = Nijmegen
X = Xanten
T = Tongeren
C = Cologne
TR = Trier
M = Mainz
R = Rottweil
A = Augsburg

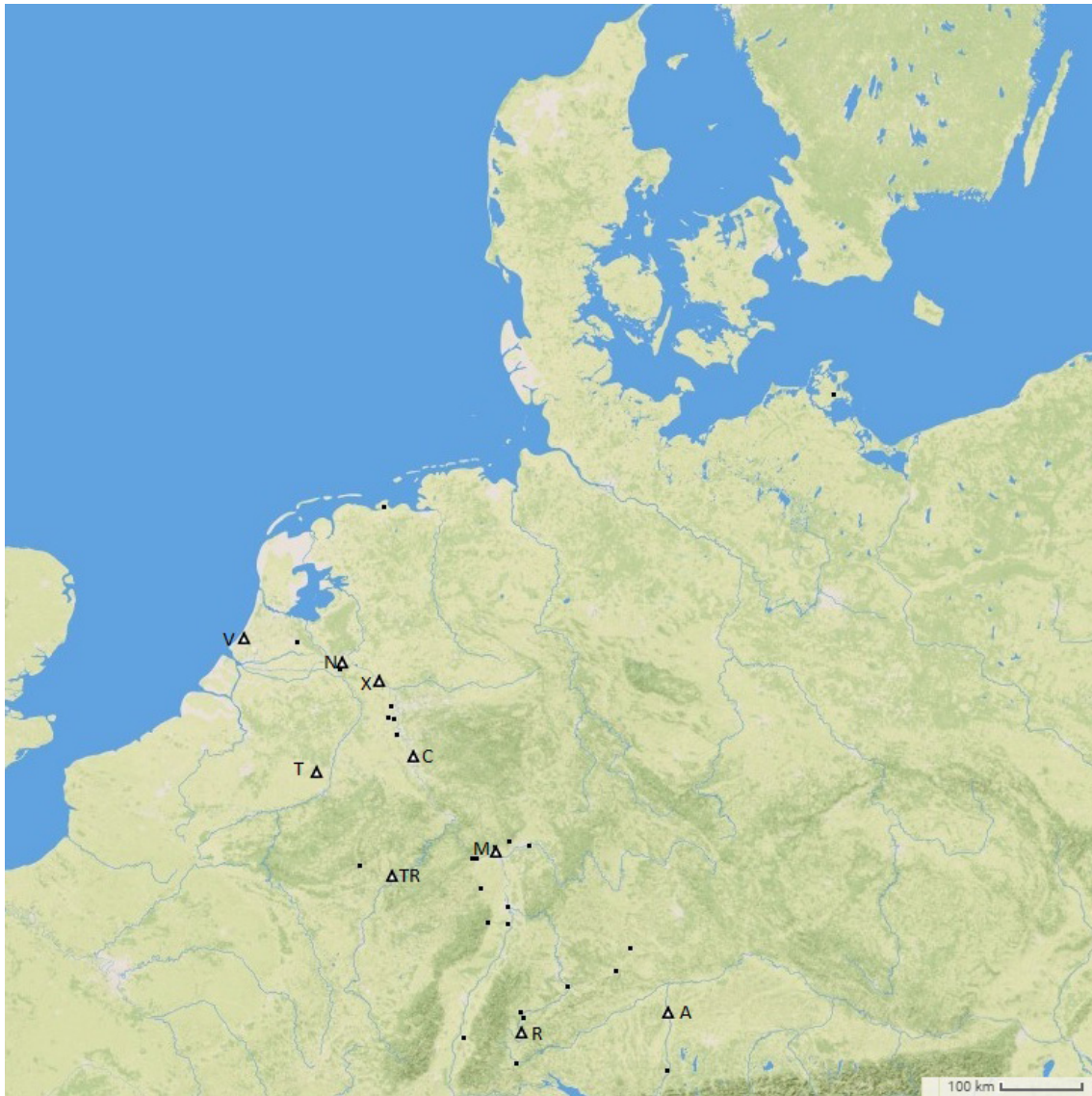


Figure 5.38: Distribution of non-hoarded RIC 333 (AD 86), issued by Domitian.

Triangle = Urban Settlements

V = Voorburg
N = Nijmegen
X = Xanten
T = Tongeren
C = Cologne
TR = Trier
M = Mainz
R = Rottweil
A = Augsburg



Figure 5.39: Distribution of non-hoarded RIC 353 (AD 87), issued by Domitian.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg



Figure 5.40: Distribution of non-hoarded RIC 395 (AD 90/91), issued by Domitian.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg



Figure 5.41: Distribution of non-hoarded RIC 397 (AD 90/91), issued by Domitian.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

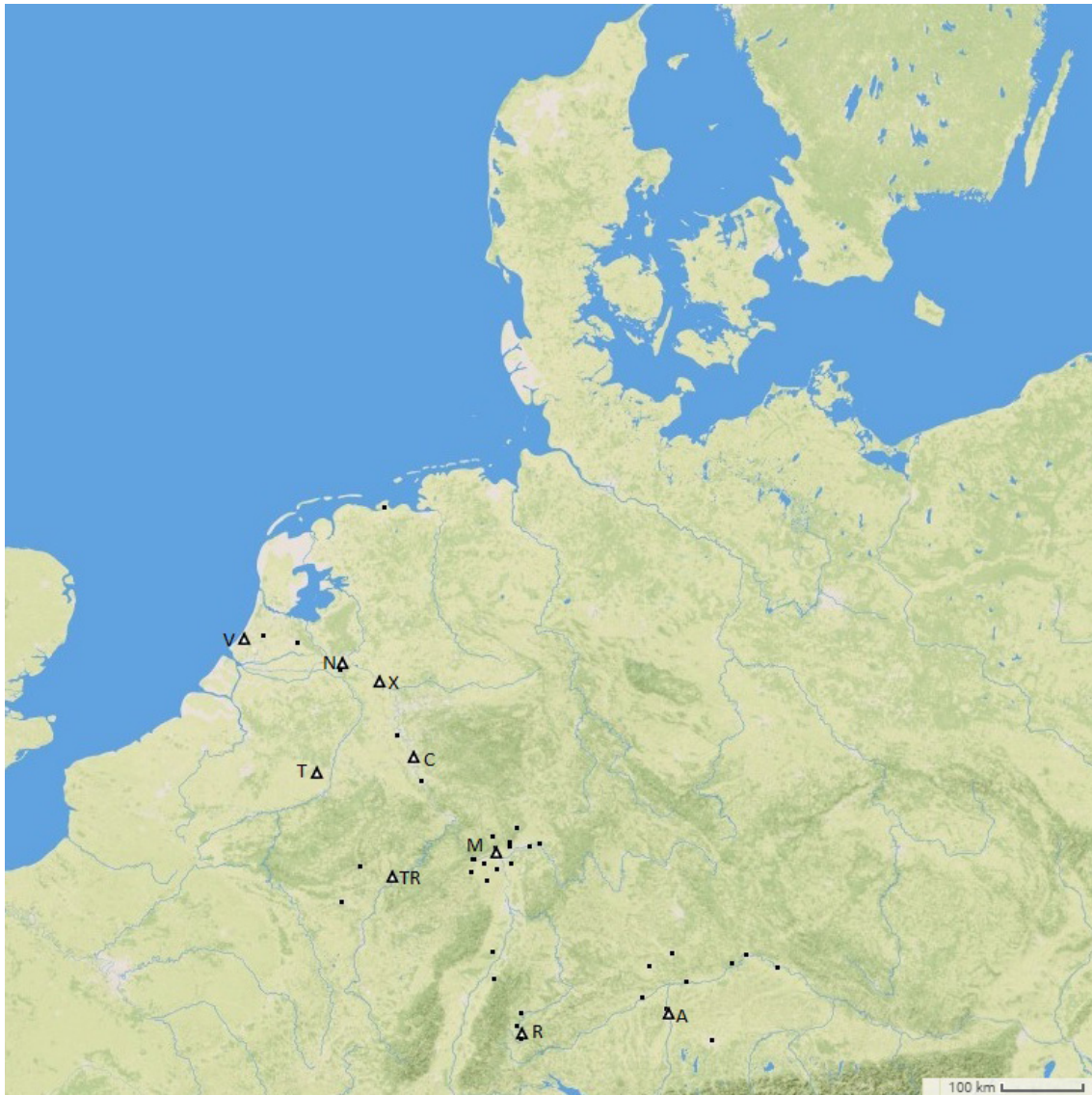


Figure 5.42: Distribution of non-hoarded RIC 408 (AD 92/96), issued by Domitian.

Triangle = Urban Settlements

V = Voorburg
N = Nijmegen
X = Xanten
T = Tongeren
C = Cologne
TR = Trier
M = Mainz
R = Rottweil
A = Augsburg

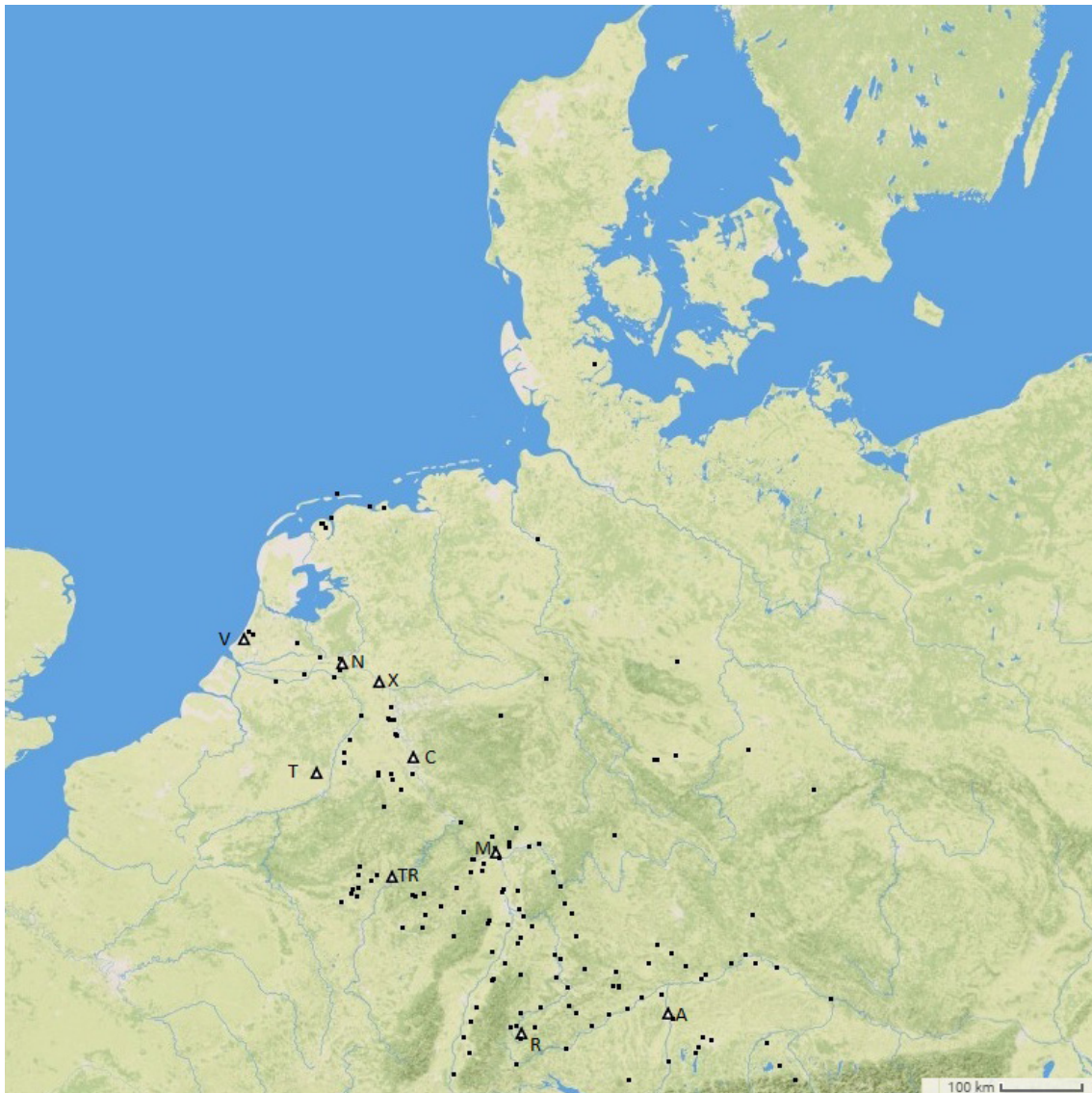


Figure 6.1: Distribution of non-hoarded coins, issued by Trajan AD 101-106.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

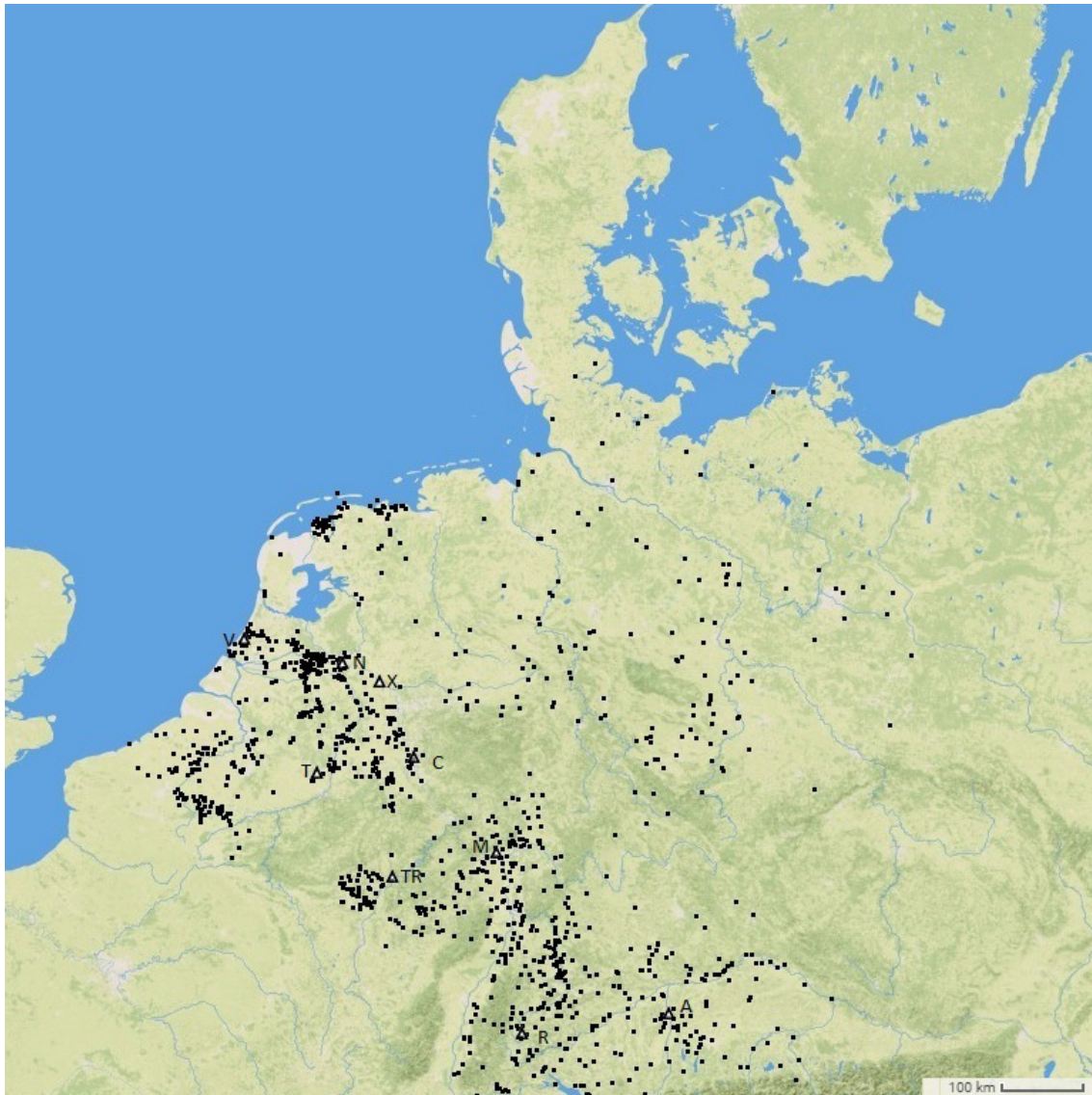


Figure 6.2: Distribution of non-hoarded coins, issued by Trajan.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

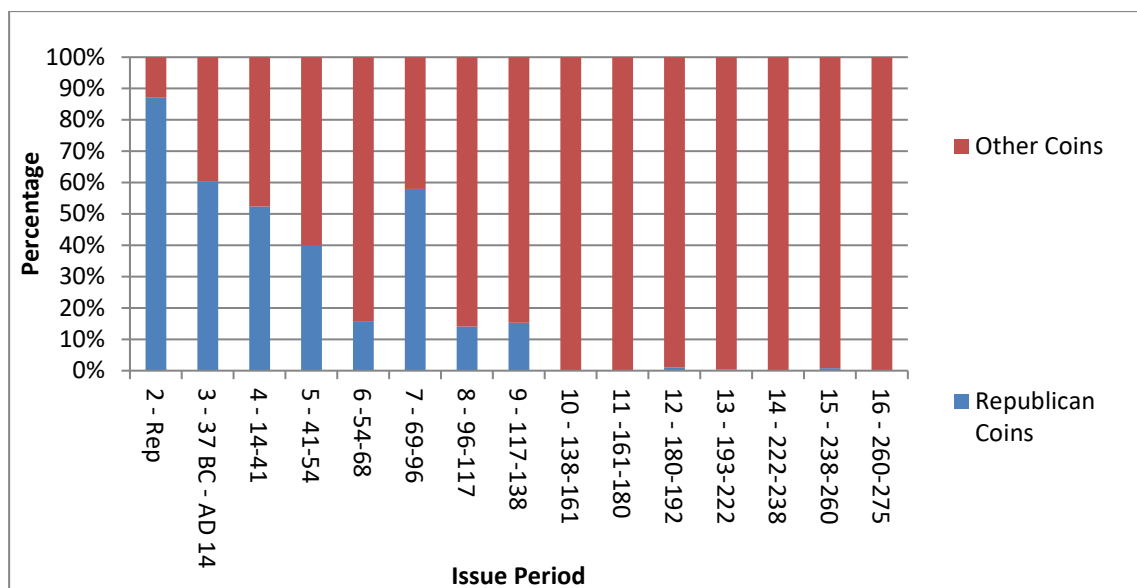


Figure 6.3: Percentage of Republican coins in hoards, by closing period.

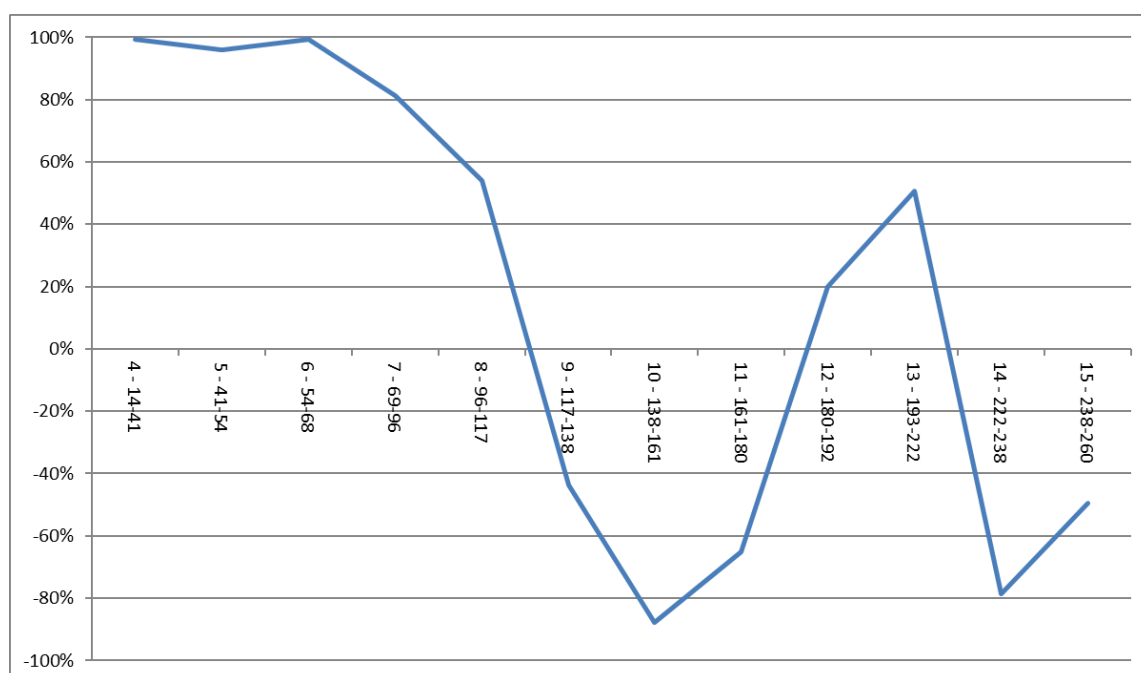


Figure 6.4: Correlation of Republican coins (excluding Marc Antony) in hoards, by closing issue period (correlation against all other coins).

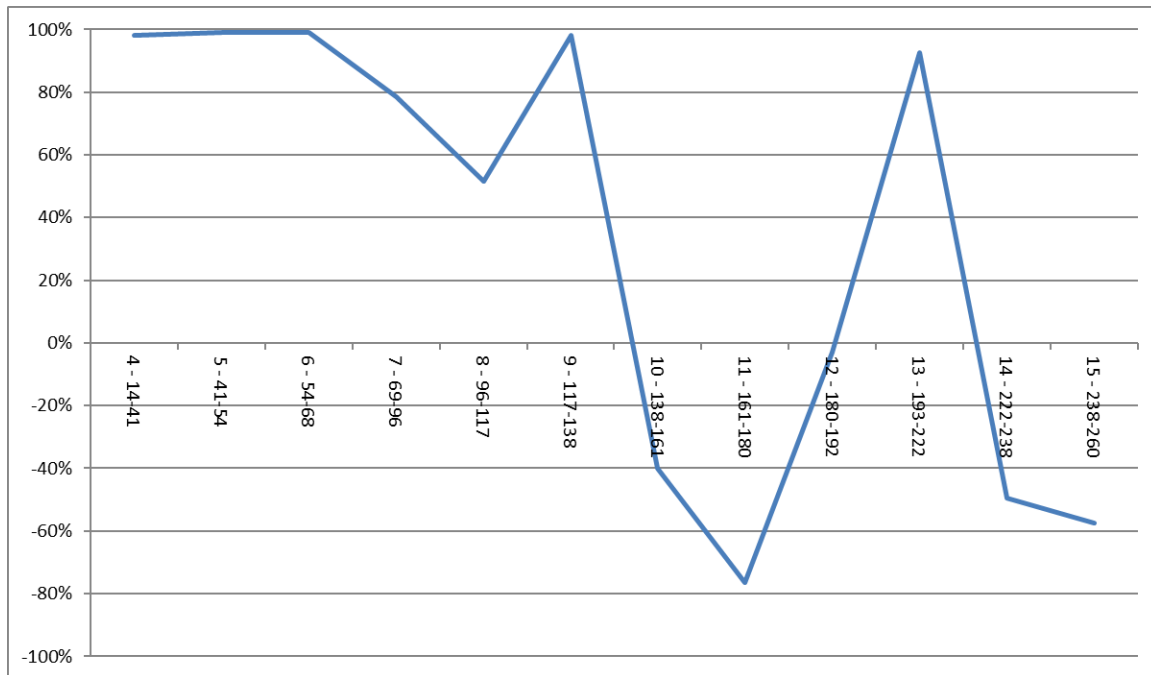


Figure 6.5: Correlation of Marc Antony's coins in hoards by closing issue period (correlation against all other coins).

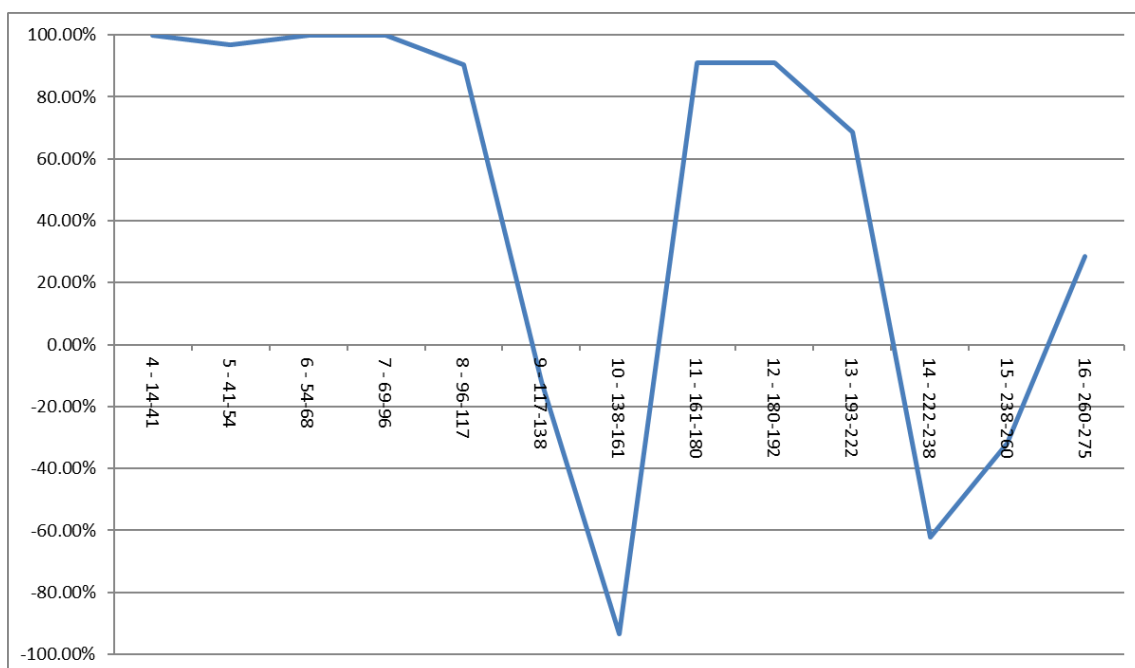


Figure 6.6: Correlation of Julio-Claudian cenarii in hoards by closing issue period (correlation against all other denarii).

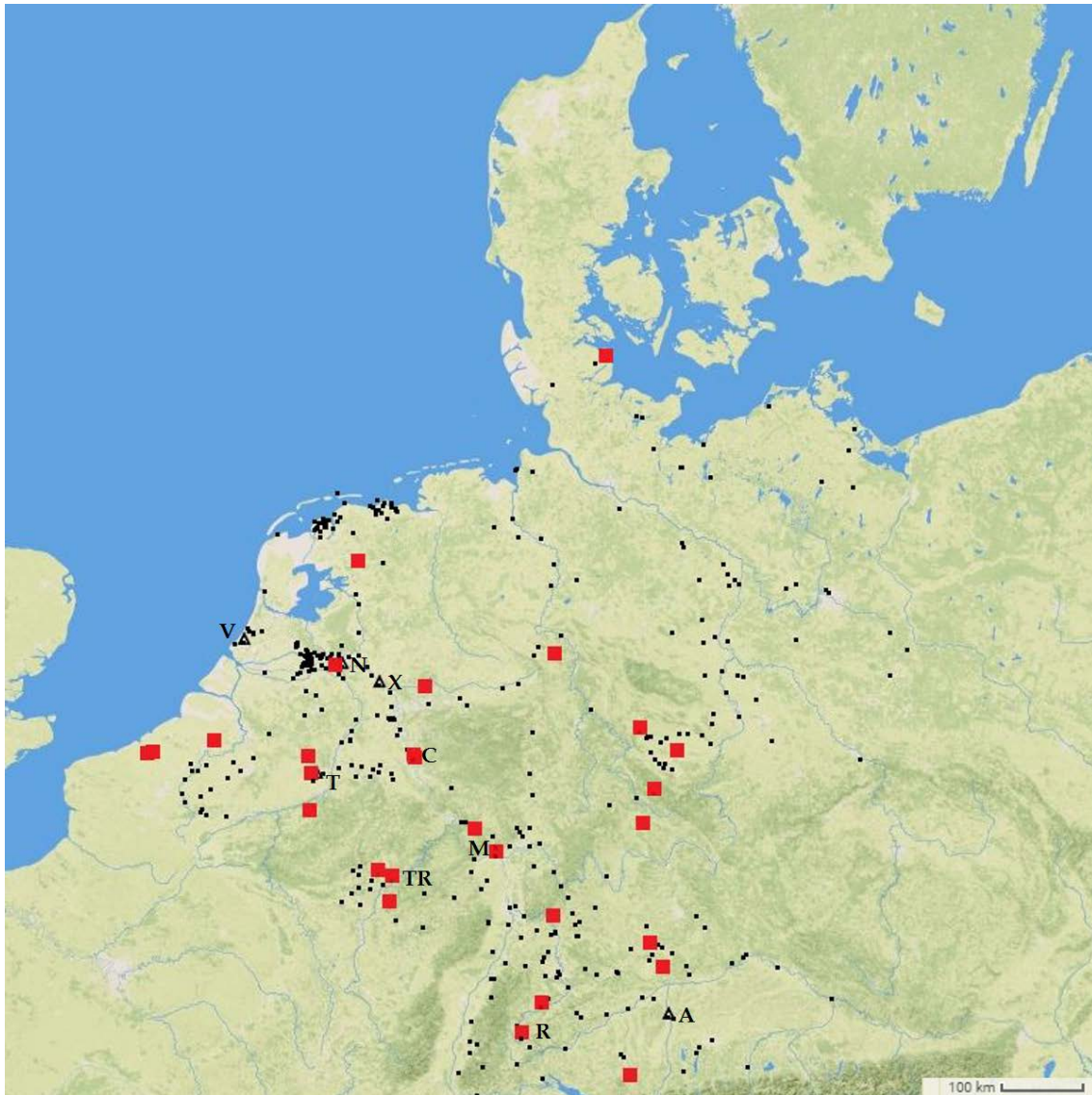


Figure 6.7: Distribution of non-hoarded gold and silver issued by Marcus Aurelius.

Red = Gold

Black = Silver

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

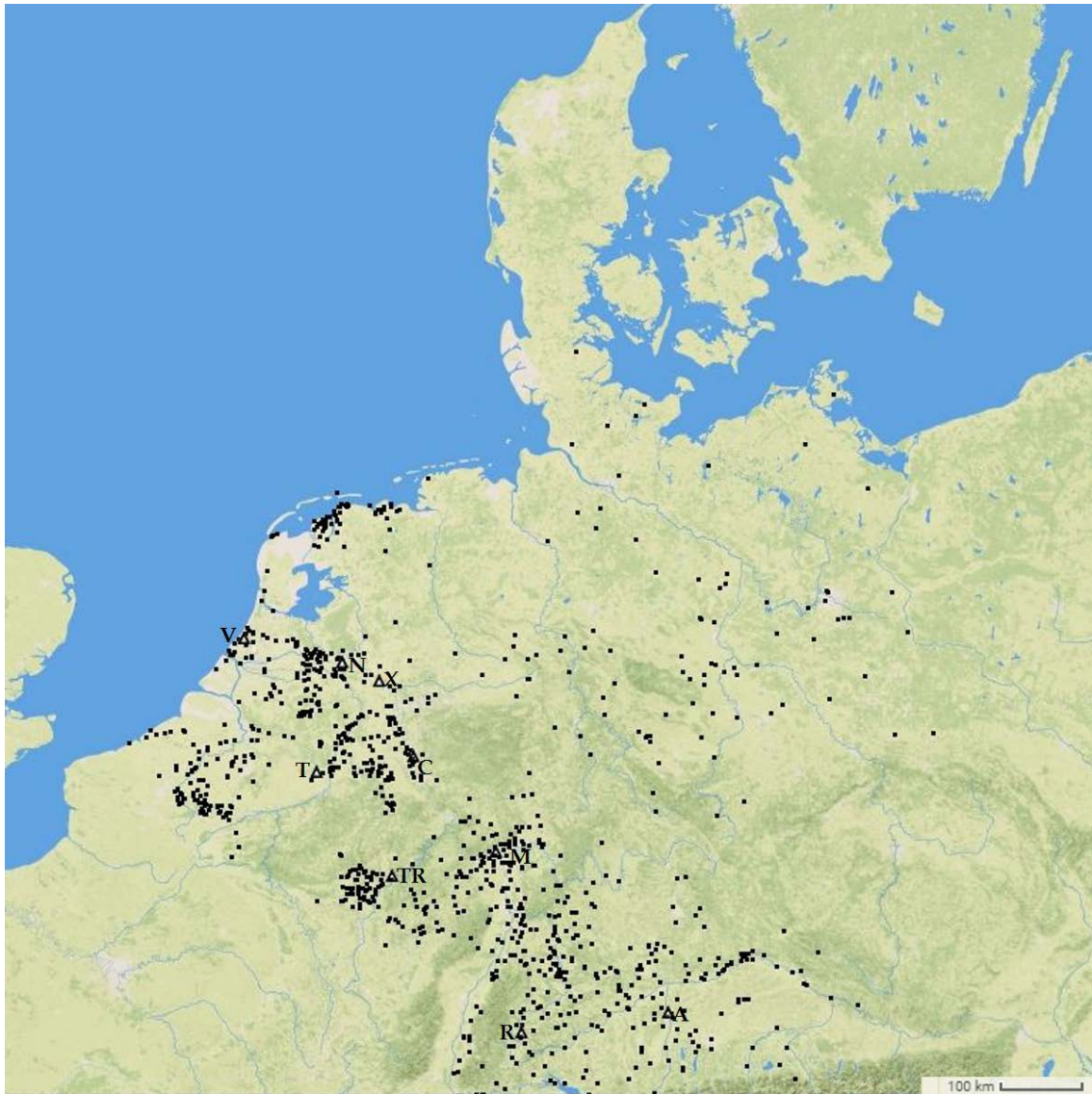


Figure 6.8: Distribution of non-hoarded lower denominations issued by Marcus Aurelius.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

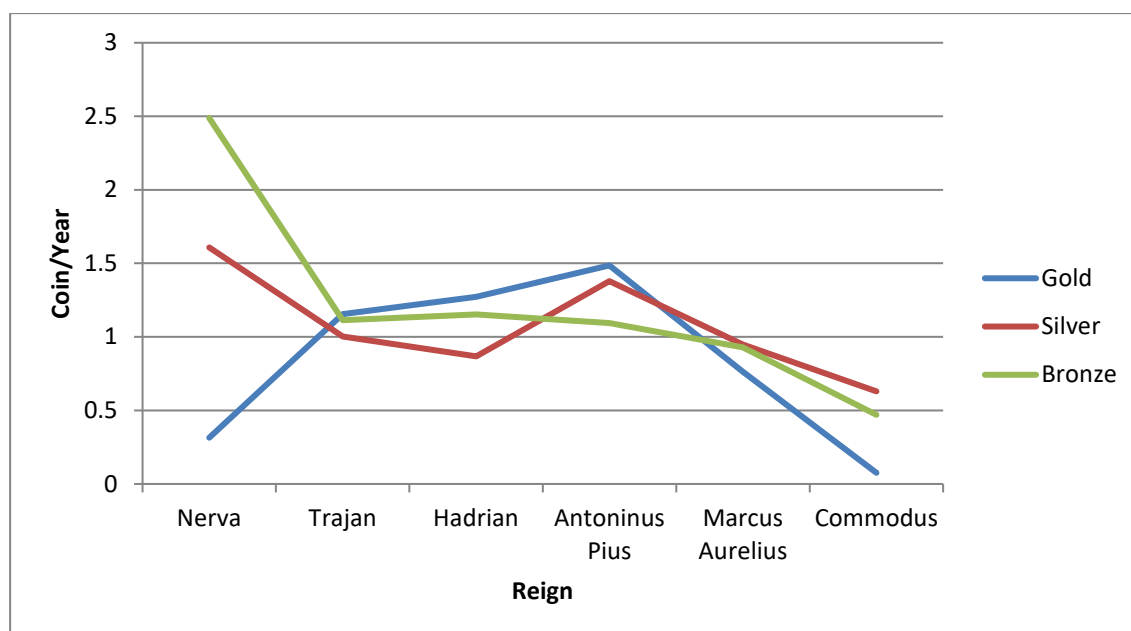


Figure 6.9: Number of hoarded and non-hoarded coin-finds by reign per metal, normalised for reign length, expressed per year.

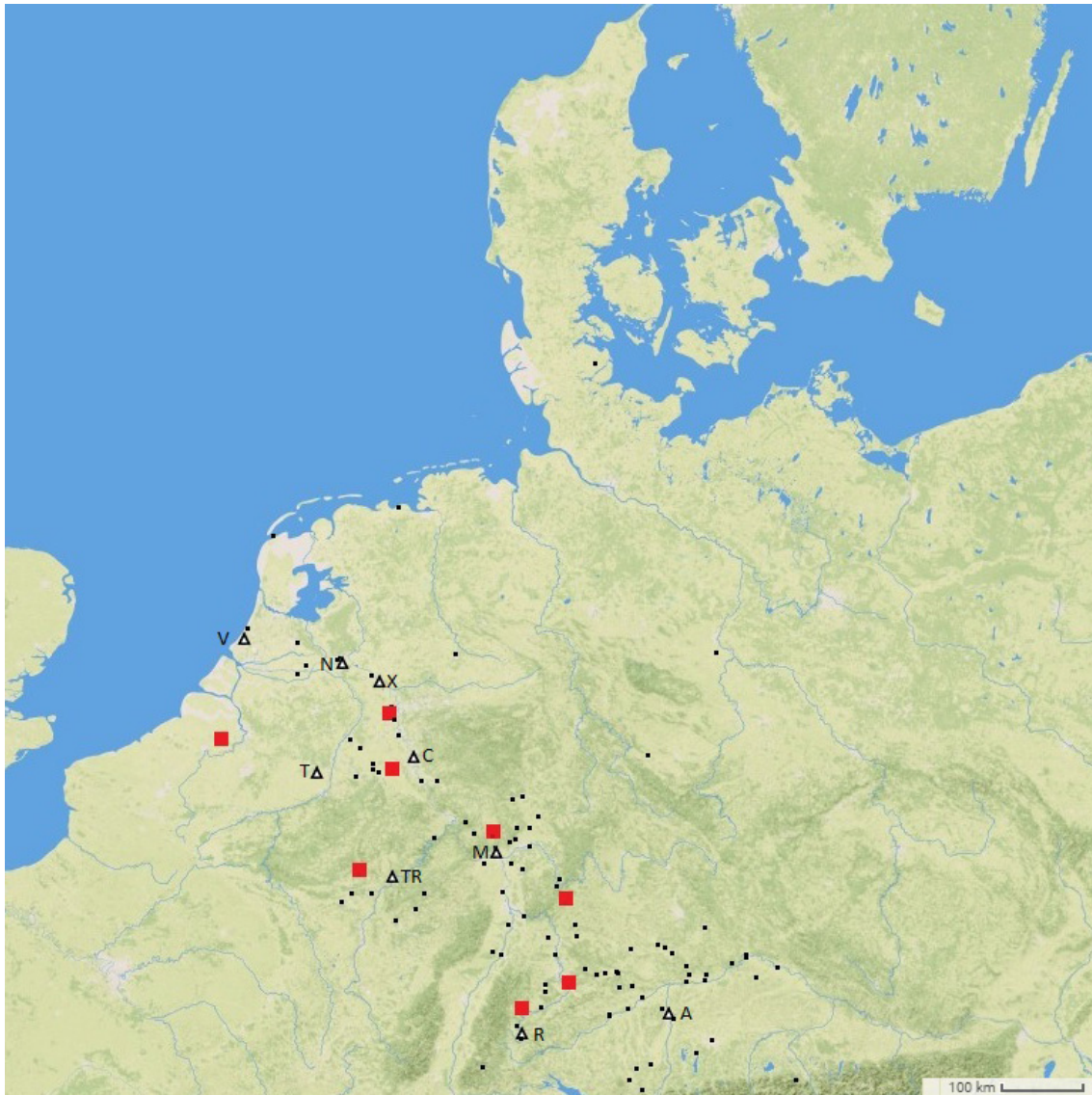


Figure 6.10: Distribution of non-hoarded coins issued in the East by Pescennius Niger and Septimius Severus.

Red = Pescennius Niger

Black = Septimius Severus

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

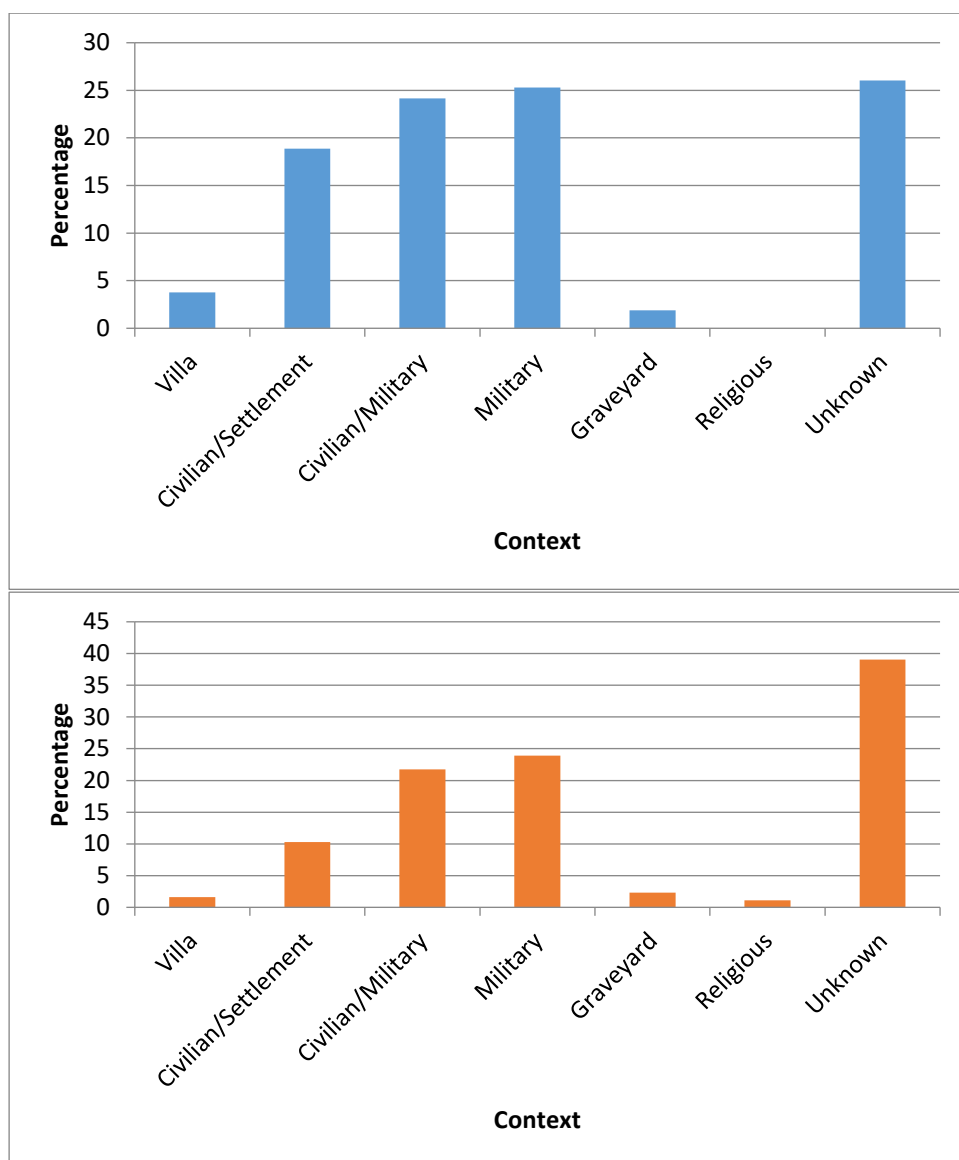


Figure 6.11: Top = non-hoarded Eastern denarii issued by Septimius Severus by context; Bottom = non-hoarded denarii issued by Septimius Severus, excluding Eastern denarii (as percentage).



Figure 6.12: Distribution of non-hoarded IP 13 (AD 193-222) RPC issued after Septimius Severus's sole reign.

Triangle = Urban Settlements

V = Voorburg
N = Nijmegen
X = Xanten
T = Tongeren
C = Cologne
TR = Trier
M = Mainz
R = Rottweil
A = Augsburg

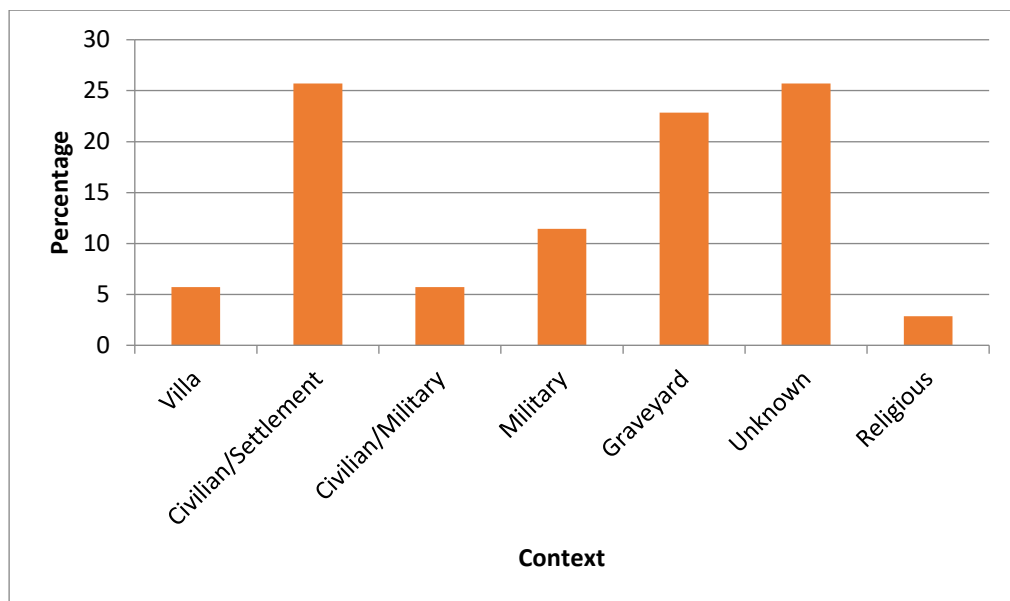


Figure 6.13: Non-Hoarded IP 13 (AD 193-222) RPC issued after Septimius Severus's sole reign by context (as percentage).



Figure 6.14: Non-hoarded silver coins issued by Maximinus.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

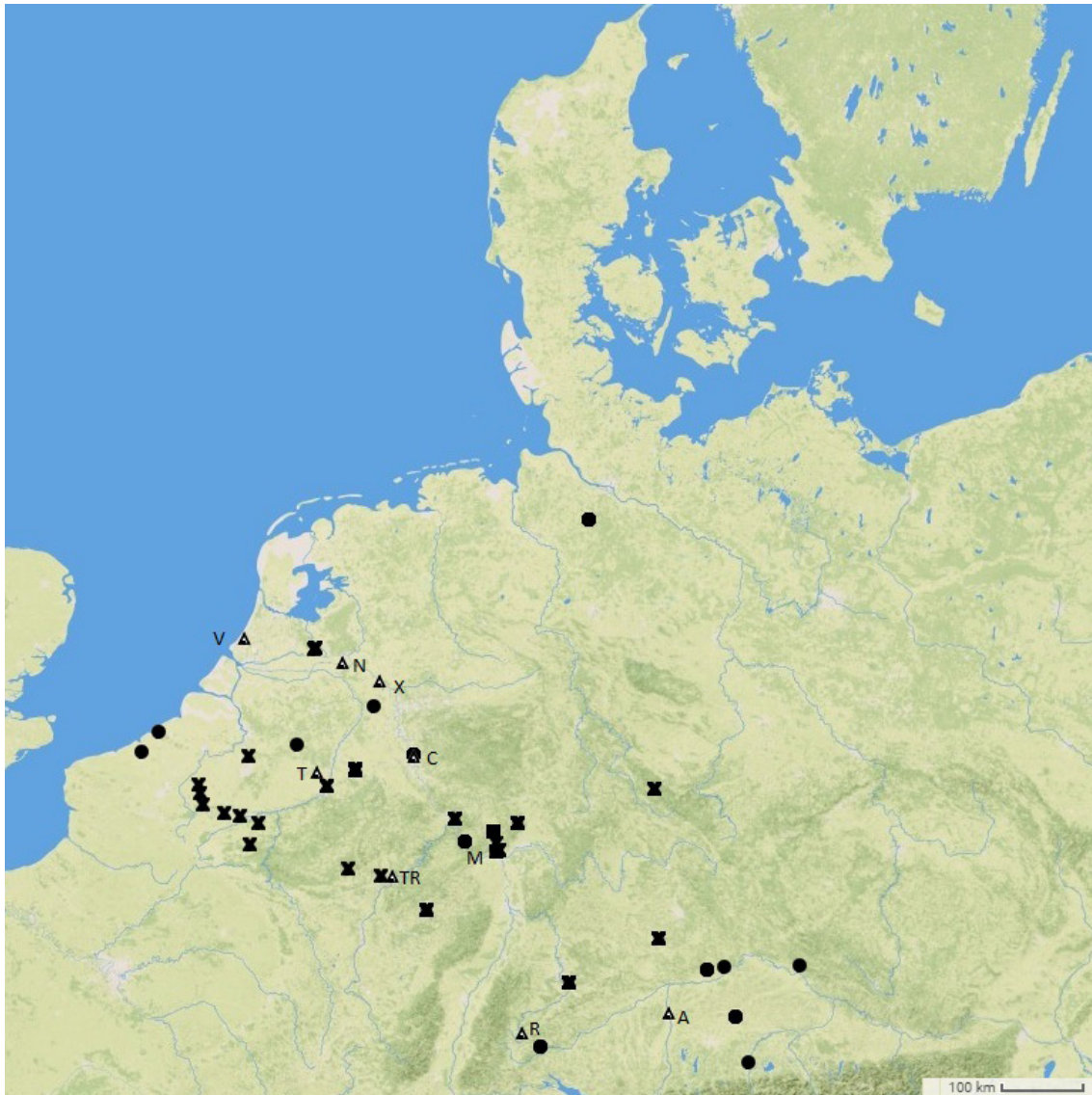


Figure 6.15: Distribution of hoards with silver coins issued by Maximinus.

Circle = Closing IP 14 (AD 222-238)

Cross = Closing IP 15 (AD 238-260)

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

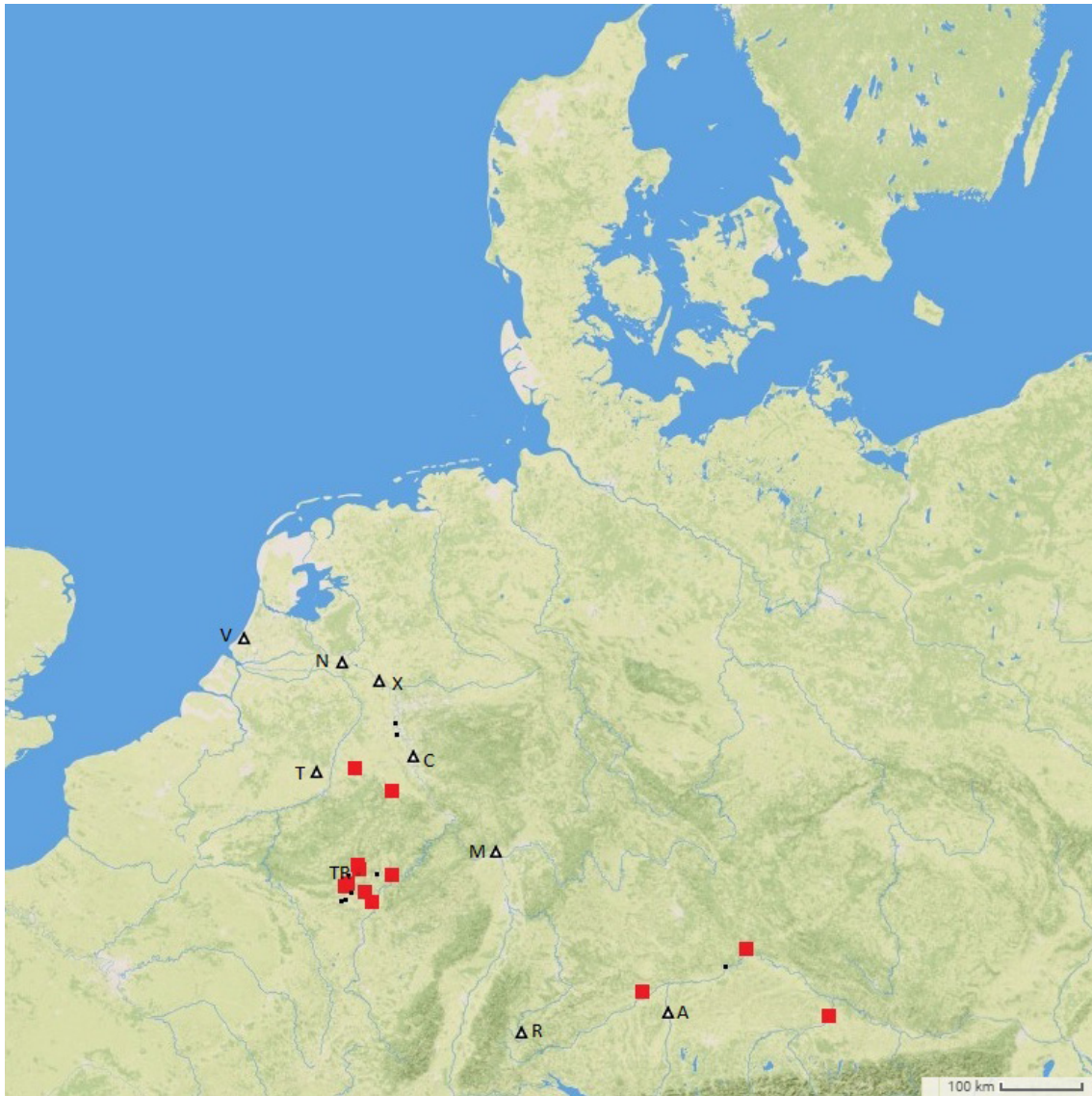


Figure 6.16: Distribution of Valerian-Gallienus radiates struck at Cologne.

Red = Hoard

Black = Non-Hoarded

The data mapped only show coins which have been recorded with the applied criteria. It by no means should be interpreted as being complete for Valerian-Gallienus. It also supports the argument that Cologne is an incorrect attribution for these coins (as is Lyon).

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

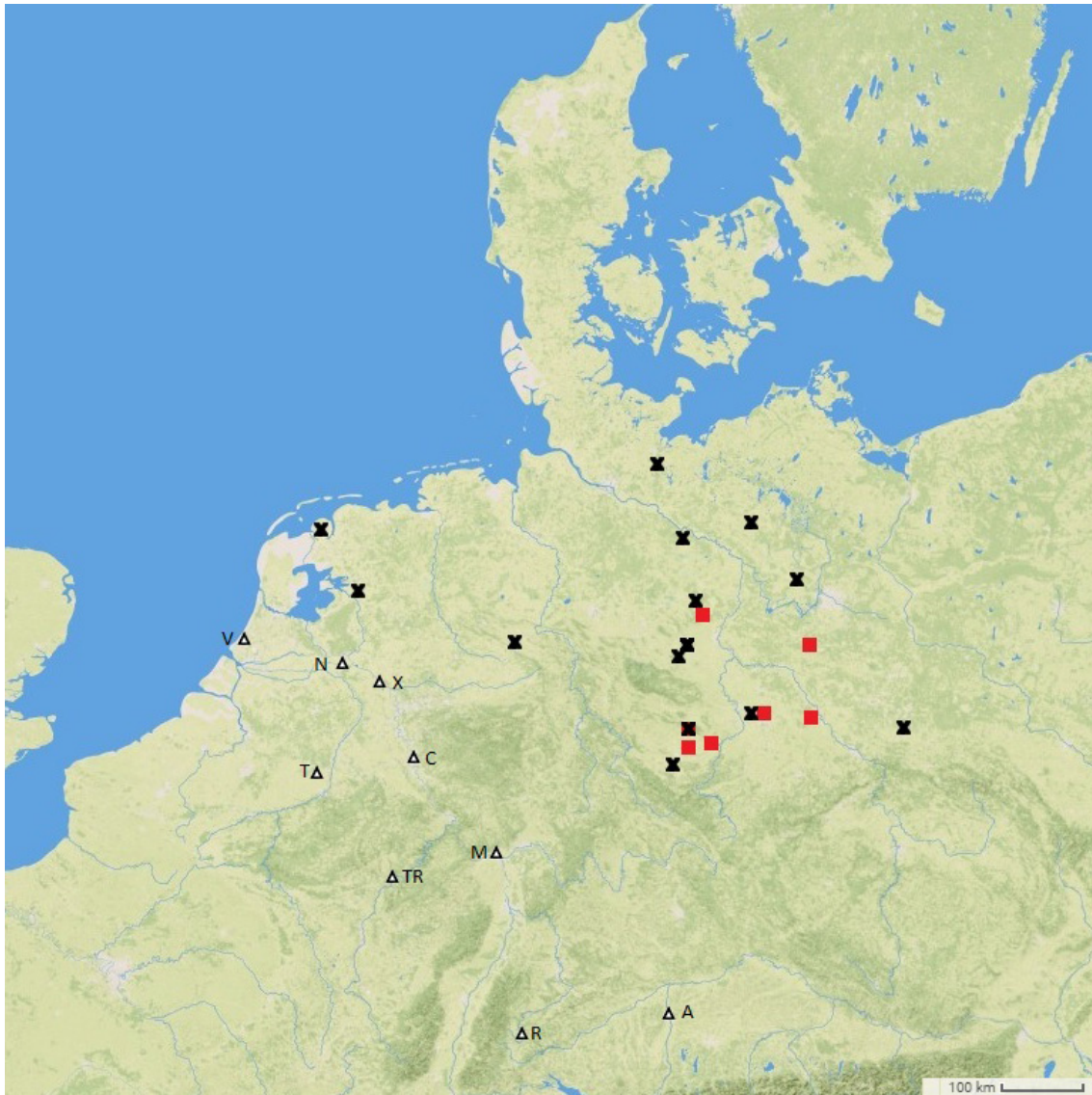


Figure 6.17: Distribution of non-hoarded gold coins in barbaricum struck AD 260-275.

Red = Central Empire

Cross = Gallic Empire

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

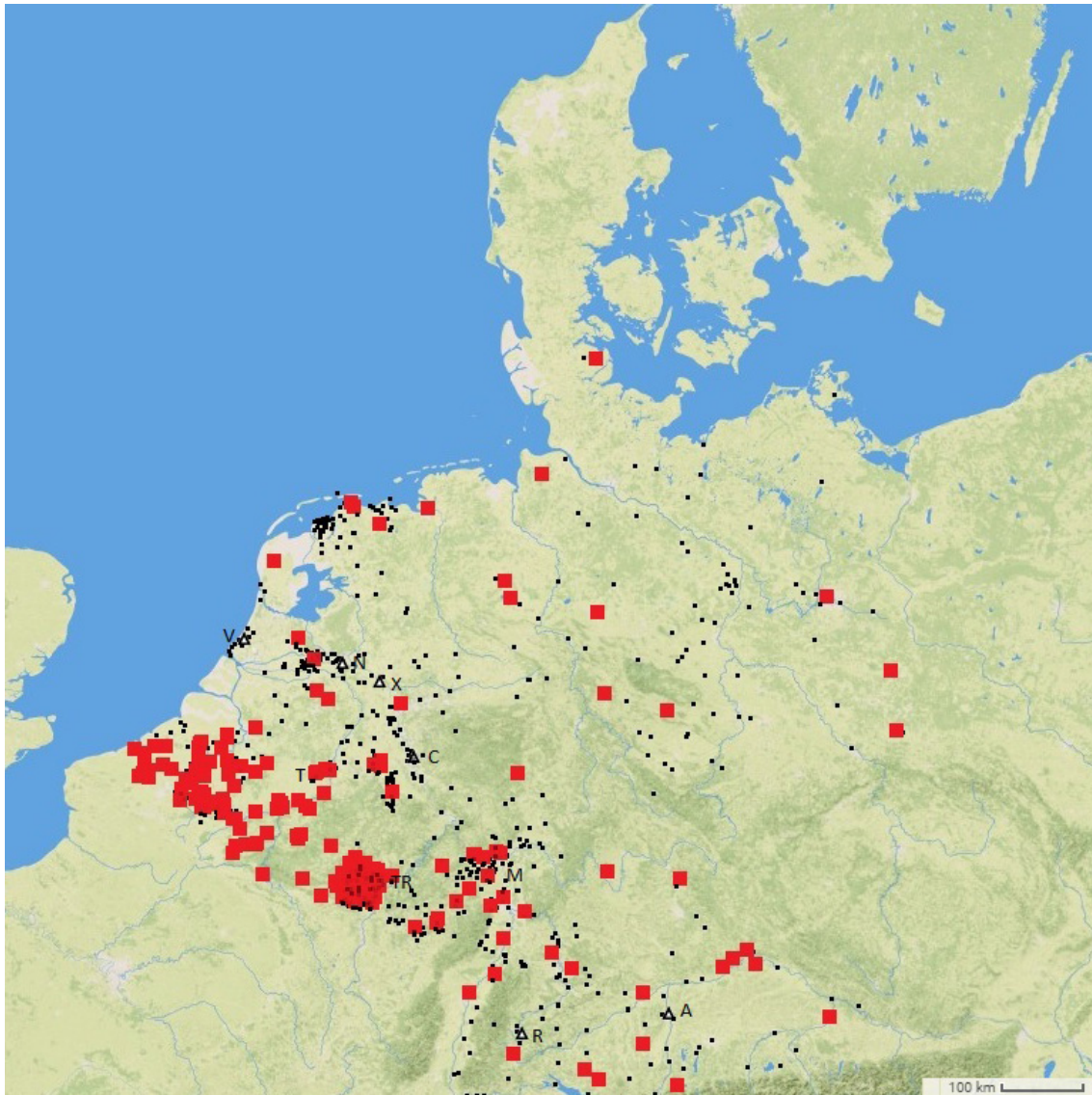


Figure 6.18: Distribution of coins IP 16 (AD 260-275).

Red = Hoards

Black = Gallic Empire Radiates

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

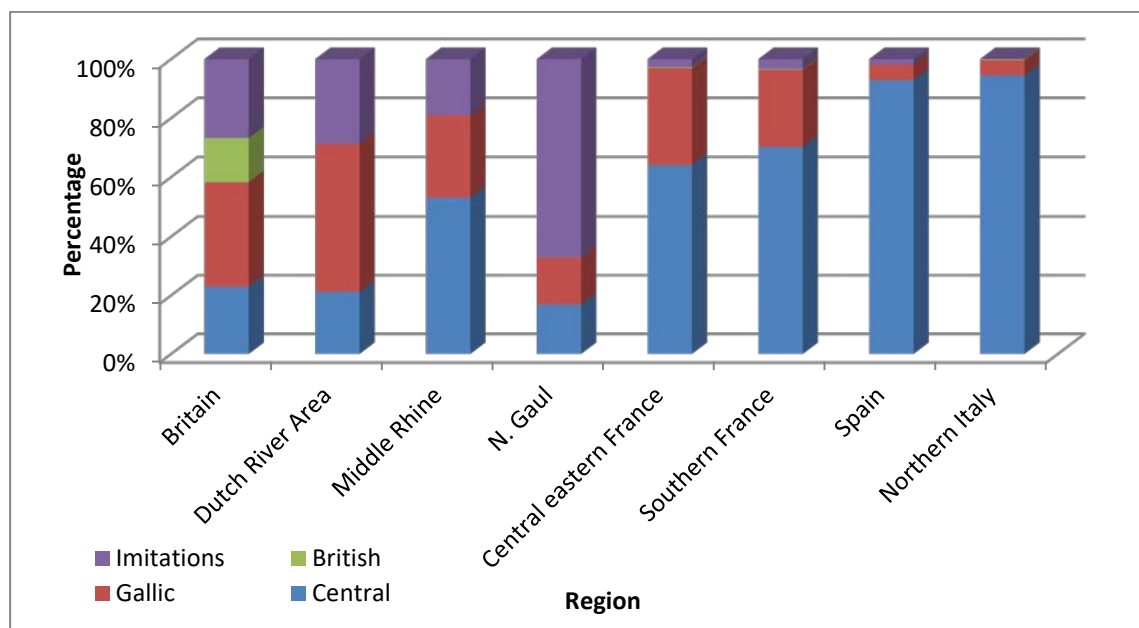


Figure 7.1: Percentage composition of "Site-Finds" AD 260-295, by region, by minting origin (Data adapted from Kropff 2005).



Figure 7.2: Distribution of hoards containing imitations attributed to IP 16 (AD 260-275).

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

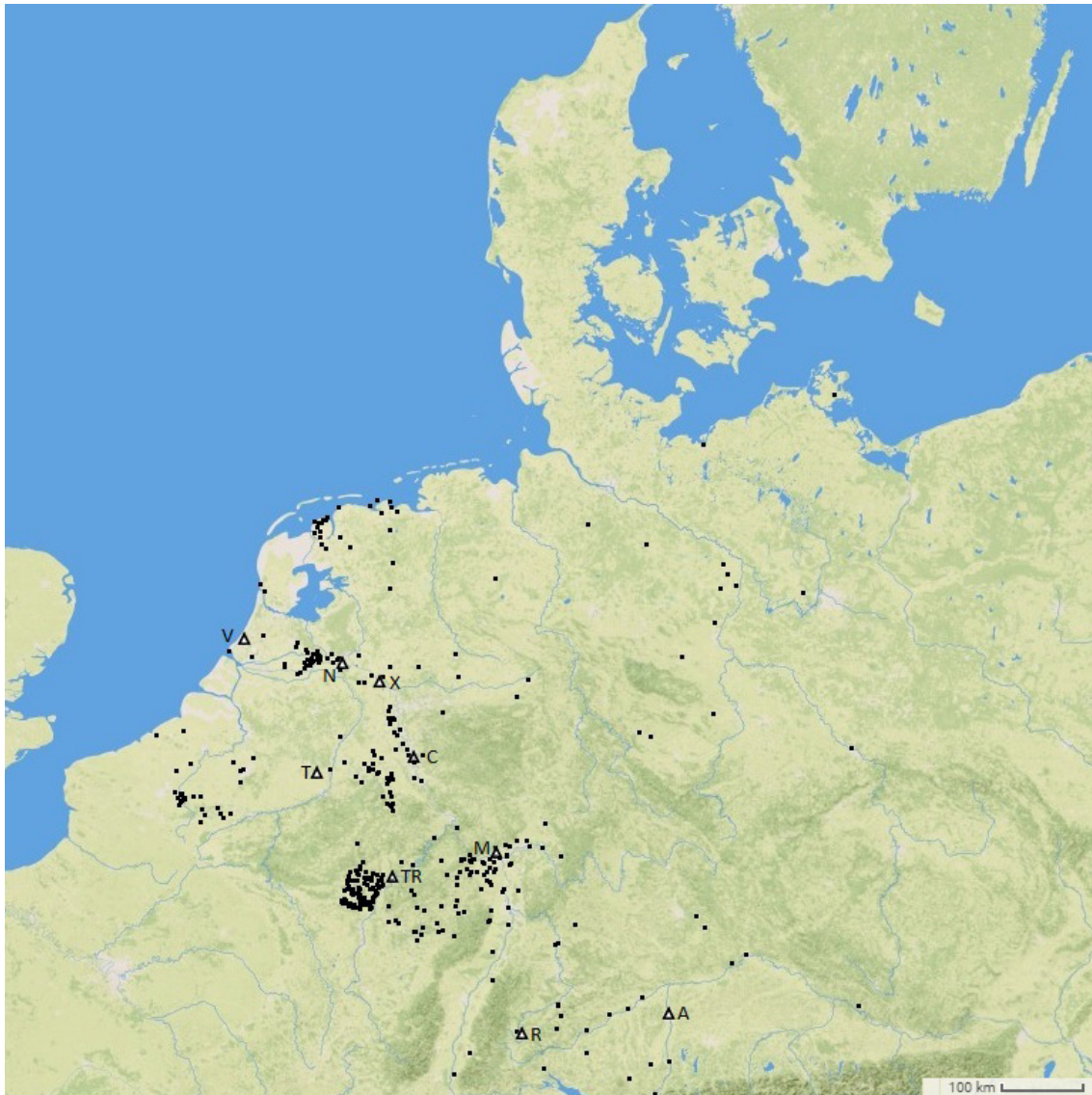


Figure 7.3: Distribution of non-hoarded imitations attributed to IP 16 (AD 260-275).

Triangle = Urban Settlements

V = Voorburg
N = Nijmegen
X = Xanten
T = Tongeren
C = Cologne
TR = Trier
M = Mainz
R = Rottweil
A = Augsburg

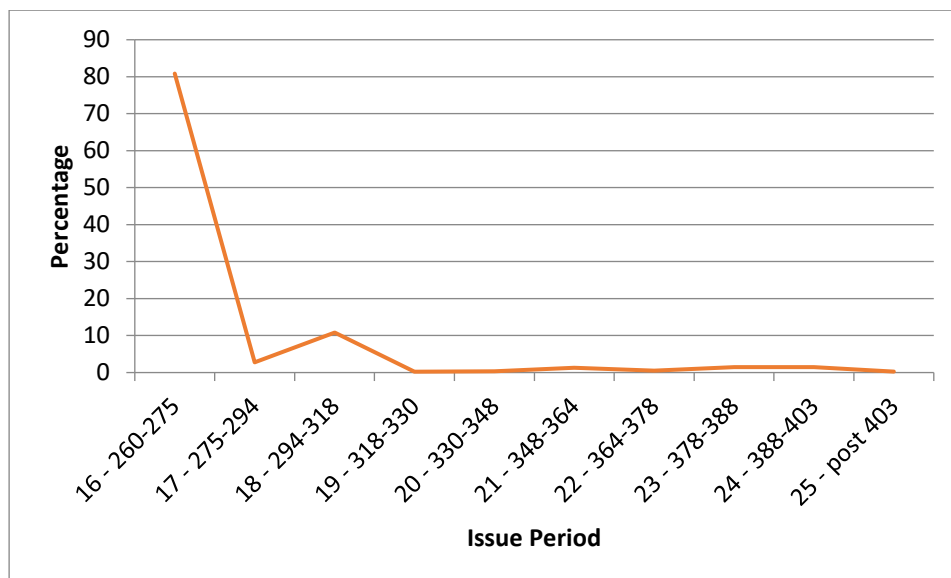


Figure 7.4: Percentage of IP 16 (AD 260-275) imitations by closing period of all hoards.

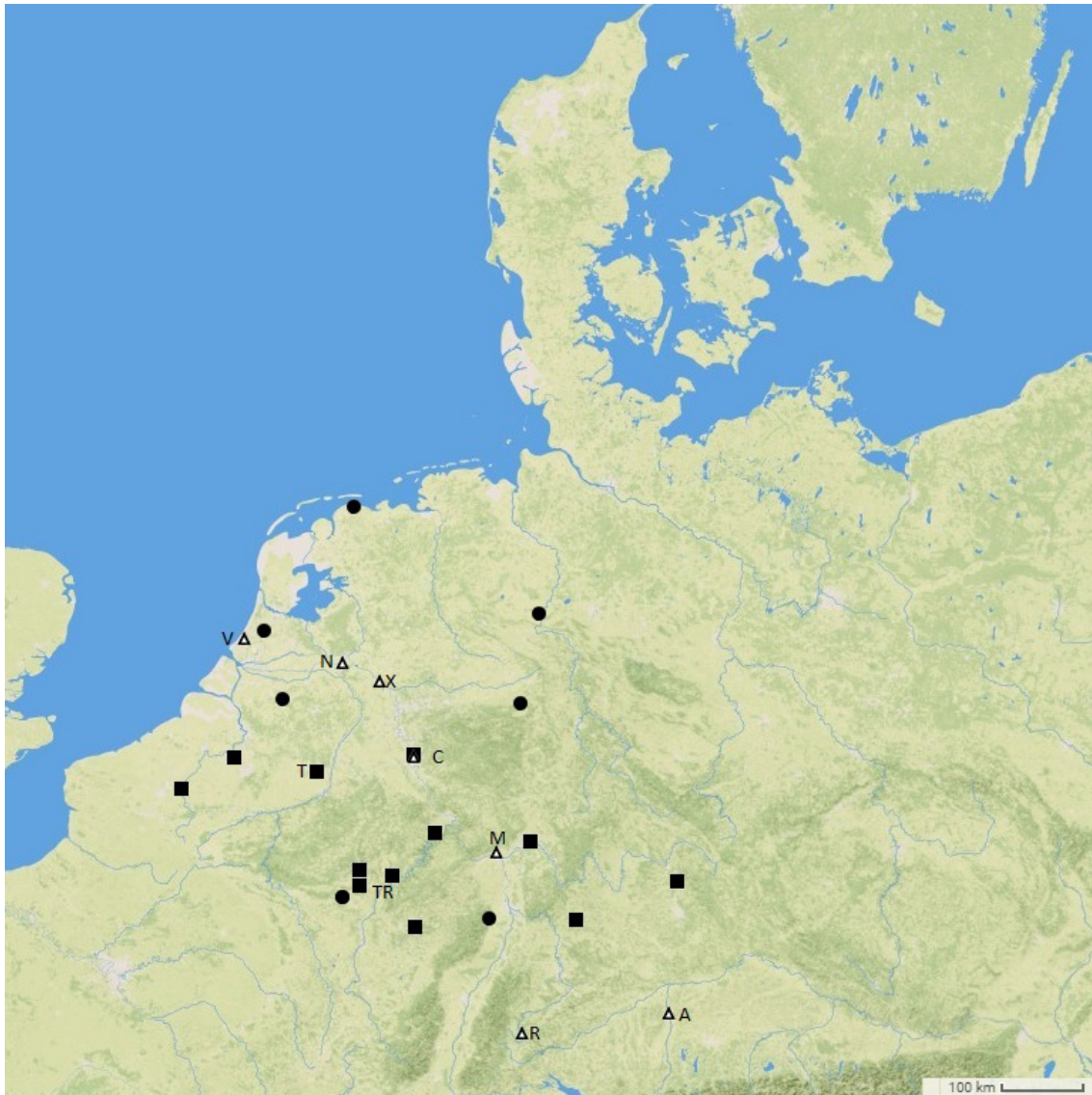


Figure 7.5: Distribution of Britannic Empire coins (all find-types).

Square = Carausius

Circle = Allectus

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg



Figure 7.6: Distribution of IP 24 (AD 388-403) non-hoarded coins.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg



Figure 7.7: Distribution of hoarded *aes* coins struck in IP 24 (AD 388-403).

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg



Figure 7.8: Distribution of non-hoarded *aes* coins struck in IP 24 (AD 388-403).

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg



Figure 7.9: Distribution of IP 24 (AD 388-403) non-hoarded *aes* coins struck at Trier.

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

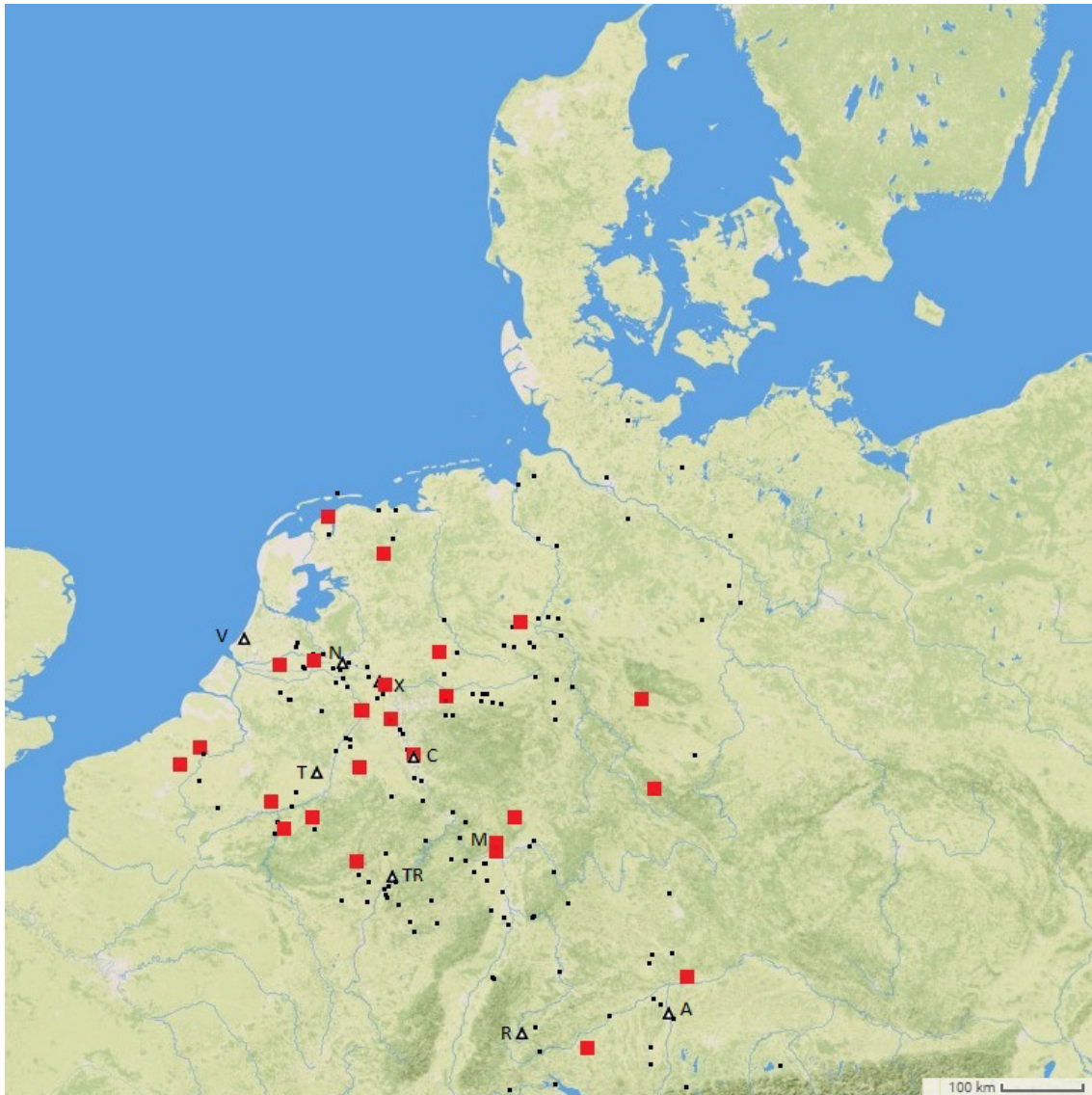


Figure 7.10: Distribution of Gold Coins Struck between IP 22 and 25 (AD 364 – post 403), excluding coins in hoards closing prior to AD 388.

Black = Non-Hoarded

Red = Hoarded

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

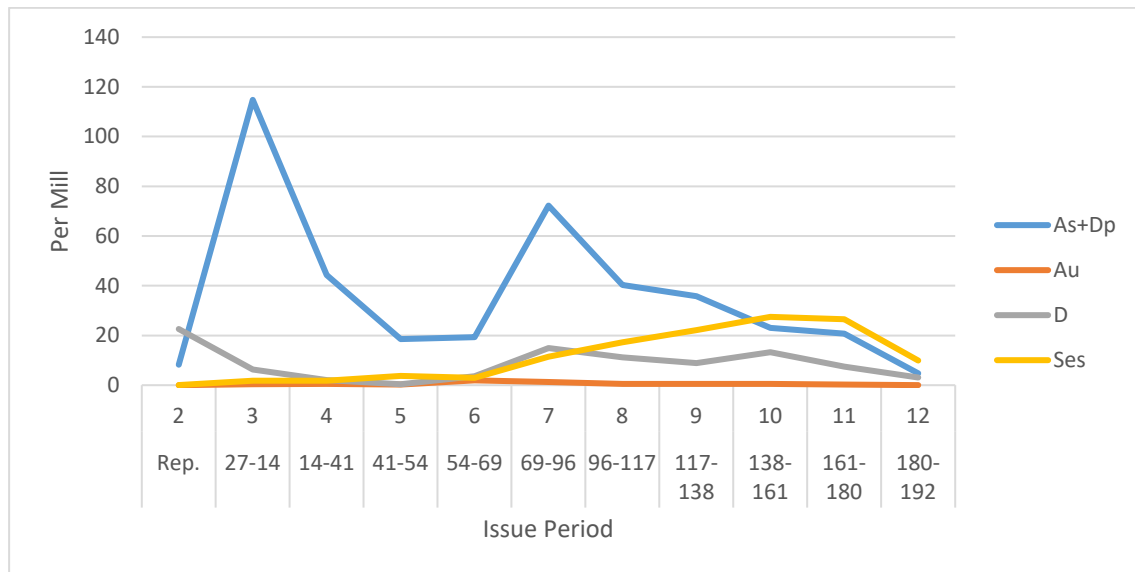


Figure 8.1: Per mill profile of non-hoarded coin-finds in northwest Europe (inside Empire), by issue period, major denominations only.

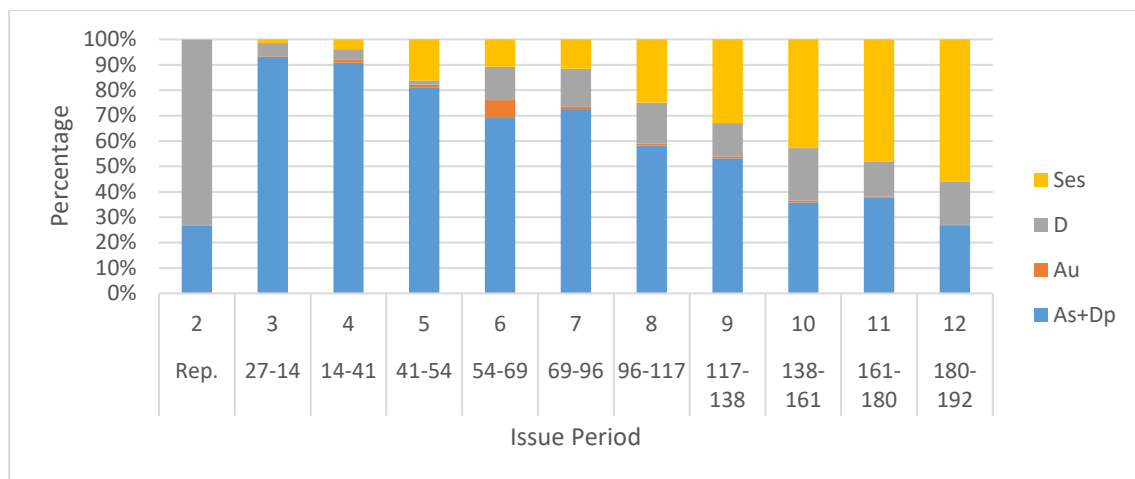


Figure 8.2: Percentage composition of non-hoarded coin-finds in northwest Europe (inside Empire), by issue period, major denominations only.

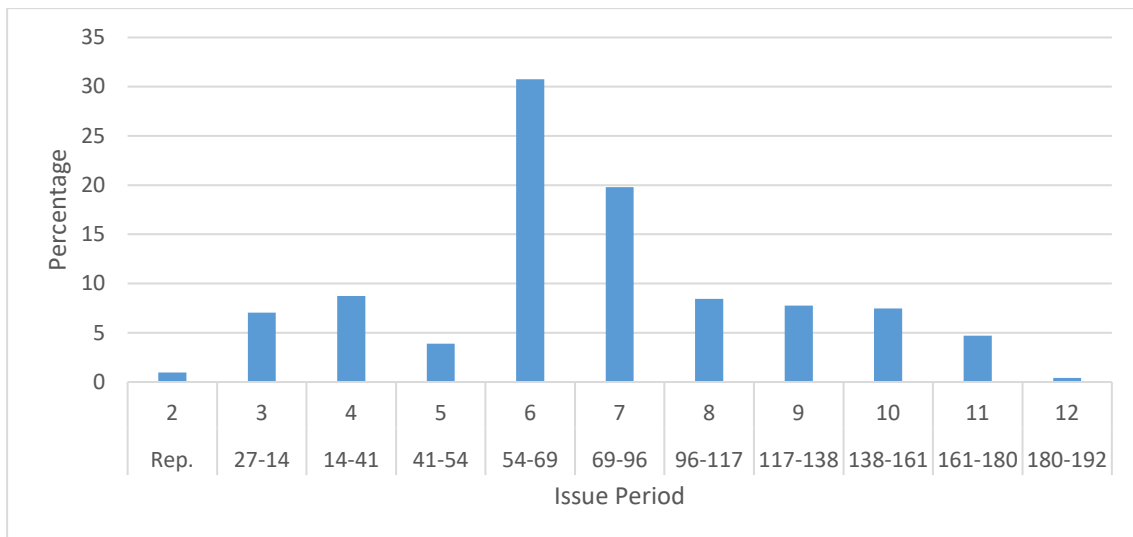


Figure 8.3: Percentage of non-hoarded gold coin-finds by issue period, in northwest Europe (inside Empire).

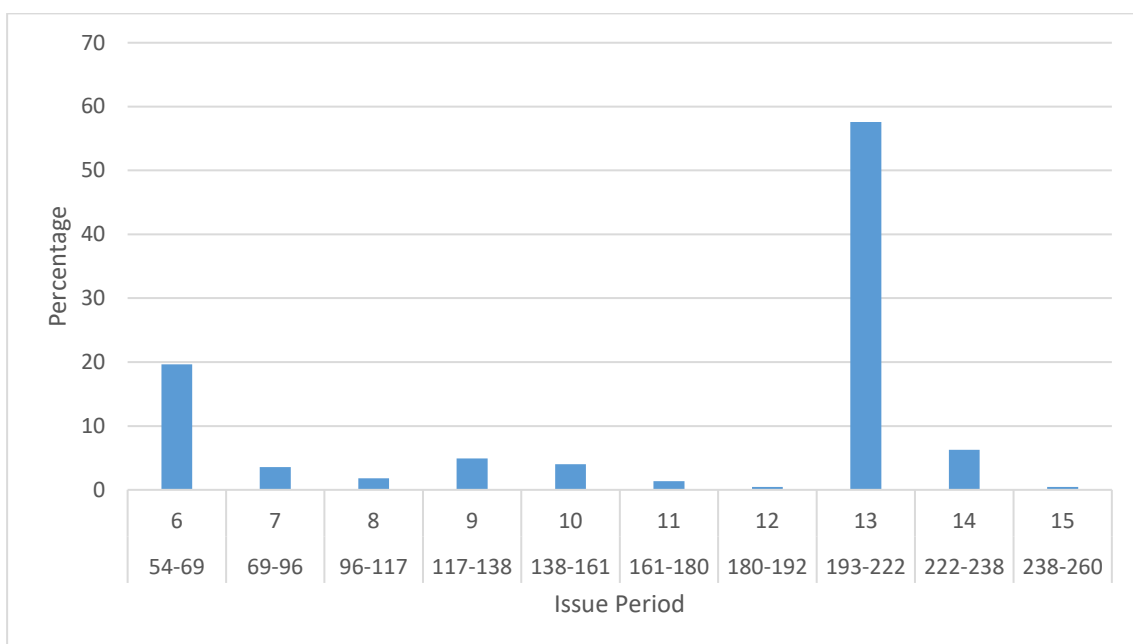


Figure 8.4: Percentage of hoarded IP 6 (AD 54-68) aurei by closing period, in northwest Europe (inside Empire).

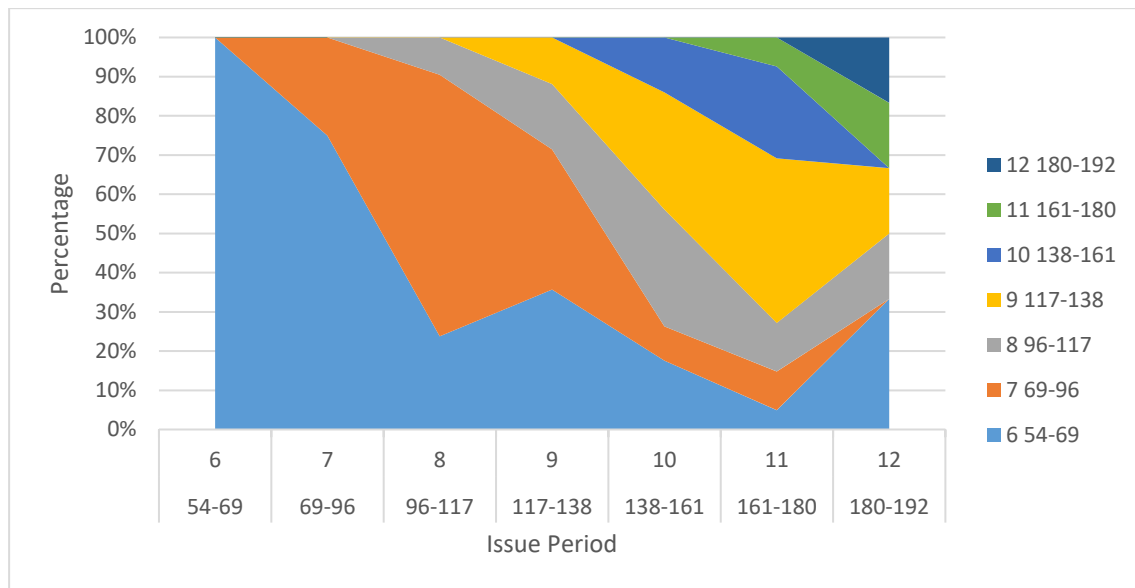


Figure 8.5: Percentage of hoarded gold by closing period, in northwest Europe (inside Empire).

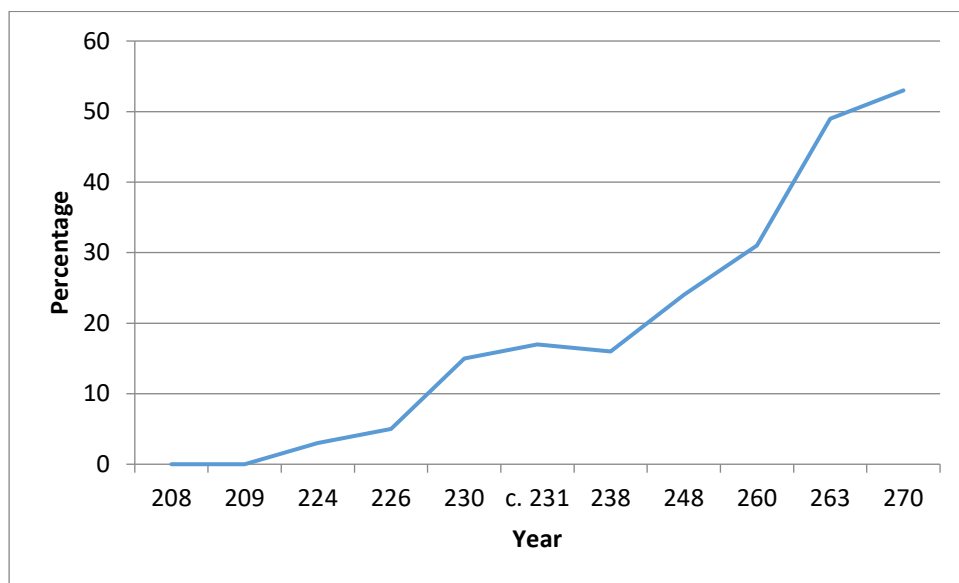


Figure 8.6: Eastern struck denarii as a percentage of hoards in Britain with a minimum of 20 denarii struck AD 193-196/7, by TPQ (Data: Howgego 2002).

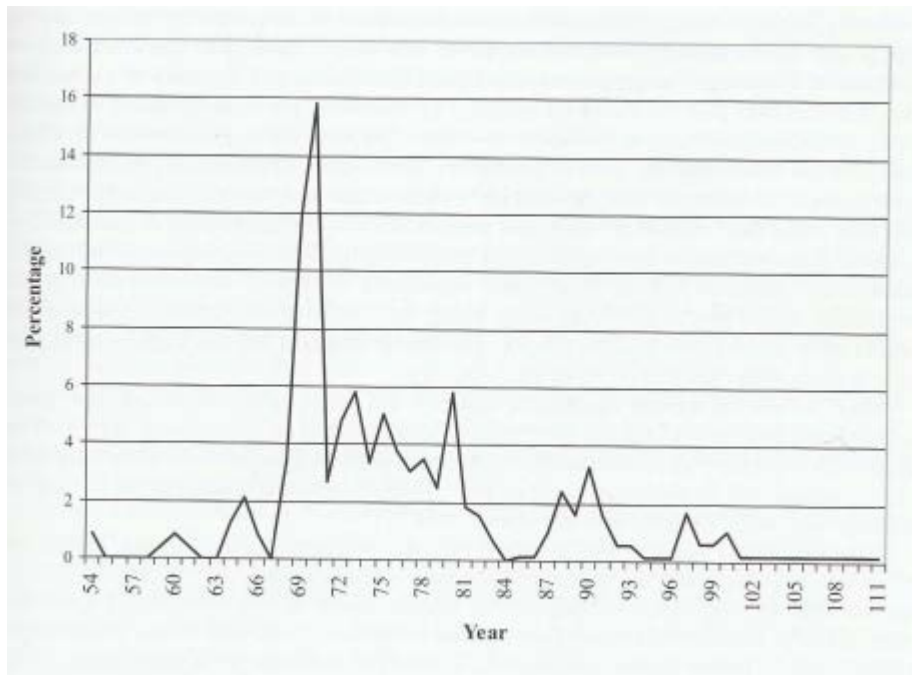


Figure 8.7: The proportion of precious metal coins per year in the canabae assemblage, Nijmegen (Data: Kemmers 2006, 207).

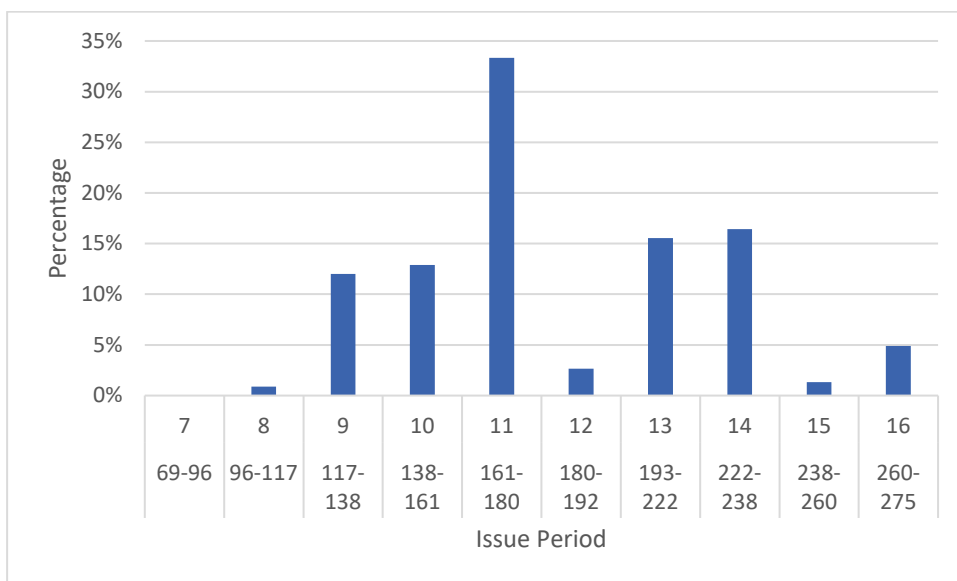


Figure 8.8: All Domitianic denarii by closing period.

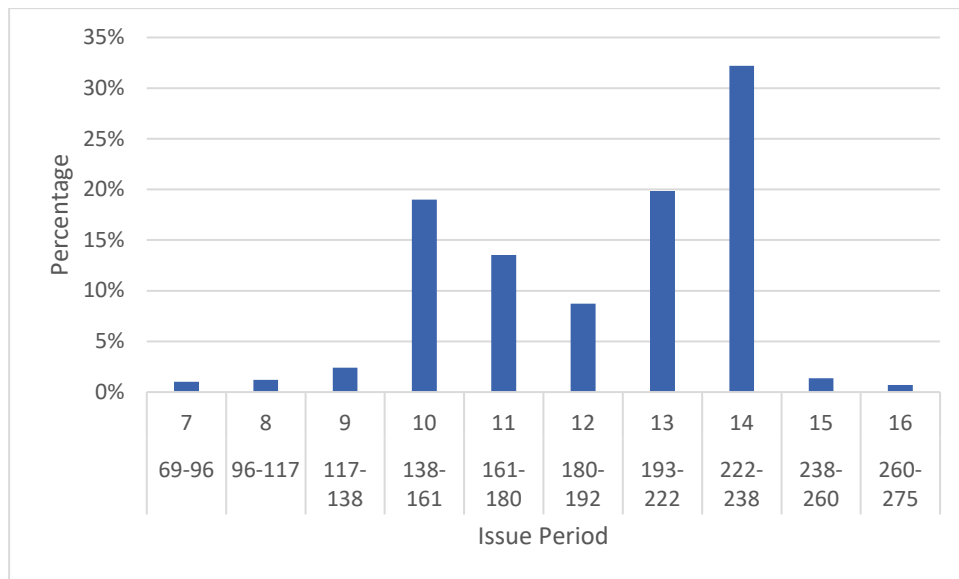


Figure 8.9: All Vespasianic denarii by closing period.

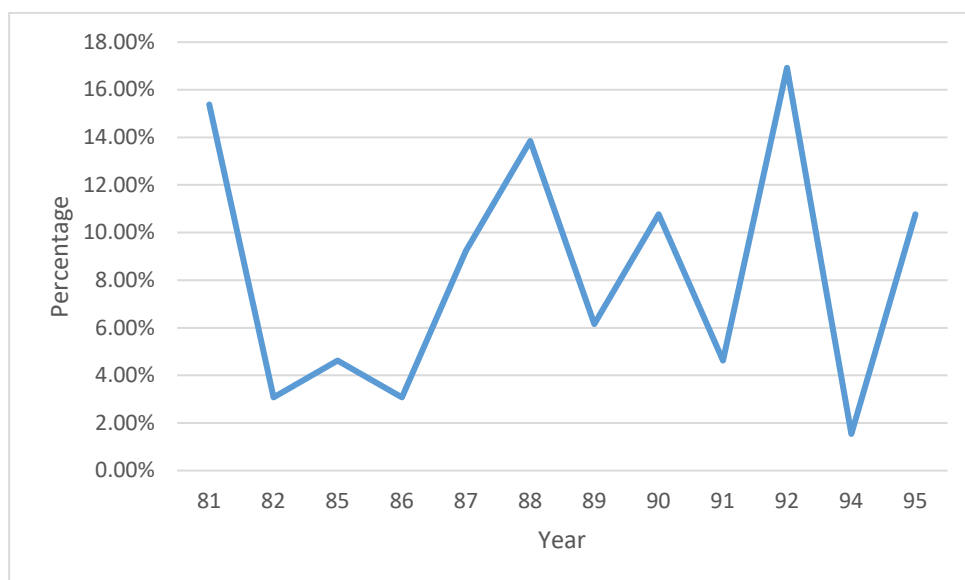


Figure 8.10: Hoarded percentage of all Domitianic denarii, dated to one year, all closing periods.

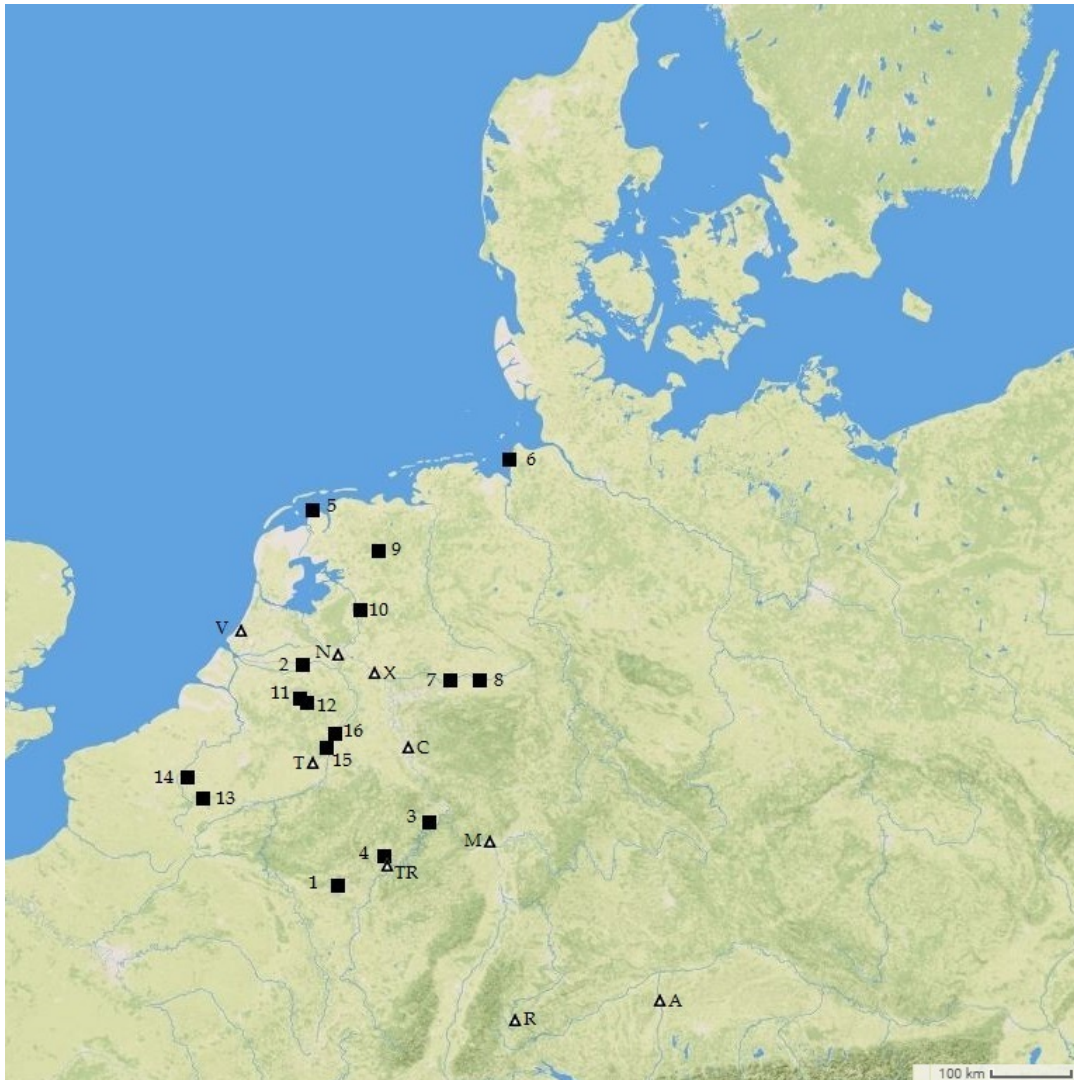


Figure 9.1: Distribution of settlements from chapter 9.

1 = Titelberg	9 = Wijster
2 = Empel	10 = Colmschate
3 = Martberg	11 = Hoogeloon-Kerkakkers
4 = Möhn	12 = Riethoven-Heesmortel
5 = Wijnaldum	13 = Élouges
6 = Feddersen Wierde	14 = Liberchies
7 = Westick	15 = Neerharen-Rekem
8 = Soest-Ardey	16 = Holtum

Triangle = Urban Settlements

V = Voorburg

N = Nijmegen

X = Xanten

T = Tongeren

C = Cologne

TR = Trier

M = Mainz

R = Rottweil

A = Augsburg

APPENDIX 1

City	Source 1	Source 2	Source 3	Additional
Voorburg	Buijtendorp (2010)	Buijtendorp (1984)	Buijtendorp (1987)	
Nijmegen	Willems and Van Enckevoort (2009)	Van Enckevoort and Thijssen (2003)		
Xanten	Hinz (1975)	Precht (2001)	Precht (2008)	Otten and Ristow (2008)
Cologne	Hellenkemper (1975)	La Baume (1972)	Bechert (1982)	Carroll (2003)
Tongeren	Vanderhoeven (2006)	Vanvinckenroye (1975)	Vanderhoeven (2001)	
Tournai	Mertens (1977)	Brulet (1994)		
Cassel	Leman (1984)			
Trier	Cüppers (1990)			
Mainz	Cüppers (1990)	Baatz and Herrmann (1982)	Heising (2008)	Jung (2009)
Wiesbaden	Czysz (1994)	Schoppa (1974)		
Heddernheim	Baatz and Herrmann (1982)	Huld-Zetsche (1994)		
Dieburg	Baatz and Herrmann (1982)	Schallmayer (1981)		
Worms	Cüppers (1990)	Grünwald (1986)		
Ladenburg	Sommer (1997)	Eingartner (2011)	Kaiser and Sommer (1994)	
Speyer	Cüppers (1990)	Bernhard (2002)		
Pforzheim	Filtzinger, Planck, and Cämmer (1986)	Damminger (2002)		
Baden Baden	Filtzinger, Planck, and Cämmer (1986)	Knierriem, Löhnig, and Schallmayer (1994)	Mayer-Reppert and Rabold (2003)	
Brumath	Flotté and Fuchs (2010)			
Riegel	Filtzinger, Planck, and Cämmer (1986)	Dreier (1997)		
Rottweil	Planck (1972)	Sommer (1999)	Filtzinger (1995)	Rüsch (1981)
Bad Wimpfen	Filtzinger, Planck, and Cämmer (1986)	Filgis (2001)		
Rottenburg Neuenstadt am Kochen	Filtzinger, Planck, and Cämmer (1986)	Rottenburg		
Kempten	Kortüm (2003)	Kortüm (2004)		
	Czysz, Dietz, Fischer, Kellner (1995)	Kleiss (1962)	Weber (2000)	Weber (2000b); Weber (1995)
Ausburg	Ortisi (2001)	Czysz, Dietz, Fischer, Kellner (1995)	Bakker (2005)	Kellner (1976); Ohlenroth (1954); Schaub and Bakker (2001).

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